

MILK YIELDS OF INDONESIAN GOATS

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SUMMARY

Milk yields of Ettawah (ET), Kambing Bogor (KB) and F₁ (ET×KB) goats were measured under housed conditions at the Centre for Animal Research and Development, Ciawi, West Java. The mean yields of milk were 1.1, 1.2 and 1.1 (kg/hd/day) with lactation lengths of 34, 23 and 27 weeks, respectively.

The mean live weights were 65, 53 and 46 kg for the ET, KB and F₁ does, respectively, as a result of eating a standard diet of 15.3% CP, 5.8% F and 18.3% CF at the rate of 1.59, 1.42 and 1.18 kg DM/hd/day, respectively or 70, 74 and 70 g/kg LW^{0.75}/day.

Conversion efficiencies of feed to milk calculated on milk yield (kg/hd/day)/DMI (kg/hd/day) varied from 86% for the ET, 100% for the F₁ and 107% for the KB.

The choice of milk or meat production from goats within Indonesia should be decided on the basis of the type of food needed to improve the health of children.

INTRODUCTION

The goat is the most widely geographically spread of the domesticated farm animals (French 1970; Devendra and Nozama 1976). As a provider of human food (meat and milk) and clothing (fibre and hide) from plants, the goat is the most important animal for the survival of poor people, who constitute the majority of the human population of this earth.

Goat breeds of Indonesia have been described by Rumich (1967). Photographs of the three major breeds in West Java, the Ettawah (ET), Kambing Kacang (KK) and the ET×KK crossbred called the Kambing Bogor (KB) are in the survey report of Obst et al. (1980a). The KB are recognised primarily by a pendulous ear intermediate in length between the long pendulous ear of the ET and the short erect ear of the KK. The KB is genetically similar to the South African Improved Boer goat which also originated from the crossing of the ET (or Jamma Pari) and the KK. The small KK is recognised as a meat-type goat compared with the big ET which was considered a milking-type.

Reproductive performance of the ET and KB has been described (Obst et al. 1980b). Females were first joined at 6 months of age and any female not giving birth to offspring within an 8-month period were classified as infertile. The mean (±SD) age (days) at first parturition was 343±24 for the KB and 418±26 for the ET. With the mean number of parturition/year being over 1.8 for both the KB and ET, the percentage number of kids born/doe/year was 368 and 309 for the KB and ET, respectively. Some of the KB had four functional teats and successfully reared quadruplets to weaning at 3 months of age under the intensive management system at BPT-Ciawi.

With such a high reproductive performance it is recognised that the KB doe may require all of its milk to rear its kids. However, the practice of early weaning and/or prolonged lactation may enable milk to be available for human consumption. Obviously, it is a balance between meat and milk production, and the choice of each can be made by the man who owns and manages the goat. It is considered that this choice can be critical to the health and survival of children in many parts of Indonesia.

Potential milk yields from the existing strains of goats need to be recorded to help make this decision between milk and meat production. This paper

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describes the milk production of three strains of goats at BPT-Ciawi in West Java during 1980.

MATERIALS AND METHODS

The herds of goats established at Bogor and their management have been described by Obst et al. (1980b). Individual pregnant goats of mixed ages were selected from these base herds, housed in individual pens and fed a pelleted diet of 50/40/10 Pennisetum purpureum/Beef Kwik concentrate (Cargills, Bogor)/fish meal. This diet had a mean (\pm SD) content of 15.3 \pm 0.28% crude protein (CP), 5.8 \pm 0.21% fat (F), 18.3 \pm 3.4% crude fibre (CF), 1.2 \pm 0.05% Ca, 0.6 \pm 0.11% P and an energy value of 19.8 \pm 1.45 MJ/kg. Ad libitum daily feed intake (DMI kg/hd) was recorded and water was provided from nipple drinkers. Live weights (kg) were recorded weekly.

Following parturition the kids were suckled by the doe for 3 days before placement in a separate house where the kids were fed goat's milk from a bottle. From the fourth day after kidding the does were hand-milked at 0830 and 1500 h daily and the volume of milk recorded. Daily milking continued until less than about 300 ml/d was obtained or if the does suddenly stopped producing milk (2 does) or if bad mastitis developed (2 does).

Data for 16 does was analysed. Mean milk yields were analysed for the first 20 weeks of lactation and mean lactation periods determined. Duncan multiple range corrections were made to LSD values to determine the significance of differences between strains.

RESULTS

The KB does produced a mean of 3.2 compared with 1.8 kids/doe for each of the ET and F₁ does. The ET goats had the longest mean lactation period of 34 weeks, and the KB the shortest at 23 weeks ($P>0.05$) (Table 1). The mean daily milk yield over the first 20 weeks of lactation was 13% higher ($P>0.05$) for the KB than the ET. The KB maintained a higher milk yield than the F₁ goats for the first 12 weeks of lactation after which there was no difference (Figure 1).

TABLE 1 Length of lactation, milk yields and live weights of three goat breeds

Character	Breed of goat		
	Ettawah (ET)	Kambing Bogor (KB)	F ₁ (ET \times KB)
No. of does	5	6	5
No. of kids born	9	19	9
Age of does (teeth)	4-8	4-8	2-6
Length of lactation (weeks)			
Range	23-47	19-28	21-33
$\bar{x} \pm$ SD	34 \pm 9.7a	23 \pm 4.2a	27 \pm 5.5a
Data for first 20 weeks of lactation			
(i) Milk yield (kg/hd/d)			
$\bar{x} \pm$ SD	1.1 \pm 0.24a	1.2 \pm 0.26a	1.1 \pm 0.13a
(ii) Live weight (kg/hd)			
$\bar{x} \pm$ SD	65 \pm 1.4a	53 \pm 2.3b	46 \pm 2.2c

Values with different superscripts are significantly different ($P<0.05$)

A comparison of the efficiency of conversion of feed to milk (Table 2) early in lactation suggests that the KB goats were more efficient milk producers than the F₁, with the ET goats being of lowest efficiency. When efficiency is compared on a metabolic liveweight basis (LWT^{0.75}) instead of a per head basis the ranking of breeds is similar with an overall difference in efficiency of about 20% with the KB goats being the highest and the ET with the lowest efficiency. These

differences in efficiency of feed conversion to milk were not statistically significant ($P>0.05$), however, the mean value across strains of 96% indicates a high level of efficiency.

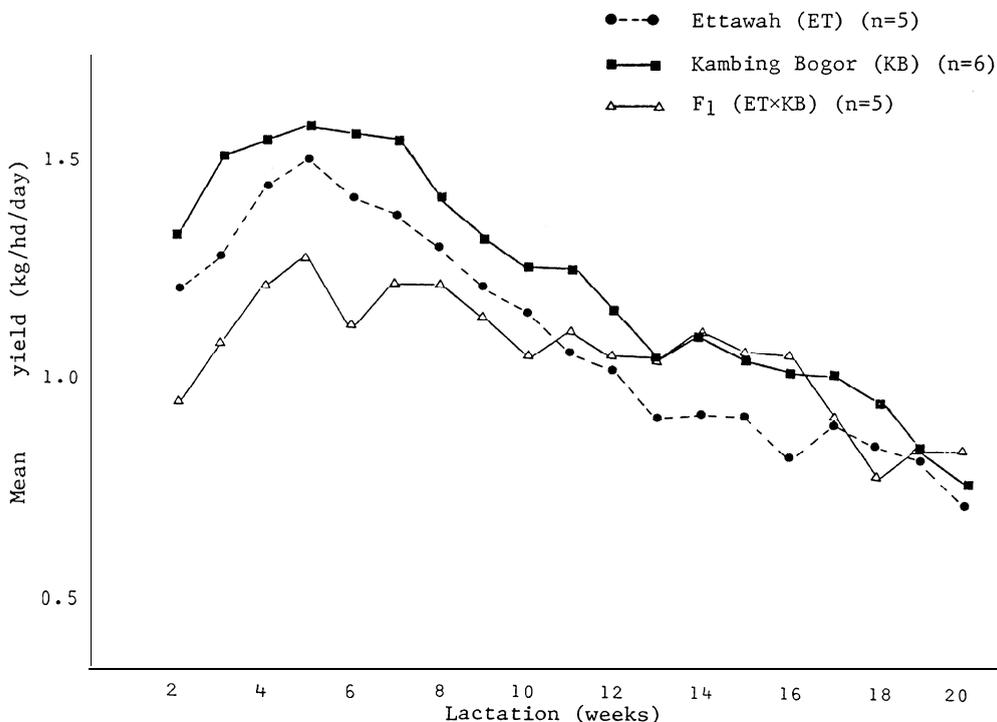


FIG. 1 Mean milk yields (kg/hd/d) for three breeds of goat in Indonesia

TABLE 2 Efficiency of conversion of feed to milk during weeks 2-5 of lactation

Breed	Live weight (kg)		Feed intake (DMI kg/hd/d)		Milk yield (kg/hd/d)		Efficiency of conversion (%)	
	\bar{x}	\pm SD	\bar{x}	\pm SD	\bar{x}	\pm SD	\bar{x}	\pm SD
Ettawah (ET)	64	0.4a	1.59	0.20a	1.36	0.14a	86	4 a
Kambing Bogor (KB)	51	0.8b	1.42	0.24a	1.50	0.12a	107	11 a
F ₁ (ET × KB)	43	1.2c	1.18	0.33b	1.14	0.14b	100	15 a

Values with different superscripts are significantly different ($P<0.05$)

DISCUSSION

In Europe a maximum milk yield of about 4 kg/hd/d was recorded from goats at about the 70th day of a 260'd lactation. Goat breeds in Switzerland produce an average milk yield of about 2.3 kg/hd/d over a 247 to 281 d lactation or about 600 kg/hd/lactation (French 1970). Lactation yields under Venezuelan and Indian conditions are reported to be from 200 to 300 kg (Shelton 1978); similar to those of the Indonesian goats reported in this study. The maximum milk yield of 2.2 kg/hd/d from some of the Indonesian goats early in lactation and the mean milk yield/lactation of 1.2 kg/hd/d (Table 1) by the KB is therefore only 50% of that of the European breeds (Saanen, Toggenburg etc.).

Observed variations in individual milk yields during the first 70 days of lactation of from 0.45 to 2.20 kg/hd/d amongst the Indonesian goats clearly indicate the probability of successful selection for higher average milk yield.

Goats in comparison with cows, buffalo and sheep have a higher efficiency of conversion of feed to milk; the difference being from 8 to 28% higher (Devendra 1975). Whilst the goat may have a higher biological efficiency for milk production than sheep, cows and buffalo the data of Dickerson (1978) indicates that of those animals which can utilise high roughage diets the rabbit is the most efficient meat producer. However, the potential for genetic change in sheep indicates that a large reduction in the feed energy required/kg edible meat protein could be made if reproductive rate was increased. The Indonesian goat already has a high reproductive performance and therefore their biological efficiency could be much closer than sheep to that of the rabbit. The decision on which species i.e. goat or rabbit would be of most benefit to the poor and hungry human population of this world is therefore also dependent upon whether milk or meat is required. If milk then the goat is probably the most biologically efficient and able to be managed by poor people.

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