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Certain blood biochemicals in crossbred (Beetal x Assam local) Female Goats Fed Different levels of dietary energy

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ABSTRACT

Certain blood constituents were estimated in twelve crossbred (Beetal x Assam local) female goats from weaning age (3 months) to 6 months, fed three levels of dietary energy. Energy levels had no significant effect on total serum protein, blood urea nitrogen, blood glucose, serum T_3 and T_4 values. However, values of blood glucose, T_3 and T_4 increased from low to high energy ration.

——x——x——x——

Besides increasing milk and meat production, one of the important aspect of crossbreeding local goat was to reduce the age of puberty / maturity to harvest the desired advantages. General health, growth and reproduction efficiency are usually considered as the guide lines for assessing the nutritional status of the animal. Optimum level of protein and energy in the ration not only helps in acceleration of growth rate, but also increase the reproductive efficiency in growing animal. Similarly thyroid activity is responsible to regulate body metabolic rate and is also necessary for normal reproductive function. A low plane of nutrition has been shown to be associated with delayed and irregular oestrus in ewes (Smith, 1962). Many workers held the view that the failure of reproduction in ewes under a low plane of nutrition may be due to reduced ovulatory rate, smaller sized ova and a decrease in fertilization rate. (Wallace, 1954; EL-Sheikh *et al.*, 1955, Sachdeva *et al.*, 1973). The study of blood composition has received great significance not only from nutrition but also from the point of reproduction. Therefore, the effect of different dietary energy levels on certain blood constituents of growing crossbred (Beetal x Assam local) female goats is studied and presented in this paper.

MATERIALS AND METHODS

Twelve female crossbred (Beetal x Assam local) goat, weaned at 3 month of age, were divided into 3 groups of 4 each in a randomised block design. At random one dietary treatment was alloted to each group.

Three isonitrogenous (15%CP) concentrate mixtures having different energy content viz. 65 (LE-Low Energy), 70 (ME-Medium Energy) and 75 per cent TDN (HE-High Energy) were compounded as shown in Table-1. Goats in different groups were offered their respective concentrate mixture and green chaffed oat fodder was fed **ad libitum.** Driking water was offered daily at 8.00, 12.00 and 16.00 hours to all the animals. Feeding trial was conducted for a period of 91 days.

Blood samples were collected from each animal just before the start of the experiment, however, during the feeding trial,

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blood samples from experimental animal of different groups were collected at fortnightly interval till the end of the experiment. Blood glucose, blood urea nitrogen and total serum protein were estimated as per the method described by Oscer (1965), Varley (1975) and Plummer (1971). T_3 and T_4 were assayed by using RIA kit supplied by BARC, Bombay as per protocol supplied with the kit. All samples were estimated in duplicate and were critically evaluated. The data so obtained were analysed statistically as per the standard methods of Snedecor and Cochran (1980).

RESULTS AND DISCUSSION

The average values of total serum protein, blood urea nitrogen, blood glucose, serum triiodothyronine (T_3) and thyroxine (T_4) in female crossbred goat of different groups were presented in table 2. No significant effect of different energy level have been observed on total serum protein and blood urea nitrogen values. The values observed were within normal range (Irfan, 1967, Pyne *et al.,* 1982). Although there was no significant difference among the energy levels, however, blood glucose values increased along with increased level of energy in the diet since the inclusion of maize grain increase from low energy to high energy ration. The higher level of blood glucose in high energy ration could be due to higher proportion of propionic acid production (MC Donald *et al.,* (1973).

Although no significant difference was observed in T_3 and T_4 values between different energy levels, however, level of T_3 and T_4 were increased along with increased age of the animal since crossbred goats (Beetal x Assam local) attained maturity at 9-10 months of age. the increase level of T_3 and T_4 with age might be due to increase gonadal activity (Ingbar and Woebar, 1974) and to increase BMS (Searcy, 1969) as the animals approached to puberty.

Based on the results of the present study it may be suggested that crossbred (Beetal x Assam local) female goats can be reared from weaning age on an optimum dietary energy level (75% TDN) to reach early maturity or puberty.

Table 1. Percentage composition of concentrate mixtures fed in different groups.

Ingredients	Groups		
	LE	ME	HE
Wheat bran	86	60	30
Crushed maize	—	25	52
Extracted groundnut cake	11	12	15
Mineral mixture	2	2	2
Common salt	1	1	1
Crude protein (%)	15.72	15.19	15.30
TDN (%)	65.86	70.25	75.05

Table 2. Average values of certain blood constituents in female crossbred (Beetal x Assam local) goats fed different levels of energy.

Blood Constituents	Energy levels	Initial (0 day)	Average of post feeding period
Total serum protein (g/100 ml of serum)	LE	5.47±0.25	5.38±0.16
	ME	5.35±0.59	5.32±0.34
	HE	5.22±0.10	5.47±0.19
Blood urea nitrogen (mg of urea/100 ml of Serum)	LE	26.70±4.38	35.48±1.09
	ME	22.38±2.89	36.75±0.51
	HE	24.69±2.53	36.10±1.25
Blood Glucose (mg glucose/100 ml of blood)	LE	66.77±7.30	66.30±3.20
	ME	64.32±2.04	70.32±4.04
	HE	67.93±4.89	74.36±0.71
Serum Triiodothyronine (T_3) (µg/ml pf serum)	LE	0.39±0.03	0.41±0.07
	ME	0.37±0.02	0.44±0.02
	HE	0.36±0.02	0.54±0.06
Serum Thyroxine (T_4) (ng/ml of serum)	LE	0.43±0.06	0.46±0.09
	ME	0.46±0.07	0.54±0.03
	HE	0.46±0.01	0.59±0.05

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