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National Capital Region

Canadian Science Advisory Secretariat
Science Advisory Report 2023/014

ADVICE REGARDING AN ALTERNATIVE BLEEDING METHOD FOR HARVESTING YOUNG GREY SEALS (*HALICHOERUS GRYPUS*)

Grey seal beater (Photo credit: Shelley Lang).

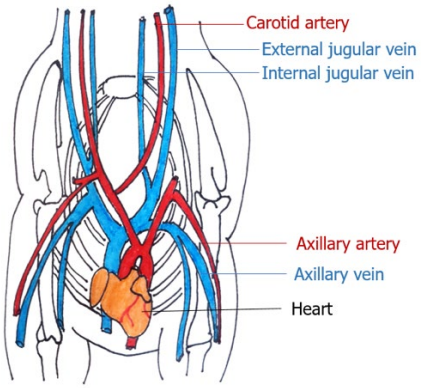

Figure 1. Schematic identifying the location of the axillary and carotid arteries, and associated veins in young grey seals.

Context:

Young of the year (YOY) grey and harp seals are hunted off Newfoundland and in the Gulf of St. Lawrence and on the Scotian Shelf. The current regulations for the humane killing of seals mandate a three-step process, which requires, as the last step, that animals be bled by severance of their axillary arteries and surrounding blood vessels prior to skinning. This usually consists of opening the animal, cutting the arteries and then turning it over to bleed out. However, the hunt for grey seals in the Gulf of St. Lawrence usually occurs on land and targets mainly young seals for commercialization of their meat for human consumption. As such the requirement to bleed via the axillary arteries may lead to contamination of the meat by debris from the ground. To minimize contamination and still meet the highest animal welfare standards, an alternative bleeding method involving severance of the common carotid (neck) arteries and surrounding blood vessels has been proposed. The objective is to reduce the likelihood of meat contamination and be as efficient from the perspective of animal welfare as the current approach identified in the regulations. Science was asked to determine if bleeding from the carotid arteries can be used as an alternative method to bleeding from the axillary arteries and if so, what factors affect the bleeding time.

This Science Advisory Report is from the November 15–19, 2021 National Marine Mammal Peer Review Committee (NMMPRC) Meeting. Additional publications from this meeting will be posted on the Fisheries and Oceans Canada (DFO) Science Advisory Schedule as they become available.

SUMMARY

- The *Marine Mammal Regulations* (MMR) mandate a three-step process when killing seals for personal or commercial purposes to comply with high standards of animal welfare. The aim of the final "bleeding step" (described in the MMR as bleeding the animal by severing the axillary arteries) is undertaken to ensure that the animal is dead before the carcass is further processed by the harvester.
- The time required to bleed young grey seals by severing either the axillary arteries and surrounding blood vessels or the common carotid arteries and surrounding blood vessels were compared.
- Results indicate that severance of the common carotid arteries and surrounding blood vessels located in the ventral part of the neck is as rapid and efficient as severing the axillary arteries and surrounding blood vessels for bleeding young grey seals and would thus be adequate to ensure death from an animal welfare perspective.
- Bleeding time with both methods was unaffected by the body weight of the young grey seals and was similar for males and females.
- Comparing bleeding time from severance of axillary arteries between young harp seals and grey seals, bleeding time was overall 60% longer in grey seals than harp seals. This is likely a result of a larger body mass and blood volume in grey seals, and differences in hunting techniques between these two species.

BACKGROUND

Mandatory bleeding of seals is required as per the Marine Mammal Regulations (MMR) as part of the three-step process of humane killing[1]. The location of artery severance was historically identified based upon the harp seal (*Pagophilus groenlandicus*) harvest which generally occurs on ice. Grey seals (*Halichoerus grypus*) are harvested on land, mainly for their meat. This study aimed to evaluate severance of the common carotid arteries and surrounding blood vessels as an alternative bleeding method to the severance of the axillary arteries and surrounding blood vessels to reduce the risk of contamination of the meat that is harvested from seals killed on land.

ANALYSIS

Bleeding time when severing axillary arteries or common carotid arteries were compared by dividing bleeding time into two parts: (1) the time elapsed between the first skin incision and the first artery cut, and (2) the time elapsed between the first artery cut and the end of a steady blood flow (i.e., duration of the actual bleeding event).

The first part of bleeding by severance of the common carotid arteries took half the time of severance of the axillary arteries, whereas the second part of bleeding was similar in duration between the two methods (Table 1). Overall, the entire procedure was similar in duration between the two methods, with no difference between males and females, and was independent of body mass.

[1] MMR Section 29: No person shall skin a seal until the cranium has been crushed and at least one minute has elapsed after the two axillary arteries of the seal located beneath its front flippers have been severed to bleed the seal.

Table 1. Comparison of bleeding time (sec) following severance of axillary or common carotid arteries in recently weaned grey seals. The first part refers to the time elapsed between first skin incision and first artery cut. The second part refers to the time elapsed between first artery cut and end of steady blood flow.

Bleeding time	Bleeding method	Mean	Standard error	Range	N	*P* value
First part	Axillary arteries	6.4	0.6	2–20	31	<0.001*
	Carotid arteries	3.3	0.8	1–8	31	
Second part	Axillary arteries	27.9	2.3	8–68	31	0.663
	Carotid arteries	29.2	2.0	12–64	31	
Total duration	Axillary arteries	34.3	2.4	11–72	31	0.556
	Carotid arteries	32.5	2.1	15–67	31	

*Significantly different

Bleeding times following severance of the axillary arteries were also compared between young harp seals and grey seals (Table 2). Results show a longer duration of the first part but a shorter duration of the second part, and a shorter total bleeding time in harp seals compared to grey seals. A more cautious approach in the initial part of the bleeding to avoid spoiling the pelt when looking for the axillary arteries might explain the longer duration of this stage in harp seals. However, most young harp seals are shot while young grey seals are struck with a hakapik. The loss of a large amount of blood from the head wound caused by the bullet in harp seals, combined with their smaller body size and blood volume, likely explains the shorter second stage and overall bleeding time in this species.

Table 2. Comparison of bleeding time (sec) by severance of axillary arteries in recently weaned young grey seals (this study) and young harp seals.

Bleeding time	Species	Mean	Standard error	Range	N	*P* value
First part	Grey seal	6.4	0.6	2–20	31	< 0.001*
	Harp seal	10.9	0.4	5–26	90	
Second part	Grey seal	27.9	2.3	8–68	31	< 0.001*
	Harp seal	11.0	0.3	5–32	143	
Total duration	Grey seal	34.3	2.4	11–72	31	< 0.001*
	Harp seal	21.4	0.6	12–35	85	

*Significantly different

CONCLUSIONS

Comparing the two techniques demonstrates that severance of the common carotid arteries and surrounding blood vessels represents a rapid bleeding method for young grey seals and would thus be sufficient to ensure death from an animal welfare perspective. This method is as quick as severance of the axillary arteries and surrounding blood vessels and could be advantageous by reducing contamination of tissues collected for human consumption from debris on the ground.

OTHER CONSIDERATIONS

The skill of the individual sealers may influence the timing of the first part, but is unlikely to have a major influence on the total duration of bleeding since the second part accounts for the majority of the time.

Bleeding time in animals is influenced by several factors such as the species, killing method, the size of the animal, and bleeding site(s). All these factors need to be taken into consideration when comparing the efficacy of different bleeding methods.

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SOURCES OF INFORMATION

This Science Advisory Report is from the November 15–19, 2021 National Marine Mammal Peer Review Committee (NMMPRC) Meeting on Alternative bleeding method for the hunt for young seals (*Halichoerus grypus*): common carotid arteries versus axillary arteries. Additional publications from this meeting will be posted on the *Fisheries and Oceans Canada (DFO) Science Advisory Schedule* as they become available.

Daoust, P.-Y. and Caraguel, C. 2012. The Canadian harp seal hunt: observations on the effectiveness of procedures to avoid poor animal welfare outcomes. Anim. Welf. 21:445–455.

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