Improved method of killing dolphins in the drive fishery in Taiji, Wakayama Prefecture

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Purpose: In the 'drive hunt' (oikomi) fishing in Taiji dolphins were killed using a spear-type instrument and harvested for food (the conventional method, see below). However, in the Faroe Islands, methods to cut around the blood vessel plexus and cervical spine have been developed (the spinal transaction method: Olsen (1999)). This method results in a shorter harvest time, and is thought to improve worker safety. We report the results of the implementation of this method.

Figure 1. Knife and wedge currently used for killing (the knife is attached to a buoyant marker in case it is dropped in the water)

Materials and Methods: From December 2000 - February 2001, Spinal cord cutting method was applied to 9 Risso dolphins, 4 Striped dolphins, and 2 Spotted dolphins and one Pilot Whale. Harvest times were recorded using the conventional method of killing a Striped dolphin as a control. Criteria for death were the termination of movement and breathing as observed by the worker (fisherman). In December 2008, the technique was applied comprehensively to the killing of Striped dolphins. In December 2009, control of bleeding was attempted by driving a wedge into the wound.

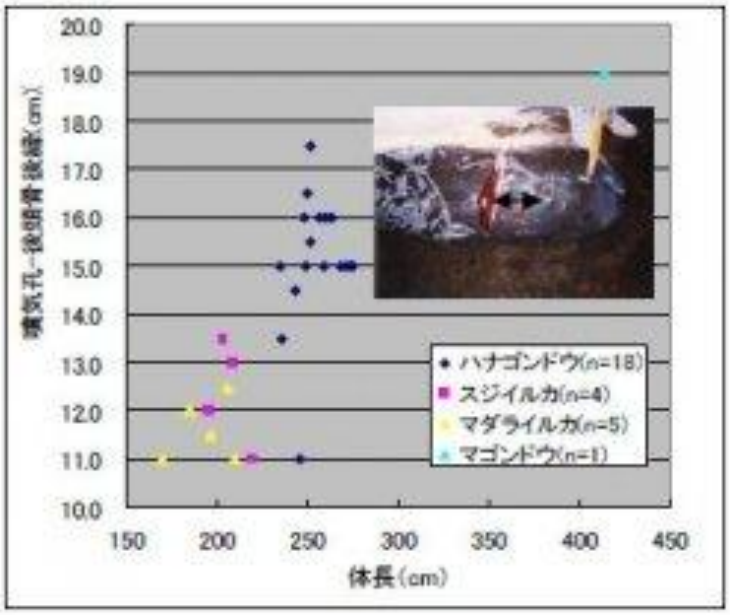
Results: The spinal transection method reduced the time to death.

Table 1. Time to harvest

Species	***Method***	***Number***	***Minimum time to death (no movement, no breathing)(T_{min} seconds)***	***Maximum time to death (no movement, no breathing)(T_{max} seconds)***	***Minimum time to death (no movement, no breathing)(T_{ave} seconds)***
Risso's Dolphin	*Spinal transection*	*9*	*5*	*40*	*13.7*
Striped Dolphin	*Spear and spinal transection*	*4*	*5*	*30*	*17.5*
Striped Dolphin	*Conventional*	*1*	*300*	*300*	*300*
Spotted Dolphin	*Spinal transection*	*2*	*8*	*10*	*9*
Pilot Whale	*Spinal transection*	*1*	*25*	*25*	*25*

Figure 2. The spinal transection method. The wound is very small because only the edge of the cutting blade is used to transect the spine

Figure 3. Relationship between location of spinal transection and body length.



[In Figure 3:
Y-axis label: "Distance between the blow hole and the base of the occiput"
X-axis label: "Body length" of the dolphin
Key:

dark blue diamonds= Risso's dolphins (n=18)
pink squares= Striped dolphins (n=4)
yellow triangles= Spotted dolphins (n=5)
teal triangle= Pilot whale (n= 1)]

Taking the width of a fist to be approximately 10cm, as shown in Figure 3, the appropriate cutting guide was considered to be behind the blow hole by one fist width for Striped and Spotted dolphins, one and a half fist widths for Risso dolphins and 2 fist widths for the larger long-finned Pilot Whale.

Figure 4. Prevention of stranding (left) Control of bleeding by using the wedge (right)

Placing a vinyl sheet over the rocks facilitated the transport of the Striped dolphins to the killing area and also the full application of the spinal trans-section technique. In addition, by driving a wedge into the cut, bleeding was controlled. Exsanguination occurred 10 to 30 minutes later at the time of gutting, and this did not affect the quality of the meat (for consumption).

Conclusion: Harvest time was shortened, improving worker safety. Control bleeding by the wedge opens up the possibility of industrial utilization of blood and prevents pollution of the sea with blood. The person who developed the spinal cord transection technique has pointed out that prevention of bleeding and internal retention of blood using the wedge risks prolonging death. Additional review to compare time to death with the Faroe Islands is required.

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