

Reproductive Management of the Ewe Flock and the Ram

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The most important factor in determining profitability of a sheep enterprise is production rate. Productivity of the ewe flock is a direct reflection of reproductive efficiency. Regardless of genetic merit, eye appeal, price or showing placing, if a sheep will not reproduce it is worth no more than current slaughter value.

To a large extent, the goals and objectives we have for our next lamb crop are determined before and during the breeding season. Increasing ewe productivity while decreasing labor, time and facilities requirements during the lambing season can be realistic objectives.

Reproduction in sheep is influenced by numerous factors. These include: genetic potential, nutritional status, environmental factors, daylength or photoperiod effects, health status and other factors. These factors are important in both the ram and the ewe. Because many sheep have the potential for multiple births we can use management practices to influence these factors and to increase the reproductive rate.

Reproduction in the Ewe

In general, most breeds of sheep have seasonal breeding patterns. Ewes will usually start to cycle when daylength is decreasing. The decrease in the light to dark ratio triggers hormonal changes, which result in ewes exhibiting heat cycles. This period usually starts around early August and lasts until January. Peak fertility for the ewe is from late September through November.

Ewes will cycle every 16 to 17 days until they are bred or they reach the anestrous period. They are normally receptive to the ram for 24 to 48 hours. Once fertilization occurs, the ewe will give birth from 144 to 152 days after mating.

Reproduction and Management of the Ram

Do **not** neglect rams all year and then expect them to perform during the breeding season. A mature, fit, healthy ram can settle 75 or more ewes during a breeding season. An unthrifty, thin, sick ram is often sterile and will not settle any ewes.

To determine fertility and reproductive capacity in rams, a breeding soundness exam can be conducted. A breeding soundness exam includes visual appraisal of general health and condition, as well as a soundness check on feet, legs, eyes, teeth, jaws, etc. A scrotal circumference measurement can be taken, along with palpation of the testicle area. Testicle mass should be firm, but not hard, with no indication of abscesses, injuries or any other condition which could affect fertility.

The penis should be examined to determine if there are indications of adhesion, pizzle rot or injury.

When measuring scrotal circumference it is important that both testicles are fully descended. The measurement should be taken at the point of greatest circumference. Guidelines from the University of Illinois relative to age and testis size are as follows:

Age (months)	Minimum circumference (cm)
5-6	29
6-8	30
8-10	31
10-12	32

12-18	33
18+	34

Research in both sheep and cattle has indicated that daughters from sires with a larger testicle circumference are more fertile than females sired by males with a smaller circumference.

A semen sample can be collected from rams by using an electroejaculator or an artificial vagina. Semen collected would then be microscopically examined for percent live cells, percent motility and percent abnormal sperm cells. Usually, veterinary assistance is required to collect semen. However, some veterinarians lack the necessary equipment or expertise to collect rams. In this situation, several producers from an area may want to consider pooling their efforts to attract a qualified individual with the necessary equipment to a centralized location. Costs could then be spread out over a larger number of rams and producers.

The use of brisket paint or grease or a ram marking harness can be a valuable tool to monitor breeding activity of the ram. Colors should be changed every 16 days, starting with the lightest color first. If a large percentage of ewes re-mark after the first 16-day heat cycle, the fertility of that particular ram may be less than optimum.

Rams should be sheared, treated for internal parasites, have their feet trimmed and started on the diet they will be consuming during breeding 2 to 4 weeks before turning in with the ewes.

Effect of Temperature on Reproduction

In general, sheep are susceptible to a lowering of reproductive ability during times of high heat (>90°F) and high humidity. Actually, the rise in body temperature is what causes reproductive problems. This occurs most commonly from increases in environmental temperature, but, can also occur from stress, disease, fever or any other factor that increases body temperature for an extended period of time. The grazing of fungus infected fescue pasture has been shown to increase body temperature in cattle, and most likely, has the same effect in sheep.

Increases in body temperature can lower reproductive rate in ewes by decreasing ovulation rate, delaying heat cycles or by increasing embryonic mortality. Rams that are heat stressed can be temporarily sterile for 6 to 10 weeks.

Common sense should be used to prevent heat stress. Sheep should not be moved or worked during the heat of the day. Deep shade of some type should be available that maximizes use of natural breezes. Cull breeding stock (especially rams) that are particularly susceptible to heat stress. Shearing the ewe flock and rams 2 to 4 weeks before breeding can help reduce heat stress. Also, rams can be turned out only at night during hot weather.

Nutrition and Management

There are some nutrition and management techniques that can be used to improve reproductive efficiency in sheep.

Two to four weeks before breeding, ewes can be flushed. Flushing consists of increasing the quantity of energy, so that ewes are gaining weight. Usually, this will result in an increased lambing rate, a shorter breeding season and a decreased number of open ewes. Flushing seems to be more beneficial early in the breeding season with thin or moderately conditioned ewes, than with fat ewes. To flush ewes, they can be fed one-half to one pound of grain per ewe per day or by grazing on excellent quality grass pasture. Ewes should be kept off pastures containing high amounts of legumes (alfalfa, trefoil, clover) two to four weeks before breeding. The estrogen content of these legumes can interfere with ewe reproduction.

The ewe flock should have access to a free choice salt and mineral mixture. The mineral mix should be designed for sheep to prevent potential copper toxicity problems.

Ewes that are healthy and fit during breeding are more likely to have multiple births and settle on the first service. Special attention should be given to feet, for footrot or other problems. Rams and ewes should be wormed prior to breeding so that flushing can have maximum effect. Shearing can sometimes be beneficial before breeding.

If there have been specific health problems, vaccinations can also be administered at this time.

Selection

Heritability of reproductive traits is considered low (15 to 20%). Therefore, improving reproduction by genetic selection takes many generations. The use of performance testing via the National Sheep Improvement Program with actual flock expected progeny differences can make this task easier. The following guidelines can be used when selecting replacement lambs:

1. Select replacements from multiple births that are born early in the lambing season.
2. Select from multiple births from young ewes.
3. Keep triplet ewe lambs. When they get into production they will usually have twins.
4. Select replacements from dams that have a high lifetime productivity in your environment.
5. Select replacements from ewes that are less seasonal in their breeding ability. Don't keep replacements from rams that are infertile during hot weather.
6. Save ewe lambs from rams that have large, well developed, problem free testicles.

Crossbreeding increases heterosis (hybrid vigor) more dramatically in traits low in heritability, such as reproduction. Therefore, commercial sheep producers can usually increase reproductive rate, milking ability and lamb vigor by utilizing crossbred ewes.

Reproduction traits can also be improved by using breeds or crosses of breeds known for out of season lambing (Dorset, Rambouillet, Polypay) and (or) highly prolific breeds (Finn, Polypay, Booroola Merino). There have been volumes of research reported that have documented the improvement in production by using breeds known for high prolificacy and out of season breeding.

Breeding Ewe Lambs

Not breeding ewe lambs is a lost opportunity. Not only lost production for that year, but for future years. Research has indicated that ewes bred to lamb at 12 to 14 months of age have a higher lifetime productivity than ewe lambs not bred.

There are several advantages to breeding ewe lambs. Obviously, there will be more lambs to market or sell for income. Furthermore, ewes that lamb as yearlings don't deposit as much internal fat and fat in the udder as ewes held over until two years of age. This contributes to the increased lifetime productivity. Also, selection decisions within that age group of ewes can be made a year earlier, based on those individual's performance. Another important aspect to consider is that if genetic progress is being made, those ewe lambs should be some of the best ewes in the flock. There are some disadvantages to breeding ewe lambs. The two major disadvantages are: increased management requirements during lambing and, increased nutrient requirements before and after lambing.

If ewe lambs are to be bred, they should be at least 12 months of age when they lamb. They should be separated into their own breeding group so they are not dominated by older ewes. These young ewes can be bred to a smaller breed ram, that hopefully, would sire smaller lambs at birth. Certainly, don't breed ewe lambs to rams known to have large lambs at birth.

Using Ram Lambs

Ram lambs can be used on a limited, but successful basis in a breeding program. A well developed 7 to 8 month old ram lamb can be bred to 15 to 25 ewes, if managed well.

Ram lambs will need to be monitored closely during the breeding season. Attention should be given to breeding technique and any other important breeding details. Ram lambs often need extra nutrition

during breeding. One method that can be successfully used, is to turn them in with the ewes only in the evening and at night. This requires daily observation and care of ram lambs, which is ofte@ needed.

Again, if genetic progress is being made, ram lambs should be a valuable source of genetics. However, rams will be born with all the genetic material they will ever have. There is no gain or loss as they mature. Therefore, the old adage that ram lambs sire smaller birthweight lambs is not factual.