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IMMOBILIZATION AND TAGGING OF MUSKOXEN (*OVIBOS MOSCHATUS*) IN JAMESON LAND, NORTHEASTERN GREENLAND

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ABSTRACT: In July 1982 and 1983, 491 muskoxen were handled in a tagging project in Jameson Land, northeastern Greenland. Groups of muskoxen as well as single individuals were rounded up effectively by Greenland huskies and kept in an accessible position suitable for injection of immobilizing drugs. Standard doses of drugs were developed for each age class. For adults the dose used was 2 mg etorphine, 30 mg xylazine and 200 IU hyaluronidase. For yearlings the xylazine was reduced to 20 mg while the etorphine and hyaluronidase remained at 2 and 200, respectively. For calves the doses were 0.5 mg etorphine with 200 IU hyaluronidase. The narcotic antagonist used was deprenorphine (used with hyaluronidase) administered via the intramuscular route so that all animals in any group would recover more or less simultaneously.

INTRODUCTION

In connection with proposed oil exploration activities in Jameson Land (70°30′N–71°45′N), northeastern Greenland, the Game Biology Station of Kalø, Denmark, is carrying out studies on the muskox population in the area as a consultant for the Ministry of Greenland. The objectives of this research are to specify ways in which the future industrial activities may affect the animals. Information on vital parameters of muskox life history will be imperative in adapting human activities and technical installations to create the least possible disturbing effect on the muskox population.

The wildlife disease section at the State Veterinary Serum Laboratory was requested to develop a safe method for immobilizing and tagging large numbers of muskoxen with a minimum of disturbance. A preliminary study was carried out during the period 20 July–1 August 1982 to find out whether it would be possible to mark the muskoxen. This study was followed by another immobilization operation in the period 9–31 July 1983.

MATERIALS AND METHODS

For the purpose of these studies, an area of approximately 25 km² was chosen in the middle of Jameson Land (71°35′N and 24°05′W). The density of muskoxen varied greatly in Jameson Land, but the area where the tagging was carried out has a very high population density, about four muskoxen per km². Aerial censuses in early April 1982 and 1983 revealed a late winter population of approximately 3,500 muskoxen in Jameson Land (area 11,000 km²) (Lassen, 1984).

Muskoxen were caught by a team of one or two biologists, one or two veterinarians, and a local Inuit hunter aided by Greenland huskies. Using natural cover it was often possible to approach within 50–70 m of the animals, otherwise two or three dogs were released when the muskox groups began to be alert. If the dogs were eager and kept circling the herd, the situation developed fairly similarly each time. The muskoxen formed a close group with each animal facing outwards. Particularly at the beginning of each encounter some muskoxen would attempt to charge after the dogs, but generally no further than 20–30 m before returning to the group. As the group shifted, all muskox within a group would eventually be exposed to a shot with an immobilizing dart. They were preferably hit in the thigh or in the shoulder from a distance of 20–30 m. In 10 cases involving solitary bulls, one man without the aid of dogs stalked the animals to within shooting distance.

A tranquilizing gun (extra long-range powder projector, Palmer Chemical Co., Douglas-

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ville, Georgia 30134, USA) with telescopic sights, low powder (green) charges and 3-ml darts with 3-cm barbed needles was used for yearlings and adults.

Initially calves were caught by two men holding a rope with a noose in the middle. Roping was done after the adults were immobilized and just before the antidote was applied. Later, instead of roping, calves were immobilized using a short blowpipe and light-weight syringes (Teleinject Q6725, Römerberg, West Germany).

Etorphine® (etorphine hydrochloride 0.4% Pharmacia, 3400 Hilleroed, Denmark) was used as an immobilizing drug supplemented with xylazine hydrochloride (Rompun® (xylazine 2%), Bayer, 1111 Copenhagen, Denmark). All the animals except for the last 50 in 1982 were given hyaluronidase (Penetrase®, Leo A/S, 2750 Ballerup, Denmark) mixed with the immobilizing drugs.

Immobilized animals were treated prophylactically with an antibiotic corticosteroid mixture (5–8 ml of Streptipen Procaine with Delcortine®, 200,000 IU penicillin, 250 mg dihydrostreptomycin and 5 mg prednisolone per ml, Leo A/S, 2750 Ballerup, Denmark).

Antibiotic powder was applied to the wound when the dart was removed. After tagging, the animals were given the appropriate antidote (Diprenorphine® 0.6%, Pharmacia) and in 1983 the antidote was mixed with hyaluronidase i.v. or i.m.

All muskoxen were tagged with cattle ear tags (Allflex, dan-mark, 7620 Lemvig, Denmark), one in each ear. In order to recognize marked animals at a very long distance, the horn bases of some adult animals were sprayed with paint.

RESULTS

In 1982, 78 adults, 12 yearlings, and 13 calves were tagged; three of these died, seven calves in the groups were not caught, and one adult female had to immobilized twice. In 1983, 253 adults, 55 yearlings, and 80 calves were tagged; five animals died, and 14 adult males, 16 adult females and three female yearlings had to be immobilized twice because they were found later in groups with untagged animals.

After 487 immobilizations and reimmobilizations and roping of 38 calves, the total result was 483 tagged and released muskoxen; of these 136 were adult males, 190 adult females, while 32 males and 34 females were just over 1 yr of age. Among the calves, of which 55 were immobilized and 36 roped, were found 45 males and 46 females. Through binoculars the ear tags were visible at a distance of at least 500 m, while the numbers in the tags could be read through a spotting scope at a distance of up to 150 m.

For males more than 1 yr old (weight up to 300 kg) and females more than 1 yr old (weight up to 200 kg), 2 mg etorphine, 30 mg xylazine, and 200 IU hyaluronidase were used. The animals usually became affected in less than 5 min after the immobilizing shot and would be immobilized in 8–15 min. Bulls were immobilized considerably faster than cows. An increase in the etorphine dose from 2 to 3 mg did not produce a quicker immobilization in either sex, while an increase of the xylazine dose from 30 to 40 mg would lead to slower and less stable recovery. Reduction of xylazine to 20 mg led to the animals recovering too soon.

For immobilization of yearlings, 2 mg etorphine, 20 mg xylazine, and 200 IU hyaluronidase were used. Calves (weighing 30–40 kg) were immobilized with 0.5 mg etorphine and 200 IU hyaluronidase. In 1982 omission of hyaluronidase led to a slower and less regular initiation of immobilization.

Considerable differences were found in the sensitivity of individuals. An example of low sensitivity to the drugs was seen in cow No. 172 who was found and tagged in company with a bull. Both she and the bull had to be immobilized again 24 hr later because they were found together with four untagged adult females. On both occasions No. 172 was only partially immobilized though given 4 mg etorphine and 30 mg xylazine, while the bull and the rest of the females were immobilized completely with the standard dose of 2 mg etorphine and 30 mg xylazine. The standard dose was inadequate in 19 adult females (often those with calves), eight adult males, and one male yearling all of

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whom had to be given an additional 1, 2, or 3 mg etorphine with or without xylazine depending on degree of sedation.

About 10% of the immobilized animals lay in sternal recumbency, while the rest lay on their sides. Respiratory rates were from 40 to 70 bpm, temperatures from 38.5 C to 40 C, and the palpebral reflex was usually present. In order to avoid bloat and aspiration of rumen contents it was important that eructation was unhindered during the immobilization period. Animals lying in sternal recumbency had no problems usually, but if adult animals were lying on their sides or with their heads downwards, their position had to be changed as quickly as possible.

The first 38 calves were roped, but this method was found too traumatic in that the struggle caused fatal injury to two calves and often resulted in blood-stained froth at the nose. Calves could be handled very gently within a few min after injection of etorphine mixed with hyaluronidase. They would recover completely within 3–5 min after i.m. injection of diprenorphine and hyaluronidase. All calves but three stayed with the immobilized herd. Of three deserted calves, two were recircled to the herd.

Intramuscular injection of diprenorphine and hyaluronidase enabled the animals to rise after 5 to 15 min. If the antidote was given intravenously (tarsal vein) the animals could be forced up within 2 min, but if left undisturbed they would remain resting often for more than 30 min. From the start in 1983, all the animals were given 200 IU of hyaluronidase mixed with the antidote given i.m., the recovery was then much quicker and similar between the groups, which enabled nearly all the groups to leave the immobilization site at the same time. After the antidote was given, the herds were observed for up to 2 hr, depending on the mobility of the herd. In general, the animals would rest during the first 30 min. Individuals lying in positions considered physiologically unsafe were encouraged to rise or their position was adjusted.

While family groups nearly always left the area as units, groups consisting of only adults sometimes dispersed in various directions. The tagging of a group had to be completed within 1 hr, because otherwise some of the animals would be too recovered for injection of the antidote with a normal syringe. A cow with a calf that had been sutured after suffering lacerations, and later also an adult male and an adult female, were left without antidote. These animals left the area after 6 hr rest.

One calf was gored to death by a bull in the herd before the immobilization started. Two calves were euthanized after roping, one because of a fractured femur; the other because of muscle damage in the hind leg, which would have prevented the calf from following the mother. One yearling was euthanized because the dart had fractured the femur. The yearling was a very small and emaciated male with nearly no musculature to protect the bone from the impact of the dart.

Two cows had to be shot, because they charged the team. One was chasing the team for more than 1 km starting a few minutes after injection of the antidote. This cow was the mother of the calf with the broken femur. Another older cow was found solitary and tagged. When the team passed the area 4 hr later, the cow charged and had to be shot at close range.

One bull was immobilized on a rocky 45° slope using 3 mg etorphine, 30 mg xylazine, and 300 IU hyaluronidase. In less than 5 min the bull fell into sternal recumbency downhill. Three min later it stopped breathing, while attempts were made to turn it. Post mortem, the animal was found in good condition, weighing 284 kg. Considerable endocardial hemorrhage was found along the blood-stained froth in the lungs.

Another bull given 2 mg etorphine, 30 mg xylazine, and 200 IU hyaluronidase was immobilized within 10 min. It was

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lying on the brisket; the animal was checked twice and found to be doing well, but owing to there being 10 other immobilized animals in the group, it was first given antidote about 1 hr after the immobilization started. At that time it died. Post mortem examination showed an animal in good condition, weighing 244 kg, and judging from the wear of its incisors it must have been a very old bull. Blood-stained froth mixed with rumen contents was found in the lungs. There were petechial peri- and endocardial hemorrhages. One cow was hit by two darts containing a total of 4 mg etorphine, 80 mg xylazine, and 400 IU hyaluronidase. The animal was immobilized in less than 10 min, respiration was normal, about 60 bpm, but there was no palpebral reflex. It reacted only slowly to the antidote and did not get up until after the rest of the herd had gone. It followed the team for about 500 m and appeared to be doing well, but 2 days later it was found dead approximately 700 m from where it had been tagged, lying on a 20° slope, head downhill. The post mortem examination showed an animal in good condition, weighing 200 kg. The lungs were filled with froth, and aspirated rumen contents were found in the bronchi.

The sites of each immobilization and tagging operation were checked within 24 hr. No further dead animals were seen by the team or by the various observers in the area.

The cylinder of the dart would plunge into the skin only when the animals were hit high on the shoulder or near the base of the tail. Four calves and one cow were wounded by goring during capture, and three calves with perforated abdomens had to be sutured. After the suturing, the calves were placed near their mothers, whom they later followed. One of the calves was observed 2 wk later.

When the muskoxen were threatened by the dogs they would start butting the calves and tossing them in the air. Both bulls and cows would take part in this act. To reduce this risk, it was important not to excite the herd and see to it that the adult animals were immobilized as quickaly as possible.

A yearling ran away from the herd with two darts in the thigh and appeared not to be immobilized. It was observed at a distance 2 hr later, apparently unaffected.

The tagged animals appeared healthy and in a good state of nutrition. The only exceptions were the yearling with the fractured femur, a thin bull lame in the left hind leg, and a bull with an abscess in the flank, the latter bull was in a good state of nutrition.

Two darts failed to release their contents, and about 1% of the cartridges failed to discharge. Less than 10% of the darts fired were lost or damaged.

DISCUSSION

The tagging operation described here cannot be compared directly with an earlier muskox tagging project (Jonkel et al., 1975) because the animals were darted from a helicopter using sernylan for immobilization, and because that project was carried out during the winter.

In the present project the animals were not immobilized longer than absolutely necessary for tagging. In Alaska, 3.5–4 mg and 4.5 mg etorphine with 20–25 mg xylazine were recommended for immobilization of, respectively, female and male muskoxen in captivity, and high dosages are used when the animals were excited, or when free-living muskoxen were immobilized from snowmobile or helicopter (Dieterich, 1983).

One reason for using dosages of etorphine two to three times lower than what was used for immobilization of free-living muskoxen in Alaska could be that the attack by dogs closely resembled a wolf attack, and even if there were no wolves in Jameson Land, the muskoxen seemed prepared instinctively for such an attack and did not seem very frightened by the dogs.

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While concentrating on the dogs they pay little attention to the man with the immobilizing gun.

Dogs were absolutely necessary for diverting the attention of the muskoxen and for keeping the group together. The ideal dogs were those which constantly circled the herd without making a direct attack. If they became too eager, they caused unnecessary disturbances and increased the risk of a dog or a calf getting injured. Thus, in three cases a dog was tossed into the air and injured.

If the dogs were restless and left the muskox group before it was fully immobilized, a dangerous situation could arise, in that the shooting had to take place from a position well within the normal charging distance of muskoxen.

The month of July seemed ideal for this kind of operation in Greenland, in that the calves were large enough to withstand the handling and the rutting season was not yet so close as to give problems with the bulls. It appeared to be advantageous to capture the animals at night, when the temperature was lower. This prevented overheating of the immobilized animals, and furthermore the dogs worked much better when it was cool.

The procedure described seemed to offer a suitable method for immobilization of both young and adult muskoxen. The method was quick, reasonably safe for the capture team and created relatively little disturbances among the muskoxen.

LITERATURE CITED

DIETERICH, A. R. 1984. Muskox and medical practice. Proc. First Int. Muskox Symp. Biol. Pap. Univ. Alaska Spec. Rep. 4, Fairbanks, Alaska. In press.

JONKEL, C. D., B. D. GRAY, AND B. HUBERT. 1975. Immobilizing and marking wild muskoxen in Arctic Canada. J. Wildl. Manage. 39: 112–117.

LASSEN, P. 1984. Muskox distribution and population structure on Jameson Land, Northeast Greenland 1982–1983. Proc. First Int. Muskox Symp. Biol. Pap. Univ. Alaska Spec. Rep. 4, Fairbanks, Alaska. In press.

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