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Rekib U Ahmed

College of Veterinary Science,
Assam Agricultural University
Khanapara, Guwahati, Assam,
India

DC Mili

College of Veterinary Science,
Assam Agricultural University
Khanapara, Guwahati, Assam,
India

RJ Deka

College of Veterinary Science,
Assam Agricultural University
Khanapara, Guwahati, Assam,
India

Purabi Kaushik

College of Veterinary Science,
Assam Agricultural University
Khanapara, Guwahati, Assam,
India

Effect of complete feed block on growth performance of crossbred calves under farm condition

Rekib U Ahmed, DC Mili, RJ Deka and Purabi Kaushik

Abstract

Twenty (20) cross bred calves (Jersey× Assam Local) of both sexes in the age of 8-10 months of age weighing average 73.61 kg body weight were randomly distributed into two groups control (T₁) and treatment (T₂) respectively with 10 animals in each group by using randomized block design (RBD). Control (T₁) group was fed with Standard feeding system (Concentrate mixture, Para grass and Paddy straw) as per farm schedule and treatment (T₂) group was fed with Complete feed block comprised of Para grass (50%) and paddy straw (50%) (Out of 60% roughage) + Concentrate mixture + molasses in the ratio 60: 30: 10.

The two groups were fed the same concentrate mixture containing 16.64 per cent DCP and 70.40 per cent of TDN for 90 days. The average daily gain and FCE of different treatment groups were 188±0.01 and 217 ±0.01 gm; 9.07±1.16 and 7.78±0.21 in control (T₁) and treatment (T₂) groups respectively. Significant ($p<0.05$) difference were observed in fifth and sixth fortnight in between the two treatment groups in respect of body weight gain per day and FCE. Significant ($p<0.05$) difference were observed in overall mean between the two treatment groups in respect of body weight gain per day. However, non-significant ($p<0.05$) difference was between the groups in respect of linear body measurement but body measurement (Body length, heart girth and height at withers) were highest in treatment (T₂) followed by control (T₁). DM intake was highest in treatment (T₂) followed by control (T₁). Significant ($p<0.01$) difference were observed in treatment (T₂) between fourth to sixth fortnight and over all mean in respect of dry matter intake. The blood constituent viz. serum glucose, serum total protein, haemoglobin, serum calcium were within the normal range for crossbred calves but were highest in treatment (T₂) followed by control (T₁). The cost per kg gain in body weight was lowest (Rs. 65.32) in treatment (T₂) group in comparison to control (T₁) (Rs. 66.28). The result suggested that crossbred calves can be reared on feeding of complete feed block having Para grass (50%) and paddy straw (50%) (out of 60% roughage) + Concentrate mixture + molasses in the ratio 60: 30: 10. with growth performance and economic advantage of rearing calves.

Keywords: Growth performance, feed intake, economics of feeding

Introduction

Dairying with crossbred cattle and high yielding buffaloes has become a remunerative business in India with income and employment generation opportunities. One of the main constraints of dairying in India is the qualitative and quantitative shortage of feed and fodder resources which lead to under nourishment of calf during the early period resulting in calf mortality, infertility and delayed conception effecting overall performance in their subsequent productive cycle. The cross breeding has been adopted as a national policy for enhancing milk production of indigenous cattle. The crossbred calve so produced have a higher growth potential and early maturity if optimum inputs are provided. In practical calf feeding practice, more emphasis is given on palatability of feed stuff with adequate quantities of dry matter, protein, energy, minerals and vitamins. The cost of feeding is a major component contributing 68 to 82 percent in calf rearing. However, cost of crossbred calf production can be reduced through the better management balanced feeding, use of performance modifiers and better health care. The shortage of feed and fodder is a chronic ailment that afflicts the livestock industry which can be managed by using complete feed which is mainly composed of locally available crop residue and agro-industrial byproducts. Complete Feed Block (CFB) is the densified form of complete feed composed of forage, concentrate and other supplementary nutrients which are mixed together to form a uniform mixture in desired proportion capable of fulfilling nutrient requirement of animal. Complete feed block is convenient, economical, multi-nutrient correcting and ready to eat ruminant complete diet.

Corresponding Author:

Rekib U Ahmed

College of Veterinary Science,
Assam Agricultural University
Khanapara, Guwahati, Assam,
India

Complete block technique provides opportunity for the incorporation of unconventional and agro-industrial byproduct for economic livestock production and cheaper transportation cost of bulky materials from abundant to scarcity areas at farmers door. In the beginning, the blocks contained only urea and salts. By now of molasses and minerals are also added. The preparation of a feed block offers scope for incorporation of tree leaves/shrubs in routine diets besides the potentiality to protect loss of feed ingredients during sneezing.

Materials and Methods

Place of experiment

The experiment was conducted in the animal shed of the Instructional Livestock Farm (Cattle), College of veterinary science, Assam Agricultural University Khanapara - Guwahati- 22 in collaboration with Department of Animal Nutrition, College of Veterinary Science, Assam Agricultural University where analysis of feed samples were carried out.

Selection and grouping of experimental animals

Twenty (20) cross bred calves (Jersey× Assam Local) of both sexes in the age of 8-10 months of age were procured from Instructional Livestock Farm(Cattle), College of Veterinary Science, Assam Agricultural University Khanapara - Guwahati- 22 for the experiment. The experiment was undertaken to study the effect of complete feed block on growth performance of cross bred calves under farm condition. The calves were divided randomly into two (2) groups Viz. Control (T₁) and Treatment (T₂) comprising of ten (10) numbers of calves in each group on the basis of body weight respectively.

Housing and management of experimental animals

The calves were housed in well ventilated, clean and having dry pucca shed. The shed was disinfected with potassium permanganate solution, sterilized and fumigated prior introduction of calves.

Each calves were tied with rope near the manger to ensure that it received feed individually.

Animal was given different identification number. Before starting the experiment all the animals were conditioned for a period of one month on feeding standard ration containing concentrate mixture, green grass and dry roughages *ad libitum* individually. All the animals were kept in a head to head

position. The selected animal were dewormed and vaccinated prior to the commencement of the feeding experiment. The calves were offered with weighed quantities of feed daily between 9:30 to 10:30 am and 2:30 to 3:30 pm after cleaning and washing of the shed and the animals.

Design of Experiment

After conditioning period was over, the twenty crossbred calves were divided into Two (2) groups of ten (10) animals each as uniformly as possible with regard to age and body weight.

Two nutritional treatments were used in a Complete Randomized Design for two groups of animals as per the following schedule.

Control (T₁) - Standard feeding system (Concentrate mixture, para grass and Paddy straw) as per farm schedule.

Treatment (T₂) - Complete feed block comprised of Para grass (50%) and paddy straw (50%) (out of 60% roughage) + Concentrate mixture + molasses in the ratio 60: 30: 10

A standard concentrate mixture with 16.64% DCP and 70.40% of TDN was prepared with conventional ingredients.

Results and Discussion

Chemical composition of feeds and estimated nutritive values of composite ration:

The chemical compositions of concentrate mixture, para grass, paddy straw and Complete Feed Block for feeding of experimental calves have been presented in table 1.

The percentage of crude protein in concentrate mixture was 18.25. Dry matter content was 90.85, crude fiber -7.76, ether extract-2.13, total ash-7.34, acid detergent fiber-12.03, neutral detergent fiber -37.2 and organic matter-92.66. The percentage of crude protein in paddy straw was 1.86. Dry matter content was 90.31, crude fiber -29.52, ether extract-2.26, total ash-11.21, acid detergent fiber-43.2, neutral detergent fiber -67.61 and organic matter-88.79. The percentage of crude protein in para grass was 10.94. Dry matter content was 17.19, crude fiber -30.29, ether extract-2.35, total ash-8.76, acid detergent fiber-25.6, neutral detergent fiber -41.22 and organic matter-91.25 and the percentage of crude protein in Complete Feed Block was 14.12. Dry matter content was 87.75, crude fiber -36.51, ether extract-6.51, total ash-9.22, acid detergent fiber- 42.45, neutral detergent fiber -69.75 and organic matter-90.78.

Table 1: Chemical composition of concentrate mixture and other feed ingredients (on percent dm basis)

Ingredients	Dry Matter (%)	Crude Protein (%)	Crude Fiber (%)	Ether Extract (%)	Total Ash (%)	ADF (%)	NDF (%)	OM (%)
Complete Feed Block	87.75	14.12	36.51	6.51	9.22	42.45	69.75	90.78
Paddy Straw	90.31	1.86	29.52	2.26	11.21	43.2	67.61	88.79
Concentrate mixture	90.85	18.25	7.76	2.13	7.34	12.03	37.2	92.66
Para grass	17.19	10.94	30.29	2.35	8.76	25.6	41.22	91.25

Growth performance

The average fortnightly changes in body weight have been presented in table 2. The average body weight of experimental crossbred calves increased along with increasing in age of the animal (Fig.1) The average body weight of control (T₁) increased from 73.60±3.88 to 90.61±3.83 kg and treatment (T₂) increased from 73.62±3.81 to 93.14 ±3.80 kg Singh. and Mehera (1990) ^[6], Singh *et al.* (2016) ^[5] also revealed similar findings.

On statistical analysis it was observed that there was not

significant difference in respect of changes in body weight in different fortnight in all the treatment groups and the average total body weight. The average body weight gain of experimental crossbred calves at each fortnight has been presented in table 3 and (Fig.1). The average gain in body weight at different fortnight ranged from 2.72±0.23 to 2.82±0.28 kg in control (T₁) and 2.81±0.19 to 3.51±0.26 kg in treatment (T₂).

The average daily gain in body weight of experimental calves at different fortnight has been presented in table 4. The

average daily gain at different fortnight ranged from 181±0.04 to 188±0.02 gm in Control (T₁) and 187±0.08 to 234±0.02 gm in treatment (T₂). The total gain in body weight in control (T₁) was 17.00 ±0.12 kg and treatment (T₂) was 19.48±0.25 kg. The rate of overall mean daily gain in body weight was 188±0.01 gm in control (T₁) and 217 ±0.01 gm in treatment (T₂). Statistically analysis found that there was significant differences (*p*<0.05) between control (T₁) and treatment (T₂) during fifth and sixth fortnight including overall mean with respect to average daily gain in body weight (gm) and total gain in body weight (kg).

Table 2: Average fortnightly body weight (kg) of crossbred calves

Fortnight	Control (T ₁)	Treatment (T ₂)	ltl-value	P value
Initial	73.60±3.88	73.62±3.81	0.554	0.997 ^{NS}
1 st	76.32±3.93	76.44±4.07	0.542	0.984 ^{NS}
2 nd	78.88±3.94	79.27±4.19	0.528	0.947 ^{NS}
3 rd	81.85±4.08	82.50±3.65	0.516	0.912 ^{NS}
4 th	84.80±4.19	85.97±3.87	0.437	0.798 ^{NS}
5 th	87.78±4.13	89.60±3.72	0.330	0.682 ^{NS}
6 th	90.61±3.83	93.14±3.80	0.269	0.533 ^{NS}

^{NS} = Non- significant

Table 3: Average fortnightly body weight gain (kg) of crossbred calves

Fortnight	Control (T ₁)	Treatment (T ₂)	ltl-value	P value
1 st	2.72±0.23	2.81±0.19	1.42	0.787 ^{NS}
2 nd	2.56±0.27	2.83±0.26	1.53	0.661 ^{NS}
3 rd	2.97±0.15	3.23±0.37	1.69	0.390 ^{NS}
4 th	2.95±0.11	3.44±0.32	1.98	0.074 ^{NS}
5 th	2.98 ^a ±0.20	3.61 ^b ±0.18	2.34	0.023 [*]
6 th	2.82 ^a ±0.28	3.51 ^b ±0.26	2.42	0.037 [*]

^{ab} Mean values with different superscripts within row differ significantly.

^{NS}=Non- significant

**p*<0.05

Table 4: Average fortnightly daily body weight gain (g/d) of crossbred calves

Fortnight	Control (T ₁)	Treatment (T ₂)	ltl-value	P value
1 st	181±0.04	187±0.08	1.42	0.787 ^{NS}
2 nd	171±0.06	189±0.01	1.53	0.661 ^{NS}
3 rd	198±0.01	215±0.08	1.69	0.390 ^{NS}
4 th	199±0.01	227±0.02	1.98	0.074 ^{NS}
5 th	198 ^a ±0.01	241 ^b ±0.01	2.34	0.023 [*]
6 th	188 ^a ±0.02	234 ^b ±0.02	2.42	0.037 [*]
Over-all mean (g/d)	188 ^a ±0.01	217 ^b ±0.01	2.47	0.027 [*]

^{ab} Mean values with different superscripts within row differ significantly.

^{NS}=Non- significant

**p*<0.05

Table 5: Average total body weight (kg) and daily gain in body weight (g/d) of experimental calves during feeding trial

Group	Average Initial body weight (kg)	Average final body weight (kg)	Average Total gain in body weight (kg)	Mean daily gain in body weight (g)
Control (T ₁)	73.60±3.88	90.61±3.83	17.00±0.12	188±0.01
Treatment (T ₂)	73.62±3.81	93.14±3.80	19.48±0.25	217±0.01

Body Measurements

Body Length

The fortnightly changes of body length of crossbred calves in control (T₁) and treatment (T₂) groups are presented in Table 6. The bar diagram presentation of fortnightly body length

changes of crossbred calves of control (T₁) and treatment (T₂) groups are presented in Fig (3) Ashok et al (2010) ^[1].

The average initial and final body length of crossbred calves of control (T₁) and treatment (T₂) group were 85.24±0.34 cm and 85.45±0.17 cm and 92.38±0.41 cm and 92.80±0.23 cm respectively and over all mean body length control (T₁) and treatment (T₂) group were 88.72±0.97 cm and 89.09±1.00 cm respectively. Statistically analysis it was found no significant difference (*p*<0.05) between control (T₁) and treatment (T₂) with respect to in initial and final body length and over all mean body length.

Table 6: Average fortnightly estimate of body length (cm) of crossbred calves

Fortnight	Control	Treatment	ltl-value	P value
Initial	85.24±0.34	85.45±0.17	0.221	0.586 ^{NS}
1 st	86.40±0.34	86.61±0.25	0.232	0.616 ^{NS}
2 nd	87.39±0.31	87.82±0.26	0.131	0.312 ^{NS}
3 rd	88.57±0.33	89.01±0.26	0.142	0.313 ^{NS}
4 th	89.96±0.34	90.38±0.24	0.154	0.332 ^{NS}
5 th	91.11±0.41	91.55±0.26	0.167	0.377 ^{NS}
6 th	92.38±0.41	92.80±0.23	0.172	0.381 ^{NS}
Over all mean (g/d)	88.72±0.97	89.09±1.00	0.364	0.798 ^{NS}

^{NS}=Non- significant

Heart Girth

The fortnightly changes of heart girth of crossbred calves in control (T₁) and treatment (T₂) groups are presented in Table 7. The bar diagram presentation of fortnightly body length changes of crossbred calves of control (T₁) and treatment (T₂) groups are presented in Fig (4).

The average initial and final body length of crossbred calves of control (T₁) and treatment (T₂) group were 97.14±0.31cm and 96.93±0.44 cm and 104.12±0.25cm and 104.82±0.37 cm respectively and over all mean body length control (T₁) and treatment (T₂) group were 100.1±1.00 cm and 100.21±1.1 cm respectively. Statistical analysis reveals non-significant (*p*<0.05) between control (T₁) and treatment (T₂) with respect to in initial and final body length and over all mean heart girth.

Table 7: Average fortnightly estimate of heart girth (cm) of crossbred calves

Fortnight	Control	Treatment	ltl-value	P value
Initial	97.14±0.31	96.93±0.44	0.472	0.695 ^{NS}
1 st	97.42±0.28	97.82±0.41	0.213	0.428 ^{NS}
2 nd	98.39±0.35	98.85±0.39	0.202	0.389 ^{NS}
3 rd	99.62±0.39	100.21±0.47	0.289	0.364 ^{NS}
4 th	101.20±0.36	101.81±0.46	0.293	0.365 ^{NS}
5 th	102.61±0.37	103.37±0.42	0.242	0.312 ^{NS}
6 th	104.12±0.25	104.82±0.37	0.237	0.317 ^{NS}
Over all mean (g/d)	100.1±1.00	100.21±1.1	0.316	0.442 ^{NS}

^{NS}=Non- significant

Height at Withers

The fortnightly changes of height of crossbred calves in control (T₁) and treatment (T₂) groups are presented in Table 8. The bar diagram presentation of fortnightly body length changes of crossbred calves of control (T₁) and treatment (T₂) groups are presented in Fig (5).

The average initial and final body length of crossbred calves of control (T₁) and treatment (T₂) group were 82.56±0.19 cm and 82.40±0.19 cm and 89.68±0.31 cm and 90.18±0.33 cm respectively and over all mean body length control (T₁) and

treatment (T₂) group were 85.61±0.99 cm and 86.02±1.1 cm respectively. The difference observed was Statistically non significant ($p < 0.05$) between control (T₁) and treatment (T₂) with respect to in initial and final body length and over all mean height at withers.

Table 8: Average fortnightly estimate of height at withers (cm) of crossbred calves

Fortnight	Control	Treatment	t -value	P value
Initial	82.56±0.19	82.40±0.19	0.356	0.564 ^{NS}
1 st	83.00±0.21	83.48±0.22	0.114	0.135 ^{NS}
2 nd	84.11±0.30	84.61±0.23	0.123	0.190 ^{NS}
3 rd	85.29±0.29	85.81±0.21	0.114	0.157 ^{NS}
4 th	86.58±0.34	87.11±0.32	0.221	0.274 ^{NS}
5 th	88.06±0.38	88.58±0.37	0.272	0.341 ^{NS}
6 th	89.68±0.31	90.18±0.33	0.234	0.287 ^{NS}
Over all mean	85.61±0.99	86.02±1.1	0.454	0.781 ^{NS}

^{NS}=Non- significant

Correlation coefficient between body weight and body measurements

The correlation coefficient of body weight and linear body measurement were presented in Table 9, Garg, M. R. and Gupta, B. N. (1992) [3] also reveals the similar reports with the present findings.

Table 9: Corelation coefficient (r) between body weight body measurements of crossbred calves in different groups

Groups	Body weight and Body length	Body weight and Hearth girth	Body weight and Height at withers
Control (T ₁)	0.87**	0.93 **	0.89 **
Treatment (T ₂)	0.92 **	0.96**	0.93**

** $p < 0.01$

The coefficient of correlation value between body weight and body length groups in control and treatment are 0.87 and 0.92 respectively. The coefficient of correlation value between body weight and heart girth were 0.93 and 0.96 in control (T₁) and treatment (T₂) groups, respectively. The coefficient of correlation value between body weight and height at withers were 0.89 and 0.93 in control (T₁) and treatment (T₂) groups, respectively. Statistical analysis reveals that body weight had highly significant positive correlation with body length, heart girth and height at withers (Table 9).

Feed Intake

The average daily feed intake (kg/day) on dry matter basis of crossbred calves of control (T₁) and Treatment (T₂) groups were presented in table 10.

The average daily feed intake on DM basis in crossbred calves of control (T₁) and Treatment (T₂) was 2.51±0.01, 2.58±0.03, 2.60±0.03 and 2.70±0.02 kg respectively. The average total intake of feed on DM basis in crossbred calves of control, treatment were 2.55±0.01 and 2.63±0.02 kg respectively. Significantly ($p < 0.05$) higher dry matter intake was observed from third fortnight onwards and significantly ($p < 0.01$) higher over all mean dry matter intake.

The Average fortnightly feed intake (Kg) On DM basis of crossbred calves of control (T₁) and Treatment (T₂) was 25.12±0.11, 25.78±0.32, 26.03±0.29 and 26.03±0.29 kg respectively. It was observed DM intake was significantly ($p < 0.05$) higher in treatment (T₂) group from fourth and fifth

fortnight and significantly ($p < 0.01$) higher sixth fortnight and over all mean dry matter intake in treatment (T₂) group (Fig.6). Singh *et al.* (2016) [5] performed a feeding trial to assess the effect of feeding wheat or rice straw based complete ration as mash or block form on growth in crossbred calves by feeding wheat straw and rice straw based complete feed blocks into four groups of 6 calves each on the basis of body weight.

Table 10: Average fortnightly daily feed intake (kg/day) on dm basis of crossbred calves

Fortnight	Control (T ₁)	Treatment (T ₂)	t -value	P value
1 st	2.51 ^a ±0.01	2.58 ^a ±0.03	1.74	0.068 ^{NS}
2 nd	2.53 ^a ±0.01	2.59 ^a ±0.03	1.65	0.404 ^{NS}
3 rd	2.54±0.01	2.60±0.02	1.76	0.064 ^{NS}
4 th	2.56 ^a ±0.02	2.62 ^b ±0.03	1.92	0.044*
5 th	2.58 ^a ±0.03	2.67 ^b ±0.02	1.97	0.018*
6 th	2.60 ^a ±0.03	2.70 ^b ±0.02	2.34	0.009**
Over-all mean (kg/d)	2.55 ^a ±0.01	2.63 ^b ±0.02	2.59	0.0001**

^{ab} Mean values with different superscripts within row differ significantly.

* $p < 0.05$

** $p < 0.01$

Table 11: Average fortnightly feed intake (kg) on dm basis of crossbred calves

Fortnight	Control (T ₁)	Treatment (T ₂)	t -value	P value
1 st	25.12±0.11	25.78±0.32	1.74	0.068 ^{NS}
2 nd	25.28±0.13	25.94±0.31	1.65	0.066 ^{NS}
3 rd	25.44±0.11	26.03±0.17	1.76	0.064 ^{NS}
4 th	25.58 ^a ±0.16	26.23 ^b ±0.25	1.92	0.045*
5 th	25.81 ^a ±0.27	26.75 ^b ±0.25	1.97	0.018**
6 th	26.03 ^a ±0.29	27.03 ^b ±0.19	2.34	0.009**
Over-all mean (kg/d)	25.54 ^a ±0.08	26.31 ^b ±0.12	2.59	0.001**

^{ab} Mean values with different superscripts within row differ significantly.

* $p < 0.05$

** $p < 0.01$

Feed conversion efficiency

Feed conversion efficiency can be defined as unit of feed (DM basis) required per unit gain in body weight. It is generally employed as an index to determine the productive efficiency in case of meat animals. Hatunngimana and P. Nodolisha (2015) [4] studied shows similar observations.

The average feed conversion efficiency for growth for the whole experimental period (90 days) has been presented in table 12. The average initial and final feed conversion efficiency of crossbred calves of control (T₁) and treatment (T₂) group were 9.23±0.03 to 9.24±0.13 and 9.17±0.08 to 6.61±0.05 respectively. The bar diagram presentation of fortnightly feed conversion efficiency of crossbred calves of control (T₁) and treatment (T₂) groups are presented in Fig (7). It was observed from the table that the feed conversion efficiency was apparently better in treatment (T₂) group and Statistically analysis found that there was significant differences ($p < 0.05$) between control (T₁) and treatment (T₂) during fifth and sixth fortnight with respect to feed conversion efficiency (Cherthong *et al.*, 2014) [2].

The average feed conversion efficiency for whole period was 9.07±1.16 in control (T₁) and 7.78±0.21 in treatment (T₂). There was no significant differences observed in average feed conversion efficiency for whole period.

Table 12: Average fortnightly feed conversion efficiency of crossbred calves

Fortnight	Control (T ₁)	Treatment (T ₂)	tlt-value	P value
1 st	9.23±0.03	9.17±0.08	1.34	0.688 ^{NS}
2 nd	9.87±0.04	9.13±0.07	1.54	0.465 ^{NS}
3 rd	8.7±0.03	8.05±0.05	1.98	0.209 ^{NS}
4 th	8.74±0.08	7.6±0.07	2.13	0.127 ^{NS}
5 th	8.69 ^a ±0.11	6.23 ^b ±0.07	3.47	0.036*
6 th	9.24 ^a ±0.13	6.61 ^b ±0.05	3.38	0.028*
Over all mean	9.07±1.16	7.78±0.21	2.25	0.134 ^{NS}

^{ab} Mean values with different superscripts within row differ significantly.

**p*<0.05

Relative cost of growth production in experimental crossbred calves

For calculation of cost of growth production the expenditure incurred on various feed stuffs have been taken into consideration Table 13. The housing and management practices were similar for all the groups and expenditure incurred on these have been excluded. The cost of unit in live weight in relation to input in terms of rupees used for the purpose of feed ingredients and green fodder per unit gain in live weight has been worked out Table 14. The average daily gain in body weight in control (T₁), and treatment (T₂), were 188 g/day and 217 g/day respectively. The cost of production per kg gain in live weight was Rs 66.28 and Rs 65.32 in control (T₁) and treatment (T₂) respectively.

Table 13: Rate of purchase of feeds and fodder used for the feeding of calves

Feeds/ fodder	Rate of purchase (Rs/100kg) as such basis	Value Rs/100 kg (on DMB)
Maize	1792.0	1991.11
Rice polish	1512.0	1698.88
Wheat bran	1904.0	2115.55
Ground nut cake	4256.0	4728.88
Rice bran	1198.0	1331.11
Mineral mixture	7852.0	8724.44
Salt	613.0	681.11
Green grass	40.0	126
Paddy straw	250.0	279.42
Molasses	3000	3722.08

Table 14: Relative cost of growth productions in crossbred calves

Particulars	Control (T ₁)	Treatment (T ₂)
Dry matter intake/animal/day(kg)		
(i) Concentrate	0.453	0.474
(ii) Roughage	2.083	2.134
Total	1.89	2.61
Cost of feed consumed/head/day (Rs.)		
(i) Concentrate	10.79	11.05
(ii) Dry roughage	1.10	1.12
(iii) Green roughage	0.66	0.67
(iv) Molasses	-	1.30
Total	12.55	14.14
Growth rate/day	188	217
Cost of production per kg live weight gain		
Absolute	66.28	65.32
Relative (%)	100	96.78

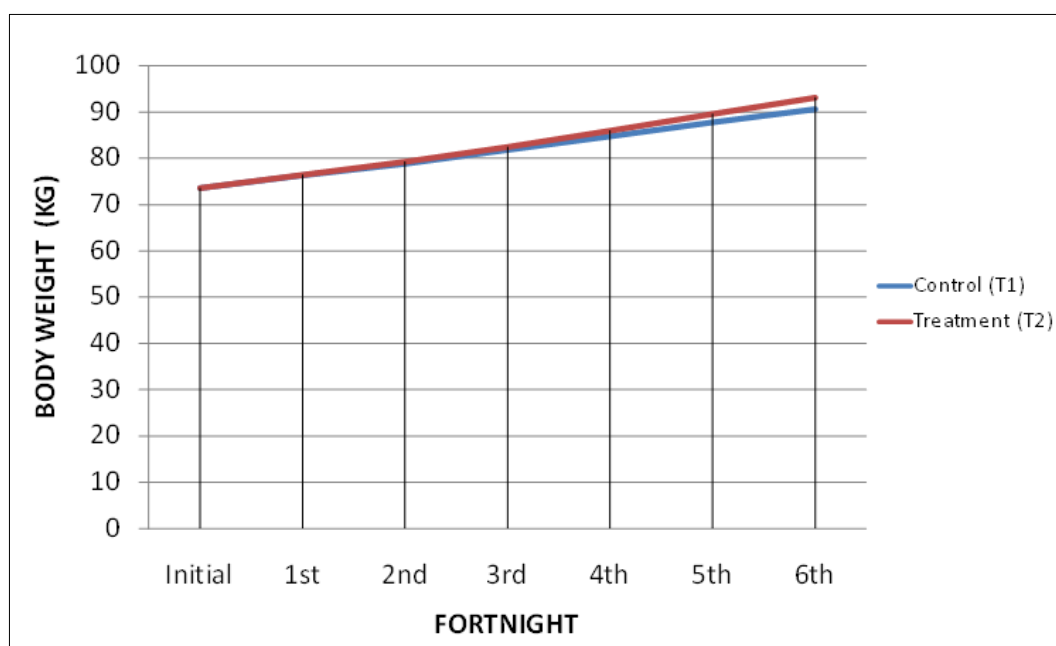


Fig 1: Body weight (Kg) of crossbred calves at fortnightly intervals

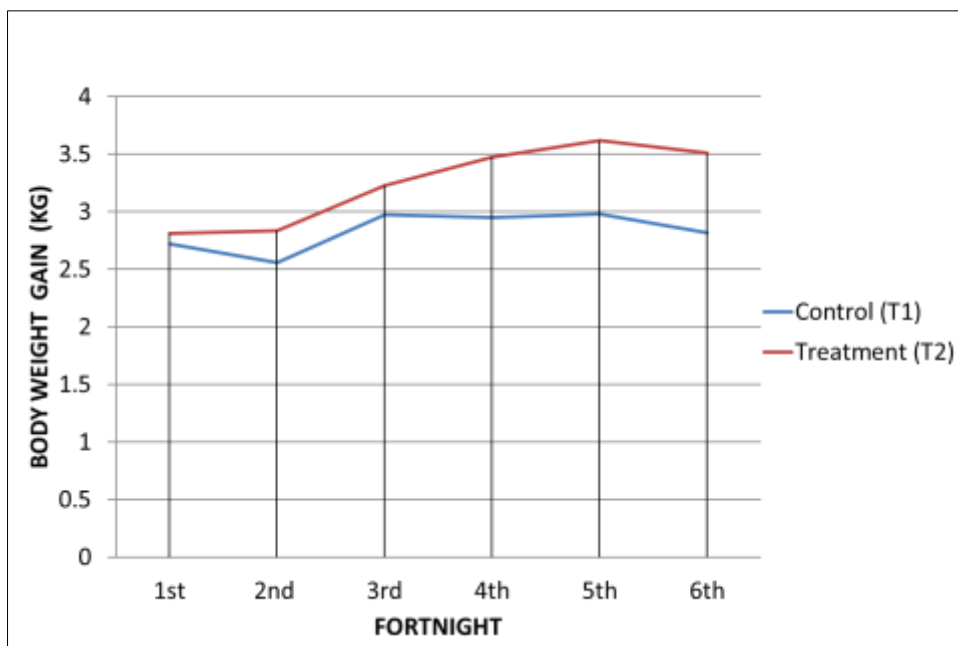


Fig 2: Body weight gain (kg) of crossbred calves at fortnightly intervals

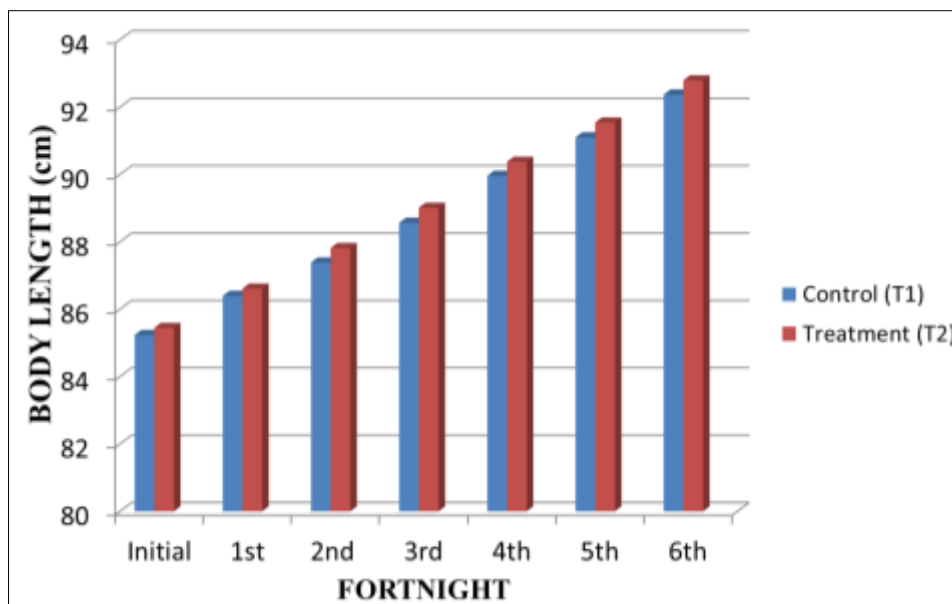


Fig 3: Body length (cm) of crossbred calves at fortnightly intervals

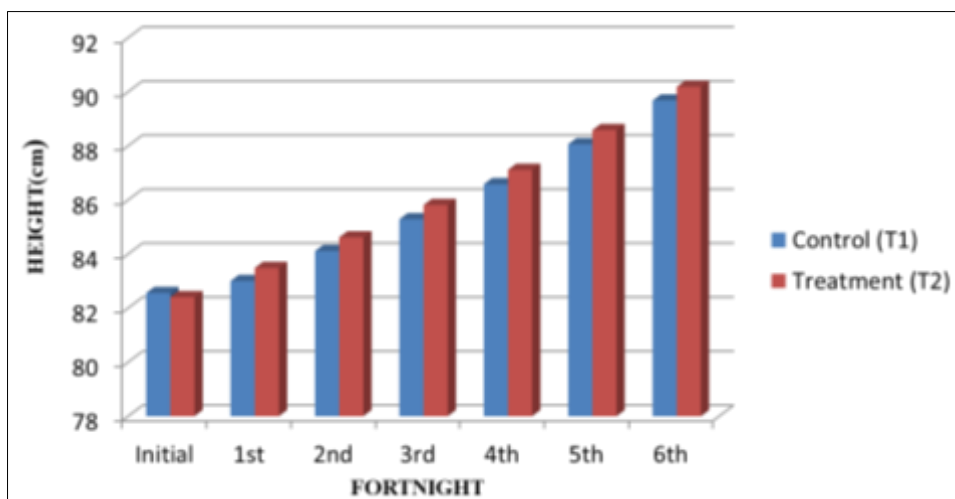


Fig 5: Height at withers (cm) of crossbred calves at fortnightly intervals

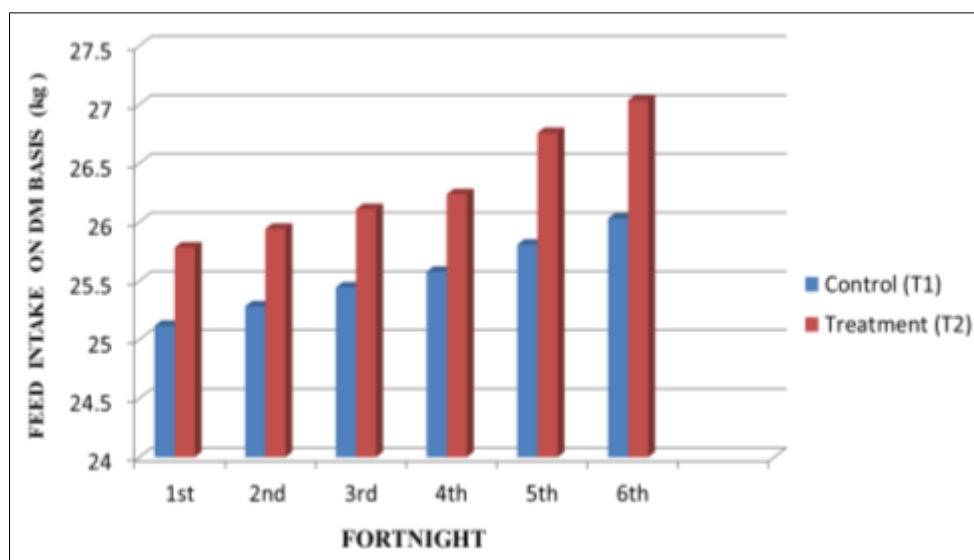


Fig 6: Feed intake (kg) on dm basis of crossbred calves at fortnightly intervals

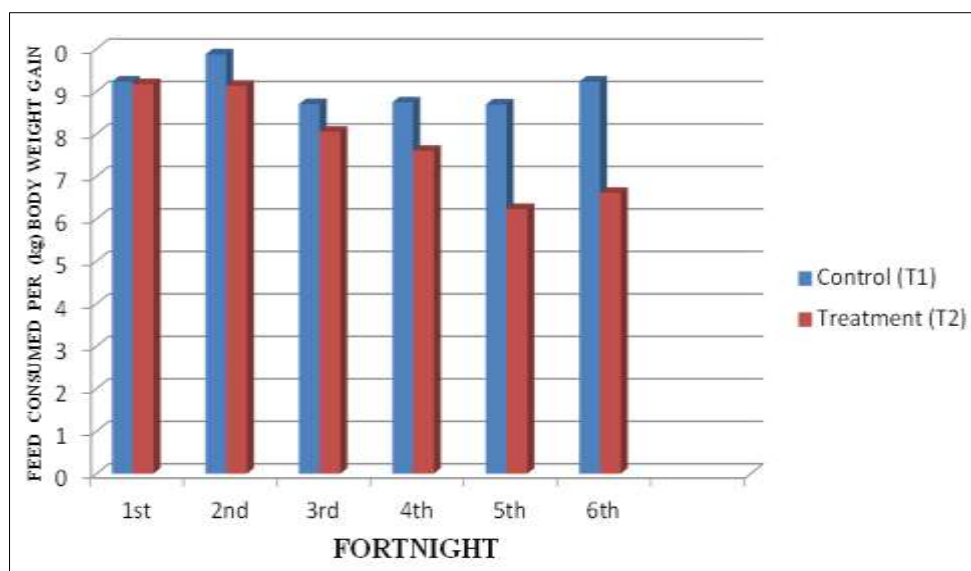


Fig 7: Fortnightly feed conversion efficiency of calves

Conclusions

Based on the present findings it might be concluded that feeding of complete feed block has shown encouraging results in terms of feed intake, body weight gain, feed conversion efficiency and economics of feedings with normal values of blood biochemical's and haematological in growing crossbred calves. However, further study needs to be carried out with more numbers of animals for a longer period to arrival definite conclusion.

Author's contribution

All the Authors have equally contributed for the research article.

Conflict of Interest

The authors declare that there is no Conflict of Interests regarding the publication of this article.

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