EFFECT OF HIGH FEEDING LEVEL ON BODY WEIGHT OF JAVANESE THIN TAILED SHEEP FROM DIFFERENT LITTER SIZE

N. Hidajati, A. Priyanti, and I. Inounu[1]

ABSTRACT

A study to observe the effect of high feeding level on body weight gain of male Javanese sheep (G) from different litter size was done in Bogor for three months. Eighteen male sheep aged 4-5 months were kept in flock of different litter size (LS1, LS2, LS3). The initial average body weight were 21.9, 21.2, and 18.6 kg per head for LS1, LS2 and LS3 respectively. Feed given was calculated based on dry matter (DM), 4.5% of body weight which consist of 85% concentrate DM and 15% grass DM. Concentrate given was GT03 with 16% crude protein and 68% TDN, and the forage was King grass. Results show that average daily weight gains (ADG) are 119.04, 124.48 and 134.52g/h/d for LS1, LS2, and LS3 respectively. The actual DM intakes are 4.2, 4.1, and 3.3% of body weight (BW) for each litter size respectively. The lowest feed conversion is resulted from LS3 (5.97), while that of LS1 is 8.94 and for LS2 is 8.46.

Key words: Javanese sheep, body weight, litter size

INTRODUCTION

In the year of 1995 Indonesia imported 8,330 tons of meat (Pusat Data Pertanian, 1996) to fulfill the demand since the local meat production was unable to meet the demand because animal production performance is low. Javanese thin tailed sheep is known as prolific sheep in Indonesia that can produce more lambs in a year time. This animal could be an alternative source of meat. But the beneficial trait is not fully advantageous since the high mortality, low weaning weight of higher litter size, and low ADG were reported (Inounu *et al.* 1993, Martawidjaja *et al.* 1990, and Wina *et al.* 1996).

The lamb weaning weight of single litter size was higher than that of twin and triplet or higher. Inounu (1993) reported that the total weaning weight of single, twin and triplet were 10.5, 12.3, and 13.1 kg respectively. This condition resulted in different ADG needed to reach the marketing body weight of 35kg from each kid originated from different litter size (Inounu 1996).

Feed that consists of high grain can impose ADG. National Research Council (NRC, 1985) recommended to give DM 4.3 - 5% of BW, 85% of which derived from concentrate to get ADG of 250 - 300g/h/d to the early-weaned lambs. This study was done to evaluate the ability of male Javanese sheep in producing ADG under the high feeding level.

MATERIALS AND METHODS

Eighteen male sheep aged 4 - 5 months were used in this study. Those sheep were grouped according to their litter size (LS1:6, LS2:7, and LS3:5) and kept in flock. Feed DM was given 4.5% of BW, 85% of it derived from concentrate and the other 15% from King grass. Feed offered and the residue were determined every day to measure the intake, while BW change was determined every 4 weeks. Water was available all day long. Daily offering of feeds was assessed every week.

Concentrate given was GT03 purchased from local feed meal with 16%

[1] Research Institute for Animal Production, P.O. Box 221 Bogor, Indonesia.

Table 1. Initial and final body weight, average daily intake and feed conversion.

Variables	Litter size		
	1	2	3
Initial BW(kg)	21.90a	21.22ab	18.60b
Final BW (kg)	31.42a	31.00a	30.20a
ADG (g/h/d)	119.04a	124.48a	134.52a
Daily intake:			
- concentrate (g)	1,064	1,054	767
- grass (g)	970	910	683
DM intake:			
- concentrate (g)	936.3	927.5	675.0
- grass (g)	194.0	182.0	136.0
Total	1,130.4	1,109.5	811.0
Ave. DM intake (%BW)	4.2	4.1	3.3
Feed conversion	9.4	8.7	5.75

crude protein content, and 68% TDN. King grass was obtained from local grassland and chopped. It contained 10% crude protein and 56% TDN (calculated).

Data collected was analyzed based on least square method (imbalance data) (SAS, 1987).

RESULT AND DISCUSSION

The initial and final BW, ADG, average daily intake are presented in Table 1. The initial body weight gain of LS1 is not significantly different from LS2 but significantly different from LS3. On the other hand, the final body weight of those three litter sizes is not significantly different. The rate of gain observed in this experiments are 119.04, 124.48 and 134.52g/h/d for LS1, LS2, and LS3 respectively, and it is statistically non-significantly different. The overall average is 123.93g/h/d, is lower than that reported by Haryanto, 1995 (140 g/h/d) but higher than that reported by Inounu 1996 (75.3 g/h/d).

The average DM intake resulted from this study shows that LS1 consumed higher DM than LS2 and LS3 (1,130.4 vs. 1,109.5 and 811.0 g/h/d). Dry matter intake reported by Haryanto (1995) was 880 g/h/d and that reported by Inounu (1996) was 750 g/h/d.

In Haryanto (1995)'s study, concentrates given contain 7% protected soybean meal while in this study GT03 (100%) was given. This protected soybean meal contributed more protein to the animal and in turn resulted in higher ADG, even though higher DM intake was observed in this study. Unlike that reported by Inounu (1996), lower DM intake resulted in lower ADG. In this study the total MD intake for all litter sizes (Table 1.) are lower than that recommended by NRC (1985).

In comparing ADG among litter sizes, LS3 achieved the highest level of ADG. The initial weight of LS3 was the lowest among three litter sizes, due to the low individual birth weight derived from litter size of triplet, and also inadequate dam's milk. During this study they can grow faster because adequate feed was provided. According to Widdowson (1980) this phenomena called the compensatory growth, since in this period (recovery period) the rate of growth is very fast. This result is also in line with that reported by Haryanto (1995), lower initial BW tend to be more sensitive to feed given.

According to Inounu (1996) to reach marketable weight of 35 kg at the same age, the ADG should be 108, 134, and 147 g/h/d for each litter size respectively. Average daily gain resulted from this study is higher for

Table 2. Crude protein and energy consumption of sheep.

Intake	LS1	LS2	LS3	NRC
Total :				
- CP (g)	169.3	166.6	121.6	
- TDN(g)	717.2	704.8	454.6	
/kgBW$^{.75}$:				
- CP (g)	14.48	14.42	11.21	17.66
- TDN (g)	61.36	61.00	41.88	84.59

LS1, but lower for both LS2 and LS3 than that proposed. This is indicating that feed given to LS2 and LS3 should be different in the protein and energy content, in order to achieve higher ADG.

The average crude protein (CP) and energy (TDN) intake of the sheep are presented in Table 2. The consumption of both crude protein and energy per kg of BW$^{.75}$ for all LS's are lower than that recommended by NRC (1985), and the real DM intake for all LS's also lower than that recommended. This is probably due to the rumen capacity of Indonesian sheep is different (lower) from that of the US sheep. This figure indicate that sheep in this study need higher protein and energy content in their concentrate to meet their protein and energy requirements.

The feed conversion in this study was calculated based on concentrate intake only, since the grass portion in this study only 15.87 - 16.76%. It is 9.4, 8.7, and 5.75 for LS1, LS2, and LS3 respectively. When it is calculated based on DM intake, the result is : 9.97 for LS1, 8.97 for LS2 and 6.08 for LS3. The average is 8.34, lower than that reported by Wina, 1995 (9.29) because in that study the main DM source of the ration derived from forage so that it might be less protein source for the animal. While feed conversion calculated from Haryanto (1995) was 6.28 close to that of LS3. Moreover he indicated that protected soybean meal could be given to sheep and produce good ADG regardless of the initial BW.

The lower the feed conversion means the higher the feed efficiency. In this study the highest feed efficiency resulted from LS3. It is indicating that LS3 is more economical when used as fattening sheep, because it needs the least feed to produce 1 g of ADG. Those sheep from LS1 and LS2 could be kept as ram for breeding purpose.

CONCLUSION

High feeding level given to sheep of different litter size resulted in significantly lower DM intake for LS3, and non-significantly different on ADG among LS1, LS2 and LS3 (119.04, 124.48 and 134.52 g/head/day). From this study it is concluded that different litter size of sheep resulted in different feed conversion. The lowest feed conversion is resulted from LS3, indicating that sheep of LS3 is good for fattening sheep.

Concentrate given in this study (contain 16% CP and 68% TDN) was not enough to achieve ADG needed to reach the marketable weight for LS2 and LS3.

REFERENCES

Haryanto, B. 1995. Variabilitas respons produksi domba terhadap pemberian pakan konsentrat mengandung bungkil kedelai berformaldehid. *Pros. Seminar Nasional Sain dan Teknologi Peternakan*, Balai Penelitian Ternak. pp: 161 - 165.

Inounu, I., L.C. Iniguez, G.E. Bradford, Subandryo, and B. Tiesnamurti. 1993. Production performance of

prolific Javanese ewe. *Small Ruminant Research.* Elseviere Science Publisher 12: 243 - 257.

Inounu, I. 1996. Keragaan Produksi Ternak Domba Prolifik. *Thesis Program Pasca Sarjana IPB.* Bogor.

Martawidjaja, M., A. Wilson dan B. Sudaryanto. 1990. *Suplementasi gaplek dalam ransum yang menggunakan rumput Gajah dan bungkil biji kapuk untuk pertumbuhan domba. Ilmu dan Peternakan* 4(3):303-306.

Pusat data pertanian. 1996. Outlook Komoditi Pertanian Semester II. Pembangunan Pertanian 1995 dan Prospek 1996. Proyek Penyempurnaan dan Pengembangan Statistik Pertanian TA 1995/1996. *Pusat Data Pertanian Jakarta.* Hal. 21.

SAS. 1987. *SAS/STAT Guid for Personal Computers.* Version 6th Edition. SAS Institute Cary., NC., USA.

Widdowson, E.M. 1980. Definision of growth. In: T.L.J. Lawrece (Ed.) *Growth in Animals.* Butterworths. London pp: 1-9.

Wina, E., M. Kayadu dan B. Tangendjaja. 1995. Pengaruh urea, amonium sulfat atau tepung gaplek terhadap performans domba yang diberi suplemen Kaliandra segar. *Pros. Seminar Nasional Sain dan Teknologi Peternakan,* Balai Penelitian Ternak. pp:176-181.