

Can Multi-Species Grazing Help Protect Stock From Coyotes

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Stocking ranges or pastures with more than one animal species often contributes to a more uniform and complete use of the available forage while providing a higher net return to producer. Cattle prefer grass, sheep prefer forbs (weeds) and goats prefer browse (shrubs and trees).

However when cattle, sheep and goats are placed simultaneously on the same range pasture, they seldom graze or browse together and the sheep and goats often suffer severe losses to predators, especially coyotes. Predation is now the greatest deterrent to sheep and goat production in a multispecies management system with cattle.

Many approaches have been used with varying success to protect sheep and goats from predation. Lethal techniques are fraught with technical, legal and humanitarian problems, and are often expensive and sometimes ineffective. The cost of constructing and maintaining electric fences can be cost effective on highly productive pastures but on the arid range it is prohibitive. Guardian dogs offer an attractive alternative. However, not all breeds or individuals within breeds are satisfactory guardians and skill and patience are required in managing the dogs. In addition, the initial cost is usually high, mortality especially among young dogs can be a problem and food and veterinarian-care costs are substantial.

Nursing calves are seldom killed by predators unless they become separated from their mothers. This is probably due to the aggressiveness of mother cows toward canines. Therefore, the question was asked, if small ruminants would stay close to cattle, would they likewise receive protection?

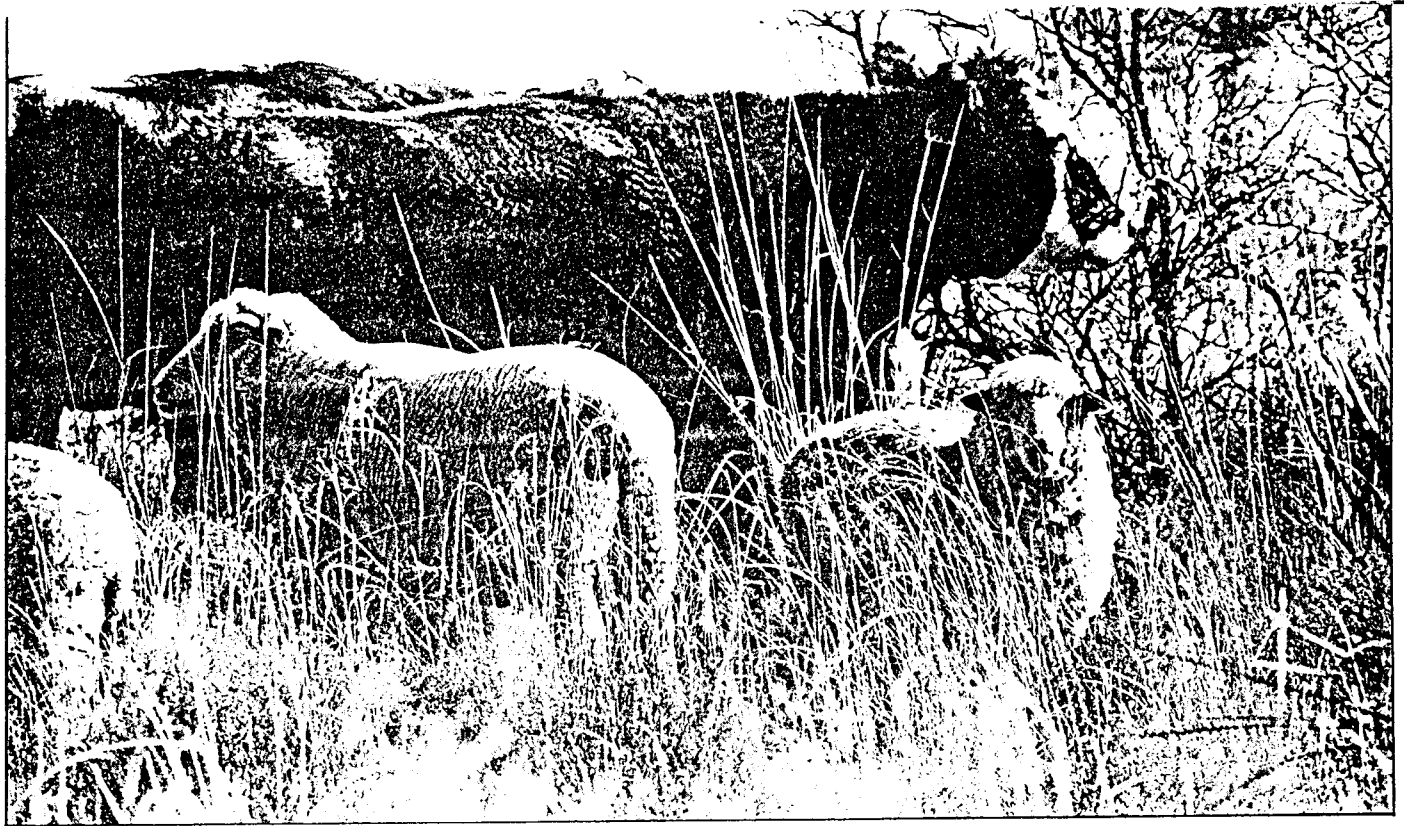
The tendency for different species

to form social attachments was reported as early as 1775. We decided to determine if small groups of 45- to 90-day-old lambs six or seven per group would develop during bonds with cattle. We penned lambs in close confinement with small groups of cattle (five per group) for 60 days. When these lambs and cattle were turned out on coyote-infested range, they consistently followed the cattle about the pastures and none were lost to predation. Was this just good luck or were the lambs protected by the cattle? Other non-bonded lambs were placed in an adjoining pasture and the bonded and non-bonded lambs were rotated among pastures. The coyotes killed non-bonded lambs at a rate of one every five days but not one bonded lamb was killed. Subsequent studies have shown that when a dog threatens bonded lambs they run to and huddle among the cattle. Non-bonded sheep on the other hand, ran when threatened, but not to the cattle. We also observed a cow chase a coyote out of the pasture when it threatened bonded lambs. Therefore, protection appears to be due to both the affinity of sheep to cattle and intimidation and aggression by cattle toward threatening canines. In this context, aggression was good, however, when cattle are persistently aggressive toward lambs (infrequent) during close confinement, bonding can be delayed or possibly even prevented.

Following our success with sheep, Angora kid goats were confined with cattle in an attempt to produce a kid-cattle bond similar to the lamb-cattle bond. A weak bond did develop and the kid goats usually followed the cattle but there were frequent separations. However, when these kid goats were confined with cattle-bonded sheep and cattle for a short period of time they

formed an attachment to the sheep and consistently stayed with them. This resulted in multi-species livestock group which stayed together at pasture. This group of animals for convenience is called a flerd (flock-herd). When we observed and compared the incidence of predation in the group consisting of kid goats and cattle with the bonded group consisting of kid goats, sheep and cattle we found that coyotes decimated the kid-goat group not with sheep. This was apparently because the goats frequently separated from the cattle. However, only the smallest kid was killed in the tri-species group during a 10-day study. No more animals were lost in the goat-sheep-cattle bonded group during an additional 163-day test period. Since that time, one or more guardian dogs have been migrating between the sheep flock and the flerd. We have recorded only one predation loss in the flerd during the past two years, a sick sheep that dropped out from the flerd. The guardian dogs are undoubtedly partially responsible for this high level of success (better than in the guarded unbonded flock). It may be that bonding to cattle plus guardian dogs represents the optimum biological method for protecting sheep and Angora goats from predators.

Spanish kid goats initially formed strong bonds with cattle and sheep, but as the Spanish goats matured they exhibited increasingly more independence from both cattle and sheep, a trait not exhibited by the Angora goats. The Spanish goats usually stayed near the cattle and sheep, but periodically would separate as a group and leave the area. This caused management problems in finding and returning the Spanish goats to the flerd. On the other hand, after three years the



Livestock grazing together multiply the benefits. Not only do they graze on different grasses and plants, multi-species grazing can also result in lower predation losses.

sheep and Angora goats have consistently stayed with the cattle. This flerd has formed the basis for continuing research to evaluate production and management in a multispecies livestock group that stays together.

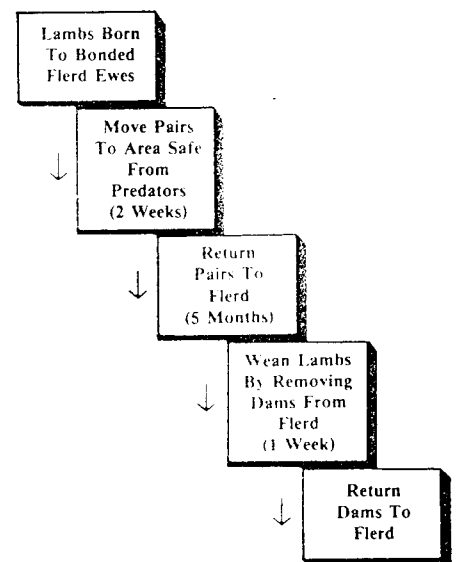
Non-bonded sheep and goats are rarely found with cattle while bonded small ruminants are seldom found disassociated from cattle. This association of the small ruminants with cattle may influence the diets of the bonded animals. In one study, bonded sheep with cattle were found to eat slightly more grass, fewer forbs and fewer shrubs than non-bonded lambs with cattle. These small differences do not change the benefits of multi-species stocking, but emphasize the need for further research to determine the effect of behavior on nutrition of free-ranging livestock.

It was not easy to develop our current flerd which consists of 85 sheep, eight Angora goats and 40 to 50 cows. Initially, when the lambs were young (100 to 150 days old) small confinement groups (six or seven lambs) would work well, but when these groups were combined, some lambs would frequently separate from the cattle. The solution was to maintain small separate groups until the lambs were six months or more of age. When combined at this age, they stayed with the cattle.

Several attempts have been made to bond lambs to cattle under pasture

rather than pen conditions. The obvious advantages would be a savings on labor and feed costs. After several failures we now have 10 yearling ewes with the flerd that were raised in the flerd with their dams. Because of the tendency of ewes to separate from the flerd when they lamb (which led to predator losses) we found it necessary to gather the ewes and lambs as soon as possible after birth and maintain them in a safe place for about two weeks. These bonded ewes were then returned with their lambs to the flerd. When the lambs were about five months old, the ewes were removed from the flerd for one week to terminate lactation. When the ewes returned to the flock, lambs still recognized and stayed with their mothers but lactation had stopped. We then tested the lambs for attachment to cattle, independent of other bonded sheep, by separating them from the flerd and putting them with a few cattle. They demonstrated attachment to the cattle but would occasionally separate. They were again tested about four months later. The bond appeared to have strengthened but still was not solid. These lambs are now yearling ewes and function satisfactorily as an integral part of the flerd. Because we found that yearling ewes which had no previous association with cattle do develop an attraction after a period of confinement with cattle, we believe that the described replacement procedure (see flow chart below) can lead to a cost effective method of maintaining a

functional flerd once it has been started. This procedure is currently being tested with the replacement ewe lambs (20) for the flerd. If it succeeds, this procedure will be adopted as the permanent means of maintaining the flerd.



These results clearly illustrate that a knowledge of animal behavior has the potential to pay big dividends to the progressive livestock producer.

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