

Global conference on animal welfare: an OIE initiative

Paris, 23–25 February 2004

PROCEEDINGS



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Foreword

It was an honour and a privilege for the Office international des épizooties (OIE) to welcome to this global conference on animal welfare so many distinguished government officials, the chief veterinary officers of numerous OIE member countries and their delegations, eminent scientists, and private sector professionals working in the production, processing and distribution of animal products, as well as numerous animal welfare activists and members of the public keen on the worldwide promotion of new rules on the relationship between humans and animals.

The OIE, as the World Organisation for Animal Health, is proud to have received a unanimous mandate from its 166 member countries to become the leading international organisation in the field of animal welfare.

How has this situation come about?

The OIE was created in 1924, thus before the United Nations Organisation, by 28 countries. These countries were seeking international cooperation to try to bring an end to the outbreaks of serious diseases that were ravaging their livestock. They wanted a mutual undertaking whereby infected countries would inform the others in the event of an animal health emergency so that they could take protective action. They also wanted information on the most effective methods to combat these devastating animal diseases. Today, these objectives of providing sanitary and scientific information in the veterinary field still feature among our organisation's priority missions, in terms of diseases affecting animals alone and also those transmissible to humans.

In 1994, the agreements that led to the creation of the World Trade Organisation (WTO) made specific provisions for the management of sanitary and phytosanitary problems (SPS agreement) relating to the risks posed by commodities in international trade. At that time, a consensus was reached that member countries' own legislation to protect against the introduction of pathogens should be science-based and avoid imposing unjustified sanitary barriers as a hidden form of trade protection. The OIE's standards, guidelines and recommendations were then designated as the international reference in the field of animal diseases and zoonoses. The OIE was chosen notably due to the fact that its standards are exclusively science-based.

As the implementation of these standards can pose a problem for developing countries, the OIE acts out of solidarity with them by supporting the efforts they have made in animal disease surveillance and control aimed at reducing poverty, improving food safety and gaining access to international markets, from which the majority of them are currently excluded, notably for sanitary reasons.

Developed countries continue to suffer occasional animal disease outbreaks, most commonly caused by the accidental introduction of pathogens, a phenomenon widely linked to the globalisation of trade. Nevertheless, the majority of the most serious animal diseases spread primarily in developing countries.

Diseases are a major and persistent factor in animal suffering and combating them worldwide must be a priority for all those seeking to improve animal welfare. It was primarily with this in mind that our member countries sought to extend the OIE's mandate to include animal welfare, even though this field is not specifically covered by the WTO agreements.

Among the OIE's other mandates are, for example, wildlife diseases and their links with diseases in other animals and with human diseases. Some emerging zoonoses are indeed linked to wild animals and the challenge facing us in this field is to fully understand these phenomena so as to combat them more effectively and preserve wildlife.

Our mandates also include food safety, the OIE working closely with the Codex Alimentarius Commission to develop standards relating to the prevention of hazards during the production

and transport of food animals, so as to avoid risks to consumers. This is also a new field for the OIE and in due course we shall also have to examine whether inappropriate production or transport conditions can subsequently affect the safety of food products of animal origin.

Other activities carried out by the OIE may also have a direct or indirect effect on animal welfare.

The OIE codes, which contain standards on animal health and conditions governing international trade in animals and animal products, also include model sanitary certificates intended to accompany animals or animal products. These certificates are issued by the official veterinary services of exporting countries and provide official certification that the requirements of importing countries have been met. They are essential in order to avoid introducing diseases into importing countries.

The OIE codes also specify what methods should be used in order to enable a member country to be considered free from a given animal disease. For some diseases, stamping out applied to the infected sites is sometimes unavoidable, but the OIE makes every effort to provide for the use of vaccination for disease prevention purposes, in order to limit, wherever possible, the application of stamping out. When there is no alternative to stamping out, the OIE recommends using methods designed to reduce animal suffering as far as possible. This topic was discussed in detail during the conference, as well as methods of slaughtering animals for human consumption. In the latter field, the OIE has in recent months begun organising the scientific and cultural discussions that will be needed so as to take legitimate religious and cultural concerns into account.

On a more general note, the OIE's aims in the field of animal welfare consist first and foremost of proposing guidelines for adoption by our International Committee. Member countries wishing to engage in trade in animals or animal products will then be able to use these guidelines on a bilateral basis. They can also be used as a national, regional or international foundation for negotiations within the private sector, for example when drawing up specifications between distributors or restaurant chains and producers in order to satisfy consumer requirements.

Ultimately, these guidelines will also lead to a gradual harmonisation of existing national and regional legislation and in particular will lend support to the many countries that do not yet have legislation in this field, enabling them to use the OIE's recommendations as the foundation for their future legislation.

Over and above its role in providing technical recommendations, the OIE must also conduct a new mission that has not yet been undertaken at worldwide level, namely to convince all the decision-makers in its member countries of the need to take into account the human-animal relationship in favour of a greater respect for animals. This also implies an internal evolution within our organisation. While maintaining our functions of excellence and rigour in the field of technical recommendations and expertise, we must become more open than in the past to the world of education and training, the private sector, consumers and the public at large. The organisation of this global conference on animal welfare has been a momentous development in this respect.

Bernard Vallat
Director-General of the OIE

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Prof. David Fraser
Dr Sira Abdul Rahman
Dr Herbert Schneider
Ms Emma Stamper
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Mrs Mariugenis Oudin
Mr Jean-Pierre Croiziers

Setting the scene

Résumé

L'OIE – Bases historiques et scientifiques et perspectives d'avenir

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Mots clés: OIE, Organisation mondiale de la santé animale, bien-être animal, santé animale, l'Organisation mondiale du commerce

L'Office international des épizooties (OIE) a été créé en 1924 par 28 pays membres. Son existence est donc antérieure à la création des Nations unies, dont il ne fait pas partie. Bien que son acronyme soit conservé pour des raisons historiques, l'OIE s'appelle maintenant Organisation mondiale de la santé animale, 166 pays ayant à ce jour adhéré à l'Organisation.

L'OIE s'est initialement consacré à la transparence de la situation zoonitaire mondiale, établie sur la base de méthodes de diagnostic et de connaissances scientifiques incontestables. Cette mission, toujours prioritaire, donne des outils à tous les pays membres pour se protéger de l'introduction de pathogènes sur leur territoire, qu'ils menacent seulement les animaux ou bien l'homme et les animaux en même temps (zoonoses).

Cette responsabilité a évolué à la suite de la reconnaissance de l'OIE par l'Organisation mondiale du commerce (OMC) en tant qu'organisation de référence pour garantir la sécurité sanitaire du commerce mondial des animaux et de leurs produits (viande, lait, cuirs et peaux, œufs...) tout en évitant des barrières sanitaires injustifiées.

Dans ce domaine, l'OIE s'associe aux efforts qui sont faits pour aider les pays en développement à accéder au marché international tout en exerçant un devoir de solidarité à leur égard. Ce devoir de solidarité s'applique à la lutte contre les maladies prioritaires et à leur éradication. Ces maladies sont un puissant facteur de souffrance animale, d'augmentation de la pauvreté et de risques de maladies d'origine alimentaire. L'OIE dispose d'un réseau de plus de 150 laboratoires

de référence dans le monde pour procurer aux pays membres les meilleures méthodes pour éliminer les maladies.

L'OIE a été mandaté plus récemment pour prendre en compte les maladies des animaux sauvages, mais aussi les problèmes de sécurité sanitaire des aliments. Dans ce domaine c'est le *Codex Alimentarius* qui est reconnu en priorité par l'OMC, mais l'OIE élabore les normes concernant tous les risques à prévenir pendant la phase d'élevage et de transport des animaux destinés à être consommés.

Il est apparu enfin à nos pays membres que le lien entre la santé des animaux et leur bien-être était si évident que l'OIE devait devenir aussi la référence internationale en matière de protection des animaux. De plus, d'autres activités courantes de l'OIE, comme les questions sanitaires relatives au commerce international des animaux vivants, la définition des normes en matière d'éradication des épizooties (dépopulation des élevages infectés, protection des autres animaux par la vaccination) ou de modalités de certification des viandes et produits après abattage des animaux, peuvent avoir un lien important avec le bien-être animal.

Nous sommes donc maintenant mandatés par nos pays membres pour préparer un socle de guide de bonne conduite international en faveur des animaux en traitant en priorité les sujets ayant un lien avec les activités évoquées ci-dessus. Nous sommes ainsi amenés à pénétrer aujourd'hui encore plus au cœur de la relation homme-animal. L'OIE, autrefois ouverte à un cercle d'experts et de spécialistes, se rapproche maintenant des consommateurs et des citoyens.

Resumen

La OIE: Historia, ciencia y perspectivas del futuro

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Palabras clave: OIE, Organización Mundial de Sanidad Animal, bienestar animal, sanidad animal, Organización Mundial del Comercio

La Oficina Internacional de Epizootias (OIE) fue creada en 1924 por veintiocho países miembros. Su existencia es pues anterior a la creación de las Naciones Unidas y no forma parte de esta institución. Aunque se conserve el acrónimo por motivos históricos, la OIE se denomina actualmente Organización Mundial de Sanidad Animal. A fecha de hoy, 166 países se han afiliado a la Organización.

La OIE se dedicó en un inicio a la transparencia de la situación zoonosaria mundial, establecida sobre la base de métodos de diagnóstico y de conocimientos científicos irrefutables. Esta misión, que sigue siendo prioritaria, facilita a todos los países miembros las herramientas de protección contra la introducción de agentes patógenos en su territorio, tanto si constituyen una amenaza sólo para los animales como para el hombre y los animales al mismo tiempo (zoonosis).

Esta responsabilidad ha evolucionado tras el reconocimiento de la OIE por la Organización Mundial del Comercio (OMC) en tanto que organización de referencia para garantizar la seguridad sanitaria del comercio mundial de animales y de los productos que de ellos deriven (carnes, leche, cueros y pieles, huevos, etc.) y a la vez para evitar obstáculos sanitarios injustificados.

En este ámbito, la OIE se asocia a los esfuerzos desplegados para ayudar a los países en desarrollo a acceder al mercado internacional ejerciendo un deber de solidaridad para con ellos. Dicho deber se aplica a la lucha contra las enfermedades prioritarias y a su erradicación. Estas enfermedades son un poderoso factor de sufrimiento animal, de aumento de la pobreza y de riesgos de enfermedades de origen alimentario. La OIE dispone de una red de más de ciento cincuenta

Laboratorios de Referencia en el mundo para ofrecer a los países miembros los mejores métodos para eliminar las enfermedades.

Más recientemente, se ha confiado a la OIE la misión de integrar en su labor las enfermedades de los animales silvestres así como los problemas de seguridad sanitaria de los alimentos. En este campo, la OMC reconoce con prioridad al Codex Alimentarius, pero la OIE elabora las normas relativas a todos los riesgos que se han de evitar durante la etapa de cría y de transporte de los animales destinados al consumo.

Los países miembros han considerado, en última instancia, que el vínculo entre la salud de los animales y su bienestar era tan obvio que la OIE debía convertirse en la referencia internacional en materia de protección de los animales. Además, otras actividades corrientes de la OIE, como las cuestiones sanitarias relativas al comercio internacional de animales vivos, la definición de normas en materia de erradicación de epizootias (despoblación de fincas infectadas, protección de los demás animales por medio de la vacunación) o de modalidades de certificación de las carnes y otros productos tras el sacrificio de los animales, pueden tener un vínculo importante con el bienestar animal.

Así pues, los países miembros nos han encomendado preparar las bases de una guía de buena conducta internacional en favor de los animales tratando prioritariamente los temas que se refieren a las actividades antes mencionadas. Todo ello nos conduce hoy día a adentrarnos aún más en el centro de la relación hombre-animal. La OIE, antes abierta a un círculo de expertos y de especialistas, se acerca ahora a los consumidores y a los ciudadanos.

Abstract

The OIE – Historical and scientific background and prospects for the future

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Keywords: OIE, World Organisation for Animal Health, animal welfare, animal health, World Trade Organisation

The Office international des épizooties (OIE) was created in 1924 by 28 member countries. Its existence therefore precedes the creation of the United Nations, an organisation to which it does not belong. Although the acronym has been retained for historical reasons, the OIE is now called the World Organisation for Animal Health, with 166 member countries currently in the organisation.

The OIE initially worked for transparency in the worldwide animal health situation, based on incontestable diagnostic methods and scientific knowledge. This mission, which is still a priority, gave all member countries the means to protect themselves against the introduction of pathogens on to their territory, whether they threatened only animals or both people and animals (zoonoses).

This responsibility was extended when the OIE was recognised by the World Trade Organisation (WTO) as the reference organisation for guaranteeing the sanitary safety of world trade in animals and animal products (meat, milk, leather and skins, eggs, etc.), whilst avoiding unjustified sanitary barriers.

In this field, the OIE is supporting efforts to help developing countries to access international markets as part of its duty of solidarity towards them. This obligation of solidarity applies to combating and eradicating priority diseases. Such diseases are a major factor affecting animal suffering, poverty and the risk of food-borne diseases. The OIE has a network of more than 150 reference laboratories throughout the world to provide

its member countries with the best means of eliminating diseases.

The OIE was more recently mandated to deal with diseases in wild animals and food safety. In this field, the Codex Alimentarius is given priority recognition by the WTO, but the OIE drafts standards relating to all 'animal production food safety' risks, including those related to the transport of animals destined for consumption.

It also became evident to our member countries that the link between animal health and animal welfare was so clear-cut that the OIE should also become the international reference organisation in the field of animal protection. Other day-to-day activities of the OIE, such as health issues relating to international trade in live animals, the definition of standards for the eradication of epizootic diseases (depopulation of infected farms, protection of other animals by vaccination) and certification procedures for meat and products from slaughterhouses, could also have a strong link with animal welfare.

We have now been mandated by our member countries to prepare the basis for an international guide to good practice for animals, giving priority to issues associated with the abovementioned activities.

We have therefore had to delve deeper into the heart of the relationship between animals and humans. The OIE, formerly open only to a circle of experts and specialists, is now moving closer to consumers and citizens.

The OIE process, procedures and international relations

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Summary

Among the several primary objectives of the World Organisation for Animal Health (OIE), is the setting of animal health standards for safeguarding international trade. In order for countries and their stakeholders to maximise the benefits of globalisation, they must become familiar with, and must adhere to, the rights and obligations set out by the World Trade Organisation, under the Agreement on Sanitary and Phytosanitary Measures (WTO-SPS). Under the obligations of this agreement, countries must adhere to the standards, guidelines and recommendations established by the OIE, on matters related to animal health and zoonoses. Countries are also encouraged to actively participate in the standard-setting process of the OIE. Only after implementing these requirements and after strengthening the veterinary infrastructures, including surveillance and monitoring systems, will countries be able to fully benefit from these new international trade rules. For the purpose of this conference, it is important to be familiar with the standard-setting process within the OIE. Animal welfare is not one of the disciplines identified by the SPS agreement for purposes of international trade. However, animal welfare is an important subject within the work plan of the OIE, and one that needs to be addressed in the same scientific manner as the development of guidelines for the protection of animal health. This paper will attempt to explain the mechanisms employed by the OIE to accomplish this objective.

Keywords: animal welfare, Office international des épizooties, World Trade Organisation, guidelines, standards

Globalisation is becoming a force that is revolutionising international trade and in particular that of animals and animal products. This increase in agricultural trade has promising benefits towards the improvement of countries' and peoples' economies. During the 1990s, the international community made significant progress towards improved fairness and transparency on how to conduct international trade in a way that ensures safety in the protection of public, animal and plant health, while avoiding unjustified restrictions. However, in order to fully benefit from these new trade opportunities, countries have to adapt their infrastructures to the modern rules of the game. In order to accomplish this, there will be a greater demand for closer collaboration and interdependence between the private and the public sector. The future of governments and the competitiveness of their industries will depend on how well the structures and operations can adapt to meet the requirements set out by the WTO-SPS agreement.

Historically, the General Agreement for Tariffs and Trade (GATT) had been working on the reduction and elimination of tariffs and subsidies in trade. During the Uruguay Round of the 1980s and early 1990s, the GATT turned its attention to agriculture and particularly the sanitary aspects of agricultural trade. One of the most significant outcomes of the Uruguay Round was the transformation of the GATT into the WTO, and the signing in 1994 of the Agreement on the Application of Sanitary and Phytosanitary Measures. This agreement sets out the legal framework for international trade that is safe for the health of the public, animals and plants. As the WTO is not a scientific and technical organisation, it recognises and relies on three relevant standard-setting organisations for delivering these standards. For purposes of animal health, including zoonoses, the WTO recognises the OIE standards, guidelines and recommendations as the foundation for a country's sanitary measures.

The WTO-SPS agreement recognises rights, obligations and special provisions as well as dispute-settlement procedures. Under rights, the WTO recognises that each country has the sovereign right to determine its own level of protection when establishing sanitary measures on imports. However, these rights are accompanied by clear obligations. The importing country, if it chooses to deviate from existing international standards and recommendations when establishing its sanitary measures, has to justify these actions through a transparent and scientifically-based risk analysis process. Countries adhering to international standards and recommendations when developing their import policies do not have to justify these through a risk analysis. Countries must also ensure that sanitary measures are applied only to the extent necessary to protect animal health and do not constitute arbitrary or unjustified discrimination between members. Sanitary measures applied on imports cannot be more restrictive than those applied at a national level.

Among the more important special provisions of the WTO-SPS agreement, are those on harmonisation, equivalence, assessment of risk and appropriate level of protection, regionalisation, transparency and notification. Recommendations on the implementation of all these provisions are found in the so-called horizontal chapters of the OIE code.

Possibly the most important of all special provisions of the agreement is the one on harmonisation. Under harmonisation, the agreement encourages its members to harmonise their sanitary measures on as wide a basis as possible, by basing them on international standards, guidelines and recommendations, where they exist, thereby conferring extreme importance to the standards set by the OIE.

Under equivalence, the agreement indicates that countries shall accept the measures of other members as equivalent, even if these differ from their own and from those applied by others trading in the same product. For this purpose, the exporting country must objectively demonstrate to the importing country that the proposed measures achieve its level of protection. The intent of this provision is to encourage trading partners to focus their attention on the desired objec-

tives of the measure rather than comparing measures for sameness.

Under the assessment of risk and the determination of the appropriate level of sanitary protection, the agreement indicates that members must ensure that their sanitary measures are based on an assessment, appropriate for the circumstances, taking into account the risk-assessment techniques developed by the relevant standard-setting organisations, the OIE in this case. This process is aimed at minimising negative trade effects, it has to utilise all available scientific evidence and it must be done in a consistent manner. Members shall take into account as relevant economic factors the potential damage in terms of loss of production or sale in the event of the entry, establishment and spread of disease, the cost of control or eradication, and the relative cost-effectiveness of alternative approaches to limiting risks. However, the economic impact on national producers such as loss of revenue resulting from competition by the imports cannot be considered in the risk determination.

Under regionalisation, the agreement indicates that sanitary measures must be adapted to the geographical and ecological characteristics of an area or region, taking into account the level of prevalence of a disease. It specifies that members shall recognise disease-free areas and areas of different health status within the territory of a country. However, it is the responsibility of the exporting country to provide the necessary evidence in order to demonstrate objectively to the importing country that such an area is safe, and is likely to remain safe. For this purpose, reasonable access shall be given to the importing country for inspection and testing. The OIE provides detailed recommendations on how to apply these provisions of regionalisation and more recently on compartmentalisation, which is a separation of animal sub-populations on the basis of management practices rather than geographical factors.

Under transparency and notification, the agreement indicates that members are required to notify changes in their sanitary measures, such as changes in import regulations, in a timely manner. For this purpose, each country has to notify the WTO with enough

time prior to these entering into force, except for urgent circumstances, so that exporting countries can adapt their products to meet the new requirements. Countries basing the import measures on international standards do not have to notify the WTO. Each country must also establish a single enquiry point which is responsible for providing answers to all reasonable questions regarding regulatory changes and specific sanitary requirements.

In order for a country to benefit from the provisions of the WTO-SPS agreement, when conducting international trade in animals and animal products, it must have a high-quality veterinary service, with a robust surveillance and monitoring system, in order to provide assurances of its sanitary status and to minimise and manage risks. However, recently most veterinary services have experienced decreases in their infrastructure due to budgetary cuts, shifts in priorities from animal health towards food safety, as well as suffering from the successes of eradication of diseases in those cases where the services have been funded primarily through eradication campaigns. Veterinary authorities must therefore look for alternative approaches to strengthening their veterinary services. The accreditation of private veterinarians and para-veterinarians for specific functions has often been used in order to strengthen existing infrastructures.

Countries should actively participate in all major objectives of the OIE. The more important ones include: (a) ensuring transparency in reporting of the animal health status worldwide; (b) safeguarding world trade in animals and animal products by establishing standards; (c) contributing to the expertise and encouraging solidarity in the control and eradication of animal diseases; and (d) improving the overall veterinary infrastructures. We are now looking at a new objective requiring active participation by all interested stakeholders. It is our expectation that, among the outcomes of this conference, we will have stakeholder recommendations as to how to jointly advance this important objective within the OIE process.

The standards, guidelines and recommendations set by the OIE can be found in several official documents. The Terrestrial Animal Health Code (Code) contains the standards

on diseases of mammals, birds and bees. The Manual of Standards for Diagnostic Tests and Vaccines complements the Code. The Aquatic Animal Health Code (Fish Code) contains the standards on diseases of fish, mollusks and crustaceans, and it is complemented by the Diagnostic Manual for Aquatic Animal Diseases.

These codes contain, in addition to disease-specific standards, recommendations on horizontal topics such as import risk assessment, regionalisation, surveillance and monitoring, and evaluation of veterinary services, as well as obligations and ethics in international trade. In the future work plan, the Code Commission has identified the following priorities for this coming year: guiding principles in animal welfare, review of existing disease chapters for inclusion of food safety recommendations, and further harmonisation of the Terrestrial Code with the Aquatic Code.

Countries and their stakeholders can improve their participation and maximise their benefits in international trade by working closely and more strategically with their OIE delegates. Draft standards and texts are distributed during the course of the year by the OIE to the delegates. These delegates and their veterinary services can then set up mechanisms for sharing these with interested stakeholders and specialists interest groups, and then receive input to be included in the national response to the OIE. While standards are only adopted during the international committee meeting in May of each year, the most profitable opportunity for submission of comments is in response to the Code Commission reports during the course of the year.

While I have described the scope and the procedures applied within the OIE for the purposes of developing animal health standards, these need to be taken into account when developing guidelines on animal welfare. It is the international recognition earned by the OIE and the scientific approach in developing standards that will provide the foundation for the development and acceptance of science-based animal welfare guidelines by all OIE member countries. These guidelines and recommendations will become the foundation for bilateral trade agreements between OIE member countries.

Résumé

L'OIE: fonctionnement, procédures et relations internationales

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Mots clés: bien-être animal, santé animale, Office international des épizooties, Organisation mondiale du commerce, lignes directrices, normes

Il s'avère important de préparer le terrain en vue de la conférence mondiale sur le bien-être animal en décrivant les procédures servant à l'établissement des normes ainsi que les relations internationales de l'OIE. L'OIE est reconnu mondialement comme chef de file pour le développement et la dissémination de lignes directrices et de recommandations en matière de bien-être animal. Cette reconnaissance est due principalement à son rôle officiel en tant qu'organisation chargée de l'établissement de normes concernant la santé animale et les zoonoses, dans le cadre de l'Organisation mondiale du commerce (OMC). Il existe un lien étroit entre la santé animale et le bien-être des animaux.

Bien qu'actuellement, il n'y ait pas d'accord sur les obligations internationales entre les partenaires commerciaux quant à la façon d'aborder le bien-être animal, les vétérinaires et professions connexes ont l'obligation professionnelle d'aborder ce thème. Les normes de l'OIE en matière de santé animale fournissent des recommandations spécifiques sur la manière d'éradiquer les maladies et de prévenir la transmission d'agents pathogènes résultant du commerce. Ces recommandations sont déjà utilisées comme fondement de l'établissement de méthodes appropriées pour l'élevage animal.

Les droits et obligations concernant le commerce international, tels que définis dans l'accord sur les mesures sanitaires et phyto-

sanitaires de l'Organisation mondiale du commerce, découlent des normes établies par l'OIE. Les autorités vétérinaires des 166 pays membres de l'OIE participent activement au développement et à la mise à jour de normes internationales. Celles-ci sont discutées et adoptées chaque année par les membres lors de la session générale.

Le directeur général de l'OIE, en s'appuyant sur ces fondements et cette infrastructure, a habilité un groupe d'experts en santé animale, internationalement reconnu, pour former un groupe de travail sur le bien-être animal. Ce groupe consultatif a apporté son aide à l'OIE et a identifié un plan de travail prioritaire pour les prochaines années.

Lors de la conférence, les procédures concernant l'établissement de normes en santé animale seront décrites de façon détaillée, et on expliquera la façon dont les pays membres participent et fournissent des commentaires. Le thème du bien-être animal a suscité beaucoup d'intérêt, non seulement de la part des pays membres, mais également de la part d'autres personnes concernées qui étaient jusqu'à ce jour familiers avec l'OIE et ses activités. Par conséquent, on devra examiner la façon dont ce vaste auditoire, y compris les représentants d'organisations non gouvernementales (ONG), pourra être incorporé dans le développement actif de lignes directrices sur le bien-être animal.

Resumen

La OIE: funcionamiento, procedimientos y relaciones internacionales

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Palabras clave: bienestar de los animales, Oficina Internacional de Epizootias, Organización Mundial del Comercio, directrices, normas

Es importante disponer el escenario para la conferencia sobre el bienestar animal describiendo los procedimientos de normalización y las relaciones internacionales de la OIE. En su calidad de organismo líder responsable de la elaboración y difusión de directrices y recomendaciones sobre el bienestar animal, la OIE se ha ganado el reconocimiento internacional. Esto se debe principalmente a su papel oficial como instancia de reglamentación en materia de sanidad animal y de zoonosis de conformidad con la Organización Mundial del Comercio (OMC). Existe un fuerte vínculo entre la sanidad y el bienestar de los animales.

Aunque actualmente no existe ninguna obligación reconocida a nivel internacional sobre cómo tratar el bienestar animal en el marco del comercio internacional, los veterinarios y otros profesionales de campos afines tienen la obligación de abordar esta cuestión. Las normas zoosanitarias de la OIE brindan recomendaciones específicas sobre cómo luchar contra las enfermedades y erradicarlas, y cómo evitar la transmisión de agentes patógenos como consecuencia del comercio. No obstante, ya se pueden considerar como el fundamento para una zootecnia apropiada.

Los derechos y obligaciones del comercio internacional estipulados en el Acuerdo de Medidas Sanitarias y Fitosanitarias (MSF) se rigen por las normas establecidas por la OIE.

Los 166 países miembros de la OIE participan activamente, por medio de los Jefes de los Servicios Veterinarios, en la elaboración y actualización de normas internacionales. Cada año, durante la sesión general, los países miembros proceden a la deliberación y adopción de las propuestas.

Tomando en cuenta estas bases y la infraestructura, el Director General de la OIE convocó a un grupo de expertos en bienestar animal de renombre internacional para constituir el Grupo de Trabajo sobre el Bienestar de los Animales. Este grupo asesor ha brindado una orientación a la OIE y ha identificado un plan de trabajo con prioridades para los próximos años.

Durante la presentación, se dará una descripción detallada del proceso de reglamentación zoosanitaria y se explicará la manera en que los países miembros formulan observaciones y participan. El tema del bienestar animal ha despertado un interés considerable no sólo entre los países miembros, sino también entre las partes interesadas, que ahora están familiarizadas con la OIE y sus actividades. En consecuencia, será necesario estudiar la manera de incorporar a esta audiencia cada vez más numerosa, incluidas las ONG y los representantes del sector industrial, en la elaboración activa de directrices para el bienestar animal.

Abstract

The OIE process, procedures and international relations

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Keywords: animal welfare, Office international des épizooties, World Trade Organisation, guidelines, standards

It is important to set the stage for the conference on animal welfare by describing the standard-setting procedures and international relations of the OIE. The OIE has gained the international recognition as the leading organisation responsible for developing and disseminating guidelines and recommendations on animal welfare. This has been obtained primarily due to its official role as the standard-setting organisation for animal health and zoonoses under the World Trade Organisation (WTO). There is a strong linkage between animal health and the well-being of animals.

While there are currently no internationally agreed obligations on how to address animal welfare between trading countries, there is a professional obligation by veterinarians and other related professionals to address the subject. The OIE standards on animal health provide specific recommendations on how to control and eradicate diseases and on how to prevent the transmission of pathogens as a result of trade. However, these already serve as the foundation for proper animal husbandry.

The rights and obligations for international trade set out in the WTO's Sanitary and Phytosanitary (SPS) Agreement are guided by

the standards set by the OIE. The 166 member countries of the OIE actively participate, through their Chief Veterinary Officers, in the development and updating of international standards. These are then discussed and adopted each year by the members during the general session.

It is on this foundation and infrastructure that the Director-General of the OIE convened a group of internationally recognised experts on animal welfare to form the Animal Welfare Working Group. This advisory group has provided guidance to the OIE and has identified a prioritised work plan for the next several years.

During the presentation, there will be detailed descriptions of the animal health standard-setting process as well as an explanation on how members provide comments and participate. The subject of animal welfare has attracted considerable interest not only from members, but also from other stakeholders, now familiar with the OIE and its activities. Therefore, there will be a need to examine how this broader audience, including NGOs and industry representatives, can be incorporated in the active development of animal welfare guidelines.

The OIE animal welfare strategic initiative – Progress, priorities and prognosis

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Summary

After inclusion of animal welfare as an important strategic initiative in the OIE third strategic plan, for the period 2001–05, an initial issues and options background paper was commissioned to assist in defining the degree and scope of OIE involvement. This paper was considered by an international ad hoc expert group and a permanent international animal welfare working group and was subsequently established to define and coordinate OIE animal welfare activities. The working group drafted a mission statement plus policies and guiding principles, developed a work programme for 2003 and reviewed the scope, drafted terms of reference and identified potential members for four separate ad hoc groups to address initial priority areas. Encouraging progress has been made over a relatively short two-year time period and recommendations made have been fully supported by all OIE member countries at the 2002 and 2003 annual general session meetings. The challenge is now to maintain this momentum and harness the support of all appropriate stakeholders. A commitment to consultation with and communication to all interested parties both within and external to the OIE will be critical to future success.

Keywords: animal welfare, animal health, Office international des épizooties, public policy, standards, trade policy, trade barriers, World Trade Organisation

Animal welfare has emerged as a significant international public policy issue over the last two to three decades. The debate regarding the role of animal welfare in international trade has also attracted considerable attention, in political and policy circles, since the conclusion of the Uruguay Round in 1994 and the formation of the WTO (2–9), (12–18).

There is an unfortunate tendency to underestimate the importance of animal health in relation to animal welfare. The prevention and control of epizootic disease, in all species, makes a major contribution to animal welfare, and veterinarians, in general, and the OIE, in particular, plays a vital role in this regard. The OIE animal health code includes a chapter on minimum animal welfare standards for trade and a standard-setting role has also been played in respect of animal transportation. The publication, *Animal welfare and veterinary services*, was included in the OIE scientific and technical review series in 1994 (11).

Historically, there has been no single international organisation with a standard-setting

role or a responsibility for the provision of expert advice on animal welfare, although a number of organisations and agencies have a significant interest in the area. By the late 1990s, there was thus growing support for the proposal that the OIE could be an appropriate, established intergovernmental organisation to address animal welfare issues and seek agreement on international standards.

In recognition of the increasing scientific, political and public attention being given to animal welfare, the topic was identified as an important emerging issue during the preparation of the 2001–05 OIE third strategic plan (4). At the 69th session of the OIE International Committee in 2001, approval was given to the Director-General's work programme to implement the recommendations of the strategic plan. In this programme, it was agreed to establish a new department specifically responsible for international trade in animals and animal products, which would provide extra resources to address new topics including food safety

and animal welfare. It was agreed that initial scoping documents would be commissioned to assist in defining the degree and scope of OIE involvement with these new topics.

At the 70th general session in 2002, specific recommendations concerning the scope, priorities, policies, functions and modus operandi for the OIE's involvement in animal welfare were presented. These were fully endorsed by all 162 member countries and are described, in detail, in Resolution XIV (1). These recommendations were based on the work of an ad hoc international expert group. In recognition of the need to approach this new area of activity in a disciplined manner, and the need to involve relevant stakeholders, the recommendations specifically included the following.

- The OIE should develop a detailed vision and strategy to recognise the complex nature of animal welfare issues.
- The OIE should then develop policies and guiding principles to provide a sound foundation from which to elaborate specific recommendations and standards.
- The OIE should establish a working group on animal welfare to define and coordinate activities and the working group should advise on specific tasks to be carried out by ad hoc groups.
- In consultation with the OIE, the working group should develop a detailed operational plan for the initial 12 months, addressing the priority issues identified.
- The working group and its ad hoc groups should consult with non-governmental organisations (NGOs) having a broad international representation and make use of all available expertise and resources, including those from academia, the research community, industry and other relevant stakeholders.

In making its recommendations, the ad hoc group made the following important observations.

- Animal welfare is a complex issue with important scientific, ethical, economic, cultural and political dimensions.
- There is a need to develop a vision, mission and strategy plus policies and guid-

ing principles to underpin future standards and recommendations.

- Animal health is a vital input to animal welfare but not the sole determinant.
- Non-veterinary scientific input is important.
- Science-based incremental change is important.
- Stakeholder involvement (both industry and NGOs) is important.
- The nature and magnitude of the communications challenge and expectations have been considered.
- A permanent working group needs to be established so progress is made regarding these recommendations.

A permanent animal welfare working group was established to define and coordinate OIE animal welfare activities and first met in October 2002. The group's initial priority was issues relating to the use of animals in agriculture and aquaculture, with transportation, humane slaughter and killing for disease control purposes to be addressed first, followed by housing and management issues.

The working group developed a work programme for 2003, which addressed the following issues:

- the development of statements of mission, guiding principles and policies for adoption by the international committee;
- the development of expertise and stakeholder databases;
- hosting of an OIE global animal welfare conference scheduled for late February 2004;
- development of terms of reference, scope and membership of ad hoc groups, with meetings of four ad hoc groups during 2003 proposed;
- increasing awareness of animal welfare in undergraduate teaching;
- increasing awareness of animal welfare research needs and funding requirements;
- promoting collaboration among academic and research institutions;
- developing a communications plan addressing both internal and external audiences; and lastly,

- identification of future activities and emerging issues (e.g. animal biotechnology and aquaculture).

The working group developed a work programme for 2003 and reviewed the scope, drafted terms of reference, and identified potential members for four separate groups covering land transport, sea transport, humane slaughter (including religious slaughter) and humane killing for disease control purposes. Initial meetings of all four groups have now taken place. The working group also recommended that the OIE continue to work with the International Air Transport Association (IATA) and the Animal Transport Association (ATA) on air transport issues.

In the area of communication, the OIE has issued a number of press releases and is progressively adding relevant animal welfare information to the OIE website. Members of the working group have also submitted articles to veterinary and agriculture publications and a paper entitled 'Science-based animal welfare standards: The international role of the Office international des épizooties' was presented at the April 2003 UFAW conference on 'Science in the service of animal welfare' (4).

The following draft mission statement, guiding principles and policies have been prepared.

OIE mission

The draft mission is:

- to provide international leadership in animal welfare through the development of science-based standards and guidelines, the provision of expert advice and the promotion of relevant education and research.

The OIE will achieve this mission through:

- promotion of science-based understanding of animal welfare;
- utilisation of appropriate expertise;
- consultation with all relevant stakeholders;
- recognition of regional and cultural dimensions;
- liaison with academic and research institutions; and lastly
- use of communication tools appropriate to all relevant audiences.

Guiding principles for animal welfare

The draft guiding principles follow.

- There is a critical relationship between animal health and animal welfare.
- The internationally recognised 'five freedoms' (freedom from hunger, thirst and malnutrition; freedom from fear and distress; freedom from physical and thermal discomfort; freedom from pain, injury and disease; and freedom to express normal patterns of behaviour) provide valuable guidance in animal welfare.
- The internationally recognised 'three Rs' (reduction in numbers of animals, refinement of experimental methods and replacement of animals with non-animal techniques) provide valuable guidance for the use of animals in science.
- The scientific assessment of animal welfare involves diverse elements which need to be considered together, and selecting and weighing these elements often involves value-based assumptions which should be made as explicit as possible.
- The use of animals in agriculture and science, and for companionship, recreation and entertainment, makes a major contribution to the well-being of people.
- The use of animals carries with it a duty to ensure the welfare of such animals to the greatest extent practicable.
- Improvements in farm animal welfare can often improve productivity and hence lead to economic benefits.
- Equivalent outcomes (performance criteria), rather than identical systems (design criteria), should be the basis for comparison of animal welfare standards and guidelines.

Policies

In undertaking its animal welfare role, the OIE seeks to adhere to the following draft policies.

- It will make appropriate use of international scientific expertise in the development of animal welfare guidelines and standards.

- In addition to the use of established consultation processes, the OIE will consult with NGO and industry stakeholder interests, which can demonstrate a broad-based international approach to issues.
- It will encourage the teaching of animal welfare and animal ethics in veterinary and other undergraduate curricula around the world.
- It will encourage the identification of animal welfare research needs and the provision of public and private sector funds to address these needs.
- It will encourage science-based methods to assess animal welfare outcomes.
- The OIE's initial priorities for animal welfare will be animals in agriculture and aquaculture particularly relating to transport, humane slaughter, and humane killing for disease control purposes.
- It will take into account regional and cultural dimensions.
- It will use communication tools appropriate to audiences.

In pursuing this important initiative, particular attention is being given to the following specific points:

- the important OIE international leadership role;
- that the OIE is aware of the importance of involvement of a broad range of stakeholders;
- that the OIE recognises the need to ensure standards are relevant to all member countries;
- the widespread support from international industry groups, NGOs and international science organisations;
- the major scientific and communications challenge which this initiative presents;
- that adequate resourcing is essential to maintain initial momentum and ensure early achievements;
- that the OIE sees future standards contributing to improved animal welfare internationally and that are valuable for bilateral agreements.

The need for international leadership in respect of animal welfare policy and standards has been evident for some time and is likely to be an expanding core role for the OIE in the decades ahead. International scientific and professional organisations such as the International Society for Applied Ethology (ISAE) and World Veterinary Association (WVA) have confirmed their interest in working closely with the OIE, as have international industry and animal welfare advocacy organisations. Other organisations such as the FAO and World Bank are also taking an interest in animal welfare and in March 2003, the Government of the Philippines hosted an intergovernmental meeting attended by 25 countries to discuss the possible development of a United Nations Declaration on Animal Welfare.

There is also, of course, a significant increase in interest in animal welfare at university undergraduate and postgraduate level, and the establishment of animal welfare chairs in universities in Canada, the USA, the EU, New Zealand and Australia, over the last few decades, has provided academic and research direction to this interest. Progress in the area of animal welfare will, of course, be a case of 'evolution not revolution' based on the principle of incremental change management (10). It is vitally important that all such changes be science-based and validated, be implemented over realistic time frames and take account of economic and cultural factors.

The OIE has made encouraging progress over a relatively short two-year period. The challenge is now to maintain this momentum and harness the support of all OIE member countries and stakeholders. A commitment to consultation with, and communication to, all interested parties both within, and external to, the OIE will be critical to success.

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Résumé

L'initiative stratégique de l'OIE dans le domaine du bien-être animal: les progrès, les priorités et les attentes

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Eu égard à l'intérêt accru que suscite le bien-être animal auprès des scientifiques, des politiques et du public, ce sujet a été défini comme étant un nouvel enjeu important lors de la préparation du troisième plan stratégique de l'OIE 2001-2005. Le programme de travail du directeur général visant à appliquer les recommandations du plan stratégique a été entériné pendant la 69^e session du comité international de l'OIE en 2001. Il a été convenu dans le cadre du programme de créer un nouveau service spécialement chargé du commerce international des animaux et des produits d'origine animale, qui permettra de disposer de moyens supplémentaires pour aborder de nouveaux sujets, notamment la sécurité sanitaire des aliments et le bien-être animal. Il a été décidé que des documents d'orientation initiaux seront commandés pour aider à définir le degré et la portée de l'intervention de l'OIE sur ces nouveaux thèmes.

Des recommandations spécifiques concernant le champ d'action, les objectifs prioritaires, les politiques, la finalité et les modalités de l'intervention de l'OIE dans le domaine du bien-être animal ont été présentées lors de la 70^e session générale de 2002. Ces recommandations s'inspirent du travail accompli par un groupe ad hoc d'experts internationaux et ont été totalement approuvées par l'ensemble des 162 pays membres. Compte tenu de la nécessité d'aborder ce nouveau domaine d'activité de manière disciplinée et d'impliquer les parties prenantes, on relève parmi les recommandations que:

- l'OIE doit élaborer un projet et une stratégie détaillés permettant de prendre en

compte la nature complexe des questions liées au bien-être animal;

- l'OIE doit élaborer les politiques et les principes directeurs constituant la base du développement de recommandations et normes spécifiques;
- l'OIE doit créer un groupe de travail sur le bien-être animal chargé de définir et coordonner les activités. Le groupe de travail doit émettre un avis sur les tâches spécifiques incombant aux groupes ad hoc;
- le groupe de travail doit élaborer en concertation avec l'OIE un schéma directeur détaillé pour les douze premiers mois portant sur les questions prioritaires identifiées;
- le groupe de travail et ses groupes ad hoc doivent se concerter avec les organisations non gouvernementales (ONG) offrant une large représentativité internationale et s'appuyer sur toutes les compétences et ressources disponibles, notamment dans les milieux universitaires, de la recherche, des filières de production et d'autres parties prenantes.

Un groupe de travail permanent sur le bien-être animal a été créé pour définir et coordonner les activités de l'OIE dans le domaine du bien-être animal; il s'est réuni pour la première fois en octobre 2002. Le groupe de travail a rédigé un exposé des missions ainsi que des politiques et principes directeurs, élaboré un programme de travail pour 2003; il a examiné le champ d'action, élaboré un projet de mandat de quatre groupes ad hoc et identifié leurs membres potentiels. Ces groupes s'inté-

resseront au transport par voie terrestre, au transport par voie maritime, à l'abattage dans des conditions décentes (y compris l'abattage rituel) et à l'élimination à des fins sanitaires. Les réunions préliminaires des quatre groupes ont eu lieu. Les recommandations du groupe de travail, ainsi que la proposition de tenir une conférence mondiale sur le bien-être animal ont été pleinement approuvées lors de la 71^e session générale de 2003.

L'OIE a accompli des progrès encourageants en deux ans, soit un laps de temps relativement court. La difficulté consiste désormais à maintenir cette dynamique et à tirer parti du soutien de l'ensemble des parties prenantes et des pays membres de l'OIE. La volonté d'agir en concertation avec toutes les parties intéressées et de communiquer avec elles sera essentielle pour la réussite de cette entreprise.

Resumen

Iniciativas estratégicas de la OIE para el bienestar animal: progresos, prioridades y pronósticos

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Como reconocimiento al creciente interés científico, político y público que despierta el bienestar de los animales, el tema de esta conferencia se identificó como una cuestión emergente importante durante los preparativos del tercer plan estratégico de la OIE 2001-2005. En la sesión n° 69 del Comité Internacional de la OIE en el año 2001, se adoptó el programa de trabajo propuesto por el Director General para implementar las recomendaciones del plan estratégico. En dicho programa, se acordó establecer un nuevo departamento responsable concretamente del comercio internacional de animales y de sus productos derivados, lo que ofrecería recursos adicionales para tratar nuevos temas incluyendo la seguridad sanitaria de los alimentos y el bienestar de los animales. Se acordó así mismo encargar la redacción de documentos de ámbito inicial para ayudar a definir el grado y alcance del compromiso de la OIE sobre estos nuevos temas.

En la sesión general n° 70, en 2002, se formularon recomendaciones específicas relativas al alcance, prioridades, políticas, funciones y *modus operandi* de la implicación de la OIE en pro del bienestar animal. Estas recomendaciones estaban basadas en el trabajo de un grupo *ad hoc* de expertos internacionales y fueron refrendadas en su totalidad por los 164 países miembros. Al reconocerse la necesidad de enfocar esta nueva área de actividad de manera disciplinada e involucrar a las partes interesadas pertinentes, las recomendaciones específicas sostenían que:

- la OIE debía desarrollar una visión y estrategia detalladas para reconocer la

índole compleja de las cuestiones relacionadas con el bienestar de los animales;

- la OIE debía adoptar, en consecuencia, políticas y principios directores que ofrecieran unas bases sólidas para la formulación de recomendaciones y normas específicas;
- la OIE debía establecer un grupo de trabajo sobre el bienestar de los animales para definir y coordinar las actividades; este grupo de trabajo debía asesorar a los grupos *ad hoc* en tareas específicas que les serían encargadas;
- en consulta con la OIE, el grupo de trabajo debía establecer un plan operativo detallado para las doce primeros meses que abordara las cuestiones prioritarias identificadas; y, por último,
- el grupo de trabajo y sus grupos *ad hoc* debían consultar con las organizaciones no gubernamentales que tuviesen una amplia representación internacional y emplear todos los conocimientos y recursos disponibles, incluidos aquellos de los medios académicos y de investigación, de la industria y demás partes interesadas.

Para definir y coordinar las actividades de la OIE en este ámbito, se estableció un grupo de trabajo permanente sobre el bienestar de los animales cuya primera reunión se celebró en octubre de 2002. El grupo de trabajo redactó una declaración de cometido, políticas y principios rectores, elaboró el programa de trabajo para 2003 y examinó su alcance, redactó los términos de referencia e identificó a los eventuales miembros de los cua-

tro grupos de trabajo. Estos grupos abordarán las cuestiones del transporte terrestre, del transporte marítimo, del sacrificio en condiciones decentes (incluido el sacrificio religioso) y la reducción de la población a fin de controlar las enfermedades. Las reuniones iniciales de los cuatro grupos se celebraron según lo previsto, y las recomendaciones formuladas junto con la propuesta de celebrar una conferencia mundial sobre el bienestar

de los animales se aprobaron en su totalidad en la sesión general n° 71, en 2003.

La OIE ha realizado avances prometedores en un período relativamente corto de dos años y el reto ahora consiste en conservar este ímpetu y aprovechar el soporte de todos los países miembros de la OIE y de todas las partes interesadas. Un compromiso de consulta y de comunicación con todas las partes interesadas será vital para el éxito.

Abstract

The OIE animal welfare strategic initiative – Progress, priorities and prognosis

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Keywords: animal welfare, animal health, Office international des épizooties, public policy, standards, trade policy, trade barriers, World Trade Organisation

In recognition of the increasing scientific, political and public attention being given to animal welfare, the topic was identified as an important emerging issue during the preparation of the 2001–05 OIE third strategic plan. At the 69th session of the OIE International Committee in 2001, approval was given to the Director-General's work programme to implement the recommendations of the strategic plan. In this programme, it was agreed to establish a new department specifically responsible for international trade in animals and animal products, which would provide extra resources to address new topics including food safety and animal welfare. It was agreed that initial scoping documents would be commissioned to assist in defining the degree and scope of OIE involvement with these new topics.

At the 70th general session in 2002, specific recommendations concerning the scope, priorities, policies, functions and modus operandi for the OIE's involvement in animal welfare were presented. These recommendations were based on the work of an ad hoc international expert group and were fully endorsed by all 164 member countries. In recognition of the need to approach this new area of activity in a disciplined manner, and the need to involve relevant stakeholders, the recommendations specifically included the following:

- that the OIE should develop a detailed vision and strategy to recognise the complex nature of animal welfare issues;
- that the OIE should then develop policies and guiding principles to provide a sound foundation from which to elabo-

rate specific recommendations and standards;

- that the OIE should establish a working group on animal welfare to define and coordinate activities and the working group should advise on specific tasks to be carried out by ad hoc groups;
- that in consultation with the OIE, the working group should develop a detailed operational plan for the initial 12 months, addressing the priority issues identified; and lastly,
- that the working group and its ad hoc groups should consult with non-governmental organisations (NGOs) having a broad international representation and make use of all available expertise and resources, including those from academia, the research community, industry and other relevant stakeholders.

A permanent animal welfare working group was established to define and coordinate OIE animal welfare activities and first met in October 2002. The working group drafted a mission statement plus policies and guiding principles, developed a work programme for 2003 and reviewed the scope, drafted terms of reference, and identified potential members for four separate ad hoc groups. These groups will address land transport, sea transport, humane slaughter (including religious slaughter) and population reduction for disease control purposes. Initial meetings of all four groups have taken place. These working group recommendations, plus a proposal to hold a global animal welfare conference were fully endorsed at the 71st general session in 2003.

The OIE has made encouraging progress over a relatively short two-year time period and the challenge is now to maintain this momentum and harness the support of all

OIE member countries and stakeholders. A commitment to consultation with, and communication to, all interested parties will be critical to success.

Global animal welfare challenges: Some perspectives

The role of the veterinarian in animal welfare – A global perspective

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Summary

The veterinary profession is dedicated to animal welfare. In many countries, veterinarians make a very special declaration when they graduate and they spend their professional lives working under a code of ethical behaviour that emphasises their commitment to animal welfare. There have been significant societal changes in the last century. These have resulted in increased demands for animal products and at the same time increasing expectations for the welfare of animals. In this paper a major focus will be on the veterinary role in animal welfare and the challenges that veterinarians face.

Keywords: veterinarian, ethics, five freedoms, societal expectation, obligation, economic perspective

The veterinary obligation

The World Veterinary Association (WVA) has developed a number of policies that relate to animal welfare. These have been developed through a process of global consultation with its members. In addition, the WVA has been actively working with global organisations such as the Office international des épizooties to ensure that the veterinary profession is actively involved in the development of official animal welfare policies.

Whilst recognising that human welfare in many cases requires dominance over animals, the British Veterinary Association (BVA) believes that this should be exercised with responsibility and with due consideration and compassion for the animals concerned.

The BVA believes that the five freedoms (as set out by the UK Farm Animal Welfare Council(2)) are essential to the welfare of any animal kept in captivity:

1. freedom from hunger or thirst
2. freedom from thermal or physical discomfort
3. freedom from pain, injury and disease
4. freedom from fear and distress
5. freedom to indulge in normal behaviour patterns.

The profession has a responsibility to take active steps to safeguard animal welfare. Following the promises taken at registration, veterinary surgeons should assess the welfare aspects of all husbandry systems, and make appropriate recommendations.

The BVA maintains that animal welfare should be based on scientific, veterinary, ecological, ethical and ethological considerations. Although recognising that neither sentiment nor economic factors can be entirely divorced from welfare, they should never be paramount in its consideration.

In Europe, the Danish Veterinary Association (DVA) has as an objective in its constitution to improve the welfare and well-being of animals. It works nationally as well as internationally (within Europe) with animal welfare issues.

The DVA is represented in the national committee which is a governmental body where government and non-governmental organisations (NGOs) meet to discuss national and international regulations on animal welfare to clarify or discuss the official Danish position. The DVA is represented in a permanent governmental review group with other NGO representatives as well as consumers and scientists. The task of the group is to analyse various animal welfare issues and make statements on what is ethically acceptable and what is unacceptable in society. The DVA is also represented in a small governmental advisory group which advises govern-

ment on regulations needed for the introduction of new species for farming purposes. The DVA is represented in the specialist group that supports the legal system in court cases on violations of animal welfare regulations.

The DVA calls stakeholders and specialists on a regular basis to develop policies on animal welfare. The most recent three papers written have involved the keeping of horses which will now lead to a Danish regulation; the legal position of the cat in society, which may lead to a regulation with mandatory identification of domestic cats to distinguish them from stray cats, and other protective measures for cats; and a review on keeping pigs leading to a number of recommendations to improve farming, transport and slaughtering procedures.

The American Veterinary Medical Association (AVMA) has a long-term concern for, and commitment to, the welfare, humane treatment and care of animals. Consequently, the AVMA develops position statements for use by members of the profession, and to provide information for the general public, that address the well-being of animals. Current scientific knowledge, professional judgement, and ethical, philosophical, and moral values inherent to the veterinary profession provide the basis for these positions.

Animal welfare is a human responsibility that encompasses all aspects of animal well-being, including proper housing, management, nutrition, disease prevention and treatment, responsible care, humane handling, and when necessary, humane slaughter.

Veterinarians may observe cases of animal neglect or abuse. When these situations cannot be resolved through education, it is the responsibility of the veterinarian to report such cases to the appropriate authorities. Disclosure may be necessary to protect the health and welfare of animals and people and in some States, there is legal protection for those veterinarians involved.

In their publication, *The veterinary role in animal welfare* (1), the American Veterinary Medical Association encourages all veterinarians to offer their time and special expertise to promote animal welfare. This may include:

- playing a key role in the development of guidelines and standards that ensure proper stewardship of animals;

- providing high quality medical care for animals; and
- participating in educational efforts aimed at promoting the well-being of animals.

In New Zealand, veterinarians are required to use their 'knowledge and skills for the benefit of society through the enhancement of animal health and welfare, the relief of animal suffering, the promotion of public health and the advancement of veterinary knowledge'.

In New Zealand, the code of professional conduct (4) states that the role of veterinarians in society is:

- to prevent and relieve animal suffering; and
- to maintain and enhance the health, productivity and well-being of animals.

This is reinforced in the guiding principles of the code of professional conduct by 'veterinarians have a special duty towards animal welfare and to alleviate animal suffering'. The first section of the code which is devoted to animal welfare, states that veterinarians 'must promote a standard of care that ensures that the needs of animals are met by themselves and those in charge... of the care of the animals'.

There are global differences in animal welfare practices that are based on cultural perspectives and beliefs. The veterinary profession must respect the different practices, but base its recommendations and practices on the science of animal welfare. Veterinarians must promote animal welfare based on science.

Society

Society has an expectation that a professional approach is applied to the management and maintenance of animal welfare. The veterinary profession interprets this as its societal obligation to meet this expressed need.

The societal views on animal welfare are changing and there is an increasing awareness of the values accorded animals. This has been driven by two major developments: the rapid urbanisation of the human population over the last half century coupled with increasing affluence. Urban populations are removed from animals used to provide feed for them. They mostly do not understand how animals are kept and increasingly people do not un-

derstand how food is derived from animals. Urban people keep companion animals that tend to be treated more like members of the family, and this has led to the expectation that all animals are well treated. Furthermore, the increasing affluence of many urban populations places increasing pressure on this. They no longer need to pursue simply the cheapest possible food products but seek additional various 'quality' characteristics (including safety, origin and environmental provenance) of which animal welfare standards is one.

The intensification of animal production industries over the last 50 years in an effort to meet the economies of scale required to feed the rapidly growing human population consequent on the developments in animal production technology and the competitive pressures to achieve lower production costs has seen spectacular improvements in animal health and production, but it has been accompanied in some cases by increasing challenges to the welfare of the farmed animals. This has been very well expressed by Professor John McNerney (3) from the University of Exeter and the Farm Animal Welfare Council in England. He has described the conflicts and choices between animal welfare and productivity from an economic perspective (Figure 1). These conflicts and choices are encountered by veterinarians in their daily work.

From a personal perspective, each member of society will view this in their own way (Figure 2). Given their particular values and preferences, each would choose a point somewhere between 'maximal' welfare (B) which emphasises the animals' interest and 'minimal' welfare (D) which is dominated by the human economic interest. The 'producer view' is represented as closer to this latter point, but not because livestock farmers have little concern for animal welfare. Rather, it is because there are no explicit financial rewards for high animal welfare. All the economic signals for commercial success (and survival) force a focus on achieving high animal productivity.

The declines in animal welfare standards have now been recognised (especially in sectors such as intensive pig and poultry production) and there are active lobbying and legislation programmes that are redressing

this decline — as well as markets developing for higher-priced 'welfare friendly' products. Examples include changes to improve the cages for laying hens, to banning tethering and crating of pigs, and the measures taken to improve transportation and the price premiums for 'free-range' and organic livestock products.

Veterinary expertise

Veterinarians have a long and very intense training that gives them an extensive range of expertise. The range of veterinary skills includes:

- anatomy and physiology;
- behaviour;
- nutrition;
- health and illness, that is, what is normal and what is abnormal.

This enables veterinarians to have an extremely good understanding of what an animal needs, what it is being exposed to, how it is reacting and what is required to return it to a good welfare state and be maintained at that level.

When veterinarians enter their profession at graduation, they accept the challenge to look after not only their clients' interests. They make the commitment to ensure that good animal welfare is achieved. Veterinarians must recognise the conflicting pressures of global demand for food and the societal expectation that animals will be treated in an acceptable manner in production.

The range of veterinary involvement in the welfare of animals encompasses:

- the use of animals for companionship, work, production, teaching, research, recreation and sport;
- knowledge of the relevant animal welfare legislation;
- advising clients, employees, co-workers and any other people that they come into contact with;
- procedures involving animals;
- handling animals;
- wild and domestic animal management;

- emergencies;
- clinical and hospital services;
- animal slaughter plants and processing industries;
- live animal transport;
- regulatory services;
- active involvement in animal welfare organisations such as the World Society for the Protection of Animals (WSPA) and the Society for the Prevention of Cruelty to Animals (SPCA) in a number of countries.

So how do we as veterinarians maximise both animal welfare and productivity to satisfy the societal demand for good animal welfare and the global demand for food?

We work on behalf of both constituencies in the area of farming production animals and yet in any one farming situation we also work for a farmer who has an economic need to operate a successful, commercially sustainable business. This means that we must look at strategies that will attempt to satisfy all the stakeholders. We need to increase overall production efficiency in the context of global demand. We need to ensure that the animals are well looked after and that their welfare is not compromised beyond an acceptable level.

We should be trying to improve animal welfare whenever we can. We should be helping the farmer stay in business to meet not just the demands for his or her personal need to make a living, but to also meet the overall demand for animal products from that area of land or water.

This requires the veterinarian to take a balanced view of all the needs to be met and advise the farmer accordingly. Remember that the veterinarian has an obligation to maintain and where needed, improve animal welfare. This may require veterinarians to introduce and/or supervise new technologies. The graphs (Figures 3 to 5) from McInerney demonstrate this challenge.

Conclusion

Veterinarians belong to the only profession that has a holistic animal welfare expertise because of their extensive education. Their professional ethics oblige veterinarians to work

for the benefit of animal welfare and society. The demographics and demands of the human population over the last 50 years and the foreseeable future are placing a major focus on animal welfare for people around the world. Veterinarians have an obligation to address animal welfare issues to meet the societal expectation being expressed most forcefully by the increasingly affluent urban population.

The challenge for all veterinarians is to actively participate and contribute to the advancement of animal welfare for all animals on this planet.

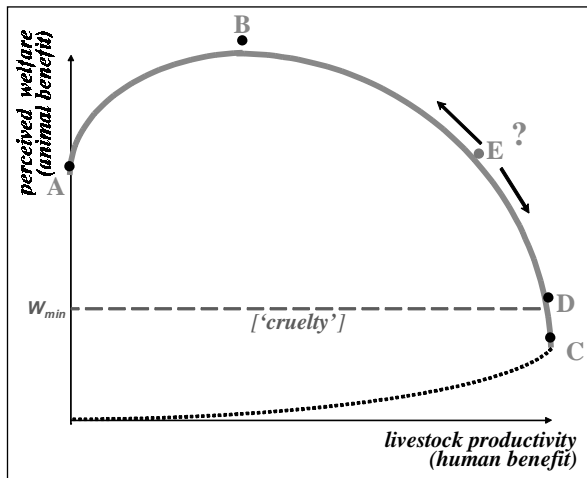
Acknowledgements

I acknowledge my colleagues around the world, in particular Dr Lars Holsaae (DVA), Helena Cotton (BVA), Dr Arthur Tennyson (AVMA), Dr Gail Golab (AVMA) and in particular, Professor John McInerney for his most relevant portrayal of the conflicts and choices faced every day by veterinarians and for his specific input into the preparation of this paper.

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Figure 1:
Conflicts and choices between animal welfare and productivity



‘Natural’ welfare (point A):

Animal-centred.
Presumably what the animal itself would choose. Animal free to act as its natural instincts dictate – feeding pattern, social grouping, mating behaviour, rearing young, establishing and maintaining territory, aggression and imposing social dominance, and the like. Clearly inconsistent with domestication and commercial production.

‘Maximal’ welfare (point B):

Animal-centred.
The best conditions attainable are offered within the (unnatural) environment of domestication. Apart from some restrictions on natural behaviour, the best possible food, shelter, space, physical comfort, health, safety, social interaction, etc. are provided. Farm animals are treated as well as we would treat our children. Not a realistic benchmark for economic livestock production.

‘Desired’ or ‘appropriate’ welfare (point E):

This is human-centred (i.e. determined by human preferences).

Some trade-offs are made between animal welfare and meeting human interests.

Costs to the animals occur because:

- we initiate and manage their lives;
- we subject them to things they would not choose; and,
- in most cases, we kill them when it suits us.

Husbandry conditions leave us feeling broadly comfortable with how animals are treated.

They correspond to an overall image of the desired or appropriate welfare standard acceptable in our society. Represents the economic optimum position defined in its widest sense.

‘Minimal’ welfare (point D):

This is human-centred.

Major trade-offs are made between animal welfare and human interests.

The husbandry conditions are at the lower limit that is socially acceptable – below it the animals are regarded as being subject to cruelty.

This is the boundary beyond which the exploitation of animals would be regarded universally in society as being unacceptable.

The concept of minimal welfare is practically the most amenable to definition and specification – its standards are embodied in much formal legislation and related legal instruments designed to safeguard animal welfare.

Welfare breakdown (point C):

The animals’ production is extended to the extreme of its biological capability.

Pushing the animals beyond this point would cause catastrophic breakdowns in health and productivity.

This leads ultimately to collapse of the livestock production system.

Figure 2:
Personal values and preferences in the definition of ‘appropriate’ welfare

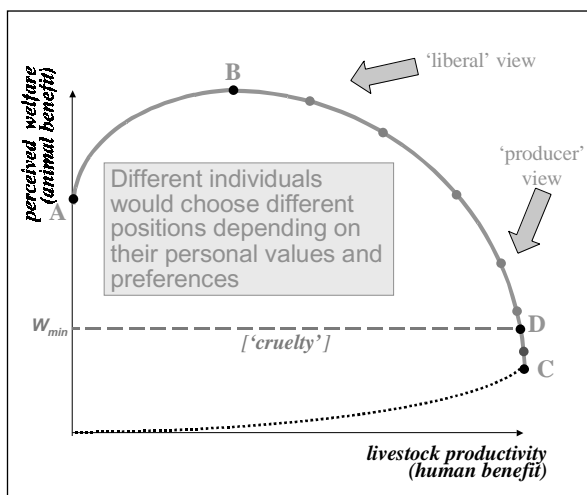


Figure 3:
Improving welfare implies some reduction in productivity

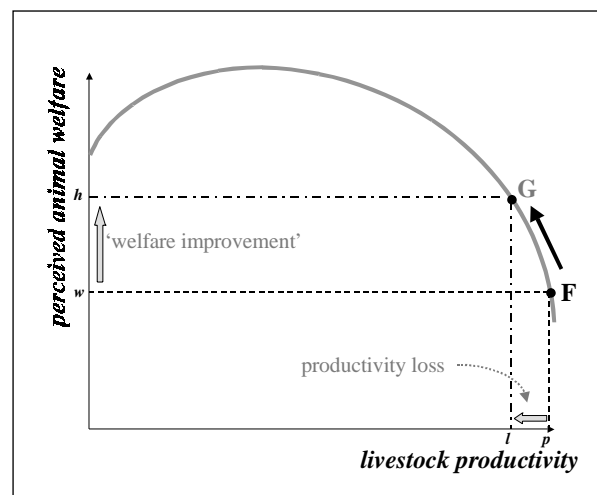


Figure 4:
New technology can improve welfare with no loss in productivity

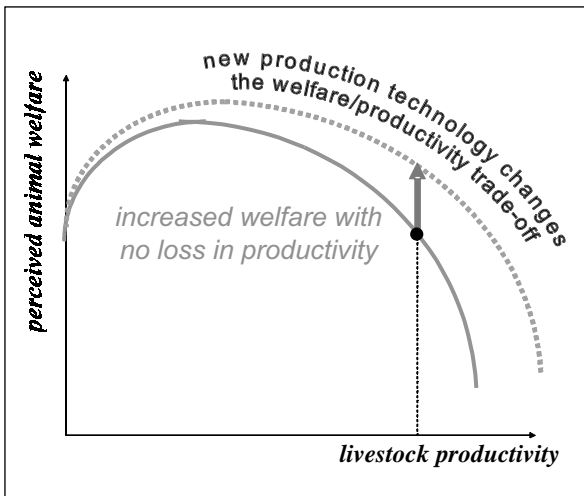
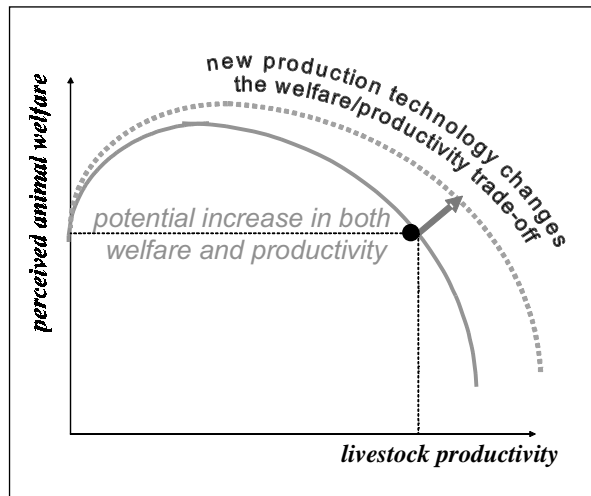


Figure 5:
Improving both welfare and productivity



Résumé

Le rôle des vétérinaires dans le bien-être animal – Une perspective mondiale

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Mots clés: médecin vétérinaire, éthique, *five freedoms*, devoir, perspective économique

La profession vétérinaire s'attache à protéger le bien-être animal. Le respect d'un code de comportement éthique qui souligne leur adhésion à cette cause est une constante dans la vie professionnelle des vétérinaires.

La société estime qu'il faudrait que l'organisation et le maintien du bien-être animal relèvent d'une approche professionnelle. La profession vétérinaire considère donc que répondre à ce besoin exprimé s'inscrit parmi ses obligations envers la société.

Ces cinquante dernières années, l'intensification des systèmes industriels de production animale, s'efforçant de répondre aux besoins d'économies tarifaires permettant de satisfaire les besoins alimentaires d'une population humaine en augmentation rapide, a vu des progrès considérables s'accomplir en matière de

santé et de productions animales, mais elle s'est toutefois accompagnée dans certains cas d'une dégradation des normes en matière de bien-être animal. Les vétérinaires sont confrontés quotidiennement à l'antagonisme et au choix entre bien-être animal et productivité.

Les vétérinaires doivent rechercher des stratégies susceptibles de satisfaire toutes les parties prenantes. Nous devons augmenter la production globale dans le contexte de la demande mondiale. Nous devons veiller à ce que l'on prenne soin des animaux et à ce que l'atteinte à leur bien-être ne dépasse pas un niveau acceptable.

Tous les vétérinaires sont mis au défi de participer activement et de contribuer à l'amélioration du bien-être de tous les animaux de la planète.

Resumen

El papel del veterinario en el bienestar animal: perspectiva global

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Palabras clave: veterinario, ética, *five freedoms*, obligación, perspectiva económica

La profesión veterinaria está dedicada al bienestar de los animales. En su ejercicio profesional, los veterinarios trabajan según un código de conducta ética que resalta de su compromiso con el bienestar animal.

La sociedad espera que se aplique un enfoque profesional a la gestión y mantenimiento del bienestar animal. Para la profesión veterinaria, esto se traduce como una obligación social para satisfacer esta necesidad manifestada.

La intensificación en los sectores de producción animal durante los últimos cincuenta años, en un esfuerzo por lograr las economías de escala requeridas para alimentar a la población humana en rápido crecimiento, ha asistido a mejoras espectaculares en la sanidad y producción animales, pero en algunos

casos se ha acompañado de un declive en las normas de bienestar animal. Los veterinarios hacen frente a conflictos y elecciones entre bienestar animal y productividad en su labor diaria.

Así pues, a los veterinarios nos corresponde buscar estrategias con miras a satisfacer a todas las partes interesadas. Necesitamos mejorar la producción general en el marco de la demanda mundial. Necesitamos garantizar que los animales reciban un cuidado adecuado y que su bienestar no se vea comprometido más allá de un nivel aceptable.

El reto que se impone a todos los veterinarios es participar de manera activa y contribuir al avance del bienestar de todos los animales en este planeta.

Abstract

The role of the veterinarian in animal welfare – A global perspective

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Keywords: veterinarian, ethics, five freedoms, societal expectation, obligation, economic perspective

The veterinary profession is dedicated to animal welfare. Veterinarians spend their professional lives working under a code of ethical behaviour that emphasises their commitment to animal welfare.

Society expects that a professional approach be taken to the management and maintenance of animal welfare; the veterinary profession considers that it has an obligation to society to meet this expectation.

The intensification of animal production industries over the last 50 years (in an effort to meet the economies of scale required to feed the rapidly growing human population), has seen spectacular improvements in animal health and production, but it has

been accompanied in some cases by a decline in animal welfare standards. The conflicts and choices between animal welfare and productivity are encountered by veterinarians in their daily work.

Veterinarians must look at strategies that will attempt to satisfy all the stakeholders. We need to increase overall production in the context of global demand. We need to ensure that the animals are well looked after and that their welfare is not compromised beyond an acceptable level.

The challenge for all veterinarians is to actively participate and contribute to the advancement of animal welfare for all animals on this planet.

Animal welfare in the veterinary curriculum

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Summary

This document describes the background to animal welfare teaching in Argentina, reviewing the history of this new discipline being taught in some veterinary schools and faculties, which has emerged as a cross-cutting discipline with a multidisciplinary syllabus.

Keywords: animal welfare, curriculum, teaching, faculties of veterinary medicine

The concept of animal welfare was born in the 1980s at a workshop held in England which brought together possibly the only spokespersons on the subject at the time (1)

One of the questions to emerge even then, posed by Professor Wood-Gush, (School of Agriculture of Edinburgh University, United Kingdom), has still not been answered: Where should animal welfare go in the veterinary curriculum? Should it be linked with the other subjects or should it be taught separately?

The first ever unit in academe to be created specifically for teaching and researching into animal welfare was the Colleen Macleod Animal Welfare Chair in the Department of Clinical Veterinary Medicine of the University of Cambridge in the United Kingdom in 1986, held by Professor Donald 'Don' Broom.

The syllabus for the creation of a veterinary science degree course at Argentina's University of Salvador (USAL) was presented and approved in 1993. At that time it was the first veterinary school, not only in the country but also on the continent, to make animal welfare a compulsory subject, and currently it is subject to the same requirements for obtaining the degree as any of the other 36 subjects in the veterinary science syllabus. In general, teaching at USAL is divided into two four-month periods. Animal welfare is taught during the first period (in 2004, from 19 March to 25 June) at a rate of one 4-hour class a week for 15 weeks, making a total of 60 hours.

To ensure that all professors apply the concept of animal welfare so as to build the pro-

fessional skills of students, the professors were notified that they must comply with the following:

- (a) the World Veterinary Association's animal welfare and ethology policies;
- (b) the Spanish version of the Canadian Council on Animal Care's 'Guide to the care and use of experimental animals' (2);
- (c) the Universal Declaration for the Welfare of Animals by the World Society for the Protection of Animals (WSPA) (3);
- (d) national legislation on animal protection (4).

This subject or syllabus was designed as a tool to help students to acquire attitudes and develop skills by understanding their ethical responsibility towards animals other than humans. This allows knowledge to create these attitudes and skills. The main aim of this knowledge is to make students:

1. appreciate the moral value of animals;
2. acknowledge that animals have the capacity to suffer and feel pain;
3. understand that we have an obligation to determine or recognise this pain, in order to alleviate or remove it.

Animal welfare should not be taught by focusing on a particular species or discipline, which is why the following three basic premises must be borne in mind.

1. Some animal welfare aspects are common to all species (pain).

2. Some aspects, developed in one species (cattle) or breeding type (laboratory animal), can be applied to other species or systems (euthanasia).
3. The knowledge contributed to animal welfare by the various disciplines (such as physiology, pathology or medicine) crosses the dividing line between species (medicine of small animals, large animals, laboratory animals and so forth).

Historically, part of the objection many teaching institutions have to incorporating animal welfare as a specific subject has been based on the hypothesis that animal welfare, like ethics, is a conceptual part of all subjects, making it unnecessary to distinguish it as a separate subject.

This is not the case, as pointed out by the World Veterinary Association in its policies on animal welfare and ethology, which state the following:

'C. Animal welfare in veterinary education.

In order to establish an informed position on animal welfare, appropriate to the veterinary professions, it is considered essential to have this subject dealt with in undergraduate education.

For this purpose the following principles should be adopted.

- (a) The subject of animal welfare should be incorporated as a discipline in its own right within the veterinary curriculum.
- (b) The overall scientific discipline of animal welfare should incorporate applied aspects of ethology, bioethics and the concepts of suffering and well-being.
- (c) The subject should be given at the preclinical level of veterinary education, although it is recognised that it must have extensions into the clinical level' (5).

In Argentina, animal welfare has recently been included in a proposal on the profile defining the future teaching of veterinary science. In the opinion of Argentina's National

Council of Deans of Veterinary Science ⁽¹⁾ teaching must include at least the following aspects:

'To train students scientifically and technically to enable them to understand and resolve problems relating to the health, welfare and production of land and aquatic animals; public health; food protection, quality and technology and environmental protection.' (6)

In this context, and analysing the core subjects in each of the thematic areas (basic sciences, higher education and general education), the Council of Deans proposes that the subject of animal welfare should come under the heading of general education, along with deontology, forensic medicine, legislation, technical English and rural and urban sociology. These subjects, as a whole, would account for between 5 and 10 % of a proposed minimum total of 3 600 teaching hours.

It is interesting to note that the abovementioned document, which demonstrates how little is known about animal welfare when one analyses the course content of each of the subjects, includes animal welfare as a subheading of sociology, without giving any description of a core syllabus.

'Rural and urban sociology: general sociology. Its contribution to the profession. Changes in Argentina's rural environment. Social structure. Groups. Family. Special types of sociology: Latin American, Argentine and rural. Colonisation in Argentina. Urban and rural society. Animal welfare' (7).

Although this document is incomplete by any standards, it does nevertheless represent a step forward out of the historical ignorance most universities have of the subject, at least in Argentina.

It is very important to heed the views of PANVET, the Pan-American Veterinary Science Association, as expressed by its then President, Francisco Trigo Tavera:

'Panvet has coordinated and spearheaded veterinary medicine on the continent for more than 50 years, in addition to organising the biannual veterinary sciences congresses. Panvet's mission is to serve the continent's

⁽¹⁾ This council includes all Argentina's State-run universities but excludes all its private universities, such as the University of Salvador (USAL), even for analysing academic issues.

veterinary profession by promoting its rights and setting out its obligations and quality standards. It promotes the development of veterinary sciences in the areas of human and animal health, animal welfare and animal production and productivity' (8).

In seeking to set out veterinary quality standards, it promotes the development of animal welfare, on an equal standing with production and productivity.

In the European Union, the FVE (Federation of Veterinarians of Europe) and the EAEVE (European Association of Establishments for Veterinary Education) have started to study the teaching of key subjects such as the well-being of livestock during transport, and the interaction between these animals and the environment, in order to meet the requirements of international trade, modern technology and European Union policy (4).

We must consider these aspects in relation to professional accreditation, which is understood to mean the recognition of an individual's level of knowledge and skills for practising his or her profession. This is an issue that has preoccupied society for thousands of years, starting in Babylonia in 2100 BC (in accordance with King Hammurabi's Laws, a 'veterinarian' was fined in the first ever recorded case of punishment for malpractice) and in the Kahun papyrus in 1900 BC (10).

The 'Standard profile for accrediting a pan-American veterinarian' (11) was drawn up to establish the precise framework for the accreditation of the veterinary profession in Latin America. This profile specifies the knowledge, skills, expertise, values and attitudes to be used as the reference framework for the evaluation process.

According to this profile, knowledge is understood to mean:

- (a) the ability to seek information;
- (b) the recognition of the existence of a problem;
- (c) the ability to resolve that problem.

Skills are understood to mean:

- (a) the ability to handle different species of animal;

- (b) the ability to observe states of health and illness in these animals and to diagnose these states;
- (c) the ability to communicate with those responsible for caring and treating animals, or with colleagues via scientific reports.

Attitudes should be moulded on the job. These attitudes must be learned and not passively acquired, and it is the responsibility of every professor (all of whom should be imbued with the concept of animal welfare) to influence the students' entire career, to enable them to think properly and to adopt the correct attitude (12).

Animal welfare is specifically mentioned in the following.

- Knowledge of the doctor of veterinary medicine (knowledge of the processes of medico-surgical care). To apply fundamental knowledge of medicine, surgery and scientific methodology to diagnose and treat diseases in animal species useful to man:
 - promotion of animal welfare.
- Skills and expertise of the doctor of veterinary medicine (to possess intellectual skills and expertise to identify, resolve and prevent problems relating to the health of animal species useful to man, based on assessing situations and taking decisions):
 - skills and expertise in the process of medico-surgical care;
 - ability to resolve behavioural problems in order to promote animal welfare.
- Values and attitudes of the doctor of veterinary medicine (to possess ethical principles and to display attitudes that contribute to the welfare of society and of animals in order to meet professional objectives):
 - Values:
 - ◆ respect for life, health and death, under all circumstances, and recognition of an animal's capacity to feel pain;
 - Attitudes:
 - ◆ commitment to contributing to animal and human welfare in carrying out their professional activities;

- ◆ equanimity in accepting the pain and distress that diseases produce in patients and their owners;
- ◆ patience to treat animals with understanding;
- ◆ empathy: sensitivity to pain and distress.

It is striking to note that this knowledge, and these abilities, skills, values and attitudes fail to make specific mention of ethical education.

So, taking as an example the entire syllabus of the University of Salvador, it is my opinion that the subjects of philosophy and ethics should be made just as compulsory for a veterinarian as anatomy or surgery. If we consider the clinical aspect of animal welfare, it is the physiological, behavioural or immune response indicators that enable me to ascertain an animal's state of well-being. However, it is the ethical and moral aspect, which should include religious, cultural and sociological considerations, which will enable us to take a decision, often based on clinical observations, on how to handle the animal.

It is important to develop a teaching system based on conceptual thinking. Many professors erroneously tend to emphasise individual aspects and few seek to promote those concepts which, in the field of animal welfare, can serve as 'bridges' between the different fields of biological science. The teacher's role is to help students to acquire attitudes, to develop abilities based on their knowledge about animals and on moral values and the capacity to suffer, and a professional obligation to determine the existence of pain and to alleviate it.

Let us take a look at a few institutions responsible for researching or teaching animal welfare in Latin America, North America, the Asia-Pacific region and Europe.

The first animal welfare chair (13) in Latin America was at the UNAM (National Autonomous University of Mexico) in Mexico in 1993 (originally a chair of ethology in the then Postgraduate Studies and Research Division and only recently given over to animal welfare). It is held by Professor Alina Suleimán de Aluja, who still teaches today, along with Dr Francisco Galindo Maldonado

from the Department of Ethology, Wildlife and Laboratory Animals, also in the UNAM's Faculty of Veterinary Medicine and Animal Science.

Six universities in Colombia have expressed their interest in animal welfare as a possible subject. They include the University of San Martín (leading professor in the country: Dr Néstor Calderón), the UDCA, the National University, the University of Tolima, the University of Los Llanos, and the Cooperative University of Colombia (Prof. Dr Héctor Aníbal Delgado).

Furthermore, the same desire to develop animal welfare has been expressed by the National University of Chile, the National University of Quito in Ecuador, Peru's Alas Peruanas University and its Mayor de San Marcos University, as well as Paraguay's National University Asunción (14).

In Brazil, the expert primatologist, Professor Milton Thiago de Mello, founded the first national chair of animal welfare in Brasilia in 1999.

Thanks to the efforts of the WSPA, animal welfare is currently taught at Castelo Branco University in Rio de Janeiro, as part of 'Environmental planning and sustainable development'; at Estácio de Sá University in Rio de Janeiro, as a compulsory subject in 'Ethology and animal welfare'; at André Arcoverde Foundation in Rio de Janeiro, as part of 'Deontology and ethics'; at the Faculty of Agro-Environmental Sciences, Rio de Janeiro, Chair of 'Alternative animal science' (optional discipline); at Plínio Leite University in Rio de Janeiro, as part of 'Ecology' (compulsory discipline); Fluminense Federal University in Rio de Janeiro, offers two lectures as part of the subject of 'Ethics'; at the Grande Rio University (Unigranrio) in Rio de Janeiro on 'Animal welfare' (compulsory discipline); at the Federal University of Lavras, Minas Gerais, MG, three chairs: 'Animal welfare', 'Ethology of domestic animals' and 'Deviant behaviour in domesticated species' (optional disciplines); at Nilton Lins University, Manaus, 'Animal welfare' (compulsory discipline).

In the near future, the Paranaense University (UNIPAR) in Paraná will teach 'Bioclimatology and animal welfare'; the Unified Facul-

ties of 'Serra dos Órgãos', Teresópolis, Rio de Janeiro, 'Animal behaviour and welfare' (optional discipline); the University of Santa Maria, Rio Grande do Sul, 'Animal welfare'.

In a development with major implications for the future, Brazil's Federal Council of Veterinary Medicine, in Resolution 756 of November 2003, places 'Behaviour and animal welfare' under the heading of 'Registration of specialities'. For Brazil's immediate future, this points to a growing interest by students and graduates in specialisation courses (15).

In Costa Rica, Dr Juan Carlos Murillo is responsible for the animal welfare course in Veritas University's San Francisco de Asís School of Veterinary Medicine. It is an optional course that includes three seminars, with the animal welfare seminar being compulsory.

The National University of Costa Rica is considering the idea of explicitly incorporating animal welfare into the core curriculum of the degree course in veterinary medicine. The adapted version endorsed by Drs Jorge Eduardo Quirós Arce and Magaly Caballero proposes that all the subjects taught in the new syllabus should contain animal welfare components (16).

While not a compulsory subject, animal welfare is taught in courses and institutes in a number of North American universities.

The School of Veterinary Medicine of Purdue University in the USA has a Center for Applied Ethology and Human/Animal Interaction, created and headed since 1982 by Professor Alan M. Beck (17). The undergraduate interdisciplinary curriculum on animal welfare and societal concerns has been taught at Purdue since 1992. The courses on offer concern ethics and animals, applied animal welfare, laboratory animal welfare, seminars on animal welfare and the human/animal interaction, animal and human welfare (18), special subjects and research projects in animal welfare, ethology and applied animal welfare, field experiments, financed from funds from the higher education challenge grants programme of the US Department of Agriculture's Cooperative State Research, Education and Extension Service (19).

Tufts University in the USA established the Centre for Animals and Public Policy in 1983. It was decided that subjects associated with ethics and values (teaching the difference between 'facts' and 'values') would be one of the five areas to which the School of Veterinary Medicine would devote more of its limited resources than to other areas, since the way in which we fulfil our obligations towards animals is set to be one of the most important issues in the new decade (the 1980s) (20). At present Tufts is teaching the Masters of Science in Animals and Public Policy.

The School of Veterinary Medicine of the University of California in Davis, USA, has a Centre for Animal Alternatives (21).

As a result of a joint effort between the College of Agriculture, the College of Home Economics, the College of Veterinary Medicine and the Department of Animal Sciences, Washington State University's Centre for the Study of Animal Well-being was created in 1993. Its objective is to produce and distribute the best possible information on human-controlled factors relevant for improving animal care and use. Dr Ruth Newberry heads the centre. The Department of Animal Sciences delivers courses on the rights and welfare of animals, in cooperation with the Department of Philosophy. Thanks to the subsequent work of Dean Emeritus Leo Bustad, Washington State University has pioneered the development of the human-animal bond concept throughout the world, and the way in which this interaction enriches the lives of both (22). Leo Bustad clearly expressed this concept when he said that a veterinarian's success both in their professional career and personal life will, in great measure, depend on their understanding of the human-animal bond in all its aspects and on how they integrate this philosophy into their daily lives (23).

Cornell University, Ithaca, New York, USA, has an Institute for Animal Welfare, established in 1997, which is headed by Dr Katherine Houpt, Professor of Physiology from the Department of Biomedical Sciences of the College of Veterinary Medicine and John Parks, Professor of Reproductive Physiology from the Animal Science Department of the College of Agriculture and Life Sci-

ences. This Institute is one of the first in the USA to offer animal welfare research grants.

Michigan State University in the USA runs the Animal Behaviour and Welfare Group, headed by Associate Professor Dr Adroaldo Zanella from Brazil, who is a disciple of Don Broom (24). In addition to the group's research work, the Animal Welfare Interactive Digital Library has been developed.

The US National Institute of Health, via its Office for Protection from Research Risks (NIH/OPRR), holds animal welfare education workshops (25).

Atlantic Veterinary College in Canada's University of Prince Edward Island has the Sir James Dunn Animal Welfare Centre (26).

The Faculty of Agricultural Sciences at the University of British Columbia in Canada (27) has an animal welfare programme in its Department of Animal Sciences, headed by Dr Jim Thompson, Dr David Fraser and Dr Dan Weary. The course, taught by the latter two professors, deals with 'Animal welfare and the ethics of animal use'.

In Europe, the historical animal welfare leader has always been the United Kingdom's University of Cambridge, which was the first university in the world to open an animal welfare chair. It is a source of pride for the university, and the chair is internationally recognised for its leadership in animal welfare research and its influence. Originally, it rose to prominence in the field because of the books published between 1979 and 1980 on Dr David Sainsbury's work on handling farm animals as a way of preventing diseases. One of Dr Sainsbury's goals was to improve animal welfare in farms and to remedy the inadequate housing conditions which, coupled with poor animal welfare, increased the risk of disease.

Then, as already mentioned, the Colleen Macleod chair was created in 1986 and, between then and now, she has been joined by Professor Donald 'Don' Broom. In those days, the study of animal welfare was not considered in academic circles as a scientific discipline, which is why the main objective that was set (and which gave the group its prestige and continues to do so) was to develop and refine techniques and methods

for ascertaining an animal's state of well-being. The aim was to find out how animals behave to adverse stimuli and in favourable and unfavourable environments. Through this work, they succeeded in establishing scientific indicators of stress, well-being and suffering that can be used for all types of animal and their work has influenced the development of legislation and codes in a number of countries (28).

At Bristol University in the United Kingdom, the story started a little after the Brambell Report was presented in 1965, with the creation of an animal behaviour 'post' that was also responsible for teaching animal welfare. This took the following form: lectures in each course (five hours in the first year, basically under the Professor of Philosophy; 18 hours in the third year on behavioural subjects, with visits to farms; four lectures in the fourth year plus three hours of seminars) (29).

Bristol University also teaches the Certificate in Animal Welfare Science, Ethics and Law. Animal welfare is a complete subject within Bristol University's Master's in Animal Science and Production. Today, the team of researchers and lecturers in the Department of Clinical Veterinary Science of the Division of Animal Health and Husbandry offers courses on animal welfare training. These top-quality courses are taught in a number of countries throughout the world, to which the teaching staff are transferred for a few days, and are mostly aimed at the personnel of firms processing foods of animal origin, at veterinary inspectors from State institutions, at veterinary students, etc. Basically it teaches subjects of animal welfare and assessment, inspection, transport, stunning and slaughter in plants processing red and white meat. Steve Wotton, Paul Whittington and Lindsay Wilkins are on the teaching staff (30).

From 1986, the former Federal Republic of Germany offered a course on animal welfare and behaviour sciences (for pets and farm animals) (31).

The Institute of Animal Hygiene and Welfare in the School of Veterinary Medicine in Westfalenhof, Hanover, Germany, is mainly responsible for teaching (animal welfare and behaviour), research and counselling, promoting an animal protection system based

on scientific fact, contributing to the future development of sustainable livestock production and integrating aspects of human and animal welfare, ecology and consumer demand on an economic basis (32).

In 1990, the Estonian Academic Society for Animal Welfare was created in the Faculty of Veterinary Medicine of Tartu University in Estonia, with Helgi Aart as its first President (33). The Estonian Agricultural University teaches veterinary ethics, discusses animal welfare issues and participates in committees on the use of experimental animals both in the agricultural sphere and in the faculty of medicine.

In Spain, the Animal Production Department of Madrid's Complutense University is developing a Master's in Veterinary Clinical Ethology and Animal Behaviour for veterinary graduates (34).

The Animal Welfare Centre of the Utrecht University in the Netherlands was founded through the joint efforts of the Faculties of Veterinary Medicine, Biology, Medicine and the Centre for Bioethics and Health Law. Its director is neurobiologist, Professor Berry Spruijt (35).

Australia's Animal Welfare Centre was established by pooling the resources of the Universities of Melbourne and Monash with the Department of Primary Industries. The centre provides the local and international farming and academic community with information on animal welfare research, teaching and training (36).

New Zealand's Massey University (37) has established its Animal Welfare Science and Bioethics Centre, headed by Professor D. J. Mellor.

This list of prestigious universities is most likely incomplete and some worthy examples may well have been omitted, for which I apologise. This does not claim to be an exhaustive report, but rather a general overview of animal welfare education provision around the world in early 2004. Basically, it is confined mainly to research institutes, with limited undergraduate teaching provisions.

Proposed teaching aid

While the teacher's academic liberty is an ineluctable principle of a professorship, we cannot escape the fact that this is a new dis-

cipline. After more than 100 years of teaching, professors of anatomy, physiology, surgery or any other subject today have a lot of issues in common in teaching their subjects. In the field of animal welfare there are doubts about what subjects should be included, how they should be taught, what should be the core subjects and what subjects can remain optional. I had the same doubts when I started my study. I had no model to follow, since, according to my information, no faculty anywhere in the world taught it as a compulsory subject.

Today, the WSPA (World Society for the Protection of Animals (38)), an international animal protection organisation working in more than 120 countries, has a worldwide network of more than 440 member societies. The WSPA advises the United Nations, the European Social Council, works jointly with the WHO (World Health Organisation) and the Federation of European Companion Animal Veterinary Associations. It has dealings with the veterinary profession and, since 2000, has offered them its 'Concepts in animal welfare' syllabus, designed to assist in teaching animal welfare in veterinary schools and faculties.

This teaching aid consists of a CD-ROM, developed by a team of professors from the veterinary school of Bristol University in the United Kingdom (39). I analysed the syllabus in January 2003, jointly with Dr Deepashree Balaram, Dr Néstor Calderón and Dr Juan Carlos Murillo from the WSPA, under the coordination of John Callaghan, WSPA's Education and Training Director. At present (January 2004) its Spanish and Portuguese versions are under final revision.

The main objective of 'Concepts in animal welfare' is to introduce this subject into veterinary schools and faculties in developing countries (40).

The syllabus has the following key objectives for veterinary students:

- (a) to develop an understanding of animal welfare relevant to an animal's physiological and psychological well-being;
- (b) to recognise welfare, ethical and legal implications and to be able to apply critical analysis from each perspective, for different species in different situations;

- (c) to stimulate focused critical thinking on welfare issues, which can be developed throughout the course and throughout the individual's professional career.

To this end, it proposes the following methodology:

- (a) to provide theoretical tuition/teaching resources on basic animal welfare principles (I recommend tuition);
- (b) to illustrate with practical examples and case studies animal welfare concepts, ethical considerations, legal implications and cultural realities.

In each teaching module on the CD-ROM there is a Power Point presentation with explanatory notes for each of the learning objectives, a Word document of suggested class discussions (intra-curricular), one of suggested short questions with answers, and another Word document of projects to be carried out by students outside class (extra-curricular) (41).

Special attention is paid to the following subjects.

1. Ethics and philosophy relating to animal health and welfare
2. Major animal welfare subjects:
 - (a) Exploitation
 - (b) Use
 - (c) Control
 - (d) Well-being
 - (e) Rights
 - (f) Liberation
3. Ethical standpoint of animal protectionists
4. Philosophical animal welfare standpoints
5. Assessing animal welfare: the 'five freedoms' (this has been translated into Spanish as 'cinco necesidades' (literally the 'five necessities'), since a literal translation of the English 'freedoms' would fail to convey the right meaning. As discussed at the World Veterinary Association, an animal does not in fact have the freedom to choose between options. Calling them 'necessities' in Spanish conveys the idea of something that is essential, not option-

al or a luxury, and something that engages the responsibility of human beings (42)).

The teaching modules are as follows (the WSPA considers the modules in italics to be compulsory, whilst those which I personally consider to be very important are marked with an #).

1. *Introduction to animal welfare*
2. *Assessing welfare and the five freedoms*
3. Physiological indicators of animal welfare#
4. Immune response and production indicators
5. Behavioural indicators
6. Group assessment and welfare administration
7. *Human-animal interactions*
8. *Introduction to animal welfare ethics*
9. Interaction with other ethical issues
10. *Role of the veterinarian and the veterinary profession*
11. Humane education
12. Protection organisations#
13. *Legislation for protecting animals, how to secure compliance with it and how to apply political pressure*
14. International legislation
15. Commercial exploitation of wildlife
16. Influence of animal welfare on markets
17. Farm animals and how to establish animal welfare conditions
18. Transport of farm animals and livestock markets#
19. Slaughter of animals reared for food
20. Working and draught animals
21. Animals used in entertainment
22. Laboratory animals
23. Companion animals
24. Population control measures for companion animals#
25. Euthanasia#

26. Handling wild animals

27. Animals and religion

28. Animals in war and natural disasters

In the view of the officers of the World Small Animal Veterinary Association (43) and the Federation of European Companion Animal Veterinary Associations (44), 'any initiative to introduce the study of these issues into the curriculum of veterinary schools should be encouraged.'

Personally, I consider the syllabus to be a valuable tool for getting schools and faculties of veterinary medicine the world over to comply with the World Veterinary Association's declared policies. Since animal welfare is a cornerstone in training the modern veterinarian, I unreservedly support the use of this syllabus.

The issue of deciding who will teach the subject of animal welfare is important and is one that has always preoccupied decision-makers (45). While the personal qualities of interested or available candidates for the job is a key consideration, adaptability is perhaps even more important than their academic background in a particular field. It is essential for candidates to be fully committed to animal welfare, since animal welfare teachers will be unable to teach something they do not believe in.

The teacher will need to recognise that animal welfare is *no longer* just an *idea*, that it does *not belong to anybody*, that he or she can be that *someone* who will put it into practice *brilliantly*. The animal welfare teacher will need to see it as an opportunity that, with effort, will allow him or her to regain a certain professional mystique, so that they can help young people – their students – in their turn to dream and to create *their own* mystique.

We are living in an era of change in the gender ratio of students and teachers. What was once a predominantly male career is now becoming the reverse. The high intake of women into the veterinary profession has done much to foster the development of the animal welfare issue, since, historically, men have had to evolve in a 'tough guy' atmosphere with little opportunity for developing welfare (46).

In universities where the subject of animal welfare is still not in the syllabus, the academic board (or similar analysis body) will be able to ascertain which members of the teaching staff are motivated to develop the subject. The key issue, which is very often ignored, is to make certain that the person who teaches this speciality is committed to animal welfare and has the desire to foster the same commitment in his or her students.

This syllabus promotes activities (workshops, discussions, learning through problem-solving) that oblige students to think, to develop critical thinking and debate, to integrate a number of resources – both personal and from the educational environment (information networks). The syllabus also enhances the knowledge and know-how of students and fosters their decision-making, communication, creative and team-working skills.

A serious drawback in Spanish-speaking countries is the lack of books and reference material in Spanish. To remedy this, as a method of training University of Salvador students in the skills for assessing and compiling relevant information and expressing it technically, it is compulsory for every student to prepare a project on a subject of their own choosing. This project, which must not duplicate previous work, is to be kept in the library for reference, in addition to being available as a Word document.

This difficulty in obtaining information led to a proposal to create an Academic Centre of Reference on Animal Welfare in the University of Salvador on 26 December 2003. This would be the first centre to compile information on animal welfare (videos, books, offprints, etc.) and so to promote this discipline among the community, all professionals in any way associated with the use of animals and students of those disciplines, as a means of disseminating these aspects throughout the community, as a genuine extension activity.

Conclusions

Aesculapius is the name that the Romans gave to Asclepius, the mythical Greek god of medicine, son of Apollo and father of Hygea

(goddess of health, who gave her name to the concept of 'hygiene') and of Panacea. In addition to his famous father, Aesculapius' mentor and adoptive father was Chiron. Chiron, a god in the form of a centaur, is the legendary founder of the veterinary art. We could say, then, that the veterinary arts have been intertwined in a relationship of fatherly affection with the medical arts since the gods inhabited the peaks of Mount Olympus. I have made bold to freely adapt some of Aesculapius' words of advice to his son and future doctor, as if they had been voiced to a future veterinarian.

'So you want to be a veterinarian my son? This aspiration is borne of a generous heart and a spirit avid for science. Do you want men to take you for a god that alleviates the ills of his beasts even though they cannot express them in their own language and frees both men and beasts from terror, pain and death?

Have you given proper thought to what sort of life you will lead? You will have to renounce your privacy. Whereas, when their work is over, most citizens can shut themselves away from intruders, your door will always remain open to all. At any hour of the day or night they will come to disturb your rest, your pleasures and your meditation, and you will have no time for your family, friends or studies, and no life of your own.

The poor, who are accustomed to their animals suffering as they do, will call you only when there is an emergency. However, the rich will take you for their slave, calling on you to remedy in their beasts the excesses they themselves have caused, because they have given the beasts indigestion or given them a cold. They will wake you up in great haste just as soon as they feel the slightest anxiety about their animals, because they love them just as much for the money they bring them or the company they afford, as for the animals themselves.

Think it through properly while there's still time.

But if you are indifferent to fortune, pleasures, or ingratitude; if, even knowing that

you will be alone among the human beasts and animals, your heart is stoic enough to be satisfied with doing your duty without delusions; if you consider it payment enough to see the joyous smile of a mother to find that the animal that keeps her dear son company, carries her husband or that she has produced on her estate no longer suffers; if it comforts you to lay to rest a dying animal which your art has helped to a painless and tranquil death; if you yearn to fathom the bond between human and animal so that you can understand the tragic destiny of both, then, my son, go and become a veterinarian'.

D. O. Jones was probably thinking of veterinarians like those when he said in his lecture to the College of Veterinary Medicine of Ohio State University in the USA: 'Every profession consists of two parts: a science and an art. The trouble with medicine is that we've got too many scientists and not enough artists' (47). This is one of the reasons that society demands professionals trained in animal welfare; who can handle objective and subjective aspects of pain and euthanasia in companion animals; who, in the case of animals for production, sport or entertainment, refuse to associate themselves with situations of cruelty and abuse and who do not endorse, tolerate or permit cruel activities simply because they are age-old traditions.

I have witnessed veterinarians who abuse animals, who used banned drugs to kill animals in the belief that this constitutes euthanasia. I have seen dozens of sad and pathetic cases, which, it pains me to say, make me feel that (apart from some marvellous and honourable exceptions) the older generations of veterinarians are doomed.

By teaching animal welfare we can kindle the light of hope for the profession's future: the young.

These are young people who will ally passionate conviction with their skills and knowledge to join forces with serious protectionists who are equally passionate and big-hearted, not fanatics.

A number of prospective studies on future issues that will affect the profession in the coming years have taken care to include the sub-

ject of animal welfare. For instance, the Australian Veterinary Association's study (48) specifically into animal welfare states that two of the prerequisites for the future are to:

1. provide the necessary knowledge on animal welfare issues, specifically on handling free-roaming animals;
2. promote professional experience in relation to society's demand for animal welfare (49).

Animal welfare is not a discipline that should be confined to veterinary medicine alone. It must draw from a number of disciplines in a 'cross-cutting' approach. Lawyers advise on legislation for the care and use of animals in various activities under the responsibility of their owners or carers; civil engineers and architects design suitable buildings to house animals temporarily (unloading bays and corrals, ramps and corridors in meat-processing plants or livestock markets) or permanently (stalls in riding clubs and race courses or animal houses in testing laboratories); humane doctors applying the three Rs encourage the ethical and responsible use of animals in research; journalists investigating and uncovering different forms of mistreatment raise public awareness and in turn influence the legislators who promulgate laws and orders to protect animals from abuse and cruelty.

We can find support in the words of Kant: 'Man can only become man by education. He is merely what education makes of him'.

My recommendations are as follows:

1. that the World Veterinary Association's 1991 recommendations on animal welfare should be followed in all continents (50);
2. that, in the Americas especially, the proposals of the 'Second International Seminar on Higher Veterinary Science Education in the Americas' should also be analysed with a view to implementing them, particularly the 'Standard profile for accrediting a pan-American veterinarian' (51), which specifies the desirable knowledge, abilities, skills, expertise, values and attitudes that a veterinarian should possess;
3. that the WSPA's 'Concepts in animal welfare' should be analysed for possible implementation;

4. that expert groups should be created from among the people who are already acting as professors, running courses or workshops, to help train people wishing to specialise;
5. that we join with protection associations, like the WSPA, that wish to support animal welfare teaching;
6. that we actively associate with the animal welfare committees of the World Veterinary Association, the World Small Animal Veterinary Association and any other professional association wishing to develop this speciality.

John Seamer and Fred Quimby, the editors of the proceedings of the animal welfare sessions of the World Veterinary Congress in Rio de Janeiro, stated that an international network of veterinarians like the World Veterinary Association enables colleagues in one country to help those in another. They said that animal welfare issues would inevitably always come second to human welfare issues and that while the task is enormous, we have useful tools at hand (52).

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El bienestar de los animales, un currículum para su enseñanza en las facultades de veterinaria

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Sumario

Describiendo los antecedentes de la enseñanza del Bienestar Animal en Argentina, se pasa revista a la historia de esta nueva disciplina que, siendo enseñada en algunas escuelas y facultades de veterinaria, se revela como una disciplina transversal, con contenidos multidisciplinarios.

Palabras clave: bienestar de los animales, currículum, enseñanza, facultades de medicina veterinaria

El «Bienestar de los Animales» (BA) nació el pasado siglo durante la década de los años ochenta. Un seminario organizado en Inglaterra reunió, en ese entonces, a los que posiblemente eran los únicos interlocutores sobre este tema (1).

Una de las preguntas que ya entonces surgió, expuesta por el Prof. Wood-Gush (Escuela de Agricultura de la Universidad de Edimburgo, Reino Unido), aún hoy no se ha resuelto: ¿Dónde debería ir el BA en el currículum veterinario? ¿Debe ser vinculado a las demás materias o debe ser dado en forma separada?

En el ámbito académico, la primera unidad creada para enseñar e investigar concretamente sobre el BA fue la Cátedra *Colleen MacLeod*, a cargo del Prof. Donald «Don» Broom en el Departamento de Medicina Clínica Veterinaria de la Universidad de Cambridge, Reino Unido, en 1986.

En 1993 se presenta y se aprueba el plan de estudios para crear la carrera de Veterinaria en la Universidad del Salvador (USAL) en Argentina. En aquel momento, fue la primera Escuela de Veterinaria, no sólo en el país sino en el continente, donde esta materia fue obligatoria, y actualmente tiene el mismo nivel de exigencias para la obtención del grado que cualquiera de las otras 36 materias del citado plan. En términos generales, la enseñanza en la USAL está dividida en dos períodos, llamados cuatri-

mestres, y le corresponde al BA el primero (en el 2004 entre el 19 de marzo y el 25 de junio), comprendiendo 15 días de clases con 4 horas semanales, para un total de 60 horas.

Para hacer que el BA fuera un concepto que aplicasen todos los profesores, para construir las competencias profesionales de los alumnos les fue notificada la necesidad de aplicación de:

- a) políticas sobre el Bienestar de los Animales y la Etología, de la Asociación Mundial de Veterinaria;
- b) el *Manual sobre el cuidado y uso de los animales de experimentación* (versión española), del Canadian Council on Animal Care (2);
- c) la Declaración Universal para el Bienestar Animal propuesta por la WSPA (World Society for Protection of Animals) (3);
- d) la legislación nacional sobre protección al animal (4).

Esta materia o *syllabus* fue pensada como una herramienta diseñada para ayudar al estudiante a adquirir actitudes y desarrollar habilidades por medio del entendimiento de su responsabilidad ética hacia los animales. De esta forma, el conocimiento genera actitudes y estas habilidades. Este conocimiento se concentra en hacer comprender al alumno:

- a) el valor moral del animal;
- b) el reconocimiento de su capacidad de sentir dolor y sufrir;
- c) nuestra obligación de determinar o reconocer el dolor, para aliviarlo o suprimirlo.

El BA no se puede enseñar pensando en alguna especie en particular o en una disciplina, por lo que deben tomarse en cuenta estas tres básicas premisas, que serían:

- a) hay temas sobre BA que son comunes a todas las especies (dolor);
- b) algunos temas, desarrollados en una especie (bovinos) o en un tipo de crianza (animales de laboratorio), son aplicables a las demás especies o sistemas (eutanasia);
- c) el conocimiento que las distintas disciplinas (Fisiología, Patología, Medicina, etc.) aportan al BA cruza la línea divisoria de especies (medicina de animales pequeños, grandes, de laboratorio, etc.).

Históricamente, parte del rechazo en muchas instituciones de enseñanza a incorporar el BA como una materia específica se ha basado en la hipótesis de que, al igual que la Ética, el BA está incorporado a todas las materias conceptualmente, haciendo innecesario particularizarlo.

Esto no es así, tal como lo ha manifestado la Asociación Mundial de Veterinaria en sus Políticas sobre el Bienestar de los Animales y la Etología, donde textualmente reza:

«C. El bienestar animal en la educación veterinaria

Para lograr establecer una posición informada sobre el BA adecuada a la profesión, se considera esencial incluir esta asignatura en la educación básica del pregrado.

Por ello se deben adoptar estos principios:

- a) el tema de BA se debe incorporar como *asignatura independiente*, por su propio derecho, en el currículum educativo;
- b) la disciplina científica del BA debe incorporar aspectos aplicados de bioética, etología y el concepto del sufrimiento y bienestar;

- c) este tema debe enseñarse a nivel preclínico y se reconoce que debe ser extendido al clínico.» (5)

En Argentina, el BA se incluye, recientemente, en una propuesta sobre el perfil que define la enseñanza de la veterinaria en el futuro. Según la opinión del Consejo Nacional de Decanos de Ciencias Veterinarias (*), debe reunir, por lo menos, los aspectos que a continuación se señalan:

«Formar científica y tecnológicamente al estudiante, para que éste se encuentre capacitado para comprender y resolver problemas en los campos de la salud, el bienestar y la producción de especies animales terrestres y acuícolas en la salud pública, en la protección, calidad y tecnología de los alimentos y en la preservación del medio ambiente.» (6)

En este contexto, y analizando los núcleos temáticos agrupados por área temática (Ciencias Básicas, Educación Superior y Formación General), se propone que la materia del BA forme parte del área de Formación General, conjuntamente con Deontología o Medicina Legal, Legislación, Inglés Técnico, Sociología Rural y Urbana. Estas materias, en conjunto, llevarían entre el 5 % y el 10 % de una carga horaria total mínima de 3 600 horas que se propone.

Es interesante mencionar que el citado documento, mostrando el poco conocimiento que existe del tema al analizar el contenido curricular de cada una de las materias, incluye el tema del BA como un subtítulo de la Sociología, sin ninguna descripción de contenidos mínimos:

«Sociología Rural y Urbana: Sociología General. Su aporte a la profesión. Evolución del medio rural en Argentina. Estructura social. Grupos. Familia. Sociologías especiales; latinoamericana, argentina y rural. La colonización en nuestro país. Sociedad urbana y rural. Bienestar Animal.» (7)

Este documento, a todas luces incompleto, es, sin embargo, un adelanto frente al histórico desconocimiento sobre esta materia de la mayor parte de las Universidades, al menos en Argentina.

(*) Este Consejo sólo agrupa a la totalidad de las Universidades Nacionales en Argentina de gestión estatal, sin incluir siquiera para análisis de temas académicos a ninguna de las de gestión privada como la USAL.

Es muy importante escuchar lo expresado por PANVET, la Asociación Panamericana de Ciencias Veterinarias, en labios de su entonces Presidente, Francisco Trigo Tavera:

«PANVET ha coordinado y dirigido la medicina veterinaria continental por más de cincuenta años, además de organizar los congresos bianuales de ciencias veterinarias. La misión de PANVET es servir a la profesión veterinaria del continente promoviendo sus derechos y señalando sus obligaciones y estándares de calidad. Promueve el desarrollo de las ciencias veterinarias en las áreas de la salud animal y humana, el bienestar animal, la producción y la productividad animal.» (8)

Buscando señalar estándares de calidad veterinaria, se promueve el desarrollo del BA en un mismo nivel de importancia con la producción y la productividad.

En la Unión Europea, la FVE (Federación de Veterinarios de Europa) y la EAEVE (Asociación Europea de Establecimientos de Educación Veterinaria) han iniciado el estudio de la enseñanza de temas clave tales como el bienestar del ganado durante el transporte, y la interacción de estos animales y el medio, a fin de adaptarse a los requisitos del comercio internacional, la tecnología moderna y la política de la Unión Europea (9).

Debemos considerar estos aspectos en la certificación profesional, entendiendo como tal el reconocimiento del nivel de conocimientos y habilidades que posee un individuo para el ejercicio de su profesión. Este tema, desde hace miles de años, ha preocupado a la sociedad, empezando en Babilonia en el año 2100 a. de C. (con las Leyes del Rey Hammurabi, en las que se multa a un «veterinario» en el primer antecedente registrado de penalización por mala práctica) o en el año 1900 a. de C., con el papiro de Kahun (10).

Para certificar en América Latina, estableciendo el marco que dé la justa dimensión a la profesión, se estableció el «Perfil referencial de validez del médico veterinario panamericano» (11), donde se especifican los conocimientos, habilidades, destrezas, valores y actitudes que constituyen el marco de referencia para el proceso de evaluación.

A partir de lo anterior, debe entenderse como «conocimientos»:

- a) la habilidad de buscar información;
- b) el reconocimiento de la existencia de un problema;
- c) la habilidad de resolver ese problema.

Y como habilidades:

- a) la capacidad de manejar diferentes especies de animales;
- b) la capacidad de observar, en esos animales, estados de salud y enfermedad, diagnosticando estos últimos;
- c) la capacidad de comunicarse con los responsables del cuidado y del trato del animal, o con colegas por medio de informes científicos.

Las actitudes se forjan en la práctica. Se aprenden, no se adquieren pasivamente, y los profesores (todos imbuidos del concepto de Bienestar Animal) tienen la responsabilidad de influir en toda la carrera del estudiante, para que éste pueda pensar de manera adecuada y adoptar la actitud correcta (12).

Específicamente se menciona el BA en:

- Conocimientos del Médico Veterinario (conocimientos en los procesos de atención médico-quirúrgica). Aplicar conocimientos fundamentales de medicina, cirugía y metodología científica para el diagnóstico y tratamiento de enfermedades de las especies animales útiles al hombre:
 - Promoción del BA.
- Habilidades y destrezas del Médico Veterinario (poseer habilidades y destrezas intelectuales para identificar, resolver y prevenir problemas relacionados con la salud de las especies animales útiles al hombre, con base en la evaluación de situaciones y toma de decisiones):
 - Habilidades y destrezas en los procesos de atención médico-quirúrgica:
 - ◆ Habilidad para solucionar problemas de comportamiento a fin de promover el BA.
- Valores y actitudes del Médico Veterinario (poseer principios éticos y mostrar actitudes que coadyuven al bienestar de la sociedad y de los animales para cumplir con los objetivos profesionales):

- Valores
 - ◆ Respeto a la vida, la salud y la muerte, bajo cualquier condición, y reconocer en los animales su capacidad de dolor.
- Actitudes
 - ◆ Compromiso para contribuir al BA y al bienestar humano en el desarrollo de sus actividades profesionales.
 - ◆ Ecuanimidad para aceptar el dolor y la angustia que generan las enfermedades en los pacientes y sus propietarios.
 - ◆ Paciencia para tratar con condescendencia a los animales.
 - ◆ Afectiva; sensibilidad al dolor y la angustia.

Llama la atención el hecho de que en estos conocimientos, habilidades, destrezas, valores y actitudes se ha omitido una mención concreta a la enseñanza de la Ética.

Por ello, tomando como ejemplo la totalidad del plan de estudios de la Universidad del Salvador, considero que la Filosofía y la Ética deben ser materias tan obligatorias como la Anatomía o la Cirugía para un veterinario. Si hablamos del BA, para el aspecto clínico son los indicadores fisiológicos, de conducta o respuesta inmune que me permiten conocer el estado de bienestar de los animales. El aspecto ético y moral, en el cual incluiremos elementos religiosos, culturales y sociológicos, nos permitirá tomar las decisiones, muchas veces basadas en las observaciones clínicas, sobre el manejo del animal.

Es importante desarrollar el sistema de enseñanza basada en el pensamiento conceptual. Erróneamente, muchos profesores tienden a enfatizar aspectos individuales y pocos buscan aquellos conceptos que, en el campo del BA, pueden actuar como «puentes» entre diferentes campos de las ciencias biológicas. El rol de quien enseña es ayudar al estudiante a adquirir actitudes, desarrollar habilidades basadas en sus conocimientos sobre el animal con valores morales, capacidad de sufrimiento y obligación profesional de determinar y aliviar la existencia del dolor.

Veamos algunos casos de instituciones en América Latina, América del Norte, Asia-

Pacífico y Europa donde se investiga o se enseñan BA.

La primera cátedra (13) en América Latina, si bien se dedicó originariamente a la Etología en la entonces División de Estudios de Postgrado e Investigación, y recién ahora al BA, fue en México, en 1993, en la UNAM (Universidad Nacional Autónoma de México), a cargo de la Maestra (denominación mexicana para un profesor) Alina Suleimán de Aluja, quien hoy sigue enseñando, y además con el Dr. Francisco Galindo Maldonado, en el Departamento de Etología, Fauna Silvestre y Animales de Laboratorio de la misma Facultad de Medicina Veterinaria y Zootecnia de la UNAM.

En Colombia, seis Universidades han expresado su interés en el BA como una materia para enseñar: la de San Martín (primer profesor en el país: Dr. Néstor Calderón), la UDCA, la Nacional, la del Tolima, la de Los Llanos y la Universidad Coop. de Colombia (Prof. Dr. Héctor Aníbal Delgado).

Además, idéntica voluntad de desarrollar el BA han expresado: en Chile, la Universidad Nacional; en Ecuador, la Nacional de Quito; en Perú, la Universidad Alas Peruanas y la Mayor de San Marcos; así como en Paraguay, la Universidad de Asunción (14).

Por su parte, en Brasil, el Prof. Milton Thiago de Mello, experto primatólogo, fundó en Brasilia la primera cátedra nacional en este tema en 1999.

Actualmente, merced a la tarea de la WSPA, se dicta BA: en la Universidad de «Castelo Branco», Río de Janeiro (como parte de «Planeamiento Ambiental y Desenvolvimento Sustentable»); en la Universidad «Estácio de Sá», Río de Janeiro, como materia obligatoria «Etología y BA»; en la Fundación André Arcoverde, Río de Janeiro, como parte de «Deontología y Ética»; en la Facultad de Ciencias Agro-Ambientales, Río de Janeiro, cátedra de «Zootecnia Alternativa» (disciplina optativa); en la Facultad de Plínio Leite, Río de Janeiro, como parte de «Ecología» (disciplina obligatoria); la Universidad Federal Fluminense, Río de Janeiro, ofrece dos conferencias dentro de la materia «Ética»; en la Universidad Grande Rio (Unigranrio), Río de Janeiro, «BA» (disciplina obligatoria); en

la Universidad Federal de Lavras, Minas Gerais, MG, tres cátedras: «BA», «Etología de los Animales Domésticos», «Desvío del Comportamiento en las Especies Domesticadas» (disciplinas optativas); en la Universidad Nilton Lins, Manaus, «BA» (disciplina obligatoria).

En un futuro inmediato, se dictará: en la Universidad Paranaense (Unipar), Paraná, «Bioclimatología y BA»; en las Facultades Unificadas «Serra dos Órgãos»-Teresópolis, Río de Janeiro, «Comportamiento y BA» (disciplina optativa); y en la Universidad de Santa Maria, Rio Grande do Sul, «BA».

Como un dato con importante proyección en el futuro, señalo que en noviembre de 2003 el Consejo Federal de Medicina Veterinaria de Brasil, por su resolución 756, considera, dentro de las áreas del «Registro de Especialidades», la de «Comportamiento y BA». Esto indica, para el futuro inmediato en ese país, la aparición de un mayor interés en cursos de especialización entre los estudiantes y los graduados (15).

En Costa Rica, en la Escuela de Medicina Veterinaria San Francisco de Asís, de la Universidad Veritas, el curso de BA está a cargo del Dr. Juan Carlos Murillo. Es un curso optativo con tres seminarios dentro del mismo, siendo el de BA obligatorio.

La Universidad Nacional de Costa Rica tiene en estudio que el BA esté explícitamente incorporado como eje curricular de la carrera de Medicina Veterinaria. En la adaptación auspiciada por el Dr. Jorge Eduardo Quirós Arce y por la Dra. Magaly Caballero se postula que, en el nuevo plan de estudios, todas las materias se impartan con componentes del BA (16).

Si bien no como materia obligatoria, en distintas Universidades de América del Norte el BA es tema vigente en cursos o institutos.

La Universidad de Purdue, EE.UU., posee en su Escuela de Medicina Veterinaria el Centro de Etología Aplicada y de Estudios de la Interacción entre los Animales y el Hombre, creado y dirigido desde 1982 por el Prof. Alan M. Beck (17). Allí se dicta, desde 1992, el Programa de Pregrado Interdisciplinario sobre Bienestar Animal y Problemas Sociales. Los cursos allí ofrecidos versan sobre: Ética y

Animales; BA Aplicado; BA Aplicado a los Laboratorios; Seminarios en BA y la Interacción entre los Animales y el Hombre; Bienestar Animal y Bienestar Humano (18); Temas Especiales y Proyectos de Investigación en BA; Etología y BA Aplicado; Experiencias a Campo; financiados todos ellos con fondos del Programa de Créditos para Desafíos en Altos Estudios del Servicio de Investigación Cooperativa Estatal del Departamento de Agricultura de los EE.UU. (19).

La Universidad de Tufts, EE.UU., estableció en 1983 el Centro de Animales y Políticas Públicas. Se decidió que los temas vinculados con la ética y los valores (enseñando a apreciar las diferencias entre «hechos» y «valores») serían una de las cinco áreas a las que la Escuela dedicaría más de sus limitados recursos que a otras áreas, entendiendo que la forma en que se cumplan las obligaciones que tenemos con los animales sería uno de los temas más importantes de la nueva década (los años ochenta) (20). Actualmente, allí se dicta la Maestría en Ciencia de Animales y Políticas Públicas.

En la Universidad de California en Davis, EE.UU., en su Escuela de Medicina Veterinaria, funciona el Centro de Alternativas al Uso de Animales (21).

En la Universidad Estatal de Washington, como resultado de un esfuerzo conjunto entre el Colegio de Agricultura, el de Economía Hogareña, el de Medicina Veterinaria y el Departamento de Ciencias Animales, se crea el Centro de Estudios del BA en 1993. Su objetivo es producir y distribuir la mejor información posible sobre aquellos factores que, siendo controlados por las personas, son pertinentes para el mejor cuidado y uso de los animales. La Dra. Ruth Newberry está al frente del mismo. En el Departamento de Ciencias Animales se dictan cursos sobre Bienestar y Derechos Animales, en cooperación con el Departamento de Filosofía. Esta Universidad, a través del trabajo del Rector Emérito Leo Bustad, ha sido pionera en el desarrollo mundial del concepto del vínculo entre los animales y el hombre, y de cómo esta interacción enriquece la vida de ambos (22). Este concepto ha quedado claramente expresado en sus palabras: «*El éxito del veterinario en su actividad profesional y en su*

propia vida dependerá en gran parte de la comprensión que tenga del VÍNCULO HUMANO-ANIMAL en todos sus aspectos y de cómo integre esta filosofía a su vida diaria» (23).

En la Universidad de Cornell, Ithaca, Nueva York, EE.UU., funciona el Instituto para el BA, establecido en 1997, estando al frente del mismo la Dra. Katherine Houpt, Profesora de Fisiología en el Departamento de Ciencias Biomédicas del Colegio de Medicina Veterinaria, y el Prof. John Parks, Profesor de Fisiología Reproductiva en el Departamento de Ciencia Animal en el Colegio de Agricultura y Ciencias de la Vida. Este Instituto es uno de los primeros en los EE.UU. en ofrecer becas para investigación en BA.

En la Universidad Estatal de Michigan, EE.UU., funciona el Grupo de Conducta y BA, dirigido por el Prof. Asociado Dr. Adroaldo Zanella, de Brasil, discípulo de Don Broom (24). Además de los trabajos de investigación del Grupo, se destaca el desarrollo de la Biblioteca Interactiva Digital en BA.

El Instituto Nacional de Salud de los EE.UU., a través de su Oficina de Protección de Riesgos en la Investigación (NIH/OPRR), desarrolla Seminarios sobre Educación en BA (25).

En Canadá, en la Universidad de la Isla del Príncipe Eduardo, en su Colegio Veterinario del Atlántico, funciona el centro de BA «Sir James Dunn» (26).

En la Universidad de la Columbia Británica, Canadá (27), en la Facultad de Ciencias Agrícolas, se ha establecido un programa de BA en el Departamento de Ciencias Animales, con los Dres. Jim Thompson, David Fraser y Dan Weary. El curso, dictado por los dos últimos profesores, trata sobre «El Bienestar y la Ética en el uso de los animales».

En Europa, el liderazgo histórico recae en Cambridge, Reino Unido, la primera cátedra del mundo, motivo de orgullo para la Universidad y reconocida internacionalmente por su liderazgo en investigación en BA y por su influencia. Originariamente, su importancia en este campo comenzó con los libros publicados entre 1979 y 1980 con los trabajos realizados por el Dr. David Sainsbury sobre el manejo de animales de granja como forma de prevenir enfermedades. Uno de sus objetivos fue mejorar el BA en las

granjas y corregir las inadecuadas condiciones de alojamiento que, con un pobre BA, aumentaban el riesgo de enfermedades.

Luego, como he mencionado, se crea la Cátedra Colleen MacLeod, en 1986, y, desde ese entonces hasta hoy, al frente de ella está el Prof. Donald «Don» Broom. En ese entonces, el estudio del BA no era considerado aún, académicamente, como una disciplina científica, motivo por el cual el objetivo principal que se planteó (y que le dio y le mantiene el prestigio actual al grupo) fue el desarrollo y el refinado de las técnicas y de los métodos para establecer el estado de bienestar de un animal. Se trataba de averiguar cómo se comportan los animales ante los estímulos adversos o en ambientes favorables o desfavorables. Así, han logrado establecer indicadores científicos de estrés, bienestar y sufrimiento que se pueden usar en todo tipo de animales y, con sus trabajos, han influido en el desarrollo de legislación o códigos en diversos países (28).

En Bristol, Reino Unido, la historia empezó poco después de la presentación del Informe Brambell (1965) con la creación de un «puesto» sobre conducta que se hizo cargo de la enseñanza, además, del BA. Esto tomó la siguiente forma: conferencias en cada curso (5 horas en primer año, básicamente a cargo del Profesor de Filosofía; 18 horas en tercer año sobre temas de conducta, con visitas a establecimientos; 4 conferencias en cuarto año, más 3 horas de seminarios) (29).

También se imparte la Certificación (diplomado) en Ética, Legislación y Bienestar Animal. El BA es un tema completo dentro del curso de Maestría en Ciencia y Producción Animal de esta Universidad. Hoy, en el Departamento de Ciencias Clínicas Veterinarias, División de Salud y Cría Animal, el equipo de investigadores y conferencistas ofrece cursos de «Entrenamiento en BA». Estos cursos, de excelente calidad, se dictan en diversos países del mundo, adonde el personal docente se traslada durante varios días, y están dirigidos, en su mayoría, a personal de la industria procesadora de alimentos de origen animal, inspectores veterinarios de organismos estatales, estudiantes de veterinaria, etc. Se enseñan, básicamente, temas de BA y su auditoría, inspección,

transporte, aturdimiento y faena en frigoríficos de carnes rojas y blancas. Steve Wotton, Paul Whittington y Lindsay Wilkins son parte del personal docente (30).

La entonces República Federal de Alemania ofrecía desde 1986 un curso sobre BA y Ciencias de la Conducta (de mascotas y animales de granja) (31).

En Hannover, Alemania, funciona el Instituto de Higiene y BA, en la Escuela de Medicina Veterinaria, en Westfalahof, siendo sus objetivos principales: la enseñanza (BA y Conducta); la investigación y el asesoramiento; la promoción de una protección al animal basada en hechos científicos; la contribución al desarrollo futuro de una producción ganadera sustentable; la integración de aspectos del bienestar humano y animal; la ecología; y la demanda del consumidor en una base económica (32).

En Estonia, en 1990, se crea, en la Facultad de Veterinaria de Tartu, la Sociedad Académica Estonia para el BA, siendo Helgi Aart su primera Presidenta (33). En la Universidad Agrícola de Estonia se enseña Ética Veterinaria, se discuten temas de BA y se participa en comités de uso de animales de experimentación tanto en el ámbito agrícola como en la Facultad de Medicina.

En España, en el Departamento de Producción Animal de la Universidad Complutense de Madrid, se desarrolla el Magister Universitario en Etología Clínica Veterinaria y Bienestar Animal, para graduados veterinarios (34).

En la Universidad de Utrecht, en los Países Bajos, el centro de BA se fundó mediante el esfuerzo conjunto de las Facultades de Medicina Veterinaria, de Biología, de Medicina y del Centro de Bioética y Leyes de Salud. Su director es el neurobiólogo Prof. Dr. Berry Spruijt (35).

En Australia se estableció el Centro sobre el BA mediante la unión de recursos entre las Universidades de Melbourne y Monash con el Departamento de Industrias Primarias. De esta forma se ofrece a la comunidad agropecuaria y académica local e internacional información sobre investigación, enseñanza y entrenamiento en BA (36).

En Nueva Zelanda, en la Universidad de Massey (37), se estableció el Centro de Cien-

cias del BA y Bioética, dirigido por el Prof. D. J. Mellor.

Este listado de prestigiosas instituciones universitarias está muy probablemente incompleto, y quizás algún valioso ejemplo se haya omitido, por lo que solicito excusas. No pretende ser éste un informe exhaustivo, sino brindar una idea general sobre cómo es a principios de 2004 la oferta educativa en BA alrededor del mundo. Básicamente, dominan los institutos dedicados a la investigación, con una oferta reducida de actividad docente de pregrado.

Herramienta didáctica propuesta

Si bien un principio indelegable en una cátedra es la libertad académica del docente, es ineludible que nos estamos refiriendo a una disciplina nueva. Luego de más de 100 años de enseñanza, los profesores de Anatomía, Fisiología, Cirugía o cualquier otra materia tienen grandes temas en coincidencia en el dictado de sus materias. En el campo del BA surgen dudas sobre qué temas incluir, cómo dictarlos, qué debe ser indispensable y qué puede ser optativo. Ésas fueron mis dudas cuando inicié mi tarea. No tenía un modelo que pudiese seguir, ya que, según la información de la que disponía, no existía esta materia con carácter de obligatoria en ninguna facultad.

Hoy, la WSPA (38), una organización internacional de protección a los animales que trabaja en más de 120 países, con una red mundial de más de 440 sociedades miembros, con carácter consultivo ante las Naciones Unidas, el Consejo Social Europeo, que trabaja en cooperación con la Organización Mundial de la Salud (OMS) y la Federación Europea de Veterinarios Especializados en Animales de Compañía, se acerca a la profesión y les ofrece desde el año 2000 su «Conceptos en BA», un *syllabus* o programa de contenidos sobre el BA diseñado para asistir a su enseñanza en facultades y escuelas de veterinaria.

Este instrumento didáctico, que consta de un CD-ROM elaborado por un equipo de Profesores de la Facultad de Veterinaria de la Universidad de Bristol, Reino Unido (39), y analizado en enero de 2003 por mí, conjunta-

mente con los Dres. Deepashree Balaram, Néstor Calderón y Juan Carlos Murillo de la WSPA, bajo la coordinación de John Callaghan, Director de Educación y Entrenamiento de esta entidad, está en estos momentos (enero de 2004) bajo la revisión final de sus versiones española y portuguesa.

El principal objetivo de los «Conceptos en BA» es introducir este tema en las Escuelas y Facultades de Veterinaria de los países en desarrollo (40).

Para ello, tiene los siguientes objetivos clave para el estudiante de esas unidades académicas:

- a) desarrollar la comprensión de los aspectos que sean relevantes a la condición física y psicológica del bienestar de un animal;
- b) reconocer las implicancias éticas y legales del BA, siendo capaces de aplicar el análisis crítico desde cada perspectiva, en diferentes situaciones y para diferentes especies;
- c) estimular el pensamiento crítico sobre el BA, que puede ser desarrollado desde el principio hasta el fin del aprendizaje en esta materia y luego durante la carrera del profesional.

En ese sentido, se propone la siguiente metodología:

- a) tomando como base los principios sobre el BA, proveer de recursos teóricos que faciliten la enseñanza por medio de la tutoría (que es la que recomiendo) o en forma tradicional;
- b) ilustrar con ejemplos prácticos y estudio de casos específicos donde se analicen aspectos éticos, legales y realidades culturales.

Este CD-ROM ofrece, en cada módulo, una presentación de transparencias en Power Point con notas aclaratorias para cada uno con los objetivos del aprendizaje, un documento en Word de discusiones sugeridas para realizar durante (*intra*) la clase, otro de preguntas sugeridas cortas con sus respectivas respuestas y otro de proyectos que deben realizar los alumnos fuera (*extra*) de clase (41).

En forma global, se le presta especial atención a los siguientes temas:

1. Ética y filosofía vinculada a la salud y el BA
2. Grandes temas sobre el BA:
 - a) Explotación
 - b) Uso
 - c) Control
 - d) Bienestar
 - e) Derechos
 - f) Liberación

3. Punto ético de partida de la protección

4. Punto filosófico de partida del BA

5. La existencia del BA esta basada en las «Cinco Necesidades» [conocidas por su nombre en inglés de «Five Freedoms», pero cuya traducción literal al español es incorrecta, tal como se discutió oportunamente en la Asociación Mundial de Veterinaria, debido a que el animal no tiene la libertad de escoger entre opciones. Por esta razón, hablar de necesidades en español implica algo esencial y excluye la idea de opciones o de lujos y, por lo tanto, compromete más la responsabilidad del hombre (42)].

Los módulos (los *resaltados* son considerados obligatorios por la WSPA, los marcados con la «#» son los que considero yo como muy importantes) son:

1. *Introducción al bienestar animal*
2. *Evaluación del Bienestar y las «Cinco Necesidades»*
3. Indicadores fisiológicos del BA #
4. Indicadores de respuesta inmune y de producción
5. Indicadores de comportamiento
6. Evaluación de grupo y administración del bienestar
7. *Interacciones de seres humanos y animales*
8. *Introducción a la ética del bienestar animal*
9. Interacción con otros temas éticos
10. *El papel del veterinario y la profesión veterinaria*
11. Educación en temas humanitarios

12. Organizaciones proteccionistas #
13. *Legislación para proteger animales, cómo hacerla cumplir y cómo presionar políticamente*
14. Legislación internacional
15. Explotación comercial de la vida silvestre
16. Influencia del BA en los mercados
17. Temas de animales de granja, cómo establecer las condiciones del BA
18. Transporte de animales de granja y mercados de concentración #
19. Faena de animales de consumo
20. Animales de trabajo, de tracción o de fuerza
21. Animales usados como entretenimiento
22. Animales en experimentación
23. Animales de compañía
24. Medidas de control de poblaciones en animales de compañía #
25. Eutanasia #
26. Manejo de animales salvajes
27. Temas sobre animales en las diversas religiones
28. Animales en desastres naturales y en guerras

Para los profesionales de la Asociación Mundial de Veterinarios Especializados en Animales de Compañía (43) y los de la Federación Europea de Veterinarios Especializados en Animales de Compañía (44), «cualquier iniciativa para introducir el estudio de estos temas en el currículum de las escuelas veterinarias debe ser estimulada».

Personalmente, considero que es una valiosa herramienta para hacer cumplir la declaración política de la Asociación Mundial de Veterinarios (WVA) en todas las Escuelas y Facultades de Veterinaria del mundo. Considerando que el BA es una piedra basal en la formación del veterinario de hoy, apoyo sin reticencias el uso de este *sillabus*.

El tema de establecer quién enseñará esta materia no es una cuestión menor y siempre preocupó a los que estuvieron relacionados con esta responsabilidad (45). Se debe tener

muy en cuenta las características personales del candidato interesado o disponible, y su capacidad de adaptación es quizás más importante que sus antecedentes académicos en una u otra área. Una actitud explícita de compromiso sobre lo que es el BA es indispensable, ya que no podrá enseñar aquello en lo que no cree.

Deberá, sobre el BA, «sentir» que ya NO es una IDEA, que ya NO es de NADIE, que él puede ser ese ALGUIEN que la podrá poner en práctica como NADIE. Deberá pensar que es un espacio donde, con esfuerzo, ayudará a recuperar una mística profesional y permitirá que esos jóvenes, sus alumnos, llenen espacios con ilusiones, con SU mística.

Estamos viviendo una época de cambio en la relación de género entre los estudiantes y los profesores. Una carrera, predominantemente masculina, hoy ha invertido esa relación. Ese predominio femenino favorece enormemente el desarrollo de este tema, ya que, históricamente, los hombres han tendido a desarrollar una atmósfera de «machos» donde esta temática dejaba poco espacio para su desarrollo (46).

En aquellas Universidades donde esta materia aún no integre los planes de estudio, el Consejo Académico (u órgano de análisis similar) podrá establecer quién de los miembros del equipo docente tiene inclinaciones a desarrollar esta materia. Este problema central, muchas veces dejado de lado, es establecer que quien enseña esta especialidad debe estar comprometido con la misma y tener el deseo de estimular ese compromiso en sus estudiantes.

Mediante este *sillabus* se favorecen actividades (seminarios, discusiones, aprendizaje, basados en resolución de problemas) que obligan al alumno a pensar, a desarrollar el pensamiento crítico y la reflexión, a integrar diversos recursos personales y del entorno educativo (redes de información) y promover en ellos las capacidades de saber, saber hacer, decidir, comunicar, crear y trabajar en equipo.

Un grave inconveniente en los países de idioma español es la falta de libros o material de referencia. Para ello, como un método de entrenar al estudiante de la USAL en sus

destrezas para evaluar, consolidar y expresar técnicamente información pertinente, es obligatorio que cada uno prepare un trabajo sobre un tema a elección, el cual no podrá ser reiteración de otro previo, quedando como elemento de consulta en la biblioteca, además de estar disponible en documento Word.

Esa dificultad para obtener información ha llevado a la propuesta de creación en la USAL del «Centro Universitario de Referencia sobre Bienestar Animal» con fecha 26 de diciembre de 2003, para ofrecer el primer centro donde se consolide información sobre BA (vídeos, libros, separatas, etc.) y así promover esta disciplina entre la comunidad, todos los profesionales vinculados al uso de los animales en todas sus facetas y los estudiantes de esas disciplinas, así como para difundir estos aspectos en la comunidad como una actividad genuina de extensión.

Conclusiones

Esculapio es el nombre que los romanos dieron a Asclepios, dios mitológico griego de la Medicina, hijo de Apolo, padre de Higeia (diosa de la salud que da el nombre a la «*higiene*») y Panacea. Además de este padre, tuvo como mentor y padre adoptivo a Cheiron. Este dios, con su forma de centauro, es considerado el fundador legendario del arte veterinario. Podríamos decir entonces que, ya desde las cumbres del monte Olimpo, las artes veterinarias se entrelazan en una relación de paternal afecto con las médicas. Como son conocidos los consejos de Esculapio a su hijo, futuro médico, me he permitido adaptar algunos de ellos, en forma libre, como si hubieran sido hechos para un futuro veterinario.

«Hijo mío, ¿tú quieres ser veterinario? Esta aspiración es la de un alma generosa y de un espíritu ávido de ciencia. ¿Deseas que los hombres te tengan por un dios que alivia los males de sus bestias pese a que no se expresan por propia lengua y ahuyenta tanto de los unos como de las otras del espanto del dolor y la muerte?

¿Has pensado bien en lo que va a ser tu vida? Tendrás que renunciar a tu vida privada; mientras que la mayoría de los ciudada-

nos pueden, terminada su tarea, aislarse lejos de los inoportunos, tu puerta quedará siempre abierta a todos. A toda hora del día o de la noche vendrán a turbar tu descanso, tus placeres y tu meditación y no tendrás horas para dedicar a tu familia, a la amistad o al estudio, y no te pertenecerás.

Los pobres, acostumbrados a que sus animales padezcan como ellos, no te llamarán sino en caso de urgencia. Pero los ricos te tendrán como su esclavo, encargándote de remediar en sus bestias los excesos que ellos mismos les producen, porque les han causado una indigestión o por que los ven acatarrados. Harán que te despierten a toda prisa tan pronto como sientan en sus animales la menor inquietud, pues los estiman a ellos muchísimo por el dinero que les producen o la compañía que les brindan, al igual que estiman a su persona.

Piénsalo bien mientras estés a tiempo.

Pero si eres indiferente a la fortuna, a los placeres, a la ingratitud, si, aun sabiendo que te verás solo entre las fieras humanas y animales, tienes un alma lo bastante estoica como para satisfacerse con el deber cumplido sin ilusiones; si te juzgas pagado lo bastante con la dicha de una madre con una cara que sonríe porque el animal que acompaña a su amado hijo, conduce a su esposo o produce en su finca no padece; si te reconforta dar la paz a la bestia moribunda y con tu arte le haces llegar la muerte sin pena ni dolor; si ansías comprender el vínculo oculto entre el animal y el hombre para así penetrar en todo lo trágico del destino de ambos, entonces, hijo mío, ve y *hazte veterinario*».

En esos veterinarios, probablemente, pensaba D. O. Jones en una conferencia en el Colegio de Medicina Veterinaria de la Universidad Estatal de Ohio, EE.UU., cuando dijo que «nuestra profesión, como muchas otras, consta de dos partes: la ciencia y el arte. El problema es que con nuestra medicina, tenemos muchos científicos y pocos artistas» (47). Y ese problema nos lleva a comprender una de las razones de la demanda de la sociedad de profesionales entrenados en el BA; que en los animales de compañía manejen aspectos objetivos y subjetivos frente a la eutanasia y el dolor; que en los animales de producción, de uso deportivo o de entretenimiento dejen

de ser cómplices de situaciones de crueldad y maltrato, que no avalen, toleren o permitan actividades crueles, so pretexto de tradiciones milenarias.

He sido testigo de veterinarios que abusaban de animales, que usaban drogas prohibidas para matar animales pensando que «eso» era eutanasia; he visto decenas de casos tristes y patéticos que, con dolor, me hacen sentir que (salvo maravillosas y honrosas excepciones) las generaciones de veterinarios viejos están perdidas.

La enseñanza del BA nos permite encender la luz de la esperanza para el futuro de la profesión: los jóvenes.

Esos jóvenes pondrán sus apasionadas actitudes al lado de sus habilidades y conocimientos para sumar a la pasión y el corazón de los proteccionistas serios, no fanáticos.

Algunos análisis prospectivos sobre los temas que afectarán el futuro de la profesión en los próximos años no dejan de incluir el tema del BA. Específicamente, la Asociación de Veterinarios Australianos (48), en su estudio realizado específicamente sobre el particular, establece que, entre las necesidades requeridas para el futuro, están:

- a) proveer el necesario conocimiento en temas de BA, específicamente en el manejo de animales abandonados en las calles;
- b) promover la experiencia profesional en temas vinculados a la demanda de la sociedad sobre el BA (49).

No se puede hablar del BA como una disciplina que pertenezca sólo a la medicina veterinaria. Debe nutrirse del aporte de diferentes disciplinas, con un criterio de «transversalidad». Los abogados asesoran en legislación sobre cuidado y uso de animales en distintas actividades, responsabilidad de sus propietarios o cuidadores; los ingenieros civiles y los arquitectos diseñan adecuados edificios para albergar animales en forma transitoria (playas de descarga y corrales, rampas y pasillos de frigoríficos o mercados de concentración de hacienda) o permanente (*boxes* de clubes hípicas e hipódromos, bioterios en laboratorios de experimentación); los médicos humanos, aplicando las «tres R», estimulan el uso ético y responsable en investigación; los periodistas, investigando y

revelando diversas formas de maltrato, hacen tomar conciencia a la opinión pública e influyen sobre los legisladores que promulgan leyes u ordenanzas que protegen al animal del abuso o crueldad.

En las palabras de Kant, podemos encontrar apoyo: «Tan sólo por la educación puede el hombre llegar a ser hombre. El hombre no es más que lo que la educación hace de él».

Éstas son mis propuestas:

1. Se propone que se cumplan en todos los continentes las recomendaciones sobre Bienestar Animal realizadas por la Asociación Mundial de Veterinaria en 1991 (50).
2. En América, especialmente, que además se analicen para su implementación las propuestas del «Segundo Seminario Internacional sobre Educación Superior en las Ciencias Veterinarias en las Américas», específicamente en lo mencionado sobre el «Perfil referencial de validez del médico veterinario panamericano» (51), donde se especifican sus deseables conocimientos, habilidades, destrezas, valores y actitudes.
3. Se recomienda el análisis, para una eventual aplicación, de «Conceptos en BA», de la WSPA.
4. Se recomienda la creación de grupos de especialistas, entre aquellos que ya actúen como profesores, encargados de cursos o seminarios, para ayudar a formar a aquellos que deseen serlo.
5. Se recomienda la integración con asociaciones protectoras que deseen apoyar los esfuerzos docentes en materia de BA, como la WSPA.
6. Se recomienda la vinculación activa a los comités en BA de la Asociación Mundial de Veterinaria, de la Asociación de Veterinarios Especializados en Pequeños Animales y de toda otra asociación profesional que desee desarrollar esta especialidad.

Recordando las palabras de los editores del libro sobre las sesiones de BA en el Congreso Mundial de Veterinaria en Río de Janeiro, John Seamer y Fred Quimby, «a través de una red internacional de veterinarios, como la que ofrece la Asociación Mundial, los colegas de un país pueden ayudar a los de otro. Frente a los problemas del bienestar humano, inevitablemente los del bienestar animal siempre estarán en un segundo lugar. La

tarea es enorme, pero tenemos útiles herramientas en la mano» (52).

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- (39) University of Bristol, Division of Animal Health and Husbandry, Department of Clinical Veterinary Science, Langford House, Langford, Bristol, BS40 5DU, Reino Unido, tel. (44-117) 92 89 46, fax (44-117) 92 89 58.
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Résumé

Le bien-être animal dans la formation des vétérinaires

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Mots clés: bien-être animal, programme, enseignement, école vétérinaire, médecine vétérinaire

Dans les années 80, le thème du bien-être animal était considéré par les uns comme peu sérieux, et par les autres comme étant, pour le moins, nouveau. La profession vétérinaire a pris conscience de cela lors d'épisodes déterminants. Le département de médecine vétérinaire clinique de l'université de Cambridge, au Royaume-Uni, fut le premier à offrir un enseignement sur le bien-être animal. Depuis 1986, Don Broom, premier professeur au monde dans cette spécialité, assure la direction de cette chaire.

Lors du congrès mondial tenu au Brésil en 1991, grâce à un groupe de visionnaires dirigé par Ely Mayer, d'Israël, l'Association mondiale vétérinaire a établi les «politiques sur le bien-être animal et l'éthologie». Dans le cadre de ces politiques, il est stipulé que, «pour réussir à établir une prise de position éclairée sur le bien-être animal qui soit en accord avec la profession, il est essentiel d'inclure cette discipline dans les études de base du premier cycle. Pour atteindre ce but, les principes suivants doivent être adoptés:

- a) le thème du bien-être animal doit être inséré comme discipline indépendante dans le curriculum de l'enseignement vétérinaire;
- b) la discipline scientifique du bien-être animal doit inclure des aspects applicables à la bioéthique, à l'éthologie et au concept de souffrance et de bien-être;
- c) ce thème doit s'enseigner au niveau pré-clinique et doit s'étendre au niveau clinique.

Il est nécessaire de créer des opportunités permettant, au niveau des études de cycle

supérieur, de toucher au bien-être animal et à l'éthologie et de faciliter leur disponibilité à tous les vétérinaires qui se dirigent vers cette spécialisation».

En 1994, la faculté de médecine vétérinaire de l'Universidad del Salvador (USAL), en Argentine, a inclus dans son curriculum l'enseignement obligatoire du bien-être animal et de l'éthologie. Ce fut la première université à effectuer cette démarche en Amérique latine et elle demeure la seule qui l'enseigne en Argentine; dans ce pays, aucune des facultés vétérinaires, qu'elles soient publiques ou privées, n'offre cette matière en option.

Par la suite, en 1998, la Société mondiale pour la protection des animaux (WSPA), grâce à ses politiques (propositions et définitions), a fait la promotion d'une éducation qui favorise le respect et les soins responsables pour tout type d'animal. Dans ce contexte, et avec l'appui de l'université de Bristol au Royaume-Uni, l'association procède actuellement au développement de «concepts sur le bien-être animal», un outil qui s'avère très utile pour toute faculté qui désire incorporer cette discipline nouvelle et indispensable dans tout curriculum moderne.

Cette discipline s'ajoute aux autres connaissances exigées du professionnel, telles que définies dans le profil de référence du médecin vétérinaire panaméricain, proposé par la Fédération panaméricaine des facultés et écoles de sciences vétérinaires, 2001.

Resumen

El bienestar de los animales, un currículum para su enseñanza en las facultades de veterinaria

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Palabras clave: bienestar de los animales, currículum, enseñanza, facultades de medicina veterinaria

En los años ochenta, hablar del bienestar de los animales era un tema para algunos poco serio; para otros, al menos, novedoso. La profesión veterinaria descubrió esto en episodios contundentes. El primer lugar en donde se enseñó fue el Departamento de Medicina Clínica Veterinaria de la Universidad de Cambridge, en el Reino Unido. Desde 1986 «Don» Broom, primer profesor del mundo de esta especialidad, sigue al frente de esta Cátedra.

La Asociación Mundial de Veterinaria, gracias a un grupo de visionarios liderados por Ely Mayer, de Israel, dio a luz en el Congreso Mundial en Brasil (1991) las «Políticas en Bienestar Animal y Etología», donde se establece: «[...] para lograr establecer una posición informada sobre el Bienestar Animal adecuada a la profesión, se considera esencial incluir esta asignatura en la educación básica del pregrado. Por ello se deben adoptar estos principios:

- a) el tema de Bienestar Animal se debe incorporar como asignatura independiente, por su propio derecho, en el currículum educativo;
- b) la disciplina científica del Bienestar Animal debe incorporar aspectos aplicados de bioética, etología y el concepto del sufrimiento y bienestar;
- c) este tema debe enseñarse a nivel preclínico y se reconoce que debe ser extendido al clínico.

Se considera necesario crear oportunidades para estudios de postgrado en Bienestar Animal y en Etología, disponibles para todos los veterinarios que deseen esta especialización».

La Carrera de Veterinaria en la Universidad del Salvador (USAL), en Argentina (1994), estableció en su currículum la enseñanza obligatoria del Bienestar Animal y la Etología. Fue la primera en América Latina y es la única Universidad en la cual se hace esto en Argentina, donde no se enseña la materia, ni como optativa, en ninguna de sus Facultades de gestión pública o privada.

Posteriormente, como lo manifiesta en sus Políticas (Propuestas y definiciones) en 1998, la Sociedad Mundial de Protección de los Animales (WSPA en inglés) promueve la educación que favorezca el respeto y la tenencia responsable de todo tipo de animal. En ese contexto, y con el apoyo de la Universidad de Bristol (Reino Unido), está desarrollando «Conceptos en Bienestar Animal», una herramienta de gran utilidad para toda Facultad que quiera incorporar esta nueva e imprescindible materia para cualquier currículum moderno.

En el perfil referencial de validez del médico veterinario panamericano, propuesto por la Federación Panamericana de Facultades y Escuelas de Ciencias Veterinarias, 2001, se incluye entre los conocimientos solicitados al profesional.

Abstract

Animal welfare in the veterinary curriculum

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Keywords: animal welfare, curriculum, teaching, faculties of veterinary medicine

In the 1980s, certain members of the veterinary profession thought that the subject of animal welfare was of some interest, but others felt it was of little importance. The veterinary profession discovered this to its cost in a series of harsh incidents. The first educational institution to teach animal welfare was the Department of Clinical Veterinary Medicine of the University of Cambridge in the United Kingdom. Donald Broom, who was appointed the world's first Professor of Animal Welfare in 1986, is still the foremost authority in this discipline.

Thanks to a group of visionaries headed by Ely Mayer, from Israel, the World Veterinary Association, at its World Congress in Brazil (1991), produced policies on animal welfare and ethology stating that 'in order to establish an informed position on animal welfare appropriate to the profession, it is essential to include the subject in basic undergraduate education. This calls for the following principles to be adopted.

- (a) The subject of animal welfare must be incorporated into the teaching curriculum as an independent subject in its own right.
- (b) The scientific discipline of animal welfare must include applied aspects of bioethics, ethology and the concept of suffering and welfare.

- (c) The subject must be taught at pre-clinical level and it is acknowledged that it must be extended to the clinical level.

It is considered necessary to make available opportunities for postgraduate studies in animal welfare and in ethology to all veterinarians wishing to specialise in this field.'

In 1994, the University of Salvador (USAL) in Argentina made animal welfare and ethology a compulsory part of its veterinary degree course curriculum. It was the first animal welfare and ethology degree course in Latin America and no other public or private universities in Argentina teach the subject or offer it as an option.

As stated in its policies (proposals and definitions) in 1998, the World Society for the Protection of Animals (WSPA) promotes education to encourage respect for and responsible stewardship of all types of animal. In this context it is developing 'Concepts in animal welfare' with the support of the University of Bristol (United Kingdom). This is an extremely useful tool for any faculty wishing to incorporate this new subject, which is essential to any modern curriculum.

In 2001, the Pan American Federation of University Faculties and Schools of Veterinary Sciences proposed that the ideal job profile for Pan-American veterinary physicians should include a knowledge of the subject.

The expectations of the international animal welfare movement

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Summary

The primary objectives of animal welfarists and animal welfare organisations are straightforward. They are the alleviation of suffering and the prevention of cruelty. Those objectives unite the animal welfare movement. Stating such objectives is a relatively simple task. Establishing a strategy with which the objectives can be achieved is more difficult and for obvious reasons, it will depend on which part of the world the animal welfarist is standing.

Keywords: animal welfare, suffering, cruelty, expectations, guidelines

Exploitation of animals occurs throughout the world and the reasons are varied. They include the need for food, for clothing and medicines. The quest for knowledge in basic research requires animals and they are also exploited for sport, for exhibition and for companionship.

Any exploitation can, and often does, lead to some degree of animal suffering. Sometimes this is justified on the grounds that it is necessary. This is reasonable in the case of farm animal transport. All transport of farm animals causes some stress or suffering. However, transport from farm to farm or farm to slaughterhouse is necessary for livestock production to exist. However, this should not prevent us asking the question: Is long distance transport of animals for slaughter necessary? Do thousands of sheep have to be transported live from Australia to the Middle East each year? Is their suffering justified when it can be replaced by trade in carcasses? Should live horses and donkeys be transported by road from Lithuania to Italy for slaughter? This trade is notorious for being conducted with little concern for the animals and their suffering is well documented.

These and many other questions are asked by the animal welfare movement. Answers are sometimes difficult but at least it is possible that this OIE initiative will lead to these questions being debated and, perhaps, answered on a sensible basis.

Another factor which is becoming increasingly important in this debate is food safety. Many factors contribute to the production of safe and nutritious food but good animal health and good animal welfare are of vital importance.

This conference will emphasise the importance of ensuring that all standards or guidelines that are published by the OIE are based on science. This is a principle that must be supported and over many years the OIE has earned its well-deserved reputation because it has not deviated from that principle.

We should all accept that science – good science – must be the basis of animal welfare standards. However, for most animal health standards the scientific basis is clear enough. Approval of a vaccine for foot-and-mouth disease or a blood test for antibodies is based on the scientific evidence received. If it is sufficient and acceptable, this approval is given.

With animal welfare standards there is a need to add other elements to the scientific package. One is the need for an expert opinion. Science can tell you a great deal about the physical state of animals and, arguably, to a lesser extent, about their mental state. But is science enough to decide, for example, whether it is acceptable to keep laying hens in an environment such as a battery cage or to keep a calf in a narrow pen in which it is

unable to turn around and to feed it a diet that is so deficient in iron that the calf is on the borderline of clinical anaemia?

The question as to whether or not it is acceptable is often a matter of opinion. In Europe at least, you would be prosecuted for keeping your pet dog in a veal calf crate but this veal production system remains legal until 2007. These systems for rearing livestock were criticised by scientists but not to such an extent that it stimulated legislative action to be taken to phase them out and replace them with alternative and more animal welfare friendly systems.

For that next step to be taken there needed to be an additional element applied which was that of an opinion or judgement although probably based on the scientific evidence. Such a judgement will need to take several factors into account and not least to answer the type of questions that arise when one is debating a commercial livestock system. Does it matter so much if the animal's life is so short? And is there a better way? The answer to the latter question is clearly yes for both egg and veal production.

The question about the animal's life being so short that it does not matter much if its welfare is poor should not normally be considered at all. But it is sometimes asked and ranks alongside the long discredited statement that if an animal is producing, for example, laying eggs or putting on weight, then there is nothing wrong with its welfare.

It is my hope that such statements will be confined to the garbage, where they belong and that the OIE initiative will herald a new and more sensible debate on how farm animals should be reared, transported and slaughtered!

On top of the science and the animal welfare opinion, there come other elements that have to be taken into consideration when deciding on farm animal standards. These include commercial practice, economic implications and political reality. Our concern is that these elements are often allowed to override both the science and the animal welfare opinion.

I will give you a European example of why animal welfarists have this concern. In bull-

fighting which takes place in Spain, Portugal and France in Europe, the physical damage caused and the pain inflicted on the bull can be described scientifically, but it continues to be a legal activity even in a society in which the welfare of animals is becoming increasingly important. The reason is that it continues to receive strong political support.

The combination of an existing commercial practice, historical significance and economic implications if change is introduced makes for a powerful lobby and strongly influences government policy on many issues.

To overcome such a strong political lobby, the animal welfare movement needs the following: good scientific evidence underpinning our demands, the support of the veterinary profession or, at least, not outright opposition and, for legislative change we then need the support of a significant majority of the general public.

That is very much a European, or a developed country, scenario. This brings me to the question: What are the expectations of the global animal welfare movement? Expectations will depend on the situation that is being faced and the feasibility of introducing change – either through officially supported codes of practice or through legislation.

It is clear that setting standards for animal transport and slaughter and for livestock production systems will keep the OIE well occupied for some time.

It is also clear that countries that trade animals and animal products have differing national standards. If, as a consequence, there is a trade dispute between two such countries then the first thing that a WTO panel would do would be to see if there were OIE standards or guidelines in place which were relevant to the dispute. Therefore, it is obvious that from our point of view, it is vital that OIE standards should be high enough to ensure that the welfare of the animals is good.

The first expectation of the global animal welfare movement will be that the OIE agrees to involve NGOs such as the ICAFAW, the group that I represent, in some way in the decision-making process and that the process itself is transparent.

The second expectation is that when OIE standards are agreed they should not result in any country – whether developed, developing, or least developed – having to move backwards in animal welfare terms. I will give one example: much beef production in Africa and South America is extensive and organic. This type of production should be encouraged and not have to compete in trade terms against cheap beef produced in overcrowded feed lot systems where the welfare of the animals is poor.

The third expectation of the global animal welfare movement is that any farm animal rearing standards that are proposed by the OIE should be based clearly and firmly on the five freedoms as agreed by the United Kingdom's Farm Animal Welfare Committee. These will be described in more detail by future speakers. These five freedoms have been accepted by the livestock industry, the veterinary profession, academic governments and animal welfarists. They can, and should, be applied in any part of the world.

As a European, I have had a difficult task in trying to represent the interests of animal welfarists in various parts of the world – Africa, Australia, Asia, North America and Europe. I regret that as yet we have no member in China. Nevertheless, our determina-

tion to alleviate animal suffering, wherever it occurs, and prevent animal cruelty is a common cause. We might vary in the priorities that we select as these must be different in, for example, central Africa as compared with central Europe. In the least developed countries we are often criticised for trying to improve animal welfare in situations where there is also enormous human suffering. Of course, solving the human welfare problem is the priority but that does not mean that animals necessarily have to be neglected. Following the recent Iraq war there was a great shortage of medicines both human and veterinary. Many organisations were involved in supplying human medicines and the World Society for the Protection of Animals (WSPA) which leads the International Coalition for Farm Animal Welfare, successfully organised the supply of essential veterinary medicines. The two actions were carried out simultaneously and I see nothing wrong in that.

Our determination to achieve a better deal for animals is universal and we will try to ensure that all the animals with which we share our planet are respected and that those which we exploit to our advantage are properly cared for. The OIE has an important role to play in order to achieve this and we will play our part in helping it succeed.

Résumé

Les attentes du mouvement international du bien-être animal

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Mots clés: bien-être animal, souffrance, cruauté, attentes, lignes directrices.

Les principaux objectifs poursuivis par les défenseurs du bien-être animal sont universels: l'allégement de la souffrance et la prévention de la cruauté envers les animaux. Les causes de souffrance animale, tant physique que mentale, sont multiples et les animaux peuvent souffrir de différentes façons et à des degrés divers. La souffrance est essentiellement occasionnée par des lésions ou des maladies; elle est parfois le fruit de l'ignorance, ou infligée au nom de la religion; parfois aussi la cruauté délibérée en est la cause. Le mouvement international du bien-être animal est uni dans sa détermination de soulager la souffrance partout où elle survient et sous toutes ses formes.

L'exploitation des animaux existe partout dans le monde. Les raisons en sont diverses: pour l'alimentation, l'habillement, le savoir, la médecine, la compagnie, le sport, le spectacle, etc.

Les animaux sont la cible de pratiques peu scrupuleuses caractérisées par un manque de soins et de respect pendant leur exploitation. On pourrait citer les systèmes d'élevage très intensifs, le maintien et l'exhibition d'animaux sauvages dans des cirques et les essais toxicologiques injustifiés.

Par ailleurs, les attentes en matière de bien-être animal varient énormément et sont fortement influencées par la situation socio-économique de la région. Les communautés où les humains souffrent d'un manque de nourriture et de confort ne consacreront pas beaucoup de temps, d'efforts ou d'argent à des problèmes liés au bien-être des animaux du voisinage.

Néanmoins, dans la plupart des régions du monde, ceux qui souhaitent protéger les humains et s'en occuper éprouvent aussi de la bienveillance envers les animaux. D'une façon ou d'une autre, on nourrira l'espoir de préserver le bien-être animal dans pratiquement toutes les circonstances. C'est pourquoi il est important que des efforts soient déployés pour réaliser ces attentes.

L'action de l'OIE consistant à élaborer des normes et des recommandations en matière de bien-être animal se situe au sommet de l'échelle des activités complexes en faveur du bien-être animal. On cherchera à établir dans quelle mesure ces normes sont susceptibles d'améliorer le bien-être des animaux.

Resumen

Expectativas del movimiento internacional de bienestar animal

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Palabras clave: bienestar de los animales, sufrimiento, crueldad, expectativas, directrices

Los objetivos principales del movimiento en pro del bienestar animal son universales: el alivio del sufrimiento y la prevención de la crueldad. Las causas de sufrimiento de los animales son múltiples, tanto físicas como mentales, y los animales pueden sufrir de maneras distintas y en grados diversos. El sufrimiento suele ser causado por lesiones o enfermedades, a veces por ignorancia, a veces en nombre de la religión y a veces es el resultado de una crueldad deliberada. El movimiento internacional de bienestar animal está unido en su determinación para aliviar el sufrimiento en donde ocurra y cualquiera sea su forma.

La explotación de los animales existe en todo el mundo. Las razones son diversas: para la industria alimentaria o del vestido, con fines de conocimiento o médicos, como compañía, para el deporte y para la exhibición.

La falta de cuidados y consideración durante la explotación del animal conduce a un gran abuso. Entre los ejemplos podemos mencionar los sistemas muy intensivos de producción pecuaria, el mantenimiento y exhibición

de animales salvajes en los circos y la realización de pruebas toxicológicas innecesarias.

Por otra parte, las expectativas de bienestar animal varían enormemente y están influenciadas en gran medida por la situación socio-económica de la región en que vive la persona. En las comunidades en donde escasean los alimentos y otros recursos necesarios para el hombre no se invertirá mucho tiempo ni esfuerzo o dinero en los problemas relacionados con el bienestar de los animales existentes.

No obstante, en la mayor parte del mundo, quienes se preocupan por la protección y cuidado del hombre sienten también compasión por los animales. En casi todas las circunstancias habrá expectativas en relación con el bienestar animal. Por tanto, es importante desplegar esfuerzos para hacerlas realidad.

En el extremo sofisticado de la escala de actividades en pro del bienestar animal figuran los esfuerzos de la OIE para formular normas y directrices sobre el bienestar animal. Examinaremos en qué medida estas normas podrían mejorar el bienestar de los animales.

Abstract

The expectations of the international animal welfare movement

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Keywords: animal welfare, suffering, cruelty, expectations, guidelines

The primary objectives of animal welfarists are universal: the alleviation of suffering and the prevention of cruelty. There are many causes of animal suffering, both physical and mental, and animals can suffer in different ways and to varying degrees. Some suffering is caused by injury or disease, some by ignorance, some in the name of religion, and some as a result of deliberate cruelty. The international animal welfare movement is united in its determination to alleviate suffering wherever it occurs and in all its forms.

The exploitation of animals occurs throughout the world for many different reasons: for food, for clothing, for knowledge, for medicine, for companionship, for sport and for exhibition. Whatever the reason for their use, animals suffer great abuse because of a lack of care and consideration. Examples of this abuse include very intensive livestock production systems, the keeping and showing of wild animals in circuses and unnecessary toxicological testing.

Animal welfare expectations, on the other hand, vary enormously and are strongly influenced by the socioeconomic situation in that part of the world in which the person lives. Communities in which there is a shortage of food and other amenities for humans are not going to spend much time, effort or money on problems relating to the welfare of animals in that community.

However, in most parts of the world those who desire to protect and care for humans also have compassion for animals. There will be expectations of some sort for animal welfare in virtually all circumstances. Therefore it is important that efforts are made to meet these expectations.

At the sophisticated end of the animal welfare activity scale is the effort of the OIE to develop standards and guidelines for animal welfare. The extent to which these standards are likely to improve the welfare of animals will be examined.

Animal transportation – An industry perspective

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Keywords: animal welfare, transport, Animal Transport Association (AATA)

The transport of live animals is essential. Significant issues in animal transportation include its contribution to national economies, its effects of animal stress and mortality, its potential to spread disease, and the many benefits of being able to move animals around the world.

The animal transport industry includes the following groups:

- academia
- airlines
- birds/poultry
- boarding/quarantine facilities
- breed associations
- cargo agents/forwarders
- consultants
- fish
- horses
- humane/industry organisations
- insurance
- livestock
- marine carriers
- research
- truckers
- veterinarians
- wildlife
- zoos/aquariums.

For example, the Animal Transport Association (AATA) has over 400 members, from 35 countries. All members subscribe to the AATA statement of policies, which concludes with:

‘As members of AATA, we subscribe to the above policies and agree that our first consid-

eration is the safe, humane and expeditious handling of any animals under our care. We pledge continued support to research and education beneficial to the animals and the industry. This is the industry that I represent.’

Some have advocated that all transport of live animals should be banned. There are solid arguments against this, including:

- consumer preferences for fresh meat as apposed to frozen meat;
- religious requirements;
- breeding programmes, due to the limitations of freezing semen or embryos of some species;
- animal relocation programmes for endangered species or where feed is insufficient;
- domestic pets/holidays/livestock shows;
- competition animals;
- transport of animals for slaughter.

All parties have an interest in maximising animal welfare during transport.

The main reasons for insurance claims as a result of animal transport are as follows:

- transport stress-related illness, particularly in some species;
- loss of use: for breeding/racing and show stock;
- abortion: due to transport too late in pregnancy, which may also cause death of the dam;
- injuries, often necessitating humane destruction;
- retest failure after arrival, sometimes triggered by transport stress;
- prohibitions on export/import due to disease outbreaks.

All these issues need to be addressed through careful risk management addressing:

- logistics of the journey: border control opening times, holding facilities, allowance for emergencies, animal illness or injuries;
- preparation of the animals to comply with the relevant health protocols;
- preparation of the vehicles/pens/stalls to comply with the relevant standards;
- competency of attendants;
- vehicle failure, including ventilation system;
- ensuring up-to-date information on the animal health situation to minimise the likelihood of animals being stopped en route or rejected on arrival.

There has been an enormous amount of research conducted on animal transport but almost no coordination among researchers. Each country tends to carry out its own research, and then develops its own rules and transport regulations. This lack of coordination has an adverse effect on the welfare of animals travelling internationally.

Europe has made significant progress in enacting legislation protecting animals during transportation. Although it is not perfect, it does allow enforcement for transport that falls outside these parameters. Implementation of these rules, however, is still not uniform among countries within the EU. Outside Europe there are few regulations – Australia and New Zealand have put together various recommendations but there are few in North America.

Animal transport is a worldwide issue that requires international coordination. The OIE's efforts in organising this conference on animal welfare and including animal transportation on the agenda are important first steps in addressing the important issues associated with the movement of animals. The OIE, the industry, researchers and animal welfare groups all share a common goal and must work together to improve animal welfare through appropriate regulations with a global perspective and based on realistic and objective research.

It is appropriate that the OIE should coordinate research projects globally and publish the results, and work towards producing international regulations for animal transportation.

A marketplace perspective

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Summary

In order to achieve real change, there must be a motivating force and all of the stakeholders need to be involved. This is the premise of the animal welfare programme developed for the food retail, wholesale and chain restaurant industries in the United States by the Food Marketing Institute (FMI) ⁽¹⁾ and the National Council of Chain Restaurants (NCCR) ⁽²⁾. This paper outlines a collaborative process that producers and retailers in the United States are using to enhance the care and welfare of animals in commercial food production. Although the efforts of the FMI and the NCCR are still underway, the process provides one example of how different parts of the food production system can work together to achieve positive change.

Keywords: food retailers, food wholesalers, chain restaurants, producers, advisors, guidelines, audit, verification

1. Introduction

In 2000, animal rights organisations began to demand that individual restaurant chain companies force their suppliers to follow specific animal welfare guidelines developed by activist organisations. The demands by the activists were followed by ‘campaigns’ that publicly portrayed the targeted companies as supporters of animal abuse, pain and suffering in food production agriculture. In an effort to respond in a manner that would demonstrate to their restaurant customers their concern for animal welfare, several chain restaurant companies began to develop their own animal welfare guidelines and programmes. These initial efforts resulted in chain restaurant suppliers facing different, customised, and sometimes conflicting, animal welfare requirements based on the requests of individual customers. Believing their tactics were achieving success, the

activists began to approach supermarket chains in the USA making similar demands.

Late in 2000, five of the FMI’s supermarket company members ⁽³⁾ asked the FMI to develop a voluntary policy and programme to address animal welfare that the entire supermarket industry could embrace. They reasoned that an industry approach would be more efficient, allow the pooling of resources and provide an incentive for the supplier community to work with their supermarket customers to develop an effective animal welfare programme. In December 2000, the FMI formed a member company advisory committee, undertook qualitative (focus group) consumer research ⁽⁴⁾ and began meetings with the producer community.

The purpose of the consumer focus groups was to informally probe what consumers

⁽¹⁾ The Food Marketing Institute (FMI) conducts programmes in research, education, industrial relations and public affairs on behalf of its 2 300 member companies – food retailers and wholesalers – in the United States and around the world. The FMI’s US members operate approximately 26 000 retail food stores with a combined annual volume of USD 340 billion, three quarters of all retail food store sales in the USA. The FMI’s international membership includes 200 companies from 60 countries.

⁽²⁾ The National Council of Chain Restaurants (NCCR) is a national trade association in the United States representing 40 of the USA’s largest multi-unit, multi-State chain restaurant companies. The NCCR’s member companies own and operate more than 50 000 restaurant facilities and another 70 000 facilities under their trademarks through franchise and licensing agreements.

⁽³⁾ Ahold USA, Inc.; Albertsons, Inc.; The Kroger Co.; Safeway, Inc.; and Wal-Mart Stores, Inc.

⁽⁴⁾ Kinzey, R. (2001). Four focus groups conducted by Kinzey and day qualitative market research; two in Richmond, Virginia, 23 January 2001; two in Baltimore, Maryland, 24 January 2001. All groups composed of primary supermarket shoppers between the ages of 25 and 55. Participants represented a mix of races, genders and household incomes. The results are unpublished.

thought the role of the supermarket should be regarding animal welfare. The unpublished results of the focus groups were that consumers want to be sure animals in food production are treated humanely. Consumers do not want to know the details of animal processing but they do believe the supermarket's role is to work with their suppliers to assure animals used for food are treated in a manner free from pain, abuse and neglect.

2. Food retail industry policy and programme

On 14 January 2001, the FMI's board of directors adopted a policy and programme to address animal welfare (Appendix I). The policy stated that animals must be raised, transported and processed in a clean, safe environment free from cruelty, abuse and neglect. The policy also stated that supermarkets will work with the food production industry to promote best practices; will consult regularly with experts in animal science and animal welfare; will urge governments to strictly enforce animal protection laws and will communicate best practices to maintain consumer confidence. The FMI board directed the FMI to develop retailer expectations for use with suppliers; to work with respected animal welfare experts and organisations; to review expectations with the producer community; to distribute expectations as voluntary recommendations for retailers to adopt; and, to support an ongoing animal welfare expert advisory council.

Following the action of its board of directors, the FMI began a series of meetings with the producer community ⁽⁵⁾ and the restaurant industry ⁽⁶⁾ to share the FMI's policy and programme. The institute formed a panel of animal welfare experts that included academicians, veterinarians and advocates ⁽⁷⁾ and publicly announced its intentions and

goals through the news media (Appendix I). The panel of animal welfare experts was asked to review current animal care guidelines of the producer organisations and identify areas where the guidelines should be improved or enhanced. The FMI's committee of supermarket companies then prioritised the gaps identified by the expert panel.

In June of 2001, the FMI and the NCCR joined their parallel efforts. The combined membership of the two organisations represents the majority of the food retailing industry in the United States. The FMI and the NCCR also combined their expert panels ⁽⁸⁾ and member committees. Jointly, the FMI and the NCCR began to meet one-on-one with the producer community to present feedback from the expert advisory panel on how current producer guidelines for animal care and welfare should be enhanced.

3. Programme goals

The food retail industry understands that the issues surrounding the welfare of animals used for food are important and complicated. Some recommendations have economic implications and some require an implementation timetable because they cannot be accomplished immediately without major disruption to the supply chain. Some areas are still being researched to confirm that changes will enhance, not hinder, animal well-being.

Retailers, animal welfare experts, animal welfare advocates, producers, processors, and the public share the common goal that all animals used in agricultural production be cared for in a manner that takes into account their daily well-being and health. We believe this means that in addition to having ready access to fresh water and feed and adequate shelter, animals in agriculture production must be kept in an environment designed to protect them from physical, chemical and thermal abuse, stress and dis-

⁽⁵⁾ American Meat Institute, Milk and Dairy Beef Quality Assurance Centre, Inc., National Cattlemen's Beef Association, National Chicken Council, National Milk Producers Association, National Pork Board, National Turkey Federation and United Egg Producers.

⁽⁶⁾ National Council of Chain Restaurants, National Restaurant Association.

⁽⁷⁾ Adele Douglass, Humane Farm Animal Care; Gail Golab, DVM, American Veterinary Medical Association; Temple Grandin, PhD, Colorado State University; Joe Mac Regenstein PhD, Cornell University.

⁽⁸⁾ Combined panel includes Adele Douglass, Humane Farm Animal Care; David Fraser, PhD, University of British Columbia; Gail Golab, DVM, American Veterinary Medical Association; Temple Grandin, PhD, Colorado State University; Joe Mac Regenstein, PhD, Cornell University; Joy Mench, PhD, University of California, Davis; Janice Swanson, PhD, Kansas State University.

stress. Managers and those responsible for handling these animals must be thoroughly trained, skilled and competent in animal husbandry and welfare. Animals must be transported in a safe and appropriate manner and be processed humanely.

4. Guideline process

The FMI and the NCCR have been working with independent expert advisors and the producer/processor community to promote 'best practices' for each species that will ensure animal well-being throughout food production agriculture. We consult regularly with experts in animal science, veterinary medicine and agriculture production to obtain objective, measurable indices for desirable practices in the rearing, handling and processing of animals for food. We continue to urge appropriate US Federal and State government agencies to strictly enforce animal welfare protection laws.

The FMI and the NCCR believe their combined efforts will further develop and support industry policies strengthening animal welfare and will support the following specific goals:

- consistent expectations across the US food retail sector;
- implementation of practicable and attainable animal welfare guidelines based on science;
- a measurable verification process;
- an ongoing advisory council of third party, independent animal welfare experts;
- improved communications across the supply chain on animal welfare issues.

Over the last three years, the FMI and the NCCR have been meeting in person and by conference call with our respective retail member committees, our independent advisors and producer organisations. Our experts have reviewed existing producer animal welfare guidelines, identified gaps, recommended specific changes, additions and revisions and endorsed all or part of specific producer animal welfare guideline programmes.

Working with our expert advisors, we created three guidance documents (Appendix II) that recommend a process, guideline content and audit components necessary to develop meaningful and effective animal welfare guidelines. We developed these guideline documents to identify best practices and assess industry standards across animal species.

Our independent expert advisors have met eight times to-date since June of 2001 to review guidelines submitted by the American Meat Institute, Milk and Dairy Beef Quality Assurance Centre, Inc., National Cattlemen's Beef Association, National Chicken Council, National Pork Board, National Turkey Federation and the commercial duck industry. Several reports have been released by the FMI and the NCCR to provide progress updates. A summary chart (Appendix III) has been developed to outline which industry guidelines have been endorsed by the FMI-NCCR independent, expert advisory council and which issues still need to be addressed.

5. Verification programme

In 2002, the supermarket company and chain restaurant members of the FMI and the NCCR requested the two organisations to develop a voluntary, independent verification programme based on third party audits to assure suppliers are following the animal welfare guidelines endorsed by the FMI-NCCR expert advisory council. The objective is to have one common audit format and process acceptable to the entire US retail food sector. The benefits of such an approach include achieving uniformity and consistency, reducing the possibility for multiple audits of individual suppliers, and eliminating the need for food retailers to develop and administer their own verification programmes.

Through a review and bid process, the FMI and the NCCR chose an audit firm, Sustainable Environmental Solutions, Inc. (SES),⁽⁹⁾ to administer the 'Animal welfare audit programme' (AWAP) independent of the FMI and the NCCR. The audits are voluntary and the audit documents are based on the guide-

⁽⁹⁾ Sustainable Environmental Solutions, Inc. (SES); 9875 Widmer Road, Lenexa, Kansas 66215, USA; tel: (913) 307 00 46.

lines that have been endorsed by the FMI-NCCR expert advisory council. The audit management company certifies auditors based on their animal welfare qualifications. Training specific to the FMI-NCCR endorsed industry guidelines is a requirement for auditor certification. The supplier owns their individual audit results and provides retailers access to the information. The FMI and the NCCR do not have access to the audit results.

Retail customers may ask suppliers to undergo an audit or to share recent audit results. The verification programme is not based on a numerical scoring or pass/fail system but on a series of major and minor non-conformances. Retailers decide what is acceptable according to their company's purchasing specifications or animal welfare expectations of their suppliers. The audit results are maintained on a secure database and the decision to accept or reject a supplier's animal welfare performance rests with each individual retail customer.

Achieving acceptance by suppliers of the independent verification programme has been a significant challenge. Suppliers would prefer self-audits rather than a third party audit programme.

6. Conclusion

It is important to note that significant work is still underway with the FMI-NCCR animal welfare programme. Some segments of the producer community in the USA have been working actively on animal welfare assurance systems for some time by undertaking research, seeking counsel of outside experts and developing and revising guidelines as new information becomes available. Other segments have begun their efforts more recently. This diversity creates many challenges but the work is motivated by the strong commitment and desire of food retailers and restaurants to enhance animal welfare. The FMI and the NCCR believe these efforts have made and will continue to make a significant contribution to enhancing the well-being of animals in food production.

Appendices

Appendix I: Food Marketing Institute (FMI) news release, 'The FMI establishes policy and programme to address animal welfare', 18 April 2001.

Appendix II: Guidance document, 'Developing animal welfare guidelines', created by the FMI-NCCR expert advisory panel, December 2001.

Appendix III: FMI-NCCR animal welfare guidelines status chart, updated December 2003.

Appendix I

The FMI establishes policy and programme to address animal welfare

Washington DC, 18 April 2001, the Food Marketing Institute (FMI) today announced its policy and programme on animal welfare. This announcement follows the formal adoption of the FMI's animal welfare policy by its board of directors at the FMI midwinter conference on 14 January 2001. This policy was established to support industry programmes that strengthen animal welfare, food quality and food safety.

Policy

The FMI believes animal welfare issues, including animal husbandry practices and humane processing, are issues of importance to all of its members. Therefore, the FMI's board of directors has adopted the following industry policy and programme components to be shared with our customers and our suppliers in the producer community.

The FMI believes animals can and should be raised, transported and processed using procedures that are clean, safe and free from cruelty, abuse or neglect.

The FMI will work cooperatively with its counterparts in the food industry to promote production 'best practices' for each species that will strengthen food quality and safety, and ensure animal well-being at every step of the production process.

The FMI will consult regularly with experts in animal husbandry, veterinary medicine and agricultural production to obtain objective, measurable indices of desirable practices in the growing, handling and processing of animals in food production.

The FMI will continue to urge the appropriate State and Federal government agencies to strictly enforce animal protection laws.

The FMI will work with suppliers to communicate examples of best practices in order to maintain consumer confidence in the safety of the food supply.

Programme components

Develop a set of retailer expectations for growers, producers and processors that are modeled on 'best practices' for animal husbandry and humane processing.

Obtain the professional assistance of respected animal welfare experts and organisations in developing retailer expectations.

Review the set of expectations with the producer community to ascertain reasonableness, cost, feasibility and realistic time frames for implementation and verification programmes.

Distribute the set of expectations as voluntary recommendations for retail companies to adopt and use in their discussions with current and future suppliers.

Support the formation of an advisory council as a mechanism for periodic, ongoing dialogue between the food industry and animal welfare experts on issues related to the care and processing of animals for food.

The FMI will develop its programme working with the assistance of animal welfare experts, including:

Adele Douglas, Executive Director, Animal Welfare Association;

Temple Grandin, PhD, Assistant Professor, Department of Animal Sciences, Colorado State University;

Joe Mac Regenstein, PhD, Professor of Food Science, Department of Food Science, Cornell University;

Gail C. Golab, PhD, DVM, American Veterinary Medical Association.

The Food Marketing Institute is a non-profit-making association conducting programmes in research, education, industrial relations and public affairs on behalf of its 1 500 members including their subsidiaries – food retailers and wholesalers and their customers in the United States and around the world. The FMI's domestic member companies operate approximately 21 000 retail food stores with a combined annual sales volume of USD 300 billion – three quarters of all grocery store sales in the United States. The FMI's retail membership is composed of large multi-store chains, small regional firms and independent supermarkets. Its international membership includes 200 members from 60 countries.

Appendix II

Developing animal welfare guidelines

Process elements.

Establish a committee structure to develop the guidelines.

Committee participants should include producers, animal scientists with animal welfare/behaviour expertise, veterinarians and advocates. Representatives from these groups do not have to serve on one committee but they should all review and comment on the final product.

The role of the Committee is to:

identify all potential key concerns – public, producer and scientific;

identify if, how and when each concern will be addressed;

oversee a technical review that includes relevant field research, experimental studies, veterinary expertise, producer expertise, environmental scan of issues, measures relevant to animal welfare.

Developing animal welfare guidelines

Guideline components

One of the most important elements for a successful animal welfare programme is the role and commitment of management. Not only is it important to have the commitment of top management, it is equally important to assure that all levels of management understand their specific role and responsibilities in assuring the implementation of the guidelines. Animal welfare programme implementation needs to be a key job responsibility against which annual performance is measured with rewards for good performance and penalties for poor performance.

The components that need to be addressed in any animal welfare guideline programme follow. These are meant to provide a framework for considering and developing species-specific guidelines.

A decision-making process that is transparent.

Identification of welfare issues needing further study along with the short-term solution.

Auditable guidelines based on performance outcomes or design criteria.

Handling guidelines.

Animal husbandry procedures (food, water, space allocation, bedding conditions).

Sanitation.

Environmental considerations (ventilation, air quality, temperature).

Health programme based on veterinary guidance (biosecurity).

Behavioural management, including identifying and minimising behavioural problems.

Facility and equipment maintenance and design.

Emergency preparedness (power outage, weather emergencies, fire).

Transportation and slaughter procedures where appropriate.

Euthanasia (in transport and on farm).

Inspection procedures and frequency.

Training programmes.

Record keeping.

Review and revision mechanism (every five years or as new research becomes available).

Developing animal welfare guidelines

Audit components

A series of items to consider when developing an auditing system follow.

Each auditing point needs to relate to a specific guideline (consider using a side-by-side format).

Choose wording that is as objective and specific as possible. Give the reason/benefits for the procedure. Be clear about the 'must' items, which are non-negotiable, and the 'should' items, which involve some judgement.

Examples

Use descriptions that give specific guidance – something you can see and access, like, 'providing enough space on the truck during transportation to lie down without being on top of one another', rather than, 'providing adequate space'.

Use words that aid objective assessment, like, 'mud and manure in a feedlot should not be over the top of a hoof', rather than, 'shouldn't be too much mud and manure'.

Words to avoid: adequate, properly, sufficient, appropriate, undue, excessive, normal, improperly, good, bad.

Use graphics or pictures where possible to aid the auditor (e.g. body condition, lesion scoring, space allocation, height of chicken cage to show normal posture).

Use established scoring systems (e.g. lameness, body condition, gait, stunning).

Develop a method for evaluating results – identifying guideline compliance and correc-

tive actions necessary. A weighting or indexing system needs to include a rationale for development of essential items: pass/fail; acceptable threshold items; weighted items.

Outline record-keeping procedures.

Consider pilot testing the audit system in the field.

Auditors should be trained based on species-specific guidelines. They should be independent and have no other contractual arrangement with the producer except as an auditor.

Appendix III

Status

FMI-NCCR animal welfare guidelines status chart

Updated December 2003

Producer organisation	FMI-NCCR endorsement	Outstanding issues
American Meat Institute (AMI)	Endorsed slaughter guidelines and training materials documents for cattle, swine, sheep and goats	None
United Egg Producers (UEP)	Endorsed production, handling, transportation, processing and euthanasia guidelines for layers of shell and breaking eggs	<ul style="list-style-type: none"> • ammonia levels (25 ppm max.; 10 ppm goal) • forced molting (phase-out feed withdrawal molting)
Note: The UEP has undertaken research to address the above two issues.		
Milk and Dairy Beef Quality Assurance Center (DQA); National Milk Producers Federation	Endorsed DQA's animal care guidelines and training programme for milk and dairy beef	
National Chicken Council (NCC)	Endorsed slaughter guidelines for broiler chickens	
	Endorsed NCC's animal welfare guidelines for handling, transportation and euthanasia	<ul style="list-style-type: none"> • stocking density (not to exceed 6.0 lb live weight, per sq. ft) • lighting programmes (four hours' darkness per day; except first and last week of growth) • catching (when birds are caught and inverted, hold by both legs)
The Pork Board FMI	FMI and NCCR are reviewing animal welfare guidelines of the swine industry. FMI and NCCR have issued a policy statement on housing for pregnant sows	Guideline review not completed
National Cattlemen's Beef Association (NCBA)	FMI-NCCR advisors reviewed NCBA's revised animal welfare guidelines in September 2002 and are waiting for a response regarding suggested modifications	Guideline review not completed
National Turkey Federation (NTF)	FMI-NCCR advisors have reviewed animal welfare guidelines of the turkey industry and have recommended changes	Guideline review not completed

Résumé

Le point de vue du commerce

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Mots clés: produit alimentaire, commerce, détaillant, grossiste, chaîne de restauration, producteur, conseiller, lignes directrices, audit, vérification

La réalisation d'un vrai changement suppose l'existence d'une motivation et l'implication de toutes les parties prenantes. Tel est le principe sous-jacent au programme en faveur du bien-être animal élaboré pour le secteur des détaillants et grossistes de produits alimentaires et des chaînes de restaurants aux États-Unis par le Food Marketing Institute (FMI) ⁽¹⁾ et le National Council of Chain Restaurants (NCCR) ⁽²⁾.

Les actions du secteur de l'alimentation de détail ont commencé en 2000 et en janvier 2001 le conseil d'administration du Food Marketing Institute (FMI) a adopté une politique visant à prendre en compte le bien-être animal. Les préceptes en sont les suivants: les animaux doivent être élevés, transportés et transformés dans un cadre propre et sûr et ils ne doivent pas être exposés à des actes de cruauté, à de mauvais traitements ou à une incurie; les membres du Food Marketing Institute (FMI) travailleront en coopération avec leurs fournisseurs pour promouvoir les pratiques optimales pour chaque espèce afin de garantir le bien-être animal tout au long du processus de production; des recommandations seront élaborées en collaboration avec des experts en matière de bien-être animal, de pratiques d'élevage, de médecine vétérinaire et de production agricole; les pratiques optimales seront communiquées à grande

échelle pour conserver la confiance des consommateurs.

En juin 2001, le FMI et le NCCR ont uni leurs efforts pour mettre en place un programme cohérent dans l'ensemble du secteur des détaillants. Il englobe un processus d'audit mesurable, la mise en œuvre de lignes directrices applicables et réalisables reposant sur des bases scientifiques, la création d'un comité consultatif permanent composé d'experts indépendants spécialisés dans le bien-être animal et l'amélioration des communications relatives aux questions de bien-être animal dans l'ensemble de la chaîne d'approvisionnement.

Depuis juin 2001, le groupe consultatif d'experts du FMI-NCCR a tenu huit réunions et examiné les propositions de lignes directrices relatives au bien-être animal émanant de sept organisations de fournisseurs. Les lignes directrices ont été entérinées en ce qui concerne l'abattage (bovins, porcins, caprins, ovins), les poules pondeuses, les bovins de race laitière et les poulets de chair (y compris l'abattage). Elles sont encore en cours d'examen en ce qui concerne les porcins, les bovins de race bouchère et les dindes et ne sont pas encore examinées en ce qui concerne les veaux de lait et les canards. L'état d'avancement de l'élaboration du programme est accessible au public.

⁽¹⁾ Le Food Marketing Institute (FMI) entreprend des programmes dans les domaines de la recherche, de l'éducation, des relations industrielles et des affaires publiques pour le compte des 2 300 sociétés qui en sont membres – détaillants et grossistes en produits alimentaires – aux États-Unis et ailleurs. Ses membres aux États-Unis gèrent environ 26 000 commerces d'alimentation avec un chiffre d'affaires annuel total de 340 milliards de dollars, soit les trois quarts du chiffre réalisé par l'ensemble des magasins d'alimentation de détail aux États-Unis. Outre les États-Unis, sur le plan international, 200 sociétés dans 60 pays sont membres du FMI.

⁽²⁾ Le National Council of Chain Restaurants (NCCR) est une association professionnelle nationale située aux États-Unis, représentant 40 des plus importantes sociétés américaines de chaînes internationales de restaurants. Les sociétés qui adhèrent au NCCR possèdent et gèrent plus de 50 000 restaurants et 70 000 autres établissements sous leur nom de marque par le biais d'accords de franchise et de licence.

Quelques segments du monde des producteurs aux États-Unis participent activement, depuis un certain temps, à l'élaboration de systèmes d'assurance en faveur du bien-être animal en entreprenant des recherches, en consultant des experts extérieurs et en préparant et révisant des lignes directrices à mesure que de nouvelles informations sont disponibles. D'autres segments se sont engagés plus récem-

ment. Cette situation contrastée est à l'origine de nombreuses difficultés, mais les actions sont guidées par la volonté et le désir des détaillants de produits alimentaires et des restaurateurs d'améliorer le bien-être animal. Le FMI et le NCCR sont convaincus que ces efforts ont grandement contribué et continueront de concourir à améliorer le bien-être des animaux dans le cadre de la production alimentaire.

Resumen

La perspectiva desde el comercio

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Palabras clave: comercio minorista de alimentos, comercio mayorista de alimentos, cadenas de restaurantes, productores, asesores, directrices, auditoría, verificación

Para lograr un verdadero cambio, se requiere una fuerza motivadora y la implicación del conjunto de las partes interesadas. Ésta es la premisa del programa de bienestar animal elaborado por el Food Marketing Institute (FMI) ⁽¹⁾ y el National Council of Chain Restaurants (NCCR) ⁽²⁾ para los sectores del comercio minorista y mayorista de alimentos y las cadenas de restaurantes en los Estados Unidos.

El sector del comercio minorista de alimentos empezó a desplegar sus esfuerzos en el año 2000, y para enero de 2001 la Junta Directiva del FMI había adoptado una política relativa al bienestar de los animales. Dicha política establece que la cría, transporte y procesamiento de los animales deben efectuarse en un medio limpio, seguro y libre de crueldad, abuso o negligencia; que los miembros del FMI trabajarán en cooperación con sus proveedores para promover las mejores prácticas para cada especie a fin de garantizar el bienestar animal durante todo el proceso de producción; que se formularán recomendaciones en el marco del trabajo conjunto con expertos en bienestar animal, zootecnia, medicina veterinaria y producción agrícola; y que se dará amplia difusión a la información sobre las mejores prácticas para mantener la confianza del consumidor.

En junio de 2001, el FMI y el NCCR aunaron sus esfuerzos para llegar a un programa

coherente en el sector minorista. El programa incluye un proceso de auditoría mensurable, la implementación de directrices aplicables y factibles sobre bases científicas, un consejo de asesoría permanente constituido por expertos independientes en bienestar animal y mejores comunicaciones a todo lo largo de la cadena de abastecimiento sobre cuestiones de bienestar animal.

Desde junio de 2001 el Panel Asesor de Expertos FMI-NCCR ha celebrado ocho reuniones y ha procedido a la revisión de las directrices de bienestar animal propuestas por siete organismos de abastecimiento. Se han aprobado las directrices relativas a los mataderos (bovinos, porcinos, ovinos y caprinos), gallinas ponedoras, ganado lechero y productos lácteos, así como pollos de carne (incluido el sacrificio). Las directrices relativas a los cerdos, al ganado de carne y a los pavos están en curso de revisión, mientras que aún falta revisar las directrices relativas a los terneros para ceba y a los patos. La información sobre los avances en la elaboración del programa está a disposición del público.

Algunos segmentos de la comunidad de productores en los Estados Unidos han estado trabajando activamente durante cierto tiempo sobre los sistemas de seguro del bienestar animal mediante la investigación, búsqueda

⁽¹⁾ Instituto de Comercialización de Alimentos. Conduce programas de investigación, educación, relaciones industriales y asuntos públicos en nombre de sus 2 300 empresas miembros – detallistas y mayoristas de alimentos – en los Estados Unidos y en todo el mundo. Los miembros del FMI en los Estados Unidos dirigen alrededor de 26 000 comercios de alimentación al por menor con un volumen combinado anual de 340 000 millones de euros, o sea, las tres cuartas partes de las ventas de negocios de alimentación al por menor en los Estados Unidos. Los miembros del Instituto a nivel internacional comprenden doscientas empresas en sesenta países.

⁽²⁾ Consejo Nacional de Restaurantes en Cadena. Es una asociación nacional mercantil en los Estados Unidos que representa a cuarenta de las principales empresas de restauración en cadena con varias unidades o multiestatales. Las empresas miembros del NCCR poseen y explotan más de 50 000 establecimientos de restauración y otras 70 000 instalaciones bajo sus marcas registradas por medio de acuerdos de franquicia y de licencia.

de asesoría de expertos exteriores y la elaboración y revisión de directrices a medida que se dispone de nueva información. Otros segmentos han empezado a desplegar esfuerzos más recientemente. Esta diversidad crea varios retos, pero el trabajo está motivado por el compromiso sólido y el deseo de los

minoristas de alimentos y restaurantes de mejorar el bienestar de los animales. El FMI y el NCCR consideran que estos esfuerzos han aportado y seguirán aportando una contribución significativa para mejorar el bienestar de los animales en el proceso de producción alimentaria.

Abstract

A marketplace perspective

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Keywords: food retailers, food wholesalers, chain restaurants, producers, advisors, guidelines, audit, verification

In order to achieve real change, there must be a motivating force and all of the stakeholders need to be involved. This is the premise of the animal welfare programme developed for the food retail, wholesale and chain restaurant industries in the United States by the Food Marketing Institute (FMI) ⁽¹⁾ and the National Council of Chain Restaurants (NCCR) ⁽²⁾.

The retail food industry's efforts began in 2000 and by January 2001 the FMI Board of Directors adopted a policy to address animal welfare. The policy stated that animals must be raised, transported and processed in a clean, safe environment free from cruelty, abuse or neglect; that FMI members will work cooperatively with their suppliers to promote best practices for each species in order to ensure animal well-being throughout the production process; that recommendations will be developed working with experts in animal welfare, animal husbandry, veterinary medicine and agricultural production; that best practices will be communicated broadly to maintain consumer confidence.

In June 2001, the FMI and NCCR joined efforts to achieve a consistent programme across the retail sector. The programme includes a measurable audit process, implementation of practicable and attainable guidelines based on science, an ongoing ad-

visory council of independent animal welfare experts and improved communications across the supply chain on animal welfare issues.

Since June 2001, the FMI-NCCR Expert Advisory Panel has held eight meetings and reviewed the proposed animal welfare guidelines of seven supplier organisations. Guidelines have been endorsed for slaughter (cattle, swine, sheep, goats), laying hens, milk and dairy cattle, and broiler chickens (including slaughter). Guidelines are still under review for swine, beef cattle and turkeys and have yet to be reviewed for veal calves and ducks. Progress in developing the programme is made publicly available.

Some segments of the producer community in the USA have been working actively on animal welfare assurance systems for some time by undertaking research, seeking counsel of outside experts and developing and revising guidelines as new information becomes available. Other segments have begun their efforts more recently. This diversity creates many challenges but the work is motivated by the strong commitment and desire of food retailers and restaurants to enhance animal welfare. The FMI and NCCR believe these efforts have made and will continue to make a significant contribution to enhancing the well-being of animals in food production.

⁽¹⁾ The Food Marketing Institute (FMI) conducts programmes in research, education, industry relations and public affairs on behalf of its 2 300 member companies – food retailers and wholesalers – in the United States and around the world. The FMI's US members operate approximately 26 000 retail food stores with a combined annual volume of USD 340 billion, three quarters of all retail food store sales in the USA. The FMI's international membership includes 200 companies from 60 countries.

⁽²⁾ The National Council of Chain Restaurants (NCCR) is a national trade association in the United States, representing 40 of the USA's largest multi-unit, multi-state chain restaurant companies. The NCCR's member companies own and operate more than 50 000 restaurant facilities and another 70 000 facilities under their trademarks through franchise and licensing agreements.

Consumer concerns for animal welfare: from psychosis to awareness

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Summary

The approach of consumers to food safety and animal welfare has thoroughly changed over the past 20 years, having merged contrasting ethical and philosophical views. According to this analysis, bovine spongiform encephalopathy (BSE) was a crucial factor, first in Europe and then in the United States of America, in raising a new concern for essential standards of animal health as a prerequisite to food safety. At this point, consumers require the implementation of minimum international rules for animal welfare, guaranteed by independent controls and validated by a transparent system of information on the end product.

Keywords: animal welfare, consumers, global market

Worldwide crises and alerts over food of animal origin and the increasing media interest in all breeding techniques correlated to food safety have changed the requirements for minimum standards of animal welfare.

Today, over 10 years since the BSE crisis, consumer attitudes are less emotional but no less mistrustful towards the industrialisation of food production of animal origin.

Account of a crisis of confidence

In Italy, 83.3 % of consumers ⁽¹⁾ are aware of the close connection between types of breeding and the ensuing quality of food products. These data are in accordance with European statistics ⁽¹⁾ that reveal periodically how EU consumers are suspicious of meat or other products of animal origin, and have doubts about conditions of animal welfare. Exactly what do consumers mean by 'conditions of animal welfare'?

Let us go back a few years to 1996, when the 'mad cow' psychosis broke out all over Europe. The BSE crisis forced most consumers to face this unbearable equation: animal = machine, and reach the unequivocal conclusion that the absence of animal welfare has an effect on the quality of food. The culprits turned out to be the breeding conditions and the unnatural livestock husbandry

systems. All over the world, the press uncovered that ruminants had been turned into carnivores and citizens discovered facts that had remained concealed until then. The media initiated an information campaign ranging from foodstuff to intensive breeding, even showing calves held in chains.

This initiated a mechanism based upon emotional reactions, feeding off one scandal after the other and involving all animal species. In 1999, poultry and the dioxin pollution held the centre of interest, followed by pigs, trout and large farm-bred fish. Besides discovering contaminated feed and unnatural breeding conditions, the media all over Europe disclosed appalling practices.

After a while, as is usual with the media, there was a shortage of news released on the subject. Not so with the attention of consumers. The mechanism of emotional reactions, once set in motion, is not perfectly, although somewhat flexible: after a first scare that resulted in a massive collapse of consumption, there was a slow comeback submitted to the condition that legislators and producers alike implement significant food quality and safety guarantees, commensurate with the impact of the scandal. Following the first phase of BSE – the big scare – authorities had to enforce as well as endorse and display to the general public

⁽¹⁾ Cirm survey 'What is there in the cattle's plate', 27 November 2003.

mandatory sanitary and hygiene regulations. The informative process of animal origin is gaining momentum and the more sensitive producers supply voluntary information, even certificates from external agencies.

A similar account is evidenced in the scandal of poultry contaminated by dioxin. In this case, however, the response came from the producers rather than the authorities. From 1999 on, the certification of feed given to chickens and hens and the labelling of breeding techniques and conditions were carried out very quickly.

After so many traumas, animal welfare has found its proper place in the consumer culture as being synonymous with food quality. This change of attitude calls for a reorganisation in the rules of communication as well as in quality and safety standards of food of animal origin.

The authorities on the whole seem to follow a much more frantic pattern. Widely predictable alerts and ensuing market crisis have led legislators to implement more stringent regulations. While acting as a temporary buffer against scandals, this position certainly does not promote understanding between producers and consumers.

Various attempts to preserve the market (such as the European Commission concealing for years any disclosure on BSE ⁽¹⁾ that could upset the market, or the efforts to raise the tolerable level of dioxin in food products in the midst of the Belgian crisis) have been followed by a series of changes at a rate totally unsustainable for producers, who ended up as the only scapegoats instead of being regarded as a key factor in promoting zootechnics with a sound respect for animals.

Cultural welfare

What do consumers really mean by 'animal welfare'? At scientific level, the term 'welfare' has not yet found an unequivocal definition, but for the general public the approach is simpler (or perhaps more simplistic). Globalisation contributes to the awareness of international crisis occurring

thousands of kilometres away, thus further confusing the issue.

Up until the 1990s, in fact, literature essentially described a threefold approach to the concept of animal welfare.

On the one hand, there is the western anthropocentric view, focusing on the fact that all treatments given to animals will have an effect on the human individual through food consumption.

Then there is the pathocentric, or compassionate, view based on the belief that 'a living being that can feel can also suffer'.

Finally, there is the approach that can be defined as biocentric, asserting that all animals deserve respect as beings having their own intrinsic value.

With the recurrence of scandals and the evidence of human variants of animal diseases that once were limited to animals, all three issues tend to merge into one.

Consumers are under the false impression that they are facing conflicting options. On the one hand, there is the practical side: since animals must be kept in perfect health, they may require medication or fall victim to diseases potentially transmissible to human beings. For the first time, consumers recognise animals as sentient beings. Suffering and stress are seen as possible dangers to animal welfare or at least to the quality of food of animal origin. On the other hand, normality is another important aspect: animals are entitled to live in harmony in their environment. The amalgam of these different approaches may be summed up with an all-encompassing term, that of health, seen not only as the absence of disease but also as the absence of stress and unnatural living conditions. There is no doubt that stress has an effect upon the resistance of the immune system of animals ⁽²⁾ and this concept is now perceived by the general public, at least over the last 10 years, as a result of the BSE crisis. The concept of welfare is strongly correlated to the concept of health, so that less use of exogenous substances (such as antibiotics) means less chance of finding them or their

⁽¹⁾ See report by Manuel Medina Ortega, commission of inquiry on BSE, Document FR/RR/319/319544fr – PE220.544/def./A, 02/071997.

⁽²⁾ Scapagni et al. 1989.

metabolites in food, and just as important, less ambient pollution. One should remember the close connection between animal breeding and the environment.

Therefore it should be interesting to observe how an Italian consumer panel defines the best conditions for safe breeding, respectful of animal welfare ⁽¹⁾.

The three prevailing ambient factors by order of importance were available space, feeding and surrounding hygiene. Under management conditions, however, the first three factors were: freedom of movement, welfare and banning all types of mutilation.

Feeding and surrounding hygiene are factors familiar to the consumers as meaning immediate danger of food of animal origin. However, it has become obvious that the concept of human and animal health is linked to animal welfare. This is perceived as a sum of practical as well as ethical rules – the latter being perhaps the most important statement in the last few years.

Guarantees

Besides developing a critical consciousness, as is usual in all fields of consumption, there is a request for accurate guarantees and controls in order to bring back confidence. First European and more recently US consumers have requested more information and transparency, insisting on extensive labelling that mentions the traceability of the product and also the methods of breeding, healthcare, non-suspect feed, and so on.

With regard to the confidence held in the trademark only 10 years ago, considered as the sole evidence of the entire production process quality, the European public now have a more down to earth approach. The same applies to US consumers who are losing confidence in the time-honoured ways that are distinctive of the USA food policy.

In this particular case, the axiom that ‘all food is considered to be safe unless there is proof to the contrary’, is no longer guiding US choices, as in the OGM policy or the use of hormones in animal breeding.

On both continents, there is a strong consumer request for labels that indicate the origin of food, and it is no coincidence that this demand follows the BSE scares that have upset the markets in the USA and the EU.

At any rate, consumers have forsaken indiscriminating reliance and require assurances rather than mere promises of authenticity and so-called quality characteristics to justify above average price levels.

A simplistic view of generalised mistrust of food can be witnessed, in particular where animal food is concerned, as the result of a long series of empty assurances made by producers and authorities alike. The phenomena described by most – and perhaps rightly so – as a ‘collective psychosis’ find their source in the conspiracy of silence and the attempts to stifle alerts that could have been much more restrained under better circumstances.

Therefore, it is quite possible to understand the source of consumer demand for the implementation of public and private cross controls, independently of any guarantee offered by the producer or the breeders.

Consequently, the consumer requests benefited the biological animal rearing farms in Europe, as well as consortiums of producers of traditionally bred animals, that were the first to adopt measures of information and certification. Today, the doubts and hopes of consumers seem to interweave with the requirements of legislators and scientists and, at least in the most exemplary cases, with those of the market. There is no doubt whatsoever that the measure of animal welfare should rely on a trustworthy procedure. In this respect, however, there appears to be a divergence of methods and, in the experts’ opinion, a lack of accuracy. Austria and then Germany were the leaders in following a largely approved pathway. In these countries, animal welfare is measured through score sheets (Ani35L and TG1200) in order to grant the necessary certification for biological farming. The basic principle, common to both tools, promotes such characteristics as moving space, social contacts, welfare and the type of medication administered to ani-

⁽¹⁾ *Il Salvagente* poll sample of 500 readers (2002).

mals. Germany also rates the quality of food and human–animal bonds. If this type of investigation were applied to transportation and slaughter conditions, these sheets could stand as a guarantee to the consumer and an opportunity to the producer for recovering market confidence.

Referring to standards of animal welfare, we are quite aware of how different cases may be found nowadays in various parts of the world and not only as would be conceivable, between industrialised and developing countries. Completely different approaches co-exist even within western nations and the most evolved forms of regulations. For instance, let's consider organic animal rearing in the United States and in Europe. Inside this sector that consumers consider the uppermost in animal welfare, there are quite different concessions between both markets. In the United States, nothing is said about animal transportation; in Europe, however, there are precise regulations for limiting stress and preventing the use of tranquilisers or any other treatment by electricity. Starting from these different considerations, seemingly obvious in nations with similar living standards, it is easy to understand the difficulties encountered when referring to minimum levels of animal welfare applied to producers who can hardly make a living from their work.

Regulation and aid

Consumers are no longer satisfied to simply look at their plates to believe that food is safe. Neither are they content to observe what is happening inside their borders, whether restricted to a nation or a continent. A global market requires a uniformity of hygiene and animal welfare standards; adhering to these standards in the coming years will be an essential condition to avoid repeating the scandals that bring whole sec-

tors of production under crisis, even if they occur thousands of kilometres from one's own backyard. The latest event to show that different markets have no boundaries nowadays was the dramatic evolution of the avian influenza epizootic that left behind staggering figures: 50 million culled animals, some 20 persons deceased and damages of up to tens of millions of dollars. Confronted with this tragedy, consumers in industrialised countries react once more in an emotional manner, requesting origin and traceability labels to avoid meat from risk areas. Scientific organisations are desperately trying to face the emergency, through animal culling and research for a vaccine to curb contamination. But once again, we find ourselves in the final phase of an illness that could have been foreseen and perhaps avoided by taking adequate measures. This may not be the best of times to discuss animal welfare (having in mind the thousands of birds closed in bags and buried alive that have been shown on television all over the world). It is possible, however, that this phase be followed by a step in awareness similar to the one following the 'mad cow' crisis, leading consumers to demand more stringent standards. We are expected to realise that mere defensive measures of national interests (such as labels of origins) may not be sufficient to ward off this type of crisis in the future.

We learn from history that most human diseases have disappeared through socio-economic progress that has brought with it an improvement in hygiene and sanitary conditions. The mere imposition of regulations (both in hygiene and animal welfare) in countries having to deal with a market that expects them to deliver low cost products at the lowest price, while preventing the transfer of technologies, cannot be considered as a solution, neither for themselves nor for more privileged areas that watch what they have chased out the door return through the window.

Résumé

Préoccupations des consommateurs en matière de bien-être animal: évolution de la psychose à la prise de conscience

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Mots clés: bien-être animal, consommateur, marché mondial

L'attitude des consommateurs concernant le bien-être animal a profondément changé au cours des vingt dernières années. Les crises et les alertes consécutives qui ont touché les produits alimentaires d'origine animale, ainsi qu'un intérêt croissant des médias pour toutes les techniques d'élevage, ont changé les exigences pour l'établissement de normes minimales devant assurer le bien-être des animaux.

Aujourd'hui, à quelque dix ans de la crise de l'encéphalopathie spongiforme bovine (ESB), nous observons que l'attitude des consommateurs est moins émotive; néanmoins, ils demeurent méfiants envers toute la réalité industrielle touchant la production d'aliments d'origine animale. En effet, des statistiques récentes révèlent qu'au Royaume-Uni, un citoyen sur deux éprouve des doutes concernant les viandes et autres produits d'origine animale, et demeure méfiant sur la façon dont les animaux sont traités. Jusqu'à présent, ces deux éléments sont intimement liés.

Depuis la crise de l'ESB, une grande partie des consommateurs s'est rendue à la triste évidence que les animaux étaient considérés comme des machines. Cette réalité entraîne inévitablement une absence de mesures favorisant le bien-être animal, ce qui, conséquemment, a une influence sur la sécurité sanitaire des aliments.

Ces réactions émotionnelles ont engendré un nouveau courant qui est à l'heure actuelle

profondément implanté dans l'héritage culturel des consommateurs. En effet, on peut observer un changement d'attitude dans la population. Ces changements appellent à une transformation des règles de communication et des normes de qualité et de sécurité des produits alimentaires d'origine animale.

Aujourd'hui, le consommateur européen réclame, non seulement plus d'information et de transparence en exigeant des labels qui certifient la traçabilité des produits, mais également des informations sur les méthodes d'élevage, les traitements utilisés, l'alimentation de l'animal libre de substances douteuses, etc.

Le consommateur européen souhaite en général un système de contrôle conjoint public et privé, qui intervienne pour garantir les déclarations des producteurs et des éleveurs.

Pour le consommateur, il ne suffit pas de regarder dans son assiette pour avoir des garanties de la salubrité des aliments. Il veut aller plus loin en remontant aux sources du processus de production, et souhaite également être témoin de l'établissement de meilleures normes concernant le bien-être animal. Il exige des règles qui soient valables pour tous. Il souhaite également une meilleure sensibilisation au fait que la mondialisation a éliminé les frontières pour ce qui a trait à la circulation des biens et il pense qu'il est nécessaire d'établir des mesures efficaces.

Resumen

Inquietud de los consumidores por el bienestar de los animales: de la psicosis a la concienciación

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Palabras clave: bienestar de los animales, consumidores, mercado mundial

La actitud de los consumidores en los estudios comparativos sobre el bienestar animal ha sufrido profundas modificaciones en los últimos veinte años. Las crisis y las alertas relativas a los alimentos de origen animal, a escala mundial, y un creciente interés de los medios de comunicación por todas las técnicas de crianza, han modificado la exigencia normal de un mínimo de bienestar de los animales.

Hoy día, más de diez años después de la crisis de encefalopatía espongiforme bovina (EEB), observamos una actitud menos emotiva de los consumidores, pero no menos recelosa, en los estudios comparativos de la realidad industrial relacionada con la producción de alimentos de origen animal. Las estadísticas recientes revelan, por cierto, que en la Unión Europea uno de cada dos ciudadanos siente recelos con respecto a la carne o a otros productos de origen animal y tiene una profunda desconfianza sobre las condiciones de bienestar del animal. Las dos señales de alarma ahora están íntimamente relacionadas. De hecho, desde la crisis de la EEB, una gran parte de los consumidores se ha visto obligada, a su pesar, a familiarizarse con la desagradable ecuación «animal = máquina» y a darse cuenta de que la falta de bienestar

repercute en la salubridad de los alimentos. Este cambio en la actitud del consumidor se traduce en una necesidad de mayor información acerca de los alimentos que ingiere, lo que ha generado una transformación de las normas de comunicación y de calidad y seguridad sanitaria de los alimentos de origen animal.

El consumidor europeo, hoy día, pide más información y transparencia, exigiendo etiquetas que certifiquen la rastreabilidad del producto y que además indiquen los métodos de crianza, los cuidados aplicados, el uso de alimentos inocuos, etc. El consumidor europeo demanda a menudo un sistema cruzado de control público y privado que garantice las declaraciones del productor y del criador.

Para estar seguro de la inocuidad de los alimentos, los consumidores ya no se satisfacen con mirar el plato, sino que quieren conocer el origen del proceso productivo y tener normas más estrictas de certificación sobre el bienestar animal. Las reglas tienen que ser absolutamente válidas para todos, conscientes de que en un mercado mundial en el que existen pocos obstáculos para el comercio es necesario establecer normas adecuadas.

Abstract

Consumer concerns for animal welfare: from psychosis to awareness

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Keywords: animal welfare, consumers, global market

The attitude of consumers towards animal welfare has changed dramatically in the last 20 years. The food scares that have occurred all over the world, and the increasing media interest in breeding techniques, have changed the requirement for minimum standards of animal welfare.

Today, over 10 years since the BSE crisis, consumer attitudes are less emotional, but no less mistrustful of the industrialisation of food production processes. Recent statistics have revealed that one in two EU citizens is suspicious of meat and other products of animal origin and has doubts about animal welfare conditions. These two factors are now very closely connected in the minds of consumers and they set alarm bells ringing.

Because of the BSE crisis a large number of consumers were forced to face the uncomfortable equation: animal = machine, and they realised that the absence of animal comfort has an effect on the safety of food.

This was quite a shocking revelation for some consumers, but now they are very well aware that there is a connection between ani-

mal welfare and the safety of food. This change in consumer attitudes has meant that they now require far more information about the food they eat and it has brought about a transformation in the quality and safety standards of foods of animal origin.

Today, European consumers ask for more information and greater transparency: they want labels that provide details of the product's origins, but they also want to know how the animals were cared for, what they ate, how they were bred, etc. There are often calls for systems of cross-checks by public and private authorities to ensure that producer and breeder guarantees are trustworthy.

To ascertain whether or not food is safe, consumers are no longer satisfied to simply look at their plates. They insist on having the full product history and details of the production process, and they want to know that certain standards of animal comfort were adhered to. These consumer requirements are important, because in a global market where there are few barriers to trade, suitable standards must be established.

Animal welfare: a developing country perspective

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Summary

Livestock undergo major suffering due to malnutrition, overloading of work animals and ill-treatment of meat animals. Draught animals work beyond their capacity. More than 100 million draught animals are idle in India for 200 days a year during which period they are ill-fed. The implements and carts to which they are hitched are inefficient, crude and painful. Improving their design will avoid the cruelty.

Cruelty to animals takes place at every stage during slaughter. Five to eight million buffalo calves are killed immediately after birth. Eighty million large animals work for 7 to 10 years before becoming available for slaughter. Over 120 million meat animals and 500 million poultry also undergo significant suffering from the time they are dispatched for slaughter till they die. Slaughter animals are made to walk long distances or are transported in overcrowded trucks and trains. At slaughter, animals are handled roughly and watch other animals being killed. Stunning is not practised.

Cruelty to other animals such as elephants, horses, donkeys, bears, and circus animals has largely been prevented through the efforts of animal welfare organisations. Prevention of killing of stray dogs through inefficient methods has been prevented by the use of alternatives to euthanasia such as animal birth control programmes.

To address the problems of animal welfare in the developing countries, it would be inappropriate to adopt international standards implemented in the developed countries. Each developing country should evolve its own standards based on their own individual priorities.

Governments have taken initiatives to establish animal welfare boards and enact laws for the prevention of cruelty to animals, but their efforts are far too limited to be of any significance. Financial constraints and lack of personnel inhibit the implementation of these rules. The only work on animal welfare is by a few dedicated organisations such as People for Animals (PFA), Blue Cross, Compassion Unlimited Plus Action (CUPA), Karuna, PETA and various SPCAs in the country, to name a few.

Keywords: animal welfare, draught animals, slaughter, companion animals, wild animals

Developing countries of the world, especially in Asia, have high human and livestock populations, mostly rural and agricultural based and limited land which leads to less pasture available for animals. Out of 100 million bullocks and buffaloes, seven million are in urban areas. These draught animals are still the backbone of agriculture and mechanisation is insignificant.

Developing countries with a rich heritage of cultural and religious traditions have not sheltered livestock from abuse. In quantitative terms, the present effort of animal welfare organisations is only a tiny fraction of

what needs to be done to improve animal welfare. It is also ironic that this happens even though most of the religions in these countries deify animals.

Welfare of animals in developing countries can be classified under the following headings.

1. Welfare of work animals
2. Welfare of production animals (milk and meat)
3. Welfare of companion animals
4. Welfare of wild and captive animals including animals used in entertainment.

To illustrate the problems of animal welfare in a developing country, the example of the situation in India is used in this paper.

Welfare of work animals

From the beginning of civilisation draught animals (DAs), bullocks, horses, camels, mules, donkeys, etc. have been making a significant contribution to society. Draught animal power (DAP) is an excellent example of mass application of appropriate technology. It is ideal for small farmers of, say, less than four hectares. Tractors and tillers become economic only when the farm size is above four hectares, though, on a hire basis, tractors and tillers can be used also for smaller farms. More than two million people in India depend on DAP for ploughing and adjunct operations. In addition, DAs haul vehicles and carry goods on their back. For a variety of reasons the developing countries of the world may have to depend on DAP for many more years to come. Fortunately, DAP is complementary to petroleum-based power and, in fact, there is no real conflict.

DAP is the muscle power of DAs. In India, 80 million bullocks and eight million buffaloes make available 40 million HP and energy worth EUR 20 million. DAs plough 100 million hectares of area sown (66 %) and haul 25 million tonne kilometres of freight in 15 million animal drawn carts (ADCs) (Table I). DAP annually saves six million tonnes of petroleum worth EUR 15 million and that too is in foreign exchange. The asset value of the DAP system is EUR 50 million and replacement of it by mechanised power would need a far higher investment, which is clearly beyond the means of small farmers and of the economy as a whole. There are over 100 million small farms in the developing countries. In a small country like Sri Lanka, it is estimated that out of a population of nearly 1.5 million cattle, around 1.1 million are with the small holders in rural areas and estate sector.

DAP being so important to developing countries, it is regrettable that these animals are not well cared for. Due to paucity of pasture and commercial feed, livestock are in semi-starved conditions (except high yielding milk animals and draught animals while at

work). In India, due to vagaries of monsoon and availability of land, ploughing is limited to certain parts of the year only. As a result, more than 100 million draught animals are idle in India for 200 days a year, during which period they are ill-fed and become weak reducing their draught capability. This leads to ill-treatment to goad them for work beyond their capacity and health. While at work, they are overworked, underfed, and maltreated. Millions suffer neck injuries and are bruised due to whipping and hot iron branding. Even shoeing and castration are done in primitive ways inflicting needless suffering. The implements and carts to which they are hitched are inefficient, crude and painful. Animal welfare organisations undertake measures to improve the situation but need more effort.

In addition to bullocks, the other working animals in the developing countries are buffaloes in Sri Lanka and donkeys in many countries of Asia. Of the more than 50 million donkey population of the world, 50 % is in Asia with China having 10 million, Pakistan 3.5 million and India two million. The popular use of donkeys is for transport, and also, to a limited extent, for ploughing.

While a pair of bullocks is able to haul a tonne in a traditional cart, donkeys and mules are able to haul half to three quarters of a tonne with ease as they are of better breeding and are well fed.

Welfare of production animals (milk and meat)

Meat animals are part of a livestock system contributing EUR 40 million to the GNP of India. The market value of livestock is EUR 80 million. Some 100 million producers of animals and birds, provide 100 million livestock, 200 million poultry every year for meat totalling five million tonnes valued at EUR 12 million. In India, there are 10 million abattoirs and meat shops both legal and illegal having one million workers involved in the meat chain.

In India, cruelty to animals takes place at every stage during slaughter. Five to eight million buffalo calves are killed immediately after birth. Eighty million large animals

work for 7 to 10 years before becoming available for slaughter. Over 120 million meat animals and 500 million poultry also undergo significant suffering from the time they are dispatched for slaughter till they die. Transport and handling methods are primitive and crude. Slaughter animals are made to walk long distances or are transported in overcrowded trucks and trains. At the slaughter stage itself animals are handled roughly and animals awaiting their turn watch other animals being killed. Due to misinterpretation of religious injunctions and continued resistance to stunning, unnecessary suffering is inflicted.

The most reprehensible part in the production sequence is the stage at which the animals are taken to the abattoirs. At present, they are marched on foot or carried in overcrowded trucks or goods trains. The typical range for the final journey is 100 to 300 miles. The southern state of Kerala in India has the unique distinction of attracting animals from all over south India, where about a million animals per year are walked 200 to 300 miles, in the course of which they lose weight and are incessantly beaten. These animals are generally not fed and watered en route. Animals – young and old, big or small – are all tied in twos and fours in order to reduce the number of animal minders or personnel on the trail. This results in injury and fatigue to the animals. They are badly beaten while they are herded together and driven fast to reach markets and abattoirs on time. It is an excruciating sight to watch them falter, fall down and being whipped so that they get up. On any working day, a million work animals may receive anywhere from 10 to 20 million beatings, assuming a five-hour working day. Similarly, needless suffering is inflicted on animals, which have to travel three or four days together in overcrowded, ill-ventilated, humid, hot trucks and wagons.

Once the animals reach the slaughterhouse they are further subjected to severe cruelty wherein they are killed in front of other waiting animals. Sharp sticks are poked into the anus or vagina to force them on to the slaughter platforms. To restrain young buffaloes, the front leg is broken and swung around the neck. Pigs are slaughtered by

repeated stabbing and cattle are cast by smashing the head, etc. Stunning has not been introduced and several attempts have been made to streamline and upgrade present abattoirs. However, every effort has been negated for various reasons.

Poultry farming

The developing countries of Asia started following the archetypal factory farming system with either intensive deep litter or battery cages from 1965 onwards. Three quarters of the world's 4 700 million egg laying hens are confined in tiny battery cages. India is the world's fifth largest egg producer with 150 million laying hens, about 60 % of which are in battery cages. These wire cages are so small that the hens cannot flap their wings; so barren they have no nest for their eggs, and so restricting that the birds' bones often become so brittle they can snap like dry twigs.

Forced moulting is widely practised both in developing countries such as India and in developed countries such as the USA. This involves inducing hens to shed their feathers unnaturally quickly by shocking their system. This 'shock' can be achieved by withdrawing feed for 10 to 14 days and reducing lighting. After one year of production, hens will naturally stop laying whilst undergoing an annual moult. Forced moulting is carried out to make hens return to lay in as short a time as possible. This practice results in a huge increase in stress and suffering to the hens, and a dramatic increase in mortality.

Broiler chickens reared for meat

Each year, about 40 000 million broiler chickens are reared worldwide. Over 650 million are slaughtered in India each year. Reared for meat, 'broilers' are usually crammed together, many thousands of birds in each barren shed. They are not caged, but kept at such high stocking densities that the birds quickly carpet the floor of the shed. Broiler chickens grow at super-fast rates, so fast that their bones, heart and lungs often cannot keep pace. Broiler chickens under six weeks old suffer painful crippling due to fast growth rates, whilst one in a hundred of these very young birds dies of heart failure.

Recommendations for preventing cruelty to animals for production

To address the problems of animal welfare in developing countries, it would be inappropriate to adopt international standards implemented in the developed countries. Each developing country should evolve its own standards based on their own individual priorities. In general, the following recommendations would be helpful to most of the developing countries and their implementation will be more easy and practicable.

Working animals

By improving the implements and carts, the draught required of the animals will be correspondingly reduced and their work capacity for ploughing and carting doubled. Injury will be reduced if not eliminated altogether. There will be no need for whipping and beating, since well-fed animals, attached to improved implements and carts, can haul effortlessly.

Production animals

Transport

- Marching animals for long distances on foot to abattoirs should be banned by law.
- Trucks and trains should be well designed and their capacity enlarged through the provision of two or three tiers.
- Feeding and watering arrangements should be made compulsory, and surveillance arranged to ensure compliance.
- Loading, unloading and handling devices should be introduced to reduce damage and suffering.
- Specific laws to protect the welfare of broiler chickens should be introduced.
- Guidelines should be set for maximum stocking density for broiler chickens.
- Changes from battery rearing to free-range systems should be implemented.
- Legislation to safeguard the welfare of animals should be introduced and old legislation amended to strengthen its enforcement.

In India, the Animal Welfare Board of India under the Ministry of Environment and Forest plays a very important role in monitoring the role of NGOs involved in animal welfare and assisting them both technically and financially and functioning as a watchdog for all abuses on animals. During the last few years, it has been responsible for strictly enforcing a ban on cow slaughter, introducing alternatives to experimentation of animals, etc.

Welfare of companion animals

Companion animals have been a subject of great concern especially as far as the welfare of stray dogs is concerned. Catching and killing stray dogs has been carried out for more than 100 years where dogs are killed under most horrific conditions. The city municipal corporations which were responsible for this were not equipped to handle it in a scientific way. To overcome this, some of the NGOs in the developing countries such as India have started animal birth control (ABC) programmes as an alternative to killing stray dogs. This programme has been successful in most of the countries which have adopted it (Blue Cross in India). The programme combined with anti-rabies vaccination has considerably reduced the number of rabies deaths in countries such as India, Sri Lanka and Nepal.

Welfare of wild and captive animals including animals used in entertainment

Animal welfare and wildlife conservation are two distinct areas of animal protection. While conservation is all about population, welfare is about the individual. Therefore, the human protection of wildlife should encompass both preservation of the species and their natural habitats while also ensuring the welfare of the individual animals. There are many issues where a combination of this is needed to achieve humane protection of animals. Examples include harvesting of wildlife (whaling and trapping of fur-bearing animals), killing for entertainment (hunting of elephants, bears, deer, etc.), exploitation (circuses, zoos and bear farms) and culling (seals and kangaroos).

Though some of these are issues of developed countries, developing countries also have a share of welfare issues regarding this. For example, marine turtles are caught in their thousands in India and transported to markets in the most inhumane conditions in which their bodies are sliced up for meat while they are alive.

Bear farming has been very common in China and Japan where bears are farmed for their bile (used in traditional medicine). For example, in Japan alone there are nine bear parks holding over 1 000 bears. These parks also serve as a source of entertainment to the public. In China, more than 7 000 bears are kept in small cages for over 10 years. Dancing bears are still found in India and Pakistan where the bear cubs are caught from the wild, usually by killing their mothers to get the cubs. The cubs are inhumanely treated to train them to 'dance' on their hind legs. The bears are forced to do what the owner wishes because of the intense pain inflicted upon the animals through the use of a chain or rope drilled through its sensitive muzzle.

Elephants play an important role as work animals and on religious occasions. Most of the elephants are kept under semi-starved conditions, working long hours and doing heavy work such as lifting logs, etc. Due to deforestation the natural habitat of elephants has been eroded and the wild elephants in Asia are living under starving conditions and at great peril of being hunted and killed when they encroach on farms in search of food.

The estimated elephant population in Sri Lanka is about 3 000. For various reasons the natural habitat of the elephant is gradually decreasing in Sri Lanka and the government established an 'Elephant orphanage' in 1975. The environment of the orphanage is very much similar to their natural habitat and animals are always kept under strict veterinary care. It has been recorded that 22 calvings have taken place since 1975 and the total number of elephants in the orphanage has increased to nearly 70 at present.

Camels are used for transport in India and their welfare is often sub-standard. Once their capacity to work is finished they are abandoned and sent for slaughter, often

treking long distances from their natural habitat.

Animals in circuses and zoos are also kept under inhumane conditions. In India, legislation has been introduced to ban animals in circuses. However, once the animals are rescued from these organisations they do not find proper care and live in overcrowded and most unfavourable conditions as the agencies which rescue them from the circuses do not have enough resources to rehabilitate them.

Animals in experimentation

Most countries have introduced laws where animals used in experimentation and research have to be cared for properly and experimentation done under strict supervision to avoid unnecessary pain and suffering to these animals. Alternatives to animals such as computer models have been introduced to avoid unnecessary use of animals in experiments and research.

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Table I
Freight carried is calculated on the following assumptions

Total number of bullock carts	15 million
Rural based carts	12 million
Urban based carts	3 million
Working days in rural areas	100 days
Working days in urban areas	300 days
Average load carried in rural areas	750 kg
Average load carried in urban areas	1 000 kg
Distance covered with load in rural areas	12 km
Distance covered with load in urban areas	15 km
Freight carried in 12 million rural based carts	$12\text{ m} \times 750\text{ kg} \times 100\text{ days} \times 12\text{ km} \div 1\ 000$ = 10 800 mt km
Freight carried in 3 million urban based carts	$3\text{ m} \times 1\ 000\text{ kg} \times 300\text{ days} \times 15\text{ km} \div 1\ 000$ = 13 500 mt km
TOTAL	24 300 million tonne kms <i>say 25 000 million tonne kms</i>



Ploughing operations



Skin bruise due to beatings



Ploughing operations



Bullocks branded with hot iron



Ploughing operations



Overloaded carts



Injury due to yoke



Overloaded carts



Overloaded carts



Horse-drawn cart



Overloaded carts



Overloaded horse-drawn cart



Overloaded carts



Camels hauling a load



Overloaded carts



Donkey being driven for work



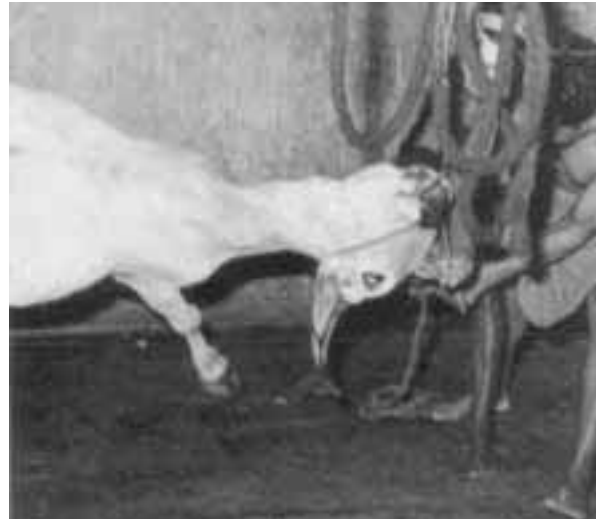
Animals stacked one above the other transported for slaughter



Cattle are cast by smashing the head



Birds for slaughter dumped on the road



Cattle are cast by breaking the neck



To goad the frightened animals to their slaughter platforms, sharp sticks are forced into the anus or vagina



Buffalo calf being restrained by breaking the front leg and swung around the neck



Animals are slaughtered in the presence of other animals



Pigs are slaughtered by repeated stabbing



Animals are slaughtered in the presence of other animals



Battery cages for laying hens



Animals are slaughtered in the presence of other animals



Dogs killed by electrocution



Mass slaughter



Garbage in the street



Stray dog eating carcass



Elephants at work



Camel hauling a load



Wound on an elephant due to the chain



Dog fighting in Pakistan



Bear-baiting in Pakistan



Camel hauling a load



Japanese bear park



Dancing bears in India

Résumé

Bien-être animal: le point de vue des pays en voie de développement

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Mots clés: bien-être animal, animal de trait, abattage, animal de compagnie, animal sauvage

Les pays en développement de la planète, notamment asiatiques, possèdent des populations humaines et des cheptels importants essentiellement ruraux et dépendants de l'agriculture; les terres sont peu étendues, ce qui aboutit à des zones de pâture réduites pour les animaux. Sur les 100 millions de bœufs et buffles dénombrés, 7 millions vivent en zone urbaine. Les animaux de trait constituent encore le pilier de l'agriculture et la part de la mécanisation est négligeable.

Les pays en développement qui ont hérité de traditions culturelles et religieuses n'ont pas préservé leurs cheptels contre la maltraitance. En termes quantitatifs, l'action actuelle des organisations pour le bien-être animal ne répond que très partiellement aux besoins d'amélioration dans ce domaine.

Les animaux endurent des souffrances considérables du fait de la malnutrition, de la sur-exploitation des bêtes de somme et des mauvais traitements infligés aux animaux de boucherie. Les animaux de trait travaillent au-delà de leurs capacités. Même le ferrage et la castration sont réalisés de façon primitive, ce qui engendre des souffrances inutiles. En raison de la rareté des pâturages et des aliments artificiels, les troupeaux sont quasiment affamés (à l'exception des bêtes laitières à haut rendement et des animaux de trait pendant le travail). En Inde, plus de cent millions d'animaux de trait sont oisifs pendant 200 jours par an, période durant laquelle ils sont sous-alimentés et affaiblis, ce qui réduit leurs capacités de traction. Cette situation engendre des mauvais traitements infligés pour les forcer à travailler au-delà de leurs capacités et de leur état. En situation de travail, ils sont surmenés, dénutris et maltraités. Des millions d'entre eux souffrent de

blessures au niveau de l'encolure. Les outils et les véhicules auxquels ils sont attelés sont inefficaces, rudimentaires et douloureux. L'amélioration de la conception des outils agricoles et des véhicules permettra d'éviter ces actes de cruauté. Les organisations dédiées au bien-être animal se consacrent largement aux animaux de compagnie et aux animaux sauvages mais font très peu de cas des animaux d'élevage.

La cruauté envers les animaux se manifeste à toutes les étapes de l'abattage, particulièrement en Inde. Cinq à huit millions de bufflons sont tués immédiatement après la naissance. Quatre-vingts millions d'animaux de grande taille travaillent pendant 7 à 10 ans avant qu'ils ne soient bons pour l'abattoir. Plus de 120 millions d'animaux de boucherie et 500 millions de volailles subissent également de grandes souffrances entre le moment où ils sont envoyés à l'abattoir et leur mort. Le transport et les méthodes de manipulation sont primitifs et frustes. Les animaux destinés à l'abattoir doivent parcourir de longues distances ou sont transportés dans des camions ou des trains surpeuplés. À l'abattoir, les animaux sont manipulés avec brutalité et ceux qui attendent leur tour assistent à l'abattage de leurs congénères. Des souffrances inutiles sont infligées par suite d'une mauvaise interprétation des préceptes religieux et d'une opposition permanente à l'étourdissement.

Les actions des organisations de défense du bien-être des animaux ont largement contribué à empêcher que soient commis des actes de cruauté envers d'autres animaux comme les éléphants, les chevaux, les ânes, les ours et les animaux de cirque. L'abattage des chiens errants par des méthodes inefficaces a été

évité en recourant à des solutions de rechange à l'euthanasie telles que les programmes de contrôle des naissances animales.

Les pouvoirs publics ont pris des initiatives pour créer des comités pour le bien-être animal et promulguer des lois pour la prévention de la cruauté envers les animaux, mais leurs actions sont beaucoup trop limitées pour avoir un impact. Les contraintes financières et le manque de personnel font obstacle à l'application de ces règles.

Bien que la législation et les lois destinées à empêcher les actes de cruauté envers les animaux soient en place depuis des décennies, leur application stricte est souvent exceptionnelle. Toutefois, des efforts sont déployés pour informer le public et intégrer des concepts de bien-être animal dans le cursus des études vétérinaires afin de sensibiliser les vétérinaires à toutes les questions relatives au bien-être des animaux, notamment l'expérimentation animale dans le cadre de l'enseignement et de la recherche.

Resumen

Bienestar animal: perspectiva de los países en desarrollo

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Palabras clave: bienestar de los animales, animales de tiro, sacrificio, animales de compañía, animales salvajes

Los países en vías de desarrollo en el mundo, especialmente en Asia, presentan un alto índice de población humana y de ganado, en su mayor parte rural y agrícola, y tierras limitadas, con lo cual hay menos pasto disponible para los animales. De los 100 millones de bueyes y búfalos, 7 millones se encuentran en áreas urbanas. Estos animales de tracción siguen siendo la piedra angular de la agricultura debido a la escasa mecanización.

Los países en desarrollo, que disponen de un rico legado de tradiciones culturales y religiosas, no han protegido al ganado de los abusos. En términos cuantitativos, el actual esfuerzo de las organizaciones de bienestar animal es sólo una ínfima fracción de lo que se necesita hacer para mejorar el bienestar de los animales.

El ganado padece los mayores sufrimientos debido a la malnutrición, la sobrecarga de los animales de trabajo y el maltrato de los animales de carne. Es sabido que los animales de tracción trabajan más allá de su capacidad. Hasta el herraje y la castración se efectúan de modo primitivo infligiendo un sufrimiento innecesario. Debido a la insuficiencia de pastos y piensos comerciales, el ganado se encuentra en condiciones cercanas a la inanición (excepto los animales lecheros de alto rendimiento y los animales de tracción mientras trabajan). En la India, más de 100 millones de animales de tracción están libres durante 200 días del año, período durante el cual están malnutridos y se debilitan con la consecuente disminución de su capacidad de tracción. Esto lleva al maltrato para incitarlo a trabajar más allá de su capacidad y de su salud. Cuando trabajan, padecen explota-

ción, desnutrición y maltrato. Millones de animales tienen heridas en el cuello. Los implementos y carros a los que están atados son ineficaces, burdos y dolorosos; una mejora de su diseño evitaría esta crueldad. Las organizaciones de bienestar animal se preocupan mucho por los animales de compañía y por la fauna silvestre, pero prestan escasa atención a la ganadería.

La crueldad con los animales ocurre en cualquier etapa del sacrificio, en particular en la India. Entre 5 y 8 millones de terneros de búfalo son eliminados inmediatamente después del nacimiento. Ochenta millones de animales de gran tamaño trabajan entre 7 y 10 años para después ser sacrificados. Más de 120 millones de animales de carne y 500 millones de aves de corral también padecen sufrimientos significativos desde el momento en que son enviados para el sacrificio hasta que mueren. Los métodos de transporte y manipulación son primitivos y rudimentarios. Los animales destinados al sacrificio tienen que recorrer grandes distancias o ser transportados en camiones y vagones repletos. En el matadero, la manipulación es brutal, y los animales que esperan su turno asisten a la eliminación de los otros animales. Se les inflige un sufrimiento innecesario debido a una interpretación errónea de los mandatos religiosos y a la oposición constante al aturdimiento.

Gracias a los esfuerzos de las organizaciones de bienestar animal, se ha evitado en gran medida la crueldad con los demás animales, tales como elefantes, caballos, burros, osos y animales de circo. La eliminación de los perros extraviados por medio de métodos ineficaces se ha evitado gracias a alternativas

a la eutanasia, tales como los programas de control de la natalidad animal.

Los gobiernos han tomado iniciativas para establecer Consejos de Bienestar Animal y promulgar leyes para prevenir la crueldad con los animales, pero estos esfuerzos son aún demasiado limitados para ser significativos. Las condiciones financieras y la falta de personal inhiben la implementación de estas reglas.

Aunque se hayan establecido leyes y se tomen acciones de prevención contra la crueldad con los animales desde hace varias décadas, suele descuidarse su aplicación estricta. No obstante, se despliegan esfuerzos para concienciar al público e incluir los conceptos de bienestar animal en el currículum veterinario a fin de sensibilizar a los veterinarios sobre todas las cuestiones de bienestar animal, incluida la experimentación para fines docentes y de investigación.

Abstract

Animal welfare: a developing country perspective

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Keywords: animal welfare, draught animals, slaughter, companion animals, wild animals

Developing countries of the world, especially in Asia, have high human and livestock populations (mostly rural and agriculture-based) and limited land, which means that there is less pasture available for animals. Out of 100 million bullocks and buffaloes, seven million are in urban areas. These draught animals are still the backbone of agriculture as mechanisation is almost non-existent.

Developing countries with a rich heritage of cultural and religious traditions have not sheltered livestock from abuse. In quantitative terms, the present effort of animal welfare organisations is only a tiny fraction of what needs to be done to improve animal welfare.

Many animals endure great suffering: work animals are overloaded, meat animals are ill-treated and livestock in general are malnourished. Draught animals work beyond their capacity. Even shoeing and castration are done in primitive ways inflicting needless suffering. Due to the paucity of pasture and commercial feed, livestock are in semi-starved conditions (except high yielding milk animals and draught animals while at work). More than 100 million draught animals are idle in India for 200 days a year; during this time they are ill-fed and become weak and their draught capability is reduced. This leads to ill-treatment to goad them for work beyond their capacity and health. While at work, they are overworked, underfed, and maltreated. Millions suffer neck injuries. The implements and carts to which they are hitched are inefficient, crude and painful. Improving the design of agricultural implements and carts will avoid this

cruelty. Animal welfare organisations largely concern themselves with pet animals and wildlife and very little attention is paid to livestock.

Cruelty to animals takes place at every stage of the slaughter process, especially in India. Five to eight million buffalo calves are killed immediately after birth. Eighty million large animals work for 7 to 10 years before becoming available for slaughter. Over 120 million meat animals and 500 million poultry also endure great suffering from the time they are dispatched for slaughter until they die. Transport and handling methods are primitive and crude. Slaughter animals are made to walk long distances or are transported in overcrowded trucks and trains. At the slaughterhouse itself, animals are handled roughly and animals awaiting their turn watch other animals being killed. Due to misinterpretation of religious injunctions and continued resistance to stunning, unnecessary suffering is inflicted.

Cruelty to other animals such as elephants, horses, donkeys, bears, and circus animals has largely been prevented through the efforts of animal welfare organisations. The killing of stray dogs using inefficient methods has been prevented by introducing alternatives to euthanasia, such as animal birth control programmes.

Governments have taken initiatives to establish animal welfare boards and to enact laws for the prevention of cruelty to animals, but their efforts are far too limited to be of any significance. Financial constraints and lack of personnel inhibit the implementation of these rules.

Though the legislation and acts to prevent cruelty to animals have been in place for decades, strict implementation is often negligible. However, efforts are being made to make the public aware and to in-

clude the question of animal welfare in the veterinary curricula, to sensitise veterinarians on all animal welfare issues, including animal experimentation in teaching and research.

Applying science to animal welfare

Applying science to animal welfare standards

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Summary

We are currently seeing very different standards being proposed, all claiming to ensure a high level of animal welfare and all claiming to be science-based. The standards differ partly because they involve different views of animal welfare, variously based on the biological functioning of the animal (health, growth, reproduction, etc.), its affective states (pain, suffering, etc.), or its ability to lead a relatively natural life. Each of these value-based views of animal welfare has generated useful scientific research and animal welfare improvements, but the science does not provide purely objective ways to weight the different views. Thus, animal welfare standards can indeed be based on science and yet still involve different values. To prevent public confusion about animal welfare standards, we need to be clear on the interplay of the scientific and the value-related components.

Keywords: animal welfare, farm animals, standards, values

During the last two decades, many of the developed countries have seen a rapid move towards systems of explicit standards intended to safeguard the welfare of farm animals. This move has taken very different forms in different jurisdictions. In Europe, governments (both national and the European Union) have created a series of increasingly stringent animal welfare regulations for most animal-based commodities. In North America, where governments have been much less involved, the food service and retail sectors have recently begun to play a leading role, with companies like McDonald's and Burger King creating standards that they require their suppliers to meet. Many countries have also seen growth in defined alternative-production systems such as free-range eggs and organic meat, promoted by animal protection agencies, retailers, and by alternative producers themselves, and often claimed to ensure a high level of animal welfare.

In all these developments, promoters of animal welfare standards have often claimed that their standards are based on science. In this paper we will examine some features of animal welfare science and the role it has played in the emerging standards.

Historical developments

Historically, three developments stand out as having influenced the move towards animal welfare standards and the scientific study of animal welfare.

One is the revolution in animal agriculture that has taken place since about 1950 in the industrialised countries, based mainly on a philosophy of maximising production efficiency (Fraser et al., 2001). The revolution has involved the use of 'intensive' systems, especially for poultry and swine, where the animals have little or no exposure to the outdoors and often severe restriction of movement. This change in housing has been accompanied by intense genetic selection for production traits, scientific feed formulation, and the use of performance-enhancing pharmaceuticals. In addition to these changes in technology, the revolution has also seen a move away from small, mixed farms and towards specialised farms producing a single product on a much larger scale. In some sectors and regions, notably the United States and some former Soviet countries, there has also been a change in farm ownership, with corporately or collectively owned units replacing many smaller, family-owned farms. Although the new methods are

strongly encouraged by economic pressures and by some advocates, the changes have attracted intense scrutiny and concern focused on the living conditions of the animals, the environmental impact of the large units, and other issues.

A second trend is the rapid increase, since about 1950, in humanitarian attitudes towards animals, seen especially in the European and English-speaking world. This builds on a long historical trend, dating at least to 1700, whereby the quality of life of animals has come to be seen as a legitimate subject of moral concern. These changes in attitude have led to demands for safeguards and standards for the care of animals in all fields including biomedical research, entertainment and wildlife management. The call for farm animal welfare standards represents, in part, a similar level of scrutiny and expectations being directed towards animal agriculture.

A third trend has been a growing scepticism, shown especially by many consumers, towards technology, industrialisation and corporate power, especially when these intrude into the daily lives of people and the processes of nature. Symptoms include protests against globalisation of trade and genetically modified foods. Traditionally, animal agriculture was widely viewed as a form of independent enterprise involving a close relationship between people, animals and nature. With the revolution in animal agriculture, animal production has come to be perceived, rightly or wrongly, more as an industrial, technological and corporate-owned activity. This change in public perception has resulted in greater ethical scrutiny of food production and a greater willingness to see standards imposed on the industry.

Different views of animal welfare

At the risk of over-simplifying, these three historical developments have given rise to, or at least reinforced, three different views of how animals should be raised and, hence, of how animal welfare should be assessed (Duncan and Fraser, 1997; Fraser et al., 1997).

Many animal producers, veterinarians and animal scientists involved in modern animal

production tend to emphasise the 'biological functioning' of the animal as the key criterion of its welfare. According to this view, good animal welfare is characterised by a high level of health, growth, production efficiency and correlated traits. Proponents of this view consider that intensive production systems, however unnatural they may seem, should be viewed as good for animal welfare as long as the animals are healthy, growing, and producing well. Indeed, according to this view, seemingly more 'natural' systems should not be viewed as promoting good welfare if these give rise to lower levels of health, growth and production.

A second view – common in humanitarian thinking and among some animal welfare scientists – emphasises the 'affective states' of animals: pain, suffering, and other feelings and emotions. According to this view, animal welfare standards should ensure that animals are spared unpleasant affective states as much as possible, and are allowed to enjoy normal pleasures of life, whether this occurs in intensive or non-intensive systems.

A third view holds that animals should be allowed to lead reasonably natural lives by carrying out their normal behaviour in a reasonably natural environment, free from undue restraint. This view is common among consumers (te Velde et al., 2002) and among many critics of modern animal production. To those holding this view, animal welfare standards should eliminate long-term confinement of animals which prevents most of the animals' natural behaviour.

Each of these viewpoints makes valid claims and attracts valid criticisms. Pursuing improved growth and productivity (biological functioning) does arguably enhance animal welfare when this is achieved by improving health care and nutrition; however, in breeding for rapid growth at the expense of leg soundness, or in using pharmaceutical products to enhance production beyond normal levels, any positive correlation between productivity and animal welfare breaks down. Reducing pain and other unpleasant affective states is related to animal welfare more or less by definition, but there is valid controversy over how accurate-

ly we can detect such states and use them as a basis for animal welfare standards. The pursuit of more natural living conditions would arguably improve animal welfare in some respects but often introduces other problems such as increased exposure to predation and harsh weather.

People holding one or other of these views often assume that the three go hand in hand. Thus producers may believe that if animals are productive, they will also be happy; or consumers may assume that if animals are kept under natural circumstances, they will necessarily be healthy and productive. Sometimes the different views do indeed agree. For example, allowing a sow to wallow in mud on a hot day is good for her welfare by natural living criteria because she can perform her natural behaviour, by biological functioning criteria because wallowing helps prevent heat stress, and by affective state criteria because the sow should be more comfortable. Nonetheless, the three views involve quite different areas of emphasis, and they sometimes lead to conflicting conclusions.

The role of science

To state the obvious, the different views arise partly because people differ in the value they attach to different aspects of animal welfare. The intensive producer sees a high level of health and growth as so important that it warrants some restriction of movement; the free-range producer sees access to the outdoors as so important that it warrants some exposure to harsh weather. It would be comforting to think that science could arbitrate among these different value-based views of animal welfare, and demonstrate which are scientifically valid and which are not. In reality, a tradition of scientific research has grown up around each of the different views.

Biological functioning

In many cases, scientists have focused on biological functioning as an avenue to improve animal welfare. For example, Ragnar Tauson and co-workers made detailed comparisons of the health and performance

of laying hens in different types of cages. They found that the majority of birds had significant foot lesions in cages with steeply sloped floors and poor quality galvanising, whereas foot health was good with plastic-coated floors of more moderate slope. Similarly, most birds developed severe lesions of the neck when feeding from deep troughs with sharp lips installed too high for comfortable access, whereas the problem was largely eliminated by a shallower trough located more conveniently for the birds. Again, the use of solid side partitions reduced feather damage due to wear and pecking, installation of abrasive strips helped prevent overgrown claws, and design improvements to the cage fronts led to fewer birds becoming trapped and killed (Tauson, 1995). These results were very influential with cage manufacturers and formed the basis of regulations on cage design in Sweden and elsewhere.

Another problem of biological functioning is tail-biting among confined pigs, a behavioural abnormality whereby pigs chew and bite the tails of their pen-mates to the point of causing injury and sometimes death. Tail-biting is one of several types of abnormal oral behaviour of farm animals along with feather-pecking by chickens, wool-pulling by sheep, and tongue-rolling by cattle. These appear to involve the natural foraging behaviour of the species redirected to pen-mates or in other inappropriate ways. There are many predisposing factors (environmental, genetic and nutritional) which need to be addressed to prevent tail-biting, but the simple provision of straw or other material that the animals can manipulate with their mouths helps to redirect oral behaviour away from pen-mates (Fraser et al., 1991). On this basis, welfare standards in the European Union require straw or other manipulable material to be provided for pigs.

Affective states

Scientists have also tried to improve animal welfare by focusing on affective states in animals such as fear and pain.

When mechanical 'chicken harvesters' were first introduced as a more efficient alterna-

tive to manual catching of chickens, there was a concern that these large machines would cause excessive fear in the birds. To investigate this concern Ian Duncan and co-workers monitored the heart rate of birds when they were captured by hand or by machine, and they found that the rapid heart rate of newly caught birds actually returned to normal more quickly if the birds had been caught by machine rather than by hand. The study also used the tonic immobility test as an index of fear. In this test a bird that has been flipped onto its back generally remains immobile for a length of time that is thought to be correlated with its level of fear. The research showed that chickens that had been captured by hand maintained tonic immobility longer than those that had been captured by machine. Both lines of evidence thus suggested that machine catching actually caused less fear than manual catching (Duncan et al., 1986). On this basis, humane organisations began promoting the mechanical catching of chickens instead of opposing it.

A second example is the effort to reduce pain in calves resulting from hot-iron disbudding. This procedure typically involves heating a ring-shaped iron to about 600° C, and pressing it against the calf's head so that it burns through the tissues that would nourish the horn bud and allow the horn to develop. One way to mitigate the pain of disbudding is local anaesthesia. A study by Petrie et al. (1996) showed that hot-iron dehorning is followed immediately by an increase in plasma levels of the stress-related hormone cortisol if the procedure is done without a local anaesthetic, but that the reaction is blocked if lidocaine is used to freeze the area. Even with lidocaine, however, cortisol still showed a large increase several hours later, probably because the area remained inflamed and painful after the freezing had worn off. However, Faulkner and Weary (2000) showed that if the analgesic ketoprofen is added to the calf's milk on the morning and evening of disbudding, the usual signs of continuing discomfort are largely eliminated. Some countries require the use of local anaesthetics for hot-iron disbudding of calves; the newer evidence suggests that including an analgesic would improve welfare further.

Natural living

Scientists have also tried to improve animal welfare by providing animals with opportunities to lead more natural lives.

One radical approach was used by Stolba and Wood-Gush (1984) who tried to accommodate the natural behaviour of pigs in a commercial housing system. They began by turning pigs loose in a hilly, wooded area and observing their behaviour. They identified certain characteristic components of the animals' behaviour; in particular, the pigs rooted in the soil, exercised their neck muscles by levering against fallen logs, built nests in secluded areas before giving birth, and used dunging areas well removed from their resting areas. Stolba and Wood-Gush also found that there were certain key stimuli in the environment which were important for these behaviour patterns to be performed. They then designed a complex commercial pen which incorporated these key stimuli including a separate dunging area, a rooting area, a log for levering, and secluded areas for parturition. The authors claimed that the animals' welfare was significantly improved by the complex pen. However, critics using different criteria of animal welfare questioned this conclusion because, for example, neonatal survival was not as high in this system as in some more confined systems.

A less radical approach involves incorporating simple elements of natural behaviour in order to solve specific animal welfare problems. In commercial pig production, piglets are usually kept constantly with the sow for two to four weeks, and then are typically weaned by being moved suddenly to a new environment and a new diet. The piglets often lose weight and may show slow growth and digestive problems for up to a week. Under natural conditions sows wean their young by gradually decreasing the frequency of nursing over several weeks, thus making the young adapt gradually to solid food. Gradual weaning can be achieved in intensive systems by allowing the sow to escape from the piglets at will by stepping over a piglet-proof barrier. In pens where this is possible, many sows begin to reduce contact with the young in the second week,

and the piglets gradually switch to solid feed with fewer problems (Pajor et al., 1999).

Influence of these views on animal welfare standards

Thus we see three rather different views of animal welfare, each with its scientific proponents and each leading to research that makes a contribution to animal welfare. We are also beginning to see quite different types of animal welfare standards, each influenced by a different mixture of biological functioning, affective states and natural living criteria.

Standards for laying hens provide a particularly clear example (Table 1). Recent decades have seen dozens of scientific studies examining the effects of different space allowances for laying hens (e.g. Adams and Craig, 1985; Rousch, 1986), mostly using basic biological functioning variables such as survival, rate of lay, and feed conversion efficiency. The studies generally show that when space allowance drops below about 450 cm² per bird, survival is reduced, rate of lay declines, and feed efficiency drops. On that basis, approximately 450 cm² per bird was adopted as a standard by several chain restaurants in the United States and by the European Union until 2003. Hence, what we might call 'basic' standards require about this amount of floor space combined with sufficient access to food and water to ensure a high level of basic biological functioning.

The standards for enriched cages, approved by the European Union in 1999, are based on a broader conception of animal welfare. One of the goals of animal welfare research has been to identify the animals' own priorities for features in their environment, often on the assumption that animals will seek out environments where they find comfort and avoid those that cause negative states such as pain, fear and frustration (Dawkins, 1980). A common approach has been to train animals to perform 'instrumental' tasks, such as pecking on a key, for access to various environmental features, and then determine which ones the birds will work to obtain. Research of this type has shown that hens will expend considerable effort to obtain a perch for resting at night (Olsson and Keel-

ing, 2002), a nest box where they can retreat to lay eggs (Duncan and Kite, 1987) and, perhaps to a lesser extent, litter for dust bathing (Widowski and Duncan, 2000). One study also found that hens would work to enlarge the floor space up to about 750 cm² per bird (Lagadic and Faure, 1987). Research of this type played an obvious role in the EU decision to require 'enriched' cages for hens containing a nestbox, perch, litter, and a space allowance of 750 cm² per bird. Such cages support a high level of biological functioning (Appleby et al., 2002); they also accommodate certain elements of natural behaviour, and by providing features that the birds themselves seek out they likely score better on affective state criteria.

The standards for 'alternative' production systems, such as the 'Freedom foods' programme in the United Kingdom and various organic production standards, take a third approach. These standards generally prohibit all use of cages, requiring instead that birds be free to move in a large area with a generous space allowance and access to the outdoors, natural light, and other amenities that provide a seemingly more natural environment. These standards appear to give special emphasis to natural living criteria.

Thus, we see in a sense, three different kinds of standards, all claimed to protect the welfare of the birds (Table 1):

- 'basic' standards, typical of those promoted by producer associations and chain restaurants in the United States, requiring roughly 450 cm², plus good access to food and water;
- 'enhanced' standards, seen in the European enriched cage, requiring 750 cm² of floor space plus a nestbox, perch, and litter; and
- 'alternative' standards used in defined alternative-production systems such as free-range and organic, generally requiring the same amenities as enhanced standards plus access to open space and natural daylight.

These standards, although all claimed to protect the welfare of the birds, set very different requirements at least partly because they are based on different degrees of

emphasis on biological functioning, affective states and natural living as criteria for animal welfare.

Concluding remarks

With a wide variety of programmes, all claiming to ensure a high standard of animal welfare and all claiming to be based on science, there is a risk that the public will become confused and disillusioned by the conflicting claims. How can we reduce the chance of this happening?

First, we need to be clear on the mixture of science and values that go into animal welfare standards. Science has a key role to play, for example by demonstrating how different housing and handling practices affect the growth and health of animals, by helping us understand their affective states, and by identifying environmental features that are important for animals to carry out elements of their natural behaviour. Science does not, however, answer or trump value-based questions about the relative importance of the different criteria of animal welfare. Hence, we need to recognise and communicate that animal welfare standards have both a scientific and a philosophical basis.

Second, we need to strike reasonable balances among the different elements of animal welfare. Standards that emphasise natural living (e.g. organic, free-range) need to provide adequate protection against disease and harsh environmental conditions. Standards that emphasise biological functioning (e.g. basic standards endorsed by producer organisations) must not ignore concerns over affective states. Perhaps no welfare standards will maintain public trust unless they take the different conceptions of animal welfare into account to some degree.

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Table 1: Examples illustrating three types of animal welfare standards for laying hens

Type of standard	Floor space (cm ² /bird)	Feed trough (cm/bird)	Water sources	Perch, litter nestbox	Outdoors, natural light
Basic	450	10	2 nipples	no	no
Enhanced	750	12	2 nipples	yes	no
Alternative	2 300	8	1 round waterer	yes	6 h/day

Sources: 'Basic' standards include those of various food companies and producer organisations; the example is the standard approved by the Council of the European Communities (1988). The 'enhanced' standard shown is the standard for enriched cages approved by the Council of the European Union (1999). 'Alternative' standards include many free-range, organic and speciality standards; the example is the organic standard of the Certified Organic Associations of British Columbia (2003). The table shows only certain elements of the standards, selected for purposes of comparison.

Résumé

Appliquer la science pour l'établissement de normes pour le bien-être animal

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Mots clés: bien-être animal, animal d'élevage, normes, éthique

Les personnes impliquées dans le développement de normes concernant le bien-être animal s'entendent généralement pour dire que celles-ci devraient reposer sur des principes scientifiques. Mais quelles sont les implications du fait d'incorporer la science dans le développement de normes pour le bien-être des animaux?

Dans notre société, nous pouvons discerner trois points de vue distincts concernant ce qui est important pour le bien-être animal. L'un est le «fonctionnement biologique», un point de vue qui soutient que le bien-être animal dépend d'un état sanitaire optimal, d'une bonne croissance, d'une production efficace et autres caractères associés; ce sont les producteurs d'élevage intensif qui adhèrent le plus à ce point de vue, qu'ils partagent avec quelques vétérinaires et scientifiques du domaine animal. Un second point de vue s'attache à la «vie naturelle», qui défend l'idée que les animaux devraient être libres de mener une vie relativement naturelle en utilisant leurs capacités d'adaptation typiques à l'espèce, le plus souvent dans un environnement naturel. Cette façon de voir est répandue parmi les consommateurs et plusieurs opposants à l'industrialisation de la production animale. Un troisième point de vue met l'accent sur «les états affectifs» des animaux. Ses partisans sont en faveur de la prévention des états négatifs (souffrance, douleur) et favorisent les états positifs (confort et satisfaction.) Cette façon de concevoir les choses est partagée par ceux qui endossent une pensée humanitaire et par certains scientifiques spécialisés en bien-être animal. Bien qu'ils se chevauchent considé-

rament, ces trois points de vue touchent des domaines d'importance différente et quelquefois conduisent à des conclusions divergentes.

Il serait réconfortant de penser que la science a le pouvoir de juger ces points de vue en démontrant que l'un est vrai et que les autres sont faux. Contrairement à cela, nous voyons plusieurs scientifiques qui amalgament ces différents points de vue concernant le bien-être animal. Certains d'entre eux mettent l'accent sur les mesures de fonctionnement biologique (santé, productivité), d'autres sur l'habileté des animaux à adopter un comportement naturel, et d'autres sur les indicateurs des états affectifs, notamment la peur et la douleur. De plus, les scientifiques utilisant une approche donnée ont parfois proclamé que les autres approches manquaient de validité scientifique.

Ces trois points de vue ont également influencé les normes de bien-être animal. Certaines normes largement appliquées concernant les locaux de stabulation des animaux, telles que celles de grandes chaînes de restauration aux États-Unis d'Amérique, reposent en grande partie sur les critères de fonctionnement biologique. Celles-ci, par exemple, estiment que l'allocation d'espace maximise les variables telles que la survie, le taux de ponte ou le taux de gain de poids. Les normes concernant la production biologique et d'autres systèmes alternatifs de production reposent sur une approche plus naturelle de la vie; elles exigent généralement un espace suffisant pour les animaux leur permettant d'adopter un comportement naturel, et parfois requièrent l'accès à l'air

frais et à la lumière du soleil. Certaines autres normes, par exemple sur l'abattage humanitaire, sont basées principalement sur des critères associés à l'état affectif, cherchant à prévenir la douleur, la peur et la détresse. Toutes ces normes ont une «base scientifique» dans le sens qu'elles impliquent la connaissance scientifique et la recherche, mais elles continuent à refléter inévitablement des vues reliées aux valeurs concernant le bien-être des animaux.

Avec une grande diversité de normes, toutes proclamant assurer le bien-être des animaux, on court le risque que le public soit troublé

et désillusionné par des déclarations contradictoires. Pour minimiser ce risque, les normes concernant le bien-être animal doivent établir un équilibre défendable parmi ces trois éléments; par exemple les normes qui reposent sur les critères d'une vie naturelle doivent fournir une protection sanitaire adéquate pour les animaux, et des normes reposant sur les critères de fonctionnement biologique doivent tenir compte du comportement naturel et des états affectifs. Il existe également le besoin d'une communication éclairée au sujet de la philosophie sous-jacente sur laquelle ces normes ont été développées.

Resumen

Aplicando la ciencia a las normas sobre el bienestar animal

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Palabras clave: bienestar de los animales, animales de granja, normas, valores

Las personas involucradas en la elaboración de normas de bienestar de los animales por lo general están de acuerdo en que las normas deben «basarse en la ciencia», pero ¿qué significa incorporar la ciencia a las normas del bienestar animal?

En la sociedad, podemos distinguir tres diferentes perspectivas sobre lo que es importante para el bienestar animal. La primera es la perspectiva del «funcionamiento biológico», según la cual el bienestar del animal depende de un alto nivel de salud, de crecimiento, de eficiencia de producción y características afines; este enfoque es bastante común en la producción pecuaria intensiva y en algunos veterinarios y científicos especializados en los animales. La segunda es la perspectiva de la «vida natural», según la cual los animales deben ser libres para vivir una vida relativamente natural y utilizar las adaptaciones propias de su especie, con frecuencia en un medio relativamente natural. Este enfoque es común entre los consumidores y varios críticos que se oponen a la industrialización de la agricultura animal. La tercera perspectiva hace énfasis en los «estados afectivos» de los animales y recomienda prevenir los estados negativos (dolor, sufrimiento) y posibilitar los estados positivos (confort, satisfacción). Este enfoque es común en el pensamiento humanitario y entre los científicos del bienestar animal. Aunque los tres enfoques se superpongan en gran medida, hacen énfasis en ámbitos distintos y a veces conducen a conclusiones diferentes.

Sería reconfortante pensar que la ciencia pudiese arbitrar entre estos enfoques demostrando que uno es correcto y que los demás son erróneos. En cambio, observamos cómo

los diferentes científicos incorporan en su trabajo estas diferentes perspectivas del bienestar animal. Algunos científicos se centran en las medidas del funcionamiento biológico (salud, productividad); otros, en la capacidad de los animales de seguir un comportamiento natural; y otros, en indicadores de los estados afectivos tales como el temor y el dolor. Además, los científicos que aplican un enfoque determinado han afirmado, a veces, que los otros enfoques carecen de validez científica.

Las tres perspectivas también han influido en las normas de bienestar animal. Algunas normas de gran difusión relativas al alojamiento de los animales, tales como las de las principales cadenas de restaurantes en los Estados Unidos, están basadas en gran parte en criterios de funcionamiento biológico. Por ejemplo, éstas establecen subvenciones de espacio que maximizan variables tales como la supervivencia, la tasa de puesta o el porcentaje de ganancia. Las normas en los sistemas orgánicos de producción y algunos sistemas alternativos están más basadas en un enfoque de vida natural, que por lo general exige un espacio suficiente para que los animales se comporten naturalmente, y a veces exigen un acceso al aire libre y a la luz del sol. Otras normas, por ejemplo en el sacrificio en condiciones decentes, están basadas principalmente en criterios de estados afectivos, que pretenden evitar el dolor, el temor y la angustia. Todas estas normas están «basadas en la ciencia» en la medida en que implican una comprensión y una investigación científicas, pero siguen reflejando (inevitablemente, a mi parecer) enfoques distintos, aunque relacionados, del bienestar de los animales.

Con una amplia variedad de normas que pretenden garantizar el bienestar de los animales, se corre el riesgo de confundir y de decepcionar al público con pretensiones conflictivas.

Para minimizar este riesgo, las normas del bienestar tienen que determinar un equilibrio justificable entre los tres elementos; por ejemplo, las normas basadas en los criterios

de la vida natural necesitan ofrecer una protección adecuada de la salud animal, y las normas basadas en los criterios de funcionamiento biológico necesitan tener en cuenta el comportamiento natural y los estados afectivos. Se requiere asimismo una comunicación clara sobre la filosofía subyacente a partir de la cual se han elaborado las normas.

Abstract

Applying science to animal welfare standards

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Keywords: animal welfare, farm animals, standards, values

People involved in developing animal welfare standards generally agree that the standards should be 'science-based', but what is involved in incorporating science into animal welfare standards?

Within society, we can discern three different views about what is important for animal welfare. One is a 'biological functioning' view which holds that animal welfare depends on a high level of health, growth, production efficiency and correlated traits; this view is especially common among intensive animal producers and some veterinarians and animal scientists. A second is a 'natural living' view which holds that animals should be free to lead relatively natural lives and to use their species-typical adaptations, often in a relatively natural environment. This view is common among consumers and many critics who object to the industrialisation of animal agriculture. A third view emphasises the 'affective states' of animals and advocates preventing negative states (pain, suffering) and permitting positive states (comfort, contentment). This view is common in humanitarian thinking and among some animal welfare scientists. Although they overlap considerably, the three views involve different areas of emphasis and sometimes lead to different conclusions.

It would be reassuring to think that science could arbitrate among these views by demonstrating that one is right and the others are wrong. Instead, we see different scientists incorporating these different views of animal welfare into their scientific work. Some scientists focus on biological functioning measures (health, productivity), others on the ability of animals to perform natural behaviour, and others on indicators of affective

states such as fear and pain. Moreover, scientists using a given approach have sometimes claimed that the other approaches lack scientific validity.

All three views have also influenced animal welfare standards. Some widely followed standards of animal housing, such as those of major chain restaurants in the United States, are based largely on biological functioning criteria. For example, these set space allowances that maximise variables such as survival, rate of lay, or rate of gain. Standards in organic and some alternative production systems are based more on a natural living approach, generally requiring sufficient space for animals to perform natural behaviour and sometimes requiring access to fresh air and sunlight. Certain other standards, for example in humane slaughter, are based mainly on affective state criteria, seeking to prevent pain, fear and distress. All of these standards are 'science-based' in the sense of involving scientific understanding and research, but they still (inevitably, it seems) reflect different, value-related views about animal welfare.

With a wide variety of standards all claiming to ensure animal welfare, there is a risk that the public will become confused and disillusioned by the conflicting claims. To minimise this risk, welfare standards need to strike a defensible balance among the three elements; for example, standards based on natural living criteria need to provide adequate protection of animal health, and standards based on biological functioning criteria need to take account of natural behaviour and affective states. There is also a need for clear communication about the underlying philosophy on which standards have been developed.

Space, environmental design and behaviour: Effect of space and environment on animal welfare

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Summary

Domestic animals are kept in environments which often induce restrictions on their life quality. This is particularly the case in 'intensive' production systems. These restrictions are usually considered as having negative consequences on animal welfare. It is usually agreed that these negative restrictions should be avoided, but the challenge scientists are facing is to assess those consequences objectively, and not by using anthropomorphism and 'good old time' attitudes.

The challenge the animals are facing relate, in particular, to available microclimatic conditions (for example, light, temperature, humidity, ammonia and dust), floor characteristics, limited environmental complexity, social density, but also restricted social environment. The questions relate often to the ability of the animals to cope with the environment, to predict and control important events, and to have the opportunity to make their own choices, moving freely, choosing their environmental conditions and their social partners.

It is concluded that, in most cases, it should be possible to improve animal welfare and still have a sustainable production by optimising the husbandry systems but also the breeding strategies. However, to be pertinent, the analysis of those new husbandry systems should not be restricted to animal welfare parameters but should also consider product qualities, characteristics of the workers' work (safety, laboriousness, self-satisfaction), environmental protection and the overall economic profitability of the production system.

Keywords: welfare, farm animals, space, environment

The ability of the industry to provide animal foods to consumers has increased greatly in the past decades. It has been made possible, in particular, by the organisation of the industry, but also by many scientific and technological innovations. Among them, the mastering of the animal's environment had a major impact on production. However, it also introduced new constraints the animals have to cope with which could ultimately decrease their welfare. Different perspectives are used for assessing animal welfare. The first one is to use the natural state considered as optimum. It postulates that biology and, in particular, behavioural abilities, has been shaped by natural selection. However, when dealing with farmed animals, even if innate mechanisms are still operating, domestica-

tion has induced a lot of changes in thresholds which should be taken into consideration. The second perspective is to consider the physiological adaptation of the animals and their coping ability. A final alternative option is to focus on the way the animal perceives its environment in terms of emotions as an ultimate goal of the assessment.

Scientists have been asked to scrutinise that impact in order to provide the stakeholders with information for taking further actions. This is particularly the case in Europe, where the European Commission has asked the Committee on Animal Health and Welfare to make extensive reviews on the impact of different production systems on the welfare of different types of farm animals, including, in

recent years, cattle kept for beef production, broilers, and force-fed ducks and geese (http://europa.eu.int/comm/food/fs/sc/scah/outcome_en.html). In previous years, the former Scientific Veterinary Committee on Animal Welfare released other reports, in particular on laying hens, pigs and calves. The approach used has been to postulate that animal welfare is a complex phenomenon and that only a multifactorial approach, including health, physiology and behaviour, can allow a relevant assessment. Different aspects of quality of life contribute to the overall animal welfare (Anonymous, 2003). Among these the man-animal relationships can be essential but are dealt with elsewhere in this conference, even if they may interact with physical factors.

The welfare of an animal depends on the way it perceives its environment. It is then important to consider not only the physical environment aspects, but also the social environment, which is at least as important as the physical one.

Various indicators are used to assess animal welfare.

- Physical health (mortality, morbidity, injuries) is a prerequisite.
- Production traits can be used as indicators of welfare, but they are generally not very sensitive.
- Physiological indicators are derived from stress physiology and their use is, up to now, mostly restricted for assessing acute stress.
- Behavioural indicators of welfare are often very pertinent criteria.

These include a wide range of experimental paradigms and measurements, such as time budgets, choice tests and operant conditioning techniques. It is only by using a wide range of indicators in a pluridisciplinary approach that a sensible assessment can be achieved, in particular when dealing with complex questions such as the one of space and environment. As a consequence of that complexity, a simple quantitative risk assessment is difficult to achieve as there is a need to weigh the importance of different parameters which are involved and sometimes to trade between contradictory factors.

Physical environment

The physical environment includes floor characteristics, microclimatic aspects, and in particular light, furniture and quality and quantity of food and water. Those last aspects concerning food and water are dealt with elsewhere, but are mentioned in the present manuscript if they interact with other aspects of the physical environment.

Animals are often confined in closed buildings. In these buildings they are protected from detrimental climatic conditions (for example, cold, rain, heat) but they can also be subjected to other climatic constraints. Moreover, these housing set-ups might prevent the expression of some of the normal behaviour patterns that the animals usually perform.

In these buildings, the most common problems are encountered when the physical coping abilities of the animals are overwhelmed. This is particularly true for temperature and humidity and especially when the two parameters are simultaneously high (apparent equivalent temperature (Mitchell and Cattlewell, 1998)). For example, high ambient temperatures occurring in temperate countries during summer may have detrimental effects on reproductive performance, milk production, mortality of sows and piglets (for review see Farmer and Prunier, 2003) as for cattle (Anonymous, 1999) and broilers (Anonymous, 2000).

Other parameters, such as carbon monoxide and dioxide, ammonia and dust can have detrimental effects if threshold levels are exceeded (Anonymous, 1996, 2000). In some cases, high levels of those parameters can lead to a high prevalence of direct mortality. More frequently, sub-optimal levels of these parameters can trigger the development of opportunistic infections. For instance, it was shown that a strong link exists between chronic ammonia exposure and the incidence and severity of atrophic rhinitis in pigs (Drummond et al., 1980; Robertson et al., 1990). In addition, ammonia may reduce olfactory acuity in pigs (Jones et al., 2001) with possible influence on social behaviour which is highly dependent on social recognition. These detrimental effects of ammonia probably explain the strong preference of

pigs and domestic fowls for fresh air compared to ammoniated air (Wathes *et al.*, 2002). Finally, it is well recognised that chronic exposure to the aerial contaminants in confined buildings constitutes a hazard for workers, especially in the pig and poultry industry (Radon *et al.*, 2002; Omland, 2002; G erault *et al.*, 2003). Indeed, these workers often develop respiratory problems (asthma-like syndrome, exacerbation of pre-existing asthma, chronic bronchitis) and have low forced expiratory volume (Iversen and Pedersen, 1990; Essen and Romberger, 2003). Therefore, ventilation of the buildings is of particular importance, not only for the health of animals, but also for the health of the animal keepers.

Several components should be considered when studying the welfare consequences of light. Among them, spectral composition, rhythms, and intensity are the most important. Their effects may differ between species. Birds, in general, are able to perceive the near IR and UV (Nuboer, 1993), which is not the case for domestic mammals, and the spectral quality of light might modify birds' behaviour (Sherwin *et al.*, 1999). Light rhythm is a key component of the behavioural and physiological rhythms of the animals and some changes can have detrimental effects on the different components, especially resting behaviour (Coenen *et al.*, 1988). Climatic problems are, however, not restricted to confinement and, when free range, the animals may also have to cope with specific stressors including extreme temperature and light rhythms, but on the other hand, other aspects such as gas accumulation are not a problem. It is usually considered that very low light intensity and very short light or dark periods can have detrimental effects on the welfare of the animals and, in particular, on the expression of exploration or rest. For example in broiler systems, very short dark periods are used with some detrimental effects on the animal welfare (Anonymous, 2000). On the other hand, split photoperiods can also stimulate activity and have positive consequences on leg quality in broilers (Anonymous, 2000).

Floor characteristics, furniture and space allowance are important for welfare. Density

aspects will be considered below, together with other social aspects. Several types of floor are used and, among them, untreated ground with different types of vegetation, different types of floor bedding (sawdust, straw, etc.) and completely artificial floors (such as wire mesh, slates, concrete, etc.).

Natural ground or litter provide a rich environment and they often stimulate exploration (Arnould *et al.*, *in press*) and fulfil the foraging or rooting motivation (Lebret *et al.*, 2003). In the absence of an adequate substrate, foraging behaviour is redirected in oral manipulation of equipment and mates which can cause damaging behaviour such as feather pecking (Blokhuis, 1986) or tail biting (Olsen *et al.*, 2000). Moreover, provision of bedding material fulfils the strong motivation of pre-parturient sows or pre-laying hens to build a nest, and they will go through the preparative phase of the behaviour 'in vacuum' if kept loose in a pen without substrate (Wood-Gush, 1969; Jensen, 1993). However, in some circumstances the fact that bedding materials represent a need for the animal can be questioned (Faure and Mills, 1995; Guesdon, *in press*).

Because they are impossible to sterilise, these different types of natural floors or litters can also induce sanitary problems. That has been particularly demonstrated in laying hens (Anonymous, 1996), but it has also been demonstrated that the quality of flooring, including abrasion and poor hygiene, can induce great damage on the feet of broilers (Anonymous, 2000) and that occurrence of lameness is higher in cattle or pigs housed on concrete floors than on soft floors (Anonymous, 1997, 2001). In pregnant grouped sows, integrity of feet and the ability to lie down are better and exercise and rooting activity are higher when the concrete floor is covered with straw than when it is slatted (Sala un *et al.*, 2002).

The structure of the space is also of importance. It can be used as a tool by keepers to control the use of the space offered to animals. For instance, it has become increasingly important in laying hens where nest, perches and a dust bath are provided in the new cages and aviaries (Waal, 2003). Brushes and shower devices can be used respectively

by dairy cows and pigs and contribute to improve their welfare. Space structuration can also improve space use by broilers kept in pens (Cornetto, Estevez, 2001; Arnould et al., in press) and free range (Moinard, 1993, Mirabito et al., 2002c, Lubac et al., 2003) or by turkeys in pens (Martrenchard et al., 2001). In pigs raised in a pen with three types of floor (litter, concrete and slatted) offered as free choice, animals used specific areas for resting and for defecation which indicate high motivation to structure their life space (Ducreux et al., 2002). The provision of playthings, such as toys or straw substrate can be used to improve the welfare through the fulfilment of the foraging motivation in pigs (Courboulay et Meunier-Salaün, 2002). Internal partitions may also reduce aggression in pigs by an increased escape behaviour limiting the body lesions (Barnett et al., 2001). 'Toys' can also be used to reduce fear or deleterious behaviour in birds (Jones et al., 1991; Jones, Waddington, 1992; Jones, 1996; Martrenchard et al., 2001).

One of the present tendencies in the farm industry, but also in proposals made for improving animal welfare, is to keep environmental factors as homogeneous as possible. It has, however, been shown that various animals might have different preferences (Kovach, 1978; Kite, 1983) and that the same animal might change its preferences according to the time of day, age or activity (Berk, 1997; Davis et al., 1999). A heterogeneous environment seems to fit better than a homogeneous one-animal-needs variability.

Social environment

In some types of productions, animals are kept in individual cages. That is the case in ducks during the force-feeding period, in lactating sows, and in grandparent stocks in poultry. It has been the case until recently with European veal calves. Some other animals can have social restrictions for at least part of the year or part of the day. This is the case for tethered cows, some horses and still for non-lactating sows. Lactating sows are kept in specific individual devices which are designed to reduce crushing of piglets. That type of environment limits social contacts and exercise but it prevents aggression and

allows precise individual food allocation. Those types of housing limit the possibilities of the animals to express some of their important behaviour, for example social behaviour and exploration.

Most of the animals are, in fact, reared in groups. However, these groups are far from the natural social structures. They are often so large that the establishment of a stable social structure, including a clear hierarchy, is prevented. They are also often from the same sex and age, with animals coming sometimes from different origins. All those factors can increase social tensions and lead to welfare problems, in particular instability and aggressiveness (Anonymous, 2001).

The space allocation per animal is very important for allowing it exercise, resting and exploration. When animals are kept in groups, the surface per animal should be large enough for positive relationships to develop while avoiding negative ones such as aggressiveness or sexual harassment. In some cases, group size and space allocation seem to have additive effects (Mirabito et al., 2002a), however, in others, space allocation can be lower in groups than if animals are individually housed as they can share part of the surface (Mirabito et al., 2002b). In large group of birds, the organisation of the pens is of importance, as it can induce high local densities in some areas (Arnould et al., 2001) and increase comfort and health problems (McIlroy et al., 1987; Frankenhuis et al., 1991).

Feeding restriction

Feeding restriction is a common practice in various production systems including poultry breeders and suckling cows. In sows, feed restriction during gestation, whilst adequate to maximise performance at farrowing and during lactation, does not fulfil behavioural needs in most animals. Hunger and frustration of feeding motivation observed in those restricted sows have been linked to the occurrence of stereotypic activity (Appleby and Lawrence, 1987). Moreover, in group-housing systems, which are considered as beneficial for animal welfare, feed restriction can be associated with increased aggression and feeding competition. A way of satisfying feeding motivation in energy-

restricted sows is to provide bulky or high-fibre diets. Indeed, fibrous diets have been shown to result in, at least, a doubling of eating duration, a 30 % reduction in operant response in feed-motivation tests, a 7-50 % reduction in stereotypic behaviour, and a decrease in general restlessness and aggression (Meunier-Salaün et al., 2001; Ramonet et al., 2000).

Conclusion

This review aims at identifying key effects of some housing systems on the welfare of the animals. It gathers information on the main types of productions, mainly cattle, pigs and poultry. The effects of the environment can differ largely between those production types, however some common key factors can be identified. The first one is that animal welfare is better in systems which provide the animals with a suitable microclimatic environment, give them space to fulfil their specific needs and an environment as rich as possible in its physical and social structure. When those needs are not provided, severe impairments of animal welfare can be observed, including on their health and production traits, which can decrease the return for the industry. However, the minimum levels are still a question of debate. To be accepted, any modification of the production conditions for improving the welfare of the animals should be economically profitable, have no adverse effect on product quality, from the organoleptic as well as food safety point of view, have no adverse ecological consequences and no adverse consequences on the workers' conditions (safety, laboriousness and self-satisfaction). That type of concern has been taken into account in reports for the European Commission concerning calves, laying hens and broilers (Anonymous, 2000).

Only the consequences of various aspects of the environment were considered in this paper. It should, however, be kept in mind that adaptation also depends on animal ontogeny and genetics and that welfare improvement should include animal improvement (Faure et al., 2003).

Combining genetic, ontogenetic and environmental aspects of the life of domestic ani-

mals, it should be possible to improve animal welfare and sustainability of animal production.

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Résumé

Espace, environnement et comportement – Effets de l'espace et de l'environnement sur le bien-être animal

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Mots clés: bien-être animal, animal d'élevage, espace vital, environnement

Les animaux domestiques sont maintenus dans des environnements qui restreignent le plus souvent leur qualité de vie, en particulier dans les systèmes de production intensive. On considère généralement que ces restrictions entraînent des conséquences négatives sur le bien-être de l'animal, qui doivent être évitées. Cependant, les scientifiques doivent relever le défi d'évaluer objectivement ces conséquences en évitant l'anthropomorphisme et en ne recourant pas aux attitudes du «bon vieux temps».

Les restrictions sont reliées principalement aux conditions microclimatiques existantes (par exemple l'humidité, l'ammoniac et la poussière), les caractéristiques des sols, la complexité environnementale relativement limitée, la densité sociale ainsi que l'environnement social restreint. Les problèmes sont souvent reliés à la capacité des animaux de s'adapter à l'environnement, de prévoir et de contrôler les événements importants et d'avoir l'opportunité de faire leur propre choix, c'est-à-dire de se déplacer librement et de choisir les conditions environnementales et leurs partenaires sociaux. De plus, les relations homme/animal peuvent avoir un impact important sur le bien-être animal et peuvent interagir avec certains facteurs physiques. Différents facteurs, en particulier leurs antécédents génétiques et leur ontogénèse, peuvent avoir des conséquences sur la manière de réagir des animaux.

Pour évaluer le bien-être animal, différentes perspectives sont utilisées. La première consiste à utiliser l'état naturel, considéré

optimal. Il postule que la biologie, et plus précisément les habiletés comportementales, ont été modelées par la sélection naturelle. Cependant, lorsqu'on travaille avec des animaux de ferme, même si les mécanismes innés se manifestent encore, la domestication a induit plusieurs changements dans leur manifestation dont on doit tenir compte. La seconde perspective consiste à considérer l'adaptation physiologique des animaux et leur capacité d'adaptation. Une dernière option alternative est de se concentrer sur la manière dont l'animal perçoit son environnement en termes d'émotions, comme but ultime de l'évaluation.

Plusieurs méthodes sont utilisées pour évaluer le bien-être animal selon ces différentes perspectives:

- la santé physique (mortalité, morbidité, blessures) est un préalable;
- les caractéristiques de production peuvent servir d'indicateurs de bien-être animal, mais ils ne sont pas suffisamment sensibles;
- les indicateurs physiologiques découlent de la psychologie du stress et leur usage est principalement limité à l'évaluation d'un stress aigu;
- les indicateurs comportementaux de bien-être animal sont souvent des critères très pertinents. Ils incluent un large éventail de paradigmes expérimentaux et de mesures telles que la planification du temps, le choix des tests et les techniques de conditionnement opérant.

Ce n'est qu'en utilisant cette gamme d'outils, dans le cadre d'une approche multidisciplinaire, qu'on pourra réussir à faire une évaluation mesurable du bien-être animal, plus particulièrement lorsqu'il s'agit de questions complexes telles que l'espace et l'environnement. Étant donné cette complexité, il est difficile de procéder à une simple évaluation quantitative des risques à cause du besoin de mesurer l'importance des différents paramètres qui entrent en ligne de compte, et qui quelquefois deviennent des facteurs contradictoires. Les auteurs présentent et analysent quelques exemples d'évaluation de la qualité de vie des animaux dans certains systèmes de production (veaux de boucherie, poules pondeuses, poulets de grill, porc), et propo-

sent quelques façons d'améliorer leur qualité de vie.

En conclusion, il devrait être possible, dans la plupart des cas, non seulement d'améliorer le bien-être animal, et ce, en conservant une production durable par l'optimisation des systèmes d'élevage, mais également par l'application de stratégies de reproduction. Cependant, pour être pertinente, l'analyse de ces nouveaux systèmes d'élevage ne devrait pas se limiter aux paramètres du bien-être animal, mais devrait également considérer la qualité des produits, les caractéristiques du travail des employés (sécurité et autosatisfaction), la protection de l'environnement et la rentabilité économique globale du système.

Resumen

Espacio, medio ambiente y comportamiento: efectos del espacio y del medio ambiente sobre el bienestar de los animales

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Palabras clave: bienestar, animales de granja, espacio, medio ambiente

Los animales domésticos están mantenidos en medios que con frecuencia conllevan restricciones de su calidad de vida. Éste es el caso, en particular, en los sistemas de producción «intensiva». Se considera por lo general que estas restricciones tienen consecuencias negativas sobre el bienestar de los animales. Así pues estas restricciones negativas deben evitarse, pero el reto que han de superar los científicos es evaluar objetivamente las consecuencias sin caer en el antropomorfismo ni en actitudes «anticuadas».

Las restricciones están relacionadas en particular con las condiciones microclimáticas existentes (por ejemplo, temperatura, humedad, amoníaco, polvo), las características del suelo, la complejidad ambiental relativamente limitada, la densidad social y también el medio social restringido. Con frecuencia se plantean cuestiones relativas a la capacidad de los animales de enfrentar el medio, de prever y controlar acontecimientos importantes, y de tener la oportunidad de hacer sus propias elecciones, desplazarse libremente, elegir sus condiciones ambientales y los actores sociales. Además, la relación entre el hombre y el animal puede tener consecuencias importantes sobre el bienestar de los animales y entrar en interacción con factores físicos. Los distintos factores, sobre todo los antecedentes genéticos y la ontogenia, pueden tener consecuencias sobre las reacciones del animal.

En la evaluación del bienestar animal se utilizan diferentes perspectivas. La primera consiste en utilizar el estado natural conside-

rado como óptimo. Su postulado es que la biología y, en particular, las capacidades comportamentales, han sido modeladas por selección natural. Sin embargo, en el caso de los animales de granja, aun cuando los mecanismos innatos sigan funcionando, la domesticación ha inducido una serie de cambios en los umbrales que han de tenerse en cuenta. La segunda perspectiva consiste en considerar la adaptación fisiológica de los animales y su capacidad de enfrentar las situaciones. Una última opción alternativa consiste en enfocar como último objetivo de la evaluación la manera en que el animal percibe su medio en términos de emociones.

Según estas diferentes perspectivas, se utilizan varios métodos para evaluar el bienestar de los animales: la salud física (mortalidad, morbilidad, heridas) es un requisito previo; las características de producción pueden utilizarse como indicadores del bienestar, pero no son muy sensibles; los indicadores fisiológicos proceden de la fisiología del estrés y su uso está restringido principalmente a la evaluación del estrés agudo; los indicadores comportamentales del bienestar suelen ser criterios muy pertinentes. Estos métodos incluyen una amplia gama de paradigmas y medidas experimentales tales como la utilización del tiempo, las pruebas de opciones y las técnicas de condicionamiento empleadas. Sólo la utilización de esta gama de herramientas en un enfoque multidisciplinario permitirá efectuar una evaluación sensible, en particular cuando se trate de cuestiones complejas tales como la del espacio y el me-

dio ambiente. Como consecuencia de esta complejidad es difícil realizar una simple evaluación cuantitativa del riesgo, ya que es necesario sopesar la importancia de los diferentes parámetros implicados y dedicar cierto tiempo al examen de los factores contradictorios. A título de ilustración, se analizarán ejemplos de evaluación de la calidad de vida de los animales en algunos sistemas de producción (por ejemplo, terneros de carne, gallinas ponedoras, pollos de carne, cerdos) y se propondrán las formas de mejorarla.

La conclusión es que, en la mayoría de los casos, debe ser posible mejorar el bienestar de los animales y mantener una producción sostenible optimizando los sistemas agrícolas, pero también las estrategias de crianza. Sin embargo, para ser pertinente, el análisis de los nuevos sistemas agrícolas no debe restringirse a los parámetros del bienestar animal, sino también debe considerar la calidad de los productos, las características de trabajo del personal (seguridad, severidad, satisfacción propia), la protección ambiental y la rentabilidad económica general del sistema.

Abstract

Space, environmental design and behaviour: Effect of space and environment on animal welfare

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Keywords: welfare, farm animals, space, environment

Domestic animals are kept in environments which often restrict their quality of life. This is particularly the case in 'intensive' production systems. These restrictions are usually considered as having negative consequences on animal welfare. These negative restrictions should be avoided, but the challenge facing scientists is that of assessing the consequences objectively and not using anthropomorphism.

Restrictions relate in particular to available microclimatic conditions (e.g. temperature, humidity, ammonia, dust), floor characteristics, relatively limited environmental complexity, and social density. Animals can also be subjected to a restricted social environment, i.e. restrictions on their ability to cope with the environment, to predict and control important events, to make their own choices, to move freely, and to choose their environmental conditions and their social partners. In addition, man/animal relationships can have a major impact on animal welfare and may interact with physical factors. Different factors, in particular their genetic background and their ontogeny, can have consequences on the way an animal reacts.

Different perspectives are used for assessing animal welfare. The first one is based on what is considered to be the animal's optimum natural state. This view states that the biology and behavioural abilities of animals have been shaped by natural selection. However, when dealing with farmed animals, even if innate mechanisms are still operating, domestication has induced a lot of

changes in thresholds which should be taken into account. The second perspective on animal welfare is one which considers the physiological adaptation of animals and their coping ability, and the third focuses on the way animals perceive their environment and aims to assess animal emotions.

Depending on these different perspectives, various indicators are used to assess animal welfare: physical health (mortality, morbidity, injuries) is paramount; production traits (these can be used as indicators of welfare but they are not sensitive); physiological indicators (derived from stress physiology and principally only used to assess acute stress); and behavioural indicators (often a very pertinent criteria). These methods of assessing animal welfare involve using a large range of experimental paradigms and measurements such as time budgets, choice tests and operant conditioning techniques. It is only by using this range of tools in a pluridisciplinary approach, that a sensible assessment can be achieved, particularly when dealing with complex questions such as space and environment. As a consequence of this complexity a simple quantitative risk assessment is difficult to achieve as there is a need to weight the importance of the different parameters involved and sometimes to trade between contradictory factors. As examples, the assessment of the quality of life of the animals in some production systems (e.g. veal calves, laying hens, broilers, pigs) will be analysed and ways to improve them will be proposed.

It will be concluded that, in most cases, it should be possible to improve animal welfare and still have sustainable production by optimising husbandry systems and breeding strategies. However, to be pertinent, the analysis of these new husbandry systems

should not be restricted to animal welfare parameters but should also consider product qualities, characteristics of the workers' work (safety, difficulty, self-satisfaction), environmental protection and the overall economic profitability of the system.

Management, handling, and transport of farm animals

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Summary

One of the most important factors affecting the welfare of farm animals is the quality of human–animal interactions. Good animal management and handling depend upon well-trained, skillful, and observant caretakers who understand behavioural principles of handling animals with minimal fear and distress. Well-designed equipment (e.g. races, chutes, loading ramps, catching machines) is also important. Handling is only one of the factors that affect welfare during the pre-slaughter period. Transport to the slaughterhouse can be associated with many stressors, including mixing with unfamiliar animals, confinement, thermal challenge, food and water deprivation, unfamiliar noises, and vibration. These can cause fear and distress, and in some cases high mortality. Welfare aspects of handling and pre-slaughter management have been evaluated by assessing physiological stress responses, behaviour (including animal preferences and aversions), and mortality and injury. Although there are still many gaps in knowledge, this information can be used to good effect to improve conditions.

Keywords: management, handling, transport, stress, fear, behaviour, injury, mortality

Handling and management

Farm animals are handled when they are loaded, unloaded and moved, when they are given medical treatment or during the performance of routine surgical procedures (like dehorning, castration, or beak-trimming), during breeding operations (e.g. artificial insemination), and sometimes during daily caretaking. As farms have continued to grow in size and normal farm operations (like delivering feed) have become increasingly automated, however, the amount of daily contact between caretakers and individual animals has decreased, sometimes dramatically. On a typical poultry farm, a single caretaker now usually has the primary responsibility for taking care of tens or hundreds of thousands of birds. The caretaker generally walks through the house once or twice per day to remove dead birds and cull sick birds, but otherwise has limited contact with the individuals in the flock. Regular human–animal contact is also relatively limited on the larger intensive dairies and swine farms that are increasingly common in some countries like the USA. Under these circumstances, human–animal contact may essen-

tially be limited to situations that are already aversive to the animal and thus likely to cause fear, for example conducting painful procedures (e.g. castration) or moving and loading the animal for transport.

Caretaker behaviour is critical in influencing the welfare of animals during routine handling and management procedures. Handling may involve several aversive elements, including social isolation, restraint, and close proximity of humans. Sensitivity to animals, and an understanding of their behaviour, is essential for good management when routine procedures are performed. While one of the effects of domestication has been to decrease fear responses to humans, livestock may still withdraw or escape from human approach. The distance at which this occurs is known as the flight distance, and this varies between different species, breeds, and genetic stocks. It is also affected by rearing conditions, with extensively reared animals having greater flight distances. For example, Grandin (8) found that extensively reared cattle had flight distances of up to 30 m, whereas flight distances in feedlot cattle were between 1.5 and 7.6 m. Livestock can be moved most efficiently, and with the least

stress to the animal and danger to the handlers, if handlers are aware of the animal's flight zone and understand how to position themselves with respect to this zone in order to initiate and stop movement (10). Another important behavioural consideration when approaching and moving animals is their sensory capabilities (7). For example, most domestic animals can hear higher-frequency sounds than humans, and thus can be frightened by sounds of which handlers are unaware. An understanding of social behaviour is also important when moving groups of animals (7, 10).

Fear of humans can have marked effects on animal welfare and productivity. Fear is considered to be an undesirable emotional state, and fearful animals may injure themselves or their handlers. Boivin et al. (2003) identify and discuss several factors that are of importance in determining the nature of the animal's response to human-animal interactions. These are the period during the animal's development when the interactions occur; the physical and social contexts in which the interactions occur; the predictability and controllability of the caretaker's behaviour towards the animal.

There has been considerable recent research on this last aspect, particularly with pigs (15, 29). Negative caretaker behaviour (e.g. slapping, hitting, kicking) towards pigs can cause the animals to become fearful, which in turn causes elevations in cortisol, decreased growth rates, and decreased pregnancy rates in gilts. Aversive handling may also depress milk yield in dairy cattle. In contrast, positive human interactions like patting and stroking can diminish fearfulness by habituating the animal to human contact. Poultry are particularly sensitive to visual contact with humans, and even a 'neutral' interaction like people placing their hands on the side of the birds' cage or placing their hand near the birds for brief periods can reduce fearfulness (13). Whether or not contact with humans will affect specific fear responses, however, depends upon context. For example, Kannan and Mench (17) found that regular human handling did not result in poultry becoming habituated to the type of handling typically used to catch the birds for loading and transport, as measured by corti-

costerone responses. Since poultry appear to perceive humans as predators (4), what may be most important in reducing fear is for caretakers to move slowly and deliberately through the house (15) and to minimise handling.

Training of caretakers is critical to improving attitudes and behaviour towards animals and thus decreasing problems attributable to fearfulness (15). The increasing use in some countries of a low-paid, unskilled workforce in animal agriculture poses a substantial impediment to good animal management, since there is often high turnover of these workers and thus little company incentive to invest in the relevant training. Rushen et al. (29) identify five aspects of caretaker-animal interactions that can be used to improve welfare:

- increased positive contact with humans, particularly when the animals are young and most sensitive to handling effects;
- knowledge of the human behaviours or postures that can frighten or startle animals;
- improved facilities designed to reduce the amount of rough handling;
- avoidance of aversive handling techniques, like using electric prods;
- taking advantage of the ability of animals to make associations between particular people/places and aversive events to structure interactions so that animals do not become fearful of all people or places.

To this list of methods for reducing fear could be added genetically selecting animals that are less fearful of humans, which has been successful experimentally with poultry (19).

A special mention should be made of handling during routine surgical procedures for farm animals, which are generally performed without anaesthetic or analgesia because it is claimed that the more extensive handling that would be required to administer these agents would simply increase the stress for the animal. However, recent research on amputation dehorning of cattle does not support this claim (24). Cortisol does show an initial increase in handled control calves, but it decreases rapidly. Similarly, cortisol levels do increase during anaesthetic administration due to handling, but they

then decline to control levels and remain low until the anaesthetic wears off. Calves not given anaesthetics, however, show a greater initial increase in cortisol than handled calves or those given anaesthetics, and this level declines only gradually after amputation. Handling stress is thus only a minor component of the stress associated with performing such routine surgical procedures, with the major increase in cortisol being pain-induced, indicating that administration of anaesthetics and analgesics is warranted to improve welfare.

Transport

Farm animals may be transported from one facility to another at various times during the production period. The number of times animals are transported, and the conditions under which they are transported, can vary greatly from one country to another, and from one species to another. Poultry are typically transported by road in crates or boxes loaded onto the truck, and are usually first transported from the hatchery to the rearing facility. Birds that are to be kept for breeding or egg production are then often transported again from the rearing facility to the facility in which they will be housed as adults. Lastly, the birds are transported to the processing facility. In the USA and United Kingdom, transport distances for poultry are generally short (from one to five hours), because poultry production is largely vertically integrated and thus all phases of the operation (hatch to slaughter) are managed by one company, with facilities in close proximity to one another. Exceptions are for laying hen production, where chicks may be transported by air from an independently owned hatchery, and where end-of-lay (spent) hens may have to be transported long distances to slaughter because their meat is now of little value and many local processors are unwilling to slaughter them (26).

Cattle may be transported by road, air, or sea, and while transport distances between feedlots and slaughter plants are relatively short in the USA, weaned calves and yearlings are often transported 1 000 to 3 000 km to feedlots (31). Breeding pigs may be shipped by air, road, rail, or occasionally by

ship, while road transport is usual for pigs destined for the slaughter plant (22). With the development of segregated early weaning systems, very young pigs may now also be transported from the farm on which they were born to a piglet rearing farm at some distance from the breeding farm.

Handling is one component of the transport process, but as Gonyou (7) points out, pre-slaughter handling and transport actually involve two distinct types of actions from the animal's perspective: movement to a new location in the first instance and remaining stationary (confinement) in the second. Transport is associated with many stressors, including mixing with unfamiliar animals, confinement, thermal challenge, food and water deprivation, unfamiliar noises, and vibration and movement of the transport vehicle. These stressors can cause fear and distress, and in some cases lead to high mortality.

Pre-slaughter handling and transport have received considerable research attention recently, not only because of animal welfare concerns, but also because of their financial impact. Mortality and carcass damage associated with handling and transport can cause significant economic losses for producers, transporters, and processors (9). Mortality losses due to transport have been reported to be about 0.06 % for pigs, with another 0.01 % of pigs dying in lairage (based on estimates from the United Kingdom and the Netherlands), but these figures can be much higher (e.g. 0.3–0.5 %) for stress-susceptible strains of pigs (21). Heat stress and a genetic predisposition towards stress susceptibility are the most important factors resulting in the death of pigs during transit, although time between last feeding and loading, the vehicle deck on which the pigs are transported, stocking density, and possibly journey time, are also important (11, 21). For poultry, estimates range from 0.06 to 0.3 % of birds dead on arrival (DOA) at the processing plant (1); Weeks and Nicol (33) estimate that globally 120 million birds die annually during transit. Gregory and Austin (12) found that most DOA broiler chickens had died due to either stress-related congestive heart failure or as a result of trauma, mainly dislocated or broken hips. Transport mortality *per se* is

usually low in cattle, but can be high afterwards due to illness. In the USA, death losses after transport are estimated at 1 % of fed cattle (9), mainly due to shipping fever (bovine respiratory disease). Neonatal calves are particularly vulnerable to transport stress-induced illnesses (21).

Handling and transport also have significant effects on carcass quality. Poor handling can lead to bruising and bone or joint trauma, which are painful and can lead to the carcass being downgraded or having to be trimmed. Factors affecting the incidence and severity of these injuries are discussed in detail in Gregory (1998). Stress associated with handling and transport can also result in physiological changes that affect meat quality, for example resulting in pale, soft exudative (PSE) meat in swine, dark-cutting meat in cattle, and toughened meat in swine and poultry (11). Meat from highly stressed animals is more prone to putrefaction (11).

Research is critical to determine which particular features or components of the transport process are most stressful for each species and how these can be modified to improve welfare. Hall and Bradshaw (1998) outline four types of studies that have been used to assess the effects of transport.

- Studies where transport is used as a stressor to evoke particular physiological or behavioural responses. The transport conditions imposed in these studies may or may not be representative of commercial practice.
- Uncontrolled studies done under conditions of commercial or experimental transport, where physiological and behavioural measures are made before, during, and/or after transport.
- Studies comparing transported animals to non-transported controls.
- Studies where the different components of transport can be separated out either statistically or by experimental design.

Measures used to evaluate welfare include injury, mortality, physiological and immunological measures, behaviour, and meat quality. Detailed discussion of the many studies involving the different farm species are

beyond the scope of this paper, but reviews for cattle, pigs and poultry can be found in Hall and Bradshaw (14), Tarrant and Grandin (31), Lambooij (22), and Weeks and Nicol (33). However, an example will be given of how different approaches can be used to understand and improve transport, drawn from studies of broiler chickens.

Survey studies of the condition of the animals arriving at slaughter plants can provide a broad-based epidemiological-type evaluation of problems found during typical commercial loading and transport. One such study in the United Kingdom revealed that several factors influenced the number of broiler chickens DOA at the processing plant, including time in transit, time in the holding area, time of arrival at the processing plant, and the age of the birds (32). Bayliss and Hinton (1) examined records from UK processing plants, and found that, in addition to the factors mentioned above, DOA rates were influenced by the number of birds per crate during the summer months and which catching team caught and loaded the birds. Hand-catching can be a significant source of injury, and a recent survey in Germany (20) found that machine-caught birds showed fewer injuries than hand-caught birds at the processing plant, although the opposite was found in a similar survey in Sweden (6). However, birds in Sweden are hand-carried in an upright position rather than in large groups in an inverted position as is common in Germany and other countries, so this probably accounts for the difference.

Aspects of the transport process can also be assessed more systematically in experimental studies. For example, the effects of various features of the transport process for broiler chickens has been investigated using physiological (e.g. corticosterone, epinephrine, norepinephrine), meat quality (e.g. colour, tenderness, cooking loss), and behavioural (e.g. fear reactions) measures in experimental studies. Kannan and Mench (16) found that the handling required to crate the birds did cause a stress response, but that the response persisted only if the birds were then crated, with corticosterone levels peaking after three hours of crating. Crating was thus a more potent stressor than handling. In a subsequent study (18), corticosterone levels were in-

creased after three hours of transport, but this increase did not depend on how long the birds had been crated (from 0 to 4 hours) prior to being transported. None of the pre-slaughter procedures evaluated markedly affected meat quality. Transport was thus a more potent stressor than crating in this study, and also in a study by Duncan (5) in which corticosterone levels were found to be higher in birds crated, loaded onto a vehicle, and transported for 40 minutes than in those that were simply crated and loaded. Fear levels of the birds, as measured by tonic immobility, are mainly determined by transport rather than catching or loading, with the duration of transit being the most important factor (3).

As mentioned, transport involves exposure to many simultaneous stressors. Tests of preference and aversion have been used to evaluate the responses of broilers to some of these factors. Broiler chickens avoid jolts and short-acting circular motions (27). Vertical and horizontal vibrations are both aversive, and aversion increases with acceleration magnitude and decreases with increasing frequencies of motion, with the frequencies typically found on commercial transport vehicles being particularly aversive (28). However, when given a choice between vibration, heat stress, or a combination, broilers avoid the heat stress but not the vibration stress (23).

Thermal stress is probably the most important factor affecting broiler welfare during transit. Several studies have measured the heat loads that build up in trucks during transit at different times of the year. Most poultry vehicles do not provide a uniform thermal environment, and as a consequence some birds may become overheated while others are wet or chilled (25). The physiological consequences of this thermal stress have been evaluated, and the results used to design improved transport vehicles that reduce stress and decrease birds' DOA at the processing plant (25). Evaluation of heat losses from 'model' chickens placed among live birds show an improvement in the thermal comfort of the environment when vehicles are fitted with side curtains and roof-mounted inlet fans, and led to recommendations regarding desirable air movement speeds during transit (34).

These studies illustrate how research using multiple approaches and measures can help to disentangle factors causing fear, stress, and injury during the pre-slaughter process, and in turn lead to welfare improvements. Similar coordinated approaches have been used for other species and have similarly proven useful, for example for setting standards for slaughter horse transport in the USA (30).

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Résumé

Gestion, traitement et transport des animaux de ferme

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Mots clés: gestion, manutention, transport, stress, peur, comportement, blessure, mortalité

Un des facteurs déterminants qui influencent le bien-être des animaux de ferme est la qualité de l'interaction homme/animal, tant à l'intérieur qu'à l'extérieur de l'entreprise agricole. Pour assurer une bonne gestion animale et une manipulation adéquate, les préposés aux animaux doivent appliquer les habiletés acquises lors d'une bonne formation. Le comportement du personnel affecté aux soins des animaux peut avoir un effet déterminant sur la productivité et le bien-être. Des études menées en Australie ont démontré, par exemple, que le comportement négatif d'un employé de ferme envers des porcs et vaches laitières (claquer, frapper, donner des coups de pied) engendrait la peur chez ces animaux et affectait la productivité. Par contre, une interaction humaine positive ou même neutre peut diminuer la peur. Par exemple, le fait d'établir un contact visuel régulier avec l'homme diminue la réponse d'évitement de ce dernier chez les volailles; de même, favoriser un contact positif (caresser) diminue la peur de l'humain chez le bétail. L'augmentation de l'embauche, dans certains pays, d'employés sous-payés et de travailleurs agricoles sans formation adéquate, constitue une entrave majeure au développement d'une bonne gestion animale. En effet, étant donné la rotation importante parmi ces travailleurs, les petites entreprises ne sont pas motivées pour leur offrir une formation appropriée.

Les fermes continuent de se développer en taille et les opérations agricoles courantes qui y sont rattachées (notamment, la distribution de nourriture) sont devenues de plus en plus automatisées. Ce facteur a contribué à réduire, parfois de façon drastique, la fréquence des contacts entre les animaux et l'homme. Dans une entreprise typique d'éle-

vage de volailles, il y a maintenant un seul préposé principalement responsable du soin de dizaines, voire de centaines ou même de milliers d'oiseaux. Il existe également une réduction du contact régulier homme/animal dans les fermes laitières à production intensive et dans les porcheries, où cela est devenu monnaie courante. Dans ces circonstances, le contact homme/animal peut être limité essentiellement à des situations déjà négatives pour l'animal. Cela a pour effet d'entraîner la peur, par exemple, lors de procédures douloureuses (notamment la castration) ou lors du déplacement et de l'embarquement des animaux pour le transport. Il est alors particulièrement important que les préposés aux animaux aient une connaissance des principes de base du comportement animal et de leurs soins, afin qu'ils puissent déplacer les animaux en temps opportun en leur causant un minimum de stress. Il est également essentiel d'utiliser des équipements bien conçus pour la manipulation des animaux (tels que glissières, passerelles et rampes d'embarquement), de manière à réduire la peur et les blessures. Pour les volailles, il peut être préférable, dans certaines circonstances, d'éliminer complètement la manipulation humaine; des appareils servant à attraper les poulets de grill ont causé moins d'hématomes, de bris d'os et de peur chez ces oiseaux que la pratique commerciale typique d'attrapage à la main.

La manipulation humaine n'est qu'un des facteurs affectant le bien-être des animaux domestiques lors de la période de préabattage. Le transport à l'abattoir peut être associé à plusieurs facteurs de stress, tels que le regroupement avec des animaux inconnus, le confinement, les changements thermiques, la privation d'eau et de nourriture, les bruits

non familiers et la vibration et le mouvement du véhicule de transport. Ces facteurs de stress peuvent causer de la peur et de la détresse, et, dans certains cas, engendrer un taux élevé de mortalité. Par exemple, il est estimé qu'environ 120 millions de poulets meurent chaque année pendant le transport; cela est dû principalement au stress thermique, bien que d'autres facteurs tels que l'âge des oiseaux, le traumatisme prolongé lors de l'attrapage et de l'embarquement, la longueur du voyage et la durée de la détention à l'abattoir avant l'abattage soient également déterminants. Les méthodes qui ont été utilisées pour évaluer les aspects du bien-être animal liés au préabattage incluent l'évaluation des réponses physiologiques au stress, le comportement, la mortalité et les

blessures. De plus, des tests de préférence ont fourni des indices importants qui ont démontré que certaines caractéristiques particulières de transport étaient négatives pour la plupart des animaux. Bien que les connaissances dans ce domaine soient encore partielles, cette information a déjà été utilisée à bon escient pour améliorer le transport. C'est ainsi qu'au Royaume-Uni, un véhicule de transport a été développé pour les volailles, permettant d'assurer un meilleur contrôle thermique, ce qui a réduit considérablement la mortalité due au transport. La recherche s'est également avérée utile afin d'établir des normes concernant certains facteurs, notamment la densité de chargement pendant le transport et des durées maximales de voyage.

Resumen

Gestión, manipulación y transporte de los animales de granja

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Palabras clave: gestión, manipulación, transporte, estrés, miedo, conducta, herida, mortalidad

Uno de los factores más importantes que afectan al bienestar de los animales de granja es la calidad de las interacciones entre el hombre y el animal dentro y fuera de la explotación. Una correcta gestión y manipulación pecuarias depende de un personal con buena formación, experto y respetuoso. El comportamiento que tiene el personal con los animales puede tener un marcado efecto tanto en la productividad como en el bienestar. Estudios realizados en Australia, por ejemplo, han demostrado que un comportamiento negativo (por ejemplo, sopetones, golpes, puntapiés) con los cerdos y con las vacas lecheras provoca temor en los animales, lo que a su vez afecta a la productividad. En cambio, las interacciones humanas positivas (o incluso neutras) pueden reducir el temor. Así pues, un contacto visual regular con las personas disminuye la respuesta de las aves de corral de evitación del hombre, y el contacto positivo (palmadas, caricias) disminuye el temor de los bovinos ante el hombre. El empleo creciente en algunos países de personal mal remunerado e inexperto en la agricultura animal plantea un obstáculo importante para el manejo correcto de los animales, ya que a menudo hay una elevada rotación de personal y, en consecuencia, escasos incentivos para que la empresa invierta en la formación pertinente.

A medida que las explotaciones han ido creciendo y que las operaciones normales (como el suministro de piensos) se han vuelto cada vez más automatizadas, el contacto diario entre el personal y los animales se ha reducido, a veces de manera drástica. En una explotación avícola típica, una sola persona suele tener actualmente la responsabilidad principal de velar por decenas, centenas o miles de aves. El contacto regular entre el

hombre y el animal está también relativamente limitado en las grandes explotaciones intensivas de vacas lecheras y de cerdos que son cada vez más comunes. En estas circunstancias, el contacto entre el hombre y el animal puede limitarse básicamente a situaciones que ya son repulsivas para el animal y que probablemente le causen temor, como por ejemplo los procedimientos dolorosos (la castración) o el traslado y la carga del animal para el transporte. Así que es particularmente importante que los encargados entiendan los principios comportamentales de la manipulación de ganado a fin de trasladar los animales con un mínimo de angustia. El buen diseño del material de manipulación de ganado (por ejemplo, recintos, rampas de caída, rampas de carga) también es importante para reducir el temor y las heridas durante la manipulación. Para las aves de corral, en determinadas circunstancias puede ser mejor eliminar totalmente la intervención del hombre; las máquinas de captura mecánica en el caso de los pollos de carne producen menos contusiones, roturas de huesos y temor entre las aves que la captura manual típica.

La manipulación por el hombre es sólo uno de los factores que afectan al bienestar de los animales de granja durante el período previo al sacrificio. El transporte al matadero puede estar asociado con varios factores de estrés, entre ellos la mezcla con animales desconocidos, el confinamiento, los cambios térmicos, la privación de alimento y de agua, los ruidos desconocidos, y la vibración y movimiento del vehículo de transporte. Estos factores de estrés pueden causar temor y angustia, y en algunos casos provocar una alta mortalidad. Por ejemplo, se estima que alrededor de 120 millones de pollos mueren anualmente du-

rante el transporte debido principalmente al estrés térmico, aunque también son importantes otros factores, como la edad de las aves, el trauma producido durante la captura y la carga, el tiempo de transporte y el tiempo pasado en la planta antes del sacrificio. Los métodos utilizados para evaluar los aspectos del bienestar durante la gestión previa al sacrificio incluyen la evaluación de las respuestas de estrés fisiológico, del comportamiento, de la mortalidad y las heridas. Además, las pruebas de preferencia han permitido realizar descubrimientos valiosos sobre las características particulares del transporte que suscitan ma-

yor inquietud en los animales. Aunque aún existen varias lagunas en el conocimiento, esta información ya se ha aplicado con efectos positivos para mejorar el transporte. Por ejemplo, en el Reino Unido se ha desarrollado un vehículo de transporte mejorado para las aves de corral que posibilita un mejor control térmico y reduce así de manera significativa la mortalidad durante el transporte; la investigación también ha sido útil para el establecimiento de normas relativas a factores tales como la densidad de almacenamiento durante el transporte y la duración máxima del viaje.

Abstract

Management, handling, and transport of farm animals

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Keywords: management, handling, transport, stress, fear, behaviour, injury, mortality

One of the most important factors affecting the welfare of farm animals is the quality of human–animal interactions both on- and off-farm. Good animal management and handling depend upon well-trained, skillful, and observant caretakers. Caretaker behaviour towards animals can have a marked effect on both productivity and welfare. Studies in Australia, for example, have shown that negative caretaker behaviour (e.g. slapping, hitting, kicking) towards pigs and dairy cattle causes the animals to become fearful, which in turn affects productivity. In contrast, positive (or even neutral) human interactions can diminish fearfulness. For example, providing regular visual contact with humans diminishes the avoidance response to humans by poultry, and positive contact (pats, strokes) diminishes fear of humans by cattle. The increasing use in some countries of a low-paid, unskilled workforce in animal agriculture poses a substantial impediment to good animal management, since there is often high turnover of these workers and thus little company incentive to invest in the relevant training.

As farms have continued to grow in size and normal farm operations (like delivering feed) have become increasingly automated, the amount of daily contact between caretakers and individual animals has decreased, sometimes dramatically. On a typical poultry farm, a single caretaker now usually has the primary responsibility for taking care of tens or hundreds of thousands of birds. Regular human–animal contact is also relatively limited on the larger intensive dairies and swine farms that are increasingly common. Under these circumstances, human–animal contact may essentially be limited to situations that are already aversive to the animal and thus

likely to cause fear, for example conducting painful procedures (e.g., castration) or moving and loading the animal for transport. It is thus particularly important that handlers understand behavioural principles of livestock handling in order to move the animals at these times with minimal distress. Well-designed livestock-handling equipment (e.g. races, chutes, loading ramps) is also important to decrease fear and injury during handling. For poultry, it may be best in some circumstances to eliminate human handling entirely; mechanical catching machines for broilers have been found to produce less bruising, bone breakage, and fearfulness among the birds than typical commercial hand-catching.

Handling by humans is only one of the factors that affect the welfare of farm animals during the pre-slaughter period. Transport to the slaughterhouse can be associated with many stressors, including mixing with unfamiliar animals, confinement, thermal challenge, food and water deprivation, unfamiliar noises, and vibration and movement of the transport vehicle. These stressors can cause fear and distress, and in some cases lead to high mortality. For example, it is estimated that about 120 million chickens die annually during transit due mainly to thermal stress, although other factors such as the age of the birds, trauma sustained during catching and loading, length of transit, and length of time held at the plant prior to slaughter are also important. Methods that have been used to evaluate the welfare aspects of pre-slaughter management include assessment of physiological stress responses, behaviour, and mortality and injury. In addition, preference tests have provided valuable insights into which particular

features of transport animals find most aversive. Although there are still many gaps in knowledge, this information has already been used to good effect to improve transport. For example, an improved poultry transport vehicle has been developed in the

United Kingdom that allows better thermal control and thus significantly decreases transport mortality; research has also been useful in setting standards for factors such as stocking density during transit and maximum journey length.

Pain, fear and distress

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Summary

Pain, fear and distress are unpleasant subjective states often grouped together as states of suffering. Welfare is reduced when animals experience states of suffering. Since states of suffering are subjective states or feelings, they are not directly accessible to scientific investigation. However, techniques are currently being developed whereby these states can be investigated indirectly and thus give information about how negative to the animal these states are. The major states of suffering that have been investigated in animals are pain and discomfort, fear, deprivation, frustration and conflict. The term 'distress' seems to be used in a general way when it is obvious that an animal is suffering but the specific state is unknown. Some examples of different states of suffering that are commonly experienced by farm animals are discussed and the techniques being developed to investigate them are described.

Keywords: conflict, deprivation, distress, fear, feelings, frustration, negative emotions, pain, suffering

Introduction

Since the debate on animal welfare heated up in the 1960s (Harrison, 1964; Command paper 2836, 1965), there has been much debate over what exactly animal welfare is and how it should be defined. More than 20 years ago, Duncan and Dawkins (1983) reviewed the whole topic of animal welfare, including the 'definitions' of welfare that various investigators had proposed. They concluded that it was impossible to give welfare a precise scientific definition and that the best that could be achieved was a broad working description encompassing the ideas of the animal in physical and mental health, the animal being in harmony with its environment and being able to adapt to that environment without suffering, and that somehow, we should take account of the animal's feelings. The problem is that 'welfare' refers to the quality of life an animal has, and quality of life is made up of many different elements such as health, contentment, longevity and so on to which different human beings attach different values (Duncan and Fraser, 1997). As well as making a definition impossible, this fact means that there can be no simple measurement of welfare (Tannen-

baum, 1991; Sandøe and Simonsen, 1992; Fraser, 1993; Mason and Mendl, 1993).

Adopting a broad description of animal welfare, as suggested by Duncan and Dawkins (1983), seemed to work quite well as scientific research into animal welfare expanded in the 1970s and 1980s. Then examples were found in which some of the components of the broad working description contradicted each other. In particular, cases were identified in which there was a divergence between the physical and psychological aspects of welfare. For example, symptoms of physiological stress, which was thought to indicate reduced welfare, sometimes accompanied activities that seemed to be rewarding and pleasurable such as sexual behaviour (Szechtman et al., 1974; Colborn et al., 1991). Also cases were described in which animals, such as sows in dry-sow stalls, were healthy and physiologically normal but were performing stereotyped movements, behaviour suggestive of reduced welfare (Terlouw et al., 1991). This discord led to a protracted debate within animal welfare circles and the development of two main schools of thought, the biological functioning school and the feelings school. The biological functioning school gave priority to

normal functioning of physiological and behavioural processes, health, longevity and biological fitness (Broom, 1986; Hurnik and Lehman, 1985, 1987; Curtis, 1987; Fraser and Broom, 1990; Barnett and Hemsworth, 1990; Broom and Johnson, 1993; McGlone, 1993). The feelings school developed the thesis that welfare is all to do with what animals feel (Dawkins, 1980, 1990; Duncan and Petherick, 1991; Duncan, 1993, 1996, 2002). The debate continues, but there are signs of resolution with more and more emphasis being placed on the feelings of animals in any assessment of welfare (Broom, 1998; Mason et al., 2001).

The acceptance that it is feelings that govern welfare, brings with it a responsibility to understand feelings. Pain, fear and distress are such feelings. They are unpleasant subjective states often grouped together as states of suffering. These states are also commonly referred to as negative emotions or motivational affective states. Since states of suffering are subjective states, they are not directly accessible to scientific investigation. However, in the welfare debate it is not necessary to know exactly what an animal is feeling. The important thing to know is whether the animal feels bad or feels good. Thus in the case of a pig that is being tail-docked, it is not necessary to know if what the pig experiences is similar to what a human being experiences with an amputated finger, or a severe burn, or a deep cut or whatever. In order to assess the welfare implications of tail-docking we need to know whether or not the pig has an aversive experience and, if possible, it would be helpful to know how aversive the experience is. It is possible to gain this type of information indirectly. Now of course, with a procedure such as tail-docking there may be other welfare costs besides pain, such as a disruption in social signalling, or a reduced ability to swish away flies, and these costs would have to be examined separately.

The major states of suffering that have been investigated in animals are pain and discomfort, fear, deprivation, frustration and conflict. Some species are thought to experience other states experienced by human beings such as loneliness, sadness and boredom, but these have not been investigated to the same extent as the previously mentioned

states of suffering. It is also recognised that animals may suffer from some states not experienced by human beings. This is more likely to be true of species with very different sensory systems. Thus fish may experience aversive states when water quality declines. It is also possible to imagine that the aversive feelings they experience may differ depending on whether it is oxygen level or pH or ionic content that deteriorates. We can have no idea of what these experiences are to the fish. Fortunately, we can gain important information to help with welfare decisions without knowing, in the words of the philosopher Thomas Nagel, 'What is it like to be a bat?' (Nagel, 1974).

The term 'distress' which appears in the title of this paper, seems to be used in a general way when it is obvious that an animal is suffering but the specific state is unknown. The major states of suffering will now be discussed in more detail.

Pain

Pain, probably more than any other state, directly reduces welfare. Pain can result from: (a) injury due to badly designed housing and equipment; (b) surgical interventions such as castration and tail-docking which, in animal agriculture, are normally carried out without anaesthesia or analgesia; and (c) metabolic pathologies which are often associated with fast growth.

Injuries: It hardly seems possible that in the 21st century, facilities for animals are being produced that result in injuries. However, since the pioneering work of Ekesbo (1966), who used an epidemiological approach to identify features of the environment that caused injury and disease in tied and loose-housed dairy cattle in Sweden, the problem has been recognised. There have been several excellent reviews since then that have suggested solutions to the design of animal facilities that do not cause injury (e.g. Baxter et al, 1983; Webster, 1994; Grandin, 2000). To take just one example, the work of Tauson (1980, 1989), also in Sweden, has identified the ways in which cages injure laying hens, and his results have improved the design of conventional battery cages to greatly reduce the incidence of injuries.

To my knowledge, none of these studies has actually measured the pain involved; the incidence and extent of injuries have been recorded and the assumption has been made (probably reasonably) that this will correlate well with pain.

Surgical interventions: Another major cause of pain are the surgical interventions that are performed on farm animals, procedures such as castration, mulesing, tail-docking, de-horning, teeth clipping, de-toeing, debeaking/beak trimming, de-snooding, dubbing, branding, ear notching and ear tagging. Many of these procedures are performed in order to increase the long-term welfare of the animals involved by either removing parts of the anatomy that cause injury (horns, beak, teeth, toes) or by removing part of the anatomy that is at risk of being injured (tail, comb, snood). Castration can also improve long-term welfare by reducing aggression and improving tractability. In some instances the risk of blow fly strike can be significantly reduced by tail-docking and/or mulesing sheep. In all these cases, the justification given for the surgeries is that welfare is at risk of being worse off if the procedures are not carried out. In the case of branding, ear notching and ear tagging, which are carried out for identification purposes, it is generally assumed that any pain caused is short-lived. However, the justification for carrying out all these procedures has generally been given without knowing what the cost to the animals is in terms of both acute and chronic pain. For example, in the case of debeaking or beak trimming of poultry, there is strong evidence of chronic pain many weeks after the surgery. Anatomical studies have revealed that the beak of the domestic fowl is well innervated (Gentle and Breward, 1981, 1986) and has mechanoreceptors and nociceptors (Breward, 1984). Examination some weeks after beak trimming has shown there is neuroma formation in the damaged beak stump (Breward and Gentle, 1985) and afferent fibres running from the stump in the intramandibular nerve have abnormal spontaneous discharges (Breward and Gentle, 1985). This activity looks very similar to the discharges emanating from stump neuromas in human amputees and implicated in phan-

tom limb pain. Careful observation of the birds in this study revealed changes in behaviour that lasted at least five weeks after beak trimming and that were strongly indicative of pain (Duncan et al., 1989). This finding was confirmed in a later study (Gentle et al., 1991).

Other investigations into pain following elective surgeries have used a similar combination of anatomical, physiological and behavioural evidence. For example, when young lambs were castrated and tail-docked using tight rubber rings, there was close correspondence between physiological and behavioural indicators of pain and between them and the amount of tissue damage (Mellor and Murray, 1989a,b). A later study, in which lambs, kids and calves were castrated using tight rubber rings, once again revealed a good correlation between the physiological and behavioural indicators of pain and distress (Mellor et al., 1991). The results also indicated interesting differences among the three species, with lambs experiencing the most pain and calves the least, with kids being intermediate (Mellor et al., 1991). This evidence of differences among species to very similar surgical interventions suggests that we should be cautious in making generalisations about animals' perception of pain.

Studies on tail-docking in dairy cattle have suggested that this procedure results in minimal pain in cattle (Eicher et al., 2000; Tom et al., 2002a,b). However, this should not be used as a reason for widespread docking. The evidence suggests that there are no health or hygiene benefits to be gained from docking (Tucker et al., 2001) and without tails during fly season, cows will have a cost to pay in the discomfort of carrying higher fly loads.

A more obvious and more easily observed response to pain are vocalisations, and they are considered a probable response to acute pain in many species (Sanford et al., 1986; Zimmermann, 1986; Molony and Kent, 1997). Dan Weary and colleagues have examined in detail the vocalisations of piglets in response to castration and have found components that correspond reliably with other measures that indicate pain (Weary et al., 1998; Taylor and Weary, 2000; Taylor et al., 2001; Lessard et al., 2002).

Metabolic pathologies: There are reports of an increasing incidence of skeletal deformities and other conditions such as ascites in poultry species that have been selected for fast growth rate (Leeson et al., 1995; Julian, 1998). There is already some indication that other livestock classes being selected for fast growth and leanness are running into behavioural problems (Grandin and Deesing, 1998) and it is probably just a matter of time before they too exhibit metabolic pathologies. Are any of these fast growth syndromes painful? The answer is not immediately obvious. In the case of meat chickens and turkeys, the birds will often be growing well and not showing obvious signs of pain. The fact that they sit around more than might be expected is usually attributed to 'laziness' or 'lethargy' associated with their heavy bodyweight. However, careful observation of the effects of analgesics on behaviour can reveal that some of these skeletal problems are indeed painful. The amount of spontaneous movement shown by male turkeys with no obvious signs of pain was increased greatly by the administration of a drug that reduces pain and inflammation in arthritic joints. These turkeys were later shown to have degenerative lesions of the hip joints (Duncan et al., 1991; Hocking et al., 1999). Similar results have been found for the domestic fowl (Hocking et al., 2001).

Recently it has been shown that when given a choice between two feeds, one of which contained an analgesic, lame broilers consumed more of the drugged feed than did broilers with no lameness. Also, the walking ability of the lame birds was improved significantly by this self-administered treatment (Danbury et al., 2000). This is powerful evidence that these birds were actually in pain and it was a negative experience, i.e. they would rather not have been in pain.

It is more difficult to investigate how animals feel when they have other metabolic pathologies such as ascites. Broilers with ascites certainly look miserable. They look as if they are suffering from ascites, and perhaps that is the best proof we can have.

Fear

Fear has also been investigated in farm animals in some detail. The types of stimuli

likely to lead to fear are fairly well understood and include stimuli that are sudden and intense, are novel, have been associated with danger in the animal's evolutionary history, and are associated with certain social situations (Archer, 1979). Animals are therefore at high risk of being frightened during procedures in which they are placed in novel situations and, in addition, may be subjected to sudden, intense stimuli and social threats. These combinations of stimuli are exactly what occur during transportation and pre-slaughter handling.

The behavioural indicators of fear are well understood, with the only complicating factor being that two very different types of response can be seen. In certain circumstances, animals will show avoidance and this may range from moving slowly to stampeding away from the frightening stimulus. In other situations, fear is indicated by immobility and freezing (Archer, 1979).

There have been experiments carried out in which animals have been exposed to putative frightening stimuli and their physiological and behavioural responses recorded. Many of these experiments have involved domestic fowl (e.g. Duncan and Filshie, 1980; Jones et al., 1981; Jones, 1987), presumably because their responses, if extreme, can interfere with productivity. However, this type of experiment does not really tell us how the animals feel about being frightened – they may be responding as a reflex action with little associated subjective feeling. However, in later experiments, Duncan and Hughes (1988) showed that domestic fowl would learn to shuttle back and forward between two compartments in response to a warning signal in order to avoid being exposed to a frightening stimulus. It was later shown that this experimental set-up only worked for fairly calm chickens. Strains of bird that were very flighty tended to panic and could not learn the shuttle avoidance (Rutter and Duncan, 1991). They were able, however, to learn a one-way avoidance task although this took a long time (Rutter and Duncan, 1991). Then it was discovered that all strains of fowl were able to learn passive avoidance (stopping performing an operant task in order to avoid a frightening stimulus) and learn it quickly (Rutter and Duncan, 1992). Recently it has been

shown that rainbow trout can learn a shuttle avoidance task (Yue et al., 2004). This suggests that the responses that all the vertebrates show to certain stimuli are more than just reflexes and are accompanied by powerful negative feelings. If given the opportunity, all vertebrate animals will learn to avoid frightening stimuli.

Frustration and conflict

Frustration occurs when behaviour that is strongly motivated is prevented from occurring by some aspect of the environment. The closely related phenomenon of conflict occurs when an animal is motivated to behave in two incompatible ways. Studies on frustration and conflict have been more limited in scope than those on pain and fear but there is still much information available. Frustration is likely to arise in intensive husbandry systems when some aspect of the artificial environment blocks the performance of a behaviour pattern. Thus a hen in a battery cage cannot perform the normal foraging motor pattern of scratching with the feet and then moving back and pecking at the scratched substrate (Moffat and Duncan, 1999). Frustration can also arise when the artificial environment fails to supply the key stimulus necessary to trigger a behavioural sequence. For example, about 24 hours before farrowing, a sow in a natural environment will seek out a suitable nest site, excavate a nesting hollow, collect nesting materials from the surrounding environment, carry them to a chosen nest site, deposit them, and build a nest (Jensen, 2002). It has been suggested that modern confinement systems will frustrate sows in the pre-farrowing period because many of these key stimuli are missing (Hansen and Curtis, 1980; Baxter, 1982). This suggestion has led to attempts to provide some of the key stimuli in an artificial way (e.g. Hutson, 1988; Widowski and Curtis, 1990).

Frustration has been investigated in a similar way to fear, with animals being placed in putative frustrating situations and their responses recorded. For example, Duncan (1970) placed domestic fowl in various frustrating situations (defined operationally) in the laboratory, and was able to compile a list

of all the responses they showed. If the frustration was severe (i.e. the frustrated tendency was strong), the birds developed stereotyped back-and-forward pacing movements and showed increased aggression. If the frustration was mild (i.e. the frustrated tendency was weak), the birds performed displacement preening. Using this data, it has been shown that the biggest problem with battery cages for laying hens is that they cause severe frustration to many hens in the pre-laying period (Wood-Gush and Gilbert, 1969; Duncan, 1970). In this particular case, there is some additional, indirect evidence that this state is aversive to hens. First, it is known that when showing the symptoms of 'frustration', they retain their eggs past the normal time of laying (Hughes, et al., 1986). Second, if given the opportunity, hens in the pre-laying phase will work very hard to reach a nest site (Follensbee et al., 1992).

However, as was the case with fear, it is generally true that these types of experiment involving placing the animal in a frustrating situation (defined operationally) do not tell us what the animals are actually experiencing while they are performing the 'frustration' responses. Moreover, it is much more difficult to 'ask' animals what they feel about frustration. This is because fear is motivated by external factors and, if the animal behaves appropriately, if it learns to avoid the frightening stimulus, then it can control the situation completely and never get frightened. Frustration, on the other hand, is driven by internal factors such as hunger or thirst or the tendency to build a nest, or some other tendency, which the animal has little or no control over. So, in the case of frustration, the animal is both attracted to the stimulus (it wants to feed, say) and is repelled by it (it cannot reach the food, becomes frustrated, and frustration is aversive). In addition, the animal cannot 'solve' the problem. It can move away from the out-of-reach food, and this might help a little, but it is still hungry and will eventually be attracted back to the (out-of-reach) food. The back-and-forward pacing movements that are commonly seen when domestic fowl are frustrated, may be the result of attraction and repulsion occurring in quick succession (Duncan and Wood-Gush, 1972).

In spite of the difficulties of investigating frustration experimentally, there is sufficient evidence to conclude that frustration is aversive (Yates, 1962). Moreover, in modern intensive husbandry systems it is probably responsible for reducing welfare more than any other state of suffering.

Other states of suffering

Other states of suffering have not been examined in such detail as those previously mentioned. Boredom has received some theoretical consideration (Wemelsfelder, 1993) but is proving difficult if not impossible to investigate experimentally. It is very important that we have a good understanding of boredom before trying to remedy a state that might not even exist in some species. In this case, 'giving the animal the benefit of the doubt' may do more harm than good. The reason for this is as follows. The way to counteract boredom is to provide a more stimulating and constantly changing environment. Suppose we have a small group of hill sheep that we suspect are bored but are actually frightened, then providing a more stimulating and constantly changing environment will exacerbate the fear. Suppose we have a young calf that we suspect is bored but is actually frustrated because it does not have a teat to suck, then providing a more stimulating and constantly changing environment will do absolutely nothing for the frustration and it may also frighten the calf. It is probably concern over boredom that is fuelling the current drive for 'environmental enrichment' for every animal of every species. It would be wiser to strive for appropriate environments (Duncan and Ols-son, 2001) which might include provisions for counteracting boredom but might not.

Something should be said about the term 'distress'. Distress appears to be used when it seems obvious to the observer that an animal is having some type of unpleasant experience, but the exact nature of the state is unknown. The term, therefore, serves a useful purpose. It was stated earlier that there is a distinct possibility that some species may experience states of suffering not experienced by human beings. We should therefore be constantly looking for symptoms that 'something might

be wrong' so that we can investigate and rectify the situation. Using 'distress' in these circumstances would seem warranted. Otherwise, there is much to be said for striving for precision in our use of terms. As was stated earlier, the remedy for fear is very different from that for boredom, and those are both different from that for frustration. Lumping these states together into the category of 'distress' is not helpful and might even hinder the finding of a solution.

States of pleasure

In order to improve animal welfare we should be constantly trying to eliminate or minimise states of suffering. However, there is growing opinion that good welfare is more than just the absence of suffering (Mench, 1998). There is increasing evidence that at least the mammals and birds of the vertebrates are able to experience pleasure and we should be investigating this field. It will be a real challenge, since pleasure may have evolved to motivate behaviour in a very different way from suffering (Fraser and Duncan, 1998). Apart from being important in its own right, pleasure may be useful for counteracting some of the unavoidable negative feelings that arise from routine husbandry procedures. We therefore need to understand it so that we can promote it.

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Résumé

Douleur, peur et détresse des animaux

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Mots clés: conflit, privation, détresse, peur, frustration, douleur, souffrance

La douleur, la peur et la détresse sont des états subjectifs pénibles que l'on regroupe souvent dans la catégorie d'états de souffrance. On appelle souvent aussi ces états «émotions négatives» ou états «motivationnels-affectifs». Comme les états de souffrance sont subjectifs, ils ne sont pas directement accessibles aux enquêtes scientifiques. Toutefois, l'on met actuellement au point des techniques grâce auxquelles on pourrait enquêter sur eux indirectement pour essayer de les mesurer objectivement. C'est un élément très important puisque, dans le débat sur le bien-être, il n'est pas nécessaire de savoir exactement ce que l'animal éprouve, mais il est extrêmement utile de savoir à quel point son expérience est négative (ou positive). Le présent exposé décrit les techniques qui sont actuellement utilisées pour étudier les états de souffrance et pour les quantifier.

Les principaux états de souffrance qui ont été étudiés chez les animaux sont la douleur et l'inconfort, la peur, la privation, la frustration et le conflit. Par analogie, on considère que certaines espèces éprouvent d'autres états que connaissent les humains comme la solitude, la tristesse et l'ennui, mais ces états n'ont pas été étudiés dans les mêmes proportions que les états mentionnés ci-dessus. On admet aussi que les animaux peuvent souffrir d'autres états que ne connaissent pas les humains. Il semble que le terme de «détresse» soit utilisé dans un sens général quand il est évident qu'un animal souffre sans que l'on connaisse exactement son état.

Probablement plus que tous les autres états, la douleur réduit directement le bien-être. Elle peut résulter a) de blessures dues à un habitat et un équipement mal conçus; b) d'interventions chirurgicales comme la cas-

tration et l'ablation de la queue qui, dans l'élevage, sont normalement accomplies sans anesthésie ni analgésique; c) de pathologies métaboliques qui sont souvent liées à une croissance rapide. Parfois le comportement d'un animal, y compris son expression vocale, peut donner une bonne indication de douleur, mais ce n'est pas toujours vrai. Il faut quelquefois adopter une approche plus expérimentale, par exemple administrer un analgésique et observer s'il y a changement de comportement. On a démontré récemment que, si on leur en donne l'occasion, les animaux chez qui on soupçonne une douleur s'administrent d'eux-mêmes un analgésique. C'est une preuve convaincante que ces animaux éprouvent vraiment une douleur et que c'est pour eux une expérience négative, c'est-à-dire qu'ils préféreraient ne pas l'éprouver.

La peur a aussi été largement étudiée chez les animaux d'élevage. Les types de stimuli qui déclenchent couramment la peur sont assez bien compris et certains sont soudains et intenses, nouveaux, liés à un danger dans l'histoire de l'évolution de l'espèce et associés à certaines situations sociales. Les animaux courent donc de gros risques d'être effrayés quand ils sont placés dans des situations inconnues, comme pendant le transport et la manipulation avant l'abattage. Les signes comportementaux de la peur sont bien connus, le seul facteur de complexité étant que l'on peut constater deux types de réaction très différents. En effet, dans certaines circonstances, les animaux manifestent un comportement d'évitement, qu'ils peuvent manifester en s'éloignant lentement du stimulus cause de leur peur, ou au contraire en s'enfuyant en débandade. Dans d'autres situations, la peur est indiquée par l'immobilité et l'arrêt sur place.

La frustration apparaît quand un comportement fortement motivé est bloqué par un aspect de l'environnement. Le phénomène de conflit, qui lui est étroitement lié, se manifeste quand l'animal est motivé pour accomplir deux actions incompatibles. Les études sur la frustration et le conflit ont une portée plus limitée que celles portant sur la douleur et la peur, mais on dispose cependant de nombreuses informations sur ces sujets. La frustration est susceptible de se manifester dans les systèmes d'élevage intensif quand un aspect de l'environnement artificiel bloque l'accomplissement d'un schéma com-

portemental. Elle peut aussi apparaître quand l'environnement artificiel ne fournit pas le stimulus clé qui est nécessaire pour déclencher une séquence comportementale. Les signes de frustration sont l'apparition de mouvements stéréotypés et d'agressivité si la frustration est grave, et le déclenchement d'activités de déplacement si la frustration est légère.

L'exposé examine brièvement d'autres états de souffrance possibles. En outre, il aborde le rôle des émotions positives dans la détermination du bien-être des animaux.

Resumen

Dolor, temor y angustia

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Palabras clave: conflicto, privación, angustia, miedo, sentimientos, frustración, dolor, sufrimiento

El dolor, el temor y la angustia son estados subjetivos desagradables que suelen considerarse en conjunto como estados de sufrimiento. También se los designa como «emociones negativas» o «estados afectivos». Dado que los estados de sufrimiento son subjetivos, no son directamente asequibles para la investigación científica. No obstante, actualmente se están desarrollando técnicas que permitirán investigar dichos estados indirectamente a través de mediciones objetivas. Esto es muy importante, ya que en el debate sobre el bienestar no es necesario conocer exactamente lo que el animal experimenta, sino más bien saber qué tan negativa (o positiva) es la experiencia. El presente documento describirá las técnicas empleadas para investigar y cuantificar los estados de sufrimiento.

Los principales estados de sufrimiento que han sido objeto de investigación en animales son el dolor y la inquietud, el temor, la privación, la frustración y el conflicto. Por analogía, se piensa que algunas especies padecen otros estados experimentados por el ser humano, tales como la soledad, la tristeza y el aburrimiento, pero no se han investigado en la misma medida que los primeros. Se admite también que los animales pueden padecer otros estados no experimentados por los seres humanos. Al parecer, el término «angustia» se emplea de manera general cuando es obvio que un animal sufre pero se desconoce el estado específico.

El dolor, tal vez más que cualquier otro estado, mengua directamente el bienestar. Las causas posibles son: a) heridas debidas al diseño erróneo del alojamiento y de los equipos; b) intervenciones quirúrgicas tales como

castración y corte de cola que, en el sector agropecuario, suelen efectuarse sin anestesia ni analgesia; y c) patologías metabólicas asociadas con frecuencia a un crecimiento rápido. Algunas veces, el comportamiento del animal, incluidas las vocalizaciones, puede ser un buen indicador del dolor, pero no siempre es así. A veces se necesita un enfoque más experimental, como por ejemplo, la administración de un analgésico y la detección de cambios del comportamiento. Recientemente ha quedado demostrado que cuando se sospecha que los animales sienten dolor, si se les da la oportunidad, éstos se autoadministran un analgésico. Esta prueba pone de manifiesto que los animales realmente sienten dolor y que se trata de una experiencia negativa, o sea, que sería preferible que no sufran dolor.

El temor se ha investigado también a fondo en los animales de granja. Los tipos de estímulos que podrían causar temor son bien conocidos y pueden ser repentinos e intensos, novedosos, asociados al peligro en la historia de la evolución del animal y asociados a ciertas situaciones sociales. Por tanto, los animales corren alto riesgo de atemorizarse durante procedimientos que los ponen en situaciones nuevas tales como el transporte y manipulación previa al sacrificio. Los indicadores comportamentales del temor son conocidos; el único factor que complica las cosas es que pueden observarse dos tipos distintos de respuestas. En determinadas circunstancias, los animales intentarán evitar el estímulo del temor y su actitud puede variar del movimiento lento a la huida en desbandada. En otras situaciones, la inmovilidad y la rigidez serán indicios del temor.

La frustración surge cuando algún aspecto del medio ambiente obstaculiza un comportamiento fuertemente motivado. El fenómeno estrechamente asociado de conflicto se produce cuando el animal está motivado para comportarse de dos maneras incompatibles. Los estudios sobre la frustración y el conflicto han sido de alcance más limitado que los del dolor y el temor, pero aún queda información disponible. Es probable que la frustración surja en sistemas de cría intensiva cuando algún aspecto del medio ambiente artificial bloquea la ejecución de un mode-

lo comportamental. Puede surgir también cuando el ambiente artificial no puede ofrecer el estímulo clave necesario para desencadenar una secuencia de comportamiento. Los indicadores de la frustración son el desarrollo de movimientos estereotipados y una agresión creciente si la frustración es severa; si la frustración es leve, entonces serán actividades de sustitución.

Se discutirán brevemente otros estados posibles de sufrimiento. Además, se tendrá en cuenta el papel de las emociones positivas en la determinación del bienestar animal.

Abstract

Pain, fear and distress

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Keywords: conflict, deprivation, distress, fear, feelings, frustration, negative emotions, pain, suffering

Pain, fear and distress are unpleasant subjective states often grouped together as states of suffering. These states are also commonly referred to as negative emotions or motivational affective states. Since states of suffering are subjective states, they are not directly accessible to scientific investigation. However, techniques are currently being developed whereby these states can be investigated indirectly and measured objectively. This is very important, since, in the welfare debate, it is not necessary to know exactly what the animal is experiencing, but it is extremely useful to know how negative (or positive) that experience is. This paper will describe the techniques that are being used to investigate states of suffering and to quantify them.

The major states of suffering that have been investigated in animals are pain and discomfort, fear, deprivation, frustration and conflict. By analogy, some species are thought to experience other states experienced by human beings, such as loneliness, sadness and boredom, but these have not been investigated to the same extent as the previously-mentioned states of suffering. It is also recognised that animals may suffer from other states not experienced by human beings. The term 'distress' seems to be used in a general way when it is obvious that an animal is suffering but the specific state is unknown.

Pain, probably more than any other state, directly reduces welfare. Pain can result from (a) injury due to badly designed housing and equipment, (b) surgical interventions such as castration and tail-docking which, in animal agriculture, are normally carried out without anaesthesia or analgesia,

and (c) metabolic pathologies which are often associated with fast growth. Sometimes, an animal's behaviour, including its vocalisations, can be a good indicator of pain, but this is not always the case. Sometimes, a more experimental approach is required, such as administering an analgesic and looking for changes in behaviour. Recently it has been shown that if animals, suspected of being in pain, are given the opportunity, they will self-administer an analgesic drug. This is powerful evidence that these animals are actually in pain *and* it is a negative experience, i.e. they would rather not be in pain.

Fear has also been intensely investigated in farm animals. The types of stimuli likely to lead to fear are fairly well understood and include stimuli that are sudden and intense, are novel, have been associated with danger in the animal's evolutionary history, and are associated with certain social situations. Animals are therefore at high risk of being frightened during procedures in which they are placed in novel situations, such as during transportation and pre-slaughter handling. The behavioural indicators of fear are well understood, with the only complicating factor being that two very different types of response can be seen. In certain circumstances, animals will show avoidance and this may range from moving slowly to stampeding away from the frightening stimulus. In other situations, fear is indicated by immobility and freezing.

Frustration occurs when behaviour that is strongly motivated is prevented from occurring by some aspect of the environment. The closely related phenomenon of conflict

occurs when an animal is motivated to behave in two incompatible ways. Studies on frustration and conflict have been more limited in scope than those on pain and fear but there is still much information available. Frustration is likely to arise in intensive husbandry systems when some aspect of the artificial environment blocks the performance of a behaviour pattern. Frustration can also arise when the artificial environment fails to supply the key stimulus neces-

sary to trigger a behavioural sequence. The indicators of frustration are the development of stereotyped movements and increased aggression if the frustration is severe, and the occurrence of displacement activities if the frustration is mild.

Other possible states of suffering will be discussed briefly. In addition, the role of positive emotions in determining an animal's welfare will be considered.

Injury and disease

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Summary

From an animal welfare point of view, it is important to know what effect different injuries and diseases have on an animal's feelings as well as its capabilities for a future good life. Any injury or disease inflicted on an animal will to some degree be a tax on the animal's capabilities to optimise its being according to its desires as well as its output from an evolutionary perspective. Many cases of injury and disease lead to sensations of pain. However, a disease where the animal has to use substantial resources, for example, its immune system, to conquer the disease, is probably also linked to negative feedback signals. Thus, the observation of injury and disease can be regarded as an important tool to evaluate the animal's condition from an animal welfare point of view. Preventive measures must be directed towards the causal factors. Systematic monitoring of injuries and symptoms of disease at critical control points is a potent tool for the monitoring of animal welfare as well as for the work to continue to improve the welfare of the animals we keep in our custody.

Keywords: injury, disease, health, welfare, prevention, monitoring

An introduction to injury and disease

There are a variety of definitions of disease although many veterinary textbooks completely lack such a definition. A recent study shows that most existing definitions of health and disease in veterinary textbooks fall into the categories of 'normality', 'homeostasis', 'physical and psychological well-being' or 'productivity and reproductive performance' (Gunnarsson, to be published). A commonly used definition of disease is 'a finite abnormality of structure or function with an identifiable pathological or clinopathological basis, and with a recognisable syndrome or constellation of clinical signs' (7), but due to the development of a variety of clinical test methods, disease is nowadays often widened to embrace sub-clinical illness. Disease comprises a wide variety of conditions ranging from infectious diseases resulting from exposure to different microbial agents to non-infectious diseases such as metabolic diseases or genetic diseases.

Injuries in animals can result from improper housing, from other animals or from poor handling. For instance, if slots in the floor surface are too wide, this will lead to injuries to claws (e.g. 1), if new animals are intro-

duced to a group, this may result in fighting and skin damage (e.g. 10), if animals are improperly handled when loading them, for example, for transportation, this results in bruising (15).

Any injury or disease inflicted on an animal will to some degree be a tax on the animal's capabilities of optimising its being according to its desires. For instance, an injured leg will prevent the animal from moving easily to access preferred resources such as water or a comfortable lying area. A disease such as pneumonia will weaken the animal so that its ability to compete for limited resources, such as food, is weakened. Injury and disease might also be a tax on the animal's output from an evolutionary perspective, i.e. to successfully wean its offspring, quickly come into heat again and become pregnant. Mastitis and metritis are examples of such diseases.

How is disease recognised?

Interestingly, one of the most important tools for the veterinary clinician is to use behavioural signs or symptoms when trying to put a diagnosis to a case. This is evident from recent textbooks in veterinary medicine where, for example, contagious bovine pleu-

ropneumonia (CBPP) is described as 'sudden onset of high fever, fall in milk yield, anorexia and rumination ceases. There is severe depression and animals stand apart or lag behind a travelling group. Coughing, at first only on exercise, and chest pain are evident, affected animals being disinclined to move... Respirations are shallow, rapid and accompanied by expiratory grunting' (23). Another example is how lameness is frequently used to identify leg and hoof or claw disease or injury.

From an animal welfare point of view, it is important to know what effect different injuries and diseases have on the animal's feelings as well as its capabilities for a future good life. Injury is usually associated with pain, which can be regarded as a negative feedback signal that guides the animal to keep the area injured from pressure or manipulation, thus improving the healing process. An injured or diseased leg or foot will eventually lead to pain and thus keep the animal from using its leg normally. The lameness caused can be used as a symptom to identify welfare problems.

In broiler rearing it has been shown that diseases related to leg weakness are frequent (25, 26). Lameness was identified in 18 and 30 % of broiler birds in Sweden and Denmark respectively. The principal causes are usually non-infectious skeletal abnormalities (30) or causes of infectious origin (19). The diseases ultimately result in lameness affecting the standing and walking pattern of the birds (29). Research has shown that the innervation and pain receptors in joints in poultry are very similar to those of mammals (12) which suggests that birds would feel pain similar to that of cattle and pigs. Interestingly, broiler birds with lameness have been shown to select more feed with analgesics added than broilers without lameness (9). Furthermore, the walking pattern of broilers that ate food with analgesic substances was more similar to that of birds without lameness (18) indicating that the changes in walking pattern do reflect a state of pain associated with the leg diseases. Thus, autopsies used to reveal the incidence of such leg diseases would reflect the welfare situation of the birds reasonably well.

Lameness of dairy cattle is one of the most important welfare issues. Information from 37 dairy farms, in four regions of England and Wales provided data on 8 991 lesions and the preventive trimming of 4 837 cows' feet (20). Of the 8 645 lesions associated with episodes of lameness, lesions in the hind limbs accounted for 92 %, of which 65 % were in the outer claw, 20 % in the skin and 14 % in the inner claw. Sole ulcers (40 %) and white line lesions (29 %) were the predominant diseases of horn, and digital dermatitis (40 %) was the most common disease of the skin. Subjective assessments showed that sand crack, penetration of the sole by foreign bodies and interdigital necrobacillosis were associated with the most severe cases of lameness. Thus, injuries as well as diseases play important causal roles for foot health in dairy cows.

The prevalence of dermatitis and heel horn erosion have been associated with a manure-contaminated environment (5, 24). The severity of lesions is affected by housing and it increases with time while grazing (17). A study of hoof lesions in 4 899 dairy cattle on 101 Swedish farms has revealed that most Swedish dairy cows have hoof lesions (17). Heel erosions were seen in 41 % of the animals, sole haemorrhages in 30 %, erosive dermatitis in 27 %, white line haemorrhages in 14 and 8.6 % for sole ulcers. Some 72 % of all animals had at least one lesion. The prevalence of lameness was 5.1 %. Although many lesions could not be associated with lameness, cows with sole ulcers had a decreased reproductive performance because of a lower first-service conception rate, a prolonged calving interval and a higher risk of receiving treatment for an oestrus.

Lameness has an influence on the animal's welfare not only because of its relation to the sensation of pain but also because it will reduce the animal's ability to compete for resources. Hassall et al. (13) showed that cows with lameness entered the milking parlour later than non-lame cows. By using trackway measurements (space measurements between footprints) for gait analysis in lame and healthy cows, Telezhenko and Bergsten (28) showed that severely lame cows were characterised by the biggest step asymmetry (length difference between con-

secutive steps), shorter stride and step length and smaller step angle than mildly lame and normal animals. Cows with severe lameness decreased the step asymmetry walking on floors provided with rubber covering, in contrast to walking on floors with bare concrete indicating that a smoother surface would reduce the suffering of lameness.

Similarly, a disease where the animal has to use substantial resources, for example, its immune system, to conquer the disease, is probably also linked to other negative feedback signals such as fatigue, that will reduce the animal's activity levels. An obvious example is weaning diarrhoea in pigs, where pigs with diarrhoea have a poorer weight gain (22) and therefore are less able to fight for resources. Pigs with poorer weight gain after weaning show less interactive and more submissive behaviour (2).

In farm animals, common diseases besides lameness in cattle and poultry are, for instance, mastitis in cattle, diarrhoea and respiratory diseases in pigs as well as parasitic diseases.

Thus, the observation of the presence of injury and disease can be regarded as an important tool to evaluate the animal's condition from an animal welfare point of view. Furthermore, it has also been shown that there are interrelationships between clinical diseases as well as the effect of diseases on the risk of culling. In Swedish red and white dairy cows there was an odds ratio of 7.4 for metritis given that the animal had suffered from dystocia when giving birth, and mastitis increased the odds ratio for culling by 1.8 (21). Thus, clinical disease obviously predisposes animals to other diseases, indicating that it is not only suffering from the disease itself that constitutes a welfare problem, but it also increases the risk of future disease and further impaired welfare.

How are injuries and diseases mitigated or prevented?

Injury and disease must be identified

Rather than treating individual cases, a successful road to reducing incidence of injury and disease is to construct monitoring programmes to assess the state of the animals'

health at critical control points. It is only by actually studying the animals that we will know if they are healthy or not. Today, it is very difficult to obtain information on the disease incidence in farm animals in many countries. However, systematic recording schemes do exist and have proven very valuable as a tool for disease prevention. Examples from Sweden are the Official Milk Recording Scheme comprising data on veterinary treatments, insemination and calving data, milk production and milk quality on 86 % of the Swedish dairy herds (27) and the database on findings at slaughter for pigs with information on pneumonia, pleuritis, joint lesions, white spots and abscesses (16). As a complement to such recordings, regular checks at farm level should be made where the farmer keeps records of any clinical signs of disease. Such observations should always be noted, but on critical occasions, such as at the start of lay, weaning or in association with farrowings, more systematic observations should be made. Similar records should be kept when animals are transported and slaughtered. Such quality analysis of control points can prove to be very useful for investigating disease patterns.

Causal mechanisms must be clarified

As the environment in housing systems has a major influence on the health of farm animals, farm records of the incidence of disease will facilitate the identification of causal factors for disease or injury. Only with an epidemiological approach to the monitoring of disease at farm level can a proper etiological diagnosis be made and appropriate measures be taken.

Diseases might result from poor climatic conditions, poor sanitary conditions or as a result of poor hygienic practices. Pneumonia and pleuritis in pigs are examples of such diseases. General recording schemes at time of slaughter have been systematically used by animal health services to analyse the effects of housing and management conditions in order to improve the health and welfare status of animals (e.g. 6). However, for example, an early outbreak of pneumonia might have healed at the occasion of slaughter which is why one must be careful not to misinterpret such data.

Injuries could also be caused by poor management practices where, for example, unacquainted animals are mixed together and as a result aggression causes wounds (10). Another example is when animals are weaned at a very early age and are kept in flatdeck rearing systems. Injuries on such pigs on ears, feet and belly might be of different origin such as a result of aggression, of poor flooring or redirected massaging behaviour of the piglets towards the belly of pen mates (1). Injuries might also be a result of poorly applied harnesses or improper tying up of animals.

Not only do environmental or management conditions affect the occurrence of injury and disease but also genetics play an important role, for example, in leg weakness in broilers which show a 10 % higher prevalence in one breed than another when kept under similar conditions (26).

Actions must be directed towards the causal factors

The preventive measures must be directed towards the causal factors. Such measures can be to increase stanchion length in the barn rather than continuing to treat cows for mastitis or to increase weaning time rather than continue to treat weaning diarrhoea with antibiotics. To use antibiotics as prevention against diarrhoea will evidently only create new problems such as increasing resistance to antibiotics (see, for example, 14).

Although more and more emphasis is put on improving housing facilities, management regimes and genetics, for example, to reduce the incidence of mastitis in dairy cows or diarrhoea in pigs, many preventive actions are taken which still only treat symptoms of the disease and not the causal factor. Examples of such measures are mutilation (tail cutting in pigs, beak trimming in poultry) or crating and caging of animals (keeping farrowing sows in crates to reduce piglet mortality, keeping laying birds in cages to reduce feather pecking and cannibalism). Such measures, however, in the best case scenario, will only reduce the symptoms targeted, but they will often also result in new welfare problems.

To be able to systematically protect animals from injury and disease a wide range of mea-

asures must be taken. To reduce the spread of infectious disease, the movement of live animals between farms must be minimised. Markets for live animals should be abandoned and within farms, animals should be kept in groups in all-in-all-out systems. Grazing areas should be rotated to avoid a build-up of parasitic infection pressure. Farms should not be placed too close to each other to avoid the spread of disease via air.

Injuries or diseases might occur as a result of poorly designed floors, unsuitable bedding material, poorly designed fittings in animal houses, transport vehicles or abattoirs. Housing facilities must be designed to meet the biological demands of the animals. Flooring must be appropriate to give a suitable wear of claws and hooves. Sows should be kept so that they can perform nest-building activities, and so on.

What is the role of injury and disease in animal welfare?

Because there is a close connection between injury and disease on one hand, and welfare on the other, the monitoring of the occurrence of injuries and disease are potent tools for the monitoring of animal welfare. Injuries and diseases can be looked upon as factors showing the present state of the animal's welfare, but they can also, to some extent, be viewed as showing the animal's welfare status integrated over a certain time period. The occurrence of abscesses must, for instance, be regarded as evidence of a chronic welfare problem.

Since 1973, the Swedish animal welfare regulations have demanded that new techniques or methods for housing farm animals should be evaluated from an animal health and welfare perspective before they are allowed to be used. Systematic recordings of injuries and disease symptoms have, together with behavioural studies, been the basis for such studies. Methods have been applied which prevent less suitable equipment or methods from being used in order to protect farmers from investing in housing systems that will result in a deterioration of animal health and welfare. The systematic recording of injury and disease has proved to be effective in the work to maintain reasonable welfare stan-

dards in housing systems used in Sweden (for review, see 11).

Over the last decades, lots of research efforts have been put into the study of how different housing or management methods evoke physiological or behavioural responses and such responses have been analysed from an animal welfare perspective (see, for example, 3 and 8). Surprisingly, there is still very little research published on how different common diseases such as mastitis, pneumonia and diarrhoea affect an animal's welfare in terms of signs of pain or fatigue, other negative feelings such as anxiety or fear, or just a lower ability to access preferred resources. However, it is less time-consuming to record injuries and symptoms of disease rather than behaviour or mental states, which is why a systematic monitoring of injuries and symptoms of disease at critical control points is a potent tool for monitoring animal welfare as well as for the work to continue to improve the welfare of animals we keep in our custody. Intensified research on how different important diseases affect the welfare of animals would help to improve the tool we already have to monitor animal welfare through the measurement of injury and disease.

The presence of an injury or a disease can be regarded as an instantaneously accessible piece of evidence of the state of an animal's welfare so it is favourably used in welfare monitoring programmes. There are examples of such national animal welfare programmes which use clinical scoring and also scoring on slaughtered animals. In the Swedish broiler welfare monitoring programme, 50 birds in each flock among the 97 % of the Swedish broiler farms associated to the programme are classified according to the lesions on their foot pad (4). The more lesions, the lower the allowed stocking rate for the next flock. In this way, an economical incentive is created to promote better broiler welfare. Together with the information about the foot pad conditions, advice was given to the farmers on how to improve their rearing. During the first three years of the programme, the incidence of severe lesions on the foot pads was reduced from 11 % of the birds to 5 % (4).

Without doubt, many types of injuries and diseases cause the welfare of an animal to deteriorate. Whether it is a wound or a dis-

ease that causes pain or whether it merely influences the animal's possibilities to live a good life by, for example, weakening the animal so that it cannot compete effectively for resources, most diseases and injuries do represent signs of a poorer state of welfare. Some signs of injury or disease represent an acute change in the level of welfare, whereas other signs, such as abscesses or chronic pneumonia or diarrhoea, show that the welfare of the animal has been deteriorated for some time. A systematic recording of a combination of suitable parameters of injury and disease has the potential to provide trustworthy information about the level of animal welfare to authorities, industry and consumers.

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Résumé

Blessures et maladies

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Mots clés: blessure, maladie, santé, bien-être animal, prévention, surveillance

Toute maladie dont souffre un animal ou toute blessure qui lui sera infligée nuira plus ou moins à sa capacité à vivre au mieux selon ses désirs, et affectera son rendement dans une perspective d'évolution. En matière de bien-être animal, il est important de connaître les effets produits par les blessures et les maladies sur les sentiments des animaux et sur leur capacité à vivre un avenir heureux.

Les blessures sont généralement associées à une douleur, qui peut être perçue comme un signal (réaction négative) qui conduit l'animal à protéger la zone lésée contre toute pression ou manipulation, ce qui favorise le processus de guérison. De même, une maladie qui oblige l'animal à utiliser des ressources importantes, par exemple son système immunitaire, pour venir à bout de la maladie, déclenche probablement d'autres signaux de réactions négatives qui réduiront son niveau d'activité. En conséquence, l'observation des blessures et des maladies peut être considérée comme un outil important permettant d'évaluer l'état des animaux du point de vue de leur bien-être.

Les blessures ou les maladies peuvent être occasionnées par des sols mal conçus, une litière non adaptée, des équipements inadéquats dans les locaux hébergeant les animaux, les véhicules de transport ou les abattoirs. En outre, les maladies peuvent résulter de mauvaises conditions climatiques, de conditions sanitaires médiocres ou de mesures d'hygiène douteuses. Les blessures peuvent également survenir à la suite de mauvaises conditions d'élevage: par exemple quand des animaux qui ne se connaissent pas sont mêlés les uns aux autres, ce qui conduit à des agressions génératrices de blessures, ou encore quand des animaux sont sevrés à un âge très précoce et qu'ils réorientent leur comportement de tétée vers leurs congénères d'enclos, ce qui

aboutit à des blessures. Celles-ci peuvent également être dues à un harnachement mal réglé ou au fait que les animaux sont mal attachés.

L'apparition de blessures et de maladies est non seulement liée aux conditions d'élevage ou à des éléments d'environnement, mais aussi à des facteurs génétiques, comme l'illustre la faiblesse des pattes chez les poulets de chair qui présente une prévalence différente selon les races.

Comme il existe une étroite corrélation entre les blessures et les maladies, d'une part, et le bien-être, d'autre part, la surveillance de l'apparition de blessures et de maladies est un outil performant permettant d'exercer un suivi sur le bien-être animal. Blessures et maladies peuvent être considérées comme des facteurs indiquant l'état de bien-être actuel des animaux, mais elles peuvent aussi, dans une certaine mesure, être des indicateurs de leur état de bien-être dans le temps.

La présence d'une blessure ou d'une maladie peut être considérée comme une preuve immédiate et tangible de l'état de bien-être d'un animal, d'où son utilisation opportune dans les programmes de suivi du bien-être animal. Comparées au comportement des animaux dans les élevages industriels, les blessures et les maladies en tant qu'indicateurs de bien-être animal sont relativement faciles à mesurer par des indices. Il existe des exemples de programmes en faveur du bien-être animal qui s'appuient sur des indices cliniques et aussi sur des indices appliqués à l'abattage des animaux. L'enregistrement systématique d'une combinaison de paramètres adaptés reflétant l'étendue de la blessure ou de la maladie permet de communiquer aux autorités, aux industriels et aux consommateurs des informations fiables sur le niveau de bien-être des animaux.

Resumen

Heridas y enfermedades

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Palabras clave: herida, enfermedad, salud, bienestar de los animales, prevención, seguimiento

Cualquier herida o enfermedad infligida a un animal tendrá en cierta medida un efecto negativo en su bienestar. Desde el punto de vista del bienestar de los animales, es importante saber qué efecto producen las distintas heridas y enfermedades en los sentimientos del animal, así como en sus capacidades de vivir relativamente bien.

La herida está asociada por lo general con el dolor, que puede considerarse como una señal negativa pero útil que induce al animal a proteger la zona lesionada de presiones o de manipulación, mejorando así el proceso de curación. De manera análoga, la enfermedad que hace al animal utilizar sus recursos esenciales para sanar (por ejemplo, su sistema inmunitario) lo inducirá a reducir sus niveles de actividad. Por consiguiente, la observación de las heridas y las enfermedades puede constituir una herramienta importante para evaluar la condición del animal desde el punto de vista de su bienestar.

Las heridas o las enfermedades pueden ocurrir como resultado de errores en el diseño de los suelos, del uso de material de cama inadecuado, errores de diseño en las instalaciones para alojamiento de los animales, los vehículos de transporte o los mataderos. Además, la enfermedad puede ser resultado de malas condiciones climáticas o sanitarias, o de prácticas incorrectas de higiene. Las heridas también pueden ser causadas por prácticas erróneas de gestión, como por ejemplo la reunión de animales que no se conocen, situación que puede conducir a una agresión con heridas consecuentes. Otro ejemplo es el destete de animales muy jóvenes, cuyo comportamiento de succión es redirigido hacia los otros animales del establo causando

heridas. El uso inadecuado del arnés o del amarre también puede causar heridas.

Las condiciones ambientales o de gestión no son los únicos factores que influyen en la presencia de heridas y enfermedades; también la genética desempeña un papel importante, por ejemplo en la debilidad de las patas de los pollos de carne que muestran distinta prevalencia según las razas.

Dado que existe una estrecha relación entre herida y enfermedad, por una parte, y bienestar, por otra, la supervisión de heridas y de enfermedades es una herramienta poderosa para el seguimiento del bienestar de los animales. Las heridas y las enfermedades pueden considerarse como factores indicativos del estado de bienestar del animal en un momento específico, y también, hasta cierto punto, como indicadores de la integridad del animal durante un determinado período.

La presencia de una herida o de una enfermedad puede considerarse como una prueba inmediata del estado del bienestar del animal, por lo cual el índice de heridas y enfermedades se utiliza en los programas de seguimiento del bienestar. Las heridas y las enfermedades son relativamente fáciles de notar como signos del bienestar animal en comparación con el comportamiento en las explotaciones comerciales. Hay ejemplos de este tipo de programas nacionales de bienestar de los animales basados en la medición clínica y de animales sacrificados. Un registro sistemático de una combinación de parámetros adecuados de heridas y enfermedades podría brindar a las autoridades, a la industria y a los consumidores información fidedigna sobre el nivel de bienestar del animal.

Abstract

Injury and disease

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Keywords: injury, disease, health, welfare, prevention, monitoring

Any injury or disease inflicted on an animal will to some degree tax the animal's capabilities of optimising its well-being according to its desires, as well as its potential output from an evolutionary perspective. From an animal welfare point of view, it is important to know what effect different injuries and diseases have on the animal's feelings as well as its capabilities of a future good life.

Injury is usually associated with pain, which can be regarded as a negative feedback signal that guides the animal to keep the area injured away from any pressure or manipulation, thus improving the healing process. Similarly, a disease where the animal has to use substantial resources, for example its immune system, to conquer the disease, is probably also linked to other negative feedback signals that will reduce the animal's activity levels. Thus, the observation of injury and disease can be regarded as an important tool to evaluate the animal's condition from an animal welfare point of view.

Injuries or diseases might occur as a result of poorly designed floors, unsuitable bedding material, poorly designed fittings in animal houses, transport vehicles or abattoirs. Furthermore, disease might result from poor climatic conditions, poor sanitary conditions or as a result of poor hygienic practices. Injuries could also be caused by poor management practices where, for example, unacquainted animals are mixed together and, as a result, aggression causes wounds. Another example is when animals are weaned at a very early age and suckling behaviour is redirected

towards pen mates with injury as a result. Injuries might also be a result of poorly applied harnesses or improper tying up of animals.

Not only environmental or management conditions affect the occurrence of injury and disease but also genetics might play an important role, for example in leg weakness in broilers, with different prevalences demonstrated between different breeds.

Because there is a close connection between injury and disease on one hand and welfare on the other, the monitoring of the occurrence of injuries and disease are potent tools for the monitoring of animal welfare. Injuries and diseases can be looked upon as factors showing the present welfare state of the animal, but they can also, to some extent, be viewed as showing the animal's welfare status integrated over a certain time period.

The presence of an injury or a disease can be regarded as instantaneously accessible evidence of the animal's welfare state, which is why it is favourably used in welfare monitoring programmes. Injury and disease is relatively easy to score, compared to behaviour on commercial farms, as signs of animal welfare. There are examples of such national animal welfare programmes which use clinical scoring and also scoring on slaughtered animals. A systematic recording of a combination of suitable parameters of injury and disease has the potential of providing trustworthy information about the level of animal welfare to authorities, industry and consumers.

Food, water and malnutrition: perspectives on nutrient requirements for health and welfare in farm animals

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Summary

Protecting farm animals from hunger and thirst is central to good welfare. However, there are a large number of situations where farm animals are exposed to nutrient restriction. Some of these, such as the effects of prenatal nutrition have received insufficient recognition as welfare issues. Generally it seems that there is a sufficient understanding of nutritional requirements for health in farm animals to form the basis for nutritional standards for health. However, our understanding of the impact of nutritional environments on psychological welfare and specifically hunger is much less well advanced. Science can make a major contribution to this area by developing a framework for interpretation of the impact of the nutritional environment on hunger. We present two frameworks that provide contrasting perspectives on welfare outcomes where nutrient restriction is achieved through qualitative restriction. We recommend that researchers should link their experimental work to a firmer theoretical construct of hunger to provide experimental tests of different frameworks. We see development of a robust framework to interpret the welfare effects of nutrient restriction as leading to improved measurements of hunger and to standards for nutritional welfare that could be accepted on a global scale.

Keywords: nutrient requirements, health, welfare, hunger, theoretical frameworks

Introduction

Food and water are essentials for life and consequently have a critical role in relation to animal welfare. This is reflected in many of the existing frameworks developed to protect farm animal welfare. For example, the first of the so-called five freedoms (7) states that animals should have 'freedom from hunger and thirst'. This prioritisation probably reflects the obvious reality that without water animals will rapidly die and lack of essential nutrients over a longer time frame can lead to illness and death (9).

The central importance of food and water to animal welfare means that the setting of international standards for nutrient intake in relation to farm animal welfare should be a priority issue. The purpose of this paper is to explore current scientific understanding and knowledge that could underpin science

based-standards for the 'nutritional welfare' of farmed livestock.

In order to give an idea of the scope of the issues that would need to be covered by such standards, we will start with examples where, from a common sense perspective, it appears that animals are subject to some degree of nutritional deficit. We will follow this with a discussion of two frameworks that can be used to interpret the health and welfare implications of exposure to nutrient restrictions. Our central message will be that science can make a major contribution by developing robust framework(s) for the interpretation of farm animals' responses to nutrition in relation to health and welfare as opposed to production. We hope to demonstrate that such an approach could provide a basis for development of approaches to measure 'hunger' and hence to standards for nutritional welfare.

Examples where farm animals can be exposed to nutrient deficits

The prenatal phase

There has been relatively little consideration of the health and welfare implications of prenatal nutrition. In mammals this is particularly relevant during the very earliest stages of development; while the oocyte is developing in the ovary and during the first week of embryonic development. At this time nutrients act as signals that alter gene expression, affecting not only the immediate development of the oocyte and/or embryo, but also programming subsequent development of the foetus or neonate (16). Changes in nutrient supply during this sensitive period therefore affect the integrity of all the tissues and organs of the body, contributing to the future health and performance of the animal. For example, in sheep, modest reductions in feed intake around the time of conception alter the development of the foetal cardiovascular system and the hypothalamo-pituitary adrenal axis such that both late foetal arterial blood pressure and plasma concentrations of ACTH are elevated. Importantly, these changes are not reversed by the provision of a maintenance control diet from the second week of pregnancy. These observations are particularly relevant in the context of epidemiological data showing associations between neonatal glucocorticoid status and health outcomes in later life (6).

Prenatal nutrient supply can also have important impacts on brain development and post-natal behaviour (14). Nutritional effects on brain development occur during rapid brain growth and during early organisational events, such as neurogenesis, cell migration and differentiation, thereafter the brain is protected in older animals even during starvation. Although some of the neuronal deficits can be recovered later, either by improved post-natal nutrition or provision of a stimulating environment, deficits in hippocampal development appear to be permanent. These can affect spatial learning and memory in the adult animal and are thus likely to be important for the welfare of the adult. However, another consequence of early prenatal malnutrition are long-lasting changes in brain neural receptor function

which affect emotional responses leading to alterations in motivation and anxiety. These changes may be of greater consequence for animal welfare than learning or memory deficits.

An important area where prenatal nutrition can have direct effects on welfare is through effects on neonatal survival. For example, low birth-weight animals have severely limited body reserves and difficulty in maintaining body temperature after birth. They also show retarded behavioural development, taking longer to feed or suck from their mothers (5), which may also influence survival. Deficits in play behaviour and social interactions are also seen in prenatally malnourished young as juveniles and adults. These results suggest that animals undernourished during early development may be less able to cope with environmental and social stresses, perhaps due to the alterations in emotional responses described above.

The juvenile phase

The goal of the farming system is frequently for animals that will be slaughtered at a young age to achieve high growth rates. In such cases (e.g. broiler production) animals usually have *ad libitum* access to well balanced diets of high nutritive value that promote rapid growth, although there are exceptions where the growth of meat-producing animals such as broilers is deliberately slowed either to protect against adverse health effects of fast growth or to meet market demands for slower growing animals.

However, for animals reared to replace breeding animals, feeding practices generally restrict the quantity or the quality of food available to the animal in order to reduce weight gains to below the genetic maximum to avoid health and welfare problems in the long term. In some production systems, e.g. the rearing of dairy heifer replacements, this reduction in weight gain is achieved mainly by restricting the animals' access to high quality (concentrate) foods while animals continue to have *ad libitum* access to forage such as straw, grass, hay or silage. The feeding of what is considered an 'appropriate diet' generally aims at achieving normal animal development without the negative consequences of excessive animal fatness (such

as calving difficulties and metabolic disorders; 12). Such practices are not generally regarded as detrimental to the animal's welfare.

In contrast, animals reared for breeding purposes in other production systems may receive a severely quantitatively restricted amount of high quality food. A system that has been a particular cause for concern is that of the broiler breeder. When broiler breeders have unlimited access to high quality food during rearing, they have very high weight gains before reaching sexual maturity. They also show a high incidence of heart failure and skeletal and metabolic diseases while their reproductive performance is impaired in later life (19). To avoid these problems, such birds are conventionally subjected to severe quantitative food restriction to around one-third of their voluntary intake during rearing (19). Under these conditions, birds consistently show behavioural characteristics (such as increased levels of activity and especially stereotypic behaviour such as spot pecking) that have been interpreted as signs of hunger and frustration of feeding motivation (20). In addition, blood indices such as corticosterone concentration and basophil frequency are sometimes higher in restricted-fed compared to *ad libitum* fed birds. The change in these indices have been seen as clear signs of stress (19), although later work has indicated complex relationships between food restriction and physiological parameters (8).

Attempts have been made to give broiler breeders unlimited access to food but to manipulate food quality such that animals restrict their voluntary intake to levels compatible with good health and reproductive success. The most frequently used manipulations are carried out with additions of 'bulky' ingredients or salts of short-chain fatty acids, so-called appetite suppressants (18). Although such manipulations can succeed in decreasing intake and growth of broiler breeders, it is at present not clear whether such manipulations result in a decrease of hunger, frustration and/or stress.

The adult phase

Adult farm animals are maintained either for breeding or for production related to their

reproductive state (eggs and milk being the main examples). Adult breeding animals can be treated in a similar way to broiler breeders in the sense that they often experience some degree of food restriction. Adult sows and boars, similarly to broiler breeders, experience imposed nutrient restriction. Similarly to broiler breeders research has indicated that these food restriction practices give rise to high and sustained levels of hunger, to increased activity and to oral stereotypes (11). Research has indicated that qualitative restriction through the addition of certain fibres (e.g. sugar beet pulp) may be effective in reducing feeding motivation and expression of oral stereotypes (13), but similar to broiler breeders there are problems over interpretation of the effects of food restriction on hunger and welfare.

Extensively managed breeding ruminants often also face nutrient restriction either because of seasonal fluctuations in food supply, local deficiencies in specific nutrients or in some areas because of pollution of water supplies (e.g. with sulphates). A major difference between these forms of nutrient restriction and that experienced by sows and broiler breeders is that the restriction is an indirect result of the nutritional environment as opposed to being directly imposed in the form of restricted access to nutrients. This may have led to a lack of concern over the impact of nutrient restriction on extensively grazing ruminants in the sense that the food restriction can be seen as a natural result of extensive farming. This lack of concern may not be justified however, given that nutrient restriction in extensive ruminants can potentially affect prenatal development (see above), can induce expressions of 'pica' (feeding on 'non-food' ('non-nutritive') items; 23) and have as yet largely unquantified effects on hunger and thirst.

Transport and slaughter

When it comes to the end of the farm animals' life it is almost inevitable that it will be transported and held in 'lairage' before slaughter. Public reaction to the transport of live animals has been an area of considerable concern within the EU, partly based on the temporary periods of water and/or food deprivation that can occur before, during

and after transportation. For example, animals may be starved before transportation and before slaughter to reduce gut fill. When animals are deprived of food and water during transportation, the effects of this deprivation can be exaggerated by: an increased energy requirement to meet the metabolic effort of (a) maintaining postural stability when responding to vibration and acceleration forces produced by a moving vehicle and/or (b) exposure to thermal environments below the animals' thermoneutral environment; and an increased insensible water loss associated with exposure to a thermal environment above the animals' upper critical temperature. In addition, changes to the animals' social and physical environment, different foods and feeding practices can reduce the ability of animals to feed, drink and utilise food and water during 'rest' or lairage periods during a long journey.

The responses of farmed animals to food and water restriction and the criteria that could be used to formulate appropriate intervals for the feeding and watering of animals during transportation have been reviewed (1). If the nature of the journey and the environmental conditions are such that they do not impose major additional requirements, the physiological responses of ruminants and pigs appear to enable them to deal with and quickly recover from most journeys without feed and water of up to 24 hours. Whether and to what extent animals experience a degree of hunger and possibly thirst during a journey of up to 24 hours remains equivocal partly reflecting the lack of data on this aspect. In some circumstances, for example, when sheep have an expectation of feeding, starvation for 18 hours can be associated with a rise in plasma cortisol concentration, but in many situations, 24 hours of starvation is not accompanied by a stress response (2).

The behavioural responses of animals after transportation can be used to indicate their relative priorities. For example, after 24 hours of transportation, most sheep will immediately feed, then mainly as a consequence of this feeding, drink and only later lie down.

Frameworks to interpret responses to nutrient restriction

There is a large amount of information on the short-term health implications of nutritional strategies. For many nutrition-related health issues, the optimum ranges in protein, mineral and vitamin levels in food that are considered optimal for healthy animals are known. Nutrient requirement handbooks are published by the agricultural research councils in many countries (15). In addition, the techniques are available to measure deviations from such optimal ranges in samples taken from animal tissues and fluids and with the help of 'metabolic profiling' (25). Thus it appears more straightforward to reach consensus about short-term animal health nutritional standards because (i) many quantitative physiological indicators of (mal)nutrition on animal health are known and (ii) there are already many national 'feeding standard' systems in use across the world.

In general, what is beneficial for the health of the animal in the short term is also beneficial for the animal's welfare (i.e. there will be no conflict between welfare and health in the short term). However, this is less obvious for the relationship between welfare and animal health in the long term. As we discussed earlier both ruminant and non-ruminant breeding animals in particular frequently receive restricted amounts of food or food(s) of lower quality to avoid long-term health problems associated with too fast growth or obesity or both. At least at first sight, this results in a conflict between the animal's short-term welfare (i.e. its 'hunger') and its health in the long term. However whilst we generally have a clear idea of what we regard as poor health (e.g. 'leg weakness' or ascites) and how to measure it, this tends not to be the case for psychological welfare. In particular we are struck by the relative lack of theoretical development of the concept of 'hunger' in the context of animal welfare despite its central importance to animal well-being. We believe that this seriously compromises our ability to both measure and interpret the impact of the many examples where animals are exposed to nutrient restriction (including cases such as the broiler breeder).

There has been a substantial amount of work on what are termed 'livestock nutritional requirements'. This research is largely based on the premise that nutritional requirements are those required to support high levels of production. This production based perspective also appears to have been influential to our thinking on hunger in farm animals. As an example, Kyriazakis and Savory (9) propose that as a result of its genotype the animal has an 'ideal trajectory' for its growth or reproduction and this determines its intake of nutrients. Animals can therefore be thought of as 'maximisers' in the sense that their food intake is governed by a 'rule' that they should always seek the maximum intake of nutrients to support maximum production. In that sense the maximisation rule is independent of the nutritional context. Deviations away from the ideal state will be caused by constraints (e.g. maximum physical capacity of the gut) and are seen as resulting in the animal then being either under or malnourished. It is further implied that hunger should be positively correlated to deviations from the ideal state as defined in terms of the amount of high quality food required for maximal growth. Many other authors appear to take a similar position (8).

An alternative paradigm is that animals are food intake 'optimisers', balancing the (long-term) benefits of eating food against the costs (21). Distinct from the maximiser approach, this framework takes account of both the benefits and the costs of acquiring and metabolising food and assumes that the animal is seeking to gain nutritional benefits at least cost in terms of oxidative metabolism. Constraining oxidative metabolism is seen as key to evolutionary 'fitness' due to the negative effects of high metabolic intensities on life span (22). Application of a model based on these principles to sheep data, can be used both to illustrate the approach and also indicate its relevance to the debate over hunger in farm animals (see Figure 1).

In Figure 1, the benefits relate to the total net energy intake consumed by the animal and the costs are expressed in litres of oxygen consumed. For all foods, as food intake increases so does the benefit:cost ratio. However it is clear that food quality has a consid-

erable effect on the maximum benefit:cost ratio that can be achieved. Much lower maximum ratios are achievable on low quality foods due to the inherent low benefits and higher costs associated with utilising these foods. The model predicts that sheep will 'optimise' their food intake corresponding to the maximum benefit:cost ratio and, as Figure 1 shows, the model accurately predicts intake of mature sheep fed different food qualities.

Tolkamp and Ketelaars (21) have also argued that short-term feeding behaviour can only be understood in terms of this long-term strategy. They argue that the optimisation approach both allows for animals to make the most of abundant food supplies whilst at the same time allowing the animal to adjust its food intake to much lower levels when food quality is low or food is costly to obtain.

So far this model has only been used in the context of understanding rules pertaining to food intake, but a logical extension would be to assume that the animals' subjective hunger state reflects and indeed controls behavioural expression of the underlying optimisation rule. In other words the subjective experience of hunger will reflect the deviation from the maximal benefit:cost ratio for any food. According to this framework, hunger is only relative to what can be achieved in a specific nutritional environment. This contrasts with the alternative framework (animals as food maximisers), where hunger is context independent through being fixed relative to the animals' ideal state and ultimately to genotype.

These two approaches give rise to quite different interpretations of the hunger resulting from commercial feeding practices for farm animals. Referring to Figure 1, let us presume a case where an animal is quantitatively restricted to 'x' on a high quality food. Both frameworks (M = animals as food maximisers; O = as food optimisers) predict that the animal is unable to achieve its 'goal'. In the case of framework M this is to have a food intake that matches the 'ideal maximum point' (MP); for O this is the 'maximum optimisation point' for the high quality food (OPH) (for a high quality food these are

essentially the same). As we are regarding MP and OPH as the same then both frameworks predict that animals restricted to 'x' will experience similar feelings of hunger. We should therefore expect animals food restricted to 'x' to express foraging behaviour and possibly also indications of 'frustration' (e.g. vocalisations; stereotypies) if the animal is unable to reduce its hunger sensations.

However, a greater contrast between the approaches emerges when we provide animals with *ad libitum* access to a lower quality food, as and when we apply qualitative restriction of food intake. In Figure 1 an animal offered the low quality food has a similar food intake (NEI) to the animal offered the high quality food but restricted to 'x'. Framework M would predict that as the animal has a food intake which deviates ('y') relative to its MP, then it will experience a corresponding level of hunger with resulting activation of foraging and/or expressions of frustration.

In contrast, framework O predicts that as the animal has reached its maximum optimisation point for the low quality food (OPL), hunger for that food should be low, with corresponding low levels of foraging. Thus whilst framework M would predict significant levels of hunger for many farm animals that experience qualitative food restriction (broiler breeders, breeding pigs, many grazing ruminants), framework O suggests that where animals can regulate their own intake even on low quality but appropriate foods, then their hunger (for the low quality food(s)) should be low.

There are two further points worth making. Those that use framework M often assume that animals offered low quality foods are constrained (e.g. by physical capacity) from reaching their MP. According to M, low quality foods can therefore create a 'dislocation' between feeding behaviour and underlying hunger. Framework O in contrast sees hunger and food intake being related expressions of the same underlying optimisation process. Second framework O does not suggest that animals on low quality foods have low hunger for higher quality foods. Indeed, when given a choice, framework O assumes

that animals will choose higher quality foods as a result of them 'aiming' for a higher maximum optimisation point. However, O also predicts that animals will be continuously optimising benefits against costs, hence a higher quality food associated with higher costs (e.g. where additional work for the food is required) may not be selected. This emphasises the central point of framework O, that hunger is essentially context-specific.

Measuring hunger

We believe that the framework used to interpret welfare responses to nutrient deficits can also inform the approaches we use to measure hunger.

Hunger measures can be broadly divided into direct and indirect measures.

- (a) Direct: these are often referred to as tests of feeding motivation and include operant conditioning approaches where animals 'work' for food (3), measurement of feeding parameters such as rate of eating (17) or compensatory food intake (8). With few exceptions these approaches have paid little attention to the relationship between the treatment foods and the food offered in the test. It has generally been the case that experiments testing the efficacy of qualitative restriction in reducing hunger have used feeding motivation tests where the test food is of a higher quality than the treatment food (10). According to framework O such an approach fails to inform us of the hunger of the animal when it has only access to the qualitatively restricted food.
- (b) Indirect: there are several measures both physiological and behavioural which have been used as indirect measures of hunger. In general we feel that physiological measures are less useful than behaviour measures. Often the same systems that are used to measure welfare effects (e.g. 'stress') are also inevitably affected by the metabolic effects of nutrient restriction. Furthermore we see behaviour as a more direct and relevant approach for assessing a subjective state such as hunger.

Framework O assumes a positive relationship between deviation from the OP for

food, hunger and food seeking behaviour. Framework O would suggest that indirect behavioural measures of hunger include increased foraging behaviour and we further suggest that higher levels of hunger will result in a 'breakthrough' of behavioural expressions of frustration. Amongst these latter measures we would include pre-feeding arousal (e.g. vocalisations) and development of stereotypes as these have been previously linked to frustration of feeding (e.g. 4). Lastly we would recommend that qualitative assessment of behavioural expressions (24) is explored as an approach which could be used to quantify the extent of 'satisfaction' resulting from varying nutritional environments.

Conclusions

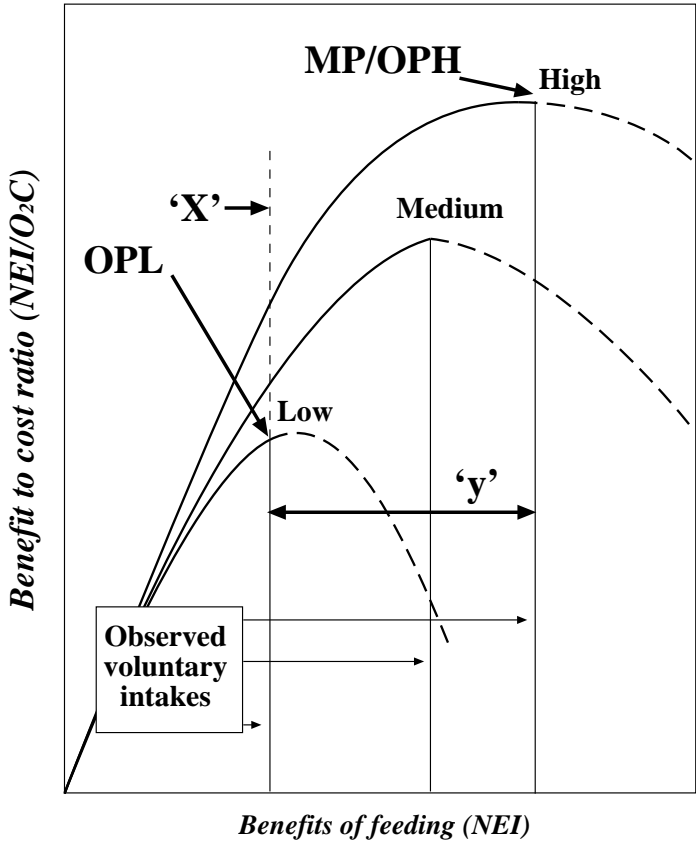
One aim of this paper has been to identify the range of conditions where farm animals may be exposed to significant levels of nutrient deficits. Some important areas such as the short- and long-term effects of prenatal nutrition and impact of extensive grazing/watering systems have not received sufficient attention. We suggest that there is a sufficient degree of understanding and consensus on health implications of nutritional strategies to form the basis for discussions of nutrient standards for health. However, in contrast it is also clear that there is a poorly developed understanding of the effects of the nutritional environment on psychological welfare. We believe that science can make a considerable contribution to this difficult area, but this requires development of our theoretical understanding of the hunger concept. We have presented two current frameworks that can be used to interpret the welfare consequences of nutrient deficits. Framework M assumes that hunger is linked to the animals' goal of maximising nutrient intake independently of the nutritional context. Framework O assumes that as hunger is linked to the animals goal of optimising the benefits and costs of utilising different foods then hunger can only be seen in the context of the current nutritional environment. We have shown that these two frameworks give rise to quite different conclusions on the welfare effects of nutrient restriction especially

where qualitative restriction is used. We don't believe that there is sufficient empirical evidence at this stage to provide convincing support for either approach. Indeed there may be other frameworks that should be considered. However we strongly recommend that researchers in the area should now focus on linking their experimental work to a firmer theoretical construct of hunger in order to provide experimental tests of different frameworks. We see that development of a robust framework for interpretation of the welfare effects of the nutritional environment would naturally lead to improved measurements of hunger and also to standards for nutritional welfare that could be accepted on a global scale.

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The relationship between the benefit of food intake (net energy intake (NEI)) and a ratio of the benefit to costs (here expressed as NEI per litre of oxygen consumed) for different levels of food intake on different food qualities (low, medium and high). MP = ideal maximum intake based on the animals' genotypic capacity to produce; OPH = maximum optimisation point for a high quality food; OPL = maximum optimisation for a low quality food; 'x' = a level of food restriction on a high quality food; 'y' = the deviation between 'x' and MP.

Résumé

Alimentation, eau et malnutrition: perspectives sur les besoins en nutriments des animaux d'élevage, qui sont le garant de leur état de santé et de leur bien-être

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Mots clés: besoin alimentaire, santé, bien-être, faim, organisation, théorie

Les besoins en nutriments des animaux sont déterminés à la fois par leur génotype et par leur état biologique. Les nutriments sont nécessaires au développement et au fonctionnement des systèmes biologiques de l'organisme. Grâce à l'évolution des processus psychologiques complexes, ces besoins sont intégrés et se traduisent par des comportements propres à localiser efficacement les nutriments dans le milieu en vue de leur consommation. Le comportement est donc l'expression de l'interaction entre les besoins en nutriments des animaux et les obstacles liés à l'environnement qui entravent l'accès aux produits nutritifs. Il serait utile pour l'élaboration des normes de bien-être de connaître les «règles» qui déterminent les besoins en nutriments des animaux et le degré de tolérance face à leur incapacité d'y répondre. Le degré de tolérance doit être basé sur des réponses physiologiques et comportementales plutôt que sur une notion de rendement. L'élaboration de normes relatives à l'alimentation et à l'eau doit prendre en compte un certain nombre de domaines de recherche et leurs interactions:

1) Périodes de privation d'eau et de nourriture: il existe des circonstances où les animaux d'élevage peuvent se voir temporairement refuser l'accès à l'alimentation et à l'eau comme pendant le transport et la stabulation avant l'abattage. Les recherches sur les effets de la privation d'eau et de nourriture pendant le trans-

port sont importantes pour l'élaboration des normes de transport (par exemple, établir pour chaque espèce le temps maximal de transport et de repos, ce dernier correspondant à la période où les animaux sont autorisés à s'alimenter et à boire). D'autres domaines importants doivent être explorés par des recherches futures, notamment les interactions entre la privation d'aliments et les autres facteurs de stress pendant le transport. Les conditions de transport dans d'autres pays ou régions peuvent être différentes; l'élaboration de normes mondiales relatives à l'accès à l'alimentation et à l'eau pendant le transport doit exploiter et développer la base de recherche existante.

2) Pratiques de restriction alimentaire: c'est parmi les élevages de porcs et de poulets de chair que l'application de restrictions alimentaires est la plus répandue, laquelle ne fait pas grand cas des conséquences sur le bien-être animal qu'elle engendre. Des recherches ultérieures ont indiqué que les restrictions alimentaires imposées par les filières d'élevage aboutissent à des degrés élevés et durables de motivation alimentaire (ou faim), bien que le débat scientifique sur l'impact de la faim prolongée sur le bien-être ne soit pas clos. D'où la nécessité de poursuivre la recherche sur le tribut payé par les animaux qui souffrent de faim chronique. Outre les solutions génétiques (voir ci-

dessous), les normes doivent reposer sur de nouvelles stratégies nutritionnelles visant à réduire la motivation alimentaire et les possibilités de comportements de quête alimentaire qu'offre le milieu.

- 3) Élevage et interaction génotype x nutrition: l'élevage influe considérablement sur les besoins en nutriments des animaux dans toutes les espèces exposées à une sélection ciblée sur le rendement. Ces besoins nutritionnels importants peuvent avoir des conséquences majeures sur le bien-être animal. En matière d'élevage de poulets de chair, on s'inquiète notamment de l'impact potentiellement important sur le bien-être engendré par la tolérance réduite que présentent des lignées fortement sélectionnées à des variations dans l'apport de certains nutriments (par exemple pour le développement squelettique). Cependant, ces préoccupations mises à part, l'élevage peut aussi améliorer le bien-être des animaux en élargissant par exemple ses objectifs pour y incorporer la santé et le bien-être. L'élaboration constructive de pratiques d'élevage prenant en compte les questions relatives au bien-être animal serait grandement facilitée par l'adoption de codes de pratiques internationaux et l'OIE pourrait jouer un rôle clé en favorisant cette approche.
- 4) Malnutrition et restrictions d'eau dans les systèmes extensifs: dans les systèmes d'élevage extensif, les animaux peuvent être exposés à une dénutrition ou une malnutrition découlant du surpâturage, des conditions climatiques ou du manque de ressources économiques qui permettraient d'assurer une alimentation complémentaire. Les conséquences peuvent influencer négativement à la fois sur la santé

et le comportement. De même, les animaux élevés dans des systèmes extensifs sont tributaires des sources naturelles d'eau potable, lesquelles peuvent être limitées en raison de la pollution ou de la concurrence des autres animaux et des utilisateurs humains. Les troupeaux élevés sur un mode extensif ne sauraient être ignorés lorsqu'on envisage de mettre en place des normes relatives à l'alimentation et à l'eau, même si la question ne suscite pas actuellement l'intérêt des pouvoirs publics.

- 5) Nutrition prénatale et développement: il apparaît de plus en plus que la nutrition du fœtus peut influencer sur la santé et le bien-être du nouveau-né et qu'elle trouve probablement des prolongements à plus long terme à un âge plus avancé. Par exemple, il a été démontré qu'un apport en micronutriments à des stades précoces clés du développement embryonnaire a des effets positifs sur la survie des nouveau-nés. Des recherches de ce type indiquent combien il est important pour le bien-être des animaux d'élargir les normes nutritionnelles à la phase prénatale.
- 6) Standardiser les mesures permettant d'évaluer les conséquences des restrictions alimentaires sur le bien-être: comme pour de nombreuses autres questions liées au bien-être, les normes mondiales de bien-être concernant les nutriments doivent faire l'objet d'un consensus international concernant les outils de mesure valables permettant d'évaluer les réponses et la tolérance aux restrictions alimentaires, tels que les instruments de mesure physiologique/comportementale de la faim et de la soif ayant une validité et une fiabilité scientifiques.

Resumen

Alimentación, agua y malnutrición: perspectiva sobre las necesidades de nutrientes para la salud y el bienestar de los animales de granja

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Palabras clave: necesidades nutricionales, salud, bienestar, hambre, marcos teóricos

Las necesidades nutricionales de un animal están determinadas tanto por el genotipo como por su estado biológico. Los nutrientes son necesarios para el desarrollo y el funcionamiento de los sistemas biológicos del organismo. Los complejos procesos psicológicos han evolucionado hasta integrar o traducir estas necesidades en comportamientos de búsqueda y consumo de nutrientes en el medio ambiente.

Así, el comportamiento expresa la interacción entre las necesidades nutritivas de los animales y las condiciones medioambientales de acceso a dichos nutrientes. La adopción de normas de bienestar se vería facilitada por la comprensión de las «reglas» que determinan las necesidades nutritivas de los animales, y su tolerancia cuando no satisfacen dichas necesidades. Las tolerancias han de basarse en respuestas sanitarias y comportamentales, y no en el rendimiento. La adopción de normas aplicables a la alimentación y al agua exige tener en cuenta una serie de aspectos y sus interacciones:

1) Períodos de privación de agua y alimentos: hay ciertos casos en que se puede negar temporalmente a los animales de la granja el acceso a la alimentación y al agua; por ejemplo, durante el transporte y estabulación previos al sacrificio. La investigación de los efectos de la privación de alimentos y de agua durante el transporte es importante para la adopción de las normas de transporte (por ejemplo, determinación de los períodos máximos

de viaje y de descanso en función de cada especie; en el período de descanso, los animales pueden alimentarse y beber). Quedan importantes aspectos por investigar en el futuro, entre otros, una mejor comprensión de las interacciones entre privación de nutrientes y otros factores de estrés durante el transporte. Aunque las condiciones de transporte en otras regiones o países difieran, las normas mundiales para el acceso a los alimentos y al agua durante el transporte deben fundamentarse sobre la base de las investigaciones existentes.

2) Prácticas de restricción de la alimentación: la restricción de alimentos es más extendida en las poblaciones de cría de cerdos y pollos de carne, sin que se tenga en consideración las consecuencias para el bienestar de los animales. Las investigaciones realizadas han indicado que la restricción comercial de alimentos genera niveles altos o sostenidos de motivación de alimentación (o hambre), aunque sigue abierto el debate científico sobre las consecuencias del hambre sostenido sobre el bienestar. De ahí, la necesidad de seguir investigando los costes del bienestar del hambre crónica. En vez de soluciones genéticas (véase a continuación), las normas pueden basarse en nuevas estrategias nutricionales para reducir la motivación de alimentación y en el suministro de oportunidades ambientales propicias al apaciento.

- 3) Interacciones entre zootecnia, genotipo y nutrición: la zootecnia ha tenido consecuencias importantes en las necesidades nutricionales de los animales de todas las especies sometidas a una selección centrada en el rendimiento. Estas elevadas necesidades pueden tener un impacto significativo en el bienestar de los animales. Un motivo de preocupación, en particular tratándose de la cría de pollos de carne, es que la tolerancia reducida de líneas altamente seleccionadas a las variaciones de nutrientes específicos (por ejemplo, para el desarrollo del esqueleto) puede conllevar consecuencias potencialmente importantes para el bienestar. Sin embargo, aparte de estas preocupaciones, la zootecnia presenta también el potencial de mejorar el bienestar, por ejemplo a través de objetivos de selección más amplios que incluyan los aspectos de salud y de bienestar. El desarrollo constructivo de prácticas zootécnicas relacionadas con las preocupaciones de bienestar animal estaría facilitado por la adopción de códigos internacionales de prácticas, y la OIE podría asumir una función clave en la promoción de este enfoque.
- 4) Malnutrición y restricción del agua en los sistemas extensivos: en los sistemas extensivos los animales pueden padecer desnutrición y malnutrición como resultado del pastoreo excesivo, de las condiciones climáticas o de la falta de recursos económicos para brindar una alimentación suplementaria. Las consecuencias para la salud y el comportamiento pueden ser adversas. Por analogía, los animales en los sistemas extensivos dependen de las fuentes naturales de agua para calmar la sed, pero éstas pueden ser restringidas, estar contaminadas o ser objeto de competición con otros animales y usuarios humanos. En la consideración de las normas sobre la alimentación y el agua, no se debe ignorar la ganadería de gestión extensiva pese a que actualmente esta cuestión no despierte gran interés.
- 5) Nutrición prenatal y desarrollo: son cada vez más numerosas las pruebas de que la nutrición del feto pueden influir en la salud y bienestar del animal recién nacido con posibles influencias a largo plazo en su vida futura. Por ejemplo, se ha demostrado que el suministro de micronutrientes en etapas tempranas, claves para el desarrollo embrional, tiene un efecto favorable para la supervivencia neonatal. Las investigaciones de este tipo indican la importancia que tienen las normas sobre los nutrientes para el bienestar durante la fase prenatal.
- 6) Normalización de medidas para evaluar las consecuencias de la restricción nutricional sobre el bienestar: las normas mundiales de bienestar relativas a los nutrientes, al igual que otros aspecto del bienestar, requieren un consenso internacional sobre las medidas válidas para evaluar las respuestas o tolerancias ante la restricción de nutrientes, como, por ejemplo, medidas comportamentales o fisiológicas válidas y fiables del hambre y de la sed.

Abstract

Food, water and malnutrition: perspectives on nutrient requirements for health and welfare in farm animals

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Keywords: nutrient requirements, health, welfare, hunger, theoretical frameworks

An animal's requirements for nutrients are determined by both its genotype and its biological state. Nutrients are required for development and the functioning of the body's biological systems. Complex psychological processes have evolved to integrate/translate these requirements into behaviour to efficiently locate/ consume nutrients in the environment. Thus behaviour expresses the interaction between the animals' nutrient requirements and environmental constraints on access to nutrients. Development of welfare standards would be helped by understanding the 'rules' determining animals' nutrient requirements, and the tolerance of the animal for failing to meet its requirements. Tolerances should be based on health and behavioural responses rather than on yields. Development of standards for food and water requires consideration of a number of discipline areas and their interactions.

(1) Periods of water and food deprivation: there are a number of instances where farm animals may be temporarily denied access to food and water such as during transport and lairage before slaughter. Research on the effects of food and water deprivation during transport is important in developing transport standards (e.g. setting species-specific maximum journey and rest times, the latter where animals are allowed to feed and drink). There remain important areas for future research including a better understanding of the interactions between nutrient

deprivation and other transport stressors. Transport conditions in other regions/countries can differ; development of global standards for access to food and water during transport should build on and develop the existing research base.

- (2) Food restriction practices: the most widespread application of food restriction is in the breeding populations of pigs and broiler chickens, which arose without great consideration to animal welfare consequences. Subsequent research has indicated that commercial food restriction results in high/ sustained levels of feeding motivation (or hunger), although there remains scientific debate over the impact of that sustained hunger on welfare. This indicates the need for further research on the welfare costs of chronic hunger. Other than genetic solutions (see below), standards could be based on novel nutritional strategies to reduce feeding motivation and provision of environmental opportunities for foraging behaviour.
- (3) Animal breeding and genotype x nutrition interactions: animal breeding has had a significant impact on animals' nutrient requirements in all species subject to focused selection on yield. These elevated nutritional requirements can have significant impacts on animal welfare. One concern, especially with broiler breeding is that the reduced tolerance of highly selected lines to variations in specific nutrients (e.g. for skeletal develop-

ment) can have potentially large impacts on welfare. However in addition to these concerns animal breeding also has the potential to enhance welfare, for example, through broadening breeding goals to include health and welfare traits. Constructive development of animal breeding practices in relation to animal welfare concerns would be greatly eased by adoption of international codes of practice and the OIE could play a key role in promoting this approach.

- (4) Malnutrition and water restriction in extensive systems: animals in extensive systems may experience undernutrition and malnutrition as a result of overgrazing, climatic conditions or lack of economic resources to provide supplementary feeding. The consequences can have adverse effects on both health and behaviour. Similarly animals in extensive systems are dependent on natural sources of water for drinking which may be restricted, subject to pollution or competition from other animal and human users. Extensively managed livestock

should not be overlooked when considering standards in relation to food and water despite a current lack of public concern over the issue.

- (5) Pre-natal nutrition and development: there is increasing evidence that nutrition of the foetus can influence the health and welfare of the neonate and with likely longer-term influences into later life. For example, supply of micronutrients at key early stages of embryonic development has been shown to have a beneficial impact on neonatal survival. Research such as this indicates the importance of extending nutrient standards for welfare to the pre-natal phase.
- (6) Standardising measures to assess welfare impacts of nutrient restriction: as with many welfare issues, global welfare standards for nutrients require an international consensus on valid measures to assess responses/ tolerances to nutrient restriction, such as scientifically valid and robust behavioural/ physiological measures of hunger and thirst.

Areas of practical application

Animal welfare: between profit and protection

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Summary

Animal welfare has become a topic of public interest in many cultures. Veterinary services play a crucial mediating role between producers, retailers and consumers. Moreover, aspects of animal welfare have to be related to the incidence of diseases in farm animals (including zoonoses) and to the use of veterinary drugs.

Societies differ in their demands for minimum standards in animal welfare, and decisions are usually taken at political level aiming to strike a balance between profit and protection. Animal protection is often considered to be in conflict with low production costs. However, this does not necessarily have to be true. Examples are given.

Keywords: veterinary services, food safety, housing systems, animal welfare assessment, cattle, pigs, poultry, politics, economics, production costs

Introduction

Animal welfare has become a topic of public interest in many countries and, consequently, is an important field to be covered by national and local veterinary services. Different members of a society usually have different views and interests with regard to animal welfare. In this context, veterinary services have to play a mediating role, bringing together producers, retailers and consumers of animal products. Moreover, aspects of animal welfare such as housing and management practices may be related to the incidence of diseases in farm animals and hence to the use of drugs and antibiotics. Some of these diseases (e.g. food-borne diseases) may also be a threat to human health.

Veterinary services and animal welfare – the Swiss way

Resources

In order to be able to play a mediating role between different sections of society, thus bringing together profit and animal protection, veterinary services have to allocate resources to this area.

In Switzerland, animal welfare is a very important topic and has become a major task

of the veterinary services. The basic philosophy is to establish and maintain a strong and comprehensive system to promote animal welfare. Components of this system include: an expert network; output-based research in animal welfare; an appropriate surveillance and monitoring system; legislation based on the latest scientific data available; and especially an operational and uniform enforcement. All components of the system are necessary for its effective function.

The Swiss Veterinary Service includes the Federal Veterinary Office (FVO), the cantonal veterinary offices and the official veterinarians and civil servants employed by the offices and communes (Rüsch and Kihm, 2003). The main tasks of the FVO consist of the preparation of the respective legislation, coordinating and supporting its enforcement, training and education of all veterinary authorities, regular contact and advice of stakeholders, public relations work, and support of research and development programmes. The cantonal services and the official veterinarians are responsible for the enforcement of the legislation. Both levels are collaborating closely.

With regard to farm animal welfare, the Swiss Federal Veterinary Office has established two centres for the proper housing of

farm animals. One centre covers housing and management of ruminants and pigs whereas the other is a centre of competence for poultry and rabbits. At both centres, research is carried out in collaboration with universities to assess the welfare of farm animals in different housing systems (Wechsler et al., 1997). Moreover, these centres play a key role in the information and education of cantonal veterinary authorities and stockpersons.

Manufacturers of mass-produced housing systems or equipment for farm animals are legally obliged to apply for an authorisation to sell their products. The authorisation can only be given if the housing system or equipment is in accordance with the requirements of the Swiss animal welfare legislation. This authorisation procedure was introduced in 1981. It applies not only to complete housing systems such as cages, boxes or crates but also to the equipment with which animals frequently come in contact (e.g. feeding and watering systems, floor coverings, dung grids, tethering arrangements, nest boxes). Whenever possible, a decision is made on the basis of literature or experience with similar housing systems or equipment. In some cases, however, practical tests are required. Such tests may include veterinary, physiological and behavioural measurements to assess animal welfare.

Authorisations are given by the Federal Veterinary Office. Over the last 20 years, more than 1 300 authorisations were given, and 16 applications were rejected. Several housing systems were further developed and improved with respect to animal welfare in the course of the testing procedure. The results of research done to assess the welfare of farm animals in specific housing conditions are presented at international conferences and published in scientific journals (e.g. Weber, 2000; Wechsler et al., 2000; Fröhlich and Oester, 2001).

Education

Most of the deficiencies in animal housing are due to a lack of knowledge. In our animal welfare legislation the principle of education and training of professional stakeholders (keepers of animals in general, animal transporters, slaughterhouse personnel,

official veterinarians) is mandatory. Training in animal welfare is crucial for a harmonised and effective implementation of the legislation. FVO organises regular conferences for local veterinary authorities on actual and relevant topics.

Advice and information of stakeholders

In order to promote animal welfare on a broad base official authorities and private organisations have to collaborate closely. FVO is in regular contact with stakeholders (e.g. farmers' associations, retailers, animal welfare and consumer organisations) to discuss problems 'between profit and protection' and to share information.

Public relations and motivation

Public relations in the field of animal welfare aims at a comprehensive information and motivation of stockpersons and farmers. Veterinary services should become a leading voice in the public debate on animal welfare. This is a long-lasting and ongoing process, also in Switzerland.

Our animal welfare legislation does not foresee any subsidies. Money would be without any doubt the most powerful motivation to house animals properly. Within the agriculture agreement of the World Trade Organisation (WTO) subsidies are possible if they comply with relevant criteria. In order to qualify for the 'green box', a subsidy must not distort trade and has to be government-funded. In the coming agriculture negotiations Switzerland will support the intention to include animal welfare in the 'green box'.

For several years regular on-farm controls of the housing conditions of the animals have been performed. Farmers asking for direct payments have to prove that their housing systems are in accordance with the Swiss animal welfare legislation. As a consequence, 30 % of the farms, chosen at random, are checked every year. Controls cover both quantitative (e.g. space requirements, width of the gaps of slatted floors) and qualitative (e.g. litter quality, provision of foraging material, animal care) aspects. The Swiss Federal Veterinary Office together with the Swiss Federal Office for Agriculture has issued manuals containing all legal requirements to be checked on the farm and forms

to report the animal welfare status of a farm based on the results of the control.

As the consumers perceive animal welfare more and more as a quality factor, constant pressure on the production sector is maintained.

Operational and uniform enforcement of the legal prescriptions

In a federal system a uniform enforcement is always a challenge. The efficiency is increased if the enforcement of animal welfare, animal health and food safety (pre-harvest and harvest) is done by one cantonal authority. Several cantons may join forces. By means of mandate agreements, the cantons are authorised to delegate specific responsibilities to private organisations, for example, control tasks or training courses.

What minimum level of animal welfare should be achieved?

Societies may differ in their demands for minimum standards with regard to animal welfare, and decisions are usually taken at political level aiming to strike a balance between profit and protection. However, it is important that scientific evidence can be provided as a basis and in support of such decisions. Consequently, the welfare of farm animals has to be assessed and compared in different housing systems. Moreover, conflicting aspects such as economics (e.g. space requirements), feasibility (e.g. castration with anaesthesia) or environmental concerns (e.g. ammonium concentration in outdoor runs of laying hen aviary systems) have to be considered. The significance of such conflicting aspects may, again, differ to a great extent between societies.

The actual level of the animal welfare legislation in Switzerland is the result of an intense debate in our society within the last 30 years. The main stakeholders in that discussion were the farmers' associations and the pharmaceutical industry on one side and the welfare organisations and the consumers on the other side. But the crucial factor was the willingness of the Parliament and the government to implement a welfare act in 1981 with an acceptable level for all concerned parties presenting something 'futuris-

tic' in comparison to the standard in Europe at that time. For example battery cages for laying hens were banned in 1981, long before ethologists could propose a new housing system giving good economic results. The veterinary service provided the scientific results from own research projects or from literature and elaborated the minimal requirements for the housing systems. Other examples are the mandatory anaesthesia when dehorning calves and, from 2007 on, the restricted use of farrowing crates in exceptional cases. These requirements are on a considerably higher level than the corresponding minimum standards within the European Community.

Over the last years the expectations of the society related to animal welfare have increased significantly. Fifty years ago most people had a more or less direct affiliation to agriculture. Nowadays the majority of people live in urban areas with no relationship with animal production. Furthermore pet animals such as dogs or cats are often compared with farm animals with the consequence of contradictory expectations and attitudes of the society as well as the risk to humanise animals. Veterinary services have to act as bridge builders and to inform the society about the needs of the animals.

As national minimum animal welfare standards are very different, it will be very challenging to set international standards. On the one hand, a certain level has to be attained to ensure minimal protection for the animals. On the other hand, national differences have to be considered. If societies legally oblige their local producers of animal products to comply with certain animal welfare standards, these producers should also benefit from trading regulations that give their products a real chance on the local market. Hence, understanding and respect are required not only towards the lower but also towards the upper end of the range of national minimum animal welfare standards.

Does progress in animal welfare standards increase production costs?

Animal protection is often considered to be in conflict with low production costs. How-

ever, this does not generally have to be true. For example, loose housing of dairy cows in cubicle systems with milking parlours is economically preferable to housing in tie-stalls, provided that herd size exceeds a minimum of 20 cows. Calculations made at the Swiss Federal Research Station for Agricultural Economics and Engineering (FAT) show that loose housing systems are favourable with respect to both building costs and labour input (Fig. 1). Similarly, group housing of dry sows using electronic sow feeders is preferable to individual housing in crates with larger herds and housing of laying hens in aviary systems can be as profitable for the farmer as housing in cages, if he can sell his eggs at a better price. In Switzerland, the home production of shell eggs remained quite stable over time although battery cages were banned in 1981 with a transitional period of 10 years. (Fig. 2).

Conclusions

(a) Animal welfare has to be considered as a very important part of Veterinary Public Health (VPH), as some aspects are often linked to food safety and animal health issues. VPH is a core competence of the veterinary services. They can and must play a mediating role between producers and consumers.

(b) Local constraints have to be considered when setting minimum standards for animal welfare at an international level.

(c) Housing systems that are beneficial for animal welfare do not generally increase production costs.

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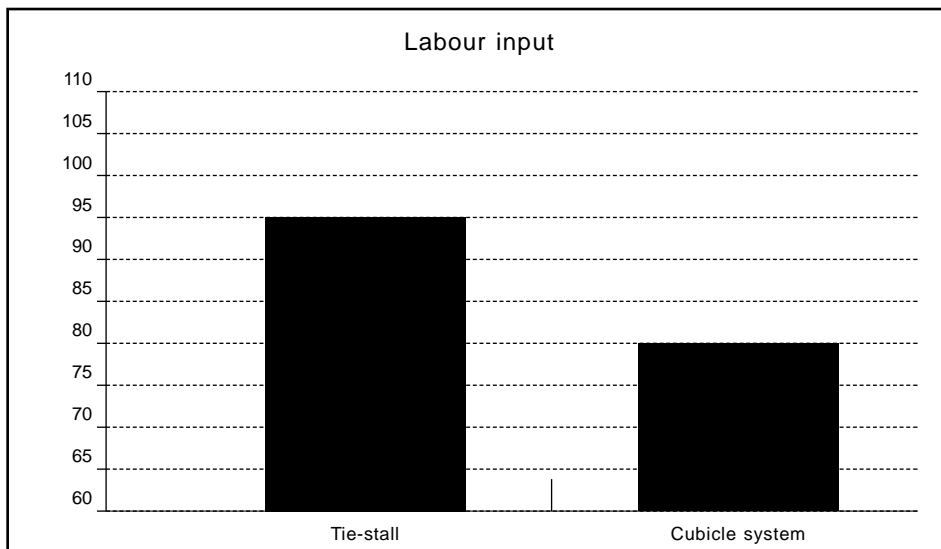
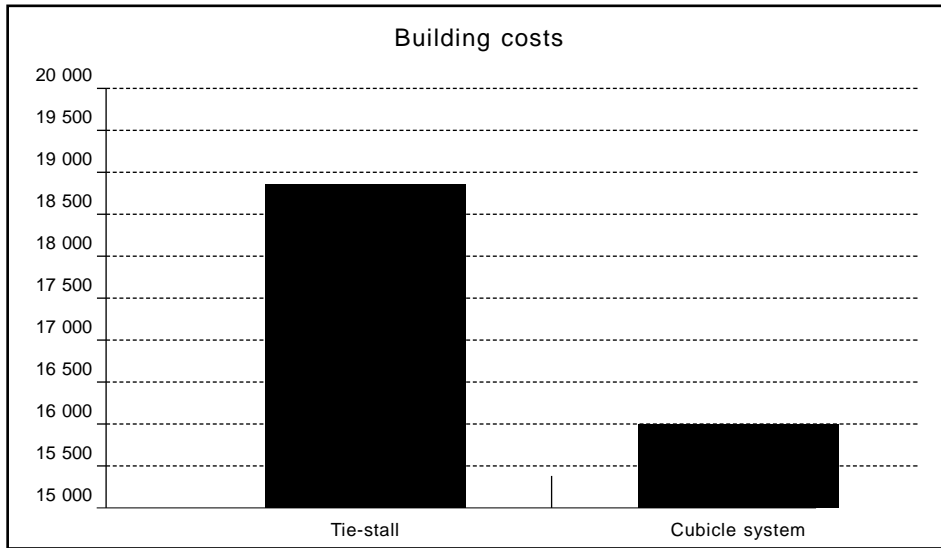


Fig. 1 Comparison of building costs (in CHF per cow place) and total labour input (hours per cow per year) for a herd of 48 dairy cows housed in a cubicle housing system or a tie-stall; based on calculations done at the Swiss Federal Research Station for Agricultural Economics and Engineering (FAT).

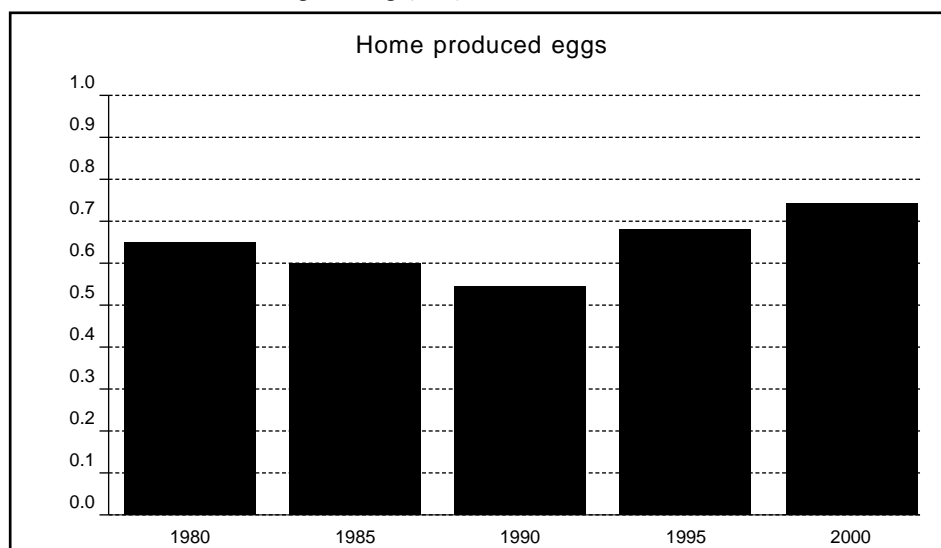


Fig. 2 Proportion of shell eggs consumed in Switzerland which were home produced over the last 20 years; based on the data of the National Poultry Centre.

Résumé

Bien-être animal: entre profit et protection

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Mots clés: services vétérinaires, sécurité sanitaire des aliments, bâtiment d'élevage, bien-être animal, évaluation, bovin, porc, volaille, politique, économie, coûts de production

Dans de nombreuses sociétés, le bien-être animal est devenu un sujet qui suscite l'intérêt du public; c'est donc un domaine important dont doivent s'occuper les services vétérinaires nationaux et locaux. Les divers membres d'une société ont généralement des points de vue et des intérêts différents concernant le bien-être animal. Dans ce contexte, les services vétérinaires peuvent jouer un rôle de médiateurs, en rassemblant les producteurs, les détaillants et les consommateurs de produits d'origine animale. Par ailleurs, certains aspects du bien-être animal tels que les modes de conduite des élevages et les pratiques d'hébergement peuvent être liés à l'incidence des maladies chez les animaux d'élevage et donc à l'utilisation de médicaments et d'antibiotiques. Certaines de ces maladies (par exemple les toxi-infections alimentaires) peuvent également constituer une menace pour la santé humaine.

Pour pouvoir jouer un rôle de médiateurs entre les différents éléments de la société et concilier ainsi profit et protection animale, les services vétérinaires doivent affecter des ressources à ces domaines. Dans le cadre du bien-être des animaux d'élevage, l'Office vétérinaire fédéral suisse a créé deux centres pour l'hébergement convenable des animaux d'élevage. L'un s'occupe de l'habitat et de la gestion des ruminants et des porcs tandis que l'autre est qualifié en matière de volailles et de lapins. Dans les deux centres, la recherche est menée en collaboration avec des universités pour évaluer le bien-être des animaux d'élevage dans les différents systèmes d'hébergement. Les fabricants de systèmes ou d'équipements d'hébergement produits en série destinés aux animaux d'élevage sont légalement tenus de demander

une autorisation pour pouvoir vendre leurs produits. Les tests visant à évaluer les systèmes ou les équipements d'hébergement dans l'optique du bien-être animal sont effectués dans les deux centres compétents. En outre, les services vétérinaires fédéraux allouent des ressources en faveur de l'éducation des autorités vétérinaires locales, de contacts réguliers avec les parties prenantes (par exemple les associations d'éleveurs, les détaillants, les associations de protection animale et de consommateurs) et des relations publiques dans le domaine du bien-être animal.

Les exigences de normes minimales appliquées au bien-être animal peuvent diverger selon les sociétés, et les décisions sont généralement prises au niveau politique dans le but de trouver un juste équilibre entre profit et protection. Il est toutefois important que les décisions soient sous-tendues et étayées par des données scientifiques. Le bien-être des animaux d'élevage doit donc être évalué et comparé dans les différents systèmes d'hébergement. En outre, il faut prendre en compte certains aspects contradictoires tels que les considérations économiques (par exemple les besoins en termes d'espace), la faisabilité (par exemple la castration sous anesthésie) ou les préoccupations écologiques (par exemple la concentration en ammonium dans les enclos en plein air des systèmes d'élevage de poules pondeuses). Ici encore, l'importance de ces aspects divergents peut être très différente d'une société à une autre. Ainsi, en Suisse, les cages en batterie pour les poules pondeuses ont été interdites en 1981, l'anesthésie est obligatoire lors du décornage des veaux et, à partir de 2007, les cases de mise bas ne pourront être utili-

sées que dans des cas exceptionnels. Le niveau d'exigence est considérablement plus élevé que les normes minimales correspondantes au sein de la Communauté européenne.

Comme les normes nationales minimales en matière de bien-être animal sont très différentes, il sera très difficile d'établir des normes internationales. D'une part, un certain niveau doit être atteint pour assurer la protection minimale des animaux et, d'autre part, il faut prendre en compte les différences nationales. Si les sociétés exercent une contrainte juridique sur leurs producteurs locaux pour qu'ils respectent certaines normes en matière de bien-être animal, ces producteurs bénéficieront aussi des réglementations commerciales qui donneront une véritable chance à leurs produits sur le marché local. En conséquence, la connaissance et le respect sont nécessaires non seulement vers le bas mais aussi vers le haut de la fourchette des normes nationales minimales en matière de bien-être animal.

On pense souvent que la protection des animaux est incompatible avec de faibles coûts

de production. Or, ce n'est pas forcément vrai. Ainsi, la stabulation libre des vaches laitières dans des systèmes de boxes avec des salles de traite est préférable d'un point de vue économique à la stabulation entravée, à condition que le troupeau compte plus de vingt vaches. De même, le logement en groupe des truies tarées utilisant des nourrisseurs électroniques pour truies est préférable au logement individuel dans des cages contenant de plus grands animaux et le logement des poules pondeuses dans des systèmes d'élevage de volailles peut être aussi rentable pour l'exploitant que le logement en cages s'il peut vendre ses œufs à un meilleur prix.

Les conclusions sont les suivantes: a) les services vétérinaires peuvent et doivent jouer le rôle de médiateurs entre les producteurs et les consommateurs; b) il faut prendre en compte les contraintes locales lors de l'établissement de normes minimales en matière de bien-être animal à l'échelon international; c) les systèmes d'hébergement qui sont favorables au bien-être des animaux n'augmentent généralement pas les coûts de production.

Resumen

Bienestar animal: entre ganancia y protección

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Palabras clave: servicios veterinarios, seguridad sanitaria de los alimentos, sistemas de estabulación, evaluación del bienestar de los animales, ganado bovino, cerdos, aves de corral, políticas, economía, costos de producción

El bienestar animal se ha vuelto una cuestión de interés público en varias sociedades, por lo cual es un campo importante que debe ser cubierto por los servicios veterinarios nacionales y locales. Los diferentes miembros de la sociedad suelen tener distintos puntos de vista e intereses con respecto al bienestar de los animales. En este contexto, los servicios veterinarios pueden actuar como mediadores para llegar a un consenso entre productores, comerciantes y consumidores de los productos de origen animal. Además, los aspectos del bienestar animal tales como las prácticas de alojamiento y de gestión pueden estar relacionados con la incidencia de enfermedades en los animales de granja y, por ende, con el uso de medicamentos y antibióticos. Algunas de estas enfermedades (por ejemplo, las enfermedades de origen alimentario) pueden constituir también una amenaza para la salud humana.

A fin de poder desempeñar el papel de mediador entre las distintas secciones de la sociedad y conciliar así las ganancias con la protección de los animales, los servicios veterinarios tienen que asignar recursos a este ámbito. En lo que respecta al bienestar de los animales en las explotaciones agrícolas, la Bundesamt für Veterinärwesen (Oficina Federal Veterinaria de Suiza) ha establecido dos centros para su alojamiento adecuado. Un centro está destinado al alojamiento y la gestión de los rumiantes y los cerdos, mientras que el otro está destinado a las aves de corral y los conejos. En ambos centros se realizan investigaciones en colaboración con las universidades para evaluar el bienestar de los animales de granja en diferentes sistemas de alojamiento. La ley dispone que los

fabricantes de sistemas de alojamiento o equipos de producción masiva para los animales de granja deben solicitar una autorización para la venta de sus productos. En los dos centros competentes se llevan a cabo las pruebas de los sistemas de alojamiento o de los equipos en materia de bienestar animal. Además, el Servicio Veterinario Federal Suizo asigna recursos para la formación de las autoridades veterinarias locales, para el contacto regular con las partes interesadas (por ejemplo, las asociaciones de agricultores, comerciantes, organizaciones de bienestar animal y organizaciones de consumidores) y para las relaciones públicas en el campo del bienestar animal.

Las sociedades pueden diferir en sus exigencias de normas mínimas sobre el bienestar de los animales, y las decisiones se toman por lo general a nivel político con miras a alcanzar un equilibrio entre beneficios y protección. Es importante, sin embargo, poder aportar pruebas científicas como fundamento de tales decisiones. Por consiguiente, la evaluación y comparación del bienestar de los animales de granja debe realizarse en distintos sistemas de alojamiento. Además, han de tenerse en consideración los aspectos conflictivos tales como el económico (por ejemplo, requisitos de espacio), la factibilidad (por ejemplo, castración con anestesia) o los intereses ambientales (por ejemplo, concentración de amoníaco en los corrales de cría de gallinas ponedoras). El significado de los aspectos conflictivos antes mencionados puede diferir en gran medida entre las sociedades. En Suiza, por ejemplo, las jaulas de batería para gallinas ponedoras se prohibieron en 1981, la anestesia es obligatoria para

descornar a los terneros y, a partir de 2007, las parideras podrán utilizarse sólo en casos excepcionales. Estos requisitos se sitúan en un nivel de exigencia considerablemente más alto que las normas mínimas correspondientes en la Comunidad Europea.

Como las normas nacionales mínimas sobre el bienestar de los animales son muy diferentes, será un verdadero reto establecer normas internacionales. Por una parte, habrá de alcanzarse cierto nivel para garantizar la protección mínima de los animales y, por otra, habrá que tener en cuenta las diferencias nacionales. Si las sociedades obligan a los productores locales de productos de origen animal a cumplir con determinadas normas de bienestar animal, éstos deberán beneficiarse también de reglamentaciones comerciales que brinden una oportunidad real de salida a sus productos en los mercados locales. Por tanto, se necesita comprensión y respeto, no sólo en un sentido, sino en ambos sentidos de la gama de normas nacionales mínimas de bienestar animal.

A menudo se considera que la protección de los animales está en conflicto con los bajos

costes de producción. No obstante, esta afirmación no tiene que ser necesariamente cierta. Por ejemplo, desde un punto de vista económico, la estabulación abierta de vacas lecheras con sistemas de cubículos e instalaciones de ordeño mecánico es preferible a la estabulación en edificios restringidos, a condición de que el tamaño del rebaño sea superior a veinte vacas. De igual manera, el alojamiento de las cerdas vacías en grupos con comederos electrónicos especiales es preferible al alojamiento individual en casetas con rebaños más grandes; y el alojamiento de gallinas ponedoras en los sistemas avícolas puede ofrecer tantas ventajas al agricultor como la utilización de jaulas a condición de que pueda vender los huevos a mejor precio.

Podemos concluir que: a) los servicios veterinarios pueden y deben desempeñar un papel de mediador entre productores y consumidores; b) las restricciones locales han de tenerse en cuenta para el establecimiento de normas mínimas de bienestar animal a nivel internacional; y c) los sistemas de alojamiento que favorecen el bienestar animal por lo general no conllevan un aumento de los costes de producción.

Abstract

Animal welfare: between profit and protection

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Keywords: veterinary services, food safety, housing systems, animal welfare assessment, cattle, pigs, poultry, politics, economics, production costs

Animal welfare has become a topic of public interest in many societies and, consequently, it is important that national and local veterinary services also take an interest in this issue. Different members of a society usually have different views and interests with regard to animal welfare. In this context, veterinary services may play a mediating role, bringing together producers, retailers and consumers of animal products. Moreover, aspects of animal welfare such as housing and management practices may be related to the incidence of diseases in farm animals and hence to the use of drugs and antibiotics. Some of these diseases (e.g. food-borne diseases) may also be a threat to human health.

In order to be able to play a mediating role between different sections of society, thus bringing together profit and animal protection, veterinary services have to allocate resources to this area. With regard to farm animal welfare, the Swiss Federal Veterinary Office has established two centres for the proper housing of farm animals. One centre covers the housing and management of ruminants and pigs whereas the other is a centre of competence for poultry and rabbits. At both centres, research is carried out in collaboration with universities to assess the welfare of farm animals in different housing systems. Manufacturers of mass-produced housing systems or equipment for farm animals are legally obliged to apply for an authorisation to sell their products. Testing of housing systems or equipment with regard to animal welfare is done at the two centres of competence. Additionally, the Swiss Federal Veterinary Service allocates resources to the education of local veterinary

authorities, to regular contacts with stakeholders (e.g. farmers' associations, retailers, animal welfare and consumer organisations) and to public relations in the field of animal welfare.

Societies may differ in their demands for minimum standards with regard to animal welfare, and at political level, decisions are usually taken with the aim of striking a balance between profit and protection. However, it is important that scientific evidence can be provided as the basis for such decisions. Consequently, the welfare of farm animals has to be assessed and compared in different housing systems. Moreover, conflicting aspects such as economics (e.g. space requirements), feasibility (e.g. castration with anaesthesia) or environmental concerns (e.g. ammonium concentration in outdoor runs of laying hen aviary systems) have to be considered. The significance of such conflicting aspects may, again, differ to a great extent between societies. For example, in Switzerland, battery cages for laying hens were banned in 1981, anaesthesia is obligatory when dehorning calves and, from 2007 on, farrowing crates may only be used in exceptional cases. These requirements are on a considerably higher level than the corresponding minimum standards within the European Community.

As national minimum animal welfare standards are very different, it will be very challenging to set international standards. On the one hand, a certain level has to be attained to ensure minimal protection for the animals, on the other hand, national differences have to be considered. If societies legally oblige their local producers of animal products to comply

with certain animal welfare standards, these producers should also benefit from trading regulations that give their products a real chance on the local market. Hence, understanding and respect are required, not only towards the lower end but also towards the upper end of the range of national minimum animal welfare standards.

Animal protection is often considered to be in conflict with low production costs. However, this does not generally have to be true. For example, loose housing of dairy cows in cubicle systems with milking parlours is economically preferable to housing in tie-stalls, provided that herd size exceeds a minimum

of 20 cows. Similarly, group housing of dry sows using electronic sow feeders is preferable to individual housing in crates with larger herds, and housing of laying hens in aviary systems can be as profitable for the farmer as housing in cages, if he can sell his eggs at a better price.

The conclusions are that (a) veterinary services can and must play a mediating role between producers and consumers, (b) local constraints have to be considered when setting minimum standards for animal welfare at international level and (c) housing systems that are beneficial for animal welfare do not generally increase production costs.

Animal welfare issues relating to aquaculture

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Summary

Aquatic animals and aquatic animal products are amongst the principal sources of protein in the human diet and while traditional fisheries have levelled out, aquaculture has, over the last three decades, developed to become the fastest growing food production industry in the world.

Although fish are covered by animal welfare legislation in some countries, experience has shown that fish do not invoke compassion in the same way as most other animals. A key element in this respect is the question; do fish, despite not possessing neo-cortex, feel pain. This paper discusses areas within aquaculture such as farming conditions, feeding, genetics, branding, handling, transport, sedation, stunning and slaughter methods in which animal welfare may be compromised and where ethics are thus of importance. Special emphasis is given to methods of fish sedation prior to slaughter and the advantages and disadvantages of such methods relating to welfare issues.

Keywords: animal welfare, fish, farming conditions, genetics, production diseases, slaughter, transport

Introduction

Aquatic animals and aquatic animal products are among the principal sources of human dietary protein seen from a global perspective. While traditional fisheries have levelled out, the aquaculture industry has, over the last three decades, developed to become the fastest growing food production sector in the world (21) and it will continue to grow in the years to come. The strong expansion in world aquaculture has thus also led to health and welfare problems. This raises questions on whether mass culture meets the intentions laid down in animal protection laws (29).

The 'Five freedoms' as described by Brambel and the additional two added by Seamer as referred to by Cawley (9):

- freedom to express normal behavioural patterns;
- freedom from pain, injury or disease;
- freedom from fear and distress;
- freedom from thermal or physical discomfort;
- freedom from thirst, hunger and malnutrition;

- freedom from stress or suffering when transported;
- freedom from stress or suffering when slaughtered;

should also be applied to fish in order to secure animal welfare.

While traditional domestic animals as well as companion animals over the years have received considerable attention in an animal welfare context, the latest 'domesticated animal', the fish, has only to a small extent been encompassed by animal welfare concepts despite the fact that fish are also covered by legislation in many countries. According to the recommendations of the 'Holmenkollen' guidelines, States should establish, implement and enforce laws and regulations to ensure responsible aquaculture, including ethical criteria, by developing standards and practises embodying ethical principles to ensure the welfare and health of fish and shellfish (42).

Intensive fish farming, either taking place in cages, ponds or tanks, has led to a series of problems that may be classified as husbandry diseases that are of animal welfare concern (30). Such systems will inevitably present challenges regarding acceptable ethi-

cal standards (7). As in any other farming enterprise, there are, even in fish farming, demands for effective profit and direct investment earnings, and so on, which lead to increased focus on production effectiveness. Animal welfare issues may thus not be prioritised, especially if resources are lacking at the farm level or when food safety and human health aspects from a legislative point of view are prioritised.

The fish

The debate continues as to whether fish feel pain or not. Rose (34) states that it is implausible that fish can experience pain or emotions despite displaying responses to noxious stimuli and thus it is important that stress responses are considered as important regarding welfare issues in fish. The main argument used by Rose, is that fish lack consciousness and thus the ability to feel pain or to suffer. A considered prerequisite for consciousness is the presence of a neo-cortex. Since this is lacking in fish, this is taken as evidence that fish do not feel pain. Other authors, however, have shown significant evidence of nociception in fish and demonstrated discomfort when noxious substances have been administered (39, 40). Bony fish have a nociceptive system with A-delta and C fibres present in peripheral nerves indicating that fish may modulate pain (22, 38). In addition, Substance P implicated in pain transmission in mammals, has been found in hypothalamus and forebrain of fish (22). One may, therefore, assume that fish do feel pain and should be handled accordingly (9, 38).

As with other animals, behavioural changes due to disease or stress factors can be observed in fish. Although different fish species may show differences in behavioural response, the most obvious and common changes observed are alterations in swimming activity and ability (such as lethargic or erratic movements or listlessness), change in respiratory frequency and feed uptake. These behavioural responses may be used as welfare indicators.

Environmental parameters

A large number of different fish species are farmed today and new species are frequently

introduced. The various species may have different demands regarding optimal environmental parameters such as stocking density, water temperature, salinity, pH, oxygen content, dissolved substances, organic load, and so on. The impact of water quality is, consequently, obvious. This means that reasonable water flow rates and good water quality, and so on, are a necessity (40). The requirements and demands as regards environment for optimal well-being and performance for all farmed fish species are not sufficiently known. The criteria vary between species, so what is optimal for one species, may not be acceptable for another.

The relationship between environment, disease and welfare is complex. However, there is little doubt that poor water quality may lead to disturbance in the fish due to acute or chronic stress. During chronic stress, the fish may lose the ability to control homeostasis, resulting in reduced growth and resistance to disease. Furthermore, it has been shown that lowered water circulation may induce aggression in fish, cause heterogeneous growth and increased susceptibility to disease.

Artificial light is being used both in cage culture and in hatcheries in order to increase production and thus economic benefit, but also for security purposes at night. It has been shown that Atlantic salmon reduce feed uptake in the first 6 to 12 weeks after the lights are turned on, indicating a stress situation. Furthermore, a failure in or unforeseen change in lighting, may result in a panic reaction, mortalities and external lesions due to unintentional contact with the cage net. A sudden transition between light and darkness should be avoided as this may result in stress as indicated by a rapid change of behaviour in fish (27).

Nutrition

A key factor in fish farming is nutrition. While feral fish normally have a varied diet, the farmed fish is dependant upon the formulated diets given and malnutrition may occur when the dietary composition does not match the needs of the fish. Lack of phosphorous is suspected to cause skeletal deformities in the backbone of salmon, use of rancid feedstuff leads to lipoic liver degenera-

tion and so-called anti-nutrients from plant products may disturb the absorption and digestion and thus induce disease, and so on. Proper ethical use of different types of feed raw material is, therefore, a must (2).

Starvation and/or reduced feeding have sometimes been used as a tool to adjust the production to the market situation. By this means, fish may be kept alive with reduced growth, with a considerable reduction in feeding costs during periods of overproduction or low market prices and thus low profitability.

Although several studies have been conducted to investigate the effects of starvation/reduced feeding on the quality of fish at slaughter and the effect on growth (10), none of the studies have taken into account such measures from a welfare point of view by measuring stress and behavioural changes in fish. Any change in the feeding regime may be detrimental. Despite this, fish may tolerate starvation for a considerable period of time dependant on the species in question and water temperature. Phenomena like eye snapping, tail biting and cannibalism may be observed, especially at high temperatures. In Atlantic halibut, the aggression mostly occurs when the fish are particularly hungry, thus resulting in physical damage to eyes and fins (17). Even though starvation may result in no physical injury to the fish and may even increase the quality of the flesh, it is, nevertheless, not acceptable as a means of production or quality control.

Starvation to empty the gut prior to slaughter is, however, acceptable, as the maximum starvation period normally is from one to three days, depending on water temperature (40, 44). From a welfare point of view, the fasting period should be as short as possible (40).

Genetics

In recent years effective genetic improvement of farmed stocks has been in focus, mostly related to production characteristics such as growth rate, food conversion rates, quality of the flesh as well as genetic resistance towards disease, fecundity, development of sex reversal, monosex and polyploid strains of fish, and so on. Although large

improvements can be achieved by genetics and genetic engineering to establish transgenic fish, it is necessary that such work is ethically based to avoid fish suffering. In the course of development of sterile fish, it was found that tetraploid fish may develop spinal deformities. Furthermore, if genetic capacity, feed utilisation and feed composition all work maximally towards the same goal, the fish may rapidly be squeezed over the biological limits which leads to a situation that may be characterised as unacceptable from a welfare point of view. So far, it has not been established whether transgenic techniques result in fish-suffering (1).

Stocking density

Increasing the stocking density is one way of optimising productivity, but on the other hand high densities may lead to stressful conditions, increase aggressive behaviour and a reduction in food conversion rate and growth (11, 24). Furthermore, in intensive fish farming whereby a large number of individuals are kept close together, physical injuries to the skin and to the fins caused due to direct contact between the fish or the cage wall may occur (44). Such lesions may allow colonisation of both primary and secondary pathogens and substantially increase the risk of infection for the fish, thus representing a welfare problem. In addition, high stocking densities may also decrease the water quality and thus accelerate other problems (40).

According to Begout and Lagardere (3), swimming activity is constrained at high densities. Bell and al. (4) investigated the effect of stocking density in Atlantic salmon and derived a welfare index from a number of welfare factors (condition factor, glucose, cortisol, behaviour, condition of the fins) based on principal components analysis. They found a non-linear correlation between stocking density and welfare with a break point at 20 to 24 kg/m³. Stocking densities above this point were reported to compromise welfare. From an animal welfare point of view, it is thus important to define stocking density in an appropriate manner for the species in question. Stocking densities are rarely defined in aquaculture texts (11).

Handling, grading and tagging

In common with other animals, fish have a variable growth rate and from time to time it is necessary to carry out grading in order to avoid bullying of smaller fish or cannibalism. Cannibalism is not uncommon in hatcheries if grading has not been carried out. In order to minimise this, fish are graded into different sizes, a process carried out either by catching the fish in nets or pumping them up before distribution over a series of bars. This type of handling in addition to the stress caused may result in damage to the skin and scale losses. Other handling procedures may also affect welfare in fish.

Tagging of live fish may be performed in many ways depending on the purpose (18). For trade in fish derived from fish farming or otherwise, tagging is seldom performed on individual fish, but may be relevant in the future in order to follow the fish from the fjord to the table. Several tagging methods have been in use over the years, largely in experiments for identification purposes. Most commonly used have been different combinations and patterns of fin clipping, external or internal tags of different kinds or thermal branding. While internal tags usually have minimal affect on the behaviour of the tagged fish, most external physical tagging methods may affect the behaviour of the fish as well as causing damage and result in secondary infections and problems. If external tags are not sufficiently anchored, they may lead to chronic open wounds. From a welfare point of view, a tagging method should result in as little damage as possible.

Transport

The manner of live fish transport depends on the purpose of the transport and the size of the consignment. For transport from hatcheries to grow-out farms, well-boats and lorries are used. The type of vehicle is dependant upon whether the fish are bound for cage culture in sea water or pond farming in inland waters. For restocking purposes, helicopters, small airplanes or buckets/sealed plastic bags with excess oxygen may also be used. It is of importance that contain-

ers for transport of fish are designed in order to eliminate damage to the fish during transport. Invidious conditions during transport such as overcrowding, unacceptable water quality due to low oxygen, may result in irreparable damage to the fish and mortality. In coho salmon, yearling transportation by truck has been reported to cause a marked physiological stress response and reduced relative fitness as well as lower survival rate and ability to tolerate a second stressing agent (20, 36, 41). Mortality in large captive broodstock of milkfish has been shown to be minimised if the fish are transported and handled in sealed oxygenated bags with chilled sea water (15). Anaesthesia combined with a recovery period also lessens the stress burden associated with hauling and transport (35).

Disease problems related to farming

There is often a close relationship between husbandry practices and incidence of disease. Under farming conditions the fish may reach the outer limit of their physiological margin due to maximal exploitation and stress making them susceptible to a wide range of diseases threatening ethical and welfare standards (40). Among the diseases which can be observed by visual clinical observations and during necropsy are various types of skeletal or soft tissue malformations, eye lesions and so on (6, 30).

Although individuals displaying deformities may be regarded as a normal feature of any biological population, sudden increases in the number of deformed specimens clearly indicate suboptimal culture conditions (8). This is an issue of concern, both due to the economic losses to the fish farmers as deformities reduce product quality, provoking adverse reactions of the consumers as well as for welfare reasons. Optimal temperatures for incubation of salmonid eggs may reduce this problem. It has been shown that high temperatures during hatching and at the start of feeding to reduce production time, may result in skeletal deformities (8). The so called 'gaping jaws' syndrome, a common problem in cultured halibut larvae and resulting in the larvae not being able to close their jaws to feed, leads to mortality when

the yolk sac is absorbed. The condition is associated with abrasion of the head and secondary invasion by bacteria and fungi (28).

In recent years, several soft tissue anomalies have been observed in Atlantic salmon including lack of septum transversum, changes in the morphology of the heart, hypoplasia, situs invertus, and so on (23). These changes may lead to disturbances in normal blood circulation, resulting in heart failure, increased mortality and reduced tolerance to stress. In addition, such fish are smaller than their siblings (23). Two hypotheses have been raised to explain the cause (Johansen, personal communication). The first is that during selection in the breeding process, anatomical details such as shape of the heart have not been considered over the years. The other hypothesis states that the observed heart problems are part of a 'life style' disease due to a cage life with little exercise and surplus of food compared to feral fish.

Blindness due to cataract in farmed Atlantic salmon has also, in recent years, become an increasing problem. It is regarded as a husbandry disease involving several predisposing factors and causes (6). Blind salmon show signs of maladjustment, listlessness and surface lesions as well as reduced growth depending on the degree of visual handicap. For welfare reasons it is of importance to clarify the cause and take steps to reduce the problem if possible.

Many of the bacterial disease problems in fish, previously treated with large amounts of antibiotics or chemotherapeutics, are now being subjected to vaccination (19, 26). Although vaccines, in general, have been proved effective in protection, and counteract suffering due to disease problems, vaccination may be hampered by certain side effects when adjuvanted. Common findings include inflammatory reactions which may vary from mild to severe and range from adhesions in the peritoneal cavity to other local reactions. The degree of local reaction may vary according to the type of adjuvant used. The local reactions are inflammatory in nature and result in granulomas and concomitant fibroplasias. The result may be adhesions between organs as well as

between internal organs and the peritoneal wall. Such reactions are a concern from a welfare point of view. The severity of the lesions are reduced in Atlantic salmon if the size of the fish is at least 70 g and the water temperature is 10° C or below at time of vaccination.

Time of vaccination also influences the development of adhesions, growth retardation and spinal deformities (5). However, reduced disease risks are thought to justify the observed level of side effects following current vaccination practices. Long-term protective immunity with negligible side effects must be a goal for the future.

An important problem in salmonid farming from a welfare point of view today, is infection with sea lice. The damage caused by the feeding habit of the sea lice causes scale loss and skin lesions. Damage in the head area may be so severe that the skull bones are exposed, a condition referred to as 'death crown' (25). Such extensive lesions lead to osmotic disturbances and mortality. To reduce the problem, treatment is carried out by either oral or bath chemical treatments or by using cleaner fish such as ballan wrasse. Treatment with dichlorvos and UV light may, however, be linked to cataracts under normal conditions. The use of ballan wrasse for the purpose has also an ethical side as the biological needs of the wrasse must also be considered (43).

Slaughter

Some 70 million salmon and trout are slaughtered on an annual basis in the United Kingdom which far exceeds the number of other animals killed (25) and for Norway, a rough estimation is approximately 150 million salmonids. At the place of slaughter, the fish are also subjected to handling stress on transfer from the transporting vehicles to the holding units where they are kept until slaughter. Additional stress due to increased crowding in the holding units prior to brailing or pumping of fish into the killing facility also occurs. In addition, rough handling may lead to abrasions and mortality (44). Whatever method used, the time the fish spend out of the water prior to slaughter should not exceed 15 seconds (40).

In order to ensure ethically acceptable slaughter, acceptable methods should be in place and since there are differences between species, establishing universal methods is difficult. While carp and eel are resistant to hypoxia, salmonid fishes are sensitive in this respect. Thus, the oxygen level in holding units must be optimal for the species.

Different methods for slaughter of fish are in place and it is no doubt that many of them may be considered as appalling from an animal welfare point of view. From an animal welfare point of view, instantaneous unconsciousness is required to avoid unnecessary stress and pain in connection with the slaughtering process. Sedation prior to exsanguination and gutting is thus necessary from an animal welfare point of view. The sedation must last for the period it takes the fish to die by the bleeding process. Methods only gradually resulting in unconsciousness may be allowed if the method in itself does not result in stress or pain (16).

Methods for sedation of fish include CO₂, cooling down to 0°C by means of ice water alone or in combination with CO₂, stunning by a blow to the head or by means of electro shock, using the same principles as used in electro-fishing gear.

The time it takes for trout to become unconscious may be as long as 15 minutes when suffocating fish in the air or ice water prior to exsanguination and slaughter (25). By using ice water, it is possible to calm down the fish and the fish may be kept alive for several hours until osmo-regulatory problems and exhaustion occur. It has been demonstrated that pre-chilling prior to slaughter is a minor stressor compared to handling and crowding prior to slaughter, but a low chilling temperature may provoke 'water belly', especially in rainbow trout due to inadequate osmo-regulation (38). It has been shown that fish have a sensory capacity some 15 minutes after being taken out of water. Asphyxiation in air or on ice on its own, has thus been deemed unacceptable from an animal welfare point of view as fish could be exposed to distress or suffering by these methods (13). Exsanguination without stunning also result, in aversive reactions in fish (31, 44).

Sedation by CO₂ is a commonly used method in Norway for slaughter of Atlantic salmon. It is carried out by placing the fish in a sea water bath saturated with CO₂. As CO₂ creates an aversive environment for the fish, they display stress reaction and erratic swimming, whilst trying to escape before losing consciousness (40). Mobility is lost before loss of sensibility which takes place after approximately six minutes, but survival lasts much longer (33). Thus, if fish are removed too early from the sedation tank, they may still be conscious when the bleeding process starts. Currently, CO₂ is probably the best method for sedation in flatfishes. In some countries, Aquis has also been approved for sedation of fish prior to slaughter with nil withholding period.

While salmonid fish are relatively easy to kill, the killing of eels is difficult. The traditional method used to deslime the fish with ammonia or dry salt followed by evisceration has now been banned in many countries for welfare reasons (33, 40). The decapitation method proposed for the killing of eels is also a non-acceptable method for eels. As spinal transection does not cause visible injury to the brain, the eel may suffer for some time if the method is used. Thus, immediate destruction of the brain in eels is required in the slaughtering process if 'neck cutting' is to be used (14).

It is stated that stunning must cause immediate loss of consciousness lasting until death (13). Both percussive stunning and spiking (Iki-Jime) lead to rapid loss of consciousness and immediate loss of visual evoked response (VERS) without aversive reaction if applied correctly (31, 33). A blow to the head normally gives momentary sedation provided that the blow is hard enough and hit in the right place. This method is normally used on large fish. Percussive stunning of flatfish may be difficult due to the shape of the fish compared to salmonids.

Although percussive stunning by a blow to the head using a hand held club is useful from a technical point of view, the method has to be automated if it is to be used on an industrial scale. Pneumatic devices suitable for industrial conditions have been developed, but care has to be taken to assure a

sufficiently high pneumatic pressure or else the fish may not be sufficiently sedated prior to bleeding.

Electric stunning is another possible and practical method for sedation of fish (38, 32). An effective electrocution depends, however, on an electrical current sufficient to achieve complete sedation as the fish will otherwise only be paralysed. The most frequent problems that may be observed if the current is too high, are fracture of the backbone and haemorrhages in the flesh. Another problem recently focused upon, is electrical stunning of Atlantic salmon without bleeding in order to keep the costs down due to low market price. Since fish may have varying individual tolerance to electric current, some fish may survive the stunning procedure and thus suffer unnecessarily before dying from suffocation.

Whatever method used for sedation, it is important that the personnel are skilled and dedicated to their work in order to reduce the levels of stress and avoid external and/or internal traumatic lesions during the slaughter process.

Conclusion

It is beyond doubt that fish do have nociceptors and thus have the possibility to register pain, although the response and way of 'showing' pain is not expressed the same way as in terrestrial animals. Therefore, there is a need to critically review all aspects and procedures in modern fish farming in order to establish ethically acceptable farming conditions, feeding and handling regimes, transport, stunning and slaughter methods.

In this respect, the veterinary profession should take increased responsibility to facilitate the development of animal welfare issues throughout all aspects of aquaculture by including legislation.

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Résumé

Prise en compte des questions de bien-être animal dans le domaine de l'aquaculture

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Mots clés: bien-être animal, poisson, conditions d'élevage, génétique, maladie, production animale, abattage, transport

Les animaux aquatiques et les produits d'animaux aquatiques figurent parmi les principales sources de protéines dans le régime alimentaire humain. Si le secteur de la pêche traditionnelle marque le pas, l'aquaculture connaît depuis trois décennies un essor tel qu'elle est devenue à l'échelle mondiale le secteur de production alimentaire à la plus forte croissance. Cette tendance se poursuivra dans les années à venir. On s'est beaucoup inquiété du bien-être des animaux domestiques «traditionnels» et des animaux de compagnie, mais on s'est peu intéressé aux animaux les plus récemment «domestiqués», à savoir les poissons d'élevage, en dépit du fait que ces animaux sont également concernés par la législation dans de nombreux pays.

Plusieurs raisons peuvent expliquer ce phénomène: les poissons sont des animaux d'élevage relativement nouveaux dont les besoins et les exigences ne sont pas totalement élucidés. Ils sont poïkilothermes et ne bénéficient donc pas de la sympathie et de la bienveillance accordées aux animaux à fourrure ou à plumes. Le système nerveux des poissons est d'une structure plus simple, ce qui a conduit à débattre de leur capacité à ressentir la douleur. Les poissons sont dépourvus de néocortex, mais il a été démontré qu'ils possèdent un système nociceptif et qu'ils peuvent donc enregistrer des stimuli douloureux.

L'intérêt accru pour le bien-être des poissons d'élevage manifesté par l'opinion, les pouvoirs publics et les parties commerciales concernées s'est concentré sur les aspects législatifs et les conditions d'élevage.

L'essor permanent des systèmes d'élevage intensif accentuera inévitablement le problème épineux que représente l'élevage éthiquement acceptable. Compte tenu de la grande variété des espèces élevées dans le monde dans les établissements d'aquaculture, de l'insuffisance des connaissances biologiques et des divergences d'opinion quant à un traitement acceptable des animaux aquatiques selon les régions et les pays, il peut être difficile de parvenir à des normes satisfaisantes d'un point de vue éthique dans un avenir proche.

Le document examine en détail différents aspects de l'aquaculture, notamment les conditions d'élevage, l'alimentation, la génétique, la manipulation, le transport, les méthodes d'étourdissement et d'abattage, etc., qui sont importants du point de vue du bien-être animal et de l'éthique. L'accent est mis sur les méthodes de sédation et d'étourdissement des poissons avant l'abattage. Les avantages et les inconvénients de ces méthodes, en termes de bien-être, sont passés en revue.

Resumen

Aspectos del bienestar animal relacionados con la acuicultura

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Palabras clave: bienestar de los animales, peces, condiciones de cría, genética, enfermedades debidas a la producción, sacrificio, transporte

Los animales acuáticos y sus productos derivados figuran entre las principales fuentes de proteínas en el régimen de alimentación humana. Mientras que la actividad pesquera tradicional se ha estabilizado, el sector de la acuicultura se ha ido desarrollando durante las últimas tres décadas hasta convertirse en el productor de alimentos de más rápido crecimiento en el mundo y seguirá creciendo en los próximos años. Todos los animales domésticos tradicionales y los animales de compañía han recibido una considerable atención en la esfera del bienestar animal; sin embargo, el «animal domesticado» más recientemente, el pez de cría, ha recibido escasa atención, pese a que estos animales también están comprendidos en la legislación de varios países.

Pueden ser varias las razones que expliquen esta situación: los peces son animales de cría relativamente nuevos para los cuales no se han elucidado completamente todas las necesidades y demandas. Como son poiquilothermos, no despiertan la simpatía y compasión que se concede a los animales de pelaje y de pluma. El sistema nervioso de los peces es de estructura más simple, lo que lleva al debate de si el pez siente dolor o no. Aunque carece de neocórtex, se ha demostrado que el

pez posee un sistema nociceptivo y, por tanto, puede registrar situaciones dolorosas.

El interés creciente en el bienestar de los peces de cría entre el público, las autoridades públicas y los intereses comerciales ha conducido a enfocar esta cuestión desde el punto de vista de la legislación y de las condiciones acuícolas.

El desarrollo continuo de los sistemas de cría intensiva incrementarán inevitablemente el reto de una acuicultura aceptable desde el punto de vista ético. Teniendo en cuenta la gran diversidad de especies acuícolas criadas en todo el mundo, el conocimiento biológico insuficiente y las diferencias de opinión, nacional y regional, sobre la manipulación aceptable de animales acuáticos, puede ser difícil alcanzar normas éticamente aceptables en los años venideros.

El documento discute en detalle las distintas áreas de la acuicultura, tales como las condiciones de cría, alimentación, genética, manipulación, transporte, métodos de aturdimiento y de sacrificio, etc., en los que el bienestar animal y la ética son importantes. Se hace especial énfasis en los métodos de sedación y aturdimiento del pez antes del sacrificio. Igualmente se discuten las ventajas y desventajas relativas a las cuestiones de bienestar asociadas con tales métodos.

Abstract

Animal welfare issues relating to aquaculture

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Keywords: animal welfare, fish, farming conditions, genetics, production diseases, slaughter, transport

Aquatic animals and aquatic animal products are among the principal sources of protein in the human diet. While traditional fisheries have levelled out, over the last three decades the aquaculture industry has developed to become the fastest growing area of food production in the world, and it will continue to grow in the years to come. While all traditional domestic animals and companion animals have received considerable attention regarding animal welfare, the most recently 'domesticated animal', the farmed fish, has received little attention, despite the fact that these animals are covered by legislation in many countries.

The reasons for this may be several: fish are relatively new farm animals and their needs are not yet fully known, they are poikilothermic, and thus do not invoke the sympathy and compassion awarded to fur- and feathered animals, and the nervous system of fish is more simple in its structure, which has led to discussions about whether or not fish feel pain. (Although lacking a neo-cortex, it has been demonstrated that fish possess a nociceptive system and thus may register painful situations).

The growing interest in the welfare of farmed fish amongst the public, public authorities and commercial interests has focused upon the welfare of fish in legislation and farming conditions.

Continuous development of intensive rearing systems will inevitably increase the challenge as regards ethically acceptable farming. Because of the great diversity in aquaculture species farmed worldwide, insufficient biological knowledge, and differences in national and regional opinion regarding acceptable handling of aquatic animals, it may be difficult to achieve ethically acceptable standards in the near future.

The paper discusses in detail different areas of aquaculture, such as farming conditions, feeding, genetics, handling, transport, stunning and slaughter methods, in which animal welfare and ethics are of importance. Special emphasis is given to methods of sedating and stunning fish prior to slaughter. The advantages and disadvantages of welfare issues associated with such methods are discussed.

The way forward

Cultural, religious and ethical issues associated with animal welfare

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Summary

Domestication of animals for food and as companions was the origin of cultures (customs), religions (beliefs) and ethics (values). A synonym of culture is civilisation. Literature suggests that the farming of crops and animals contributed to the wealth and well-being of our ancestors and played key roles in the advancement of civilisations. Owing to this, animals had a special place in human civilisation. Religions evolved to strengthen or provide new moral guidelines, values and codes. There is no religion without compassion to animals. Ethics evolved with humankind and it will continue to do so because individuals and society as a whole require value and meaning for their actions. Commitment to improving animal welfare should become a 'universal culture', which is the way forward to attaining standards that are ethically justifiable.

Keywords: animal, welfare, civilisation, culture, religion, ethics, attitude, education

Introduction

The majority of people in this world rely on animals for food (consume meat, milk and its products and eggs) and many developing countries rely on animals as a source of energy to produce food crops (e.g. ploughing). It is generally believed that our attitude to animals is influenced by culture, religion and ethics, which are intrinsically linked. Most of us live in a multicultural society and 'Multiculturalism itself is simply the existence and interaction of difference. The problem is how some people REACT to that difference' (Paul Gorski, Association of Professional Humane Educators (APHE); <http://aphe.vview.org>). Needless to say, the intention of this conference and, particularly, this paper is not to provoke or elucidate these 'reactions' but to seek common ground to ensuring animal welfare globally.

Some animals are considered as pets in some countries, whereas, in others they are a potential source of food. This is a contrast rather than a conflict in our multicultural society. Farming of animals for food has been an integral part of agriculture and practised for many centuries with little change. Our increased concern for animal welfare emerges at least on two grounds (1) large scale industrial farming systems are seen as

mass exploitation of animals and not conducive to ensuring animal welfare (refer to paper by Wilkins), and (2) consumers are becoming increasingly concerned about animal welfare and food safety. Duncan and Fraser (1997) aptly wrote, 'Animal welfare is not a term that arose in science to express a scientific concept. Rather it arose in society to express ethical concerns regarding the treatment of animals'. It is therefore not surprising to note that a stakeholder in the UK said, 'Keeping animals is a privilege, not a right' when asked to comment upon 'animal keepers' during a recent consultation process (DEFRA, 2003). The world is becoming one marketplace, for example, chickens produced in Thailand and Brazil are consumed in Europe. Therefore, producers in countries wanting to export cannot afford to ignore the consumer concerns in importing countries if they wish to sustain their economic prosperity and trade. For example, perceived animal welfare benefits have been suggested as an important aspect of consumer motivation in buying organic food and European farmers have certainly responded to this demand. Taking the UK as an example, the estimated farm gate value of organically grown food derived from farm animals has increased dramatically in recent years (Table; Hovi, 2003).

	2001	2002
Beef	3.0	5.7
Lamb	2.1	5.5
Pork	3.5	6.9
Poultry	7.2	10.5
Eggs	21.7	21.3
Dairy	21	47.2

The slight decrease in the egg production sector could be attributed to the confusion consumers were subjected to by misleading labelling during the 1990s (e.g. free range versus barn eggs). Labelling is another issue that concerns consumers and they demand that more information concerning production and slaughter methods, in particular those relevant to animal welfare and food safety, are made available to them. Literature suggests that stress could affect the immune response of all animals and hence would increase colonisation and excretion of pathogens. The inference is that improving animal welfare would have a positive impact on food safety. Owing to this, medical professionals and health organisations are becoming increasingly concerned about the problem of drug resistance in parasites and pathogens, irrespective of whether the infestation and infection affect the health of humans, other animals or are common to both. Another concern of consumers is that of the impact of farming on the environment and developing sustainable farming systems is crucial to achieving this.

Culture

Domestication of animals, which seems to have started with sheep around 9000 BCE (Before Common or Christian Era), was a major event in the evolution of human civilisation. It allowed the hunter-gatherers to become pastoral nomads and eventually establish stable and sedentary communities. This dramatic change in lifestyle seems to have brought with it the need for tribal customs, laws, values and beliefs (The Columbia Encyclopaedia, www.bartleby.com/65/an/animalhu.html; The culture of world civilisations, www.aquinas.edu/homepages/brookdan/CWCtext/chap1/ch1c.html). Therefore, we

could infer that the domestication of animals was the origin of cultures (customs), religions (beliefs) and the ethics (values). Another way of looking at this is that societies hold moral values and their interpretation is a matter of ethics, i.e. ethics is the study of moral values (discussed later).

Literature suggests that the farming of crops and animals (agriculture) contributed to the wealth and well-being of our ancestors and played key roles in the advancement of civilisations. Owing to this, animals had a special place in human civilisation. For example, many of the deities of civilisations were envisioned to have the heads or bodies of animals and birds. Of all the ancient civilisations, Egyptian civilisation fostered the closest relationship with the animal world, for example, Anubis, Bastet, Hathor, Horus, Matet, Seth, and Thoth. In all aspects of life, both secular and sacred, animals were treated as symbols of creation equal in the hierarchy of life to humankind and closely tied both to everyday experience and the realm of the gods (Germond, 2001). Horus was the divine protector and patron of the king and he was envisioned as a falcon. Hathor, depicted as a cow-headed woman or a woman with a cow's horns and ears, was a symbol of motherhood and fertility, suckler of the King, and the patron goddess of unmarried women. Hathor was closely associated with Horus, as his wife and as mother of his son. The Greeks identified Hathor with Aphrodite, the goddess of love, and Hindus (Indus Valley civilisation) worship Kamadhenu, the sacred cow (www.bbc.co.uk/history/ancient/egyptians; www.historylink101.net/egypt). Considering this evidence in the history of humankind, one could argue that there isn't a true culture without compassion to animals. This is probably why many countries, including develop-

ing ones (e.g. India), provide free medical care to humans and other animals. Nearly two thousand people died last year due to rabies in India alone. However public opinion seems to be in favour of neutering, rather than euthanasia, of stray dogs that cause the disease (with no remedy or cure). In addition, the existence of animal cruelty laws in many countries itself can be seen as more evidence to suggest that there isn't a culture in which intentional harm or cruelty to animals is tolerated.

However, APHE lists 'three levels of culture' (<http://aphe.vview.org/packrat/April2000/>):

1. Concrete: clothes, food, music and games are the most visible level of culture.
2. Behavioural: language, social roles, non-verbal communication, family dynamics and structure, government and gender roles.
3. Symbolic: reflects our values and beliefs, including our worldview, religion, customs and spirituality.

It is stated that 'Culture is very complex and our perceptions of animals are culturally based. Even within the animal welfare community there are many different perceptions on any given specific issue'. However, it is also stated that 'No cultural group can be rigidly stereotyped as to behaviours, attitudes or customs. Although there can be commonalities of beliefs or customs in certain ethnic groups, individual members will always represent considerable variations'. It is possible to suggest that this variation is due to individuals' ethics, which could determine how people 'REACT'.

In Egyptian civilisation, Thoth was a moon god who was the inventor of writing, depicted as an ibis-headed man. On the other hand, Anubis was embodied in the jackal (or wild dog) that was seen emerging from a den or scavenging in burial grounds, and hence, associated with the dead and the underworld (funerary god). Although Thoth and Anubis seem to have shared a similar 'status' of being gods, one wonders whether they were possibly the origin of hierarchical positioning or placement of animals based on their natural habitats and human perception of their sentience. In general, animals that provide pleasure, comfort or companionship to humans

are treated better than those reared for food, despite the satiety value that non-vegetarians derive from eating meat. Secondly, the levels of sentience attributed to various farm animals seem to differ. For example, animal welfare laws in many countries prohibit shackling or hanging of conscious animals at the time of slaughter. However it can be done legitimately to poultry species although the process is equally painful and distressing to all (Gentle, 1992). Legislators in some countries (e.g. USA) failed to consider farmed poultry as sentient, and therefore excluded them from the Animal Welfare Act that mandates minimum welfare standards at slaughter. Nevertheless, many practices that inflict unnecessary pain and suffering on animals take place around the world and most of them could be justified on 'cultural' grounds, one way or the other, with some imagination. For example, let us assume that the severing of Achille's tendons in the hind legs of cattle is practiced in Central and southern America to immobilise them prior to slaughter. This practice could be attributed to the influence of Spanish bullfighting culture in these countries (that involves similar intention; Odberg, 1992). Bullfighting comes from the Solutrean culture which, in turn, could be attributed to the hunter-gatherer culture of Neanderthals (*Homo Sapiens*) who were thought to have lived until 20 000 years ago in Iberia; some people attribute this act of cruelty to the Moorish culture who invaded (riding on bulls) southern Europe centuries ago (www.asa3.org/archive/asa/200003/0253.html; www.nicelyhistoryclass.com – for children). It is possible to speculate that the Neanderthals would have evolved, in parallel, and survived to this day perhaps if only they had the imagination, intuition and skill to match that of our ancestors (*Homo Sapiens Sapiens*), i.e. to domesticate animals and to care for them. Modern whaling practices that are cruel have similar 'cultural' backgrounds dating back thousands of years (<http://darwin.bio.uci.edu>).

In contrast with the notion of culture being responsible for our attitudes to animals, issues such as a lack of education, knowledge, understanding, infrastructure and willingness to change seem to be the underpinning causes of cruel practices in some

instances. For example, pigs contained in bamboo baskets are drowned (head first) in water contained in clay pits in some developing countries in South-East Asia, which is extremely painful and distressing. Although the use of carbon dioxide as an anaesthetic gas was abandoned in clinical practice and inhalation of this gas has been known to be acutely painful and distressing in humans, it is widely used to stun or kill pigs and, more disconcertingly, the Food and Agriculture Organisation listed it for killing calves, sheep and pigs (www.fao.org/ag/aga/aw/tanuvavet/miss/a7.txt). Webster (2004) said it eloquently (in his book to be published) that stunning of animals with carbon dioxide makes slaughter without stunning a more humane practice.

Religion

Religions evolved in different parts of the world to strengthen and provide new sets of guidelines, values or codes. Broom (2003) argues on the basis of scientific evidence that the codes of conduct and religions that exist in our society have evolved as a consequence of natural selection, that morally acceptable behaviour benefits humans and other animals and that a principal function of religion is to underpin and encourage such behaviour. Today, some people just obey the teachings of their religion and some others accept the conventional wisdom of the day. For example, some Hindus consider the doctrine of their religion as sacrosanct and hence treat all animals as sentient beings. On the other hand, Catholic doctrine teaches that animals have no souls, although as in other Christian groups, compassion to animals is practised widely (www.humanism.org.uk). Advancement in scientific knowledge and understanding of other animals could be attributed to this change (Fraser, 2001). In Judaism, the Torah law either forbids cruelty to animals or requires Jews to show compassion and mercy throughout their lives. Hunting is forbidden to Jews, since the methods employed to kill animals were considered to be long and painful (Genesis 9:4). The prohibition from working on Shabbat includes not only the master and his family and servants, but also the cattle (Exodus 20:12). A similar set of rules applies during the south Indian

Hindu harvest festival of *mattu pongal* (Tamil). However, cattle are subjected to cruelty in manners similar to bullfighting.

Animal welfare teaching in Islam is evident. Tarik Abdul-Rahman quotes in his article on meat and modernity: A funeral procession passed by Allah's Apostle who said, 'Relieved or relieving?' The people asked, O Allah's Apostle! What is relieved and relieving?' He said, 'A believer is relieved (by death) from the troubles and hardships of the world and leaves for the Mercy of Allah, while (the death of) a wicked person relieves the people, the land, the trees (and) the animals from him' (Bukhari 8.519 Abu Qatada bin Rib'I Al-Ansari) (www.geocities.com/Tokyo/Spa/3879/meat.html). Many more examples are frequently cited on the concept of compassion in Islam (www.bodhicitta.net). These quotes probably explain why Muslim authorities in some countries (e.g. Saudi Arabia, UK, New Zealand) have considered (positively REACTed, perhaps) the animal welfare benefits of pre-slaughter stunning and accepted some methods as being conducive to practising their religious code. Indeed, a joint meeting of the Muslim World League and World Health Organisation in 1985 led to a similar conclusion and recommendation (www.islamset.com/hip/health8/methods.html). Therefore, we could infer that there is no religion without compassion to animals. The aforementioned statements and actions from religious authorities could also be considered as examples of the principal function of religion, which is to underpin and encourage behaviour that benefits humankind and other animals (Broom, 2003). In contrast with this view, although the sharpening of a knife in front of, and killing in sight of, animals awaiting slaughter are prohibited in Islam, these are simply ignored in some countries, which cannot be attributed to culture or religion.

On the other hand, interpretation of religious scripts varies widely and cultural attitudes seem to overcome religious codes or values in some instances. For example, some religious people who would not kill animals (e.g. Buddhists and Hindus) remain meat eaters as did their ancestors during the evolution of religion. Bullfighting carries on in spite of the condemnation from churches

centuries ago. Although the population in the Far East is predominantly Buddhist, domestic and wild animals are subjected to extreme cruel practices.

Ethics

Ethics is the science of moral philosophy (www.utm.edu/research/iep/e/ethics.htm). Animal welfare falls into a category of philosophy commonly referred to as applied ethics. Ethics deals with principles by which our actions may be judged as good or bad, right or wrong. Animal welfare scientists, philosophers and organisations believe that humans have a duty to treat farm animals in ways that respect their welfare and 'intrinsic natures', and the environment that we share with them and, where appropriate, kill them humanely (Sandoe et al., 1997; www.foodethicscouncil.org). As presented in this paper, some argue that people and animals have evolved together in a mutual interdependence, so that animals have become part of our culture (www.foodethicscouncil.org).

Ethics evolved with humankind and it will continue to do so because individuals and society as a whole require value and meaning for their actions. Humanists argue that if human civilisation were to develop all over again, it is highly unlikely that exactly the same religions would develop. However, it is very likely that our basic moral principles would be the same, because humans, who evolved to live in groups, need those kind of rules that enable us to live together cooperatively and harmoniously. Non-believers living in a religious society and religious people living in a society of another religion have many things in common, including ethics. In a secular world, most of the people probably pick and choose from the many conflicting rules by using their ability to reason and to learn from experience (www.humanism.org.uk; see also Broom, 2003).

In terms of ethics and animal welfare, Bentham (1789) wrote, 'The question is not, Can they (animals) reason? nor, Can they talk? But, Can they suffer?' Animal welfare scientists have sought answers to these questions. Philosophers like Sandoe et al. (1997) have elaborated on these questions and presented various views concerning how we ought to

treat other animals, justifications upon which these views are based, and why it is important to hold a justified view concerning one's duties to animals. Nevertheless, ethics concerning animal welfare seems to override the cultural values or religious codes. For example, Plotkin (Rabbi of Temple Beth Am in Margate, Florida, USA and chairman of the Committee on Jewish Law and Standards' kashrut subcommittee) argues, 'The *halakhic* system (Jewish Law) includes cases where an action is prohibited, yet the result of the prohibited act is permitted'. Plotkin's argument is based on the fact that modern intensive farming systems are not conducive to animal welfare and some are against the religious laws. However the animals become potentially kosher when they are brought to the shochet for slaughter (http://learn.jtsa.edu/topics/luminaries/monograph/forum_arshtml). The article clearly highlights the contradiction between the religious laws and agricultural practices. In the same monograph, Lavinsky (Rabbi at Beth El Congregation in Arkon, Ohio, USA) states that 'For centuries, *kashrut* (Jewish dietary Laws) provided the world with the most humane form of slaughter known to humankind. But as the methods of farming and slaughter evolve, the laws of *kashrut* must also evolve to reflect our sensitivity to *tzaar baalei hayim*' (compassion for living beings). Similarly, Cohn-Sherbok, a professor of Judaism at the University of Wales says 'Shechita was the most humane form of slaughter when it developed over a millennium ago, but it is no longer in keeping with high ethical principles'. In addition, these statements are also suggestive of an evolution of religious codes on the basis of ethics. They could also be used as 'REACTIONS' to evolving multiculturalism around the world. They would also justify the need to reform slaughter practices such that improvements in animal welfare on the farm are complemented by improved slaughter methods under any new agricultural policies or initiatives intended for a better future for all the stakeholders. It is worth noting that evolution is a continuous process and any party involved in such a process should not perceive it as a 'moving of the goal posts'.

Therefore, one could argue that our cultural and religious attitudes to animals have been gradually eroded over the years from the

family farming systems, that were based on compassion to animals, to intensive or industrial farming systems based on productivity and profitability. Some of the ways in which we farm, transport and slaughter animals for food are not conducive to ensuring their welfare and they also appear to be in contradiction with our historical cultural and religious values.

The way forward

Ruth Harrison (1964) highlighted to the public during the 1960s that farm animals are subjected to avoidable pain and suffering under the intensive livestock farming systems and their welfare could not be ensured by the existence of laws on the prevention of cruelty to animals. This led to increased public awareness and pressure, and culminated in a series of proactive animal welfare legislation in the UK and Europe. Evidently, our attitudes seem to change to a demand for better practices in line with an increasing level of education, knowledge and understanding of the issues. Therefore, educational institutions should be actively encouraged to cultivate a 'culture of education and research' into animal welfare issues. There are emerging 'cultures' of political, economic and educational reforms around the world and the growing consumer concern certainly warrants an 'animal welfare culture' and a 'culture of commitment to improving animal welfare'. Education rather than legislation is needed in many countries to achieve real progress but education is a slow and lifelong process. The Food Ethics Council has suggested a number of measures as 'the way forward' and I consider one of them to be very appropriate: 'The ethical, social and environmental consequences of the ways in which we use animals for food should be given much greater prominence in education curricula at all levels'. Such an education should be based on sound scientific evidence, rather than culture and / or religion, to benefit humankind in the long term.

Webster (1994) concluded in his book 'Mankind has a capacity for compassion (to animals), and once we have met our immediate needs, we can afford to be compassionate. When we can afford the cost of altruism we

can enjoy the benefits. Until he extends the circle of his compassion to all living things, man will not himself find peace'. However, since very little progress has been made over the last 10 years, he is now persuaded to write 'Limping towards Eden' (Webster, 2004). Mahatma Gandhi said, 'The greatness of a nation and its moral progress can be judged by the way its animals are treated' (www.moggies.co.uk/html/awquotes_2.html). I sincerely hope that this global conference will make a significant contribution to our understanding and commitment to improving animal welfare such that every nation can attain high moral standards.

In summary, it is stated that in view of the fact that domestication of animals was the origin of our cultures, religions and ethics, and that animals continue to be important to the wealth and well-being of humankind, our attitudes to animals should be positive in respect of their welfare. Existing scientific evidence suggests that improving animal welfare would contribute to improving the quality and safety of food we derive from them. Animal welfare education is vital to improving our knowledge and understanding and such an educational programme should be based on sound science. Commitment to improving animal welfare should become a 'universal culture' and I believe this is the way forward.

'Yesterday is but a dream, tomorrow is but a vision. But today well lived makes every yesterday dream of happiness, and every tomorrow a vision of hope. Look well, therefore, to This Day' – Sanskrit Proverb. (www.moggies.co.uk/html/awquotes).

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Résumé

Problèmes culturels, religieux et éthiques associés au bien-être animal

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Mots clés: bien-être animal, civilisation, culture, religion, éthique, comportement, éducation

La domestication des animaux à des fins alimentaires a été un événement majeur dans l'histoire de l'humanité. Elle a permis aux chasseurs-cueilleurs de devenir des pasteurs nomades qui ont fini par créer des communautés sédentaires et stables. Ce changement radical de style de vie a eu pour corollaire la nécessaire adoption de coutumes, de lois, de valeurs et de croyances tribales. Nous pouvons donc en déduire que la domestication des animaux est véritablement à l'origine des cultures (coutumes), des religions (croyances) et de l'éthique (valeurs). La civilisation est synonyme de culture. Il ressort de la littérature publiée que l'agriculture et l'élevage des animaux ont contribué à la richesse et au bien-être de nos ancêtres et ont joué un rôle clé dans le progrès des civilisations et dans la création de monuments. En cela, les animaux ont occupé une place particulière dans la civilisation humaine. Nombre de divinités, tant dieux que déesses, de ces grandes civilisations ont été imaginées avec une tête et un corps d'animal ou d'oiseau. Aujourd'hui encore, aucune culture au monde ne tolère qu'on nuise intentionnellement aux animaux ou qu'on commette des actes de cruauté envers eux.

Dans les différentes régions du monde, les religions se sont constituées pour renforcer ou apporter de nouvelles règles, valeurs ou prescriptions morales. Il n'existe pas de religion qui ne préconise la compassion et n'interdise les actes de cruauté envers les animaux. Dans la société actuelle, d'aucuns se contentent d'obéir aux préceptes de leur religion et d'autres acceptent les conventions du moment. Cependant, quelles que soient nos différences, nous considérons les animaux

comme des êtres dotés de sensibilité. C'est pourquoi les humanistes affirment que si le parcours de la civilisation humaine était à refaire, il est fort improbable que les mêmes religions auraient pris naissance de la même façon. En revanche, il est très vraisemblable que nos principes moraux de base (éthique) seraient identiques puisque les humains, qui ont évolué vers la vie en groupe, ont besoin de règles qui leur permettent de vivre ensemble de façon harmonieuse et dans l'assistance mutuelle.

L'éthique est la science de la morale. Elle s'est développée et continuera d'évoluer avec le genre humain car les individus et la société dans son ensemble ont besoin de donner une valeur et un sens à leurs actions. Les éthiciens soutiennent que les animaux d'élevage qui se sont prêtés à la domestication par les humains s'attendaient probablement que ceux-ci prennent soin d'eux ou ont été génétiquement conditionnés pour le croire au fil des millénaires. C'est pourquoi nous avons une obligation morale envers les animaux. Notre attitude culturelle et religieuse à l'égard des animaux s'est progressivement altérée au fil du temps et nous sommes passés des systèmes d'élevage familiaux fondés sur la bienveillance envers les animaux à des systèmes d'élevage intensifs et industriels axés sur la productivité et la rentabilité. Certains des modes d'élevage, de transport et d'abattage des animaux à des fins alimentaires ne sont pas propres à assurer leur bien-être et apparaissent comme étant en contradiction avec nos vraies valeurs culturelles et religieuses.

La domestication des animaux étant à l'origine de nos cultures, religions et valeurs

éthiques, et les animaux restant importants pour assurer la richesse et le bien-être de l'humanité, notre attitude envers eux doit favoriser leur bien-être. Il existe des preuves scientifiques indiquant que le mieux-être des animaux contribuera à améliorer la qualité et la sécurité sanitaire des aliments d'origine animale que nous produisons. L'éducation en matière de bien-être animal est essentielle au perfectionnement de nos connaissances, et un tel programme pédagogique doit être

étayé par des éléments scientifiques solides. L'engagement en faveur de l'amélioration du bien-être animal doit devenir une «culture universelle». Il représente à mon sens l'une des étapes de demain.

«Hier n'est qu'un rêve et demain n'est qu'une vision. Mais aujourd'hui, bien vécu, fait de chaque hier un rêve de bonheur, et de chaque demain une vision d'espoir. Vis donc ce jour avec confiance» (proverbe sanscrit).

Resumen

Aspectos culturales, religiosos y éticos asociados al bienestar animal

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Palabras clave: animal, bienestar, civilización, cultura, religión, ética, actitud, educación

La domesticación de animales con fines alimentarios fue un acontecimiento principal para la civilización humana. Facilitó el paso de los cazadores-recolectores a nómadas pastores y, en última instancia, el establecimiento de comunidades estables y sedentarias. Este cambio dramático de estilo de vida conllevó la necesidad de establecer costumbres, leyes, valores y creencias tribales. Podemos, por tanto, inferir que la domesticación de los animales fue, en efecto, el origen de las culturas (costumbres), de las religiones (creencias) y de la ética (valores). La civilización es un sinónimo de cultura. La literatura sugiere que la agricultura y la cría de animales contribuyeron a la riqueza y al bienestar de nuestros ancestros y desempeñaron papeles clave en el progreso de las civilizaciones y la creación de monumentos. Por estas razones, los animales ocupan un lugar especial en la civilización humana. Muchas de las divinidades de las grandes civilizaciones fueron imaginadas con las cabezas o cuerpos de animales. Incluso hoy, no hay ninguna cultura en el mundo que tolere el daño o la crueldad intencionales hacia los animales.

Las religiones evolucionan en diferentes partes del mundo para reforzar u ofrecer nuevas pautas morales, valores o códigos. No hay religión que carezca de compasión hacia los animales y que no prohíba estrictamente la crueldad hacia éstos. En la sociedad actual, los hay quienes sólo obedecen las enseñanzas de su religión y los que aceptan la sabiduría convencional del día. Sin embargo, a pesar de nuestras diferencias, consideramos a los animales como seres sensibles. Así pues, los humanistas sostienen que si la civilización humana tuviera que volver a desarrollarse, sería poco probable que se crearan exactamente las mismas religiones. En cam-

bio, es bastante probable que nuestros principios morales básicos (ética) fuesen los mismos, porque, como humanos que hemos evolucionado para vivir en grupo, necesitamos reglas que nos permitan vivir juntos en cooperación y armonía.

La ética es la ciencia de la moral. Evoluciona junto con la humanidad y seguirá haciéndolo porque los individuos y la sociedad en su conjunto necesitan atribuir un valor y un significado a sus acciones. Los éticos afirman que los animales de granja que mostraron tendencia a la domesticación por el hombre probablemente confiaban, o esta impresión genética se fue forjando durante milenios, en que los humanos los cuidarían y, por consiguiente, tenemos una obligación moral. Nuestras auténticas actitudes culturales y religiosas para con los animales se han deteriorado con el paso de los años desde los sistemas agrícolas familiares basados en la compasión por los animales, hasta los sistemas agrícolas intensivos o industriales basados en la productividad y en la rentabilidad. Algunas formas de cría, transporte y sacrificio de animales para el consumo no llegan a garantizar su bienestar y, según parece, están en contradicción con nuestros valores culturales y religiosos.

En vista de que la domesticación de los animales dio origen a nuestras culturas, religiones y ética, y que los animales siguen siendo importantes para la riqueza y el bienestar de la humanidad, nuestras actitudes hacia ellos han de ser positivas para su bienestar. Las pruebas científicas existentes sugieren que una mejora del bienestar de los animales contribuiría a mejorar la calidad y seguridad de los alimentos que nos brindan. La educación sobre el bienestar animal es vital para mejorar

nuestro conocimiento y comprensión; de hecho, un programa educativo de este tipo debe tener un buen fundamento científico. El compromiso para mejorar el bienestar de los animales debe ser una «cultura universal»; creo que ésta es la perspectiva del futuro.

«El ayer no es más que un sueño; el mañana no es más que una visión, pero el presente bien vivido hace de cada ayer un sueño de felicidad y de cada mañana una visión de esperanza. Por lo tanto prestemos atención a este día.» (Proverbio sánscrito.)

Abstract

Cultural, religious and ethical issues associated with animal welfare

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Keywords: animal, welfare, civilisation, culture, religion, ethics, attitude, education

Domestication of animals for food was a major event in the civilisation of humankind. It facilitated the hunter-gatherers to become pastoral nomads and eventually establish stable and sedentary communities. This dramatic change in lifestyle brought with it the need for tribal customs, laws, values and beliefs. Therefore, we could infer that domestication of animals was indeed the origin of cultures (customs), religions (beliefs) and ethics (values). A synonym of culture is civilisation. Literature suggests that farming of crops and animals contributed to the wealth and well-being of our ancestors and played key roles in the advancement of civilisations and creation of monuments. Owing to this, animals had a special place in human civilisation. Many of the deities of gods and goddesses of these great civilisations were envisioned to have the heads or bodies of animals and birds. Even today, there isn't a culture in the world in which intentional harm or cruelty to animals is tolerated.

Religions evolved in different parts of the world to strengthen or provide new moral guidelines, values or codes. There is no religion without compassion to animals and cruelty to animals is strictly prohibited. In today's society some people just obey the teachings of their religion and some others accept the conventional wisdom of the day. However, regardless of our differences, we consider animals as sentient beings. Humanists therefore argue that if human civilisation were to develop all over again, it is highly unlikely that exactly the same religions would develop. But it is very likely that our basic moral principles (ethics) would be the same, because humans, who evolved to live in groups, need the kinds of rules which enables us to live together cooperatively and harmoniously.

Ethics is science of morals. It evolved with humankind and it will continue to do so because individuals and society as a whole require value and meaning of their actions. Ethicists argue that farm animals that tended themselves to be domesticated by humankind probably trust, or have been genetically imprinted over thousands of years to believe, that humans will take good care of them. Therefore, we have a moral obligation to animals. Our true cultural and religious attitudes to animals have been gradually eroded over the years from the family farming systems that were based on compassion to animals to intensive or industrial farming systems based on productivity and profitability. Some of the ways in which we farm, transport and slaughter animals for food are not conducive to ensuring their welfare and they also appear to be in contradiction with our true cultural and religious values.

In view of the fact that domestication of animals was the origin of our cultures, religions and ethics, and animals continue to be important to the wealth and well-being of humankind, our attitudes to animals should be positive towards their welfare. Existing scientific evidence suggest that improving animal welfare would contribute to improving the quality and safety of food we derive from them. Animal welfare education is vital to improving our knowledge and understanding and such an educational programme should be based on sound science. Commitment to improving animal welfare should become a 'universal culture' and I believe this is the way forward.

'Yesterday is but a dream, tomorrow but a vision. But today well lived makes every yesterday a dream of happiness, and every tomorrow a vision of hope. Look well, therefore, to this day' – Sanskrit proverb.

The application of legislation, scientific guidelines and codified standards to advancing animal welfare

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Summary

The New Zealand experience of incremental animal welfare change management over the last 25 years is used to illustrate the importance of a number of critical factors and the different roles that can be played by legislation, scientific guidelines and codified standards. Matters considered include changes in the law that reflect the evolution of societal attitudes towards animals, the need for leadership and wide participation in achieving forward-looking animal welfare developments, the roles of science in setting standards, and the complementary roles of the veterinary profession, animal welfare advocacy groups and public input. Also addressed are key factors in developing a comprehensive and well-coordinated animal welfare infrastructure, supported by robust legislation. Finally, these factors are related to the OIE strategic animal welfare initiative.

Keywords: animal welfare science, leadership, advice, guidelines, participation, law, comprehensive infrastructure

Introduction

Progress in animal welfare began well before the 1970s when the term 'animal welfare' first came into use (15). It initially occurred mainly via science-based improvements in animal nutrition and health, but these are only two of the five major areas of need where compromise to animal welfare may occur, the others being environmental, behavioural and mental areas (6, 9). As good welfare is present when the needs of animals are met in these five areas (6, 9), defining what those needs are and devising practical ways of meeting them have made major contributions to improving animal welfare.

The focus of much science-based activity 25 to 50 years ago was on improving the productivity of farm livestock (e.g. 10), but animal welfare improved at the same time because of the close linkages between health and welfare. During the last 20 to 25 years, and especially the last 10 to 15 years, such activities have increasingly had an explicit animal welfare focus. Their main purposes being to develop and introduce scientifically verified and improved methods for manag-

ing farm livestock and other animals. Examples include practices designed to minimise the pain and distress livestock experience before and during slaughter (5, 15), the distress, injury and pain caused during transport (2, 15), the distress caused by painful husbandry practices (7, 8), the suffering caused by vertebrate pest control methods (3, 5), and many more (16).

Such scientific advances have driven animal welfare improvements by identifying problem areas and helping to provide practical solutions, and by validating existing acceptable practices. They demonstrably form the foundations of numerous positive changes that have occurred over many years.

On the other hand, some critics argue that the application of science has actually caused many animal welfare problems by exploiting animals to their detriment, and among the examples they cite are some features of intensive pig and poultry production systems. However, it is important to recall that major reasons for the original adoption of, for instance, sow stalls and layer hen cages were to improve the nutritional and health

status of the animals and the hygiene and stability of their environments. It is because marked improvements were made in these areas that we are now free to focus on other welfare problems, including those associated with barren environments and behavioural restrictions.

These science-driven developments in the productivity, health and welfare arenas have been associated with major changes in how animals are perceived, especially with regard to what their needs are, how they are affected positively or negatively by what is done to them, and how they should be treated. These changes are part of a continuing evolution in thinking about the ways animals may be used legitimately for human purposes and the responsibilities we have towards the animals we use for these purposes. When evolution in thinking leads to a more general acceptance of new ideas, changes in practice almost invariably follow. This will continue to be the case during ongoing change in the animal welfare arena. However, although animal productivity and health will quite rightly continue to receive significant attention for many years, animal welfare thinking and practice are developing to such an extent that they will clearly be major foci internationally for the foreseeable future. The mounting of this OIE First Global Conference on Animal Welfare attests to this.

Science has been emphasised in this paper thus far. However, the challenge posed by animal welfare developments is characterised, nationally and internationally, by a need to address cultural, religious, ethical, economic and political issues, not only scientific issues. All need consideration when we seek to formulate robust and credible animal welfare policies and guidelines for application globally. Cultural, religious and ethical issues are subjects covered in the preceding paper (13) and the others are considered here.

There is also a need to adopt credible practical strategies for progressing positive animal welfare developments. New Zealand experience shows that making a genuine commitment to incremental improvement towards defined and reachable higher standards

allows some immediate progress, the specific scheduling of further improvements in the future, sustained stakeholder involvement in the process and time for more complex issues to be analysed and resolved (9). Demanding immediate compliance with what are at the time unreachably high standards has the opposite effects (9). Accordingly, the New Zealand experience of incremental animal welfare change management, over the last 25 years, is used here to illustrate the importance of a number of critical factors and the different roles that can be played by legislation, scientifically supported guidelines and codified standards.

Legislative developments

The major changes in our knowledge of animals and our attitudes towards them that have occurred during the last 50 years are evident in New Zealand legislation. The Animals Protection Act (1960) focused primarily on defining, identifying and punishing acts of neglect, ill treatment and cruelty. It took a traditionally reactive approach. In contrast, the Animal Welfare Act (1999) now requires a 'duty of care' towards animals we control or own. Although neglect, ill treatment and cruelty are still prohibited and punishable under this act, our 'duty of care' covers a much broader spectrum of behaviour towards animals. The act takes a proactive approach of defining a number of core obligations whereby animal care-givers or owners are required to meet animals' physical, health and behavioural needs. However, although these outcomes are set by the legislation, the ways individual animal care-givers or owners reach them are essentially up to each individual. This outcomes orientation is a strong feature of New Zealand's animal welfare policy. It focuses on what is important – the welfare status of the animal – and thereby allows flexibility and innovation in how an acceptable welfare state is achieved.

Leadership and participation in animal welfare change management

Primary responsibility for animal welfare in New Zealand rests with one government

minister, the minister of agriculture, who is advised by two independent national committees. The first is an animal welfare committee (NAWAC ⁽¹⁾) which deals with welfare-related matters relevant to virtually all animal uses in New Zealand. A major exception is the scientific uses of animals (i.e. research, teaching and testing), which are the responsibility of a national animal ethics committee (NAEAC ⁽²⁾). These formal arrangements and the duties of the different parties are outlined in the Animal Welfare Act (1999). They were developed over a period of about 20 years by a number of forward-looking individuals who recognised the value of having animal welfare well managed and regulated at a national level and who displayed the resolve to see the project through to completion.

The provision of independent advice from a national animal welfare committee (NAWAC), consisting of animal welfare advocates, animal welfare and livestock scientists, educators, veterinarians, primary industry stakeholders, lay people and others, was considered to be an important means of identifying animal welfare problems and effective remedies for them. This New Zealand committee was modelled on a similar advisory body in the United Kingdom (FAWC ⁽³⁾). Between 1989 and 1999, this committee led the development of 21 codes of recommendations and minimum standards for the welfare of animals. Although these codes were voluntary, they were widely adopted. Under the Animal Welfare Act (1999), codes of welfare replace the previous voluntary codes, and the minimum standards outlined in them are legally binding. Input from stakeholders, others likely to be affected and by the wider public is required under the law and is essential because the minimum standards, once implemented as regulations, apply to all people living in New Zealand. Wide consultation during the formulation of these codes, as occurred with the previous voluntary codes, is considered to be a major factor in securing stakeholder cooperation with implementing them.

Moreover, the 10-year period during which the previous voluntary codes were developed and used successfully is also considered to have greatly facilitated acceptance by stakeholders and others of the legally binding minimum standards in the codes of welfare mandated under the Animal Welfare Act (1999).

The NAEAC and the regulatory system it advises on were established by amendments of the Animals Protection Act in 1984 and 1987. The initiative for this came from New Zealand animal-based scientists and their institutions (universities, research institutes) with additional participation from animal welfare advocates, ministry officials and others (1). The system was designed to encourage animal-based scientists and their institutions to explicitly take ethical responsibility for their actions rather than to negotiate a centrally regulated, bureaucratic 'obstacle course' without much thought for the ethical implications of their planned actions (14). The system, which involves institutional animal ethics committees and codes of ethical conduct which are formally approved on the recommendation of the NAEAC, is legally mandated under the Animal Welfare Act (1999).

A key mechanism for highlighting the ethical dimensions of the scientific use of animals in New Zealand was the establishment in 1993 of an Australian and New Zealand council (Anzccart ⁽⁴⁾) which, through its annual conferences and other activities, successfully explores the different dimensions of the humane, responsible and ethical use of animals in science (e.g. 4). The work of this council therefore complements and enhances the regulatory oversight role of the NAEAC, and has attracted international attention and respect.

Wide participation was a major feature of these developments and it continues with the ongoing work of the two national advisory committees (NAWAC, NAEAC) and the Anzccart, the members of which are national figures of high standing whose dedicated

⁽¹⁾ NAWAC: National Animal Welfare Advisory Committee.

⁽²⁾ NAEAC: National Animal Ethics Advisory Committee.

⁽³⁾ FAWC: Farm Animal Welfare Council.

⁽⁴⁾ Anzccart: Australian and New Zealand Council for the Care of Animals in Research and Teaching.

and generous input of time and effort is given in a true spirit of public service.

The Animal Welfare Act (1999) was the product of at least a decade of policy development and advocacy. After initial drafting, done by ministry officials (MAF ⁽⁵⁾), the draft legislation was not given high priority until the late-1990s when members of a national consultative committee (ABWCC ⁽⁶⁾) wrote to all Members of Parliament (MPs) asking for their support for new animal welfare legislation. One MP, a veterinarian, offered to guide such a bill through the parliamentary process. The ABWCC, which includes representatives of animal welfare organisations, the national veterinary association, animal welfare scientists and other researchers, educators, primary industry groups, companion animal groups, zoos, research funding authorities, regulators, various ministries, and others, then commissioned an animal welfare lawyer to draft a private member's bill. This bill was selected by ballot and, together with an updated version of a government bill (drafted by the MAF), was considered by Parliament with active input from members of the ABWCC, the two national advisory committees and numerous others. The act came into force on 1 January 2000. These events further illustrate how a group of action-orientated individuals, who were also committed to seeing the process through to completion, achieved major advances in the animal welfare arena in New Zealand.

Roles of science in setting animal welfare standards

The Animal Welfare Act (1999) requires that when the NAWAC considers the content of draft codes of welfare, in particular minimum standards and recommendations for best practice, it must, among other things, have regard to good practice, scientific knowledge and available technology. Science is therefore expected to play a major part when the committee seeks to define animal welfare standards: but what sort of science, and what part does it play?

⁽⁵⁾ MAF: Ministry of Agriculture and Forestry.

⁽⁶⁾ ABWCC: Animal Behaviour and Welfare Consultative Committee.

What sort of science?

Animal-based, as opposed to physical, sciences are clearly the most relevant to animal welfare and these may be classified according to the recognised disciplines of, for instance, anatomy, biochemistry, genetics, nutrition, physiology, pharmacology, parasitology, pathology, microbiology, behavioural science and clinical sciences. Superimposed on these disciplines, and evident within each, are three orientations. They relate to whether research activity in particular is directed towards: (1) acquiring knowledge of biological processes simply to improve understanding (fundamental studies); (2) seeking solutions to practical, husbandry, clinical or other problems in the medium term by acquiring fundamental knowledge in a more directed way (strategic studies); or (3) seeking such solutions in the near future by using established knowledge to solve specific problems (applied studies).

Animal welfare science has emerged during the last 10 to 15 years as a recognised discipline and encompasses animal-based facets of nutritional, environmental, health, behavioural and cognitive/neural sciences. As noted above, consideration of all five areas is necessary to achieve comprehensive coverage of the different dimensions of animal welfare. Moreover, it is necessary for fundamental, strategic and applied research to be conducted in all five of these areas.

What part does science play?

Science plays a major role when minimum standards and recommendations for best practice are formulated. Scientific knowledge with the dimensions outlined above and the scientific method in terms of its rigour and objectivity of evaluation, including critical peer-review, are both employed. However, it is not only experimental support for animal care and management practices that is considered. Also included are common sense (critically evaluated), experience with the practical care and management of animals in the circumstances of their use, clinical observation of health and welfare status, and experience with the outcomes of veterinary therapies.

However, these elements of knowledge and experience are not sufficient in themselves, individually or collectively, to determine precisely what are and are not acceptable minimum welfare standards. They allow the known and unknown, theoretical and practical, workable and unworkable facets of each problem to be evaluated, and thereby provide a basis for decision-making. In some cases, what a standard should be is apparently obvious, whereas in others it is less clear. In all cases, however, it is a matter of judgement, judgement exercised collectively through the combined and diverse expertise of the NAWAC members, expertise which extends beyond science (see above).

No such animal welfare decisions can be made on the basis of science alone, but science does underpin all of them. Judgement, broadly based and carefully exercised, is the other major element. Thus, the New Zealand NAWAC defines minimum welfare standards and makes recommendations for best practice by exercising scientifically informed best judgement.

New Zealand's animal welfare science research capability

Building on decades of wide-ranging research in animal and veterinary sciences, the 1990s saw a marked increase in New Zealand's specific animal welfare science capability. In 1991, an animal welfare science research group was created in the country's only veterinary school (7) at Massey University and a centre for research into animal behaviour and welfare was established at a national animal research institute (ABWRC (8)) at AgResearch (Hamilton). A growing recognition within livestock industries of the strategic significance of animal welfare for New Zealand's continuing export success, resulted, in 1993, in an agricultural trust (AGMARDT (9)) providing funds for the establishment at Massey University of a Chair

in Animal Welfare Science. The leadership provided greatly strengthened the country's burgeoning animal welfare research and educational activities. A continuing commitment to animal welfare science, together with a growing interest nationally and internationally in ethical issues raised by animal management and use generally (e.g. 3, 5, 9, 16, 17), led to the establishment in 1998 of a Massey University centre to provide leadership in this additional area (AWSBC (10)). Throughout the same period, animal welfare research was also undertaken by a group in an institute funded by the meat industry (MIRINZ (11)) and by individuals in other research centres.

These and other developments have provided New Zealand with wide-ranging expertise in animal welfare science and the capacity for linked bioethical analysis. This strength is essential for reviewing and establishing credible animal welfare standards nationally, for providing authoritative critiques of standards operating in other countries, and to maintain the respect currently accorded to New Zealand standards internationally. Both national advisory committees (NAWAC, NAEAC) regularly draw on this expertise. During the 1990s, increasing MAF funding was made available to support specific research projects designed to address particular issues of interest to these national committees (12). Other areas of animal welfare research were also supported by industry groups and by a national public good science-funding agency (FRST (12)).

Roles of the veterinary profession

From the mid-1990s, in recognition of the close relationship between animal health and welfare, the veterinary profession in New Zealand strongly supported specific animal welfare initiatives. This built on the profession's comprehensive contributions over many decades through its focus on promoting animal health. Thus, veterinarians con-

(7) Veterinary Science Faculty.

(8) ABWRC: Animal Behaviour and Welfare Research Centre.

(9) AGMARDT: Agricultural and Marketing Research and Development Trust.

(10) AWSBC: Animal Welfare Science and Bioethics Centre at Massey University.

(11) MIRINZ: Meat Industry Research Institute of New Zealand.

(12) FRST: Foundation for Research, Science and Technology.

tribute in numerous ways: through service on the two national advisory committees (NAWAC, NAEAC); as independent members of all institutional animal ethics committees; as a respected source of animal welfare advice for animal owners and caregivers; by providing expert field support in animal welfare investigations and prosecutions; by helping to maintain New Zealand's 'disease-free' status through major roles in biosecurity and disease surveillance; by explicit responsibility for humane handling and slaughter of livestock in all commercial processing plants; as MAF staff members with specific responsibility for promoting animal health and welfare; and other roles.

Roles of animal welfare advocacy organisations

A major New Zealand organisation (RNZSPCA⁽¹³⁾) has made sustained contributions to animal welfare nationally by direct involvement in all of the above developments. Its members continue to contribute as appointees to the two national advisory committees (NAWAC, NAEAC), as independent members of all institutional animal ethics committees and, through their local organisations, as animal welfare inspectors recognised under the Animal Welfare Act (1999). Animal rights advocacy groups (e.g. SAFE⁽¹⁴⁾) are also active in highlighting what they consider to be inappropriate and unethical animal use. One of these groups (ARLAN⁽¹⁵⁾) consists of lawyers who provide legal analyses of different features of draft codes of welfare when they are released (by the NAWAC) for public comment. This trend of increasing legal input and challenge to animal welfare standards is also evident internationally.

Roles of public input

The requirement under the Animal Welfare Act (1999) that the public must have input into all draft codes of welfare before the NAWAC recommends them to the Minister for Agriculture has advantages and disad-

vantages. The major advantage is that carefully argued, detailed comment, both positive and negative, is provided by some submitters on every aspect of draft codes, which helps to ensure that the full spectrum of views on each issue is considered thoroughly before code details are finalised. A major disadvantage is that single-issue lobbying, supported by advertising campaigns and pre-printed postcard submissions, heightens public expectations for change beyond the legally mandated capacity of the national advisory committee to respond. An additional disadvantage is that consideration of all submissions is exceptionally time-consuming and slows completion of codes, which itself elicits critical comment from some members of the public. Nevertheless, the national advisory committee welcomes all public input, takes it very seriously, and considers explicitly every matter raised about draft codes.

New Zealand experience suggests that it is important to encourage wide stakeholder input in order to ensure that highly vocal, well-organised, single-issue advocacy groups are not the only ones heard. Domination by such groups can impede desired progress by generating defensive reactions which tend to reinforce the status quo. The commitment of the OIE to broadly-based and internationally recognised stakeholder input into the development of global animal welfare guidelines, as indicated by the diverse affiliations of those attending this conference, is therefore to be welcomed.

Principal features of a cohesive animal welfare infrastructure

A cohesive and integrated animal welfare infrastructure has developed in New Zealand during the last 20–25 years. Initially, each component emerged independently in order to manage specific welfare issues as they arose. By the mid-1990s, however, the value of coordinating activities to achieve a managed evolution to the current comprehensive national infrastructure was recog-

⁽¹³⁾ RNZSPCA: Royal New Zealand Society for the Prevention of Cruelty to Animals.

⁽¹⁴⁾ SAFE: Save Animals from Exploitation.

⁽¹⁵⁾ ARLAN: Animal Rights Legal Advocacy Network.

nised. The MAF created an animal welfare group which, in addition to providing support for the two national advisory committees (NAWAC, NAEAC) and constructive input into most other animal welfare activities nationally, also developed extensive networks and relationships with key international stakeholders (11).

As high animal welfare standards do not arise spontaneously, continuing activity is required in several areas. These include: education at all levels, high quality research, defining operationally credible animal welfare standards, continuing formal review of those standards, providing practical advice on how to meet them, surveillance to ensure that the standards are maintained, and enforcement accompanied, where necessary, by penalties. These facets of the New Zealand animal welfare infrastructure are directly or indirectly defined and empowered by the Animal Welfare Act (1999).

Finally, New Zealand experience demonstrates that assigning responsibility to one minister and one ministry substantially improves the capacity for integrated, comprehensive and effective management of animal welfare nationally.

Public awareness of animal welfare

The support of all political parties for the Animal Welfare Act when it passed through the New Zealand Parliament in 1999 indicated an undercurrent of thought favouring commitment to and effective management of animal welfare nationally. However, apart from sporadic interest in specific animal welfare issues, generated by vocal pressure groups, in the population as a whole, the majority of people probably do not think about animal welfare very much. Most people are content to be reassured that processes, procedures, standards and binding welfare guidelines are in place to allow them to go about their daily lives without worrying about whether they are contributing to animal suffering. They place their trust in the governmental system and voluntary national organisations, such as the SPCA⁽¹⁶⁾, to keep things right. Those directly involved in the

system for managing animal welfare nationally therefore have the responsibility to ensure that this public trust is well founded. It is interesting to note that welfare standard-setting by multinational food companies that use animal-derived products is currently also contributing to animal welfare initiatives internationally.

Concluding remarks

Improvement in animal welfare standards is facilitated by the introduction of a coordinated national infrastructure. It requires wide participation of stakeholders, groups with particular interests in animal welfare and the general public, and time for those directly affected by proposed changes to assimilate the new ideas and approaches. Changes in animal welfare law generally follow shifts in thinking and are facilitated when responsibility for implementing them rests with one minister and ministry.

Although science has made major contributions to improving animal welfare, science alone cannot be used to determine what are and are not acceptable animal welfare standards. Judgement, involving consideration of cultural, social and ethical issues, practicalities of achieving change, economics and other factors, is also required. Nationally, there is value in nurturing animal welfare, veterinary and related sciences and the capacity for linked bioethical analysis. There is also value in having good international networks in these areas.

When setting standards that are defined by binding guidelines it is important to focus on outcomes, as there are many different ways of achieving a good welfare status, and being too prescriptive with regard to inputs tends to stifle innovation and impede progress. Moreover, continuing progress is possible when standard setting is done in the context of a genuine commitment to incremental improvement towards defined and reachable higher welfare standards. Some progress is possible immediately, further improvements can be scheduled, sustained stakeholder participation is encouraged and time is allowed to deal with more complex issues.

⁽¹⁶⁾ SPCA: Society for the Prevention of Cruelty to Animals.

The OIE, with its extensive international networks and its commitment to consultation and participation, is well suited to undertake this global animal welfare initiative. The diverse inputs that this process will elicit will undoubtedly contribute to significant further developments in animal welfare thinking and practice. Thus, all of those attending this conference will contribute to the continuing improvement in animal welfare standards, but now, and for the first time, credibly on a global scale.

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Résumé

Application de la législation, des lignes directrices scientifiques et des normes codifiées relatives à l'amélioration du bien-être des animaux

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Mots clés: bien-être animal, direction, conseil, lignes directrices, participation, législation, organisation

L'évolution de l'état d'esprit au regard du bien-être animal au cours des cinquante dernières années a engendré un important problème de gestion du changement. Cela s'applique tant à l'amélioration des systèmes existants qu'au passage à des systèmes plus acceptables dans des délais plus réalistes. Les notions de gestion de la qualité totale, d'amélioration permanente et de gestion du changement font l'objet de nombreuses publications et s'appliquent directement au domaine du bien-être animal.

Le défi du bien-être animal se caractérise par la nécessité de prendre en compte des questions d'ordre culturel, religieux, économique, politique, éthique et scientifique dans la mise en place de politiques et de pratiques tangibles et crédibles en matière de bien-être animal. Il est également nécessaire d'adopter des stratégies pratiques fiables visant à soutenir l'amélioration du bien-être des animaux. S'attacher à évoluer progressivement vers des normes supérieures bien définies permet de réaliser des avancées immédiates, de programmer les améliorations de demain, de faire participer durablement les parties prenantes au processus et de dégager du temps pour analyser et résoudre des problèmes plus complexes. Il est toutefois admis que les politiques reposant sur une philosophie de changement évolutionniste et progressif ne satisferont pas les groupes minoritaires de l'une ou l'autre des extrémités de l'éventail d'opinions concernant le bien-être et les droits des animaux.

L'expérience de la Nouvelle-Zélande concernant la gestion progressive du changement en matière de bien-être animal au cours des vingt-cinq dernières années permet d'illustrer l'im-

portance d'un certain nombre de facteurs essentiels et de mettre en lumière les différents rôles que peuvent jouer la législation, les recommandations scientifiques et les normes codifiées.

Figurent parmi ces facteurs:

- Le rôle des associations de défense du bien-être animal
- Le rôle de la profession vétérinaire
- Le rôle des comités consultatifs ministériels indépendants
- Le rôle des comités consultatifs nationaux
- L'importance des capacités scientifiques en faveur du bien-être animal
- Le recours initial aux codes librement consentis
- Le passage aux codes adoptés par voie réglementaire
- Les avantages et les inconvénients des consultations publiques
- Les lois fondées sur les résultats par opposition à une législation normative
- L'importance de l'implication des parties prenantes et de leur sentiment d'adhésion pleine et entière
- Le rôle et les possibilités des programmes d'assurance qualité

L'importance que revêtent certains de ces facteurs sera illustrée par des exemples pratiques. Il sera également fait mention du poids croissant du marché en tant que moyen permettant d'établir les normes et d'assurer leur respect, à travers l'influence des consommateurs et des détaillants.

Resumen

Aplicación de la legislación, de las directrices científicas y de los códigos de normas para favorecer el bienestar de los animales

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Palabras clave: ciencia del bienestar de los animales, liderazgo, asesoría, directrices, participación, ley, infraestructura global

En la medida en que las actitudes respecto al bienestar animal han evolucionado durante los últimos cincuenta años, también han presentado un importante reto de gestión de cambio. Esto se aplica tanto a las mejoras de los sistemas existentes como al paso a sistemas más aceptables en un plazo realista. Los conceptos de gestión de calidad total, mejora continua y gestión del cambio son objeto de una extensa literatura de gestión y son directamente pertinentes en el ámbito del bienestar animal.

El reto del bienestar animal se define por la necesidad de hacer frente a cuestiones culturales, religiosas, económicas, políticas, éticas y científicas en la formulación de políticas y prácticas sólidas y dignas de crédito. También es necesario adoptar estrategias prácticas y fidedignas para mejorar el bienestar animal. Además, un compromiso para una mejora continua que aspire a la definición de normas más altas y permita realizar progresos inmediatos, el calendario específico de otras mejoras en el futuro, la implicación sostenida de las partes interesadas en el proceso y tiempo para cuestiones más complejas que deben analizarse y resolverse. No obstante, se reconoce que las políticas basadas en una filosofía de cambio evolutivo creciente no satisfarán a los grupos minoritarios en los extremos del espectro de opinión sobre el bienestar animal o los derechos de los animales.

La experiencia neozelandesa de una gestión mejor del cambio en lo referente al bienestar animal, durante los últimos veinticinco años,

sirve para ilustrar la importancia de una serie de factores críticos y los diferentes papeles que pueden desempeñar las legislaciones, las directrices científicas y las normas codificadas.

Estos factores incluyen:

- el papel de las organizaciones que abogan por el bienestar animal;
- el papel del sector veterinario;
- el papel de los comités asesores ministeriales independientes;
- el papel de los comités consultivos nacionales;
- la importancia de la capacidad de la ciencia del bienestar animal;
- el uso inicial de códigos voluntarios;
- la transición a los códigos legislativos;
- los pros y los contras de la consulta pública;
- la legislación basada en los resultados frente a la legislación preceptiva;
- la importancia de la implicación y la «parte poseída» por las partes interesadas;
- el papel y potencial de los programas de seguro de calidad.

La importancia de una serie de estos factores se ilustrará con ejemplos prácticos. Se aludirá también al impacto creciente del mercado como un medio de fomentar las normas y garantizar su cumplimiento, a través de la influencia del consumidor y del comerciante minorista.

Abstract

The application of legislation, scientific guidelines and codified standards to advancing animal welfare

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Keywords: animal welfare science, leadership, advice, guidelines, participation, law, comprehensive infrastructure

As attitudes to animal welfare have evolved over the last 50 years, they have presented a significant change management challenge. This applies to both improvements to existing systems and moving to more acceptable systems over a realistic time frame. The concepts of total quality management, continuous improvement and change management are all subjects of an extensive management literature and have direct relevance in the animal welfare arena.

The animal welfare challenge is characterised by a need to address cultural, religious, economic, political, ethical and scientific issues in the formation of robust and credible animal welfare policy and practice. There is also a need to adopt credible practical strategies for progressing animal welfare improvements. Committing to incremental improvement towards defined higher standards allows some immediate progress, the specific scheduling of further improvements in the future, sustained stakeholder involvement in the process and time for more complex issues to be analysed and resolved. It is accepted, however, that policies based on a philosophy of incremental, evolutionary change will not satisfy minority groups at either end of the animal welfare/animal rights spectrum of opinion.

The NZ experience of incremental animal welfare change management, over the last 25 years, is used to illustrate the importance of

a number of critical factors and the different roles that can be played by legislation, scientific guidelines and codified standards.

These factors include:

- the role of animal welfare advocacy organisations;
- the role of the veterinary profession;
- the role of independent ministerial advisory committees;
- the role of national consultative committees;
- the importance of animal welfare science capability;
- the initial use of voluntary codes;
- the transition to legislated codes;
- the pros and cons of public consultation;
- the outcomes-based versus prescriptive legislation;
- the importance of stakeholder involvement and 'ownership';
- the role and potential of quality assurance schemes.

The importance of a number of these factors will be illustrated by practical examples. The burgeoning impact of the marketplace as a means of raising standards and ensuring compliance, via consumer and retailer influence, will also be referred to.

Closing remarks

The OIE animal welfare strategic initiative – The way forward

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Summary

The active involvement of all OIE member countries and international stakeholder organisations will be critical to the success of the OIE strategic initiative on animal welfare. The key objectives of the global conference were achieved and a number of important issues identified. These will be included in OIE's short and medium term operational planning and also included in strategic updates of the animal welfare initiative.

Keywords: animal welfare, animal health, office international des épizooties, public policy, standards, trade policy, trade barriers, World Trade Organisation

Introduction

The decision to include animal welfare as one of two strategic initiatives in the 2001–05 OIE strategic plan was fully supported by all member countries and was recognised as a significant departure from the historical OIE focus on animal diseases of international significance and their potential impact on international trade. It was recognised, from the outset, that involvement in animal welfare would present the OIE with some unique and demanding challenges and, particularly, the challenge of approaching animal welfare on a truly international basis, rather than from a narrower, regional perspective.

The initial background scoping paper and recommendations of the permanent animal welfare working group identified a number of issues which were considered to be critical to the successful implementation of the initiative. These included:

- the need to initially develop guiding principles and policies, establish priorities and agree a clear mission statement, prior to commencing work on the detail of standards;
- the need to involve experts from scientific disciplines other than veterinary science;
- the need to involve, and communicate effectively with, all stakeholders at international level.

The permanent working group recommendation to hold an international conference was directly related to these perceived priorities and the following conference objectives were agreed:

- to give visibility to OIE's work and to explain the OIE's strategy on animal welfare to the widest number of stakeholders, and to obtain their support;
- to enhance OIE's leadership role in providing global animal welfare guidance and standards;
- to examine the role of stakeholders in the framework of the OIE standards development process and the most effective way they may contribute;
- to stimulate links with international organisations liable to support OIE's work and to agree on how they can best contribute;
- to consider the future role of OIE in animal welfare and its influence on member countries' decision-making worldwide;
- to support the OIE in a science-based approach to the welfare of animals including the provision of international guidance and standards.

It is considered that the conference achieved all these objectives. Strong support for the OIE's international animal welfare leadership mission was provided by representa-

tives of member countries, industry organisations, non-government organisations and the scientific community, plus regulators and policy-makers. Very importantly, the conference also provided the OIE with the opportunity to emphasise its commitment to consultation and communication.

Specific issues

In continuing to implement the strategic initiative, a number of issues received particular emphasis, and support, from conference delegates. These will be carefully noted by the OIE and include the following:

- the importance of science-based standards;
- the importance of incremental change and a commitment to continuous improvement;
- the importance of the stockperson/caregiver in ensuring the achievement of animal welfare objectives;
- the need to clarify the legal significance of the World Trade Organisation (WTO), sanitary and phytosanitary (SPS) and technical barriers to trade (TBT) agreements, in relation to animal welfare and international trade;
- the successful track record of the OIE ad hoc group model in providing expert international opinion on specific animal welfare topics;
- the respective merits of voluntary, as opposed to compulsory standards;
- the respective merits of outcome-based, as opposed to prescriptive (input-based) standards.

Specific challenges

In continuing to implement the strategic initiative, a number of important issues were identified, which will pose particular challenges.

These include the following:

- the need for science-based standards to also take into account regional, religious and cultural issues;
- the need to better coordinate animal welfare research internationally;

- the need to promote the teaching of animal welfare and ethics at both undergraduate and postgraduate levels and as part of ongoing continuing professional development programmes;
- the need to actively involve all OIE member countries in the implementation of the initiative and to ensure that effective communication and consultation with stakeholders take place at member country level;
- the need to harness available resources and utilise information already available internationally;
- the need to ensure that expectations of the OIE role are realistic in relation to resource availability;
- the need for the OIE to clearly focus on agreed priorities.

Operational planning

The 2003/04 OIE animal welfare working group operational plan has already addressed, and progressed, a number of these issues. The conference discussions and recommendations will provide valuable focus and direction to the 2004/05 operational plan. This plan will continue the work of the existing four ad hoc groups and include the establishment of a fifth group to address aquatic animal welfare issues relating to transport, slaughter and killing for disease control purposes.

Conclusion

The progress made by the OIE, to date, in relation to international animal welfare leadership is, by any standards, impressive. The future OIE *modus operandi* will be characterised by a commitment to communication, consultation, continuous improvement and incremental change, as part of a long-term 'journey', rather than any expectation of reaching a short to medium-term 'destination'. The notion of approaching animal welfare change management on a truly global, rather than a regional, basis, represents a significant paradigm shift. The support goodwill and *esprit de corps* so evident during the conference bode well for the future.

Formal closure

B. Vallat

Director-General of the OIE, World Organisation for Animal Health

The outcome of this conference and the intensive debate which it fostered will guide the OIE as it takes its first steps in this new field for our organisation, namely animal welfare.

Numerous participants in the conference indicated that the OIE has successfully demonstrated, for the first time, that it is possible to have an open and constructive dialogue between institutions, the animal production sector, scientists and animal welfare activists from all continents. Furthermore, thanks to this conference, the OIE now appreciates on a worldwide scale those who are involved in animal welfare issues.

We were warned to expect clashes between the different groups but in the event this did not occur and we are therefore encouraged to pursue our course of action. Participants came from all over the world and all played an active part in the conference in the course of which all demonstrated great maturity. The OIE sees this as an endorsement of our role as the worldwide leader in developing guidelines on animal welfare.

Transparency and openness are basic principles that must be respected in future.

It has become apparent, however, that progress will be difficult without the simultaneous support not only of institutions, the private sector and non-governmental organisations campaigning for animal welfare, but also of other international organisations. Indeed, the conference has confirmed the key role that the World Trade Organisation could play in the context of international trade and the standards that are used for this purpose.

The use of scientific evidence as the foundation for any international standard has once again been shown as essential. A science-based approach that acknowledges the cultural diversity existing worldwide is essential if all those involved in discussions in the field of animal welfare are to reach a consensus. The quality of

the debates has indeed demonstrated that all the participants in the conference are already adopting this scientific and multicultural approach.

The debates that took place in the various discussion groups have of course indicated potential strategies and steps for the future. More than 120 of the OIE's member countries are developing countries or transition countries. Their representatives at the conference have clearly indicated their interest in developing animal welfare in their countries, but they have also emphasised that it will take them a long time and that their constraints will have to be taken into account. They have promised to do their best to advance the concepts developed at the OIE, but it will be essential to provide them with the necessary technical and financial aid.

The conference also emphasised the key role that the veterinary services of our member countries (veterinary administrations, private veterinarians, para-veterinarians) play, or indeed should play. Firstly, they are involved in preparing their country's legislation, but they must also monitor its application. Whether or not they are attached to the public sector, all veterinarians have a fundamental role to play in mediating between the State, the private sector and consumers. Even in developed countries, they are rarely provided with the necessary support and resources to accomplish the tasks in the field of animal welfare and they will therefore need to be strengthened before any animal welfare policy can be developed.

On behalf of the OIE International Committee, I should first like to thank the OIE staff who organised this conference (David Wilson, Antonio Petrini and all the others), the Conference Steering Committee, the members of the OIE Working Group on Animal Welfare, chaired by David Bayvel, the organisations and member countries that provided financial support (the

European Commission, the United States of America, Germany, Canada, the United Kingdom, Ireland, New Zealand, etc.) and in partic-

ular all the participants who gave us their confidence and will, I hope, continue to support us in the future.

Appendices

Appendix I Conference programme

23 February 2004

10.00 am–1.00 pm **Registration**

Session 1:	Setting the scene <i>Chair: Dr Abdulaye Bouna Niang (President, OIE Administrative Commission)</i>	
2.00–3.00 pm	Official conference opening	<p>Dr Adjoudji Hamadjola Minister for Animal Production, Fisheries and Animal Industries (Cameroon)</p> <p>Commissioner David Byrne European Commissioner for Health and Consumer Protection (European Union)</p> <p>Mr Daniel Caron Ministry of Agriculture, Food, Fisheries and Rural Affairs (France)</p> <p>Ms Renate Künast Minister for Consumer Protection, Food and Agriculture (Germany)</p> <p>Mr Joe Walsh TD Minister for Agriculture and Food (Ireland)</p>
3.00–3.15 pm	The OIE: History, scientific basis and future opportunities	Dr Bernard Vallat OIE Director General
3.15–3.30 pm	The OIE – Processes, procedures and international relations	Dr Alex Thiermann President of OIE Terrestrial Animal Health Standards Commission
3.30–3.45 pm	The OIE animal welfare strategic initiative – Progress, priorities and prognosis	Dr David Bayvel Chair OIE Working Group on Animal Welfare
3.45–4.15 pm	Afternoon tea/coffee	
	Global animal welfare challenges: Some perspectives <i>Chair: Dr Barry O’Neil (Vice President, OIE Administrative Commission)</i>	

4.15–4.30 pm	The role of the veterinarian in animal welfare A global perspective	Dr Jim Edwards World Veterinary Association
4.30–4.45 pm	Animal welfare in the veterinary curriculum	Prof. Leopoldo Estol Universidad del Salvador, Argentina
4.45–5.00 pm	The expectations of the international animal welfare movement	Mr David Wilkins International Coalition for Farm Animal Welfare (ICFAW)
5.00–5.15 pm	Discussion and identification of important issues	Ms Emma Stamper Animal Transport Association (AATA)
5.15–5.30 pm	An industry viewpoint	
5.30–5.45 pm	A marketplace perspective	Ms Karen Brown Food Marketing Institute, USA
5.45–6.00 pm	Consumer concerns	Mr Riccardo Quintili Chief Editor, <i>Il Salvagente</i> , Italy
6.00–6.15 pm	A perspective from developing countries	Dr Sira Abdul Rahman Retired Dean, Bangalore Veteri- nary College, India
6.15–6.30 pm	Discussion and identification of important issues	
6.45–8.00 pm	Reception (Salons Hoche, 9, avenue Hoche, F-75017 Paris)	

24 February 2004

Session 2:	Applying science to animal welfare <i>Chair: Dr Hamadou Saïdou</i> <i>(OIE Regional Commission</i> <i>for Africa)</i>	
9.00–9.20 am	Applying science to animal welfare Q + A 10 mins	Prof. David Fraser University of British Columbia, Canada
9.30–9.50 am	Space, environmental design and behaviour Q + A 10 mins	Dr Pierre Le Neindre Institut National de la Recherche Agronomique INRA, France
10.00–10.20 am	Management, handling and transport Q + A 10 mins	Prof. Joy Mench University of California, USA

10.30–11.00 am	Morning tea/coffee <i>Chair: Dr Hernan Rojas Olavarria (OIE Regional Commission for the Americas)</i>	
11.00–11.20 am	Pain, fear and distress Q + A 10 mins	Prof. Ian Duncan University of Guelph, Canada
11.30–11.50 am	Injury and disease Q + A 10 mins	Prof. Bo Algerts Swedish University of Agricultural Science, Sweden
12.00–12.20 pm	Food, water and malnutrition Q + A 10 mins	Prof. Alistair Lawrence Scottish Agricultural College, United Kingdom
12.30–1.00 pm	Panel discussion	
1.00–2.30 pm	Lunch	
	Areas of practical application <i>Chair: Dr Hassan Abdul Aziz Aidaros (OIE Regional Commission for the Middle East)</i>	
2.30–2.50 pm	Issues relating to slaughter for human consumption Q + A 10 mins	Dr Muhammad Chaudry OIE ad hoc group
3.00–3.20 pm	Issues relating to killing for disease control purposes Q + A 10 mins	Dr Harry Blokhuis OIE ad hoc group
3.30–4.00 pm	Afternoon tea <i>Chair: Dr Nikola Belev (OIE Regional Commission for Europe)</i>	
4.00–4.20 pm	Issues relating to land transportation Q + A 10 mins	Dr Donald Broom OIE ad hoc group
4.30–4.50 pm	Issues relating to sea transportation Q + A 10 mins	Dr Richard Norris OIE ad hoc group
5.00–5.20 pm	Animal welfare: between profit and protection Q + A 10 mins	Dr Hans Wyss Chief Veterinary Officer, Switzerland
5.30–5.50 pm	Issues relating to aquaculture Q + A 10 mins	Prof. Tore Håstein National Veterinary Institute, Norway

25 February 2004

Session 3:	The way forward <i>Chair: Dr Herbert Schneider</i> <i>(World Veterinary Association)</i>	
9.00–9.20 am	Cultural, religious and ethical issues Q + A 10 mins	Dr Mohan Raj University of Bristol, United Kingdom
9.30–9.50 pm	The application of legislation, scientific guidelines and standards Q + A 10 mins	Prof. David Mellor Massey University, New Zealand
10.00–10.30 am	Morning break Feedback questionnaire	
10.30 am–1.00 pm	Syndicate groups Topics arising from earlier conference discussions	
	Other possible issues for discussion include: – land transport of animals; – sea transport of animals; – killing of animals for disease control purposes; – slaughter of animals for human consumption; – animal welfare research: current activities and future priorities; – role of the veterinarian in animal welfare and its incorporation into the veterinary curriculum; – communication challenges in animal welfare.	
1.00–2.00 pm	Lunch	
Closing session	<i>Chair: Dr Carlos Correa Messuti</i> <i>(OIE Administrative Commission)</i>	
2.00–4.00 pm	Reports from syndicate groups and general discussion	
1.00–2.00 pm	Lunch	
Closing session	<i>Chair: Dr Carlos Correa Messuti</i> <i>(OIE Administrative Commission)</i>	
2.00–4.00 pm	Reports from syndicate groups and general discussion	
4.00–5.00 pm	The way forward	Dr David Bayvel Chair OIE Working Group on Animal Welfare
	Formal closure	Dr Bernard Vallat OIE Director General
5.00 pm	Press conference	

Appendix II

List of participants

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Appendix III

Land transport

Chairman: Donald Broom

Rapporteur: Catherine Scovil

Training

- encourage training of everyone involved in animal transport.
- consider obligatory training for personnel involved in commercial transport.
- need to determine means of assessing outcome of training.

Fitness to travel

- someone must be responsible for determining whether animals are fit for the particular journey envisaged and it is necessary to specify that person.
- the responsible person must ensure that animals are fit for transport using a list of recognisable conditions, for example be able to stand on each of the four legs, except for animals going for veterinary treatment.

Journey duration

- there was a view that slaughter near the point of production is preferable.
- for long distance transport; better conditions and health checks are needed.
- with good quality transport; it is reasonable to transport some animals, e.g. breeding stock; show horses.

Other journey issues

- important not to be able to insure against bad loading and driving practices which would result in poor welfare in transported animals.
- any animals showing significant distress, for example resulting from severe injury, should be euthanised as quickly as possible by a trained person.
- if animals are tied, the ties used must not be harmful to the animal during transport.
- for some species, e.g. sheep, goats and deer, electric prods should not be used; when they are used, they should be used on a small proportion of individuals only and not on sensitive areas or when the animal cannot easily move.

Monitoring and enforcement

- every vehicle moving with animals must have adequate records carried with the vehicle.
- effective means of marking and tracing animals and vehicles is a target for the future.

Sea transport

Chairman: Richard Norris

Rapporteur: Jim Edwards

The trade

- agreed that we have to accept that there is a trade which is demand driven.
- agreed that animals should be transported in the best possible conditions.
- agreed that there are opportunities to influence animal welfare throughout the export and import process.
- acknowledged that animals may not always be able to be slaughtered as close to the place of origin as possible.
- noted that not all shipments are carried under good conditions on well designed ships and that they are carried on small vessels such as dhows.
- recognised the different forms of containment used – pens, containers, roll-on roll-off vessels.

Sources of animals

- importance of preparation and selection of animals for shipment.
- conditions en route should be taken into account prior to shipment.

Regulatory controls

- Ireland and New Zealand have adopted 'Australian rules' with modifications.
- some countries have demonstrated that, with proper regulatory controls, the export of live animals and their welfare can be managed successfully.
- agreed that recommendations also apply to inter-island trade within one nation's territories.
- discussed whether the intention of government controls was to ensure animal welfare.
- discussed the role and independence of the veterinarians who accompany the shipments.
- veterinarian's role is to monitor and report on the welfare of the animals throughout the voyage.

Shipment reports

- records of each shipment enable incremental improvement regarding individual ships returning for another export consignment.
- controls exerted over exporters and ships require on-going approval to operate. This enables exporting countries to influence issues extending beyond the departure of shipments from their territories.
- governments can refuse to permit future exports when unsatisfactory compliance is reported.

Competence

- good management of the whole export process is critical to a good animal welfare outcome.
- IATA has defined competence for animal attendants for air transport and this definition should be considered by the OIE for sea transport.
- exporting countries may assist with resources and expertise to provide training under the auspices of the OIE.

OIE's role

- key issue is how the OIE can effect change in those countries that will have difficulty meeting animal welfare outcomes that may be seen as acceptable.
- OIE guidelines need to become part of member countries' legislative regulations.
- important that the OIE uses the experience of successful exporting countries when targeting where standards are required to get and maintain improvements.
- requires an excellent communication strategy.

Shipment rejection

- recognised difficulties in dealing with shipments when they are not accepted by the importing country.

- animals should be given first priority – early resolution is critical for animal welfare.
- could be aided by use of electronic certification at the time of export to identify and resolve problems early – concern expressed about quality of present certification.
- OIE has a role in dispute settlement but OIE involvement needs to be agreed by each party; OIE should take on the role of providing independent assessment of the health and welfare status of animals, even if not involved in a formal dispute.

Recommendations

- animal welfare should be given the first priority throughout the export process

and especially if an importing country rejects a shipment.

- should adopt a ‘duty of care’ approach.
- contingency plans should include an alternate port of discharge.
- electronic transfer of export certification should be exploited to give the importing country time to prepare to receive a shipment.
- the OIE has a standard setting and dispute resolution role.
- should be a focus on communication of the principles and adoption of standards.
- a strategically placed conference should be used to launch these standards – the OIE regional commissions could take the lead.

Killing for disease control purposes

Chairman: Harry Blokhuis

Rapporteur: Michael Appleby

Disease control

- Aiming at best humane practice as ideal.
- Important issues:
 - o flexibility
 - o timeliness
 - o species differences
 - o human safety – cooperation among OIE/WHO/FAO needed.

Contingency plans

- OIE coordination will be invaluable.
- Both government and industry need to be involved.
- Plans need to be species and disease specific.
- There are regional issues, for example the difference between industrial, rural and remote regions.
- Trial runs and updates will be needed.
- Wildlife or other disease reservoirs need to be considered.
- The broader context is also important: e.g. vaccination programmes and production methods may ameliorate or contribute to risks.
- Finance needs to be considered well in advance: both investment and running costs.

Methods

- Methods that do not use 'machines' or expensive equipment (e.g. neck-pulling of poultry) may be easy to implement but not ideal. Provision of machines (e.g. for gas slaughter), should be planned, and will probably need finance from WHO/FAO/EU/Others.
- In some circumstances people may hope to use carcasses as food, but this should not be a major consideration compared to other priorities.
- Review/research of appropriate methods – including their humaneness – is still needed.

- Relative costs must inevitably be considered.

Resources

- OIE coordination will be invaluable.
- Information needs to be shared (e.g. UK's Department of Environment, Food and Rural Affairs has documented lessons learned from the foot-and-mouth disease outbreak).
- Training at all levels is important.
- Reporting, evaluation and communication are vital. Some of this may be integrated with existing OIE structures.
- Relevant information will be forthcoming from the European Food Standards Agency.
- Financial issues may involve international agencies such as the World Bank.

Organisation

- Veterinary services are important where they exist, but are not well developed in all countries.
- Farmer associations will be important especially where veterinary services are scant.
- Cultural factors must be borne in mind.
- Economics are critical. In some cases efficiency of control will be strongly affected by whether farmers get compensation for their animals. Economic impacts include those on trade (both direct and through bad publicity); awareness of this is an incentive for action.
- Disposal of carcasses is also important, both intrinsically and because of the public impression created.
- Sometimes additional animals have to be culled, for example as a result of movement restrictions. This is not a major consideration in disease control programmes but still needs to be included. Because such culling will not be as urgent as that carried out specifically for disease control, use of humane methods is even more appropriate.

Slaughter of animals for human consumption

Chairman: Mohammad Chaudry

Rapporteur: Arnon Shimshony

Introduction

- members of the OIE ad hoc group updated the syndicate group on issues it had considered and progress to date in its work.
- noted that the OIE was developing guidelines for all 166 OIE member countries to implement.
- considered it essential that they address the important borders between culture, ethics and religion.
- noted that the entire process must be humane
 - movement and unloading (arrival on abattoir premises)
 - lairage issues
 - slaughter process – holding, stunning, bleeding.
- noted that the ad hoc group is working on commercial slaughter only – noted that, at this level, guidelines would be easier to implement.
- recommended that aquatic invertebrates be covered by welfare standards.

OIE guidelines

- noted that, while local applications of the guidelines will differ, the outcome in terms of welfare should be the same; also noted that improving welfare is a continuous and incremental process.
- recommended that the OIE take various available guidelines into account when drawing up the code, including Codex standards, to avoid contradictions and confusion, and noted that the ad hoc group is currently looking for such inputs. The Humane Slaughter Association (UK) is currently working on an example intended for universal application: OIE needs to ensure that the guidelines are not seen as just for developing countries.
- noted that, as OIE guidelines progress, they will be sent out to member countries for comment.

- OIE should focus on the state of the animal rather than physical inputs in the slaughter process; noted the importance of being clear and specific on what should not be done – such as a list of acceptable/unacceptable practices.
- guidelines must have broad levels of acceptability but individual governments must use these as a baseline for a domestic debate on welfare; guidelines can thus be used as a starting point.
- OIE should regularly update the guidelines as necessary.
- Universities Federation for Animal Welfare (UFAW) and the Humane Slaughter Association (UK) would like to use OIE as a channel to gather information on slaughter methods and laws around the world.

Transport

- noted the importance of pre-slaughter transport, and that a separate group was working on this.
- noted the long distances to which animals for slaughter are sometimes subjected, and that it may lead to compromises in terms of on-farm slaughter.
- noted that transport to an abattoir may be undertaken by various transporters (farmers, companies, even abattoir vehicles) – guidelines must take this into account.
- believed that the standards should state that responsibility for the animal at each step in the process must be defined, rather than for the code to assign responsibilities.
- considered it critical to have assessment of animals at the access point to the abattoir.
- noted USA FMI recommendations regarding arrival at the abattoir – offloading, etc.; noted that the OIE guidelines will not be prescriptive.

Abattoir

- considered that it may be better to concentrate on export plants where international welfare guidelines could be enforced as part of trade; national vs. international dimension must be taken into account by the ad hoc group when it reconvenes.
- Code should mention a 'competent authority' to be designated for policing of abattoirs; provision must be made for performance measurement, inspection, audits; standards must be set in this respect.
- OIE needs to deal with variations in lairage and abattoir design around the world; in this regard, guidelines should centre on welfare of the animals – design of facilities must be appropriate to species and their innate behaviour.
- guidelines from retailers would be valuable.
- welfare procedures for mobile plants should be the same as those for fixed abattoirs.
- considered that lairage time was important – animal traceability is important to get some idea of how long the animal has been fasted; time standing in lairage is also important for welfare and disease transmission.

- line speed is important to ensure that there is no neglect of standards.
- noted that some traditional slaughter methods would not be acceptable from a welfare viewpoint and noted the position of the ad hoc group on religious slaughter 'exemption' – welfare principles apply throughout to all types of process.
- product from animals slaughtered without stunning should be labelled.
- noted the importance of good stunning but also noted that slaughter without stunning will be considered in drawing up guidelines. Even best killing methods are not reliable if not well implemented; checking and control are necessary.
- guidelines must emphasise importance of notification of change of equipment to regulatory authority; also need to address misuse and failure of equipment in abattoirs.
- noted the controversial issue of the cleaning of animals.

Competence

- noted the importance of training of all slaughter personnel; people being trained must also have the right skills level prior to training.

Animal welfare research

Chairman: Valerie Stevens

Rapporteur: Linda Keeling

- recognised that fundamental and applied research are both needed.
- recognised that animal welfare needs to be accepted as a multi-disciplinary science in its own right that incorporates elements of ethology, veterinary science, physiology, economics, ethics, etc.
- need coordination of research and research information globally, with priorities reflecting problems of international concern.
- need to encourage and help developing countries carry out animal welfare research.
- need to identify valid, objective indicators of welfare for use on farm, at slaughter, etc; emphasised epidemiological approach to identifying these critical indicators and testing of new techniques.
- concern about relationship between animal breeding and welfare – intensive and extensive systems.
- considered the role of multinational corporations in global animal welfare.
- noted the importance of economics as an area of research, including the economic consequences of changing systems.
- requested more research on motivational affective states.
- suggested that OIE coordinate research organisations to identify these priorities.

Animal welfare in the veterinary curriculum

Chairman: Herbert Schneider

Rapporteur: Hanne M. Strabursvik

A. The role of the veterinarian

- Leadership: holistic approach, communicate to farmer and society.
- Enforcement: vets need para-professional assistance to safely comply with our role and responsibilities.
- Two aspects of our role, animal health and teaching the public as well as judicator in animal welfare disputes, benchmark standards to come up with uniform guidelines.
- Public health aspects: cooperate with industry to develop animal welfare concepts.

B. Training aspects

Rationale

Veterinarians must receive training in animal welfare and ethics at both pre-graduate and CPD levels. One example of the importance of this is in order to fulfil demands of international veterinary certification in the trade of animals and animal products, which will increasingly include animal welfare elements. Some teaching material is already available: examples are the AFANET (funded by EU Socrates) survey on the teaching of animal welfare and ethics to veterinary and animal science students in Europe.

The Animal Welfare Information Centre (part of the USDA) collates information on animal welfare and makes it available to the general public; as well as the Animal Welfare Foundation of the BVA.

- Where to place course, SWOT, proactive, must train undergraduates to gain ground, global perspective of animal disease and welfare.
- Animal welfare is a subject in its own right (a statement of the WVA).
- Uniform teaching backbone.
- Ethics and ethical commitment from the profession: also educate other members of profession to understand our role and responsibilities. Animal welfare training must be compulsory, also at CPD level.

Multidisciplinary approach, veterinarian leadership to be encouraged, but be prepared for the role, and it should be a holistic approach. Animal behaviour must be included.

- Teach students to think: some faculties include ethics, philosophy and religion reflection at the beginning of vet study; ethics, philosophy, legislation, ecumenical concepts of animal welfare. Economics should also be taught to provide an ample basis for our professional services. The actual welfare studies must come after the student has acquired basic medical knowledge and ethics of use of animals.
- Postgraduate courses more suitable for the more profound aspects of ethics, etc; pre-graduates cannot relate to certain aspects of AW and ethics until they have a suitable scientific background.
- Not only focus on student but also on CPD.
- Careful not to shorten vet course to the point of becoming too condensed.
- Teaching important strategies – problem based vs. traditional.

Learning – information – must be structured, allow for different experiences.

- Highlight relation between animal health and welfare.

Recommendations

Medium to long-term project for OIE to support and develop network of animal welfare experts/professors and knowledge transfer.

1. OIE to develop network of expertise in animal welfare science and ethics.
2. OIE to coordinate a project involving centres of expertise (veterinary colleges and others) in elaborating a series of courses on the different aspects of animal welfare and ethics, for the training of pre-graduate students and for continuing education purposes.
3. OIE to offer access to the courses on its Internet site for veterinarians and other stakeholders.

Communication challenges in animal welfare

Chairman: Bob Van Tongerloo

Rapporteur: Sonia Van Tichelen

Challenges for OIE

Challenges for stakeholders

- Communication should be a dialogue – two way process with all stakeholders.
- Global OIE communication and need for adapted national dissemination.
- Need for a long-term OIE strategy.
- Need to consider animal welfare as a holistic concept.
- Role of OIE in information exchange.
- Means of communication.

Communication should be a dialogue with all stakeholders

- NGOs; consumers, farmers, producers, experts.
- Developing countries as well as developed.

Process to communicate with stakeholder

Need to clarify who stakeholder can contact in OIE.

- Possibility to participate in meetings.
- Information on policy/standards review.

Global OIE communication and need for adapted national dissemination

- How to set up an effective communication network.
- How to address different target audiences.

– Language: five freedoms, humane.

– Context: industrialised vs. least developed countries, economic, cultural.

– Countries with high animal welfare standards vs. no legislation.

The need for a long-term OIE strategy

How will OIE proceed?

Need to establish short-term and long-term goals – strategy plan.

Is this a long-term ongoing activity of OIE?

Follow-up conference of meeting of stakeholders per issue.

Animal welfare as a holistic concept

OIE to consider

Social, geographical, economic, ethical, cultural diversities.

The role of OIE in information exchange

- To balance information avoiding inaccurate information.
- Sharing animal welfare knowledge and expertise; on national rules.
- Exchange and peer review of research.

Means of communication

- Improved ways of communicating events such as conferences.
- Database with relevant animal welfare information.
- Advisory committee with stakeholders.
- Forum web.

Issues concerning animal welfare and international trade, companion animals, wildlife

Chairman: David Bayvel

Rapporteur: Alex Thiermann

Issues concerning animal welfare and international trade

- OIE should develop recommendations on how to establish and strengthen a national animal welfare infrastructure, as it has done with veterinary services.
- International standards on AW will become a value added feature for products in trade (voluntary labelling).
- OIE should develop standards on animal welfare that facilitate international trade and provide a basis for national technical regulations, standards and conformity assessment procedures in the context of the WTO agreements. This should not preclude countries from applying stricter standards.
- The international AW standards must be achievable and applicable to all countries.
- OIE should undertake an international survey of member countries' reports on the existence of animal welfare standards, in conjunction with the European Commission and other interested countries.
- The OIE should develop, in conjunction with the WTO, a document clarifying the international legal issues associated with animal welfare and international trade, with reference to existing WTO agreements.
- Implementation and extension on AW guidelines should be focused and addressed at local government level in addition to national level.
- OIE should set standards that are achievable by all countries. Training and capacity building should assist all countries in meeting them.
- Animal shelters may be part of the solution to companion animal issues. They should be applied only after examining whether local culture and religion accept euthanasia and/or neutering of stray dogs. Importance of rabies should not be forgotten.
- Need for international standards and guidelines on a minimum age for puppies prior to shipping (animal transport group).
- Recommendation to the OIE to consider dogs and cats only as companion animals did not reach consensus by the group.

Companion animal issues

- OIE should provide guidance and support for companion animal shelters, spaying and neutering and euthanasia programmes, and legislation.
- OIE should assist in the dissemination of relevant literature on the prevention of cruelty to animals used while inflicting pain (e.g. fighting dogs and bullfighting).
- Research is needed on the growing issues of AW as it relates to confinement. Problems encountered in farm animals are now appearing among companion animals.

Wildlife

- OIE should work with all stakeholders, including the World Association of Zoos and Aquariums, CITES, animal welfare organisations as well as other relevant organisations, on the subject of animal welfare standards for wildlife.
- OIE should take into consideration endangered animal species when developing animal welfare standards.
- OIE should provide guidelines and recommendations particularly to consumers on the proper care and welfare of wildlife and exotic animals kept in captivity.

Use of animals in research, testing and teaching

- OIE should liaise closely with the relevant international animal organisations dealing with use of laboratory animals, prior to developing standards. OIE should con-

sider the welfare of animals kept in laboratories and develop standards and guidelines. These should include recommendations on auditing the implementation of these standards.

- OIE should take a leadership role in the recommendation on the use of alternative methods to laboratory testing and research.
- OIE should devote attention and resources to training and extension of animal welfare issues to all stakeholders. This should be done via website, courses, training modules and written material.
- OIE should strongly pursue the application of the three Rs.

Appendix IV

The OIE in summary

The Office international des épizooties (OIE) or World Organisation for Animal Health is an intergovernmental organisation created by the international agreement of 25 January 1924, signed by 28 countries. The trigger for the creation of the organisation was the incursion of rinderpest into Europe after World War I, particularly the epizootic in Belgium in 1920. The objectives of the OIE laid out in 1924 continue to be valid.

The present missions of the OIE can be described as:

- to ensure transparency in the global animal disease and zoonosis situation;
- to collect, analyse and disseminate scientific veterinary information;
- to provide expertise and encourage international solidarity in the control of animal diseases;
- within its mandate under the WTO SPS agreement, to safeguard world trade by publishing health standards for international trade in animals and animal products;
- to improve the legal framework and resources of national veterinary services;
- to provide a better guarantee of the safety of food of animal origin and to promote animal welfare through a science-based approach.

The OIE currently comprises 166 member countries and maintains permanent relations with more than 20 other international organisations.

Structure

The OIE operates under the authority of an international committee formed by permanent delegates designated by the governments of all member countries. This committee, which meets annually in general session in Paris, has the following primary functions:

- to consider and adopt international animal health standards and guidelines proposed by the specialist commissions of the OIE;

- to consider and adopt resolutions on the control of the major animal diseases;
- to consider the animal health status claims of member countries;
- to elect the Members of the various governing bodies of the OIE;
- to examine and approve the annual report of activities and the annual budget of the OIE.

The OIE is administered by its central bureau (about 45 staff) under the leadership of the OIE Director-General. The central bureau implements the resolutions of the international committee, with support from an administrative commission and five regional commissions. The regional commissions (Africa; the Americas; Asia, the Far East and Oceania; Europe and the Middle East) were formed to promote cooperation, to study specific problems encountered by veterinary services in regions, and to organise disease surveillance and control activities on a regional basis. Regional representatives provide an essential link between the regions and the central bureau.

Animal health information

One of the main functions of the OIE is to inform the governments of member countries of the occurrence and course of animal disease outbreaks which could pose an international threat to animal or human health. The urgency of dispatching information varies according to the category (urgent/non-urgent) of the disease.

A formal disease notification system enables member countries to act rapidly should the need arise. Within 24 hours of the occurrence of certain diseases or epidemiological events, the affected country is required to report the incident to the OIE central bureau. The information is then transmitted immediately to member countries and is placed on the OIE web page. Follow-up reports are also required until the situation in the country has stabilised.

This emergency notification system is supplemented by the routine distribution of

information received from member countries through OIE publications and also via the web page.

International standards development

The standards referenced in the WTO SPS agreement include the following OIE codes and manuals:

- the OIE terrestrial animal health code, prepared by the Terrestrial Animal Health Standards Commission, contains standards, guidelines and recommendations designed to prevent the introduction of pests and diseases into an importing country during trade in live animals, animal genetic material and animal products;
- the manual of diagnostic tests and vaccines for terrestrial animals, prepared by the Biological Standards Commission, lists laboratory diagnostic techniques and requirements for production and control of biological products (mainly vaccines);
- an aquatic animal health code and a manual of diagnostic tests for aquatic animals, prepared by the Aquatic Animal Health Standards Commission, are sister publications to the above.

These standards are produced through formal consultation involving all member countries. Proposals from member countries for the development of new standards or the revision of existing standards are addressed by the relevant specialist commission. Firstly, a draft new or revised existing standard would be developed, perhaps by an expert from a member country, an OIE ad hoc working group convened for the purpose, or by the specialist commission itself. The draft standard would then be circulated to all member countries for comment and initial discussion by the international committee. The specialist commission would then revise the draft, taking into account the comments received, and submit the revised draft for adoption by the next international committee in general session. Once formally adopted, the standard would be published in the relevant publication.

The OIE terrestrial animal health code aims: ‘...to ensure the sanitary safety of international trade...through the detailed definition of health guarantees to be required of trading partners so as to avoid the transfer of disease agents’.

As well as chapters specific for listed diseases, the Terrestrial Animal Health Code contains generic chapters on such subjects as the principles of health certification, obligations and ethics in international trade, recommendations for the transport of animals, import risk analysis methodology, and disease monitoring and surveillance standards.

The manual of diagnostic tests and vaccines for terrestrial animals contains information on sampling methods, good laboratory practice, quality control, human safety in the veterinary microbiology laboratory, and the principles of veterinary vaccine production.

The aquatic animal health code and the manual of diagnostic tests for aquatic animals contain equivalent chapters.

Disease control

The OIE provides technical support to member countries requesting assistance with animal disease control and eradication operations, including diseases transmissible to humans. The OIE notably offers expertise to the poorest countries to help them control animal diseases that cause livestock losses, present a risk to public health and threaten other member countries.

Animal health research

The task of promoting and coordinating research into the surveillance and control of animal diseases throughout the world is undertaken by OIE specialist commissions and working groups, with support from OIE collaborating centres and reference laboratories. These meet to review progress made in their field, to ensure that OIE member countries have up-to-date scientific knowledge available to them, and to organise scientific meetings, seminars, workshops and training courses.

The role of the reference laboratories and collaborating centres is to provide OIE member countries with scientific and technical assistance, and expert advice on topics linked to disease surveillance and control. This support can take various forms including: funding the availability of experts, preparation and supply of diagnostic kits or reference reagents, training courses, workshops and the organisation of scientific meetings.

Dispute settlement

The OIE's dispute settlement mechanism is available for use by member countries to try to resolve differences over, for example, the recognition of another country's animal health status claims, or the use of OIE international standards. The offices of the OIE are available for settlement of such differences before they become of such significance that recourse to WTO dispute settlement under

the SPS agreement is necessary. Both parties must agree, however, before the process can be initiated. Use of the OIE process is not compulsory (member countries may go direct to the WTO) and the outcomes are not legally binding. OIE opinion, however, would be expected to influence any subsequent WTO proceedings. The OIE also provides technical advice to the WTO and nominates experts for WTO panels.

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