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Breeding Soundness Evaluation in Rams

[1]Dr.Peddireddy Siva Kumar Reddy, [2]Dr.T.Sravan Kumar, [3]Dr.M.Ajay Kumar, [4]Dr.Mounika, [5]Dr.M.Mahender, [6]Dr.R.M.V.Prasad, [7]Dr.N.Rajanna.

Abstract

Fertility and soundness of breeding rams highly contribute to the reproductive efficacy of a sheep flock.. **Breeding Soundness Evaluation (BSE)** is a scientific execution of a ram s potential to successfully mate and impregnate females during a breeding season. The examination includes by physical examination, body condition scoring, scrotal circumference measurement, reproductive organ inspection, semen quality analysis, and libido testing. The genetic and productive enhancement of the flock is guaranteed through selection of the breeding rams under a **visual** inspection, **performance** characteristic, and **pedigree**. Key indicators of reproductive soundness include a scrotal circumference above 33 cm in mature rams, semen with ≥70% normal morphology and ≥30–40% progressive motility, and good health free from infectious diseases such as brucellosis or epididymitis. BSE conducting at least two months prior breeding enables early detection and correction of reproductive or physical deficiencies. Overall, breeding soundness evaluation serves as an essential management tool to enhance fertility, prevent reproductive failures, and maximise the genetic potential of the flock.

Introduction

Numerous factors determine reproductive capacity of the herd/flock among them is reproductive health, fertility, prolificacy, the ability to mount, and the nutritional level of individuals. A breeding period relies on mating an appropriate number of sound males to the reproductively active females and observe to identify any problems. In fact, 50% of the reproductive potential and genetic change of a flock is provided by the mating male animal, care and strategic management of them is required. To help recognising males that will or will not capable of settling females, producers can perform breeding soundness examinations (BSE). Breeding soundness examination 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. The appraisal would include of a physical examination, body condition score, scrotal circumference, inspection of the reproductive organs, semen evaluation, libido assessment and screening for sexually transmitted disease. Scrotal circumference has been measured to indicate the weight of the gonad and therefore the ability of sperm production and it has a great value as an indicator of the onset of puberty, total semen production, semen quality, pathological

conditions of testes, and the potential subfertility or infertility.Breeding soundness examination should be conducted at least two months before breeding season to allow animals to recover from pathologies or poor physical conditions and it also should be a routine activity in breeding programs. Periodical BSE identifies the main causes of ram/buck failures, making it an important tool to increase the reproductive efficiency of the herd. Rams/bucks are subsequently categorized as sound/satisfactory, temporarily unsound/questionable, or unsound. The good reproductive performance of the satisfactory rams will be achieved once joined to the ewes at 1:50 ratio over a period of 60 days.

Selection of breeding Ram

- The most common methods of ram selection are visual appraisal and performance traits.
- The best and scientific way of selecting the rams is the estimation of EBV (estimated breeding value).
- The ram is most important for a successful breeding program. A good mature ram can breed more than 50 ewes in a season.
- Body Condition Score (BCS) is 3.0–3.5 on a 5-point scale (not too fat or thin).

Methods of selection of breeding Ram

- **Selection on the basis of visual trait:**
- Visual appraisal is a form of selection method where the breeder chooses and selects breeding ram on the bases of external appearance and correct structure.
- As correct structure enables, the ram to move and eat properly and mount ewes comfortably during mating.
- A breeder should have sound knowledge of external anatomy of ram for making visual selection decisions. Each part has an ideal characteristic for breeding rams. An ideal breeding ram should possess certain physical characteristics or visual traits mentioned below.

Mouth:

Mouth defects affect grazing and feeding, hence overall health status and breeding behaviour of ram.Adult sheep have eight incisors on the lower jaw. In normal sheep incisor

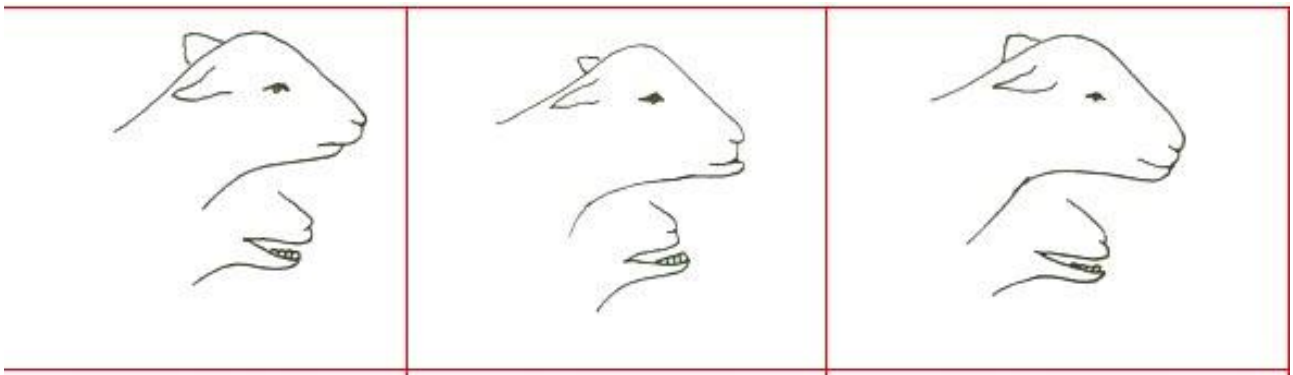
teeth come close to end of dental pad. The breeding ram should be checked for overshot jaw or parrot mouth (lower jaw is too short) and under short jaw or monkey mouth (lower jaw is too long). Both jaw conditions are inherited defect, hence ram with any of these defects should not select for breeding.

Conformation :

Knock-kneed:

A sheep is knock-kneed if its knees bend towards one another when seen straight on (Melanie, 2021).

Splayfooted or toed-out:



Overshot jaw | Undershot jaw | Normal mouth

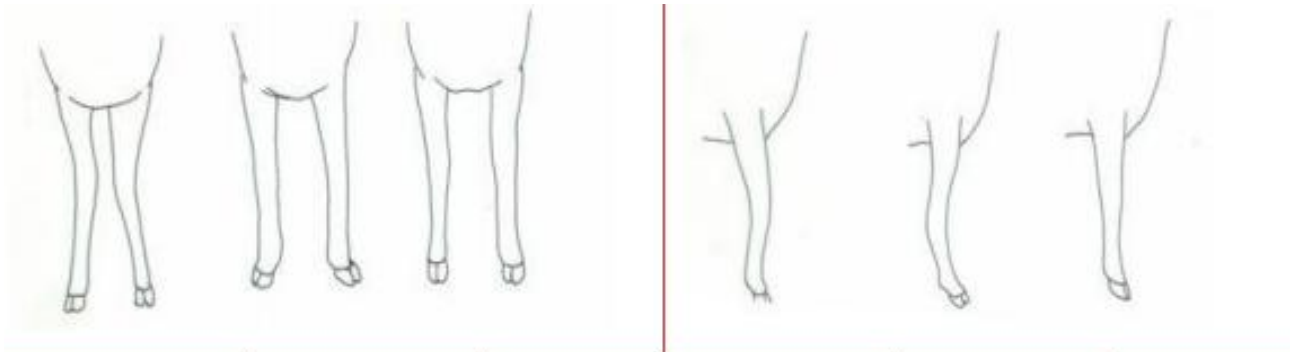
A sheep when viewed from front, toes are not turned towards one another, instead pointing straight forward (Melanie,2021).

Buck kneed:

An animal is buck kneed, or over at the knees",When a leg is being viewed backwards, the legs appear slightly bent. The condition will prevent full extension of the animal s knee and is usually seen the rams too straight at the shoulder (Melanie, 2021).

Calf kneed :

The opposite of buck kneed is Calf kneed. This implies that the animal stands back at the knees" when viewed from the side (Melanie, 2021)



Knock-kneed | Splay-footed | Normal | Buck-kneed | Calf-kneed | Normal

Cow hocked:

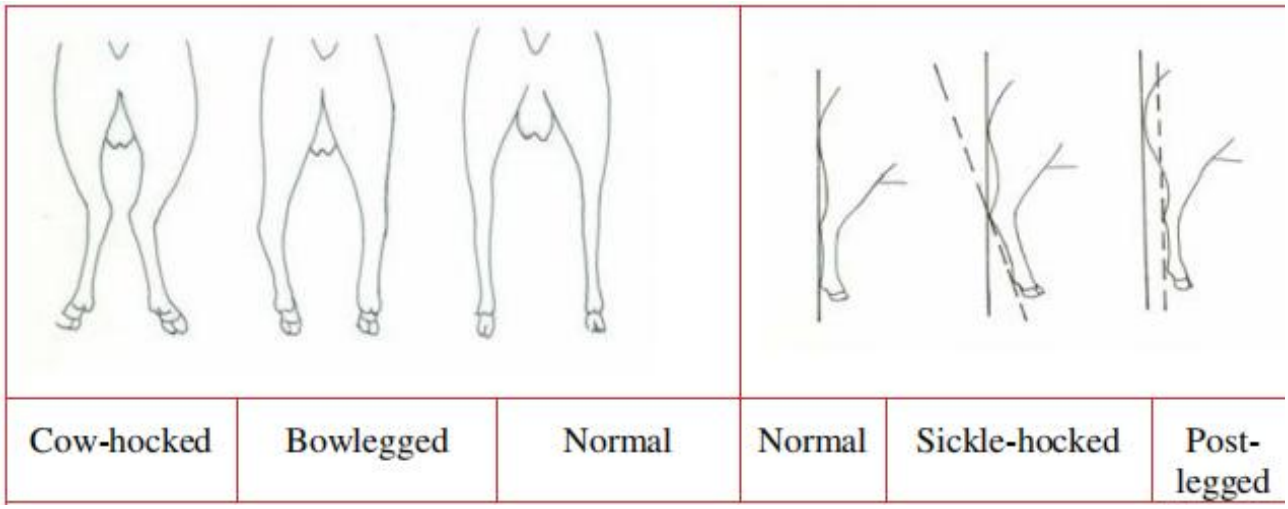
when viewed from rare, the hocks are turned inward or are placed too close together.

Bowlegged :

A sheep, if viewed from front and its knees bend out away from each other or viewed from the rear and its hocks bend out away from each other, is bowlegged (Melanie, 2021).

Sickle hocked:

A ram is sickle hocked the angle of the hock is excessively high or set when viewing the right angle of legs from the side. The cannon bone lies in a parallel line dropped perpendicular from



Cow-hocked	Bowlegged	Normal	Normal	Sickle-hocked	Post-legged

the pin bones to the ground (Melanie, 2021)

Post legged:

A ram is post legged when the hock has too little angle or set (Melanie, 2021)

Health:

- The breeding ram should be health and free from any disease.
- A sound and healthy ram is active, alert and does not separate from the rest of the flock.
- Rams with abscesses, pink eye, mouth lesions, respiratory distress, extremely poor body condition, chronic diarrhea, bottle jaw, sheep pox *etc* should not be selected for any breeding program.
- The ram should be screened for contagious diseases in particular from Brucellosis, Listeriosis *etc.*

Considerations while assessing a ram:

Following are some of the conditions which a breeder must keep in mind while selecting a ram for breeding:

Age:

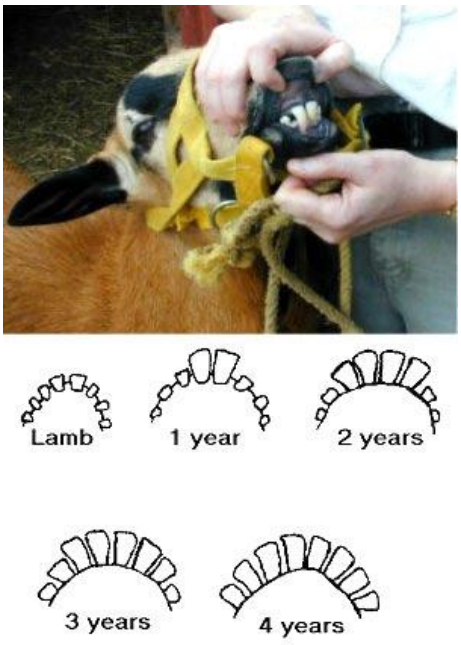
- For selecting a breeding ram, aim for an animal age between 1.5 and 2 years old, as this is when rams achieve sexual maturity and have sufficient experience.
- A mature ram aged 1.5 to 2 years can effectively breed 30-50 ewes in a season.
- Younger ram lambs (around one year old) should be limited to breeding fewer ewes, ideally 15-30, due to their in experience and lower stamina in extensive conditions.
- The age can be estimated by looking at the ram's teeth
- A ram can be reproduced actively by 7 to 9 years.
- The buck/ram with central pair of permanent incisors signifies that the animal age is one year
- If there will be two pairs of incisors, it signifies that animal age is two years

Performance:

- Performance selection is based upon measurable indicators or observable responses such as growth rate measured through body weight from birth and at various stages of growth.
- The advantage of performance selection over visual appraisal is that there is less risk of subjective valuation or guesswork as more emphasis is placed on characteristics of high economic importance.
- If a producer fails to consider performance characteristics in the selection process, his or her flocks will not reach the highest envisaged production levels.
- Keeping seperate production records of both rams and ewes, that will allow the producer to select and cull accurately based on record.

Pedigree:

- Pedigree selection takes place when animals are selected along family lines, particularly from sire lines.
- Line breeding is a modified form of inbreeding that uses pedigree selection to concentrate the genetics of a superior ancestor.
- However, pedigree selection will be used to make decision that reduced inbreeding in any form. The use of pedigrees in selection will enable decisions that minimize the use of rams that are closely related.



Reproductive Organs Examination:

Testicles:

The scrotum and testicles must be screened and palpated in terms of their tone and size. One important factor when evaluating a ram s breeding potential is testicle size. There is a direct correlation between testicle size and semen quality. The testicles should be firm (but not contain any areas of increased firmness or abscesses), freely movable within the scrotum, and of similar size. Pronounced differences in size may indicate fertility problems. Swelling of the testicles or epididymis indicates injury or infection. While palpating the testicles, also evaluate the epididymis. One disease producer should be aware of is epididymitis, a disease caused by

Brucella ovis, and a common reason for culling rams and bucks. This condition causes swelling and hardening of the epididymis. It is transmitted during sexual activity, either ram to ram (or buck to buck), or through the ewe or doe. Ewes and does can be carriers, and those that are bred by infected rams may have abortions, stillbirths, or weak lambs and kids. Rams or bucks infected with epididymitis should be culled. Cryptorchidism: One or both testes not descended.

Scrotal circumference:

Scrotal circumference should be measured at the greatest circumference of the scrotum.Scrotal circumference can vary by season and with body condition. It is usually larger during the fall breeding season (September to November), and can decrease 2 to 3 cm during the off-season.It is recommended that mature rams that are used for breeding have a minimum scrotal circumference of 33 cm, while 30 cm is acceptable for ram lambs.Rams and bucks failing to meet these criteria should be culled, as they are likely incapable of producing enough semen to service multiple females during the breeding season.

Minimum Scrotal Circumference

AGE (Months)		MINIMUM CIRCUMFERENCE (CM)
5-6	-	26-29 cm
6-8	-	30 cm
8-10	-	31 cm
10-12	-	32 cm
12-18	-	33 cm
18	-	34 cm

Semen Evaluation:

Collection :

Artificial vagina (AV) or electro ejaculator.Semen characteristics:

- Volume: 0.5–2.0 ml
- Color: Milky/creamy (watery = poor quality)
- Mass motility: 3–5 (scale 0–5)
- Progressive motility: ≥30–40%
- Sperm concentration: 2–3 billion/ml
- Normal morphology: ≥70% normal sperm cells

Libido / Mating Ability

- Observed by exposing ram to ewes in estrus.
- Ram should actively seek, mount, and achieve intromission within few minutes.

Ram physical examination checklist

1. Starting at the head, check teeth to ensure he can eat well and maintain condition while serving.
2. Check for any wounds as pain and inflammation will affect semen quality.
3. Body condition scoring rams should be score 3.5 at the start of tupping, too thin and they may not manage to serve all the ewes, too fat and they may have less libido and excess fat in the scrotum can decrease fertility.
4. Check feet for any sign of lameness as this is a common cause of problems.
5. Size varies with age, breed and time of year but as a guide should be over 34cm for ram lambs and 36cm for mature rams.
6. Check for any lumps or soft areas in the testicles – these may indicate infection or abscesses.
7. Check the penis to make sure it moves freely in the prepuce and there are no signs of trauma.
8. Check brisket for sores.

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