

## Effects of Breed of Sire and Double Insemination on Performance of Reproduction of Local Sheep

Ismaya and M. Soetimboel

Faculty of Animal Husbandry GMU.

**ABSTRACT:** The objectives of the study were to know the effects of breed of sire and double insemination on non return rate (NR), conception rate (CR), lambing rate (LR) and newborn weight (NW) in local sheep. Data obtained from 24 ewes that divided into 4 groups (G1, G2, G3 and G4) in which group was 6 ewes. G1 and G2 were inseminated by single and double semen (diluted) of local ram, respectively. G3 and G4 were inseminated by single and double semen (diluted) of Merino ram,

respectively. Results of the study showed that NR in G1, G2, G3 and G4 were 50% and 50%, 50% and 33.3%, 66.7% and 33.3%, and 16.7% and 16.7%, respectively. Newborn weight of local sheeps were lighter ( $P < 0.05$ ) than newborn weight of crossing between local ewes and Merino ram. A conclusion can be made from this study, that double inseminated with range 24 hours did not effectively on performance of reproduction. Merino ram can be improve newborn weight of local sheep.

Key Words : Sheep, Non-Return Rate, Conception Rate, Lambing Rate, Newborn Weight

### Introduction

Many farmers raise local sheep in rural areas. This sheep raising is done as a sideline job, and done in a traditional way so that its productivity is relatively low.

One way to increase the productivity of local sheep is by crossing the local ewe with the Merino ram. In order to use Merino ram more efficiently, artificial insemination is done in the crossing. In the artificial insemination, diluted sperm produced in each ejaculation is able to inseminate 20-50 ewes.

Repeated insemination is unnecessary in sheep breeding because it is inefficient and ineffective (Ismaya 1994). In natural mating the male sheep is able to deposit an abundant amount of sperm cells to the female sex organ, but in the artificial insemination the amount of sperm cells deposited to the female sex organ is relatively small. This research aims to find out the effect of the male type and double insemination to the NR, CR, LR values and the weight of the newborn sheep will.

### Materials and Methods

This research examines 24 local ewes aging 1-1.5 years, 1 male local sheep and 1 male Merino aging 2 years. The male and female sheep are put separately in a stable. The feed consists of 0.3 kg

starlak and 5 kgs grass (*Pennisetum purpurium*) for 1 sheep per day.

After conducting a 2-week preliminary research, the 24 ewes are divided into 4 groups (G1, G2, G3 and G4) at random, each group consisting of 6 sheeps. To obtain efficient insemination, the estrus of the female sheep is synchronized by using Prostaglandin  $F_{2\alpha}$  analog (reprodin, product of Bayer). Synchronization is done intra muscularly, 2 times with an interval of 10 days with a dosage of 0.5 ml per ewe.

Insemination is done 48 hours after the second reprodin injection, and this varies with the group: G1 is inseminated once and G2 twice with the local sheep's diluted sperm. G3 is inseminated once and G4 twice with Merino sheep's diluted sperm.

The sperm dilutant in this research is cow-milk heated to 95°C for 2 minutes. The artificial insemination dosage is 0.5 ml and contains approximately 100-150 million sperm cells. The sperm is squirted into the upper cervix by the aid of an insemination tube. In the double insemination, the second one is done 72 hours after the injection of the second reprodin.

After the insemination, an observation is made to find out whether there is any female sheep which wants to mate again. If there is any, she must be mated according to her group.

Pregnancy test is done by means of the Ultrasound Pregnancy Detector 50 to 60 days after the last insemination. The data on non-return rate (NR), conception rate (CR), and lambing rate (LR) are then examined with the Chi-square, and the data on the weight of newborn sheep are examined with the t-test (Steel and Torrie, 1981).

**Results and Discussion**

*Non Return Rate (NR)*

The research results do not indicate any significant increase in the NR value in the female local sheep inseminated with the local sheep's sperm. The NR value is even lower when female local sheep are doubly inseminated with the Merino sperm (Table 1).

In this research the NR values taken from artificial insemination are lower than those taken from natural mating. According to Ismaya (1994) single natural insemination in sheep gives an NR value of 100.0 % while double natural insemination 87.5 %. In contrast, double insemination, both natural and artificial, does not present any significant difference. This result is in accord with Toeliere's opinion (1981)

*Conception Rate (CR)*

Ultrasound Pregnancy Detector used in this research to test the CR gives a result with an accuracy rate of 87.5 %.

The CR figure from the single artificial

insemination both with the local sheep sperm and the Merino sperm similarly amounts to 50 % (Table 2). However, the double artificial insemination with local sheep sperm results in a relatively high CR (66.7 %), while that with Merino sheep sperm results in a low CR (16.7 %).

Chemineau et al (1991) reported that estrus synchronization in sheep using vaginal sponge with 40 mg FGA for 14 days produced a CR of 61,4 %, while that using Subcutaneous implant with Hydron 3 mg Norgestomet for 12 days produced a CR of 66.8 %. Meanwhile, according to Inskeep and Peters (1981) female sheep whose estrus is synchronized by using 20 mg PGF<sub>2</sub>α and 20 mg Flourogestone acetate produced a CR of 64 % and 62 %, respectively.

Compared with the above figures, the CR value obtained in this research is relatively low (Table 2), excepting the CR value from double insemination with local sheep sperm (66.7 %). Probably, the difference results from the sperm dilutant which is used, namely cow-milk, which makes sperm fertility relatively low.

The conception rate from artificial insemination is much lower than that from natural mating. According to Ismaya (1994) the CR's from single and double natural mating are both 87,5 %. This difference is due to the differences in sperm cell concentrations deposited into the female sex organ. In natural mating the amount of sperm is 20-40 times that in artificial insemination.

Table 1. NR value (%) local sheep singly and doubly inseminated with local sheep sperm and Merino sheep sperm<sup>a</sup>

Insemination type	NR value (%)	
	Local sheep sperm	Merino sperm
Single	83.3	66.7
Double	83.3	33.7

<sup>a</sup>effect insignificant

Table 2. Effects of male type and insemination type to conception rate in ewe (%)<sup>a</sup>

Male	Conception Rate (%)	
	Single insemination	Double insemination
Lokal	50.0	66.7
Merino	50.0	16.7

<sup>a</sup>effect insignificant

Table 3. Effect of male type and insemination type to lambing rate of local sheep<sup>a</sup>

Male	Lambing Rate (%)	
	Single insemination	Double insemination
Lokal	50.0	33.3
Merino	33.3	16.7

<sup>a</sup> effect insignificant

Table 4. Effect of male type to weight of newborn sheep with artificial insemination

Birth Type	Newborn Weight (kg)		
	Local Sheep	Merino Descendant	Up grade
Female Single	2.09±0 (1)	2.27±0.04 (3)	8.6%
Male Single	1.89±0.24 (5)	2.61±0.24 (5)	38.1%
Female Twin	1.38±0.31 (4)	1.81±0.47 (3)	31.2%
Male Twin	1.67±0.21 (4)	1.92±0.33 (3)	15.0%
Average <sup>a</sup>	1.76±0.30	2.15±0.36	21.16%

Figure in the bracket is the n

<sup>a</sup> Showing significant differences (P<0.05)

### Lambing Rate (LR)

In this research LR is the percentage of the newborn sheep divided by the number of singly inseminated females. LR in single insemination gives a better rate than that in double insemination (table 3) and local sheep sperm produces better LR than Merino sheep sperm. The outcome in this research is relatively low in comparison with that from natural mating. Ismaya (1994) states that single and double natural inseminations produce the same LR's, namely 137.5 %. LR is also influenced by the preservation time of the diluted sperm. According to Chemineau et al., (1991) an insemination using fresh diluted sperm produces an LR of 60 %, whereas one using diluted sperm preserved for one day produces a lower LR of 34 %. LR is also influenced by the chemical substances given to synchronize estrus. The same dosage (20 mg) of PGF<sub>2</sub>α and flourogestone acetate produces an LR of 64 % and 60 %, respectively (Inskeep and Peters, 1981).

### Newborn Weight

The results of this research shows that up-grading of local sheep with the Merino male can increase the weight of its offspring by 21.16 % in

average, depending on sex and birth type (Table 4). Single newborn and male newborn are heavier than twins and female newborn.

The results of this research do not differ much from those of Harmadji's research (1977) which states that the crossing between male Australian sheep and DEG female produces an average weight of 2.52 kg for single male newborn, 2.22 kg for single female newborn, 1.96 kg for male twins, and 1.97 kg for female twins. The weight of a newborn from the Merino line of descent in this research is relatively low. According to Edey (1983) the weight of a newborn from the Romney line of descent crossed with the Merino sheep is 4,6 kg, whereas the weight of Merino newborn is 4.7 kg. These differences are probably due to the kind of sheep, breeding procedures, and the environment.

### Conclusion.

Double insemination is not necessary for sheep breeding because it is ineffective and inefficient. The weight of Merino descendant is heavier than the weight of local newborn.

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