UNITED STATES LAMB RESOURCE CENTER

Increasing Your Lamb Crop Series

Testing Rams for Breeding Soundness

Introduction

A breeding soundness examination (BSE) is an overall assessment of a male's potential ability to service and impregnate a given number of females during a given period of time. It is a picture-in-time of the male's reproductive potential. The evaluation includes:

- A thorough physical exam
- A body condition score (BCS)
- A scrotal circumference (SC)
- A thorough microscopic semen evaluation

Rams contribute up to 75% of the genetic change in a flock, therefore, it is very important to not short cut the selection or care of the ram. A breeding soundness exam prior to purchase should be part of buying criteria. Producers must also remember that things change; a ram can acquire a disease, such as bluetongue, pneumonia, or get injured. Additionally, any major stressor may cause a change in breeding ability and semen quality.

Rams contribute up to **75% of the genetic change** in a flock.

A BSE should be performed annually on all rams six months of age or older in a flock, allowing producers to cull less productive rams, provide adequate feed to increase or decrease body condition, provide any care or treatment as needed and purchase any replacement(s) prior to mating.

The First Steps

As a BSE is performed, the ram should be bright, alert, walk with a sound gait and have no physical lesions or signs of illness. Each individual ram must have a unique identification. All information pertaining to that ram should be recorded on a breeding soundness form.

Body condition score (BCS)

A BCS is assessed by feeling along the ribs and lumbar spine. It is based on a scale of 1 to 5. A score of 1 means a ram is very thin and under conditioned. A BCS of 5 is a very fat, over-conditioned ram that is unable to be palpated on the individual lumbar spine or dips along the vertebrae. Both a score of 1 or 5 are unsatisfactory and require feeding changes to modify the score prior to the breeding season. A BCS in between these is considered satisfactory, with a 3 or 4 ideal going into the breeding season.

Rams have a job to do and often will forego eating enough to maintain their physical condition, thus thin rams may not make it through the breeding season. Meanwhile, an over-conditioned ram will often have very poor semen quality, cause interference with other rams while they are breeding ewes, and be lazy and not perform – these are referred to as the "couch potatoes."

Scrotal circumference (SC)

The genitalia are examined next.

The scrotal exam includes palpation of the testes and epididymi. These should be firm, with no lumps, lesions, swellings, hard or soft spots, no difference in size and no atrophy. Out of breeding season, they may be slightly flaccid.

Scrotal circumference relates to the capacity to service more ewes per breeding cycle, earlier maturing female offspring and the increase in number of multiple births produced. The heritability of SC is estimated at 35% (SID 2002). A SC is measured in centimeters.

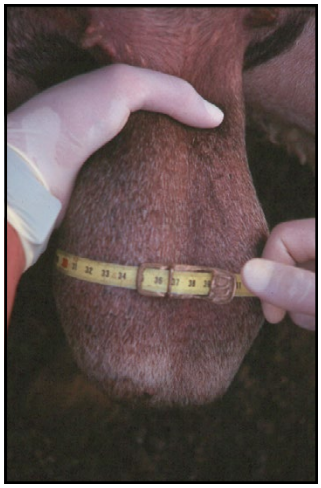
Acceptable scrotal circumference

	Rams 6 to 14 months	Rams > 14 months
Unsatisfactory	< 26cm	< 29cm
Questionable	27 to 29cm	30 to 32cm
Satisfactory	30 to 36cm	33 to 40cm
Exceptional	>36cm	>40cm

Source: Guidelines for Ovine Breeding Soundness Examination

Scrotal circumference (SC) (cont.)

Seed stock producers should set higher SC standards for their own flock. As part of the genitalia exam, the penis is extended fully. The penis and prepuce are examined to ensure there are no lesions, e.g., pizzle rot), injury, strictures or adhesions. Having the penis extended also allows for a clean semen collection.



A scrotal circumference is measured in centimeters.

Semen evaluation

A semen sample is collected via artificial vagina (AV) or electro-ejaculation (EE). The use of AVs requires a ewe being in heat at time of semen collection and is often used when collecting for artificial insemination (AI) and/or freezing as a larger volume of semen is often collected.

EE is more often used when time is a constraint, such as with the annual breeding soundness exam, especially with multi-sire flocks. A modified calf table may be used to hold the ram during this procedure. The semen motility, or sperm showing forward progressive movement, is evaluated. The sample is diluted to show individual cell motility and the non-diluted sample should be scanned for swirling. Motility is easily influenced by poor technique, improper diluent and temperature; therefore, it has a lower threshold of 30% and above normal motility for a satisfactory rating.

The size and shape of the individual cells – the morphology – is evaluated using a phase contrast microscope, as some defects are undetectable with a regular light microscope. Any defects should be noted on the BSE form. Above 50% normal morphology is satisfactory and above 80% normal morphology is exceptional. The presence and volume of white blood cells (WBC), if found on the microscope, will be noted as it may indicate disease. This may warrant an ELISA blood test or semen PCR test for *Brucella ovis (B. ovis),* or other treatment and breeding soundness retest.

The overall results and other considerations

The overall breeding soundness rating for a ram is based upon the parameters measured above. The ram will be rated as:

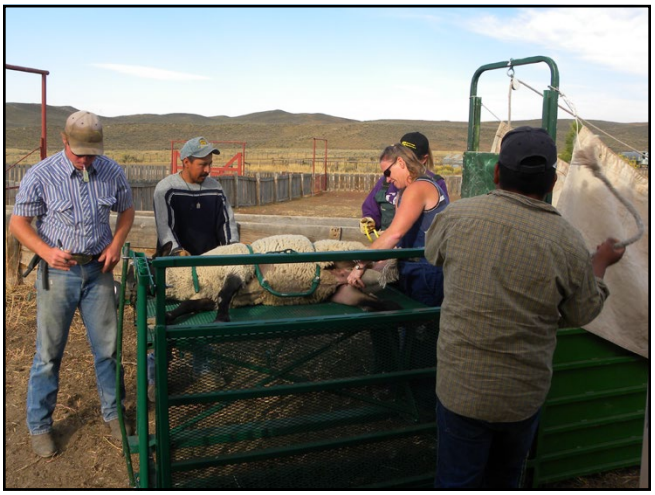
- E = Excellent
- S = Satisfactory
- Q = Questionable
- U = Unsatisfactory

The libido or sexual drive of the ram is not part of the BSE; therefore, it is essential to observe the sexual activity of each ram. A mature ram rated as excellent should be able to service 75 to 100 ewes in a 17-day breeding cycle under most range and semi-confinement conditions. Similarly, one rated as satisfactory should be able to breed 50 – 75 ewes in that time period (Kimberling et al., 2007). Depending on what makes a ram rate as questionable, or unsatisfactory, along with its age and prior history, will effect whether the ram warrants a retest in 30, 45, or 60 days, if at all.

Other testing may be incorporated at the same time as a breeding soundness examination but is not limited to:

- Blood testing for *B. ovis* (the most common cause of epididymitis in mature rams)
- Codon testing (scrapie or spider lamb)
- Ovine progressive pneumonia (OPP)

Most states require a *B. ovis* negative test within the past 30 days or that a ram be from a *B. ovis* free certified flock for any change in ownership. Buyers should always require this, as well as all rams over six months of age and owned by the seller, be tested and *B. ovis* negative – and get this in writing!



A modified calf table may be used to comfortably and safely hold the ram during an electro-ejaculation procedure.

Why do breeding soundness examinations?

Incorporating ram BSEs as part of production management can increase profits by $20 to $27 per ewe. A study in south central Wyoming was conducted in the late 1980s using a range flock of 2,800 ewes divided equally into two groups.

Group 1 was exposed to rams having a BSE of satisfactory or better. Group 2 was exposed to non-tested rams selected by traditional ranch selection criteria. At weaning, the Group 1 ewes produced an average of 17 more pounds of weaned lamb per ewe than those in Group 2 (Colorado State University, 1983-1993). Assuming a low market price of $120/cwt and a high market price of $160/cwt, this equates to a $20 to 27 increase in revenue per ewe. This increased revenue was realized with a cost of $0.60 per ewe for the BSE. The assumptions being the cost of the BSE is $18 per ram and the exposure rate is 30 ewes per one ram.

Healthy rams with excellent semen can service more ewes in a given year and produce more lambs. In one case, a western U.S. range flock of 1,410 ewes utilizing BSE tested rams with satisfactory or better semen was able to run one ram per 85 ewes. Only 50 (3.55%) ewes turned up not pregnant. More impressively, 1,050 (74.47%) of the ewes had twins, while only 310 (21.99%) had singles and a total of 90% of the lambs were born in the first 18 days of lambing (Kimberling et al., 1999-2008). A shorter lambing season decreases labor costs and provides the producer with better feeding and marketing options with a more uniform lamb crop.

Increasing the number of ewes served per ram in an operation can have a significant impact on lowering costs per lamb produced. Assuming a 150% lamb crop and $400 annual ram costs, using one ram per 30 ewes translates into a ram cost of $8.89 per lamb produced. Increasing the number of ewes per ram to 50 head would lower the ram cost to $5.33 per lamb produced. A ratio of one ram per 85 ewes would lower the ram cost to $3.15 per lamb.

BSEs are inexpensive insurance

Producers often think if ewes are getting pregnant, they do not have a problem or need to semen test rams. If rams are not tested, they will not know if there is a problem. A BSE will:

- Identify less productive rams so they can be culled, therefore improving overall flock reproductive efficiency.
- Set the stage for a more uniform lamb crop by producing more lambs in a shorter period of time.
- Maximize ram breeding potential (higher ewe-to-ram ratio), thus allowing for fewer rams to keep, manage and replace.

The ram breeding soundness examination provides much needed information, allowing producers the ability to make better management decisions.

- Decrease the number of open ewes. In single ram operations, a BSE can save the producer from the disaster of no lamb crop.

These attributes add to the bottom line in the production scheme. Producers who have adopted BSEs, and utilize the information, look at the testing as an inexpensive insurance policy. The ram breeding soundness examination provides much needed information, allowing producers the ability to make better management decisions.

What are you paying to keep a ram for just one year?

Ram Cost/Year

Purchase Price: $1,000 per Ram*
Salvage (Cull) Value: $170

Depreciation (4 years)	$207.50
Interest (6%)**	$35.10
Death Loss (5%)	$29.25
Feed & Maintenance	$120.00
Cost/Year	**$391.85**

Annual ram costs of around $400 are common when fully accounting for investment value, depreciation, feed and maintenance.

** Average sale price at 2015 Wyoming Ram Sale*

*** Based on $585 average investment value in rams on a per head basis in any given year*

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More information

U.S. Lamb Resource Center
http://lambresourcecenter.com/production-resources/productivity/

National Sheep Improvement Program
http://www.nsip.org

U.S. Sheep Industry Roadmap
http://lambresourcecenter.com/reports-studies/roadmap/

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