Majumdar. (1960) reported that Jamunapari bucks consumed 3.05 kg dry matter / 100 kg body weight on ration containing rape seed cake as sole concentrate and wheat bhoosa as sole roughage.

Brannon. (1966) observed that depending on the size, the goat could consume substantially more dry matter as compared to either cow or sheep. The dry matter intake was found to vary from 6.5 to 11.0 % of the body weight, the average being 5 to 7 %.


Devendra and Burna. (1970) noted average dry matter intake of 2.75 kg/100 kg body weight in kambing katjang goats of Malaysia.

Singh and Sengar. (1970) carried out studies on Barbari and Jamunapari goats by feeding nine different treatment combinations involving three levels (high, medium and low) of energy and protein. The average daily dry matter intake ranged from 2.03 to 2.82 and 1.86 to 2.65 kg/100 kg body weight in two breeds, respectively, depending upon the levels of nutrition. While digestibility of various nutrients varied considerably with regard to breed and treatment groups, but in general, it was found to be maximum in case of high energy-cum-low protein group. The values in respect of dry matter, crude protein, ether extract, crude fibre, nitrogen-free-extract and total carbohydrates were 62.63 and 75.12, 61.80 and 62.73, 54.43 and 55.22, 44.04 and 61.81, 72.38 and 83.89 and 65.38 and 79.52 %, respectively, for Barbari and Jamunapari goats. The minimum nitrogen intake (5.5 g in Barbari and 7.4 g in Jamunapari) in this group maintained them in a positive nitrogen balance.

Johri and Talapatra. (1971) reported that in Jamunapari kids kept under browsing and stall feeding, average daily dry matter intake was 3.70 and 3.52 kg/100 body weight during 3 to 12
months of age, respectively. They also noted that the kids grew at the rate of 39 g/day on both browsing and stall feeding conditions during this age.

Acharya, and Patanayak. (1974) reported the role of sheep in desert ecosystem and proofing through improved sheep-bred kids.


Gupta. (1976) reviewed the factors affecting digestibility of various nutrients. Some of the important factors suggested are increased feed intake, more crude fibre content of the diet, variation in plant species, animal species variation and increased frequency of feeding and association of poor quality fodder with high quality feed. He further observed that the deficiency of protein and mineral resulted in a marked reduction in digestive energy due to starvation of rumen micro flora.

Sato. (1977) observed individual differences in urinary phosphorus excretion in the 6 goats fed equal amount of concentrate mixture and cubed hay for 22 days. Urinary phosphorus excretion was less than 1.0 % in two goats, from 1.0 to 10.0 % in two goats and over 10.0 % in the other two goats.

Ali et al. (1979) maintained four groups of lambs weighing 15 kg in weight on diets having different roughage to concentrate ratio as roughage alone (T1), 75 : 25 (T2), 50 : 50 (T3) and 25:75 (T4). The digestibility coefficients of DM, CP, EE, CF, and NFE were found to be 41.2, 52.9, 51.9, 43.6 and 56.5 % in T1; 50.6, 53.8, 63.7, 54.0 and 63.2 % in T2; 56.6, 63.0, 73.7, 36.7, and 66.7 % in T3; 66.9, 63.0, 80.6, 27.0 and 78.8 % in T4 group, respectively.

Calhoun et al. (1979) fed five levels of monensin (0 to 33 mg/kg) to feeder lambs and found that feed intake decreased linearly but weight gain and feed efficiency showed quadratic response, increasing initially but then declining.
Das. (1979) reported average daily body weight gain of 36, 31 and 28 g in Jamunapari × Black Bengal, Barbari and Black Bengal breeds of goats, respectively, maintained on standard ration. The daily weight gain of Black Bengal and Jamunapari × Black Bengal goats fed individually between 3 to 6 months of age were 39.72 and 55.27 g, respectively. The growth rates of Beetal × Black Bengal crosses and Jamunapari × Black Bengal crosses were almost same in the same age groups (Anonymous, 1982).

Jindal et al. (1979) studied the effect of feeding three different levels of energy (100, 120 and 140 % of Morrison’s standard for sheep) in growing goats. The intake of DM and CP was maximum on 120 % level but their digestibility coefficients were highest on 140 % level. The digestibility coefficients of CP and EE increased significantly with increase in energy level of the diet. The intake of DE and ME also increased with the increase in energy level.

Mukherjee et al. (1979) reported average body weight gain of Grey and Brown Bengal goats of Bihar at 6 months of age as 11.5 and 11.6 kg, respectively.

Kumar and Mudgal. (1980) maintained four groups of dry non-pregnant Beetal goats on diets containing DCP and TDN in the ratio of 100 : 100 (T1), 100 : 130 (T2), 130 : 100 (T3) 130 : 130 (T4). The average DM intake (g/w kg\(^{0.75}\)) ranged from 42.57 in group T3 to 62.75 in group T4. There was no significant effect of dietary energy and protein levels on DM digestibility. CP digestibility was significantly (P < 0.05) decreased with the increase of energy level of the diet. EE digestibility increased significantly with the increase of protein level. However, there was no significant (P<0.05) effect of energy or protein on the digestibility of gross energy. They also reported average digestibility coefficients of gross energy as 58.97, 64.42, 64.17, and 62.62 % for four different protein and energy levels. The corresponding figures for the loss of energy through faeces were 41.03, 35.58, 37.83 and 38.38 %, respectively. The average percentage of energy loss through urine ranged from 1.59 for high Protein-high energy group to 2.04 for high protein-medium energy group and methane loss from 7.30 for medium protein-medium energy group to 7.66 medium protein-medium energy groups. The losses of energy through faeces, urine and methane were not affected significantly (P>0.05) by the level of dietary protein and energy in the ration.
Mairal. (1980) maintained three groups of Osmanabadi goats on diets containing 100 (T₁), 120 (T₂) and 80 % (T₃) DCP levels of NRC (1981) feeding standard for goats. The digestibility coefficient in the three groups was 69.97, 69.21 for DM and 69.17 %, CP 69.49, 69.36 and 66.11 % for CP, 61.88, 61.12 and 61.77 % for CF, 43.65, 42.15 for E.E and 44.05 ,79.39, 79.16 and 78.76 %, for NFE, respectively. He also reported the consumption of DM as 41.29, 39.67, 41.56; DCP 1.68, 1.71, 1.44 and TDN 47.11, 45.15, 47.69 kg per kg body weight gain in the goats, respectively. The average daily gain in body weight was 36.65, 29.04 and 21.9 g, respectively.

Rajvir et al. (1980) fed diet containing 100, 115 and 130 per cent of the TDN required for sheep according to Morrison’s standard to crossbred female goats of about 6 months age. The average daily intake of dry matter was found to be 708,725 and 765 g, respectively.

Ranjhan. (1980) reported that goats consume on an average 3.0 to 3.5 % dry matter of the live weight. However, with increase in an ambient temperature over 20°C the dry matter intakes are reduced. They eat more in cold weather, although intake is inhibited by extreme cold.

Sharma. (1980) reported the average daily dry matter intake as 64.96, 80.57 and 89.74 g/w kg 0.75 in three different groups of Beetal goat fed diet containing wheat straw and concentrate in the proportion of 60 : 20, 50 : 30 and 20 : 80, respectively.

Singh et al. (1981) fed two groups of Barbari kids with Lucerne hay to appetite alone or with 100 g barley grain daily for 52 days and conducted a metabolic trial. The DM intake was 3.76 and 4.45 % of body weight and 66.0 and 76.8 g/w kg 0.75/day for the two groups, respectively. The retention of N, Ca and P in respect of two groups was 2.68 and 1.69g; 1.59 and 2.47g; 0.51 and 0.61g, respectively.

Ellis. (1981) reported that sorghum Abu 70 contains 0.44 and 0.01% of calcium and phosphorus, respectively. Fodder beet exceeded fodder sorghum in calcium and phosphorus contents respectively. Milk produced in the first feeding trial was more than that in the second one.

Jaikishan et al. (1981) maintained three groups of cross bred adult male goats on diets containing three levels of energy (100, 73 and 140 per cent of standard for sheep) with same
level of protein. The retention of N, Ca and P were more on 140 per cent level than the other two levels. DM, CF and NFE digestibilities were depressed due to limiting energy intake on 73 % level.

**Haryanto et al. (1982)** reported that goats seem to prefer cassava leaves to sweet potato leaves. **Singh et al., (1983)** recorded balances of N, Ca and P in Barbari and Jamunapari goats as 1.58 and 2.57; 0.06 and 0.99 and 0.14 and 1.05 g/day on the ration having energy and protein level of Morrison’s feeding standard for sheep.

**Sreemannarayana and Mahapatro. (1982)** formulated three different concentrate mixtures as control (consisting of equal quantities of maize, GNC and wheat bran), concentrate with 35 % DCP requirement supplied by urea molasses at 1:10 T1 and concentrate containing GN cake heated at 150˚C for one hour in an oven T2. The digestibility coefficients of DM, CP, cellulose, ADF and total carbohydrates did not differ significantly. The balances of nitrogen and energy also did not differ significantly.

**Singh et al. (1983)** reported the daily weight gain in Barbari and Jamunapari goat on different plane of nutrition and on different age. During 20 months of period the daily weight gain of does were 22.47, 23.04 and 19.37g for Barbari and 17.05, 12.01and 10.98 for Jamunapari fed on 125:125, 100:125 and 100:100 DCP-TDN levels of Morrison’s feeding standard for sheep.

**Thomas and Prasad. (1983)** studied the replacement of maize partially or completely with tamarind seed in Large White Yorkshire. Diets with maize partially or completely replaced with 20 % tamarind seed and % molasses or 30 % tamarind seed and 10 % molasses with similar amongst the various economic rations. It was concluded that replacing maize partly or completely with 20 % and 30 % tamarind seed was equally good.

**Tyagi and Jaikishan. (1983)** reported that in goat the rate of N absorption varied from 69.45 to 79.58 %, increasing with higher intake. Urinary N excretion varied from 43.5 to 57.8 % of the intake. In absolute terms, the urinary N excretion decreased with decreasing N intake. The N retention was positive and 23.11, 23.67, 27.13, 15.46 and 11.53 % of N intake in five groups
kept on different concentrate mixtures and wheat straw to prove 100, 120, 84, 61 and 46 % of DCP requirement (NRC standard), respectively. Beetal × Black Bengal and Black Bengal consumed 7.01 and 6.23 kg DM per kg body weight gain under intensive system of rearing, whereas, under semi-intensive system the values were 3.51 and 8.55 kg, respectively.

**Prasad. (1985)** reported certain blood values of day old kids of either sex as hemoglobin 11.69 per cent, total erythrocytes 13.2 million/cu mm blood and total serum protein 5.1g.

**Upadhyay and Rao. (1985)** reported normal values of some of the hematological and biochemical constituents of blood in goats aged one year were as RBC 13.51±2.86 million/cumm blood, WBC 18.40±3.51 thousand/cumm blood, haemoglobin 9.48±1.68 g/100 ml blood, PCV 31.38±3.67 %, total serum protein 7.72±6.93 per cent, serum calcium 9.87±1.87 mg % and serum organic phosphorus 6.91±1.18 mg %.

**Reddy et al. (1986)** studied the effect of replacing maize (D-1) with 30 % tamarind seed and 10 % molasses (D-2) or 22.5 % rice polish and 10 % molasses (D-3) on the performance, characteristics and nutrient utilization of desi pigs from 24 kg to 60 kg of weight. Daily feed intake in D-1, D-2 and D-3 were 1421, 1563 and 1709 g, respectively. Daily gains in three groups were 282, 261 and 250 g, respectively. Feed gain ratio was 5.18, 6.01 and 6.89 in three groups, respectively, which differed non-significantly.

**Bhadauria et al. (1988)** reported the effect of feeding kodo in the ration of growing indigenous pigs. Weaned at 8th week of age and weighing 5-6 kg. Pigs were given maize based diets with 0, 50 or 100 % (w/w) of maize replaced by kodo millet until 32 weeks of old and showing 50 kg live weight. They observed no significant growth, feed intake, or feed conversion efficiency ratio between various groups.

**Chatterjee and Das. (1989)** reported the fodder beet tops and roots are succulent, palatable and easily digestible and liked by most livestock.
NRC. (1993) reported that fodder beet root contains slightly less carbohydrates (as nitrogen free extract), crude protein, and fat than yellow corn. On the other hand fodder beet roots contain much more sugar (150-200 g kg sucrose), total ash and crude fiber than yellow corn. Therefore, fodder beet could prove to be a suitable alternative to cereal grains.

Helal et al. (1998) reported in Egypt, the TDN and DCP (Digestible Crude Protein) values of fodder beet roots were higher than those of Berseem hay or Sugar Beet Pulp.

DAF.(1998) studied dry matter production of fodder beet when grown under suitable conditions, can produce almost 21 ton dry matter h⁻¹ compared with 13-15 ton DM from four harvests of grass. They also reported that approximately 75% of fodder beet DM is present in the roots.

Gabra and Gad. (1999) studied the effect of fodder beet as an unconventional new forage, especially for the summer season when animal are under-fed.

Collomb et al. (2004) recorded the effect of hay and fodder beets are common components of the basal diets for dairy cows during winter.

EL- Sarag. (2004) reported the fodder beet is an important winter forage crop. It is tolerant to high soil salinity and somewhat low water requirement. It’s total yield, above and under the ground, can directly be used in animal feeding or may be processed as silage. The roots can also be stored in the soil for the period of time without being greatly damaged, thus used when needed. Therefore, cultivation may be help in overcoming the problem of animal feeding shortage in the summer season.

Eriksson et al. (2004) reported that neither fat nor lactose concentrations were altered by diet of fodder beet or barley in lactating Swedish red and white dairy cows.

Mahto et al. (2004) studied the utilization of tamarind seed in pig grower ration and the control group was fed standard diets containing 60 per cent maize. In experimental groups maize was replaced with tamarind seed either at 50 per cent (T₂) or 100 per cent (T₃) on w/w basis. The
daily DM intake varied but differences were non-significant. The digestibility co-efficient of DM, EE, NFE and organic matter between groups were also similar. The digestibility co-efficient of crude protein was significantly low in group T3. However, the digestibility of crude fiber significantly improved in group T3 group. Balances of N, P and Ca were positive in all the three groups and differences were found to be non-significant.

**Das. (2008)** studied the effect of different levels of concentrate supplementation on growth performance of Sikkim local kids fed mixed jungle grass based diet. Twelve Sikkim local male kids (3–6 months of age) of 10.29±0.70 kg body weight were divided into three groups of 4 each in an experiment based on randomized block design. Mixed jungle grass (winter season, Dec-Feb) was offered *ad libitum* to all the animals. Besides, all the kids received about 500g of fresh Nevaro (*Ficus hookerii*) leaves. Concentrate was supplemented @ 0.5, 1.0 and 1.5% of body weight, in groups I, II and III, respectively. The trial was conducted for 90 days during which weekly change in body weight and feed intake was recorded. All the kids consumed all the nevaro leaves and consumption of jungle grass was not affected by different level of concentrate supplementation. As a result, total dry matter intake (DMI) increased significantly (P<0.05) with increased level of concentrate supplementation. Digestibility of dry matter (DM) and organic matter (OM) was significantly (P<0.05) higher in groups II and III in comparison to group I. The combined effect of increased intake and digestibility of CP and OM resulted in higher (P<0.01) digestible crude protein (DCP) intake, N balance, and significant (P<0.05) increase in digestible organic matter (DOM) intake in groups II and III in comparison to group I. Average daily gain (ADG) was 24.40, 42.55 and 51.40 g/day in groups I, II and III, respectively. ADG was significantly (P<0.01) higher in group III as compared to other groups. Hence, it was concluded that maximum growth rate during winter season can be obtained in Sikkim local kids fed mixed jungle grass based diet when concentrate is supplemented @1.5% of their body weight.

**Patil et al. (2008)** recorded the data of twenty four Osmanabadi weaned kids of similar age and body weights were randomly allotted to six housing patterns *viz.*, T0: Floor murum with no ventilator + thatch roof (control), T1: Floor murum with no ventilation + tin roof, T2: Floor murum with one ventilator + thatch roof, T3: floor murum with one ventilator + tin roof, T4: floor murum with two ventilators + thatch roof and T5: Floor murum with two ventilators + tin roof.
All the kids were maintained on the common feeding regime of available roughages and homemade concentrate mixture. The observations on body weight gains showed significant (P<0.01) differences among the treatments means. The kids kept under T₂ (12.30 kg) and T₄ (12.42 kg) showed superior growth to those under other treatments. Providing ventilation proved significantly superior (P<0.01) for body weight gains as compared with no floor ventilation. However, no significant gains in live weight could be recorded by providing either one or two floor ventilators. Provision of various roofs to the shed resulted in significant differences among the mean values of body weight gains. Covering the roof with a thatching materials proved beneficial and resulted significantly (P<0.01) higher body weight gains over to tin roofing. The cost of one kg gain in body weight was highest (Rs.9.41) in T₁ (tin roof with no ventilator) whereas lowest (Rs. 7.80) in T₂ (thatch roof with two ventilators). It is concluded that thatch roofed house with floor ventilation is economical for the better comfort and growth of the kids.

Tanwar et al. (2008) Conducted study on 120 goat keepers randomly selected from two tribal tehsils i.e. Mavli and Jhadol of Udaipur District of Rajasthan. The socio- economic profile of the selected respondents was that majority of the respondents belonged to 31–50 years of age group, schedule tribe, illiterate, medium size family and having small land holding. Goats were housed near dwelling, loose housing as well as open yard/under trees was common housing practices adopted by respondents. All categories of goats viz; Male, Female and Kids were housed together. Floors of the shed were dusty, no provision was made in the shed for drinking water. Animals got contaminated water from village pond, when they were out for grazing. Placenta was disposed of either by throwing near the village premises or by burying in the soil. Carcass of dead animals was left to decay automatically out side the village. Knuckling method of milking was prevalent. Precautions like washing hands, washing udder and washing charry (Brass pot) with plain water were adopted by the respondents. Milk was utilized for household purpose and charry (brass pot) were used as milk collection utensil.

Devi et al. (2009) conducted an experiment on effect of different processed soybean meal as a source of animal protein on feed conversion efficiency and economics of pig farming. The present study was carried out on 215 crossbred piglets belonging to 30 sows maintained at Pig Breeding Farm of Ranchi Veterinary College, Birsa Agricultural University, Ranchi (Jharkhand).
They were randomly divided into 5 groups having 6 sows in each and allotted to 5 treatment groups. T₁ was control diet where fish meal of T₁ was replaced by 50 and 100% heat treated soybean meal in T₂ and T₄ diets, respectively. Similarly, fish meal of T₁ was replaced by 50 and 100% raw soybean meal in T₃ and T₅ diets, respectively. The cost of feed per kg gain in live weight over an experimental period of 32 weeks of age were 32.94, 30.11, 29.17, 28.19 and 30.00, respectively. The most economic ration was T₄ (100% replacement of fish meal by roasted soybean meal) followed by T₃, T₅, T₂ and T₁ groups. It is inferred that toasting of soybean had a positive effect in eliminating the ant nutritional factors of raw soybean. Hence, roasted soybean can be incorporated at 8% levels as a substitute for fish meal in a composite pig diets (w/w) without having any adverse effects on the performance of starter, grower and finisher pigs.

Katongole et al. (2009) recorded performances of kids (less than 15 g daily weight gain) when sweet potato vines are used to supplement a diet of Napier grass (Pennisetum purpureum), maize bran and Leucaena leucocephala leaves. Higher animal performances (44 to 82 g daily weight gain) are obtained when sweet potato vines supplement a cottonseed cake and maize bran mixture at 1:4 ratio.

Kebede et al. (2011) studied the performances of cassava leaf meal and sweet potato vines in goats and found better results in DM intake and animal performances have been yielded when goats could get accustomed to sweet potato vines.

Singh and Garg. (2012) conducted experiment on possible use of fodder beet in feed mixture, particularly in the scarcity period. The fodder beet crop was found to be highly nutritious to the animals. Sugar beet hybrids such as cauvery, calixtra, Mangnolia, PAC 60008, and ‘SZ 35’ and fodder beet hybrids Monro, Spendide, Jauna, and J.K.Kuber may be cultivated for fodder purpose in the country.