

**A COMPARISON OF THE CARCASS CHARACTERISTICS OF
THAI NATIVE (TN) AND ANGLO-NUBIAN X TN
MATURE DOES**

W. Pralomkarn, S. Saithanoo and J.T.B. Milton¹

**Department of Animal Science, Faculty of Natural Resources,
Prince of Songkla University,
Hat Yai 90110, Thailand**

**¹Resident advisor, Thai-Australian Prince of Songkla University
Project, Faculty of Natural Resources,
Prince of Songkla University,
Hat Yai 90110, Thailand**

ABSTRACT

This paper presents results from a study of the body and carcass composition of Thai native (TN) and 50% Anglo-Nubian (AN x TN) mature does. All goats were raised from birth at the university campus farm under controlled managements. The goats were culled due to low fertility and chosen to be of similar age (mean age 821 and 828 days for TN and AN x TN, respectively).

When compared at the same empty body weight (EBW), 50% AN goats had significantly higher ($P<0.05$) head and blood as a % of EBW, longer ($P<0.01$) bodies and cannon bones, but lower ($P<0.05$) kidney fat (%) than TN goats. There were no significant differences between the two genotypes in any other body components, linear measurements or dissected tissues.

INTRODUCTION

A crossbreeding scheme between Thai native (TN) and introduced Anglo-Nubian (AN) goats is in progress at the Prince of Songkla University (PSU), Thailand. However, there is little definitive information on the potential of Thai native and crossbred goats for increased meat production. Female goats in villages are culled for slaughter at the end of their breeding life (Saithanoo 1991) and information on their carcass characteristics would be valuable.

The present experiment was designed to compare body and carcass composition of TN and 50% AN mature does culled from the flock at PSU.

MATERIALS AND METHODS

Animals, Management and Slaughter Procedures

Six each of Thai native and 50% AN of mature does raised from birth at the

PSU campus farm were culled because of low fertility. The mean age with SE of the two genotypes at slaughter was 821 ± 3.0 and 828 ± 3.0 days with fasted live weight (FLW) of 33.4 ± 1.6 and 45.6 ± 1.6 kg for TN and 50% AN, respectively. The goat management and slaughter procedures have been reported by Milton *et al* (1987) and Pralomkarn *et al* (1990), respectively.

Statistical Analyses

Co-variance analysis in the Statistical Analysis Systems (SAS 1987) was used to analyze for differences between genotypes in carcass characteristics using empty body weight (EBW) as a covariable and for body measurements using fasted live weight (FLW) as a covariable.

RESULTS AND DISCUSSION

The Effect of Genotype on Linear Measurements and Body Components

Anglo-Nubian (50%) goats had significantly ($P < 0.05$) longer bodies (withers to tip of tail) and cannon bones (metacarpus) than TN goats, but there was no significant difference between the groups for heart-girth circumference or height at withers in the live animals (Table 1). Chawla and Nath (1979b) compared the body size and carcass traits of Beetal and Alpine x Beetal and Saanen x Beetal male goats at 9 months of age. They found that both breeds of crossbred goats had significantly longer body measurements than Beetal goats, but the differences between the two breeds of crossbred were not significant. This concurs with the results reported in this study, but the head weight of Thai native as a percentage of EBW was also significantly lower ($P < 0.05$) compared to 50% AN goats.

Dressing percentage (carcass weight as a percentage of live weight) is an important measurement to assess meat production in animals. Devendra and Burns (1983) reported that this measurement is affected by age, sex and plane of nutrition. Chawla and Nath (1979a) found that there were no significant differences in dressing percentage between Alpine x Beetal and Saanen x Beetal and Beetal goats. In the present study, TN and 50% AN goats did not differ significantly in their dressing percentage (58.1%, TN; 57.1%, 50% AN)

The Effect of Genotype on Dissected Carcass Fractions

There was no significant difference for bone, fat and connective tissue contents (%), muscle to bone ratio (MBR) and edible meat (muscle plus fat) to bone ratio between the two genotypes. However, TN goats had significantly higher ($P < 0.05$) proportion of kidney fat than the 50% AN goats (Table 2). Pralomkarn *et al* (1990) reported that the carcass of Thai native male goats raised at the PSU campus farm and with a mean fasted live weight of 15.1 kg and mean age 212 days contained only 8.4% fat. This is a marked contrast with the Thai native mature does in the present study with a fat content of 27.0%. These mature does had a higher proportion of kidney fat to total fat (0.38) compared with that of young Thai native male goats (0.14). MBR of goats in the present study is higher (5.0) compared with that of Thai native

male goats (3.8) with a fasted live weight of 15.1 kg reported by Pralomkarn et al (1990).

Pralomkarn et al (personal communication) compared the carcass traits among genotypes of male goats with a mean FLW of 21.2 kg and found that MBR for 75% AN and 50% AN goats was significantly ($P < 0.01$) lower compared with TN goats. There were no significant ($P > 0.05$) differences for MBR between 50% AN and 25% AN and between 25% AN and TN goats. The results suggest that Thai goats have desirable attributes as meat goats and care needs to be taken these characteristics are not lost in crossbreeding programme with introduced European breed goats.

Table 1 Mean values with SE (corrected for differences in empty body weight) for linear measurements, carcass weights and body components of Thai native and 50% Anglo-Nubian mature does

	Thai native		50% Anglo-Nubian	
	Mean	SE	Mean	SE
No. of goats	6		6	
Age (days)	821.0	3.0	828.5	3.0
Linear measurements (mm)*				
Girth	78.7	2.5	77.8	2.5
Height	65.7	2.8	62.7	2.8
Length*	59.7	1.1	65.1	1.1
Cannon bone length**	14.5	0.2	16.0	0.2
Empty body weight (kg)	29.6	1.3	39.7	1.3
Gut contents (%)	11.9	0.6	12.5	0.6
Hot carcass weight (kg)	20.3	0.2	19.8	0.2
Body components (%)				
Head*	6.2	0.2	7.5	0.2
Hide	9.2	0.3	8.9	0.3
Tail	0.16	0.02	0.24	0.02
Intestinal tract	5.9	0.3	6.0	0.3
Blood*	2.5	0.4	4.9	0.4
Feet	2.1	0.1	2.1	0.1
Liver	1.6	0.1	1.7	0.1
Lung + Trachea	0.81	0.16	0.82	0.16
Omental fat	11.1	0.6	8.3	0.6
Ovary	0.23	0.03	0.27	0.03
Udder	0.90	0.14	0.83	0.14
Spleen	0.16	0.01	0.19	0.01
Heart	0.33	0.02	0.43	0.02
Diaphragm	0.41	0.02	0.45	0.02
Kidneys	0.26	0.01	0.27	0.01
Dressing %	58.1	0.5	57.1	0.5

*Significance level $P < 0.05$; ** ($P < 0.01$)

*Corrected for differences in fasted live weight

Table 2 Mean values with SE (corrected for differences in empty body weight) for the muscle, bone, fat and connective tissue contents (%) of carcasses of mature Thai native and 50% Anglo-Nubian does

Carcass component	Thai native		50% Anglo-Nubian	
	Mean	SE	Mean	SE
% Muscle	57.2	1.9	63.6	1.9
% Connective tissue	4.6	0.5	3.4	0.5
% Bone	11.2	0.5	12.8	0.5
% Total fat	27.0	2.2	20.2	2.2
% Subcutaneous fat	0.75	0.19	0.65	0.19
% Intermuscular fat	15.2	2.0	12.5	2.0
% Pelvic fat	0.90	0.14	0.59	0.14
% Kidney fat*	10.2	0.7	6.5	0.7
Muscle : bone ratio	5.1	0.1	5.0	0.1
Edible meat : bone ratio	7.5	0.3	6.6	0.3

*Significance level $P < 0.05$

ACKNOWLEDGEMENTS

The authors wish to thank the graduate assistants of the PSU Goat Research and Development Unit for their assistance with this study. The study was undertaken as part of the Thai-Australian Prince of Songkla University Project; funded by The Australian International Development Assistance Bureau and the Thai government. Staff of the University of Queensland provided advice and training in slaughter techniques for the senior author.

REFERENCES

- Chawla, D.S. and Nath, I. (1979a). A note on the studies on meat production in goat: effect of castration on dressed meat production in Beetal and its exotic crosses. *Indian of Animal Sciences*, 49: 406-408.
- Chawla, D.S. and Nath, I. (1979b). A note on body size measurements and traits in Beetal and its exotic cross-bred males. *Indian Journal of Animal Sciences*, 49: 759-762.
- Devendra, C. and Burns, M. (1983). *Goats Production in the Tropics*. Agricultural Bureaux, Farnham Royal, U.K.
- Milton, J.T.B., Kochapakdee, S., Saithanoo, S., Pralomkarn, W., Rakswong, W. and Suttiyotin, P. (1987). Features of the goat research facility at the Prince of Songkla University. Proceedings of the 25th Annual Conferences on Animal Science held at Kasetsart University, Bangkok, Thailand, 3-5 February 1987, pp. 14-21.

- Pralomkarn, W., Kochapakdee, S., Milton, J.T.B., Pattie, W.A. and Norton, B.W. (1990). Carcass characteristics of Thai native male goats. Thai Journal of Agricultural Science, 23: 5-18.
- Pralomkarn, W., Norton, B.W., Milton, J.T.B. and Tinnimit, P. (personal communication). Growth, body composition and nutrient utilization by Thai native (TN) and Anglo-Nubian x TN male goats offered a concentrate diet.
- Saithanoo, S. (1991). Breeding Systems for Village Goat Production in Southern Thailand. PhD thesis, University of Queensland, Australia.
- SAS (1987). Generalised Linear Model Procedures (6th ed.). The Statistical Analysis Systems, SAS Institute Inc., Cary, North Carolina, U.S.A.