

SHORT COMMUNICATION

SCREENING FOR BREEDING SOUNDNESS IN RAMS

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The profitability of livestock enterprises depends largely on the effective management of reproduction. As greater emphasis is being placed on the small ruminant as source of meat in Nigeria (FAO, 1975, Green Revolution report, 1981), it has become increasingly necessary to improve their reproductive efficiency. Local herdsmen and government livestock project managers have largely ignored the male in their breeding efforts, the general assumption being that virtually all intact adult males are fertile.

Consequently most breeding soundness evaluation have been performed after unsuccessful breeding. It would be more efficient and profitable to livestock owners to conduct breeding soundness evaluations on prospective breeding males prior to purchase or use in breeding. Selecting potential sires are an important contribution that the practicing veterinarian can make towards the success of livestock production programmes. In this communication, we outline methods we have used to evaluate breeding soundness in a flock of rams. In most breeding soundness, semen evaluation attracts most of the emphasis and little attention is given to physical examination and other aspects of breeding. In addition to semen quality evaluation, we have also taken the physical and infectious disease status of each animal into consideration in arriving at a rating.

Thirty-four Balami and Uda rams were purchased from the open market in Maiduguri, Borno State and transported to the livestock farm in Katsina. Breeding soundness examination was conducted a

week after arrival at the farm. After the routine general physical examination, particular attention was paid to the locomotor and genital systems. The locomotion system was examined for evidence of overgrown hoofs, interdigital abscesses and fibromas, foot-rot, solar abscess and bruises; the joints and tendons were examined by palpation and inspection for pain, evidence of inflammation, excessive swellings and degenerative changes. The long bones were checked for fractures by palpation and manipulation. Finally, the rams were observed while walking and trotting, for abnormalities in gait and co-ordination.

The testicles and epididymis were palpated for consistency, resilience and presence of lumps, fibrous hyperplasia or softness which would indicate inflammatory or degenerative changes, and the scrotum was inspected for scars. The scrotal circumference (both testes) was measured with a tape at the widest point on the testes. Presence of structural abnormalities such as bifida or cryptorchidism were noted. The preputial space was washed with about 100mls of phosphate buffered saline (PBS) pH.7.4, and the washing were examined for the presence of *Trichomonas* and *Vibrio* organism by darkfield microscopy. Unclotted (ED-TA.) blood samples were examined for hematozoan parasites. The physical condition of each animal was rated as normal or abnormal on the basis of the findings at physical examinations.

Semen samples were collected with the aid of an electroejaculator and evaluated for volume, colour/consistency, concen-

tration, and gross (sperm) motility. A drop of sperm-rich semen was mixed with a drop of stain (methylene blue), smeared on microscope slide, air dried and examined at 1000× magnification for evidence of sperm abnormalities.

Unclothed blood samples were obtained from all the rams and the resultant serum tested for Brucella antibodies using *B. abortus* (smooth antigen), *B. canis* and *B. ovis* (rough antigens). The Rose Bengal plate agglutination test (RBPT) and the serum agglutination tests (SAT) were done using the method of MORGAN *et al* (1971). For the SAT, reactions at 1:20, which is equivalent to 40 or more international units (i.u.) per ml., were considered as positive. The complement fixation test (CFT) as described by CORBEL *et al* (1978) was used as confirmatory test on all samples.

All the rams were within 1½ to 2½ years of age as determined from physical examination. No significant abnormality was observed in the locomotor system in any of the rams. The scrotal circumferences (SC) observed for this group of rams (34.3 ± 2.4cm for Uda, and 35.3 ± 2.7cm for Balami breeds) (Table 1), were within the range reported for temperate breeds (BRAUN *et al*, 1980). The SC were therefore considered to be within normal range as there are no data on SC in local breeds of sheep. A few cases of epididymitis and testicular degeneration were observed.

The results of the screening tests for semen quality and brucellosis are summarised in Table 1. The rams were divided into four groups on the basis of the results:

Group I — Recommended for use as breeders because of absence of evident abnormalities.

Group II — Recommended with reservation, because of some minor abnormalities which could result in future impairment. Rams in this group had some mild testicular abnormality or were Brucellosis positive. If rams from this group

are to be used it is recommended that they be subjected to further field trials, or to chemotherapy, and retested at intervals before being integrated into the herd. Group III and IV — Not recommended, because of severe or multiple abnormalities. Animals in group III were marginally better than those in group IV, and in situations of dire necessity, some could be salvaged for use after adequate field trials.

Breeding soundness evaluations (BSE) are done primarily to provide information on the breeding and reproductive potential of sires before they are purchased or turned out with the flock. Occasionally BSE are conducted to determine the role of the males in a herd having reproductive problems. The locomotor system is important because a ram needs to balance on the rear legs to mount successfully. Any structural or functional lameness or damage to the limbs would prevent successful mounting and greatly limit the effectiveness of the ram. Testicular size (weight and volume), which is highly correlated with scrotal circumference, has been shown to be an accurate estimator of the amount of sperm-producing parenchyma in the testis (WILLET and OHMS, 1957, OSINOWO *et al*, 1977). Hence rams with larger testicles tend to produce more sperm, and fertility is closely related to sperm production (OTT and MEMON, 1980).

Several parameters have been used to evaluate semen quality. Unfortunately, there are few parameters which have been actually tested and correlated with fertility. We are therefore forced to make our assessment on the basis of (1) total cells; (2) motility; and (3) proportion of normal cells and incidence of morphologically abnormal cells (Laisen, 1983).

It is also important that potential breeding rams be examined for significant infectious diseases which could impair fertility. Almost any disease condition can be detrimental to reproduction, but infec-

TABLE I

Summary of the Results of the Screening Tests for Breeding Soundness in a Group of Rams

Group	Identification No.	Breed	Scrotal Circumf. (cm)	Physical Findings	Semen Quality	Brucellosis	Recommendation
I	387	Uda	33.8	N	excellent	Negative	Recommended
	36	Balami	33.5	N	V. Good	Negative	
	4	Uda	31.3	N	V. Good	Negative	
	87	Balami	33.8	N	Acceptable	Negative	
	55	Uda	33.8	N	Acceptable	Negative	
II	199	Balami	33.8	ABN	Good	Negative	Recommended with Reservation
	549	Balami	30.0	ABN	Good	Negative	
	82	Uda	37.5	N	V. Good	Positive	
	206	Balami	38.0	N	V. Good	Positive	
	178	Uda	37.5	N	V. Good	Positive	
	526	Uda	31.3	N	V. Good	Positive	
	32	Uda	38.8	N	G. Good	Positive	
	541	Balami	38.8	N	Good	Positive	
	511	Balami	33.3	N	Good	Positive	
	550	Uda	33.8	N	Good	Positive	
	580	Uda	37.5	N	Good	Positive	
	74	Balami	34.5	N	Good	Positive	
III	23	Uda	35.5	N	Acceptable	Positive	Not Recommended
	582	Balami	37.5	ABN	Acceptable	Positive	
	87	Uda	36.3	N	Acceptable	Positive	
	531	Uda	33.8	ABN	Acceptable	Positive	
	103	Uda	33.8	ABN	Acceptable	Positive	
	389	Balami	37.5	N	Acceptable	Positive	
	546	Uda	33.8	N	Acceptable	Positive	
	564	Uda	32.5	ABN*	V. Good	Negative	

Group	Identification No.	Breed	Scrotal Circumf. (cm)	Physical Findings	Semen Quality	Brucellosis	Recommendation
IV	12	Uda	34.5	N	Poor	Positive	Reject
	334	Balami	33.3	N	Poor	Positive	
	542	Uda	33.8	N	Poor	Positive	
	93	Uda	33.8	N	Poor	Positive	
	438	Balami	38.8	N	Poor	Positive	
	67	Uda	35.8	N	Poor	Negative	
	412	Balami	36.3	N	Poor	Negative	
	524	Uda	32.5	ABN	Poor	Positive	
	110	Uda	28.8	ABN	Poor	Negative	

N = Normal

ABN = Abnormal

*ABN = Abnormality in both testicles.

Mean SC:

Uda: 34.3 ± 2.4 (n = 21).Balami: 35.3 ± 2.7 (n = 13).

tions by such organism as *Brucella*, *Vibrio*, *Trichomonas*, should be given priority consideration.

In conclusion pre-purchase examination of breeding rams should pay particular attention to the scrotal cir-

cumference as a good indicator of sperm-production potential, and to a sound locomotor system as absolutely essential for successful mounting. As a result of the high prevalence of *Brucellosis* found in the present study, it is recommended that

Brucellosis testing should supplement semen quality examination in arriving at the final selection of rams intended for breeding. Careful combination and evaluation of all these tests should insure the breeder of efficient, trouble-free breeding season. The tests described here are however not intended as substitutes for detailed sire proving, breeding trials. It is well accepted that as far as possible, proven sires should be used in livestock breeding. It is also obvious that the majority of small ruminant farmers or herdsmen in this country have neither the ability nor the finances to conduct full scale breeding trials required to produce proven sires. Even establishments that can conduct breeding trials need some method for initial selection of potential sires from the large numbers of available males. The tests described here are therefore designed to provide a logical basis for pre-purchase and pre-breeding differentiation of the most promising from the least desirable sires.

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REFERENCES

- BRAUN, W.F., THOMPSON, J.M. and ROSS, C.V. (1980). Ram Scrotal Circumference Measurements. In "Sheep and Goat Manual," Society for Theriogenology, Association Building, Nebraska, USA, (R.S. OTT and M. MEMON, Eds).
- CORBEL, M.J., GILL, K.P., REDWOOD, D.W. (1979). Diagnostic procedures for non-smooth *Brucella* strains. Min. of Agric. Fisheries and Food, England. Public Booklet No. 2074.
- FAO (1966). *Agricultural Development in Nigeria 1965—1980* — Food and Agricultural Organisation of the United Nations, Rome.
- GREEN REVOLUTION COMMITTEE (1981). A livestock Production Plan for Nigeria, Interim Report Vol. II Part II. National Committee on the Green Revolution Nigeria.
- LARSON, R.E. (1983). Breeding soundness and semen handling in the stud dog. Proceedings of the Society for Theriogenology, Annual Meeting, Nashville Tenn. USA 1983. p.29—135.
- MORGAN, W.J.B., MACKINSON, D.J., GILL, K.P., GOWER, S.G.M. and MORRIS, P.W. (1971). Standard Laboratory Procedures for the diagnosis of Brucellosis. MAF, Central Veterinary Laboratory, Weybridge, England.
- OSINOWO, O., DENNIS, S.M., OSORI, D.I. and MOLOKWU, E.C. (1977). Scrotal and testicular dimensions in some West African bulls. *Nig. Jour. of Animal Production* 4(2); 31—36.
- OTT, R.S. and MEMON (Editors) (1980). "Sheep and Goat Manual" Society for Theriogenology Publication. Association Building, Nebraska, USA.
- WILLETT, E.L. and OHMS, J.I. (1957). Measurement of Testicular size and its relation to production of spermatozoa by bulls. *J. Dairy Sci.* 40; 1559—1569.