



RESEARCH ARTICLE.....

Effect of different concentrates on growth performance of crossbred calves

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ABSTRACT..... The present study on effect of different concentrates on growth performance of crossbred calves was conducted for period of 90 day. Fifteen crossbred calves were divided into three groups on the basis of nearness to the age and body weight. Three feeding treatment were studies namely T₁ Dry fodder (Soybean straw) + Green fodder (Hybrid napier) + Readymade concentrate (Sugras) mixture, T₂ Dry fodder (Soybean straw) + Green fodder (Hybrid napier) and Homemade concentrate-I mixture and T₃ Dry fodder (Soybean straw) + Green fodder (Hybrid Napier) + Homemade concentrate-II, dry fodder, green fodder and concentrate quantities was calculated as per feeding standard and provided to the crossbred calves in all treatments. Daily DMI differed significantly between the treatments. The calves from T₂ groups need more DM than that of T₃, and T₁ groups. The average daily intake was 2.32, 2.59 and 2.47 kg/day/calves in T₁, T₂ and T₃ groups, respectively. Higher intake of DM per 100 kg body weight was noticed in treatment T₂ and lowest in T₁ and T₃. All the crossbred calves exhibited satisfactory growth rate 324 to 456 (g) per day and differences were significant. The per kg of body weight gain was higher in T₂ (0.456 g.) followed by T₃ (0.431 g.) and T₁ (0.324 g.) treatments.

KEY WORDS..... Readymade concentrate, Homemade concentrate, Crossbred calves, Dry matter, Body weight

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INTRODUCTION.....

India is endowed with largest livestock population in the world. It accounts for 57 per cent of the world buffalo population and 15 per cent cattle population. According to livestock census (2012). Country has about 275.9 million cattle and 165.3 million buffalos and livestock population is 512.1 million. (NDDDB Report 2012). Feeding is important aspect in rearing of these

animals as part of nutrition for their various physiological growths. But due to some constraints on voluntary intake of feed it is well known fact the growing animal is unable to meet out the nutrients for metabolic and physiological development which causes underfeeding of animals. This under feeding cannot be corrected by overfeeding in peak growth period of animal. Crossbred calves grow faster as compare to indigenous. There is continuous growth

Ingredient T ₁	Per cent	Ingredient T ₂	Per cent	Ingredient T ₃	Per cent
Sugras	100	Maize	30	Sorghum	40
		G.N.C.	20	C.S.C.	20
		Wheat bran	28	Wheat bran	18
		Tur chuni	20	Tur chuni	20
		Minerals mixture	1	Minerals mixture	1
		Common salt	1	Common salt	1
Total	100		100		100

of calves from birth to young stage. Concentrate feeding plays an important role in growth, age at maturity, first conception, first calving in heifers. Low productivity of animals is accounted with underfeeding, lack of quality feed and poor management practice this adverse nutritional conditions lead ultimately to stunted growth.

Balanced feeding is another necessity, it has been observed that animal in certain region are suffering from various mineral disease. These are instances, where animal do not grow and perform well even after feeding the adequately due to nutritional imbalance. Therefore, it is beneficial to analyze available feed and fodder and prepare a feed schedule, balancing the entire beneficial nutrient. Effort in planned feeding of the animals will not only enhance the production and profit but also reduce feed shortage.

RESEARCH METHODS.....

The present investigation on effect of different concentrates on growth performance of crossbred calves was undertaken at Livestock Instructional Farm, of Department of Animal Husbandry and Dairy Science, Dr. Panjabrao Deshmukh Krishi Vidyapeeth, Akola during the year 2016-2017, for a period of 90 days (10 October to 10 January). The material used and methods employed for this investigation is presented in the following pages under appropriate heads. Fifteen

crossbred calves were selected and divided into 3 groups on the basis of nearness to the age and body weight. As per treatments requirement homemade concentrate-I and II was prepared by using various ingredients and quantities as shown in Table A.

RESEARCH FINDINGS AND ANALYSIS.....

It is essential to include quality feeds in the ration of animals for maintaining their production and productivity. The term quality implies to feed physical texture and chemical composition which has direct impact on its palatability and in turn supply of nutrient to animal body. Therefore, chemical composition is one of the most important indexes of nutritive value of feed. With this view the feed stuffs were analyzed for proximate principles and the data were established in Table 1.

From the Table 1 it was observed that the readymade concentrate, homemade concentrate-I, homemade concentrate-II, Soybean straw and green fodder contains 90.80, 90.96, 90.12, 90.51, 24.16 DM, respectively. The homemade concentrate-I containing 19.28, 10.64, 4.05, 60.19, 5.84 per cent, CP, CF, EE, NFE, and total ash, respectively. Homemade concentrate-II contains 17.94, 12.24, 3.98, 60.49, 5.35 per cent CP, CF, EE, NFE and total ash, respectively among these NFE content was lower than readymade concentrate but CP, CF, EE and total ash was having higher percentage than

Particulars	Readymade concentrate (Sugras)	Homemade concentrate- I	Homemade concentrate - II	Soybean straw	Green hybrid napier
DM	90.80	90.96	90.12	90.51	24.16
CP	17.63	19.28	17.94	6.81	7.5
CF	11.68	10.64	12.24	38.32	35.76
EE	2.72	4.05	3.98	1.65	2.40
NFE	64.08	60.19	60.49	41.36	44.18
Total ash	3.89	5.84	5.35	11.86	10.16

that of readymade concentrate. Concentrate mixture but lower CP, CF, EE and total ash content *i.e.* 17.63, 11.68, 2.72, 3.89, respectively. Soybean straw contained 6.81, 38.32, 1.65, 41.36 and 11.86 per cent CP, CF, EE, NFE and total ash, respectively. Green fodder contained 7.5, 35.76, 2.40, 44.18 and readymade concentrate was having higher NFE (64.08%) than other 10.16 per cent CP, CF, EE, NFE and total ash, respectively.

Adangale *et al.* (2009) studied the chemical composition of concentrate DM, CP, CF, EE, NEF and ash as 90.18, 19.17, 10.46, 3.42, 51.55 and 5.58 per cent, respectively and the chemical composition of *Jowar* straw and soybean straw used. Was DM, CP, CF, EE, NEF and ash as 90.82, 90.74, 2.72, 6.68, 35.04, 41.70, 2.42, 1.51, 38.96, 28.03 and 12.26, 11.68 per cent, respectively.

Pachauri *et al.* (2010) reared the female crossbred heifer on wheat straw and concentrate mixture (conventional system, T₁), wheat straw based total mixed ration (WSTMR, T₂) and urea ammoniated wheat straw bases mixed ration (AWSTMR, T₃). The composition of different rations indicated that they were nutritionally sufficient for the feeding of growing crossbred heifer. The chemical composition of rations on DM basis was 11.46, 12.38 and 14.18 per cent CP, 22.78, 21.25 and 20.78 per cent CF with 87.79, 87.70 and 87.42 per cent DM for T₁, T₂ and T₃ rations, respectively.

Daily dry matter intake :

Daily dry matter intake was calculated from intake of different feeds and data obtained was tabulated and presented in Table 2.

From Table 2 it was observed that the daily DM intake was significantly differed among the treatments. The average daily intake of dry matter was 2.780, 3.965 and 3.392 kg per crossbred calves of treatments T₁, T₂ and T₃, respectively. It was noted that the daily DM intake was differing significantly between the treatments. The calves from T₂ groups consumed more DM than that of T₃ and T₁ calves. Higher intake of DM per 100 kg body weight was noticed in treatment T₂ (3.820) and lowest in T₁ (2.990). This trend thus, indicates that there was increase in the daily DM intake when concentrate mixture was incorporated as food in the rations of crossbred calves.

The present intake values are nearer to the values reported by past research workers like Adangale *et al.* (2009) reported that the average daily dry matter intake was higher in T₁ and the values being 3.050, 3.262 and 3.178 kg in T₀, T₁ and T₂, respectively. Also Yadav and Chaudhary (2010) reported that the crude protein (CP) intake per 100 kg body weight was significantly higher in T₁ as compared to T₃ group.

Growth performance of crossbred calves :

The growth performance of crossbred calves on

Table 2: Effect of feeding of different concentrate mixture on dry matter intake of crossbred calves

Treatments	Average body weight (kg)	Requirement of daily DMI / 100 (kg) BW (as per standered)	DMI (kg)	Daily DMI / 100 kg BW (kg)
T ₁	92.80	2.32	2.780	2.990
T ₂	103.80	2.59	3.965	3.820
T ₃	98.80	2.47	3.392	3.430
“F” test	Sig.	-	Sig.	Sig.
S.E. ±	2.36	-	0.03	0.02
C.D. (P=0.05)	7.706	-	0.11	0.077

Table 3 : Growth performance of crossbred calves

Treatments	Average Initial weight (kg)	Weight gain kg/day/ calves	Weight gain kg/week/ calves	Period total weight gain(kg)	Average final weight (kg)
T ₁	87.40	0.324	2.25	29.20	116.60
T ₂	94.40	0.456	3.16	41.10	135.50
T ₃	91.00	0.431	2.98	38.80	129.80
“F” test	NS	Sig	Sig	Sig	Sig
S.E. ±	2.31	0.01	0.01	0.14	4.35
C.D. (P=0.05)	-	0.029	0.034	0.442	14.193

different concentrates feeding was judged on the basis of body weight gain and gain in body measurements. The results obtained in this regard are discussed in the following Table 3.

It was observed from the Table 3 that there was significant difference in weight gain under different treatments groups. The average final weight gain was highest in T₂ followed by T₁ and T₃ groups. Lowest weight gain was recorded in T₁ treatment group *i.e.* the effect of different concentrate feeding on body weight gain of growing calves was significant (Table 3). The initial body weight were 87.40, 94.40 and 91.0 kg in T₁, T₂ and T₃ groups, respectively and final observations of body weight were 116.60, 135.50, 129.80 kg in respective treatments. The total gain in body weight was higher in treatment T₂ (41.10 kg) followed by T₃ (38.80 kg) and T₁ (29.20 kg) treatment. Average daily gain in body weight was higher in T₂ (0.456 kg) followed by T₃ (0.431 kg) and T₁ (0.324 kg).

The present values are nearer to the values reported by past research results of present study were in close agreement with Ahmad *et al.* (2005) conducted on 30 sahiwal heifers of similar age of about one year and similar live weight (155-159 kg) to determine the effect of corn steep liquor on growth rate. The total live weight gain during the trial were 273±or-9.73, 270±or-4.86, 268±or-12.37, 261±or-7.23 and 260±or-6.28 in groups I, II, III, IV and V, respectively.

Sreedhar (2015) a study was conducted on growth performance of indigenous and crossbred calves under field conditions. Twelve each from indigenous and cross bred calves were selected for the present study. The average birth weight of indigenous and cross bred calves was 23.39±1.23 and 25.27±1.54 kg, respectively. The mean body weight of indigenous calves and cross bred calves at 24 weeks of age was recorded as 87.94±1.31 and 96.89±1.37 kg, respectively, which indicated faster growth of cross bred calves. The mean ADG of indigenous and cross bred calves were 314±11.2 and 365±10.2 g/day, respectively. The maximum average daily gain was observed at 22-24 weeks in indigenous calves

whereas in cross bred calves, peak ADG obtained at 12-14 weeks during 24 weeks of growth period. It was found that cross bred calves have grown faster as compared to the indigenous calves. Hence, it can be concluded that in addition to genetic inheritance of cross bred calves, improved feeding and managerial practices that are being followed by the dairy farmers resulted higher body weight of the calves.

Helal *et al.* (2011) effect of feeding different levels of concentrates on buffalo calves performance, digestibility and carcass traits month experiment was carried out in order to investigate the effect of concentrate levels on performance of buffalo calves. 21 male buffalo calves with average body weight of about 286 kg divided into three equal groups the overall average feed intake for groups A, B and C were 8.65, 9.81 and 11.11 kg/d, respectively. Feed conversion was better for the 70 per cent group than the control. No differences were found regarding the digestibility of all nutrients as a result of feeding different concentrate levels during summer season.

Conclusion:

It is concluded that the feeding of Homemade concentrate mixture meet the maintenance and growth requirement of experimental crossbred calves. The feed intake recorded was sufficient to fulfil the dietary requirement and appetite of the crossbred calves. Significantly more dry matter intake was noticed in T₂ followed by T₁ and T₃. It indicates the influence of incorporation of soybean straw with green fodder and homemade concentrate-I, the dry matter intake of the experimental crossbred calves. Maximum growth rate (Body weight gain) was obtained by feeding of treatment T₂.

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