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Providing animals with an adequate amount of protein is important for their growth, development and general health

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Abstract

Providing animals with an adequate amount of protein is crucial for their growth, development, and overall health. The feeding levels of goats reared in Bonli, Sawai Madhopur district, would depend on various factors such as the purpose of rearing (dairy or meat production), breed of goats, age, weight, and available feed resources. Protein plays a vital role in the body of animals, such as providing energy, supporting the production of meat, milk, and other products, repairing tissues, and supporting various physiological processes. The main sources of protein for animals include meat, fish, eggs, milk and dairy products, grains, legumes, feedstuffs, and specially formulated feed for animals. The protein (D.M., D.C.P. and T.D.N.) requirements for animals depend on various factors such as reproductive status, age, weight, performance level, and reproductive fitness. In summary, providing animals with an adequate amount of protein is essential for their health, development, performance, and livelihood. A balanced diet and the use of high-quality protein sources will help animals meet their nutritional needs according to their requirements, ensuring their overall development and well-being.

Keywords: D.M., D.C.P., goats, mineral supplements, T.D.N

Introduction

Goats consumes wide varieties of feeds and vegetation than either sheep or cattle. It has been shown that goats can distinguish between bitter, sweet, salty and sour taste and that goats have higher tolerance for bitter tastes than cattle. The rumen is not developed at birth, but young kids start picking hay or grass at 2-3 weeks of age and by 3-4 months rumen is fully functional. Unlike sheep, goats relish eating aromatic herbs in areas of space food supply and hence can penetrate deep into desert. It has been observed that when goats find opportunities to browse for about 8-9 hours a day, the goats can take care of their maintenance and slow rate of growth but if goats are to produce large quantities of milk or to grow quickly and to yield high quality meat, they must have additional leguminous fodders as well as concentrate feed.

The apparent digestibility of nutrients in goat is higher than cattle and buffaloes and lower than sheep. The apparent digestibility of various nutrients had found to as dry matter-59.7%, O.M.-64.0%, crude protein-66.4%, ether extract -71.2%, crude fibre-66.9%, and nitrogen-free-extract - 60.9% (Jang and Majumdar, 1962) [2]. Meat goats have a dry matter intake of 3-4% of their live weight, whereas dairy goats have a D.M. intake of 5-7% of their live - weight. The other factors which affect the D.M. consumptions are availability of feeds, palatability, moisture content and amount of fibrous material present in feed. Dry matter requirements as has been observed by I.C.A.R. for kids with 10, 15, 20, 25 and 30 kg body weight and growing at the rate of 50 g/day are 425, 600, 700, 800 and 950 gm per day respectively.

Variation in Dry matter intake: It is well known that the amount of dry matter consumed by the dairy animals is responsible for satisfying their appetite which in turn varied with the live - weight of the animal and the nature of its production (Sen and Ray, 1964). In other words, it means that any deficiency in the quantity of dry matter consumed by the animal will influence the production and health of the animals adversely. As such measurement of daily dry matter intake in goats is of utmost importance in a programmer aimed to work out the feeding practices of goats. The variation in daily dry matter intake of goats in association to number of goats per household are depicted through Table No. 4.3.

Material and Methods

The region has a sub - tropical climates with an average annual rainfall of 60 mm. Maximum temperature during summer may go up to 38 °C, while the minimum temperature may reach even below 5.5 °C during the month of January. To be more specific the survey covered the goat’s owners from the following five villages. (1. Sotoli, 2. Bonli, 3. Puneta, 4. Harsota and 5. Badagava sarwar). In each of the villages 8-10 goats’ owners were selected randomly for collecting necessary information. In all forty-nine households with varied land holdings and possessing goats were chosen for this very purpose. The work pertaining to collection of data and information of feeding of adult goats was carried out during the rainy season starting from June to July in 2020. In all forty - nine households with varied land holdings and possessing goats were chosen for this very purpose. Collection of data and preparation of research instrument.

Measurement of Girth and Length of goats for taking linear body measurement the animal was kept in standing position preferable in a Travis if available using a helper. Procedure recommended by Lush (1930) [3] were adopted for taking length and heart girth of the goats. All measurements were taken three times and the average of these three was taken as representing the requisite dimension. Determination of the Daily Quantity of Feeds Supplied to the goats for this observation at least three consecutive days were taken for each of the goat owned by the farmers, quantity of all feeds viz., roughages and concentrates supplied during the day were ascertained either by actual weighing using spring balance or other volumetric measures of known capacity which was determined previously on the basis of three day observations average quantities of feeds supplied to individual goat was estimated.

Estimation of daily milk yield for this observation for each goats in milk were taken by measuring the value of milk obtained animal wise at each milking for at least three days. Average of these was worked out to know the milk yields of each animal.

Estimation of live - weight of the goat

for this purpose the animal wise observations on the length and heart girth taken earlier were utilized. The live weight of the goat was estimated using the following formula:

$$W = \frac{L.G.^2}{300 \times 2.2}$$

Where,

W = Weight of the animal in kg.

L = Length of the animal in inches

G = Girth of the animal in inches.

More or less similar formula was used by Ahlawat *et al.* (1960) [1] earlier for estimating the weight of goats in seers. Results of the aforesaid formula were compared with those obtained by using the formula recommended by Manik *et al.* (1981) [5] in which no significant difference was found.

Estimation of daily nutrient intake For this purpose the average quantity of each of the feeds supplied daily to each animal was multiplied by the respective value of digestible crude protein (DCP), total digestible nutrients (TDN) and dry matter as given by Sen and Ray (1975). Variation in daily feed and nutrients consumption of goats It may not be worthy to repeat that total nutrient intake is an important factor in determining the overall performance of an animal. The data pertaining to variation in the intake of different nutrients viz., D.M., D.C.P. and T.D.N. in relation to number of goats possessed in the households are narrated through vide Table No.1,2 and 3 respectively.

Results and Discussion

Variation in Dry matter intake

The daily dry matter intake of goats during present study has to range from 1.17 to 2.49 kg with a concomitant average figure of 1.72 kg per goat. No significant variation due to change in size of goat’s herd per household was encountered with regard to average total dry matter intake and average D.M. supplied either through roughages or through concentrate parts of ration.

Table 1: DM intake of goats

Group	No. of households	Av. No. of adult goats	Av. Body weight (kg)	Average D.M. intake through (kg)					Ratio of D.M. through	
				Dry	Green	Total	Conc.	Total	Rough	Conc.
I(<5)	14	3.29	32.28	0.96 66.67@	0.47 33.33@	1.44 78.69@	0.391 21.31@	1.83	3.68	1.00
II(5-10)	28	7.64	27.67	0.90 65.22@	0.48 34.78@	1.38 82.14@	0.301 17.86@	1.68	4.58	1.00
III(>10)	7	13.00	33.59	0.90 62.50@	0.54 37.50@	1.44 84.71@	0.265 15.29@	1.70	5.43	1.00
Overall mean		7.16	29.84	0.92 64.80@	0.48 35.20@	1.40 81.40@	0.32 18.60@	1.72	4.38	1.00
F. Ratio		105.49**	2.97*	0.19	0.31	0.23	4.24*	0.88		

**Significant (p<0.01) *Significant (p<0.05)

The daily average dry matter intake either through roughages or concentrate tended to enhanced with decrease in size of goat herd per household. It is noteworthy that the percentage contribution of roughages and concendrate dry matter of the ration towards daily total average D.M. supply to goats was being worked out as 81.40 and 18.60 per cent respectively which quite fall within the accepted principles of feeding for profitable performance.

In sight into the data make it tangible clear that daily dry matter consumption by the surveyed goats either through

roughage or through concentrate get significantly influenced by the size of goats - groups holding per household (Table 4.3). The daily dry matter intake through roughages per goat per day tended to be decreased with increase in size of goat groups holding and was significantly higher in those groups which possessed less than 5 goats per households. Through the daily dry matter intake through concentrates portion of ration exhibited significant (p<0.05) irregular fluctuation due to change in size of goat number per household, which make it perceptible clear that besides these there are several other

factors which also impart significant influence on daily dry matter consumption of animals. Body weight and milk production potentials are one of them which also tended to exert significant influence on daily dry matter intake.

This could be borne out by the fact that daily dry matter intake of animals appeared to have a positive and significant relationship with their daily milk production capacity the respective correlation coefficient (r) worked out was +0.76 between daily total dry matter intake and daily milk production. However, no perceptible relationship has been exhibited between the daily dry matter intake of goat and their body weight ($r = 0.21$).

The daily dry matter intake through roughage or concentrate demonstrated a more or less similar trend and was apparently enhanced with increase in size of goat's groups holding. Though when daily dry matter intake through roughage partitioned into dry matter supplied either through green or dry roughage there was an appreciable variations existed between them and it was appeared that daily supply of dry matter through green roughage tended to increase with change in size of goats per household. The proportion of dry matter supplied through green fodder in I (<5 goats), II (5-10 goats) and III (> 10 goats) groups average as 33.33, 34.74 and 37.50 per cent of total roughage dry matter respectively and overall average for this was estimated as 35.20 per cent. In other words over 64.80 per cent of the daily roughage dry matter was supplied through dry roughage which is quite on line of the basic principle advocated for feeding animals for

profitable performance (Sen and Ray, 1964). Further the roughage parts of ration which consist mostly of wheat bhusa and other residues of crops after harvesting of grains was found to account for 78.69, 82.14 and 84.71 per cent of the total dry matter consumption of goats in I, II and III groups respectively. Obviously, the proportion of roughage dry matter to total dry matter consumption did not show any appreciable deviation with variation in size of goat's groups holding.

Variation in digestible protein intake

Average daily DCP intake of goats was found as 0.044 kg of which major portion came through concentrate (59.10%) Roughages contributed only 40.90 per cent of total DCP supplied to goats daily. A more or less parallel trend of results have been encountered with regard to daily DCP intake of goats surveyed either through roughage or concentrate moiety of ration and was appeared to exhibit insignificant influenced by the size of number of goats kept per household. Interestingly it has appeared that daily intake of D.C.P. of the goats tended to decreased with increase in size of goat's herd per household. As such in such a study, observations on protein consumption in goats cannot be ignored. Based on the observation of goats spread over forty - nine households, the average daily consumption of D.C.P. per goats was found to be 0.044 kg with a corresponding range of 0.024 to 0.068 kg of which 0.018 kg was contributed through roughages and the remaining 0.029 kg came through concentrate.

Table 2: DCP consumption pattern of goat

Group	No. of households	Av. No. of adult goats	Av. Body weight (kg)	Average D.C.P intake through (kg)				Ration of DCP between Rough and Conc.
				Roughage	Concentrate	Total	Rough	
I(<5)	14	3.29	32.28	0.016 31.37@	0.035 68.63@	0.051	1.0	3.50
II(5-10)	28	7.65	27.64	0.021 43.75@	0.027 56.25@	0.048	1.00	1.35
III(>10)	7	13.00	33.59	0.016 37.20@	0.029 62.80@	0.086	1.00 1.00	2.40 1.44
Overall mean		7.16	29.84	0.018 40.90	0.029 59.10	0.044		
F. Ratio		105.49**	2.97*	0.33NS	4.30*	2.49NS		

**Significant ($p < 0.01$) *Significant (< 0.05) NS=Non-significant

The results made so far with this regard revealed that contribution of roughages and concentrate towards daily DCP intake of goats tended to be decrease with increase in number of Igoats per household. This may probably be due to fact that goats are mainly husbanded by the landless labourer and the goat are exclusively maintained on grazing of pauster.

Variation in Daily Intake of Total Digestible Nutrients

It has been recognized that the value of the ration or feeds consumed by an animal is dependent on the proportion of present therein. That consideration of variation in intake of total digestible nutrients (TDN) will, therefore, of great practical significant needs no mention, keeping above fact in view the observations were also made with regard to computation of daily TDN intake of goats surveyed during the present investigation and as such the results are enumerated so far are narrated in Table 4.5. Based on the observations

pertaining to goats spread over forty - nine household in the experimental area, it has been estimated that the daily intake of TDN per goat ranged between 0.058 to 1.425 kg with average figure of 0.92 kg of which 0.68 and 0.24 kg were supplied through roughage and concentrate moiety of the ration respectively. The results indicate that much portion of total TDN came through roughages portion of the ration, it become more clear when contribution of roughages and concentrate to total TDN supply was expressed in terms of percentage. As such out of total TDN supplied daily to goats about 73.91 per cent was made available only through roughages and the remaining i.e. 26.09 per cent came through concentrate parts of the ration

Based on the results recorded during this investigation, it hasbeen estimated that daily intake of T.D.N. per goat ranged between 0.58 to 1.43 kg with an average figure of 0.92 kg of which 0.68 and 0.24 kg were supplied through roughage and concentrate moiely of the ration respectively.

Table 3: T.D.N. intake of goats in relation to size of goat herd per household

Group	No. of households	Av. No. of adult goats	Av. Body weight (kg)	Average D.M. intake through (kg)				
				Dry	Green	Total	Conc.	Total
I(<5)	14	3.29	32.28	0.43	0.26	0.69 69.70@	0.29 30.30@	0.99
II(5-10)	28	7.64	27.46	0.40	0.26	0.67 75.28@	0.22 24.72@	0.89
III(>10)	7	13.00	33.59	0.40	0.30	0.75 78.13@	0.19 21.87@	0.96
Overall mean				0.14	0.27	0.68 73.91@	0.24 26.09@	0.92
F. Ratio		105.49**	2.97*	0.19NS	0.29NS	0.93NS	4.28*	1.15NS

**Significant ($p<0.01$) *Significant ($p<0.05$) NS=Non-significant

The results further indicate that much portion of T.D.N. i.e. 73.91 per cent came through roughages portion of the ration. The contribution of concentrate towards daily supply of total T.D.N. was only 26.09 per cent. Again it has appeared the supply of TDN to the goat under reference did not differed significantly as the number of goats per households increased.

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