

FACT SHEET

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FACTORS AFFECTING FERTILITY IN RAMS

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The trend toward more breeding during the hot summer months encourages more breeding problems. Producers need to be aware of these problems and do whatever is necessary to produce a desirable environment for good reproduction.

Influence of Breed

Rams are less seasonal in their breeding habits than ewes. The mutton breed rams are somewhat more susceptible to periods of temporary sterility than are rams of the finewool breeds. The cross-bred breeds and crosses between the finewools and mutton breeds are in between the finewools and mutton breeds in their susceptibility to temporary sterility.

Some rams, within breeds, have higher reproductive rates than others. This allows for improvement through selection for this trait. Reproductivity, however, is a little more difficult to determine in rams than in ewes. The type of birth—single, twin or triplet—influences the reproductive rate, twin and triplet being the highest.

Age of the Ram

Rams reach sexual maturity between 4 and 7 months of age or upon attaining certain body weights. In west Texas, finewool ram lambs weighing 75 pounds and rams of the mutton breeds weighing 80 to 85 pounds are capable of reproduction. When rams follow normal patterns of growth and development the above "rules of thumb" should apply.

Age of usefulness is governed more by condition than by the age of the animal. Rams in good physical condition usually are capable of reproduction. The condition of the incisor teeth and the feet have a great deal to do with this. When a ram's mouth begins to weaken, he usually slips physically. Older rams with weak mouths may be

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in good condition at the start of the breeding season but may lose condition rapidly once it is under way. Consequently the reliability of these older rams is questionable. If they can be supplementally fed they probably will serve. If run under strictly range conditions, they probably should be culled.

Rams with weak pasterns or poor feet and legs may be fertile, but unable to get to the ewes.

Environment

A change in the environment of a ram often causes temporary sterility, which may last through a breeding season. When rams are purchased from northern states, they need time to become acclimated. Usually several weeks will be adequate, but occasionally a ram needs more time.

After rams are brought in from the northern states and given time to adjust, a fertility test should be run to see if the ram is fertile. This may prevent the loss of a lamb crop.

Temperature

The average normal body temperature of a sheep is 102.3 degrees F and ranges from 100.9 to 103.8 degrees F, according to Ensminger.¹ Exposure to extremely high temperatures for a long time may result in temporary sterility. Overheating of the animals also may produce temporary sterility. When supplemental feeding is practiced before the breeding season, use cooling feeds rather than heat-producing feeds such as oats or wheat bran rather than corn and milo.

The next point is one of considerable debate among producers. When rams are to be bred during hot weather the wool should be sheared from the scrotum. During cooler weather, it does not make as much difference. Many producers ask shearers to leave the scrotum unshorn rather than risk injury during shearing. The function of the

scrotum is to cool the testicles. Leaving wool on the scrotum only makes this function more difficult. Good shade and cool drinking water provide a desirable environment for rams just before the breeding season.

Nutrition and Management

Keeping rams in good physical condition is probably the key to good ram performance. When rams are allowed to become too fat or too thin, their reproductive performance is likely to be impaired.

Rams should be conditioned 2 to 3 weeks before the breeding season. Use feeds that are nutritious, but not too high in energy, such as oats, wheat bran and other bulky feeds.

Osborne² says that protein and vitamin A should be supplied in special supplements when rations are likely to be deficient. Many situations, especially during dry seasons, present this problem in this section of the country.

When possible, some producers like to supplement the rams during the breeding season. Other producers like to rotate the rams, turn out half the rams for 2 weeks, pick these up, feed them and turn out the other half. These differences in management have to be worked out by individual producers.

Some producers like to bunch the ewes and rams in the pastures for better circulation of the rams. Still others pen the ewes and rams at night during the breeding season.

In west Texas, rams perform better if they are sheared 2 weeks before the breeding season. This gives the rams ample opportunity to recover from injury at shearing. It is a good idea to treat the animals for internal parasites before turning them in with the ewes. This provides opportunity to drench the animals twice before releasing them.

Disease

In the past few years, a good many neighboring states have become concerned with epididymitis in rams. Epididymitis, according to Osborne, may be caused by a variety of organisms and by injury. Of these, there are two for which adequate transmission data are available, *Brucella ovis* and *Actinomyces seminis*. Epididymitis caused by *Brucella ovis* is probably the one of greatest concern.

Osborne found several Texas flocks infected with *Brucella ovis*. In general, finewool flocks having from 1 to 5 percent epididymitis were considered normal and in all probability the infection

did not result from *Brucella ovis*. Several flocks of the mutton breeds had a high infection (30 to 50 percent). In mixed flocks of mutton breed and finewool rams, a much higher infection was found in finewool rams. Most of these flocks with high infection were found to be infected with *Brucella ovis*.

Osborne states "Records are available to show that in flocks in which 20 to 50 percent of the rams had epididymitis due to *Brucella ovis* infection, lambing percentages of the order of 90 percent have been obtained." Consistently low lamb crops in several instances were traced to *Brucella ovis* infection. Because of the twinning ability of ewes it is difficult to determine the exact effect of *Brucella ovis* on the percent lamb crop.

Brucella ovis does not cross over to other classes of livestock. Cattlemen do not have to worry about this infection invading cattle herds.

A few characteristics of the disease include:

1. Rams can be infected and spread the organism without showing lesions.
2. Spread of the infection takes place from ram to ram by sodomy (riding each other) or mechanically via the ewe at service.
3. Infection in ewes appears to be self limiting and they are not a factor in control.
4. Some infected rams with lesions of epididymitis may not react to the complement fixation test (blood test).

Testicular abnormalities are easily determined by manual palpation. All rams should be palpated manually before releasing them into the breeding herd each year. If possible, have the semen tested. Normal testes are said to have good tone. Soft testes are an indicator of semen degeneration. Other abnormalities are abscesses (hard spots), fibrosis (a general hardening or woodiness of the testes), degeneration, hernia and enlargement. Do not use rams with any of these abnormalities.

When a high percentage of epididymitis exists in a ram flock, seek veterinary assistance. Some rams are carriers, but do not show lesions. Actually, a few rams are carriers and are not detected by the complement fixation test.

When a flock is found to be infected with *Brucella ovis*, take the following steps to eradicate the disease.

1. Remove all cases of epididymitis and other testicular abnormalities from the flock.

2. Blood test all rams and cull positive and suspicious reactors to the complement fixation test.
3. Repeat steps 1 and 2 at 6-month intervals (usually 1 to 2 months before and 1 to 2 months after mating) until lesions and serological reactions cease.
4. Raise new rams separate from the rest of the flock and mate separately until the disease is eradicated.

Step 4 probably is the most involved since it is difficult to run two separate flocks. But it may be necessary to do this to eradicate the disease. In the absence of facilities for serological testing, substantial reduction of the incidence of epididymitis caused by *Brucella ovis* infection can be made by manual examination and culling alone.

Osborne states, "Vaccines are used in New Zealand and South Africa and, to a small extent, in Australia. These will confer a substantial immunity to rams *but not enough* to eradicate infection from the flock." Osborne's opinion is that vaccines should not be used if a good possibility exists of eradicating the disease without them.

Use of Hormones

The physiology of sperm production is complex. Both follicle stimulating (FSH) and luteinizing hormone (LH) are necessary for the successive stages of spermatogenesis (sperm development). Testosterone alone is effective only during one stage of sperm development. If levels of testosterone are too high, gonadotrophic hormone production will be inhibited leading to developmental failure of spermatogenesis during critical phases of production, which in turn results in sterility.

Several authorities have studied the effects of hormones on ram fertility, semen quality and libido. Hulet³ states that prolonged treatment with PMS (Pregnant Mare's Serum), because of the immune response of sheep to PMS, could not be expected to be effective. Little response has been obtained from short-term treatment (Ahmed, 1955; and Luktuke and Bhattacharya, 1958). Ortega⁴ found that intratesticular implants of 225 to 375 milligrams of testosterone tended to improve semen

quality in rams, particularly those of medium fertility. Injection of testosterone at doses of 25 to 50 milligrams three times a week caused almost complete loss of sperm production in 3 months. Daily oral administration of 25 to 50 milligrams methyl testosterone improved sexual drive and semen quality. Subcutaneous implantation of estradiol caused complete loss of sex drive. Intra-testicular implants of estrone sulphate, desoxycorticosterone acetate and luteinizing hormone were detrimental to semen quality. These results indicate that great caution should be exercised in using hormones to improve sex drive and fertility in rams. It is best to consult a reproductive physiologist before using hormones.

Fertility Testing

No method has been devised to determine a ram's fertility with complete accuracy except by an actual breeding test. Fertility testing will detect most rams of low fertility, although occasionally a ram of high fertility will be discarded after a poor showing under fertility testing. If a particularly good ram appears infertile after being ejaculated with the electro-ejaculator, it may be wise to repeat at a later time. This may prevent discarding a good ram as infertile.

Much less frequently, a ram of low fertility will show good fertility when tested. There actually is very little danger of getting a low fertility ram passed as showing good fertility when tested.

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4. Hafez, E. S. E. 1968. *Reproduction in Farm Animals*. 2nd Edition. Lea and Febiger, Philadelphia.
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quantity in most particularly those of median fertility. Injection of testosterone at doses of 10 to 50 milligrams gave more a wide spread than complete loss of sperm production in 7 weeks. Daily oral administration of 25 to 50 milligrams methyl testosterone improved sexual drive and semen quality. Subcutaneous injection of testosterone, in amounts of 10 to 25 milligrams, caused complete loss of sex drive. Intra-uterine injections of testosterone in amounts of 10 to 25 milligrams, in doses of 1 to 2 milligrams, were detrimental to sperm quality. These results indicate that the best method of testosterone administration is by the oral route. It is best to consult a reproductive physiologist before using hormones. It is best to use the lowest possible dose that gives a light but not too heavy effect. The best time for treatment is about 15 days before mating.

Fertility testing

No method has been devised to determine a man's fertility with complete accuracy except by an actual breeding test. Fertility testing will determine a man's fertility, although occasionally a man of high fertility will be classified as a poor showing under fertility testing. If a particularly good man appears sterile after being classified with the electro-ejaculator, it may be wise to repeat the test later. This may prevent classifying a good man as sterile. The best time for the test is about 15 days before mating.

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of blood count, sperm count, and other factors. The best time for treatment is about 15 days before mating. The best method of testosterone administration is by the oral route. It is best to consult a reproductive physiologist before using hormones. It is best to use the lowest possible dose that gives a light but not too heavy effect. The best time for treatment is about 15 days before mating.

logical reaction cases. In addition, the use of testosterone in the male is not recommended. The best time for treatment is about 15 days before mating. The best method of testosterone administration is by the oral route. It is best to consult a reproductive physiologist before using hormones. It is best to use the lowest possible dose that gives a light but not too heavy effect. The best time for treatment is about 15 days before mating.

Use of Hormones

The physiology of sperm production is complex. Both follicle stimulating (FSH) and luteinizing hormone (LH) are necessary for the successive stages of spermatogenesis (sperm development). Testosterone alone is effective only during one stage of sperm development. If levels of testosterone are too high, spermatogenesis is inhibited. If levels are too low, spermatogenesis is inhibited. The best time for treatment is about 15 days before mating. The best method of testosterone administration is by the oral route. It is best to consult a reproductive physiologist before using hormones. It is best to use the lowest possible dose that gives a light but not too heavy effect. The best time for treatment is about 15 days before mating.

When a man is found to be infertile, the first step is to determine the cause. The best time for treatment is about 15 days before mating. The best method of testosterone administration is by the oral route. It is best to consult a reproductive physiologist before using hormones. It is best to use the lowest possible dose that gives a light but not too heavy effect. The best time for treatment is about 15 days before mating.