A VETERINARY ANALYSIS OF A NOVEL APPROACH TO DOLPHIN SLAUGHTER USED IN THE 'DRIVE HUNTS' IN TAIJI, JAPAN

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Abstract

It is estimated that each year within Japanese waters up to 22,000 small whales, dolphins and porpoises (known collectively as 'small cetaceans') are killed in hunts that involve a range of techniques. The Taiji Fishing Cooperative, Japan has published the details of a new killing method which involves cutting (transecting) the spinal cord. Analysis of video material of this method indicates that it does not immediately lead to death, and that the time to death data provided in the description of the method, based on termination of breathing and movement, is not supported by the available video data. Damage to the vertebral blood vessels and the vascular rete from insertion of the rod will lead to significant hemorrhage, but this alone would not produce a rapid death in a large mammal of this type. The method induces paraplegia (paralysis of the body) and death through trauma and gradual blood loss. This method of slaughter and killing does not conform with the recognized requirement for 'immediate insensibility' and would not be tolerated or permitted in any regulated slaughterhouse process in the developed world.

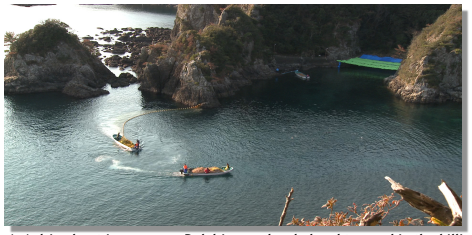

Fig. 1. A drive hunt in progress. Dolphins are herded and trapped in the killing cove.

Introduction

It is estimated that each year within Japanese waters up to 22,000 small whales, dolphins and porpoises (known collectively as 'small cetaceans') are killed in hunts that involve a range of techniques. Most of these small cetaceans are killed in a direct hunt for Dall's porpoises, but others are taken in a particular category of hunt known as 'drive hunts' or the drive fishery. The main species taken in the drive hunts include: common bottlenose dolphins *(Tursiops truncatus)*, striped dolphins *(Stenella coeruleoalba)*, Risso's dolphins *(Grampus griseus)* or short-finned pilot whales (*Globicephala macrorhynchus).* These animals are herded at sea - using small fishing vessels, underwater noise (this is referred to as the Oikomi method) - and driven into harbors or shallow coves which have been netted off and where they are then killed (Fig. 1) .

To date, little data on the animal welfare aspects of these drive hunts have been made available by the Government of Japan (GoJ) and thus, independent assessment of the killing techniques used during these hunts and their efficacy has not been possible. In 2000, fishermen began using a new killing method suggested as being an improved and more humane method of killing. Until the introduction of this new method, the primary tools used for slaughter were knives and spears, targeted at various parts of the dolphin or whale body. According to information on the website of the Taiji Fishing Cooperative (Iwasaki & Kai, 2010), this new killing method, which is intended to sever the spinal cord at the junction between the occiput and first cervical vertebra, was tested from December 2000 to February 2001. When the hunt was carried out in 2008, the technique was applied comprehensively to the killing of striped dolphins and, from December 2009, control of bleeding was achieved by driving a wooden wedge into the wound.

We analyzed videotape footage of a dolphin drive hunt involving striped dolphins (*Stenella coeruleoalba)* conducted in Taiji, Japan in January 2011. We compared our observations and analysis to a published assessment by Iwasaki & Kai (2010) and translated from Japanese into English in order to facilitate a comparison of data on kill methods and dolphin behavior. Independent observers have not previously assessed the killing methods used in the dolphin drive hunts in Taiji, Japan.

Methods

The video material was analyzed by one of the authors (AB), a veterinarian. The video footage used in this analysis was provided by an independent video journalist. Events and event intervals were documented, tabulated, and timed using the time base available on the video material.

'New' killing blade (transecting knife) with wooden plug (Iwasaki & Kai, 2010). Wooden peg inserted into wound to stem bleeding

Results

Figure 2A. Overlay of skeletal and soft tissues on an image of a striped dolphin (*Stenella coeruleoalba).* The images were referenced to the written description of the method which is described in Iwasaki & Kai (2010). This overlay shows the relationship between the skeletal and soft tissues compared with the external anatomical features (eye, mouth, blow hole, dorsal fin, and pectoral fin) and with the course and positioning of the metal rod.

Figure 2B. A wooden rod is inserted into the wound after the rod is removed. This is done to prevent the blood from escaping the body. This technique will actually prolong time to death.

Table 1. Video analysis – timing of events during use of the new killing device.

Timecode (seconds)	Duration (seconds)	Event	Comment
----	Prolonged	Dolphins secured by their tail fluke and dragged by boat	Dolphins are unable to swim effectively and are being repeatedly pushed under the water by the action of dragging and by pressure of other animals tied up with them. The inability to control the timing of breathing (and enforced submersion) is causing profound distress and restricted escape movements in these animals. Some experiencing 'forced drowning' due to their inability to control whether they are at the surface or forced underwater.
02:37	Start	Dolphin 1 – first forceful insertion of metal rod	The rod pushed into tissues rapidly. It appears unlikely that this first 'push' penetrates bone. Severing the spinal cord at the first attempt (as claimed in the description of the method) is not achieved at this first insertion.
02:40 - 02:44	3 to 7	Animal moves strongly and operative redirects and re-forces the rod at multiple angles repeatedly pushing it into the animal	The animal responds strongly to the first insertion of the rod and the operatives have to hold the animal whilst the operative with the rod redirects the rod and repeatedly pushes it into the animal.
02:44 - 02:48	7 to 11	The rod appears to hit hard (bony) obstruction and the operative pushes the rod in at different angles but does not achieve deep insertion of the rod	At this point it appears likely that the rod makes first contact with the vertebral bones of the cervical (neck) vertebrae. The rod clearly requires very significant force to push further into the tissues at this time. At the end of a period of pushing, it is possible that the cervical vertebrae have now been damaged sufficiently to allow the spinal cord to also be damaged by the rod.
02:50	13	Insertion of the wooden peg	The rod is withdrawn and a wooden peg inserted. This is intended to 'reduce pollution of the sea' with blood. If 'rapid bleed out' (as is required in animals slaughtered and killed in a slaughterhouse)[1] is part of the killing process, then blocking the bleed out passage may slow down bleed out and prolong the time to death.*
03:17	40	Animal with wooden peg in puncture site visible	The animal is stationary at this time, but the wooden peg is clearly visible.
03:48	71	Small vertical head movements	The animal starts to make regular rhythmic vertical head movements.
04:10	93	Animal stationary	The animal stops moving.
04:30	113	Slow rotational movements of the body seen	The animal now makes slow regular rotational movements.
04:33	116	Vertical head movements	The animal makes regular rhythmic vertical head movements.
04:39	122	Vertical head tremor	The head movements become rapid and repetitive.
05:07	150	Major body movements start	The entire body now makes major large scale regular repetitive movements.
05:24	167	Major body movements continue with thrashing fluke causing splashing	The repetitive movements now include the whole body and the tail fluke and this thrashing throws up considerable spray. Because this spray is interfering with the operative (who is now using the rod on another animal) – another operative puts a rope around the thrashing animals tail fluke. Both operatives are not showing attention to the movements of the animal other than to remove it from the 'work area'.
05:25	168	Operative secures thrashing fluke and drags animal away from other operative	The powerfully moving animal is dragged out of the 'work area' – but its tail fluke movement bring it back toward the operative who is using the rod on another animal.*
05:29	172	Vigorous thrashing of the flukes	
06:02	205	Animal motionless	The animal now becomes motionless.
06:36	239	Mouth visible and making small regular and co-ordinated opening and closing movements	Regular small movements of the mouth are visible.*
06:51	254 s (4 min 14s)	Opening and closing movements of mouth continue - end of available video material	Regular small movements of the mouth are visible.*

[1] If the stated criteria for establishing time to death (no movement) are applied, then this animal has not yet achieved death.

Discussion & Conclusion

The results of our analysis of the killing methods utilized in the Taiji dolphin drive hunt provide strong evidence that the claims regarding the killing method describe in Iwasaki & Kai (2010) are not substantiated, and stand in sharp contrast, and are contradictory, to their descriptions and conclusions. Contrary to Iwasaki & Kai which publish Time to Death (TTD) data ranging from an average of 13.7 to 25 seconds, our video analysis reveals prolonged TTD. This killing method cannot be considered as humane as it does not fulfill the recognized requirement for immediacy, and in fact may result in a prolonged aversive application of a violent and traumatic physical process followed by death by spinal paralysis and blood loss. This method would not be recognized or approved as a humane or acceptable method of killing for mammals in any setting.

This method for killing highly developed mammals for commercial gain is in striking contrast to EU, US and existing Japanese legislation which aims to ensure the humane treatment of farm, domestic and laboratory animals. Dolphins are sentient, highly social mammals that exhibit advanced cognitive abilities. Our existing scientific knowledge and understanding of cetacean anatomy, physiology, social behavior and cognition should inform local and global fisheries and animal welfare policies on the treatment of these species.

Animals used for commercial purposes have been afforded the status of sentient beings under the Treaty of Amsterdam, and there exists a moral (and established legislative) obligation to exercise a duty of care for animals under the control of humans. As humans determine when and where these animals die, there is an ethical obligation, as well as a practical opportunity, to closely control the method of death to minimise pain or suffering. There appears no logical reason to accept a method for slaughter that is clearly not carried out in accordance with fundamental and globally adopted humane principles.

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