

JURNAL SAINS DAN TEKNOLOGI INDUSTRI PETERNAKAN

MORPHOMETRIC DEVELOPMENT OF PRE-WEANING THIN-TAILED LAMBS RECEIVING CREEP FEED

Hamdani Maulana^{a*}, Monita^a, Nono Ngadiyono^a, Panjono^a, Endang Baliarti^a

^aDepartment of Animal Production, Faculty of Animal Science, Universitas Gadjah Mada, Daerah Istimewa Yogyakarta, Indonesia, 55281

Article history:

Received: 20-05-2026

Revised: 23-07-2026

Accepted: 15-08-2026

Corresponding author :

Hamdani Maulana

Department of Animal Production,

Faculty of Animal Science,

Universitas Gadjah Mada

Email:

hamdani.maulana@mail.ugm.ac.id

ABSTRAK: Penelitian bertujuan untuk mengetahui dampak pemberian creep feed pada pertumbuhan pra-sapih anak domba ekor tipis. Penelitian menggunakan 8 anak domba yang dibagi kedalam 2 kelompok, yaitu pemberian tanpa creep feed (NCF) dan creep feed (CF). Pemeliharaan anak domba dilakukan bersama dengan induk selama penelitian berlangsung pada kandang individu selama 90 hari. Pengukuran ukuran tubuh ternak dilakukan setiap bulan dengan Teknik pengambilan data yang sama. Parameter ukuran tubuh meliputi panjang badan (BL), lingkar dada (HG), tinggi gumba (WH), tinggi pinggul (HH), dalam dada (CD), lebar dada (CW), dan lebar pinggul (HW). Seluruh data dianalisis secara statistik (independent T-test) dengan aplikasi SPSS. Hasil penelitian menunjukkan pertambahan BL, HG, WH, HH, CW, HW, dan CD kelompok NCF vs CF berturut-turut, yaitu $19,50 \pm 2,38$ vs $24,22 \pm 1,57$; $26,25 \pm 2,36$ vs $32,89 \pm 2,63$; $17,75 \pm 2,63$ vs $20,54 \pm 0,93$; $17,75 \pm 1,89$ vs $20,54 \pm 1,24$; $12,00 \pm 1,63$ vs $13,72 \pm 0,99$; $6,50 \pm 1,29$ vs $7,78 \pm 0,92$; dan $9,25 \pm 0,50$ vs $12,47 \pm 1,35$ cm/90 hari. Variabel BL, HG, HH, dan CD menunjukkan pertumbuhan yang lebih baik pada domba yang diberi creep feed selama fase pra-sapih ($P < 0,05$). Kesimpulan dari penelitian ini Adalah penambahan creep feed pada fase pra-sapih dapat meningkatkan pertumbuhan domba ekor tipis sejak lahir hingga umur 90 hari. Kata kunci: *Creep Feed*; Domba Lokal Indonesia; Morfometri; Pra-Sapih.

ABSTRACT: This study aimed to observe the effect of creep feeding on pre-weaning morphometric growth of thin-tailed lamb. Eight lambs were divided into two groups which consisted of four lambs, the first group was given creep feed (CF) whereas the second group was not given creep feed (NCF). Lambs were raised together with their dams in the individual pen up to 90 days. The body frame was measured monthly. The body measurement variables included body length (BL), heart girth (HG), wither height (WH), hip height (HH), chest width (CW), hip width (HW), and chest depth (CD). The data obtained were analyzed using Independent Sample T-test. The results showed that BL, HG, WH, HH, CW, HW, and CD gain of group NCF vs CF were 19.50 ± 2.38 vs 24.22 ± 1.57 ; 26.25 ± 2.36 vs 32.89 ± 2.63 ; 17.75 ± 2.63 vs 20.54 ± 0.93 ; 17.75 ± 1.89 vs 20.54 ± 1.24 ; 12.00 ± 1.63 vs 13.72 ± 0.99 ; 6.50 ± 1.29 vs 7.78 ± 0.92 ; dan 9.25 ± 0.50 vs 12.47 ± 1.35 cm/90 days, respectively. Variable BL, HG, HH, and CD of lambs which were given creep feed were higher ($P < 0.05$) than those of lambs without given creep feed. It was concluded that creep feed increases pre-weaning growth of thin-tailed lamb from birth to 90 days old age. Keyword: *Creep Feed*; Indonesian Local Sheep; Morphometric; Pre-Weaning.

INTRODUCTION

Local sheep are one of the livestock resources developed to meet the national meat supply. Local sheep are kept by the smallholder farmers because they have several superiorities, such as high number of litter size, the age of sexual maturity is relatively fast, and there is no mating season so they can give birth throughout the year (Jarmuji, 2011). However, the increase in sheep population rate is not fulfilled by Indonesian lamb productions (Maulana, Baliarti, Astrini, et al., 2021). Therefore, efforts are needed to improve livestock production performance.

The pre-weaning period is a critical phase that determines the subsequent performance of sheep. Growth during the pre-weaning period is primarily influenced by nutrient intake from milk and supplementary feed. However, milk production of ewes tends to decline with advancing lactation, which may negatively affect lamb growth rate. Therefore, supplementary feeding is often provided to improve lamb growth performance (Agwa et al., 2016). Early supplementation can be implemented through creep feeding, which may also benefit the ewes by reducing suckling frequency.

Creep feeds have long been used to fill the gap between the nutrient requirements of lamb and the availability of the ewe's milk production during pre-weaning period (Urbano et al., 2017). Creep feeds have been reported to improve the growth performance of lamb after weaning. Previous study stated that the higher weight of the lambs, kept on pasture, at the weaning time is possible because the creep feed compensates for the decrease in milk production during lactation (Terblanche et al., 2012). However, there is no information on the effect of creep feed supplementation on pre-weaning growth of thin tailed sheep, therefore this study was conducted.

METHODOLOGY

Data collection

Eight pre-weaned thin-tail sheep (0 days) were used in this study and divided into 2 groups: non-creep feed (NCF)(n=4) and creep feed (CF)(n=4). All lambs were twin born, consisting of seven males and one female. To eliminate the effect of sex, the data from the female lamb were adjusted to the male equivalent using Equation 1 which the born weight NCF vs CF: 2.10±0.19 vs 2.05±0.11 kg. Lambs were kept together with their dams in individual pens for up to 90 days with a creep feeder facility (housing that is only accessible to lamb) for the CF group. The feed given was elephant grass (*Pennisetum purpureum*) and concentrate, while the CF group received creeping feed (Table 1). Feed and water are provided ad-libitum. Morphometric measurements were taken before the start of the treatment (day 0) and monthly thereafter until weaning (day 90).

Sex adjustment factor = $\frac{\text{female data}}{\text{mean of males data}} \times \text{female data}$
(Equation 1)

Morphometric measurements

The body measurement variables included body length (BL), heart girth (HG), wither height (WH), hip height (HH), chest width (CW), hip

width (HW), and chest depth (CD) were measured monthly.

The data were analyzed using Independent Sample T-test, operated by SPSS 20.0 program.

RESULTS AND DISCUSSION

Body length, hearth girth, hip height, and chest depth of lambs which were given creep feed were higher (P<0.05) than those of lambs without given creep feed (Table 2). Body length and heart girth have a major impact on growth because the increase in morphometric is accompanied by an increase in muscle mass resulting in an increase in body weight. Animal morphometric is closely related to body weight (Atta et al., 2024).

Giving creep feed causes the lamb's body size to be larger than the lamb without being given creep feed. Differences in animal growth are influenced by nutrient consumption (Maulana, Baliarti, & Astrini, 2021). Lack of feed is a big obstacle in the growth process, especially if the feed lacks substances such as protein, vitamins, and minerals, this can lead to suboptimal livestock growth. The difference in body size can be seen in Graph 1.

Feed plays an important role in supporting growth requirements. Creep feeding is a strategy to increase nutrient intake of lambs during the pre-weaning period. The provision of creep feed with a high protein content (Table 1) can significantly improve protein intake in lambs, particularly because the main problem in Indonesian local sheep during the lactation period is nutrient deficiency (Budisatria et al., 2007). Creep feeding may stimulate feed intake and exploratory behaviour in lambs, which consequently promotes better growth performance (Adeleye et al., 2014; Silva et al., 2012). Other studies have reported that the provision of a solid diet through creep feeding contributes to rumen development and improves the animals' readiness to digest feed after

Table 1. Nutrient content of feed

Feed	DM (%)	CP (%)	CF (%)	EE (%)	Ash (%)	NFE (%)
Ewe's concentrate	88.32	12.42	25.59	2.30	13.08	49.15
Elephant grass	11.22	9.89	31.15	1.44	16.31	38.67
Creep feed	88.68	16.49	14.96	7.56	7.62	53.76

DM: Dry matter, CP: Crude protein (%), CF: Crude fiber, EE: Extract ether, NFE: Nitrogen free extract

Table 2. Morphometric growth of Thin-tailed lambs during the pre-weaning period with creep feed supplementation

Variable	Treatment (cm/90 d)		Sig.
	Non-creep feed	Creep feed	
Body length	19.50±2.38	24.22±1.57	*
Heart girth	26.25±2.36	32.89±2.63	*
Wither height	17.75±2.63	20.54±0.93	NS
Hip height	17.75±1.89	20.54±1.24	*
Chest width	12.00±1.63	13.72±0.99	NS
Hip width	6.50±1.29	7.78±0.92	NS
Chest depth	9.25±0.50	12.47±1.35	*

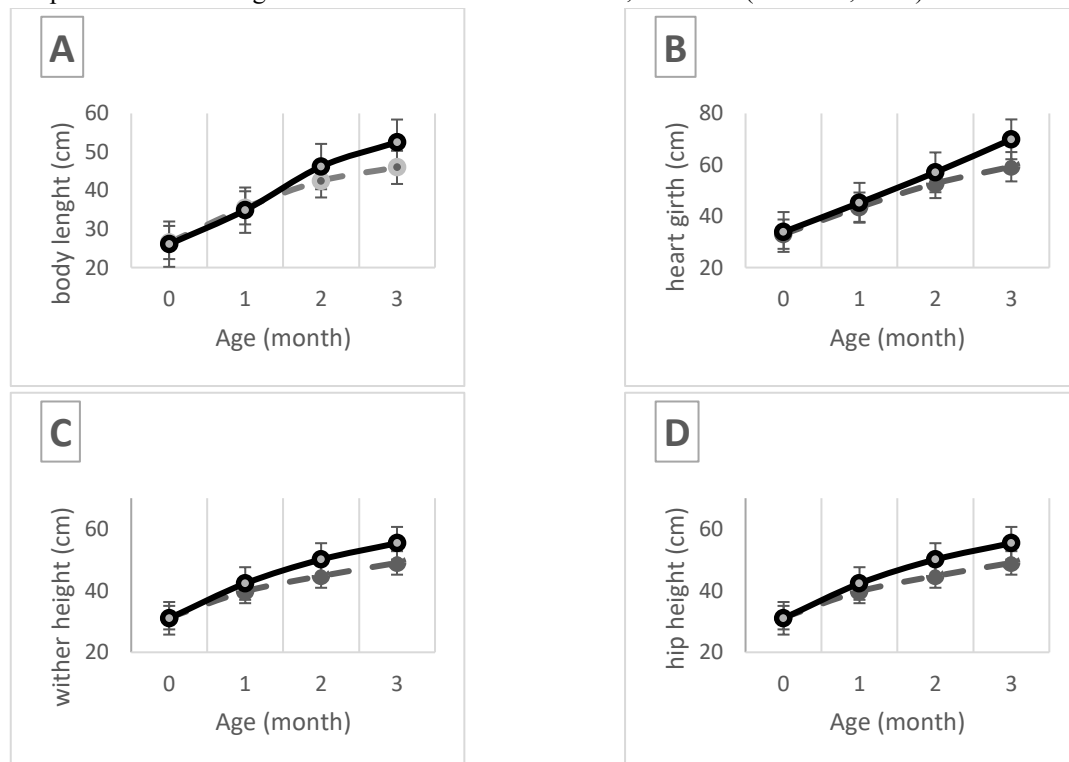
*P<0.05; NS: non-significant (P>0.05)

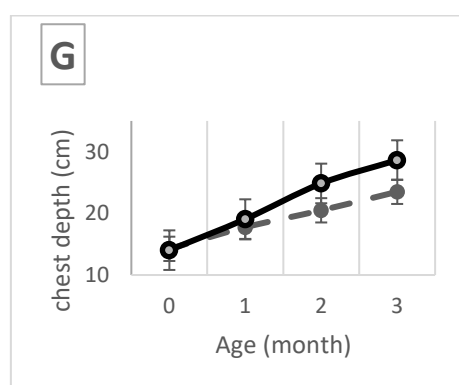
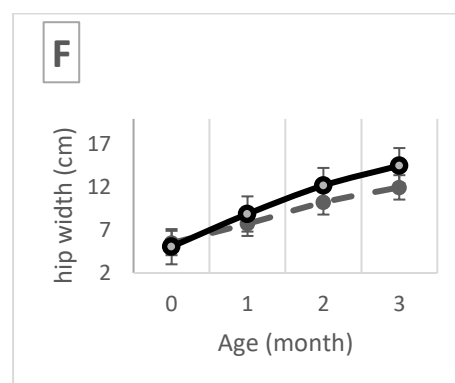
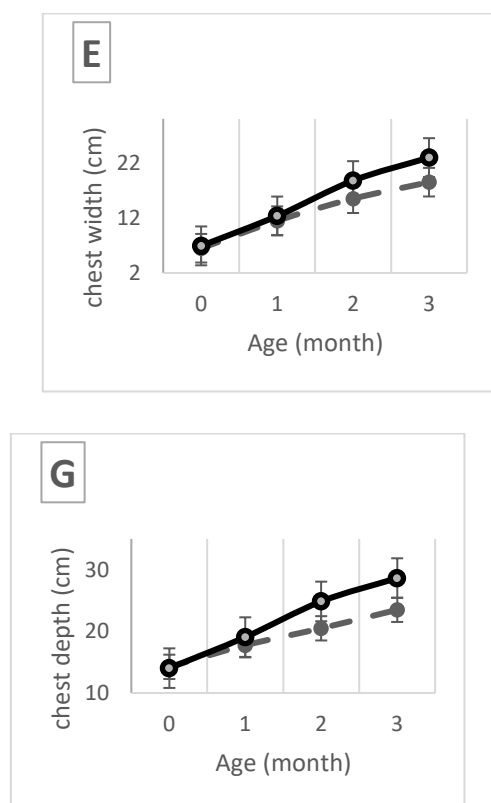
weaning (Urbano et al., 2017; Zhang et al., 2016). Therefore, improving nutrient supply through the implementation of creep feeding may support better growth in lambs.

The nutritional needs of pre-weaning lamb are sourced from milk, so creep feed would give other nutrient sources to meet their needs which affect the increase in weaning weight. Physiologically lamb is monogastric which still has an esophageal groove who conducts milk directly to the abomasum. However, the production of dam's milk will not always meet the needs of lamb during the pre-weaning period. Furthermore, at the end of the first week of life, lambs begin to eat solid feed which stimulates the development of micro-organisms in the rumen.

This improves feed efficiency in the next growth phase (Urbano et al., 2017).

Creep feeds have an impact on the growth of pre-weaning lambs reared on pastureland. Furthermore, the achievement of body weight at the age of 90 days illustrates the potential for livestock growth when getting better nutrition (Terblanche et al., 2012). This result is greater than the previous study which stated that the weaning weight of twin thin-tailed sheep in Sedan Village, Kab. Rembang was 9.65 ± 0.58 kg (Najmuddin & Nasich, 2019), the increase in body length, wither height, heart girth, chest width and chest depth of thin-tailed lamb per month was 4 cm in a row; 3.33 cm; 4.2 cm; 1.7 cm; and 2 cm (Jati et al., 2019).





GRAPH 1. Body length (A), heart girth (B), wither height (C), hip height (D), chest width (E), hip width (F), and chest depth (G) of pre-weaning lamb with non-creep feed (—●—) and creep feed (—●—)

CONCLUSIONS

It was concluded that creep feed increases pre-weaning growth (body length, hearth girth, hip height, and chest depth) of thin-tailed lamb from birth to 90 days old age.

ACKNOWLEDGEMENTS

The authors wish to acknowledge Universitas Gadjah Mada (UGM) for facilitating this research. The works are conducted under UGM funding, supported by the Peningkatan Kapasitas Peneliti Dosen Muda research grant.

REFERENCES

Adeleye, O. O., Guy, J. H., & Edwards, S. A. (2014). Exploratory Behaviour and Performance of Piglets Fed Novel Flavoured Creep in Two Housing Systems. *Animal Feed Science and Technology*, 191, 91–97.

<https://doi.org/10.1016/j.anifeedsci.2014.02.001>

- Agwa, H. M. M., Saleh, H. M., Abd El-Rhman, G. A., & Ayyat, M. S. (2016). Effect of Creep Feeding of Lambs And Plane of Nutrition of Ewes on the Productive Performance of Ewes During Suckling Period. *Zagazig Journal of Agricultural Research*, 43(2), 447–462. <https://doi.org/10.21608/zjar.2016.101531>
- Atta, M., Ali, A. S., Mohamed, M. B., Al-Dosari, H. M., & Al-Shamari, H. S. (2024). Prediction of body weight using body measurements in some sheep and goats in Qatar. *Journal of Applied Animal Research*, 52(1). <https://doi.org/10.1080/09712119.2023.2288917>
- Budisatria, I. G. S., Udo, H. M. J., Eilers, C. H. A. M., & Van Der Zijpp, A. J. (2007). Dynamics of small ruminant production: A case study of Central Java, Indonesia. *Outlook on Agriculture*, 36(2), 145–152. <https://doi.org/10.5367/000000007781159976>
- Jarmuji. (2011). Nilai Korelasi Antara Ukuran Tubuh dan Ambing Induk Domba Lokal Jonggol Terhadap Produksi Susu. *Agrinak*, 1(1), 52–55.
- Jati, R. P., Restitrisnani, V., Mawati, S., Lestari, C. M. S., & Purnomoadi, A. (2019, August). Pertumbuhan Domba Ekor Tipis Muda yang Diberi Pakan dengan Level dan Sumber Protein Berbeda. *Seminar Nasional UNS*.
- Maulana, H., Baliarti, E., & Astrini, A. L. (2021). Productivity of Different Local Sheep

- Breeds Fed by Water Spinach Straw. *Buletin Peternakan*, 45(1), 33. <https://doi.org/10.21059/buletinpeternak.v45i1.61764>
- Maulana, H., Baliarti, E., Astrini, A. L., & Pamungkas, A. P. (2021). Garut Sheep productivity in different initial body weight with feeding by water spinach straw at adaptation phase. *IOP Conference Series: Earth and Environmental Science*, 782(2). <https://doi.org/10.1088/1755-1315/782/2/022091>
- Najmuddin, M., & Nasich, M. (2019). Produktivitas Induk Domba Ekor Tipis di Desa Sedan Kecamatan Sedan Kabupaten Rembang. *TERNAK TROPIKA Journal of Tropical Animal Production*, 20(1), 76–83. <https://doi.org/10.21776/ub.jtapro.2019.02.0.01.10>
- Silva, C. J. A. da, Monteiro, A. L. G., Fernandes, S. R., Poli, C. H. E. C., Prado, O. R., & De Souza, D. F. (2012). Effect Of Creep Feeding and Creep Grazing on The Characteristics of Tifton and Italian Ryegrass Pastures and on Sheep Performance. *Ciência Animal Brasileira*, 13(2). <https://doi.org/10.5216/cab.v13i2.8812>
- Terblanche, S., Brand, T., Jordaan, J., & Van der Walt, J. (2012). Production Response of Lambs Receiving Creep Feed While Grazing Two Different Pastures. *South African Journal of Animal Science*, 42(5). <https://doi.org/10.4314/sajas.v42i5.19>
- Urbano, S. A., Ferreira, M. D. A., Rangel, A. H. D. N., De Lima Júnior, D. M., De Andrade, R. D. P. X., & Novaes, L. P. (2017). Lamb Feeding Strategies During the Pre-Weaning Period in Intensive Meat Production Systems. *Tropical and Subtropical Agroecosystems*, 20(1). <https://doi.org/10.56369/tsaes.2242>
- Zhang, N. F., Cha, J. M., Diao, Q. Y., Wang, S. Q., & Wang, H. C. (2016). Effect of Weaning Time on Growth Performance And Rumendevlopment of Hu Lambs. *Indian Journal of Animal Research*, (OF). <https://doi.org/10.18805/ijar.v0iOF.6822>