Indian J. Anim. Prod. Mgmt. Vol. 29 (3-4) 82-86 (2013)

EFFECT OF STARTER RATION ON GROWTH PERFORMANCE OF CROSSBRED CALF*

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Received : 12.11.2013 ***Accepted : 28.01.2014***

ABSTRACT

An experiment was conducted for a period of 90 days with twelve crossbred calves to investigate the effect of calf starter on growth performance, feed intake, feed conversion efficiency and economics of feeding. The calves were placed under two groups of six in each and fed with calf starter, CS_1 and CS_2 to Group I and Group II respectively. The calves were also fed with *ad libitum* green fodder and whole milk. Significant differences (P>0.01) were observed in mean daily body weight gain, feed conversion efficiency, and dry matter intake per 100 kg body weight between the groups. However, no significant difference was observed in respect of linear body measurements, and intake of whole milk, calf starter and green fodder between the groups. Significant differences (P>0.01) were also observed in total serum protein and blood calcium level while no significant difference was observed in blood glucose level between the groups. The total cost of feed and the cost per kg weight gain were found to be lower in Group II.

Key words : Calf starter, feed intake, FCR, blood constituents, economics of feeding.

The calf nutrition plays an important role in the cattle industry because the effect of nutrients directly reflects on growth in early life. The increase feed intake capacity of calves may be utilized beneficially by feeding low energy but palatable diets. Due to pressure on food grains for meeting the requirements of ever increasing human population coupled with high cost, it is almost impossible for the farmer of low income group to include cereal grains in the rations of livestock.

The availability of oil cake is also limited and not sufficient to meet the requirements of livestock in India. The farmers depend mainly on the agro-industrial byproducts to meet the energy and protein requirements of their livestock. There is a need to develop low cost feeding systems with grainless diet to spare grains for human consumption. The rice bran is one of the cereal milling byproducts which is available in plenty and can be utilized by the ruminants. Considering the above, two calf starters with supplementation of grains by deoiled rice bran were fed to the calves to investigate the growth performance, feed intake, FCR and economics of feeding.

MATERIALS AND METHODS

An experiment was conducted with 12 crossbred calves (Jersey x Assam local cattle) of

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either sex with birth weight ranged from 23-25 kg at the Instructional Livestock Farm (cattle), College of Veterinary Science, Assam Agricultural University, Khanapara, Guwahati-781022 from 23rd May to 23rd August, 2010. The calves were put into two groups of six each by following RB Design on the basis of similar body weight. The calves of Group I and II were fed with calf starter rations CS_1 and CS_2 respectively. The composition of rations–

Ingredients	Calf starter	
	CS_1	CS_2
Crushed maize	45	20
Deoiled rice bran	20	45
Deoiled GNC	27	27
Fish meal	5	5
Mineral mixture	2	2
Common salt	1	1
DCP (%)	18.78	18.73
TDN (%)	77.54	76.64

The calves were fed colostrum within two hours after birth and twice daily for 3 days at the rate of 10 per cent of their body weight. Whole milk, calf starter and green fodder were fed as per ICAR (1991) standard feeding schedule. Whole milk was fed after completion of colostrum feeding and calf starter along with green fodder were offered from 2nd week onwards. The feed was divided into two equal halves and fed to the calves in the morning and evening. Green fodder was offered *ad libitum* and clean water was made available all the times.

Birth weight and leaner body measurements were recorded prior to feeding of colostrum. The body weight and leaner body measurements were recorded at weekly intervals up to 13th weeks of age. The daily intakes of whole milk, fodder and calf starter were recorded up to 13th weeks of age. Blood samples were collected in the beginning of the experiment and then at fortnightly interval up to the end of the study. The statistical analysis of the experimental data was carried out as per the standard methods [11].

RESULTS AND DISCUSSION

The overall mean body weight changes, weekly body weight gain and daily body weight gain of calves in Group I and Group II were recorded as 44.48 ± 0.12 and 40.17 ± 0.11, 2.79 ± 0.24 and 2.52 ± 0.23, and 0.39 ± 0.04 and 0.35 ± 0.03 kg respectively. Highly significant differences ($P<0.01$) were observed between the groups in respect of weekly body weight gain and mean daily body weight gain while no significant difference was observed in respect of mean initial and final body weight of calves. The present findings are in close agreement with reports of other workers [1, 6] in crossbred calves.

The overall mean body length, height at withers and heart girth of calves in Group I and Group II were recorded as 74.27 ± 0.30 and 73.88 ± 0.26, 75.44 ± 0.20 and 75.47 ± 0.23, and 91.35 ± 0.94 and 90.95 ± 0.91 cm respectively. No significant difference was observed between the groups in respect of initial and final body length, height at withers and heart girth of calves. Similar observations were also reported by workers [10] in buffalo calves and other workers [2, 5] in dairy calves.

Table 1 : Correlation coefficient (*r*) between body weight and body measurements of crossbred calves

Group	Body weight and body length	Body weight and heart girth	Body weight and height at withers
I	0.97**	0.975**	0.96**
II	0.96**	0.97**	0.95**

The body weight of calves had highly significant positive correlation with body length, heart girth and height at withers. Certain workers[13] also observed similar trends in crossbred calves.

Table 2 : Average total feed intake, DMI from feed, DMI per 100 kg body weight and FCR in crossbred calves

Particulars	Total intake (kg) of			DMI (kg) from			D M I/ 100 kg body weight	FCR
	Whole milk	Green Fodder	Calf starter	Whole milk	Green Fodder	Calf starter		
Group I	134.80 ± 0.01	105.06 ± 0.01	89.40 ± 0.12	24.23 ± 0.01	26.23 ± 0.03	81.26 ± 0.02	4.75 ± 0.03	3.23 ± 0.03
Group II	133.78 ± 0.04	125.56 ± 0.02	87.50 ± 0.12	24.07 ± 0.02	25.65 ± 0.02	80.37 ± 0.05	4.52 ± 0.03	3.42 ± 0.45
'F' value between groups	1.34^{NS}	1.4251^{NS}	1.1246^{NS}	0.304548^{NS}	2.961^{NS}	2.406^{NS}	118867.8**	16657.99**

Table 3 : Economics of feeding

Groups	Calf starter			Whole milk			Green fodder			Total cost of feed (Rs.)	Total weight gain (Kg)	Cost of feed/Kg weight gain (Rs.)
	Cost/Kg (Rs.)	Intake (Kg)	Cost of feed (Rs.)	Cost/Kg (Rs.)	Intake (Kg)	Cost of feed (Rs.)	Cost/Kg (Rs.)	Intake (Kg)	Cost of feed (Rs.)			
I	13.50	89.40	1206.90	20.00	134.80	2996.00	0.20	105.06	21.01	4223.91	36.18	116.74
II	12.50	87.50	1093.70	20.00	133.70	2674.00	0.20	125.50	25.10	3792.80	32.93	115.17

There was no significant difference in the total intake of whole milk, green fodder and calf starter between the experimental groups. However, in the present study the total whole milk consumption was as per recommendation of ICAR (1991). The whole milk feeding was decreased gradually as the calves became older and totally stopped from 10th week of age as they consumed appreciable amount of calf starter and green fodder. The calf starter consumption was found to be more by the calves of Group I which might be due to better nutrient utilization because of higher availability of soluble carbohydrates in the ration.

There was no significant difference in dry matter intake through whole milk, calf starter and green fodder between the experimental groups. The present finding is in close conformity with the findings of other workers [14, 3].

Highly significant difference (P<0.01) was observed between the groups in respect of dry matter intake per 100 kg body weight. A group of workers [3] also reported mean dry matter intake per 100 kg body weight as 1.25 to 5.05 kg in crossbred calves when fed restricted milk feeding along with calf starter. But much lower value of dry matter intake in crossbred calves (1.95 to 3.50 kg per 100 kg body weight) was reported by certain workers [9]. The higher dry matter intake by the calves of the experimental groups might be due to low energy density in the ration.

Highly significant difference (P<0.01) were observed between the groups in respect of feed conversion efficiency. Other workers [3] also reported similar findings of feed conversion efficiency in crossbred calves.

Table 4 : Overall mean calcium, protein, glucose concentration in crossbred calves.

Particulars	Calcium (m. mol/litre)	Protein (gm/dl)	Glucose (gm/dl)
Group I	2.70 ± 0.12	7.52 ± 0.22	70.77 ± 1.50
Group II	2.60 ± 0.04	6.72 ± 0.18	71.22 ± 1.99
'F' value between groups	12.0602*	48.64877*	0.603285^{NS}

The serum calcium level was found to differ significantly (P<0.01) between the two groups. A group of workers [7] reported similar findings of serum calcium level as 2.68 ± 0.04 and 2.67 ± 0.03 m.mol/lit in pre-weaning (5 to 19 days old) and post-weaning (105 to 180 days old) calves respectively with significant difference between the two levels. Another group of workers [4] also reported serum calcium concentration as 2.64 m.mol/lit in crossbred calves.

The serum protein level was found to differ significantly (P<0.01) between the two groups. This finding is in close agreement with the reports of workers [8] who recorded a mean total serum protein level as 7.04 ± 0.10 and 7.25 ± 0.11 g/dl in younger and aged cattle respectively.

The blood glucose level was not found to differ significantly between the two groups. The blood glucose level was found to be higher at early age but reduced gradually with the advancement of age which is corroborated well with the study conducted by a group of workers[12].

The cost of feeding was declined sharply as soon as the whole milk feeding was stopped after 9th week of age. The cost of feeding per kg weight gain was found to be higher in Group I but the difference was not significant between the groups.

CONCLUSION

Based on the present findings it might be concluded that the crossbred calves can be raised economically by replacing maize at 50 per cent level in calf starter ration without affecting growth, feed intake, feed conversion efficiency, nutritional status and health of the calves. Green fodder should be offered *ad libitum* with limited amount of whole milk feeding. Clean water should be made available round the clock.

However, further study needs to be carried out with large sample size to arrive at a definite conclusion.

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