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Animal Health
Fact Sheet

BREEDING SOUNDNESS IN RAMS:

HOW TO DO IT AND HOW TO INTERPRET IT

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In order for ram breeding soundness examinations to be of maximum value to producers they must be relatively thorough as well as consistent. There is so much normal variation between rams that we cannot afford to add additional variability by lack of observation or inconsistent techniques. The goal of the examination is to classify the potential breeding ability of each ram into one of four general categories: 1) unsatisfactory breeder, 2) questionable breeder, 3) satisfactory breeder, or 4) excellent breeder. This is challenging in the best of circumstances. It is made more difficult by economic pressures, weather problems, lack of technical assistance and the constraints of time and facilities. Most of these problems can be reduced or eliminated with planning and effective communication.

CONDUCTING A BREEDING SOUNDNESS EXAM

1. Physical Examination

The general health of the ram should be evaluated and any abnormalities recorded. Especially the eyes, feet, legs and penis should be observed for any defects that would interfere with the breeding process. The body condition should be observed and a score noted.

The testes and epididymidis should be palpated. The impairment of one testicle with scar tissue, or abnormally small size will almost certainly reduce the breeding capacity and endurance of that ram, even if the semen parameters are normal.

2. Scrotal Circumference Measure

This measure gives a good indication of breeding endurance and has also been correlated in cattle with age at development of puberty. Ram lambs of less than 30 cm and adult rams of less than 31 cm should usually not be approved as acceptable breeders. However, recognize that scrotal circumference may be greatly decreased by recent weight loss as well as by season of the year (smallest in the spring and early summer). Pull the tape tight on the scrotum at its area of greatest circumference, then let out some slack in the tape until it stops at a consistent tension. Have the testes pulled well down into the scrotum and not distorted.

3. Restraint

Semen may be collected from rams while they are standing, but since it is best to manually extend and hold the penis during collection, they are usually placed on their side. A calf table is of help for evaluating a large number of rams. The ram can be laid on his side onto some bales of hay or straw, or onto a board on the ground. These aids help to reduce the contamination with dirt and debris which is more likely to occur if the ram is placed directly on the ground.

4. Extension of the Penis

It is best to extend the penis from the prepuce and manually hold it with a piece of clean gauze during collection of the semen sample. This prevents contamination of the sample with white blood cells that may be present in the prepuce and also allows observation and examination of the penis for any defects.

The penis is most easily extended if the ram is set up on his rump, as in the shearing position. When a calf table is used, the rear legs are tied back slightly, the penis is grasped through the wall of the prepuce and gradually pushed out where the head of the penis can be grasped and held with a gauze sponge. This will require some practice to learn the technique.

5. Semen Collection

The hand held ram electroejaculator is preferred, but the small ram probe of the bull-type electroejaculator can also be used. The lubricated probe is inserted into the rectum and with downward pressure on the front of the probe, the area of the seminal vesicles is massaged several times. With the probe held onto the area of the seminal vesicles, an electrical charge is applied for 4 to 8 seconds. The electro-stimulation is stopped briefly (3–4 seconds) while further massage is applied with the probe. This cycle is repeated until a 1–2 ml sample of semen is collected (usually 2–3 electro-stimulations). The semen sample is usually best collected into a warm, 17 x 100 mm plastic test tube, although a whirl-pack bag can also be used. The tube and semen is placed into a heat block to maintain a temperature of near 37 degrees C until the BSE is completed.

The urethral process usually vibrates rapidly during ejaculation and sprays the semen into the test tube. An occasional ram will have a defect in the urethra that allows the semen to flow out the side of the head of the penis. Although this is not normal and hence not desirable, the actual effect of this type of defect on conception is not known.

6. Semen Evaluation

The use of phase contrast microscopy for semen evaluation has been encouraged by those who are doing research on bovine semen. Its use has also been advocated for ovine semen. However, this type of microscope is seldom available to veterinary practitioners and the techniques described here are for use with a light microscope.

When the weather is cool, the manipulation and evaluation of semen should be done in a controlled environment to avoid the effects of cold shock. Some possible sites for the microscope and lab equipment include a heated office or shed, a pickup cab, the back seat of a car, or a mobile trailer.

The semen sample should be kept warm in a heat block and the microscope slides, coverslips and pasteur pipettes should be warmed on a slide warmer. An electric frying pan, with the thermostat set very low, also works very well for warming glassware.

The sperm motility is evaluated by placing 2 small drops of semen on the slide. A drop of diluent (sodium citrate, Ringers lactate, or physiological saline solution) is placed near one of these drops. A coverslip is used to mix the one drop of semen with the diluent and the coverslip is

applied over that diluted sample.

The slide is placed on the microscope stage and the undiluted sample of semen is examined at 100 x and scored for gross motility on a scale of 1 to 4. The diluted sample is then examined and scored on the basis of the percent of sperm showing progressive forward motility (an estimate) and this score is also recorded. The magnification should be increased to 400 x to make this evaluation. Some sperm adhere to the coverslip, so it is necessary to focus so you are visualizing the active level of sperm below these. This results in a field that is slightly out of focus.

While determining motility, it is also important to observe for white blood cells. They will appear as round objects 2–3 times as large as the head of a sperm. Focusing up and down will aid in determining the average number present in several fields on the diluted sample. The presence of over 10 per low power field (100 x) should cause serious concern. The number can be varied by the rate of dilution. Try to dilute to near the same concentration. The goal is to have a uniform layer of sperm, but with enough space between them that they can move independently.

A small amount of urine will greatly decrease or eliminate motility and so will a diluent in which the pH has changed.

A slide of stained sperm is prepared to evaluate the sample for morphological abnormalities. A small drop of semen is placed on one end of the slide and a small drop of semen stain (Blom's or Hancock's) is placed next to it. A corner of another slide is touched to the semen, set down and rocked back and forth slightly in the front edge of the stain and then streaked out across the slide. After drying, the sperm are examined at 1000 x (oil immersion) and 100 of them are classified on morphology. It is desirable to have a lightly stained background for contrast. The sperm cells which were alive at staining will be white (unstained) while those that were already dead will be pink. Although the percent alive is not used to score the semen, it can be used to confirm or question other values obtained during the semen evaluation.

The normal sperm are counted as well as those with abnormalities.

INTERPRETATION OF DATA COLLECTED FROM BREEDING SOUNDNESS EXAMS

CLASSIFICATION OF RAMS AT SEMEN EVALUATION

CLASS	SCROTAL CIRCUM. <14 MOS.	SCROTAL CIRCUM. >14 MOS.	MOTILITY	MORPHOLOGY
Excellent	> 33 cm	> 35 cm	> 50%	> 90%
Satisfactory	> 30 cm	> 33 cm	> 30%	> 70%
Questionable	< 30 cm	< 33 cm	< 30%	< 70%

If there are over five white blood cells per high power field, the ram should be classed as questionable until retested.

The ram is classified where he ranks the lowest for any of the categories. If he is classed as "questionable," the ram should be retested in 4–8 weeks before making a final classification of "unsatisfactory breeder."

Sperm motility may be reduced and even completely stopped by cold shock, the presence of urine in the semen and by diluting fluid with an abnormal pH. Sperm morphology is impaired by cold shock, rough semen handling, prolonged sexual inactivity, and abnormal heat or cold

stress during sperm storage in the epididymis. The elevated body temperature which accompanies bluetongue infection may greatly impair semen quality for 6–10 weeks.

A large number of separated sperm heads is usually accompanied by reduced motility and an increased proportion of dead sperm. The presence of an increased number of white blood cells may be induced by systemic illness and other bacterial infections of the reproductive tract as well as by B. ovis infection. Some of these other infections appear to respond to antibiotic therapy. The stress of common procedures such as transport and housing at sales, especially during the heat of summer, may result in a variety of the above abnormalities. These changes are usually temporary and resolve in 3–8 weeks.

It must be recognized that semen evaluation has limitations. An evaluation should be considered as one “snapshot” in the reproductive life of a ram. Rams which are classed as questionable or unsatisfactory should be rechecked that same day and preferably again in 4 to 8 weeks.

Another principle that is often misunderstood by producers is that there are very few sterile rams. The objective of semen evaluation is to find any of those that are present, but also to find the rams with reduced fertility. The removal of these rams with reduced fertility from the breeding flock prevents them from competing and interfering with rams which have good quality semen.

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