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AN EXPERIMENT ON TRANSAMINASE ACTIVITY IN RUMEN LIQUOR OF GOAT ON OPTIMUM DRY MATTER AND 9 PER CENT CRUDE PROTEIN DIET

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The transaminase activity in the rumen liquor of goat on optimum dry matter and 9% level of crude protein diet is discussed. A pre-experimental period of 15 days and a collection period of 7 days were followed. The average dry matter and crude protein consumptions were 605.1 and 48.11 g respectively. The average percentage of crude protein consumption on dry matter basis was 7.95 and the average dry matter and crude protein consumptions per kg of live weight were 27.01 and 2.14 respectively. The average transaminase activity in the rumen liquor of goat was 103.5 mg of pyruvic acid/ml of strained rumen liquor during the 10 min of incubation period. A still lower level of transaminase activity was observed with the present diet than 15% (355.7 mg), 13% (269.7 mg) and 11% (166 mg) % crude protein diet (Saha and Sadhu, 1971*a*, 1971*b* and 1972) and hence, it may be concluded that the transaminase activity decreased with the decreased amount of protein in the diet.

INTRODUCTION

Transaminase activity was determined in the rumen liquor of goat on diet of optimum dry matter and 9% crude protein. Hawk *et al.* (1951) revised the process of transamination. For determining GOT activity, Karman (1955) devised a spectrophotometric method. Sall *et al.* (1957) expressed the transaminase units. Cammarata and Cohen (1950), Feldman and Gunsalus (1950), and Meister & Tice (1950) and reported the scope of the transaminase reaction as broad and that virtually all the amino acids participate in enzymic transamination and in protein synthesis.

MATERIALS AND METHODS

Healthy male goats of approximately same age (2 years) and weight (22.4 kg) were selected for the experiment. The goats were kept under observation for several days before the actual selection, and the body weight, pulse rate, respiration rate and rectal temperature were recorded. An operation was performed to make a permanent rumen fistula. When the operated animal was normal the pre-experimental and the collection period started for 15 and 7 days respectively.

For computation of the diet, 454 g of 'Arahar Bhusi' was used as a concentrate along with 2 kg of green grass fodder. Generally, Morrison's (1959) method of standard was followed for feeding the goats. The animal was kept in a clean, dry and well

ventilated shed and a good nursing and management provided. regularly. The animals were fed at a particular hour of the day and fresh and sufficient drinking water was provided to them. The concentrate quota of the ration was weighed and offered to each animal daily at 9.30 AM in a galvanised iron trough separately assigned to them. The body weight of the animal was recorded both at the start and at the end of the experiment. The methods recommended by A.O.A.C. (1965) were generally followed for the analysis of feeds.

The sample of rumen liquor was collected 2 hours after the feeding of the concentrate quota. At each sampling time about 250 ml of rumen liquor was collected from different parts of the rumen. The samples were strained through a double layer of fine muslin cloth and immediately stored in a refrigerator. The methods of procedure, principle and calculations of Sall *et al.* (1957) were followed for the estimation of transaminase activity in the rumen liquor of goats. The activity of the enzyme was expressed as the amount of pyruvic acid (mcg) produced per ml of strained rumen liquor during the 10 min of incubation at 37°C (Blinco & Dye, 1958).

Results and Discussion

The percentage of dry matter in 'Arahar Bhusi' and green grass was 90 and 25 and the crude protein as 5.6 and 2.5 respectively. The percentage of crude protein on the total dry matter basis was 8.3. The average dry matter and crude protein consumptions were 605.1 and 48.11g respecitvely (Table I). The average live weight of goats was 22.4 kg and the average per kg live weight on dry matter and crude protein basis was 27.01 and 2.14 respectively. The average datum for the transaminase activity was 103.5 mcg (Table II). The results were statistically analysed. The analysis of variance data shows that the '*F*' value corresponding to days was significant at 5% level.

TABLE I

Dry matter and crude protein consumption data of the goat during the collection period

Days	Goat No.	Dry matter consumption (g) from Arahar bhusi	Green grass	Total	Crude protein consumption from Arahar bhusi	Green grass	Total	Average crude protein on dry matter basis (%)
7 days	1	329.5	269.6	599.1	20.50	26.96	47.46	
mean	2	328.8	275.0	603.8	20.46	27.50	47.96	
value	3	326.7	285.9	612.6	20.34	28.57	48.91	
Overall mean		328.3	276.8	605.1	20.43	27.68	48.11	7.95

TABLE II

Transaminase activity during the collection period (mcg of pyruvic acid/ml of strained rumen liquor)

Animal No.	1st	2nd	3rd	4th	5th	6th	7th day	Gross average
1	90	130	100	60	120	125	60	
2	125	100	115	100	140	100	70	103.5
3	85	145	85	65	115	150	95	

The transaminase units vary with the level of protein in the diet and hence the study of transaminase activity in the diet in rumen liquor helps in the study of the mechanism of nitrogen utilization.

The average data of the transaminase activity were 355.7, 269.7 and 166 mcg in 15, 13 and 11 % level of protein diet (Saha & Sadhu, 1971*a*, 1971*b* and 1972) respectively and in 9 % was 103.5 mcg (present study). It was observed that the value decreased with the decreased amount of protein in the diet. The high transaminase activity was observed with the higher level of protein diet presumably due to the presence of essential keto acid which might help in the process of transamination and protein synthesis in the rumen. The lower is the intake of protein the less is the transaminase activity probably due to the less turn over of amino groups with the lower intake of protein diet.

The data do not support any better economy of nitrogen utilization in rumen as the transminase activity decreases with the low protein intake.

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