

Document 1

The Food Standards Agency's Current Stance

[FSA comment: As published on Agency's web site in late August 2006 – see www.food.gov.uk/foodindustry/farmingfood/organicfood/]

ORGANIC FOOD

Summary

The Agency recognises the role that organic food plays in providing choice for consumers.

There are many different reasons why consumers choose to buy organic food. These can include, for example, concern for the environment and animal welfare. Eating organic food can help to minimise peoples' intake of pesticide residues and additives.

Consumers may also choose to buy organic food because they believe that it is safer and more nutritious than other food. However, the balance of current scientific evidence does not support this view.

Further information on the environmental benefits of organic farming can be found at <http://www.defra.gov.uk/farm/organic/consumers/index.htm#21>

Is the Agency for or against organic food?

What is organic farming and food?

How is organic food production regulated?

Who is responsible for controlling organic food production?

Is all organic food produced to the same standards?

How should organic food be labelled?

Is organic food safer than other food?

How are pesticide residues and additives controlled in food?

Is organic food more nutritious?

Is organic milk more nutritious?

Isn't there evidence that organic food is safer and more nutritious?

Is the Agency for or against organic food?

The Agency is neither for nor against organic food. Our interest is in providing accurate information to support consumer choice.

What is organic farming and food?

Organic farming is a holistic approach to food production, making use of crop rotation, environmental management and good animal husbandry to control pests and diseases. Processed organic foods use ingredients that were produced organically and organic ingredients must make up at least 95% of the food. There are only a limited number of additives used in organic food production.

Some key aspects of organic farming and food are:

- restricted use of artificial fertilisers or pesticides;
- emphasis on animal welfare, and prevention of ill health, including stocking densities, free range, choice of suitable breeds;
- use of conventional veterinary medicines is focussed on treating sick animals;
- emphasis on soil health and maintaining this through application of manure, compost and crop rotation;
- processors of organic foods have a restricted set of additives to use;
- no use of GMOs or their products allowed,.

How is organic food production regulated?

All food sold as 'organic' must be produced according to European laws on organic production.

These laws require food sold as 'organic' to come from growers, processors and importers who are registered and approved by organic certification bodies, which are in turn registered by the Department for Environment, Food and Rural Affairs (Defra) or a similar control body elsewhere in the European Union.

Organic certification bodies must appoint inspectors who are, for example, expected to visit farms and check that no fertilisers or pesticides have been used that are not approved for organic production, and that land has been farmed organically for the conversion period (normally two years) before food is sold as 'organic'.

Who is responsible for controlling organic food production?

Defra is responsible for regulations governing the production of organic foods and the administration of organic schemes in the UK. See: <http://www.defra.gov.uk/farm/organic/default.htm>

Is all organic food produced to the same standards?

All organic food must meet a common set of minimum standards that are set out in European law (see: <http://www.defra.gov.uk/farm/organic/default.htm>). However, this does not prevent organic food being produced to higher standards. Some organic certification bodies produce their own standards, which are over and above the required minimum, and inspect organic producers against these.

How should organic food be labelled?

Labels on food sold as 'organic' must indicate the organic certification body that the processor or packer is registered with. The labels must, at the minimum, include a code number that denotes the approved certification body. The name or trademark (logo) of the certification body may also, but does not have to be, shown on the label.

It is not always possible to make products entirely from organic ingredients, since not all ingredients are available in organic form. Manufacturers of organic food are permitted to use specific non-organic ingredients provided that organic ingredients make up at least 95% of the food.

If the product contains between 70% and 95% organic ingredients, organic ingredients can be mentioned only in the ingredients list, and a clear statement must be given on the front of the label showing the total percentage of the ingredients that are organic.

Is organic food safer than other food?

Both organic and conventional food have to meet the same legal food safety requirements.

How are pesticide residues and additives controlled in food?

Before pesticides are approved they are rigorously assessed to ensure they do not pose an unacceptable risk to human health or the environment, and that any pesticide residues left in food will not be harmful to consumers. Pesticide residues in the food chain are also monitored to check they are within legal and safe limits. Additives are also subject to rigorous, pre-market safety assessments before they can be used in foods. Their use is controlled by legal limits, which ensures consumption does not exceed safe levels.

Is organic food more nutritious?

Consumers may choose to buy organic fruit, vegetables and meat because they believe them to be more nutritious than other food. However, the balance of current scientific evidence does not support this view.

Nutrient levels in food vary depending on many different factors. These include freshness, storage conditions, crop variety, soil conditions, weather conditions and how animals are fed. All crops and animals therefore vary in nutrient level to some extent. The available evidence shows that the nutrient levels and the degree of variation are similar in food produced by both organic and conventional agriculture. All processed

food, including organic, has a nutrient content that is dependent on the nutrient content of ingoing ingredients, recipe and cooking methods. The impact of processing on nutrient levels will be the same for products made from organically and conventionally produced ingredients.

Is organic milk more nutritious?

Whilst the nutrient profile of organic milk appears to be different from non-organic milk, care must be taken when drawing conclusions as to the nutritional significance of this. Dairy sources of omega-3 polyunsaturated fatty acids are not a viable alternative to eating oily fish. Milk contains the shorter chain form of omega-3 polyunsaturated fatty acids (alpha-linolenic acid), while the forms present in oily fish are the long chain fatty acids (eicosapentaenoic (EPA) and docosahexaenoic acids (DHA)). Research has shown that the short chain form found in plant and dairy sources does not appear to be as beneficial as those found in oily fish, which have been shown to be protective for cardiovascular disease, and may also have beneficial effects on foetal development. Although the shorter form can be metabolised to the longer forms, in humans the conversion appears limited.

Isn't there evidence that organic food is safer and more nutritious?

It is true that some scientific papers reach this conclusion. However, others find no difference. As in any field of science, to reach a robust conclusion it is necessary to evaluate the weight of evidence across a range of published papers. Care should be taken over reliance on single papers.

The Agency maintains a close watch on scientific papers that evaluate organic food and will continue to assess new research as it is published.

Document 2

Internal email regarding why and how the standard Agency line on organic food was to be changed.

[FSA comment: The process resulted in the position paper as set out in Document 1]

01/08/06

Subject: Organic Line – Changing the tone

Colleagues

You will be aware that the Dean report highlighted that there was a perception among a range of stakeholders that the Agency is anti-organic. Part of the action to address this,

is to try to change the "tone" of our statements on organic. Once agreed, these statements will replace the current text on our website and should be used in correspondence, press enquiries etc.

The aim is to try to finalise an agreed text before September so that it is ready for our organic fortnight. We therefore would welcome any comments by 18th August.

Note: It is not intended to change the Agency's actual line, given that that line is based on an assessment of the scientific evidence currently available.

Document 3

Internal email considering wording of Agency stance on minimising pesticide residues and the fact that the Agency's position is based on evidence.

17/01/07

You asked for the old and new lines on this to be set out.

Sir John Krebs (2003 speech) said: "Organic food contains fewer residues of pesticides used in conventional agriculture, so buying organic is one way to reduce the chances that your food contains these pesticides."

The equivalent text in the current Agency line on organics is:

"Eating organic food can help to minimise consumption of pesticide residues and additives."

[Information withheld under section 35, FoI Act]

We have to be careful not to talk about pesticides in absolute terms. There is evidence to show that organic food can have pesticide residues - not because they have necessarily been used on them directly (although a few are allowed) but because of environmental contamination, spray drift etc.

Evidence vs no evidence

[Information withheld under section 36, FoI Act] the question of whether our position is based on evidence or lack of evidence. We have to be very careful about this. Our position is based on evidence. We have reviewed the evidence and it shows that there is no difference. This is very different to saying that there is no evidence of any difference [Information withheld under section 36, FoI Act]

Document 4

Questions and answers produced for Agency staff attending the City Food Lecture on 23/01/07.

General – Andrew Wadge

Is the Agency for or against organic food?

The Agency is neither for nor against organic food. Our interest is in providing accurate information to support consumer choice and we recognise the contribution organic food makes to the range of choice available.

What is the Agency's view on organic food in terms of safety and nutrition?

Based on the current evidence, the Agency's assessment is that organic food is not significantly different in terms of food safety and nutrition from food produced conventionally.

Did the review by Brenda Dean not conclude that the Agency's position on organic food was unscientific?

No, this is not the case. The Dean report was significantly misrepresented in the press on this point. What the Dean review did highlight was that there is a perception among stakeholders that the Agency is against organic food and that our stance is unscientific.

Given that organic farming is more sustainable, why doesn't the Agency promote organic food?

Promotion of particular systems of food production, including organic, as well as promotion of sustainable food consumption and production falls within Defra's remit and that of devolved administrations. The Agency's role is to help consumers make informed choices.

If we are to help consumers make informed choices about the relative sustainability of different foodstuffs there is a need for robust evidence and we are supportive of the work that Defra and others are doing to fill this gap.

Pesticides – Andrew Wadge

If I buy organic food will it help me avoid pesticide residues?

Yes. Buying organic can minimise the chances that your food contains pesticide residues as organic food contains fewer residues of pesticides used in conventional agriculture. It doesn't follow, however, that organic food is safer than conventional food. The use of pesticides in food is controlled by a strict regulatory approvals process, and the Agency is satisfied that any residues present on food within the legal limits are do not present a significant health risk.

The Agency has recognised that consumer preference is for food that does not contain pesticide residues, even when risk assessments show that there are no likely health effects. As a result the Agency has published 5 guides covering key crops (cereals,

apples, pears, potatoes and tomatoes) which aim to assist the food industry to deliver existing pesticide minimisation initiatives.

What about the so called “cocktail effect”?

A report by the independent Committee on Toxicology concluded that the probability of any health hazard due to exposure to mixtures of chemicals (including pesticides), each present at a low level (as is the case in food), is likely to be small and that their effects are unlikely to be greater than additive.

Nevertheless, the Agency is undertaking further research.

Veterinary medicines / new superbugs – Andrew Wadge

Aren't organic foods safer because the use of veterinary medicines is limited?

No. All veterinary medicines must be assessed for the safety of any residues. There are also controls over their use which apply to both organic and conventional farming. The use of medicines does not imply that residues remain in food, nearly all samples tested are free of residues.

Nutritional benefits – Gill Fine

Is organic milk more nutritious than conventional milk?

There is some evidence that organic milk may have higher levels of omega-3 fatty acids than conventional milk. However, the omega-3 fatty acids in organic milk (short chain) are not the same as those found in oily fish (long chain) that have been shown to be beneficial.

But can't the short chain omega-3 fatty acids be converted to the long chain forms in the human body?

The conversion rate is very low which means that the short chain omega-3 fatty acids cannot be used by the body in the same way.

You would need to drink approximately 100 litres of organic whole milk to obtain the benefits of consuming one portion of oily fish. This conflicts with advice on what constitutes a healthy, balanced diet.

Even if the conversion rates are low, isn't it beneficial for vegetarians as they can't eat fish?

Given that the body cannot use short chain omega-3 fatty acids in the same way as it uses the longer chain versions non-fish sources of omega-3 fatty acids can only make a limited contribution towards daily requirements. Vegetarians can get the short chain omega-3 fatty acids from a number of sources, including for example flax and linseed.

Is it not true that FSA says that "The trans fats found in food containing hydrogenated vegetable oil are harmful and have no known nutritional benefits? Are organic foods therefore not better for you?"

Trans fatty acids can be harmful because they have a similar effect as saturated fats in increasing the risk of coronary heart disease. This doesn't necessarily mean that organic food is better for you.

The key point is that the nutritional value of processed food depends to such a great extent on the recipe that comparisons between organic and conventional processed food is of little benefit in drawing general conclusions about any possible health benefits or disbenefits. To imply that organic processed food is healthier because it does not contain hydrogenated fat is a significant oversimplification. Levels of fat, saturated fat, sugar and salt are all important. To focus on trans fats as a single factor is to ignore these.

Hydrogenated fats have to be included on the label and so consumers can choose to avoid them.

Do organic fruit and vegetables have higher levels of vitamins and minerals?

The weight of current evidence does not support the claim that organic fruit and vegetables are significantly different to conventional produce in terms of nutrient content.

The ranges of nutrient content found in organic and conventionally produced food are both wide and about the same. There are many factors apart from type of cultivation that influence the nutrient content of fruits, vegetables and cereals, for example, variety, soil, degree and nature of fertiliser, climate, storage time and conditions, and maturity.

Data clearly shows that minerals in fruit and vegetables have declined over the last 40 years because of conventional farming methods.

The Food Standards Agency is aware of a report that compared the mineral content of fruits and vegetable from 1940 and 1990 and, using two sets of data produced 50 years apart, suggested that the mineral content of fruit and vegetables had declined during this period. However, the data used as the basis for this study were not designed to provide historical data. There were many confounding factors, which means that it is difficult to draw the conclusion that there has been a significant depletion in mineral content of food over time or due to different farming practices.

Agency research – Gill Fine

Is the Agency currently funding any research into nutritional or other benefits of organic food?

Not at present. The Agency remains interested in emerging research investigating differences between foods produced organically and conventionally as it is important for informing consumer choice.

The Agency considered the merits and difficulties of conducting research into nutritional content and pesticide content of organic and conventionally produced food at a workshop in November 2002. Since then a large EU funded project, led by Newcastle University, has been commissioned which will address many of the issues. Rather than duplicate effort, the Agency is awaiting initial outcomes before considering if there is further work that might be usefully done.

General – Terrence Collis

Does the invitation to Peter Melchett signal a change of policy on organics by the FSA?

No. Our position on organics remains the same [see above]. The invitation to Peter Melchett to give the lecture demonstrates that we are open-minded on the issue of organic food and we recognise the contribution it makes to consumer choice.

[FSA comment: Documents 5 & 6 comprise information used in answering general correspondence]

Document 5

05/06/06

We have not carried out any research ourselves on nutrition or safety aspects.

However, there is significant and still growing body of scientific evidence in published papers that looks at various comparative aspects of organic and conventional food and food production systems. We reviewed this evidence in coming to our position (well over 100 papers and other articles) and continue to keep any new evidence under review as it emerges. In addition, each of the areas, eg pesticides, TSEs, nutrition, additives, nitrate, dioxins etc. also have a further wealth of evidence on which we have drawn. Although most of this will not be in the form of direct comparison between organic and conventional food it is still relevant to the discussion.

We have not ruled out conducting our own research. However, a key reason for not commissioning research at present is that there is a major European funded project that is being led by the University of Newcastle. This project is looking at a very wide range of issues and comparing organic and other farming systems. Their research will include nutritional and safety aspects. Rather than duplicating effort we need to wait to see what emerges from that project before making any further decisions about possible research.

Of course, the Newcastle led project is not the only ongoing research. Research into organic food and farming is a very active field.

Document 6

01/08/2006

[Information withheld under section 40 of FoI Act] has passed your enquiry about possible Agency support for your intended proposal to NERC to me to respond.

The Agency would very much welcome any robust and independent review of current knowledge on organic food production and its impacts on the environment and human health. Clearly the focus of our interest would be on nutritional aspects and any toxicological issues that could affect food safety. The proposed conference also sounds interesting and could provide some useful insights into future priority areas for research. We ourselves have wrestled with trying to think of possible research approaches that would illuminate the organic debate and know how difficult it is. As a funder of research ourselves, however, it would be a little difficult for the Agency to be fully involved in the proposed conference. That said, we would be interested in having observer status or possibly providing input in a way other than as full participants.

Document 7

In December 2006 we informed the Chair of the following information, in advance of the launch of “Good farming, better environment”

- Organic food is often thought to be safer and more nutritious, but the balance of current evidence does not support this view. Nevertheless, the Agency will continue to review new evidence as it arises.
 - Organic food is often generalised as being more sustainable than conventional food, but this is not necessarily the case. Recent Defra funded research (the “Shopping Trolley Survey”) showed a far more complex picture. For example, the Defra report showed that organic, on the vine, specialist tomatoes incur about 6 times the Global Warming Potential of non-organic, loose, classic tomatoes.
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Document 8

Email from FSA to media

22/05/07

PROS AND CONS OF ORGANIC FOOD

Thank you for your letter of 6 May 2007 regarding organic food.

The Agency's remit in relation to organic food focuses on food safety and nutritional aspects, and ensuring that consumers have the appropriate information to make informed choices. Whilst the Agency recognises that organic food contributes to consumers' choice, in terms of safety and nutrition the Agency's opinion is that, on the basis of current scientific evidence, organic food is not significantly different from food produced conventionally. If you are interested in obtaining more information on the Agency's position on the safety and nutritional aspects of organic food you may find it helpful to visit our website at <http://www.food.gov.uk/foodindustry/farmingfood/organicfood/>

I have enclosed also a list of reference papers which review some of the research in relation to the differences between organic and conventional foods that you may find useful should you wish to get hold of some of them. The Agency is not necessarily supporting any of the papers or their conclusions.

At present there is no conclusive evidence to indicate whether organic food is more or less prone to contamination by fungal toxins (mycotoxins) than conventional food. The European Union's Scientific Committee on Plants has considered the available data from field studies on the influence of pesticides on the production of mycotoxins. It concluded that there was insufficient evidence to confirm whether pesticides play a prominent and consistent role in preventing the production of mycotoxins by toxigenic fungi. However, it is likely that future fungicides will be selected on the basis that they can effectively inhibit production of mycotoxins

In relation to the possible environmental benefits of organic food production that you mention in your letter it is Defra and devolved agriculture departments that have primary responsibility for the regulations governing the production of organic foods and so they take the lead in government on the environmental and animal welfare aspects. Information and details of Defra funded projects relating to the environmental benefits of organic farming are available on Defra's website www.defra.gov.uk should you wish to obtain more information on this matter. Should you wish to discuss these matters further then the contact person to contact in Defra in the first instance would be [information withheld under section 40 of FoI Act]

List of scientific review papers

Bourn D. and Prescott J. (2002) A comparison of the nutritional value, sensory qualities and food safety of organically and conventionally produced foods. *Critical Reviews in Food Science & Nutrition*, 42 (1): pages 1 - 34.

Shane Heaton *Organic Farming, Food Quality and Human Health: A Review of the Evidence*.

This is a Soil Association publication and can be obtained through their web site.

Worthington V. (2001) Nutritional quality of organic versus conventional fruits, vegetables and grains. *Journal of Alternative and Complementary Medicine*, 7, No.2, pages 161- 173

Magkos F., Arvanti F., Zampelas A. (2006) Organic Food: Buying More Safety or Just Peace of Mind? A critical Review of the Literature. *Critical Reviews in Food Science and Nutrition*, 46, pages 23 - 56.

Document 9

Email from FSA to media

21/06/07

Thank you for your email of 12 June expressing concern about the issues raised by the Tonight Programme on organic poultry.

Most of the areas that you mention are not in fact matters within the remit of the Food Standards Agency.

Organic food has to meet standards set out in European legislation. Nationally the Department for Environment, Food and Rural Affairs (Defra), and its equivalents in the devolved administrations, lead on this legislation and oversee the standards and their enforcement. Certification bodies (such as the Soil Association and Organic Farmers & Growers) check that producers are meeting the required standards. These certification bodies are overseen by Defra. Ultimately, should legal enforcement be required this is through Local Authority enforcement officers who can take action under the organic standards legislation, again overseen by Defra or devolved equivalents.

You also mentioned that poultry should be produced in free range systems. This is again a matter for Defra and its devolved equivalents.

The one area you mention that the Agency does have an interest in is in relation to antibiotic use in poultry production. The UK Government policy lead on veterinary medicines lies with the Veterinary Medicines Directorate (VMD). However, the FSA plays an important watchdog role from the point of food safety in the authorisation and surveillance of veterinary medicines.

Antibiotics are an essential tool for the treatment of certain bacterial diseases of animals and their availability to veterinary surgeons ensures that animal welfare is not compromised by the failure to treat disease effectively.

On welfare grounds antibiotics are used in organic and free range poultry production systems. As with conventional production a legally binding withdrawal period is enforced following treatment to ensure any drug residues diminish to legally acceptable levels. The use of antibiotics solely for growth promotion in livestock is illegal in the European Union.

If you wish to contact Defra their email address is helpline@defra.gsi.gov.uk.

Document 10

Information prepared for www.food.gov.uk

July 2007

Organic food contains fewer residues of the pesticides used in conventional agriculture, so buying organic is one way to reduce the chances that your food contains these pesticide residues.

Minimising residues is not just about organic versus conventional methods – it is about good practice among producers, whatever methods they use. So the Agency is developing an action plan that will build on good practice to minimise residues. Some organic production techniques may be transferable to conventional production and help in reducing pesticide use and residue levels.

The Agency's view is that, based on the evidence available, organic food is not significantly different from conventionally produced food, in terms of food safety or nutrition.

Document 11

Information prepared for www.food.gov.uk

11/04/2007

In most cases organic food is produced without using pesticides. However, EU organic food regulations do allow a very limited range of pesticides in organic food production, that are used as a last resort and for restricted crops. I believe the pesticides allowed are based on natural products but may be artificially produced. The line on the Defra website is better: "The main components of organic farming are avoiding the use of artificial fertilisers and pesticides, and the use of crop husbandry to maintain soil fertility and control weeds, pests and diseases".

Document 12

Information used in response to media enquiry

01/06/07

Below is the FSA's response to your queries - I have provided a top line response followed by more detailed info on the various issues that fall to the Agency about

campylobacter incidence and nutrition (although obviously we do not have control over organic vs. free range vs. conventional poultry production).

FSA response

The FSA believes it is important that consumers should be confident about the foods they choose to buy – both in terms of their safety and their nutritional content. We are neither for nor against organic food but would be concerned if consumers felt they were being misled about the value of organic poultry. Whilst some people may believe that organic food is safer and more nutritious, the Agency is clear that the balance of current scientific evidence does not support this view.

Organic food

The Food Standards Agency recognises the role that organic food plays in providing choice for consumers. There are many different reasons why consumers choose to buy organic food, including reducing the amount of pesticide residues and additives they consume. However, the Agency is neither for nor against organic food. Our interest is in providing accurate information to support consumer choice. Consumers may believe that organic food is safer and more nutritious than other food. However, the balance of current scientific evidence does not support this view.

It is true that some scientific papers reach this conclusion. However, others find no difference. As in any field of science, to reach a robust conclusion it is necessary to evaluate the weight of evidence across a range of published papers. Care should be taken over reliance on single papers. The Agency maintains a close watch on scientific papers that evaluate organic food and will continue to assess new research as it is published.

Both organic and conventional foods have to meet the same legal food safety requirements.

Campylobacter

Campylobacter is a major cause of foodborne disease and is one of the key organisms the Agency is tackling in order to continue reducing foodborne illness. The Agency has always been clear to consumers that evidence suggests that chicken may be a significant source of Campylobacter infection in humans. The Agency has a target to work with industry to achieve a 50% reduction in campylobacter in UK produced chicken by 2010 and, as a baseline for this target, a review of the available data established that 70% of UK chickens were contaminated with campylobacter.

The Agency's Food Hygiene Campaign has been on-going for a number of years, with a major focus on informing the public about the risk from poultry and the importance of ensuring that ALL poultry is cooked properly. The Campaign continues next week during National Food Safety Week, again with a focus on reducing the risk of food poisoning during the summer months.

The majority of chickens produced in the UK are housed (indoor) broilers and the current focus of the Agency's Campylobacter control strategy has been a campaign to improve biosecurity on the broiler farm. However extensively produced (outdoor) chicken is increasing in popularity. There is some evidence to suggest that extensively

produced birds that are allowed to roam outdoors are more likely to be contaminated with Campylobacter than birds reared indoors. There is limited data on the levels of Campylobacter in outdoor birds produced in the UK. Preliminary findings have suggested higher levels of Campylobacter in outdoor reared chickens. Although there is no definitive explanation for the apparent difference between production systems, birds that are allowed to roam outdoors will be exposed to a wider range of potential sources of Campylobacter including water soil, wild birds and other animals.

The Agency is funding a programme of research to investigate potential controls for outdoor flocks, including investigating the effects of probiotics, manipulating the diet and potential diet components on Campylobacter levels. In addition a new research project which started last year will review current farm practices used in the free range and organic sectors. Those practices thought to reduce the likelihood of chicken flocks becoming colonised with campylobacter will be investigated.

The Agency is also currently undertaking a survey to establish the prevalence of Campylobacter in retail poultry on sale in the UK, including the levels of Campylobacter in outdoor reared birds.

FSA advice to consumers

The FSA has consistently advised people on the safe handling and cooking of ALL poultry, irrespective of whether it's organic, free range or conventionally produced poultry. Good hygiene in the kitchen and thorough cooking of poultry will help reduce the chances of consumers getting campylobacter.

Nutrition

Comparing the fat content of chicken with other meat data from McCance and Widdowson's The Composition of Foods (Sixth summary edition, 2002), chicken is still a low fat form of meat protein. The total fat content of grilled chicken breast (without skin) is 2.2g/100g. This is substantially less than that of grilled lean rump steak (5.9g of fat /100g) or a grilled lean pork loin chop (6.4g of fat/100g). These figures are all based on conventionally produced meats. Looking at raw meat, chicken meat contains 2.1g of fat/100g and 22.3g of protein/100g. A raw beefburger contains about 24.7g of fat/100g and 17.1g of protein/100g.

Document 13

Information from internal emails of 12/09/06 and 24/01/07 accompanying and setting into context a list of references being supplied to the media in response to a query

12/09/06

Listed below are some of the papers reviewing some of the research in relation to the differences between organic and conventional foods which we feel would be of most use to the journalist. Also nutrition have kindly provided a list of some of the ones

specific to organic milk and specifically in relation to omega 3 fatty acids in milk and the n3:n6 ratio question.

You should make it clear that we are not necessarily supporting any of the papers, or their conclusions. The ones below are probably the most useful and do have the advantage of including all of the relevant references so the journalist can get hold of as many, or as few as they wish.

24/01/07

[Information withheld under section 35, Fol Act] these references *[Information withheld under section 35, Fol Act]* are a very small sub set of the papers that we have considered. To give you an idea about how much of a subset they are we have a database containing about 150 individual papers looking at aspects of organic food, and many further papers dealing with specific related aspects such as pesticides, additives, nutrition, contaminants etc.

General References

- Bourn D. and Prescott J.2002
A comparison of the nutritional value, sensory qualities and food safety of organically and conventionally produced foods.
Critical Reviews in Food Science & Nutrition, 42 (1): pages 1 - 34.
- Shane Heaton
Organic Farming, Food Quality and Human Health: A Review of the Evidence.
This is a Soil Association publication and can be obtained through their web site.
- Worthington V.2001
Nutritional quality of organic versus conventional fruits, vegetables and grains.
Journal of Alternative and Complementary Medicine, 7, No.2, pages 161- 173
- Magkos F., Arvanti F., Zampelas A.2006
Organic Food: Buying More Safety or Just Peace of Mind? A critical Review of the Literature.
Critical Reviews in Food Science and Nutrition, 46, pages 23 - 56.

Milk references

REVIEW PAPERS

Williams, CM and Burdge G (2006) Long chain n-3 PUFA: plant v. marine sources.
Proceedings of the Nutrition Society 65:42-50.

Other papers

Akabas, S. R. and Deckelbaum, R J (2006) Summary of a workshop on n-3 fatty acids: current status of recommendations and future directions. *American Journal of Clinical Nutrition* 83 [6] 1536S-1538S.

Burdge G, Calder P (2005). -Linolenic acid metabolism in adult humans: the effect of gender and age on conversion to longer-chain polyunsaturated fatty acids. *Eur. J. Lipid Sci Technol.* 107: 426-439

Ellis K, G Innocent, D Grove-White, P Cripps, W G McLean, C V Howard and M Mihm (2006) Comparing the Fatty Acid Composition of Organic and Conventional Milk. *J. Dairy Sci.*, 89: 1938-1950

Sanderson P, Finnegan, Y, Williams C, Calder P, Burdge G, Wooton, S, Griffin B, Millward, D, Pegge, N and Bemelmans, W (2002) UK Food Standards Agency -linolenic acid workshop report. *Brit, J Nutr* 88: 573-579

Wang C, Harris WS, Chung M, Lichtenstein AH, Balk EM, Kupelnick B, Jordan HS, Lau J.(2006) n-3 Fatty acids from fish or fish-oil supplements, but not alpha-linolenic acid, benefit cardiovascular disease outcomes in primary- and secondary-prevention studies: a systematic review. *Am J Clin Nutr.* 84(1):5-17.

In addition, the following papers were discussed at yesterday's N02 workshop on the n-6:n-3 ratio (which also dealt with the conversion of ALNA to EPA and DHA).

(Review papers in bold below)

Burdge GC, Calder PC (2006). Dietary alpha-linolenic acid and health-related outcomes: a metabolic perspective. *Nutrition Research Reviews*; 19:26-52.

Goyens PL, Spilker ME, Zock PL, Katan MB, Mensink RP. (2006). Conversion of alpha-linolenic acid in humans is influenced by the absolute amounts of alpha-linolenic acid and linoleic acid in the diet and not by their ratio. *Am J Clin Nutr* 84(1):44-53.

Harris WS (2005). Extending the cardiovascular benefits of omega-3 fatty acids. Current Atherosclerosis Reports 7:375-380.

Wijendran V, Hayes KC (2004). Dietary n-6 and n-3 fatty acid balance and cardiovascular health. Annu. Rev. Nutr. 24: 597-615.

Document 14

Internal email of 04/07/07

[FSA comment: The information is related to the recent scientific paper on tomatoes (Mitchell et al, Journal of Agricultural and Food Chemistry, published 06/23/07.)

[Information withheld under section 40, Fol Act] has gone to a meeting but we suggest something along the lines:

"The Agency has not yet seen the paper and so we cannot comment specifically on it. However we welcome any new data on this area. The Agency maintains a close watch on scientific papers that evaluate organic food and will continue to assess new research as it is published."

Internal email of 04/07/07

Please could you have a look at the synopsis of an article which is due for publication tomorrow in the New Scientist (please see below) The Express wants a line about our stance on organics in light of this study.

Grateful for your guidance on what we can say. The deadline is this afternoon (15:00).

Document 15

Internal email of 04/07/07

[FSA comment: The information is related to the recent scientific paper on tomatoes (Mitchell et al, Journal of Agricultural and Food Chemistry, published 06/23/07.)

Could you see if you could get hold of this story please. Once we have it we should have a quick look and send it to Nutrition Division and SWANI for any comments - especially on whether they think that it means that we should change our line.

Document 16

Internal email of 05/07/07 (to colleagues in nutrition division)

[FSA comment: The information is related to the recent scientific paper on tomatoes (Mitchell et al, Journal of Agricultural and Food Chemistry, published 06/23/07.)]

I have attached a copy of the research paper on organic tomatoes, conducted by the University of California and recently published in the Journal of Agricultural and Food Chemistry, for you to consider.

I would be grateful if colleagues in Nutrition could let me know if the study has any nutritional significance and whether, as a result of it, we need to change our line on organic food.

Document 17

Internal email of 05/07/07 (to Agency statistician)

[FSA comment: The information is related to the recent scientific paper on tomatoes (Mitchell et al, Journal of Agricultural and Food Chemistry, published 06/23/07.)]

We thought that it might be a good idea if you too had a look at this paper in order to consider whether its statistical analysis is sound.

Document 18

[FSA Comment: Internal note by the Agency's Nutrition Division after consideration of the recent scientific paper on tomatoes (Mitchell et al, Journal of Agricultural and Food Chemistry, published 06/23/07).]

13/ 07/07

Flavanoid content of organic tomatoes

1. Findings from a study by Mitchell et al., 2007¹ suggest that the flavonoid content of organic tomatoes is higher than conventionally grown tomatoes.

¹ Mitchell et al., Ten-year comparison of the influence of organic and conventional crop management practices on the content of flavonoids in tomatoes, Journal of Agriculture and Food Chemistry, 2007

2. The Agency recognises the role that organic food plays in providing choice for consumers. However, the Agency does not specifically promote the consumption of organic produce, as the current evidence does not demonstrate that there is a significant difference, in terms of food safety or nutritional content, from conventionally grown foodstuffs.
3. This study alone would not change the Agency's position on organic food.
4. The Agency will continue to monitor emerging evidence in this area of research.
5. Epidemiological studies have demonstrated that flavonoids may have a protective effect in terms of chronic disease.
6. As part of the long-term research on agricultural systems project (LTRAS) in California, tomatoes were grown under organic or conventional conditions over a twelve year period. Samples of dried tomato were taken at different time points over a 10 year period and stored for analysis.
7. The levels of three flavonoids, quercetin, kaempferol and naringenin, were compared between the two model systems and it was found that the mean levels were higher in the organically grown tomatoes. Quercetin was the most abundant flavonoid in both organic and conventionally grown tomatoes. The overall flavonoid content increased in both systems over time, with the largest increases being observed in the final 4 year period. The authors correlated the difference in flavonoid content of the tomatoes with nitrogen availability.
8. This is a useful piece of research, as it aims to address the problems of confounding factors encountered in other studies by growing the plants in similar environments i.e. same soil, climate, cultivars, pest and weed challenges and sampling methods were employed. Commercial-scale equipment was also used in an attempt to reflect farming practices.
9. The WHO 2003 report² states that there is some observational data which suggest that flavonoids may have a protective effect against coronary heart disease, however the evidence as a whole is conflicting. In terms of cancer, the evidence base for non-nutrients, including flavonoids is weak. Therefore, this study does not provide a cause for promoting the use of organically grown produce on this basis alone. Also, the group only investigated one type of produce. Therefore, comparative data on other organically grown food products, which are consumed in the UK, would be needed before making any recommendations.

² WHO/FAO (2003) Diet, Nutrition and the Prevention of Chronic Diseases. WHO Technical Report Series 916. Report of the Joint WHO/FAO Expert Consultation.

10. Due to potential differences in the agricultural environment and cultivars used, it is unclear whether these findings would be applicable to the UK. Model systems were based on simple crop rotation, therefore it is uncertain whether this would reflect the systems employed by commercial agriculture and what effect they would have on nutrient content of foodstuffs.
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Document 19

PQ 56990, 2005/2006 – asked about nutrient levels in organic baby foods. The answer was drafted by the Agency.

[FSA comment: available publicly through the Hansard web site – www.publications.parliament.uk/pa/cm/cmhansrd.htm The question was answered on 14 March 2006, Column 2186W.]

Document 20

Letter from Defra to the Soil Association, 18 January 07.

[FSA comment: Copy of the letter enclosed separately as Document E. The Annex contains a note produced by the Agency at the request of Defra.]

Document 21

Internal email of 25/08/06 regarding Agency's view on organic milk and omega 3 levels.

FYI - Following our discussions today, here is the comment that will be issued to the Observer with regards to the organic milk study.
Many thanks for your help.

Comment from the FSA:

"The Agency has not yet seen the detail of this research but we will certainly study it carefully in the usual way, seeking independent expert advice as necessary."

Document 22

Transcript of radio broadcast (20/09/06) regarding Agency's view on organic milk and omega 3 levels.

TRANSCRIPT

Programme(s)	Farming Today Radio 4
Date & time	Wednesday 20th September 2006 0545
Subject / interviewee	Benefits of Organic milk - Doctor Alison Tedstone & Lord Peter Melchett
Prepared by:	Trish Gwilliams and Ellie Persse
Contact numbers:	020 7276 1080 - Pager 07659 137 572 – 24hrs, every day

Mark Holdstock: Well another growth area in dairy is organic milk but the Government's food watchdog says there's still no evidence showing it's any better for us than the conventionally produced white stuff.

The Food Standards Agency issued a response to a letter from a group of scientists who claim that there's now proof organic cow's milk contains higher levels of Omega 3 fatty acids, believed to have several health benefits including reducing the risk of heart disease.

Doctor Alison Tedstone from the FSA told me that the problem is there are two sorts of Omega 3, one more useful to the human body than the other.

Doctor Alison Tedstone (Food Standards Agency): *There may be some compositional differences but the differences are related to the amount of short chain Omega 3 fatty acids within the milk ...*

MH: But I thought Omega 3 fatty acids were good for you.

AT: *Well the evidence suggests that it is the long chain Omega 3 fatty acids that are good for you, particularly in relation to heart disease, and those are only found in fish.*

MH: But you do accept that compositionally that organic milk is different from conventional milk?

AT: *Well we accept that the evidence supplied by Glasgow University suggests that (indistinct) from their study which looked at organic milk from a specific number of farms and compared it with farms, a specific number of conventional farms, that they saw differences in those particular milk samples.*

MH: But you say there's no, no benefit at all from the differences?

AT: *There may be differences but there are not any health benefits. There are no additional benefits of drinking organic milk other than those that, above those which are supplied by having conventional milk. But we are very open to looking at new evidence as it comes in and will keep our position under review.*

MH: Is there a bias within the Food Standards Agency against organic food? Your previous Chairman, Sir John Krebs, was quite outspoken in his assertions that there was no health benefits from organic food. Is there, if you like, a, a cultural bias against organic food within the FSA?

AT: *Not at all, we have very carefully considered this evidence. We are neither for or against (indistinct) organic food. All we want to do is provide consumers with accurate information.*

MH: Well Peter Melchett is the Policy Director for the Soil Association which campaigns on behalf of organic farming. I suggested to him that the FSA's findings are a definitive judgement that there are no additional health benefits from drinking organic milk.

Lord Peter Melchett (Policy Director, Soil Association): *They received a letter from some scientists which we certainly were very interested in which suggested that there was now clear evidence that there are nutritional differences between organic milk and non organic milk ...*

MH: Well you were interested because you were hoping that this would not prove nutritional differences but nutritional benefits. That's what you wanted the FSA ...

PM: Well ...

MH: ... to say wasn't it?

PM: ... no, the letter asked the agency to acknowledge the nutritional differences and the (indistinct) the Food Standards Agency have said it does seem that there are nutritional differences. Now going on to ...

MH: They've also said that there are no benefits.

PM: ... well going on to look at the impact on an individual's health is always going to be difficult. The Food Standards Agency have raised a couple of red herrings, one of which is oily fish appropriately, and said of course organic milk is not a substitute for oily fish and it doesn't make saturated fat a good thing to eat. Well we certainly agree with Deirdre Hutton and the FSA about that.

MH: But that doesn't knock down their argument that the type of Omega 3 fatty acids in organic milk are not recognised as being beneficial, particularly for things like heart disease.

PM: The short chain fatty acids do get converted in the human body to longer chain. There is scientific dispute about how much that happens and whether it's significant.

MH: But what the FSA's saying is that you, you simply couldn't drink enough milk to convert enough of the short chain ...

PM: No of course not.

MH: ... Omega 3 in to long chain Omega 3 to have any benefit.

PM: ... well not to have any benefit, to have, no they don't say that and it's important to note they don't say (indistinct) ...

MH: Or (indistinct) significant benefit.

PM: ... they say, yes, they say compared to eating oily fish. But then nobody's suggested, least of all the scientists who wrote to the FSA, that you know people should swap their fish for a glass of milk.

I'm not arguing with the FSA about this, I agree that (indistinct) ...

MH: So you accept that there are no health benefits from organic milk?

PM: ... no, what, nor do the FSA say that (indistinct) ...

MH: No, no additional health benefits from organic milk?

PM: There's, there's, there's no evidence that, what they say is there's no evidence that there are additional benefits over and above the benefits you get from much cruder or grosser changes in your diet and ...

MH: And you, you accept that?

PM: ... but there are, well let me finish, there are, there are real differences between organic milk and non organic milk that, that are nutritional. Now whether they affect individual's health for the better or not the jury's out on.

MH: Does, does this mean though that the organic movement has now given up the idea of saying to people that you are going to improve your health simply by eating organic?

PM: Well I, as I say, I think there is plenty of evidence that there's nutritional differences between organic and non organic and more emerging all the time.

MH: Mm, mm, that's, that's not, that's not nutritional benefit though is it?

PM: ... no, no, and I've said that to, to identify (indistinct) in a, in a scientific study, in a large sample differences in health outcomes, in whether people get sick and when they die, from simply what they eat is extremely difficult in, in any dietary adjustment, in anything that you, you want to talk about in terms of a healthy diet because there are so many other variables to do with our wealth and our habits and our exercise and whether we smoke or not and so on.

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Document 23

Speaking Note for the Agency's Chief Executive to use at Agency Board meeting (20/09/06) regarding Agency's view on organic milk and omega 3 levels.

GLASGOW UNIVERSITY ORGANIC MILK LETTER

SPEAKING NOTE FOR JOHN HARWOOD

Summary

- Board members may have seen some press coverage regarding organic milk.
- A letter was sent to the Chair from scientists at Glasgow University on 29 August about the nutritional benefits of organic milk.
- A reply was sent to Glasgow University on 19 September, accompanied by a web story which was placed on the Agency website.
- Board members will be aware of a web story on organic milk that was published on the Agency website on 19 September, as a result of this letter.
- Peter Melchett (Policy Director of the Soil Association) was informed in advance of publication of the web story on 19 September.

What is current Agency advice on milk consumption?

- Agency advice is to consume milk and other dairy foods in moderation as part of a healthy balanced diet. Milk and dairy foods such as cheese, yoghurt and fromage frais are an important source of calcium in the diet (needed for bone health) and are also a source of protein and vitamins A, B12, and D.
- Agency advice to consumers is to try to cut down on fat, especially saturated fat. As such, the Agency advises consumers to try to choose lower fat milk and dairy foods, such as skimmed or semi-skimmed milk and reduced-fat cheeses, or to have smaller amounts of higher fat versions or eat them less often. However, only full-fat milk is suitable for children below the age of five, unless they are eating and growing well, in which case semi-skimmed milk can be introduced from the age of two.

Glasgow University Research

- The Glasgow University letter raised the following points:
 - Organic milk contains more of the short chain omega-3 fatty acids than conventional milk on the basis of their new research.
 - The short chain omega-3 fatty acids found in organic milk are of nutritional benefit.
 - The Agency was therefore invited to recognise that there were nutritional differences between organic and non-organic milk, specifically in relation to the omega-3 content.

Chair's response to Glasgow University

- The FSA welcomed the new study as adding to the evidence base.
- The evidence on the nutritional benefits of organic milk contained within the letter was checked and carefully considered by the FSA. This included discussions with scientists at a workshop in September 2006, on fatty acids and health, which was attended by international experts on nutrition.
- The Chair replied to Glasgow University on 19 September.
- The Agency concluded, having taken expert advice, that whilst the study showed that there could be compositional differences between milk produced organically compared to conventional methods, there was no evidence that organic milk provides nutritional benefits over and above those associated with conventional milk.

Document 24

Questions and Answers regarding Agency's view on organic milk and omega 3 levels - 19/09/2006

Why does the Agency not agree with the views of the researchers at the University of Glasgow?

Whilst the new study provided by Glasgow on the composition of organic milk shows that organically produced milk can contain higher levels of types of fats called short-chain omega-3 fatty acids than conventionally produced milk, the evidence suggests that these fatty acids appear to be of limited health benefit compared to the longer chain omega-3 fatty acids found in oily fish.

Is the Agency changing its advice on milk consumption?

No. The Agency believes that it would not be appropriate to advise consumers to switch to organic milk for reasons related to dietary health. This is because the new evidence, whilst interesting, does not justify the assertion that organic

milk provides health benefits other than those associated with conventionally produced milk.

What is current Agency advice on milk consumption?

Agency advice is to consume milk and other dairy foods in moderation as part of a healthy balanced diet. Milk and dairy foods such as cheese, yoghurt and fromage frais are an important source of calcium in the diet (needed for bone health) and are also a source of protein and vitamins A, B12, and D.

Agency advice to consumers is to try to cut down on fat, especially saturated fat. As such, the Agency advises consumers to try to choose lower fat milk and dairy foods, such as skimmed or semi-skimmed milk and reduced-fat cheeses, or to have smaller amounts of higher fat versions or eat them less often. However, only full-fat milk is suitable for children below the age of five, unless they are eating and growing well, in which case semi-skimmed milk can be introduced from the age of two.

Why are you sponsoring the City Food Lecture on organic food?

The organic food market is a growing area and the FSA is keen to facilitate an open debate about consumer choice and organic food. We see the City Food Lecture as a ready-made opportunity to have a high profile public debate each year on a current and lively food topic.

What is Agency advice on consumption of omega-3 fatty acids?

The Agency continues to advise that people should eat at least two portions of fish per week, including one of oily fish, which is rich in long-chain omega-3.

Are you going to do more research on this issue?

The Agency has convened two workshops of independent expert scientists to review the evidence on polyunsaturated fatty acids (PUFA) in relation to health.

- At a 2002 Agency workshop on alpha-linolenic acid (ALNA), experts concluded that there were little if any benefits of ALNA to cardiovascular disease risk. A 2006 USA workshop came to similar conclusions.
- At a 2006 Agency workshop on the effects of n6:n3 fatty acid ratio on cardiovascular health experts concluded that findings from the ratio is of limited use. Instead, absolute amounts of different fatty acids should be used.

As a result of these findings, the Agency plans to conduct no further research in this area, but will remain alert to new evidence and continues to fund research investigating the potential beneficial effects of the long-chain PUFAs (LCPUFAs) found in oily fish.

Are the experts in your workshops really independent?

Yes, participants at FSA nutrition workshops are UK and international academics from universities and research institutions. They are not paid for their attendance (other than reimbursement of travel and accommodation where appropriate) and do not have a vested interest.

The researchers from Glasgow University have the backing of a large number of other expert scientists - are you saying that you disagree with them all?

We have carefully considered the opinion presented in the letter and research papers, and have taken advice from experts in the field, including [s40], who signed the letter and attended the Agency workshops.

Are you not just siding with manufacturers of conventional milk?

The Agency is neither for nor against organic food. Our interest is in providing accurate information to support consumer choice. The Agency is always open to new evidence and maintains a close watch on scientific papers that evaluate organic food and will continue to assess new research as it is published.

How much organic milk would a person need to consume to get benefit from the additional short-chain fatty acids in organic milk?

According to the Composition of Foods, whole milk contains 4g/100g total fat. The Ellis paper quotes organic milk as containing 1.1% total fat as n-3 fatty acids. Therefore, organic milk contains 0.044g n-3/100g whole milk.

Based on a conversion rate of 8% ALNA to EPA, humans could derive approximately 0.00352g EPA/100g whole milk consumed. This equates to 0.0352gEPA/litre of whole milk.

A 150g portion of oily fish contains 3g LCPUFAs (EPA and DHA).

Therefore, you would need to drink approximately 100 litres of organic whole milk to obtain the benefits of consuming one portion of oily fish. This conflicts with advice on what constitutes a healthy, balanced diet and it is therefore debatable whether there are any health benefits of the short-chain n-3 fatty acids derived from organic milk.

How much more Omega 3 does organic milk have compared to conventional milk?

According to the paper by Ellis *et al*, organic milk contains 1.1% total fat as n-3 fatty acids compared to 0.66% in conventional milk.

How many more fatty acids would organic milk need to contain for you to change your advice? Would this be achievable, or would the milk have to lose its organic status to do this (i.e would the fatty acids have to be added artificially)?

Current research suggests that the health benefits derived from n-3 fatty acids are related to the LC PUFAs found in oily fish. Organic milk does not represent a viable alternative to oily fish as a source of LCPUFAs.

**What other benefits does organic milk have over conventional milk?
Does it contain a higher amount of other vitamins or minerals?**

The available evidence shows that the nutrient levels and the degree of variation are similar in food produced by both organic and conventional agriculture. Nutrient levels in food vary depending on many different factors. These include freshness, storage conditions, crop variety, soil conditions, weather conditions and how animals are fed. All crops and animals therefore vary in nutrient level to some extent.

We are aware of some research suggesting organic milk has higher levels than conventional milk of certain nutrients such as Vitamin E and carotenoid antioxidants (e.g. beta-carotene, lutein, zeaxanthine). The differences again are related to the feed regime, and vary through the year, as the nature of cows' diets tends to change with the seasons.

What do cows on organic farms eat that makes their milk so much richer in omega 3?

Feed for organically reared livestock has higher levels of grass and clover based forage, particularly in winter when livestock do not graze. It is well known that the composition of animal feed (as well as other factors such as seasonality, age and health status of the cow) influences the composition of milk.

Do conventionally reared cows not eat any of the same food?

They may, but this will depend on individual farming practices. Similar results might be found in conventionally reared livestock if fed on a diet rich in grass and clover forage.

Document 25

**Information used in answering general correspondence regarding
Agency's view on organic milk and omega 3 levels.**

27/09/06

In the specific case of milk it has been found that milk from cows that are fed on a diet containing a good proportion of clover tends to have higher levels of omega 3 fatty acids than milk from cows not receiving such a diet. Organic farmers use clover to fix nitrogen in their grassland, organic milk is therefore particularly likely to contain omega 3 fatty acids. It is also possible to obtain similar results by changing the feed composition of cows producing

conventional milk. We are not aware of any research suggesting that higher nitrogen levels suppress omega 3s.

Do conventionally reared cows not eat any of the same food?

They may, but this will depend on individual farming practices. Similar results might be found in conventionally reared livestock if fed on a diet rich in grass and clover forage.

With regard to the question if organic cheese is better than conventionally produced cheese, the Agency is aware of recent research indicating that organic milk and certain dairy products have higher levels of omega-3 fatty acids, vitamin E and certain antioxidants (e.g. beta-carotene and lutein). The differences are linked to the different feeding regimes, in particular the amount of clover in the diet. Such research often claims that organic milk is an alternative to oily fish as a source of beneficial omega-3 fatty acids.

However, sources of omega-3 fatty acid present in milk (short chain) are not the same as those found in oily fish (long chain) that have shown to have protective effects for cardiovascular disease. Therefore it would be wrong to present milk and dairy products as an alternative to oily fish.

In relation to the nutritional significance of vitamin E and antioxidants, it should be noted that vitamin E is not in short supply in the nation's diet, and milk and dairy products contribute only about 3-5%. Even if levels were substantially increased, the overall effect would be small. Also, since these substances reside in the fat component of milk, any increase in intake from this source would be accompanied by with an increase in saturated fat, which could have adverse consequences.

Document 26

Papers (including documents A – D enclosed separately) related to a mini workshop on organic milk held on 1 June 2007 with key stakeholders

AGENDA

- | | |
|---------------|---|
| 09.30 - 10.00 | Tea and Coffee |
| 10.00 - 10.10 | Welcome and Introduction
Dr Elaine Stone, FSA |
| 10.10 – 10.40 | Nutritional Significance of Organically Produced Milk
Dr Kathryn Ellis, University of Glasgow |

10.40 – 10.50	Questions and discussion
10.50 – 11.00	Break
11.00 – 11.30	Conversion of alpha linolenic acid to longer chain polyunsaturated fatty acids in adult humans Dr Graham Burdge, University of Southampton
11.30 – 11.40	Questions and discussion
11.40 – 12.30	General discussion
12.30 – 13.00	Lunch

References to background papers considered by the workshop

Burdge G, Calder P (2006). Dietary a-linolenic acid and health – related outcomes: a metabolic perspective. *Nutrition Research Reviews* 19: 26-52

Burdge G, Calder P (2005). A-linolenic acid metabolism in adult humans: the effect of gender and age on conversion to longer-chain polyunsaturated fatty acids. *Eur.J.Lipid Sci Technol.* 107: 426-439.

BurdgeG, Wooton S (2002). Conversion of a-linolenic acid to eicosapentaenoic, docosapentaenoic and docosahexaenoic acids in young women. *British Journal of Nutrition* 88:411-420.

Goyens PL, Spiker ME, Zock PL, Katan MB, Meysink RP (2006). Conversion of a-linolenic acid in humans is influenced by the absolute amounts of a-linolenic acid and linoleic acid in the diet and not by their ratio. *American Journal of Clinical Nutrition* 84: 44-53.

Williams, CM and Burdge G (2006). Long chain n-3 PUFA; plant v. marine sources. *Proceedings of the Nutrition Society* 65: 42-50.

Summary note of the Organic Milk Workshop (01/06/07)

Background

Back in August 2006 the Chair of the Food Standards Agency received a letter from Dr Kathryn Ellis, University of Glasgow asking the Agency to revise its position on the nutritional composition and health benefits of organic milk, quoting several scientific papers.

The Agency examined these studies and concluded that although organic milk had a higher level of short chain n3 fatty acids the nutritional significance was weak. The discussion continued regarding the conversion rate of short chain n-3 to EPA and DHA, and as a result of the last letter it was suggested that a workshop be convened to discuss the evidence on the conversion rate.

Presentations and Discussion

Dr Kathryn Ellis (KE) presented on the background of organic farming, organic milk production and consumption and the compositional differences in organic and conventional milk.

The main part of the KE presentation focussed on the fatty acid composition of organic milk. A 12 month longitudinal field study (conducted by *[information withheld under s40 FOIA]*) confirmed that there were fatty acid compositional differences in organic and conventional milk. Organic milk contained higher amounts of total omega 3, compared to conventional milk.

KE wanted to highlight organic milk research as an area of growth and the number of unknown issues that currently require investigation.

Points raised:

- Importance of distinguishing between short and long chain omega 3
- Conversion rate is limited in humans
- Although the conversion rate is limited, organic milk may be beneficial for certain groups of the population e.g. vegans and vegetarians

Dr Graham Burdge (GB) presented a review of the isotope and intervention studies investigating alpha-linolenic acid metabolism in humans.

Points raised:

- There were differences in the method used in the isotope studies.
- The rate of conversion was different in men and women, with the conversion limited in men, as it could be under the control of oestrogens.
- The conversion is affected in a limited way by intakes of ALNA.
- Whether it was more beneficial to consume 1 portion of oily fish a week in one serving or to spread the portion out over seven days.

Overall conclusion

- The FSA had noted that there was a compositional difference in organic milk compared to conventional milk and as a result of this the Agency had amended their statement on the website. However, it was still unclear as to what extent the fatty acid composition of organic milk was likely to have on human health.
- The discussions at the workshop had extended the list of areas and population groups (e.g. children, vegans) that required further research in this area.

Document 27

In January 2007 we updated the incoming Deputy Chair on the Agency's position on organic. All the information is publicly available or being released to you.

Document 28

On 2nd May 07, we updated the Chair on the Agency's position on organic in advance of her visit to Ashlyns Organic Farm, accompanied by Peter Melchett, Soil Association. The information is publicly available or being released to you.

Document 29

In May 2007, we updated Michael Wight on the Agency's position on organic, in advance of his visit to Peter Melchett's Farm. The information is publicly available or being released to you, apart from the following:

- **Organic fruit and vegetables nutritional superiority**

We note that not all of the emerging research was quite as positive as was presented in the press. For instance, a paper on peaches was cited in the press as 'proving' that organic peaches had higher levels of certain nutrients. However, when you look at the paper itself this difference was noted in one year of the trial, but not in the other.
