

GROWTH PATTERN AND BLOOD PICTURE OF BEETAL AND BARBARI GOATS

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Summary

A comparative growth trial involving 12 Beetal and 12 Barbari kids was conducted for 120 days. The kids were allowed to suckle their dams and also offered ad libitum green fodder and concentrate at 2% of their liveweight. Beetal kids attained higher ($P < .01$) weight, consumed more ($P < .01$) milk, green fodder and concentrate, and utilized protein efficiently as compared to Barbari kids. However, variation due to sex was non-significant. Blood glucose, protein and cholesterol levels increased ($P < .01$) with increasing age irrespective of sex and breed.

(Key Words: Growth Pattern, Blood Picture, Goat)

Introduction

Goat and sheep provide good scope for enhancing the supply of meat vis-a-vis animal protein in Pakistan. Goat meat is preferred to sheep meat, and needs to be increased in quantity to cater for the requirements of the human population. The goat population in Pakistan is estimated to be 28.7 million and has shown an 84.0 percent increase during the period 1971-72 to 1983-84 (Anon., 1984). This increase is indicative of the successful adaptability of goats to varying environmental conditions and the preference of the people for goat meat. There are many breeds of goats in Pakistan, and each breed has its own specific attributes under different climatic conditions. Of the existing breeds of goats, Beetal and Barbari breeds are popular. Beetal goats are famous for milk and meat, whereas Barbari goats are well known for high prolificacy and meat production. Ishaq (1983) reported that body weight of Beetal and Barbari kids increased from 2.6 and 2.0 kg to 14.8 and 10.3 kg from birth to sixth month of age, respectively. In view of the individual characteristics and growing popularity of these two breeds, it has become necessary to study their growth pattern capabilities. A study was planned to see the effect of breed, age and sex

and growth, protein efficiency and blood components in Beetal and Barbari kids. Components of blood such as glucose, protein and cholesterol reflect the nutritional status, health and vigour of the animal.

Materials and Methods

Twelve kids (6 males and 6 females) of both the Beetal and Barbari breed, born within a span of 15 days, were randomly selected for the experiment. The kids were allowed to suckle their dams for the first seven days after birth. After seven days, suckling was limited to twice a day (morning and evening). The quantity of milk consumed by the kids was determined by weighing them before and after suckling. Ad libitum feeding of green fodder started at two weeks of age. To meet growing requirements, a concentrate mixture (table 1) was also offered individually to the kids from seven weeks onward at 2 percent of liveweight. Fresh and clean water was available at all times. The kids were weaned at the age of 90 days. Complete records were maintained of birth weights, daily milk intakes, green fodder and concentrate consumption, and weekly weight gains. Blood samples from the jugular vein of each animal were taken at the age of one, two, three and four months in the morning prior to feeding. Heparin was used as anticoagulant. The blood samples were centrifuged at 2500 revolutions per minute for 10 minutes to separate plasma which was analysed for glucose, protein and cholesterol by Kit method (E. Merck, Cat. No. 3335, 3327 and 3312, respectively).

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Representative samples of milk, green fodder and concentrate mixture were collected every month and analysed for protein, crude fibre,

TABLE 1. COMPOSITION OF CONCENTRATE MIXTURE (%)

Item	Ingredient composition ¹
Maize oil cake	10.0
Rapeseed cake	10.0
Maize gluten meal, 30%	5.0
Rice polishing	30.0
Wheat bran	17.0
Molasses (cane)	25.0
Bone meal	1.0
Common salt	1.0
Urea	1.0
	Nutrient density
Dry matter	86.6
Crude protein	16.0
Crude fibre	5.9
Calcium	0.7
Phosphorus	1.0
Total dig. nutrients(calculated) ²	74.6

¹Dry matter basis

²Harris et al., 1968.

calcium and phosphorus contents (AOAC., 1975). At the end of experiment, one male one female kid of each breed was randomly picked and slaughtered for the evaluation of dressing percentage. The effect of age, breed and sex on feed intake, weight gain, protein efficiency and blood components was determined by the analysis of variance (Steel and Torrie, 1980).

Results and Discussion

Data of feed intake, weight gain and protein efficiency is shown in table 2. Beetal kids consumed 21.8 percent more ($P < .01$) milk than Barbari kids (390 vs 320 g/head/d). Males consumed slightly more milk than females in each breed. Milk consumption of all kids was maximum in the fourth week. Early decline in milk consumption may be due to the low milk yield of their dams, who were not given extra allowance for milk production. Iqbal (1976), observed that the average milk consumption by Barbari kids was 35.1 kg up to weaning at seven weeks of age.

Green fodder intake was 35.6 percent higher ($P < .01$) in Beetal kids than Barbari kids (1044 vs 770 g/head/d) from three to seventeen weeks of age. Males consumed slightly more green fodder than females of the same breed. Green fodder intake by all kids increased linearly throughout the experimental period. Similar results were

TABLE 2. COMPARATIVE FEED INTAKE, WEIGHT GAIN AND PROTEIN EFFICIENCY OF BEETAL AND BARBARI KIDS

Variable	Breed			
	Beetal		Barbari	
	Male	Female	Male	Female
No. of kids	6	6	6	6
Days on experiment	120	120	120	120
Intake, g/d				
Milk	392.85 ^a ± 10.73	387.14 ^a ± 13.98	328.57 ^b ± 11.65	311.43 ^b ± 14.59
Fodder	1075.71 ^a ± 23.33	1011.42 ^b ± 20.47	777.14 ^c ± 19.83	762.86 ^d ± 10.93
Concentrate	238.75 ^a ± 18.26	232.85 ^a ± 17.19	161.42 ^b ± 7.29	154.28 ± 8.81
Protein	68.84 ^a ± 9.29	66.16 ^a ± 8.68	49.38 ^b ± 5.92	47.77 ^b ± 6.04
Weight gain, g/d	113.16 ^a ± 3.55	102.12 ^a ± 4.12	80.00 ^b ± 5.46	71.79 ^b ± 4.04
Protein efficiency ratio	1.64 ^a ± 0.021	1.54 ^b ± 0.009	1.62 ^a ± 0.013	1.50 ^b ± 0.02

Means in the same rows without a common superscript differ ($P < .01$)

Milk, fodder (Maize) and concentrate contained 12.87, 20.19 and 86.5% dry matter, respectively

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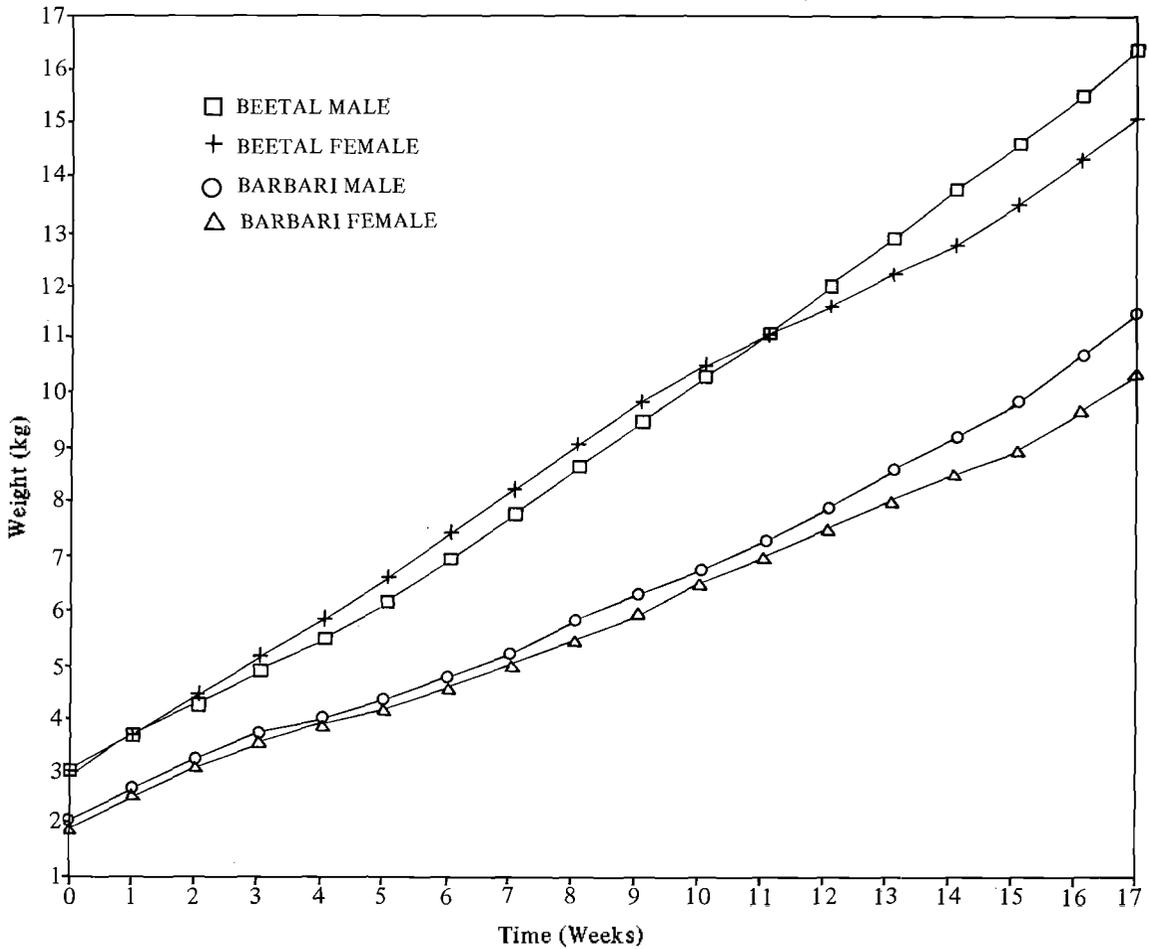


Figure 1. Growth curve of Beetal and Barbari kids

also reported by Iqbal (1976). Concentrates consumption by Beetal kids was 49.4 percent higher than Barbari kids (236 vs 158 g/head/d). Males consumed more concentrate than females in each breed.

Weight gain by Beetal and Barbari kids was 107.7 and 76.0 g/d, respectively (figure 1). This reflects 41.7 percent superiority of Beetal over Barbari kids. Male kids were heavier than female kids by 10.8 percent in the Beetal and 11.4 percent in the Barbari breed. Weight gain varied from 74 to 133 g/d and 41 to 125 g/d in the Beetal and Barbari breed, respectively. Maximum weight gain was observed at four weeks of age in both breeds. These results are in agreement with those reported by Iqbal (1976), who found that in Barbari males the average weekly weight gain per kid was 495 g from birth to four months of age.

Protein efficiency ratio (PER) as quantity of

protein required per unit of weight gain, was a little higher (1.64) in male than female (1.54) Beetal kids. This difference, though not very large, suggests that males used protein more efficiently than females. Similarly, Barbari males exhibited a better PER (1.62) than females (1.50). Overall PER was higher in Beetal than Barbari kids. Protein is the most expensive component of feedstuffs and the breed using it most efficiently should be the most economical if raised on a commercial basis. Raja (1973) and Iqbal (1976), reported PER as 1.60 and 1.82 in Lohi lambs and Barbari kids, respectively. Protein consumption by male and female Beetal and Barbari kids was 68.84, 66.16, 49.38 and 47.77 g/d, respectively.

Glucose, protein and cholesterol concentration in the blood of Beetal and Barbari kids at different ages is presented in table 3. Glucose content of blood in the two breeds gradually increased with

TABLE 3. COMPARATIVE GLUCOSE, PROTEIN AND CHOLESTEROL CONCENTRATION IN THE BLOOD OF BEETAL AND BARBARI KIDS

Variable	Breed			
	Beetal		Barbari	
	Male	Female	Male	Female
Month	Glucose, mg/100 ml			
1	42.33 ± 1.06	41.75 ± 0.90	42.92 ± 1.32	40.00 ± 1.02
2	44.88 ± 1.43	44.60 ± 1.23	45.33 ± 0.86	43.42 ± 0.79
3	48.67 ± 1.53	45.97 ± 1.52	46.08 ± 1.54	45.50 ± 1.43
4	47.90 ± 2.93	47.25 ± 1.83	47.78 ± 1.32	46.21 ± 0.92
Month	Protein, g/100 ml			
1	6.02 ± 0.40	6.00 ± 0.63	5.92 ± 0.53	5.53 ± 0.65
2	6.35 ± 0.09	6.46 ± 0.50	6.38 ± 0.46	6.31 ± 0.43
3	6.59 ± 0.53	6.57 ± 0.29	6.50 ± 0.37	6.46 ± 0.50
4	6.68 ± 0.70	6.70 ± 0.67	6.62 ± 0.43	6.60 ± 0.48
Month	Cholesterol, mg/100 ml			
1	103.67 ± 2.58	100.67 ± 2.93	100.92 ± 3.00	104.33 ± 2.54
2	131.00 ± 3.53	126.75 ± 4.20	121.83 ± 2.68	120.00 ± 2.73
3	152.00 ± 4.53	137.75 ± 5.00	132.67 ± 3.67	132.75 ± 3.96
4	155.75 ± 5.63	145.58 ± 5.72	139.42 ± 4.89	145.08 ± 4.73

age. In Beetal kids the blood glucose was 42.0 mg/100 ml in the first month and rose to 47.6 mg/100 ml in the fourth month, a 13.2 percent increase. Blood glucose level also increased (13.4 %) in Barbari kids from 41.5 mg/100 ml in the first month to 47.0 mg/100 ml in the fourth month. In both breeds, males had higher ($P < .01$) blood glucose concentration than females. The glucose results of present study are in agreement with those reported by Gill (1970) and Dukes (1970).

Blood protein was 6.0 and 5.7 g/100 ml and 6.7 and 6.6 g/100 ml in the first and fourth month, respectively in Beetal and Barbari kids. Differences in blood protein due to sex were non-significant but increased ($P < .01$) linearly from the first to fourth month in both breeds. Dukes (1970) and Nasim et al. (1981) reported similar blood protein values in goats.

Blood cholesterol level ranged from 102.2 to 150.7 mg/100 ml and 102.6 to 142.3 mg/100 ml in the first and fourth month of age, in Beetal and Barbari breeds, respectively. This increase in age was greater ($P < .01$) in Beetal (47.5%) than Barbari kids (38.6%). The increase in blood

cholesterol with age was reported by Gill (1970), and Nasim et al. (1981).

Dressing percentage of male and female Beetal and Barbari kids was 51.53 and 50.30 vs 55.30 and 53.14, respectively. The animals were slaughtered at a comparatively young age and the carcasses showed very little fat deposition or marbling.

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