



ISSN (E): 2277- 7695  
ISSN (P): 2349-8242  
NAAS Rating: 5.23  
TPI 2021; SP-10(7): 858-860  
© 2021 TPI  
[www.thepharmajournal.com](http://www.thepharmajournal.com)  
Received: 13-02-2021  
Accepted: 15-03-2021

**Kamalahasan K**  
M.V.Sc (LPM), Department of  
Livestock Production  
Management, College of  
Veterinary and Animal Sciences,  
Mannuthy, Thrissur, Kerala,  
India

**Sabin George**  
Assistant Professor, Department  
of Livestock Production  
Management, College of  
Veterinary and Animal Sciences,  
Mannuthy, Thrissur, Kerala,  
India

**Corresponding Author:**  
**Kamalahasan K**  
M.V.Sc (LPM), Department of  
Livestock Production  
Management, College of  
Veterinary and Animal Sciences,  
Mannuthy, Thrissur, Kerala,  
India

## Effect of feeding milk replacer on the growth measurements of crossbred calves

**Kamalahasan K and Sabin George**

### Abstract

This study was carried out to evaluate the effect of feeding milk replacer on growth parameter of crossbred calves. Eighteen healthy crossbred calves both male and female around one week of age were selected and randomly divided into three groups of six each (T1, T2, and T3), as uniformly as possible with regard to age, sex, and body weight. The calves of T1 received whole milk as per routine farm practice, T2 group was offered whole milk plus commercial milk replacer as per manufacturers recommendation and T3 group was offered a formulated milk replacer @ 12.5 per cent of body weight. All the calves received ad libitum green fodder. The means body length at initial in T1, T2 and T3 were 55.66±1.42, 55.16±0.7 and 54.5±0.61 cm, respectively and at the end of the experiment corresponding body length were 70.66±1.56, 68.16±1.93 and 67.83±1.01 respectively. There was no significant difference in body length at fortnightly intervals in crossbred calves. The initial mean height in T1, T2 and T3 were 67.66±1.66, 68.33±1.87 and 68.83±1.37 cm, respectively and the corresponding height at the end of the experiment were 84.43±2.05, 79.83±1.68 and 80.5±0.92 respectively. The height at withers of crossbred calves had no significant difference during the period of the experiment. The mean initial heart girth in T1, T2 and T3 were 68±1.18, 69.5±1.25 and 67.16±1.07 cm, respectively and at the end of the experiment corresponding heart girth were 88±2.78, 83±1.36 and 83.3±1.85 cm respectively. The fortnight heart girth was statistically non-significant between the treatments. This result shows that feeding of milk replacer to cross bred calves have no impact on their growth parameters.

**Keywords:** crossbred calves, milk replacer, fortnight, growth parameter

### Introduction

Calf is the future of a dairy herd. The success of dairy farming mainly depends on rearing of calves to a breedable age at a faster rate with minimum mortality. The first 90 days of calves was always neglected by dairy farmers in terms of feeding milk which results in mortality and delayed puberty. So initial milk feeding and impact on farmers economy has to be addressed. For this an alternatives was milk replacers which were developed in many countries to cut down rearing cost and to spare milk for human consumption (Mete *et al.*, 2000) [2]. Being a good liquid feed alternative to raise calves, Milk replacer has many advantages like; it is cheaper than whole milk, storage flexibility, day to day constancy of product and conducive to the control of diseases in the calves (Heinrichs, 1995) [1]. The present study was investigated on growth parameters of crossbred calves under different feeding systems.

### Materials and Methods

The study was conducted for a period of three months in University Livestock Farm and Fodder Research and Development Scheme (ULF and FRDS), College of Veterinary and Animal Sciences, Mannuthy during 2017-2018. Eighteen healthy crossbred calves both male and female around one week of age were selected and randomly divided into three groups of six each (T1, T2, and T3), as uniformly as possible with regard to age, sex and body weight. The calves were dewormed as per routine farm practice (at 15<sup>th</sup> and 45<sup>th</sup> day of age) during the experimental period. All the experimental calves were maintained under identical conditions of feeding and management throughout the experimental period, except for milk feeding as followed.

T1: Feeding whole milk (Farm practice)

T2: Feeding commercially available milk replacer (CMR)

T3: Feeding formulated milk replacer (FMR) with 25 per cent crude protein

From the first week to 90 days T1 was fed with whole milk as per standard routine farm practice.

The group T2 was fed with a combination of Commercial milk replacer (Jeevan-Amul®) and whole milk as per manufacturer recommendations and the group T3 was fed with a formulated milk replacer given @ 12.5 per cent body weight. The formulated milk replacer consists of Table -1 proportion (Shukla *et al.*, 2016)<sup>[5]</sup>.

All calves were fed liquid milk and milk replacer with an upper limit of 4 kg/day. The liquid milk replacer of T2 and T3 was prepared by dissolving 100 g powder in one liter of boiled water and fed at 38 °C to 40 °C temperature in two equal parts. All the groups were fed throughout the experiment period as per the schedule Table-2, Table-3 and Table-4.

**Table 1:** Composition formulated of milk replacer

Ingredients	Parts (%)
Milk	20
Skimmed milk powder	10
Soya meal	25
Maize	30
Palm Oil	12
Minerals	2
Salt	1
Nicomix	0.020
Total	100

**Table 2:** Feeding schedule of treatment 1 group of calves

Age in weeks	Whole milk (Body weight)	Calf starter (g)
1 wk	Colostrum 1/10 B.wt	Nil
2 wk	1/10	Nil
3-4 wks	1/10	150g
5-6 wks	1/10	400g
7-8 wks	1/15	
9-12 wks	1/20	600g

**Table 3:** Feeding schedule of treatment 2 group of calves

Age in weeks	Whole milk(kg)	Commercial milk replacer(g)	Calf starter (g)
1 week	Colostrum 1/10 B.wt	Nil	Nil
2 week	3.0	50	Nil
3week	1.0	150	150g
4 week	1.0	250	
5 week	Nil	350	400g
6 week		450	
7 week		500	
8 week		400	
9-12 weeks		400	600g

(\*As recommended by manufacturer)

**Table 4:** Feeding schedule of treatment 3 group of calves

Age in weeks	Whole milk	Formulated milk replacer	Calf starter (g)
1 week	Colostrum 1/10 B.wt	Nil	Nil
2 wk	1/10	Nil	Nil
3-4 wks	Nil	Milk @ 12.5 % of body weight upper limit 4 kg	150g
5-8 wks	Nil		400g
9-12 wks	Nil		600g

\* Green fodder will be fed ad libitum in all three experiment groups

### Fortnight measurement of growth parameters

Along with the recording of fortnight body weight, the body

measurements were taken with the help of measuring tape on centimeters scale (cm) at fortnight interval for each calf. Body measurements were taken when the calves were standing in a normal body posture. The body measurements of calves recorded was as follows:

#### Body length

Body length of calf was measured by taking the distance from point of withers to point of pin bone.

#### Height at withers

Height at withers was measured at highest point of the body (from ground level to the point of withers).

#### Heart girth

The measurement of heart girth was taken when the calves were standing in a vertical position (smallest circumference immediately behind the shoulder).

### Results

#### Body length

The mean body length at fortnight intervals is presented in Table 5. The means body length at initial in T<sub>1</sub>, T<sub>2</sub> and T<sub>3</sub> were 55.66±1.42, 55.16±0.7 and 54.5±0.61 cm, respectively and at the end of the experiment corresponding body length were 70.66±1.56, 68.16±1.93 and 67.83±1.01 respectively. There was no significant difference in body length at fortnightly intervals in crossbred calves.

#### Height at withers

The mean height at withers in dietary treatments measured at fortnight intervals has been presented in Table 6. The initial mean height in T<sub>1</sub>, T<sub>2</sub> and T<sub>3</sub> were 67.66±1.66, 68.33±1.87 and 68.83±1.37 cm, respectively and the corresponding height at the end of the experiment were 84.43±2.05, 79.83±1.68 and 80.5±0.92 respectively. The height at withers of crossbred calves had no significant difference during the period of the experiment.

#### Heart girth

The mean heart girth at fortnightly intervals is presented in Table 7. The mean initial heart girth in T<sub>1</sub>, T<sub>2</sub> and T<sub>3</sub> were 68±1.18, 69.5±1.25 and 67.16±1.07 cm, respectively and at the end of the experiment corresponding heart girth were 88±2.78, 83±1.36 and 83.3±1.85 cm respectively. The fortnight heart girth was statistically non-significant between the treatments.

**Table 5:** Fortnight of body length (cm) of the crossbred calves

Fortnight	Dietary treatments			P value	F value
	T <sub>1</sub>	T <sub>2</sub>	T <sub>3</sub>		
Initial	55.66±1.42	55.16±0.7	54.5±0.61	0.709 <sup>ns</sup>	0.352
1	59.33±1.58	58±1.15	59±1.06	0.752 <sup>ns</sup>	0.752
2	63±1.29	60±0.73	60±1.21	0.120 <sup>ns</sup>	2.455
3	64.5±1.83	62.83±0.9	62.66±1.33	0.608 <sup>ns</sup>	0.515
4	67.33±1.68	63.16±0.98	63.66±1.05	0.072 <sup>ns</sup>	3.158
5	68.66±1.66	64.66±1.2	65.5±1.36	0.145 <sup>ns</sup>	2.200
6	70.66±1.56	68.16±1.93	67.83±1.01	0.393 <sup>ns</sup>	0.995

<sup>1</sup>Average of six values with SE

ns- Non significant, P>0.05

**Table 6:** Fortnightly height at withers (cm) of the crossbred calves

Fortnight	Dietary treatments			P value	F value
	T <sub>1</sub>	T <sub>2</sub>	T <sub>3</sub>		
Initial	67.66±1.66	68.33±1.87	68.83±1.37	0.883 <sup>ns</sup>	0.126
1	70.16±1.66	71.16±1.47	71±1.26	0.887 <sup>ns</sup>	0.132
2	75.5±1.85	72.5±1.05	73.33±1.6	0.379 <sup>ns</sup>	1.036
3	76.83±1.53	74.66±1.40	74±1.03	0.324 <sup>ns</sup>	1.218
4	79.16±2.15	75.66±1.35	75.66±1.08	0.234 <sup>ns</sup>	1.601
5	81.83±1.85	78.16±1.75	77.66±1.25	0.181 <sup>ns</sup>	1.917
6	84.83±2.05	79.83±1.68	80.5±0.92	0.093 <sup>ns</sup>	2.797

<sup>1</sup>Average of six values with SE

ns- Non significant,  $P>0.05$

**Table 7:** Fortnightly mean heart girth (cm) of the crossbred calves

Fortnight	Dietary treatments			P value	F value
	T <sub>1</sub>	T <sub>2</sub>	T <sub>3</sub>		
Initial	68±1.18	69.5±1.25	67.16±1.07	0.387 <sup>ns</sup>	1.012
1	70.66±1.35	71.83±1.24	71.5±1.14	0.798 <sup>ns</sup>	0.229
2	74.33±2.21	74.16±1.13	72.66±1.22	0.726 <sup>ns</sup>	0.328
3	77.83±2.27	75.5±1.28	74.5±1.25	0.376 <sup>ns</sup>	1.046
4	82±2.56	77.83±1.32	77.16±1.83	0.206 <sup>ns</sup>	1.756
5	84.5±2.24	81.33±1.47	80.66±1.62	0.308 <sup>ns</sup>	1.275
6	88±2.78	83±1.36	83.33±1.85	0.200 <sup>ns</sup>	1.797

<sup>1</sup>Average of six values with SE

ns- Non significant,  $P>0.05$

## Discussion

The body measurements did not shown any significant difference among the groups. Body measurements provide the overall gross picture of skeletal and tissue growth of the animal. A clear increment in the body measurements were found in all the groups as the age progressed in the present study. The present study agreed with Shakya *et al.*, (2017) <sup>[4]</sup> and Morang *et al.* (2012) <sup>[3]</sup> indicated that by feeding soyamilk and milk replacer no significant difference was observed in body measurement of dairy calves. In contrary to the present findings, Shukla *et al.* (2016) <sup>[5]</sup> reported a significant difference in the body measurements of crossbred calves when fed with whole milk, commercial milk replacer and formulated milk replacer

## Conclusion

From the present experiment results, it can be concluded that feeding of milk replacers in crossbred calves have no effect on their growth parameters.

## Acknowledgement

The authors are grateful to the Hon'ble Vice Chancellor, Registrar, Director (Academics & Research) and Director (Entrepreneurship), Kerala Veterinary and Animal Sciences University, Pookode and Dean, College of Veterinary and Animal Sciences, Mannuthy, for providing necessary facilities for successful conduct of the work.

## References

1. Heinrichs AJ, Wells SJ, Losinger WC. A study of the use of milk replacers for dairy calves in the United States. *J Dairy Sci* 1995;78:2831-2837.
2. Mete Y, Sadrettin Y, Ugur Z, Yanar M, Yuksel S, Zulkadir U. Replacement of whole milk by milk replacer in the ration of Holstein-Friesian calves raised in Eastern Turkey. *Ind. J Anim. Sci* 2000;70:977.
3. Morang M, Sarma NK, Saharia J. Body weight, body measurements and physiological responses of yak calves under artificial rearing systems. *Indian J Anim. Prod.*

*Mgmt* 2012;28:234-238.

4. Shakya A, Roy B, Baghel RPS. Effect of soymilk as partial milk replacer on feed intake and growth performance on Murrah buffalo calves. *Buffalo Bull* 2017;36:537-546.
5. Shukla R, Shah SV, Pandya PR, Lunagariya PM, Parmar M, Divekar BS. Impact of feeding milk replacer on growth rate and blood parameters in Holstein x kankrej crossbred calves. *Int. J Sci. Environ. Technol* 2016;5:3847-3855.
6. Snedecor GW, Cochran WG. *Statistical Methods.* (8<sup>th</sup> Ed). The Iowa State University Press, Ames, Iowa, USA 1994.