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## STATUS AND USE OF LIVESTOCK GUARDING DOGS IN NORTH AMERICA

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### INTRODUCTION

The concept of using dogs to protect sheep and other livestock from predators is an ancient one and can be traced to many centuries B.C. in Eurasia (Bordeaux, 1974). The Spanish conquistadors brought guarding dogs with them to the western hemisphere to help protect their flocks (Lyman, 1844). Darwin (1839) noted that guarding dogs were commonly seen with large flocks of sheep in South America. Despite this long history, with the exception of the Navajo Indians who have used dogs with their sheep and goats since the early 1700's (Black, 1981), the use of dogs to protect livestock in the United States is relatively new.

Guarding dogs continue to accompany and protect livestock in many Old World countries including Turkey (Nelson and Nelson, 1980), Italy (Breber, 1978), India (Bardoloi et al., 1979), and Yugoslavia (Coppinger and Coppinger, 1980a). Livestock guarding dogs have primarily been used in the United States since the mid to late 1970's (Green and Woodruff, 1980), although isolated anecdotal accounts of successful dogs were reported earlier. Dogs are currently in use in the majority of states where significant numbers of sheep and goats are raised, with concentrations in Colorado, North and South Dakota, Oregon, Texas, and the New England states. There are no published figures on the number of guarding dogs currently in use, but the number is apparently growing steadily.

Only recently have researchers begun to ask pertinent questions regarding livestock guarding dogs: which breeds are most suited to the

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task, how should dogs be raised and trained, and perhaps most importantly, can dogs effectively reduce the loss of livestock to predators (Coppinger and Coppinger, 1978; Linhart et al., 1979; Green and Woodruff, 1980).

Interest in guarding dogs is growing, and there is evidence that dogs are effectively reducing or eliminating predation on sheep in many instances. A survey showed that over 75% of the dogs were effective in reducing losses (Green and Woodruff, 1980). In addition, using a dog is relatively trouble free, economically practical (Green et al., 1980), and environmentally and aesthetically appealing. Suitable guarding breeds are becoming more readily available, and no special skills or equipment are generally needed to raise a puppy to a successful adult (Arons, 1980; Coppinger and Coppinger, 1980b).

Research with livestock guarding dogs in the United States is centered at two locations; Hampshire College's New England Farm Center (NEFC) in Amherst, Massachusetts, and the U.S. Sheep Experiment Station (USSES), U.S.D.A. Science and Education Administration in Dubois, Idaho. Many cooperating sheep producers are assisting the research effort by rearing and working with dogs from the two research centers, and many independent sheep producers have purchased and raised their own guarding dogs. In addition, the U.S. Department of Agriculture has funded two cooperative research projects on guarding dogs, one at Colorado State University and the other at Brigham Young University.

Researchers at the NEFC are working with several breeds of dogs from Europe and Asia, including the Maremma (Italy), the Shar Planinetz (Yugoslavia), the Anatolian Shepherd Dog (Turkey), and various crosses of these breeds. Researchers at the USSES are working with the Hungarian Komondor, the Great Pyrenees, and the Akbash Dog.

Relatively few quantitative data have been compiled comparing livestock predation losses with and without the protection of a guarding dog. Probably two to five more years of study will be needed before an accurate assessment of the effectiveness of guarding dogs can be determined.

## DISCUSSION

### What Is A Livestock Guarding Dog?

A successful livestock guarding dog possesses several key characteristics: (1) it remains with or near the sheep continually (or at least during times when the potential for predation is high), (2) it does not harm, chase, or harass the sheep, and (3) it is appropriately aggressive to potential predators (Coppinger and Coppinger, 1980<sub>b</sub>). Although a variety of dogs may possess the necessary characteristics, several specific Old World breeds appear to most consistently display the required traits.

No consensus exists as to which breed of dog is the best livestock guardian and, indeed, there may never be a "best" breed. Individuals have reported protection offered by a variety of breeds, some of which have traditionally never been guardians. Further research may identify which dogs are best for livestock protection. It is also conceivable that certain breeds or lines can be matched to specific guarding situations (pastures or open range).

### Socialization and Training

Although attentiveness to sheep and aggressiveness to predators are traits which have been selected over the centuries, the guarding dog's inclination to remain with sheep is increased with early and continual socialization. It appears that placing a puppy (approximately eight weeks of age) with several lambs enhances the formation of a bond to sheep.

Such a bond is critical since the dog is later placed alone with sheep and away from human supervision. The guarding behaviors (aggressiveness and tendencies to patrol, scent mark, and bark) appear to be largely instinctive but can only be used to an advantage when the dog remains near or with the sheep.

Generally, the guarding dog is not a pet, and it is important that this distinction be made at the outset. The dog must learn that its place is with the livestock and not at the farm house. The dog should be praised for correct behavior and reprimanded for unacceptable behavior. Consistency and repetition will help the guarding dog learn to perform its intended function.

#### Dog Age and Effective Guarding

Mature and effective guarding dogs are not generally available to most sheep producers. Most dogs are purchased as pups and must be reared under appropriate conditions until they become mature enough to repel predators. This level of maturity varies among individual dogs, and there is no predetermined age when an adolescent dog can be expected to become an effective guardian.

Several criteria indicate a dog's readiness to assume the guarding role. The following behaviors tend to increase in frequency as guarding maturity is reached: (1) male dogs (and sometimes females) use raised leg urinations rather than squat urinations to scent-mark, (2) scent-marking (urination and defecation) becomes more deliberate and marks are concentrated near the periphery of a pasture, (3) barking at novel stimuli becomes more frequent and direction oriented, (4) dogs become more interested in the sheep than the handler, and (5) deliberate patrolling activities increase in frequency and duration. We have observed many of

these behaviors in dogs as young as 4½ months of age. However, before a young dog is placed where sheep predation losses are high, it should be capable of defending itself if confronted by several coyotes.

As a dog becomes more experienced, its behaviors (barking, scent-marking, patrolling) are usually more closely oriented to its guarding responsibilities. If coyotes are frequently near, the dog may mark and patrol more than if coyotes are rare. As a dog becomes more familiar with its area and the normal activities that occur there, random barking may occur less frequently. Successful guarding dogs have an appropriate mix of physical and behavioral maturity, combined with experience.

#### Daily Routine and Behavior

How should a new owner of a guarding dog expect the dog to behave during a 24-hour period? A guarding dog uses its senses and experience to know when and where to patrol and how to best keep predators away from sheep. Some people have mistakenly attempted to impose their own conceptions of the guarding routine on the dog. The dog should be given freedom to develop its guarding behaviors within the limitations imposed by each particular livestock operation.

Some people are surprised that a dog that appears to sleep most of the time can be a deterrent to predation. It is true that some guarding dogs, especially immature dogs, seem to spend a large part of their time sleeping. If the sheep are active (moving and feeding), the dog may also be active. However, dogs are not necessarily with the sheep constantly. The dog may sleep during the day while the sheep are feeding, or the dog may be away from the sheep investigating adjacent areas. With experience, the dog will learn when disturbances from predators are likely to occur

(evening and early morning hours) and will be actively patrolling or alertly positioned at a selected location. A dog will often bed with the sheep but is usually quickly aroused by any disturbance.

#### Dogs In Fenced Pastures

Over 80% of the people who raise sheep in the United States maintain their flocks in fenced pastures exclusively or at least during some portion of the year (Gee and Magleby, 1976). This represents over 50% of the nation's sheep. It has been predicted that the greatest growth in the sheep industry will come from pastured flocks of sheep.

The majority of producers now using guarding dogs run their sheep in fenced pastures which range in size from 10 to 500 acres (Green and Woodruff, 1980). Pastures, when compared to open rangeland, are particularly well-suited for using a guarding dog. The sheep are confined in a fenced area, and a dog can quickly establish territorial ties. A dog will generally patrol and scent-mark the fence line thus adding an additional element of "separateness" between the sheep within and the predatory canids without. Since the sheep are confined they quickly become accustomed to the presence of the dog. Care and feeding of the dog are easier because the dog is in a predictable location from day to day.

Several factors must be considered to determine the number of dogs needed to achieve effective predator control. The performance of individual dogs will differ. Some experienced dogs may effectively patrol a large area containing hundreds of sheep, while younger dogs may not cover as much territory.

The topography and habitat features of the pasture must also be considered. Relatively flat, open areas can be adequately patrolled by

one dog, but when brush, timber, ravines, and hills are in the pasture, several dogs may be required.

The behavior of the sheep is important in determining the number of dogs needed. Sheep that flock and form a cohesive unit, especially at night (a typical time of predation), can be protected by one dog more effectively than sheep that are continually scattered and bedded in a number of locations.

It appears that under some circumstances one experienced dog may be capable of adequately protecting several hundred sheep in a pasture several hundred acres in size. However, if the terrain is rough and brush-covered, if the sheep remain scattered, or if predation pressure is severe, several dogs may be required. Each situation must be evaluated individually.

#### Dogs on Rangeland

Management practices differ between pasture and range operations and affect the overall concept of predator control by guard dogs. Pastures have fenced boundaries which provide a clearly defined, stationary territory for a dog to defend. There is little chance that the sheep will be lost if they scatter within a pasture, so a full-time shepherd is usually not needed. On the open range, however, fences are rarely encountered and a shepherd tends the flock, controls the grazing pattern, and provides some degree of protection from predators. A dog on the range must learn to identify the ever-changing area occupied by the sheep as a defendable territory. The dog must adapt to new areas as the shepherd implements the grazing plan, and since the dog remains unsupervised with the sheep much of the time, its behavior must not cause the flock to scatter.

Planning is critical to the successful use of a livestock guarding dog on the range. Several months are required to socialize and prepare a pup for rangeland use. Preliminary information suggests that the first dog to be incorporated into a range flock should be between 7 and 10 months of age. Therefore, a producer would need to purchase a two-month-old pup five to eight months prior to incorporating the dog into the flock. During this period, while gaining physical and behavioral maturity, the pup can be socialized to the stock it will guard as an adult.

An ideal time to place a dog with sheep is when the sheep are in a pasture or fenced area. Sheep producers who shed lamb can incorporate a dog into the flock shortly after the ewes have lambed and while the main flock is being formed. At this time the shepherd can get to know the dog and teach basic obedience commands such as Come, Sit, and Stay. This period will also allow the shepherd time to observe how the dog and sheep interact prior to going on the range, and perhaps more importantly, will allow the sheep to become accustomed to the dog.

Several factors, including terrain and the type of sheep and dogs being used, make it difficult to generalize on how many dogs are needed to be effective on the range. Some range operators have reduced predation with a single dog, but others may require more than one dog to achieve similar results.

In most operations it would be advantageous to start with a single dog and add additional dogs as needed, preferably after the first dog is well established. Once the experienced dog develops an effective working pattern, it can often be used as a role model in training a second dog.



Herding dogs are an integral part of a range sheep operation. Herding dogs and guarding dogs can coexist. The guarding dog must be taught that its role is different from that of the herding dog. Immature guarding dogs may attempt to mimic the herding dog as it moves the sheep. This behavior cannot be tolerated. Juvenile guarding dogs can interfere with a working herding dog and must often be restrained (tied or held) by the shepherd. As the guarding dog matures, it will learn that there are times when the herding dog is in charge (when the sheep are moved) but that it assumes the dominant position at all other times. Brief fights may result between the herding and guarding dogs while each dog learns its respective role.

#### Guarding Dog - Predator Interactions

The behaviors of guarding dogs discussed earlier (barking, patrolling, and scent-marking) are usually enough to repel many potential predators from the sheep. In other situations, when predators are more persistent and aggressive, physical encounters (fighting) may occur between a guarding dog and a predator. However, in a questionnaire sent to owners of working Komondor and Great Pyrenees dogs, only 3 out of 30 respondents claimed that their dog(s) had killed a predator (Green and Woodruff, 1980). Dog-predator encounters may be relatively uncommon, and to the casual observer it appears that "nothing ever happens" (Coppinger and Coppinger, 1980b).

Dogs are the principal predator of sheep in many areas. Some guarding dogs regularly repel strange dogs from the pasture, and all guarding dogs are potentially capable of similar behavior. If the dog owner routinely discourages all strange dogs from coming near the sheep, a guarding dog can be encouraged to do the same. As a guarding dog matures, its aggressive behavior to strange dogs should increase.

## Problems With Using Guarding Dogs

The use of guarding dogs is not free of problems, especially on rangeland. If losses to predators are substantial, the sheepman may be more willing to spend time raising and training a dog. If losses are minimal a guarding dog may not be practical.

Some potential problems can be prevented by proper and early socialization of dogs to sheep. However, sometimes the most serious problem encountered is one of personal disillusionment with the guarding dog concept. Some livestock producers think that the purchase of a guard dog will immediately solve their predator problems. Unfortunately, this is rarely the case.

Livestock guarding dogs mature slowly. Komondors seem to reach behavioral maturity at 18 to 30 months of age while Great Pyrenees appear to mature somewhat earlier. During maturation a dog experiences physiological and behavioral changes that may contribute to a form of emotional instability. The young dog may show strong desires for playful activities and seemingly irrational behavior. A puppy or adolescent dog should not be expected to match the performance of a mature, experienced guardian. When placed alone with livestock for the first time, a young dog will almost certainly make mistakes and may require an adjustment period of weeks or months, depending on the individual.

We have raised dogs side by side under similar conditions. Some become good livestock guardians, and others do not. After a certain point it appears that no amount of proper training and early exposure will guarantee that every dog will become a good guardian. Instinctive ability must be present if a guarding dog is to be successful.

## CONCLUSIONS

A growing number of guarding dogs are being used to combat predation. They appear to be particularly effective in fenced pasture conditions, and there is growing interest in the use of guarding dogs among range producers. However, dogs are not the solution to all predator problems. Considerable time, effort, and good fortune are required to bring a puppy to maturity, and not every dog becomes an effective flock guardian.

The coyote is an adaptable predator, and experience has shown that a variety of control methods is necessary to minimize predation. Livestock guarding dogs are another tool available to livestock producers for protection from predators. In some situations use of a guarding dog may be ineffective. In others a dog may be all that is necessary to stop predation. Between these two extremes, dogs may be used to supplement electric fencing, trapping, aerial gunning, or other forms of control.

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