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Authors

Green, Jeffrey S.
Woodruff, Roger A.

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ADC GUARDING DOG PROGRAM UPDATE: A FOCUS ON MANAGING DOGS

JEFFREY S. GREEN, USDA-APHIS-ADC, U.S. Sheep Experiment Station, Dubois, Idaho 83423.

ROGER A. WOODRUFF, USDA-APHIS-ADC, 61396 S. Hwy 97, Bend, Oregon 97702.

ABSTRACT: One hundred dogs were placed with sheep producers in Idaho, Oregon, Washington, and Wyoming during summer 1987 through summer 1988 as part of the APHIS-ADC livestock guarding dog program. Mortality as of February 1990 from culling and accidents is 39% and was evenly split between the first and second year of life. The 60 dogs currently working were rated as follows: 78% good, 12% fair, and 10% poor. All dogs rated good or fair were judged to have reduced predation or helped to keep predation minimized. Success of the dogs was breed-related but did not differ between pasture and rangeland sheep operations. About 50% of the producers who participated in the program either have purchased or plan to purchase additional guarding dogs.

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INTRODUCTION

In response to a Congressional Directive in fiscal year 1987, Animal Damage Control (ADC) of the U.S. Department of Agriculture's Animal and Plant Health Inspection Service instituted a livestock guarding dog program in Oregon, Washington, Idaho, and Wyoming. The objective of the program was to promote the use of guarding dogs as a method of reducing coyote depredation on sheep. Part of the effort to achieve the objective involved using Federal funds to purchase guarding dog pups for placement with sheep producers in the 4-state area.

In 1987 and 1988, 100 dogs (mostly pups) were purchased and placed with 82 producers who were given instructions on how to rear and train them. Ninety-three dogs lived long enough to be rated on their performance (at first rating, dog's age ranged from 10-22 months); 68% were rated as good, 17% fair, and 15% poor. Sixty-one percent of the dogs were used on pasture operations and 39% on range operations. Nineteen percent of the dogs died prior to reaching 18 months-of-age (Green 1989).

This report presents information on the current status of the dogs, essentially one year later than the last report. In addition, information concerning the use of guarding dogs for protecting livestock is presented in light of information gleaned in over a decade of work with this method of predation management.

METHODS

Details concerning the purchase of the dogs and how producers were selected to raise them were reported previously (Green 1989). Dogs were rated using the following criteria: 1) the frequency of occurrence of significant problems (e.g., dog wandering excessively; dog harassing, injuring, or killing livestock; dog posing a serious threat to people; dog seriously disrupting sheep management), 2) evidence of the dog displaying guarding behaviors (e.g., barking at disturbances, moving around the sheep, remaining near the sheep), 3) the dog's apparent effect on the incidence and severity of predation, and 4) the producer's satisfaction with the dog.

Data on the dogs' performance were accumulated during visits to ranches and through telephone conversations. Each dog was rated as follows: 1) good-dog generally remained near the sheep, incidents of predation markedly reduced or

kept to a minimum, minor problems, producer pleased with the results; 2) fair-dog had potential, predation somewhat reduced or unchanged, benefits outweighed problems, or 3) poor-dog had no influence on predation, major problems outweighing benefits. Chi-square procedures were used to analyze the data.

RESULTS AND DISCUSSION

Great Pyrenees (n=65) and Anatolian Shepherds (n=27) represented the majority of dogs purchased. Akbash Dogs (n=5) and Kuvasz (n=3) were the other breeds used in the program.

Performance

Ninety-five of the dogs lived long enough to be rated on their performance. As of February 1990, 66% were rated good, 14% fair, and 20% poor (Table 1). Great Pyrenees were rated higher than Anatolian Shepherds ($P=0.99$). Sample size was insufficient to allow meaningful statistical comparisons with the other 2 breeds. Nevertheless, all 3 Kuvasz (littermates) were rated as poor, and 4 of the 5 Akbash Dogs were rated good.

Table 1. Ratings of performance of livestock guarding dogs used in the ADC dog program in Idaho, Oregon, Washington, and Wyoming (n=95; consists of all dogs that lived long enough to receive a rating including those that were ultimately culled; percentages in parentheses).

Breed	Good	Fair	Poor
Great Pyrenees	49 (80)	8 (13)	4 (7)
Anatolian Shepherd	10 (38)	5 (19)	11 (43)
Akbash Dog	4 (80)	-	1 (20)
Kuvasz	-	-	3 (100)
Total	63 (66)	13 (14)	19 (20)

Sixty-two of the 100 dogs were alive as of February 1990. Two dogs were not rated, 1 because it had recently been

transferred and the other because it was temporarily in a nonworking status. Of the 60 dogs working, 27 were on rangeland operations, and 33 were on pasture operations. Ratings for dogs did not differ significantly between the two management systems ($P=0.31$) nor was one sex rated better than the other ($P=0.84$). Following culling and other deaths, the percentage of dogs rated good increased while percentages of dogs rated fair and poor decreased (Table 2). Even after culling, Great Pyrenees were rated higher than Anatolians ($P=0.99$).

Table 2. Ratings of performance of ADC livestock guarding dogs as of February 1990 and working (n=60; excludes dogs that were culled or died accidentally; percentages in parentheses).

Breed	Good	Fair	Poor
Great Pyrenees	36 (88)	4 (10)	1 (2)
Anatolian Shepherd	7 (54)	3 (23)	3 (23)
Akbash Dog	4 (100)	-	-
Kuvasz	-	-	2 (100)
Total	47 (78)	7 (12)	6 (10)

Thirteen of the dogs were transferred to another sheep operation, once (n=8) or twice (n=5). Transfers were made primarily because the dog was not working satisfactorily (n=10). The results after transfer varied: 6 were unsuccessful (dogs rated poor), 2 successful (dogs rated good), and 2 somewhat successful (dogs rated fair). Three of the 13 dogs were relocated after their owners either sold their sheep or determined that they did not need a guarding dog in their operation. In all three instances, the dogs were rated good in their new location. In general, dogs with behavior problems serious enough to warrant moving (i.e., harassing or killing sheep), did not perform better in their new location. Once unacceptable behaviors become ingrained in a dog, a change of scenery is unlikely to negate the problems.

Mortality

Thirty-eight of the 100 dogs are no longer in the program because they disappeared (n=5), were culled (n=10), or died (n=23). (Hereafter, all 38 will be termed deaths). Dogs were culled (26% of the deaths) because of unsuitable behavior, usually killing sheep. As discussed previously, failure of a dog (thus culling) was breed-related. The number and percentages culled by breed are as follows: 6 Anatolian Shepherds (22%), 2 Great Pyrenees (3%), 1 Kuvasz (33%), and 1 Akbash Dog (20%). Age of the dogs at culling ranged from 10 to 23 months. Five more dogs may be culled in the future because they are currently displaying problem behaviors (3 Anatolians and 2 Kuvasz). This would bring the total number of dogs culled to 15 (15%). The level of acceptable performance varies among dogs, and some poorly performing dogs are kept because they are valued as pets. Lorenz et al. (1986) reported a similar rate of culling (16%) in a sample of 449 guarding dogs.

Two of the 23 dogs that died were diagnosed by a veterinarian as having died from poison. Seven dogs died after being hit by a vehicle, 4 were accidentally strangled, 1 died as a result of being trapped, and 1 was shot. The cause of death for 8 dogs was unknown but was likely a result of illness from disease or poisoning. Three of the 5 dogs that disappeared were presumed stolen; the fate of the remaining 2 is unknown. Age at death (exclusive of culled dogs) was about equally split between the first (n=15) and the second (n=13) year of life. There was no difference between rangeland or pasture operations in the likelihood of a dog dying.

With one exception (a 38-month-old dog), the living dogs (n=62) range in age from 23 to 33 months as of February 1990. Lorenz et al. (1986) noted that 86% of accidental deaths and 90% of the culling occurred before dogs reached 30 months-of-age. Coppinger et al. (1988) reported that semi-annual death rate of livestock guarding dogs decreased to about 10% after 30 months-of-age. We previously stated that the probability of premature death of guarding dogs could be decreased by properly caring for the dogs' health and taking appropriate precautions to avoid accidents (Green and Woodruff 1983). This statement bears repeating. Nevertheless, it is highly probable that 20 to 35% of guarding dogs will die within their first 2 years of life. The rate of culling can be reduced by selecting dogs from breeds and bloodlines with a history of success. In this project, 60% (n=9) of the dogs culled or likely to be culled because of poor performance are Anatolian Shepherds.

Management Considerations

A major consideration in using a livestock guarding dog is determining which breed to use. We described behavioral differences among several breeds and how the differences related to where the dogs were used (i.e., on pasture or rangeland operations, Green and Woodruff 1933a,b). Other authors reported that trustworthiness, attentiveness, and protective ability varied among breeds (Coppinger et al. 1988). In contrast, a report of 763 guarding dogs revealed no significant difference in the rate of success among breeds (Green and Woodruff 1988). At least one current information leaflet on guarding dogs states that differences in temperament are greater between dogs of the same breed than between dogs of different breeds (Lorenz 1989). The author later presented oral information corroborating that breed differences exist (Lorenz, pers. comm.). Based on our experience with guarding dogs of several breeds, we reaffirm that breed differences do exist and can be significant.

Breed differences are not necessarily problematic as long as they are understood. More aggressive breeds (e.g., Anatolian Shepherd, Akbash Dog, Komondor) may be desired where bears (*Ursus* spp.) (Green and Woodruff 1989), wolves (*Canis lupus*), or mountain lions (*Felis concolor*) are frequent predators. In our experience, aggressive dogs are more likely to kill smaller predators such as coyotes (*C. latrans*) and domestic dogs or to bite people than are dogs of less aggressive breeds (e.g., Great Pyrenees). With aggressive dogs, there is a higher likelihood for more problems (e.g., more sheep injured as a result of more intense and longer duration play behaviors) during the rearing period than for less aggressive dogs.

Great Pyrenees were less likely to be aggressive to unfamiliar domestic dogs that entered their territory, and Komondors were more likely to bite people than were dogs

of several other guarding breeds (Green and Woodruff 1988). However, biting people occurs infrequently, and none of the ADC dogs have yet exhibited this behavior. Many of the Great Pyrenees are described as "too friendly," but occasionally some are "standoffish" to people. Akbash Dogs and Anatolians are more likely to bark and approach a strange person or vehicle and "investigate" the intruder. In general, livestock guarding dogs can be described as having defensive, rather than offensive, aggressive behavior toward people.

Producers who have raised one guarding dog are likely to be successful in working with additional dogs in the future, particularly if the first dog worked well. This is true not only because experience is a good teacher, but also because the producer has developed confidence that guarding dogs are a worthwhile technique for managing predation. Experienced producers learn to recognize traits in the growing dog that may indicate future success or failure and can take appropriate actions to foster the good traits and discourage the bad ones. Sometimes an established, effective working dog can help train a young pup. Conversely, if an older dog displays unacceptable behaviors, a pup may develop them also. Sheep usually become accustomed to a guarding dog quite rapidly, a factor that makes integrating a second dog into the flock easier.

Problem Behaviors

Problem behaviors (e.g., harassing or killing sheep, excessive playfulness, roaming) displayed by livestock guarding dogs manifest themselves in varying degrees. These behaviors may be temporary in nature, but they can also become persistent if not corrected. Sometimes a problem behavior develops as a result of the dog's environment. For example, a young dog may learn to excessively play with sheep and eventually learn to kill sheep by associating with another (usually older) dog that is displaying those behaviors. We observed this in one Great Pyrenees that had to be culled because it learned from another guarding dog to kill lambs with some regularity.

Other problem behaviors are likely to be genetic in origin and thus are breed-related. In this project, the 3 Kuvasz and about 50% of the Anatolian Shepherds consistently displayed behaviors that were unacceptable for a livestock guarding dog. Despite the fact that these dogs were reared under a wide variety of conditions and by different people, their behavior was markedly similar and consistent. While it is true that some Anatolians in this study and others have become good guardians, in our opinion, the probability of experiencing serious problems is significantly higher in this breed than in others we have observed (i.e., Great Pyrenees and Akbash Dogs).

Dogs from particular lines within a breed may be more prone to manifest unacceptable behavior than dogs from other lines. This underscores the importance of purchasing guarding dogs from proven working lines whenever possible. An increasing number of dog breeders are selecting lines that are likely to perform the guarding role well.

Problem behaviors can be classified under three categories: 1) not trustworthy (i.e., dog harms the livestock it is to protect), 2) not attentive, and 3) not protective. Forty percent of the ADC dogs injured livestock (24% of the Great Pyrenees, 73% of the Anatolians), and 15% of the dogs killed livestock (7% of the Great Pyrenees, 31% of the Anatolians). A greater proportion of Anatolians than Great Pyrenees were

involved in both activities ($P=0.99$). These behaviors occurred predominantly in adolescent dogs. Several management techniques can be used to minimize the severity of this problem until a dog matures. A dog should be supervised and reprimanded when it exhibits the undesirable behavior. Verbal reprimands are often sufficient, but a shock collar can also be effective when used judiciously. If a dog focuses on an individual sheep, remove that animal from the dog's territory. Other techniques to deal with this problem center on limiting a dog's mobility by chaining it, attaching a drag to its collar, using a cable run, or confining the dog in a pen when it can't be supervised. Placing the dog with larger or different type stock (e.g., rams) that it is less likely to injure is sometimes an effective approach. Boredom is often a factor in overplayfulness and can be decreased by changing the dog's environment (e.g., putting it in a larger pen or field). Some people have suggested that overfeeding dogs may contribute to their rambunctious behavior. Therefore, restricting caloric intake may be indicated for some overly active dogs. Some producers have simply kenneled the dog until it outgrows the problem. Sometimes, culling and replacing the dog are the only suitable solutions to the problem.

Roaming is a component of attentiveness and can be a significant problem, sometimes leading to premature death of a dog. Dogs that are shot, stolen, hit by vehicles, caught in traps, or poisoned are often the dogs that roam beyond their territory. Properly socializing (bonding) the pup from about 8 to 16 weeks-of-age with sheep can help reduce roaming later in the dog's life. Neutering the dog is also advised (6 months-of-age for females and 9 months-of-age for males). Using good fencing around pastures or adding single or multiple charged wires to a fence can deter wandering. Enlist the aid of neighbors in chasing the dog away from areas that are off-limits. Chaining, using a drag, or cable run will keep a dog within a defined area. Dogs that are incorrigible in this behavior may need to be culled.

Coppinger et al. (1988) reported that dogs that were attentive were usually protective as well. In some instances, protective dogs aren't highly aggressive; nevertheless, they are successful in reducing predation by small canid predators (i.e., foxes [*Vulpes* spp.] coyotes, domestic dogs). These smaller predators can sometimes be diverted from attacking sheep by the mere presence and behavior (i.e., scent marking, dominance displays, play, ritualized aggression) of a guarding dog (Coppinger et al. 1988). In other instances, however, guarding dogs with mild dispositions are ineffective in sufficiently reducing predation, particularly when large predators are involved. In these situations, a higher level of aggressiveness is required, and, as discussed previously, this trait is largely breed-related.

Producer Satisfaction

Eighty-seven producers have participated in the ADC dog program, and 53 currently have working dogs. The numbers of original and current producers, respectively, by state are as follows: Idaho, 29 and 21; Oregon, 15 and 9; Washington, 12 and 7; and Wyoming, 30 and 16. One producer in Montana worked with 2 dogs but is not currently involved with the program.

A majority of the producers were pleased with the addition of a guarding dog to their operation. At least 33 of the 87 (38%) producers have purchased their own guarding dogs, either to supplement the ADC dog(s) they received or

to replace their ADC dog that died. At least an additional 15 of the 87 (17%) producers intend to purchase guarding dogs in the near future. All producers who currently use dogs plan to continue to use them in their operations. Several quotes indicate the level of satisfaction in the producers: "I wouldn't raise sheep without a guarding dog," "They are about the only way to stay in the sheep business," "We recommend dogs to everyone we see," and "One of the most important advances in the sheep industry in recent history."

Most producers in the ADC dog program currently use and intend to continue using a variety of techniques to manage predation. These may include night corralling, electric fences, trapping, and lethal controls such as shooting and toxicants. Many producers rely on the services of government or private animal damage control specialists. Thirty-three of the 53 (62%) producers who currently have dogs use 3 or more control techniques in addition to guarding dogs, 13 (25%) use 1 or 2 techniques in addition to dogs, and 7 (13%) rely exclusively on dogs. Without exception, producers who rated their dogs as good or fair also believed that their dog(s) helped to reduce or prevent predation. In some instances the reduction has been dramatic. A producer in Wyoming reported a 10% loss to predators prior to using dogs and a 2% loss after incorporating dogs. This resulted in an annual savings of approximately 340 sheep.

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