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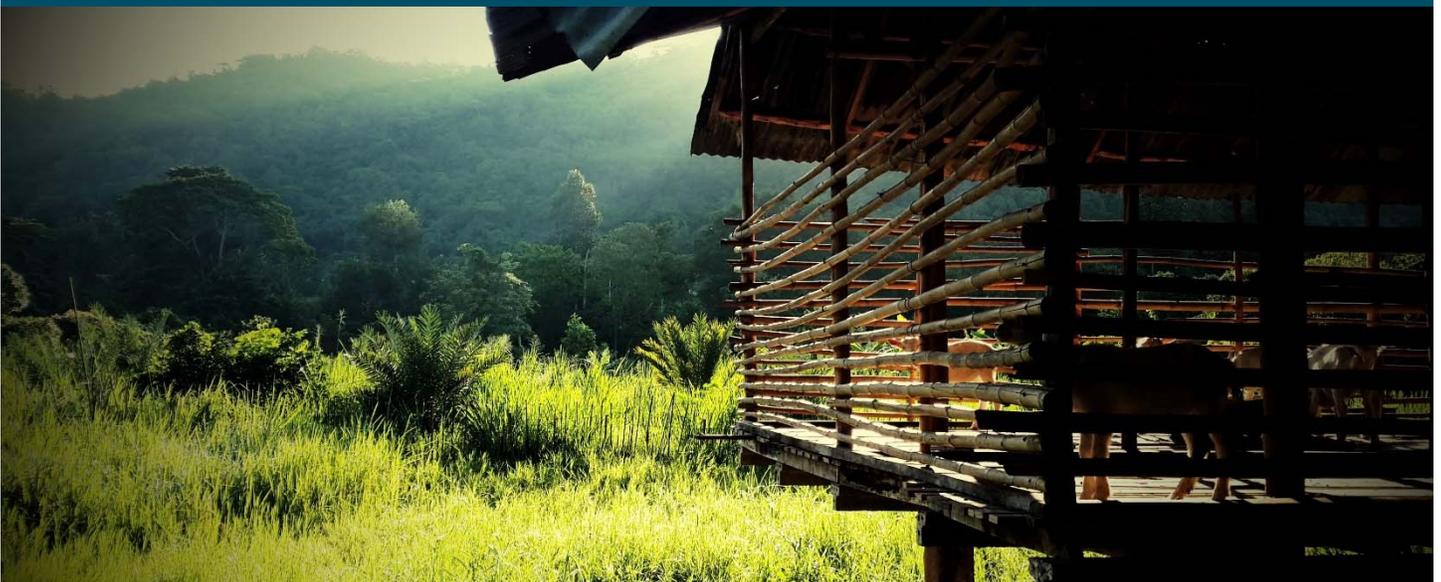
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# (SAADC 2015)

## October 27-30, 2015

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# Breeding Soundness Evaluation in Garut Ram

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## Abstract

Breeding soundness evaluation of the male offers predictive information on expected performance that may enhance overall herd productivity. The aim of this study was to examine breeding soundness evaluation in Garut rams. Twenty four rams with aged of 10 month to 3 years were examined at Faculty of Animals Science, Bogor Agricultural University (IPB). Clinical examination was performed with each ram. External genitalia was examined by visual assessment and palpation for testicular tone. Scrotal circumference was measured using a metal scrotal tape. Semen was collected using artificial vagina andassessed on the basis of progressive motility, sperm concentration and sperm morphology. Result demonstrated that the average body weight of the 24 rams were 29.85 ±3.13 kg (range of 24-36 kg), scrotal circumference were 25.35±2.10 cm (range of 22-28 cm). Around33.3% (8/24) rams producing semen with a progressive motility more than  75%, 54.16% (13/24) rams  ranges from 60 to 70% and less than 12.5% (3/12) demontrated < 60% motility. Four rams demontrated the sperm concentration > 4000 x$10^6$cell per ml,  13 rams ranges from 2000-4000 x$10^6$cell per ml and only 1 ram demonstrate less than 2000 x$10^6$cell per ml. All rams producedan excelent morphologically normal spermatozoa >93.82%±2.03%.

*Keyword: Breeding soundness evaluation, Garut ram*

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## Introduction

Garut is one of local Indonesien germplasm sheep that is often used for competition and for general consumption. The National demand for Garut rams were quite high, thus an effort to meet that demand through increasing in population and quality should be done immediately. Improving in Garut rams quality can be done with selection of good quality and cross breeding rams. Breeding program require rams with good physic and provide healthy spermatozoa for female rams in estruses period. Thus, an evaluation for ram's performance has to be done before initiate the breeding program. One of the methods to evaluate the ram's performance is with *breeding soundness evaluation* (BSE). BSE is an evaluation method to decide the performance excellences of the male by observing the physic and reproduction performance. BSE method has been tested on several livestock such as bull (Leamaster & Duponte, 2007), buck (Bagley, 1997) and rams (Pezzanite et al., 2004). The BSE method evaluate scrotal circumference and semen quality such as motility, concentration and spermatozoa morphology(Leamaster & Duponte, 2007).The aims of this study was to examine breeding soundness evaluation in Garut rams.

## Materials and Methods

### *Animals*

Twenty four Garut rams with age ranging from 10 months to 3 years, were examined at Faculty of Animals Science, Bogor Agricultural University (IPB).

### *Clinical examination*

Clinical examination was performed with each ram. External genitalia was examined by visual assessment and palpation for testicular tones. Scrotal circumference was measured using a metal scrotal tape.

### *Semen collection and evaluation*

The semen was collected from the ram with the aid of an artificial vagina. Immediately after collection, the semen was evaluated for progresive motility, sperm concentration and sperm morphology. Progresive sperm motility (%) was performed by placing 10 µL semen on a object glass and covered by cover slip pre-heated to 37 C and analyze the sample subjectively under light microscopy at 200×–400× magnification. Sperm concentration was measured using improved Neubauer hemocytometer by diluting the semen to 1:500 ratio with formal-saline on test tube and gently mix well the solution. After mixing, one drop of solution were placed in a clean and dry hemacytometer covered by cover slip and counted the sperm dispersed in the middle square and the four corner squares of the 25 squares in the grid. Number of spermatozoa was counted in 100 squares with the help of manual counter. The number of spermatozoa from 5 square covered by cover slips were multiplied by 25 x $10^6$ (Arifiantini 2012). Sperm morphology was evaluated using eosin nigrosin, 100 µl eosin nigrosin well-mixed with 10 µl semen, smeared at object glass by sliding with a clean another object glass. The smears were air dried and examined directly. Two smears were made from each sample. Sperm were assessed with a light microscope (Olympus CH 20) at 400x magnification. At least 200 sperms were evaluated on each smear.

## Result and Discussion

Result demonstrated that the average body weight of the 24 rams was 29.85 ±3.13 kg (range 24-36 kg). Around 62.5% rams hadbody weight of 30.9 ± 3.28 kg and this weight was reached when rams age were 1.5 years (Tabel 1). The average of scrotal circumference of garut rams were 25.35±2.10 cm (range of 22-28 cm). After rams reached one year, the scrotal circumference seems to be stable.

Table 1. Age, body weight and scrotal circumference of garut rams.

| Age (years) | Number (head) | Body weight (kg) | Scrotal circumference (cm) |
|---|---|---|---|
| <1 | 1 | 28.0± 0.00 | 22 ± 0.00 |
| 1-1.5 | 15 | 30.9 ± 3.28 | 25.50 ± 1.92 |
| >1.5-2 | 4 | 32.5 ± 2.08 | 25.63 ± 2.56 |
| >2-3 | 4 | 28.5 ± 2.65 | 25.38 ± 2.5 |

Sperm motility is the indicator of sperm fertility. Around 33.3% (8/24) garut rams produced semen with a progressive motility more than 75%, 54.16% (13/24) rams ranges from 60 to 70% and less than 12.5% (3/12) demontrated < 60% motility.

Table 2. Progresif sperm motility distribution of garut rams.

| Sperm motility (%) | Number (head) | Percentage (%) |
|---|---|---|
| >75 | 8 | 33.3 |
| >60-75 | 13 | 54.16 |
| < 60 | 3 | 12.5 |
| Total | 24 | 100 |

Sperm concentration were defined as the number of sperm in 1 ml semen volume. The 75% (18/24) oframs demonstrated sperm concentration range from 2000 to 4000 x10$^6$ cell per ml and four rams demontrated sperm concentration of > 4000 x10$^6$cell per ml, only 1 ram demonstrate less than 2000 x10$^6$ celll per ml.

Table 3. Sperm concentration distribution of Garut rams.

| Sperm concentration ( x106 /ml) | Number (head) | Percentage (%) |
|---|---|---|
| 1000-2000 | 1 | 4.16 |
| 2000-3000 | 13 | 54.16 |
| 3000-4000 | 5 | 20.8 |
| >4000 | 4 | 16.6 |
| Total | 24 | 100 |

All rams showed an excelent normal sperm morphology. The average of normal sperm morphology was > 93.82%±2.03% range from 86.76% to 96.35%. According to Bagley (1997), ram with the age of > 14 monthswithif the scrotal circumference <33 cm were catagorized as questionable. In this study, the maximum scrotal circumference was 28 cm with the average of 25 − 35±2.10 cm. When we perform BSE according to Bagley (1997), all rams were failed to pass the test. The BSE forlocal ram must be adapted to the average of the rams. Garut rams more than 1 year were categorizedas satisfactory if the scrotal circumference > 25 cm and categorized as questionable when less than < 25 cm. Based on semen evaluation, rams that demonstrated > 75% sperm motility were categorized as excellent, 60-75% as satisfactory and <60 % as questionable. Garut rams sperm concentration were categorized as excellent if the sperm concentration > 4000x10$^6$ /ml, satisfactory if > 2000 - <4000x10$^6$ /ml and questionable if < 2000x10$^6$ /ml catagories as questionable. Since the sperm mophology demonstrated high number of normal sperm, we were categorized garut ram with sperm morphology of> 86.76 % as satisfactory and < 86.76 % as questionable.

Based of this finding the catagorization of BSE as excellent, satisfactory or questionable shoud be done specifically based on the breed.

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