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Proceedings of the Eighteenth Vertebrate Pest Conference (1998). Paper 31.

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NORTH DAKOTA'S COST-SHARE PROGRAM FOR GUARD ANIMALS

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ABSTRACT: Beginning in July 1991, the North Dakota Game and Fish Department authorized the use of funds in a cost-share program to assist farmers and ranchers with the implementation of nonlethal methods to protect livestock. Fund expenditures are administered and approved by the U.S. Department of Agriculture, Animal and Plant Health Inspection Service, Wildlife Services, North Dakota program. The program provides a 50:50 cost-share up to a maximum of \$150 per purchase of nonlethal items for the protection of livestock from predation. During the six year period from July 1991 to July 1997, the program has cost-shared dogs, donkeys, electronic guards, and llamas. The Great Pyrenees dog breed was the method most frequently selected.

KEY WORDS: guard dogs, Great Pyrenees, Akbash, Maremma, llama, donkey, nonlethal

Proc. 18th Vertebr. Pest Conf. (R.O. Baker & A.C. Crabb, Eds.) Published at Univ. of Calif., Davis. 1998.

INTRODUCTION

In the 17 western states the economic impact of predation on sheep exceeds \$50 million annually (Connolly 1992). Methods used by livestock producers to reduce or eliminate predation consist of both of lethal and nonlethal practices. Lethal practices are usually implemented by professionals with experience in wildlife damage management because of federal and state regulations and because special skills are required. Nonlethal techniques are usually implemented by livestock producers and consist of preventive methods such as habitat modification, animal husbandry, and modifying animal behavior.

Animal husbandry practices generally involve modifying the level of care or attention given to livestock and include, but are not limited to: guard animals, herders, shed lambing, carcass removal, and fencing. Habitat modification alters habitats to attract or repel certain wildlife species or to separate livestock from predators. Modifying animal behavior refers to tactics used to alter the behavior of wildlife and reduce predation (e.g., fences, propane exploders, pyrotechnics, guard animals, or electronic guards).

Beginning in 1991, Wildlife Services (WS) entered into a cooperative reimbursable agreement with the North Dakota Game and Fish Department to reduce the loss of domestic livestock to coyotes (*Canis latrans*) and red fox (*Vulpes vulpes*). The agreement provided two years of funding for cost-sharing of aerial hunting, and the cost-sharing of providing technical assistance and education to farmers and ranchers. Technical assistance included electronic scare devices, guarding animals, propane exploders, and other mutually agreed upon expenditures. The agreement has been renewed three times since its inception.

BACKGROUND

North Dakota encompasses approximately 45 million acres with the primary land use being agriculture. During 1995, North Dakota agriculture generated almost \$3

billion in cash receipts (North Dakota Agriculture Statistics Service 1995). On less than 2 million acres of public grazing land during 1991, gross livestock sales generated \$71.5 million (Bangsrud and Leistriz 1992). Consequently, livestock production plays an important role in North Dakota's economy.

Predation on livestock economically impacts producers. Predation on cattle occurs periodically throughout the year, whereas sheep are killed year-round. Consequently, individual sheep producers may suffer greater economic losses from predators than do cattle producers. The 1994 National Agriculture Statistics Service (1995) figures for North Dakota reported 4,000 sheep and lambs killed by predators. Coyotes were reported as the largest cause of predator loss accounting for 82% of the sheep and 89% of the lambs.

North Dakota averaged 164,667 sheep during 1993 to 1995 (North Dakota Agriculture Statistics Service 1995). Of the predation verified by WS employees in North Dakota during 1993, 1994, and 1995, coyote predation accounted for 96%, 95%, and 95% of the lambs and 100%, 64%, and 82% of the sheep, respectively.

METHODS

When a WS employee is called to investigate a possible incident of predation on livestock, he/she uses the Animal Damage Control Decision Model (Slate et al. 1992) to assess the problem, evaluate the currently employed methods, formulate a strategy, provide assistance, and monitor the results. WS assistance can be technical assistance or direct control or a combination of both methods.

As part of the technical assistance program, WS offers the producer an opportunity to participate in the cost-share program. The cooperative program provides funding on a 50:50 (WS:producer) basis with a maximum expenditure of \$150 per purchase. For example, if the assistance cost \$100, the producer would receive \$50 or if the assistance costs \$400, the producer would receive a maximum of \$150. For the producers to claim a

reimbursement, they have to submit to WS a form describing the item they purchased and a signed copy of the bill of sale. This paper pertains only to the data collected from the "Guarding Animal Cost Share Application."

RESULTS

During the six years the program has been implemented, sheep producers purchased 63 guard animals. Three producers purchased guard dogs to protect goats and one producer purchased a donkey (*Equus assinus*) to protect his horses and cattle. Eighteen producers did not report the type of livestock to be protected.

During the 1992-1993 biennium, 47 producers participated in the program purchasing 2 llamas (*Lama glama*), 9 donkeys, and 42 guard dogs. Producers reported purchasing burros and donkeys, but the names are used interchangeably (Green 1989b). For this paper the authors will use the name donkey. The average purchase price for a donkey was \$236 with a range of \$75 to \$500. The price for each guard llama was \$500. Great Pyrenees dogs were the breed of choice accounting for 95% of the selection and averaged \$137 with a range of \$47 to \$300. One Akbash dog (\$250) and one Maremma dog (\$250) were also purchased.

During the 1994-1995 biennium, 22 producers participated in the program purchasing 0 llamas, 8 donkeys, and 19 guard dogs. The average purchase price for donkeys was \$226 with a range of \$50 to \$600. Great Pyrenees dogs were again the breed of choice accounting for 95% of the selection and averaged \$172 with a range of \$55 to \$300. A Maremma dog was also purchased for \$300.

During the 1996-1997 biennium, 16 producers participated in the program purchasing 3 llamas, 4 donkeys, and 14 guard dogs. The average purchase price for donkeys was \$194 with a range of \$75 to \$250. Llamas averaged \$417 and had a range of \$350 to \$500. Great Pyrenees again outnumbered other breeds of guard dogs with 64% of the selection and averaged \$191 with a range of \$100 to \$275. Akbash dog was the second most selected dog breed (29%) and averaged \$537 with a range of \$450 to \$750. One Maremma dog was also purchased for \$150.

Not all producers reported the size of their sheep herds. Of the 54 producers that used guard dogs to protect their sheep, the average size of sheep herd was 234 head (range 4 to 1,500). Eighty-eight percent of the guard dogs selected to protect sheep were Great Pyrenees. The average size of the sheep herd protected by Great Pyrenees was 234 head (n=48, range 4 to 1,500). The average size of the sheep herd protected by Akbash dogs was 271 head (n=5, range 200 to 500) and only one Maremma dog was reported as protecting sheep (45 head). The average size of the sheep herd protected by llamas was 512 head (n=5, range 87 to 1500) and the average size of the sheep herd protected by donkeys was 405 head (n=17, range 44 to 2,500).

Ages varied among the guard animals purchased. Great Pyrenees (n=48) ranged in age from 1.5 to 72 months with 75% less than 6 months (Figure 1). The median age for Great Pyrenees was 3 months and the

mode was 2 months. The average age for Akbash dogs (n=5) was 7.4 months and ranged from 5 to 11 months. Maremma dogs (n=3) were aged 2, 3.5, and 8 months. Guard donkeys (n=21) ages averaged 45 months and ranged from 2 to 144 months (Figure 2). The average age for llamas (n=5) was 29.6 months with a range of 13 to 48 months.

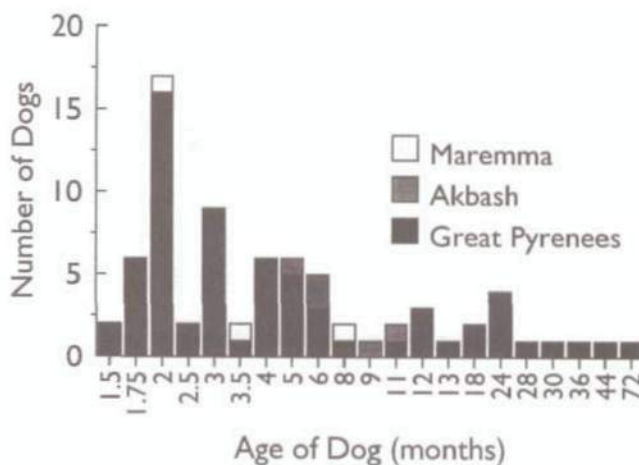


Figure 1. The age of guard dogs selected in the cost-share program in North Dakota during 1991 to 1997.

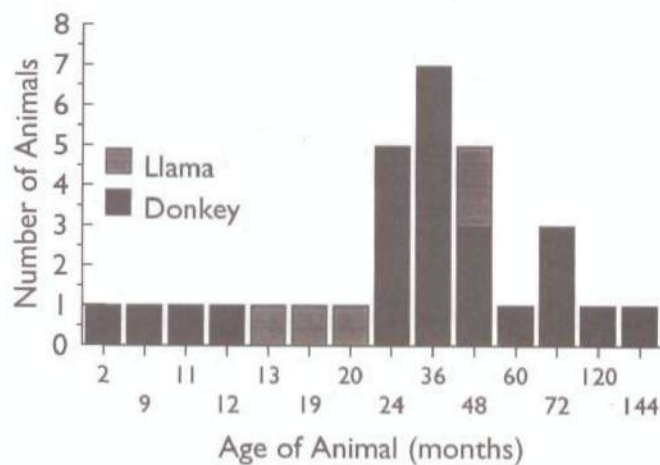


Figure 2. The age of guard llamas and donkeys selected in the cost-share program in North Dakota during 1991 to 1997.

Training of the guard animal varied from none to extensive on-the-job training. There was some confusion on the survey as to what type of training was to be reported. Some producers reported what education they or the seller had for training guard animals. Thirty-three Great Pyrenees (49%) were listed as having no training, while 25 (37%) had been raised with sheep (Figure 3). Eleven donkeys (52%) had some experience protecting flocks of sheep or goats and four individuals (19%) had been raised with sheep since birth (Figure 4). Sixty percent (3) of the llamas had some experience working with sheep.

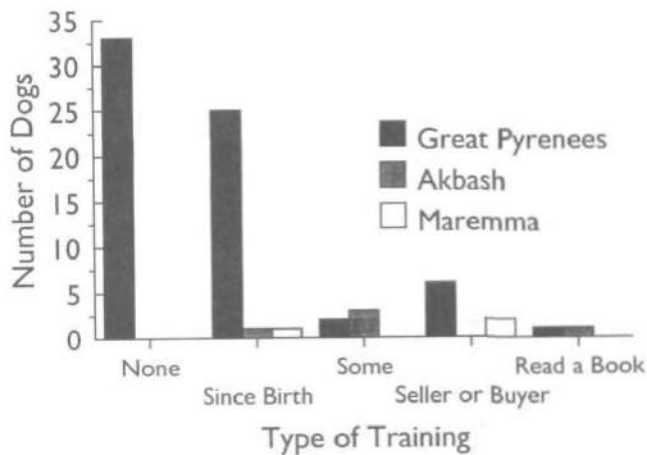


Figure 3. The type of training that individual guard dogs had when they were purchased by the cost-share program in North Dakota during 1991 to 1997.

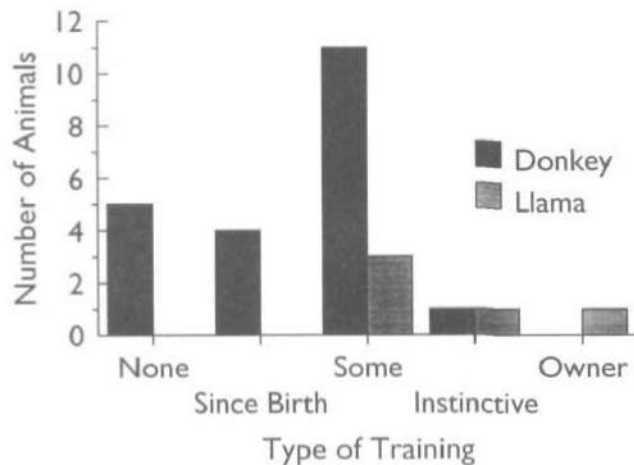


Figure 4. The type of training that individual guard llamas and donkeys had when they were purchased by the cost-share program in North Dakota during 1991 to 1997.

DISCUSSION

The use of guard animals enables producers to use grazing areas that were under utilized due to the presence of predators (Green and Woodruff 1996). Producers also become more self-reliant and gain other potential benefits such as: 1) reduced predation; 2) reduced labor; 3) improved potential for profit; 4) increased flock size; 5) protection of family members and other property; and 6) peace of mind (Green and Woodruff 1996).

Factors influencing the selection of guard animals include: cost, experience of the producer, size of herd, characteristics of the species or breed, maintenance of the species or breed, accessibility to breeders, time available for training, whether the guard animal is trained, and the availability of guard animals.

Nationally, 38% ($\pm 1.4\%$ SE) of sheep producers used guard dogs, 11% ($\pm 0.9\%$ SE) used guard donkeys, and 6% ($\pm 0.6\%$ SE) used guard llamas (U.S. Department of Agriculture, Animal and Plant Health Inspection Service, Veterinary Services 1996). The national figures are comparable to North Dakota WS data for producers using WS where 34% ($n=134$) of the sheep producers and 30% ($n=6$) of the goat producers used guard dogs, 12.7% ($n=50$) of sheep producers and 10% ($n=2$) of the goat producers used guard donkeys, and 2.3% ($n=9$) of the sheep producers and 5% ($n=1$) of the goat producers used guard llamas (North Dakota Wildlife Services unpubl. data). But when given the opportunity to cost-share guard animals, livestock producers chose guard dogs (74%) over guard donkeys (21%) and guard llamas (5%).

Guard dogs have been used in North Dakota since the mid-1970s (Pfeifer and Goos 1982). During a 1981 survey, 96% of the guard dogs used in North Dakota were Great Pyrenees, and 4% were Komondor dogs (Pfeifer and Goos 1982). During the 1990s, Great Pyrenees (89%) are still the dog of preference, with Akbash dogs (6%) and Maremmas (4%) also being selected.

North Dakota livestock producers have stated their preference for Great Pyrenees because they mature at an earlier age, are less possessive and more mobile, easier to breed and to train (Pfeifer and Goos 1982). Additional studies have also stated that Great Pyrenees mature at an earlier age, are less aggressive towards livestock and family members, and are culled less often than other breeds (Green and Woodruff 1988; Green 1989a).

During the 1970s, the average cost of guard dogs in North Dakota was \$590 (Pfeifer and Goos 1982). During the past 20 years, the average price of guard dogs in North Dakota has dropped to a low of \$176 with individual guard dogs costing as little as \$47.50. A reduction in purchase price could be attributed to the increased use of guard dogs in the United States and a subsequent supply of puppies from additional breeders.

Based on this survey, Akbash were at least twice as expensive to purchase as Great Pyrenees. The authors speculate that the reason producers were willing to pay more for a certain breed is similar to Colorado sheep producers who stated that Akbash were significantly more effective than Great Pyrenees (Andelt and Hopper 1997). They also rated Akbash as being more aggressive, more active, faster, and more intelligent than Great Pyrenees.

During the 1990s, the survey showed that 75% of Akbash had some form of training or experience prior to being purchased, whereas only 40% of Great Pyrenees and 33% of Maremmas had some form of training or experience. This is a change from the 1970s when ranchers were buying dogs with no experience for guard dog work (Pfeiffer and Goos 1982).

The age of guard dogs was not noted in Pfeiffer and Goos' (1982) 1981 survey. They did note that producers had the best luck with pups purchased at six weeks of age and raised with lambs. During this survey over 95% of the dogs and puppies purchased were more than seven weeks of age. Seventy-five percent of the producers showed a preference for purchasing puppies by buying animals that were less than six months old.

The average sheep herd size protected by guard dogs during the 1970s was 590 animals (Pfeifer and Goos 1982). Twenty years later, the average size of sheep herds protected by guard dogs has dropped more than 50% to 234 animals. The average size of sheep herds (405 head) protected by donkeys in North Dakota was almost twice the size of the average sheep or goat herd size (213 head) guarded by donkeys in Texas (Walton and Field 1989) and dogs in North Dakota. The average sheep herd size guarded by llamas was more than twice the sheep herd size guarded by dogs in this survey. The authors suggest caution when comparing the numbers provided on llamas and donkeys due to the small sample sizes.

Franklin (1993) stated that guard llamas which were gelded cost \$700 to \$800 and intact males were \$100 cheaper. The average purchase price for llamas bought in the cost-share program was \$450 with a maximum cost of \$500. The authors suggest that the pricing of llamas, as with the pricing of guard dogs, follows the typical economic theory of supply and demand.

In a study conducted by Iowa State University, producers had good success with llamas averaging two years of age and no prior experience guarding sheep (Franklin 1993). The llamas purchased during this program were more than one year of age with the maximum age being four years. Fifty percent of the llamas purchased in the cost-share program had some experience as a guard animal.

The purchase price for donkeys in North Dakota ranged from \$50 to \$600 with an average price of \$235.71. The North Dakota purchase price was higher than the price paid for donkeys in Texas which ranged from \$75 to \$150 dollars (Wilbanks 1995). The low purchase price of \$50 was for an immature donkey purchased from a private seller and the high range was for an animal having experience with sheep. Seventy-one percent of the donkeys purchased in the cost-share program had experience with sheep or goats. The increased amount paid for a guard donkey in North Dakota vs Texas suggests that producers were willing to reduce their risk on an unproven feral animal by paying more for an experienced animal.

The cost-share program entered its fourth biennium on July 1, 1997. The program continues to offer producers a means to be more self reliant and use a wide range of techniques to manage predation.

ACKNOWLEDGMENTS

The authors thank the North Dakota Game and Fish Department who have provided funding for the cost-share program. They also thank P. Ressler for diligently managing the funds and database for the cost-share program and the North Dakota WS Specialist without whom the program would not be able to be implemented. The authors also thank J. Green for reviewing the manuscript.

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