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COMPARATIVE STUDY OF FEEDING MILK REPLACER, WHOLE MILK PLUS MILK REPLACER BLEND AND WHOLE MILK ON DRY MATTER INTAKE, AVERAGE DAILY GAIN AND FEED CONVERSION RATIO IN NILI RAVI BUFFALO CALVES

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ABSTRACT

Buffalo calves are generally deprived of milk due to high prices of buffalo milk. The experiment was planned to find out the result of whole milk, calf milk replacer and whole milk cum milk replacer on dry matter intake, average daily weight gain, and feed efficiency in Nili Ravi buffalo calves. Eighteen newborn buffalo calves were randomly divided into three treatment groups. Six calves in each treatment group. Treatment A (Whole milk), B (50% whole milk & 50% milk replacer) & C (milk replacer). All the calves were fed calf starter (19% CP) from day 20 to day 120 of age. They had free access to drinking water. Green fodder was given to all the treatment calves from day 60 to day 120 of age. The average dry matter intake on a daily basis in treatment A, B and C was 1540.5±2.0936, 1534.7±2.5386 and 1529.2±1.5366 g, respectively, The least square mean of total dry matter was higher in treatment of whole milk group than treatment of milk replacer group, while it was similar (P>0.05) between whole milk group treatment and 50% whole milk group + 50% milk replacer group. There was also non-significant difference in treatment group of 50% whole milk + 50% milk replacer and milk replacer treatment group. The average weight gain on daily basis for groups of treatment A, treatment B and Treatment C was 442.00±6.6933, 438.50±0.7638 and 401.17±2.3863 grams respectively. Average daily weight gain was higher in whole milk treatment group than group of milk replacer Treatment, while it was similar (P>0.05) among Treatment groups of whole milk and 50% whole milk + 50% milk replacer. The mean values for FCR in all the three treatment groups (A, B and C) were 3.4895±0.0561, 3.4998±5.306 and 3.8125±0.0225, respectively. The feed conversion ratio (FCR) of treatment group A and treatment group B was lesser than FCR of treatment group C. It can be accomplished that 50% whole milk can be replaced with calf milk replacer on a daily basis milk allowance of Nili Ravi buffalo calves devoid of effecting dry matter intake, growth and feed efficiency.

***Keywords**: whole milk, milk replacer, weight gain, dry matter intake*

1. INTRODUCTION

Buffalo has native capability to produce milk having milk fat ranging from 6 – 8 percent. Due to this higher level of fat content in the milk, the milk of the buffalo is prefer over the milk of the cow (Sarwar et al., 2002, Khan et al., 2008). Under existing husbandry situation, neonatal calves are often affected because of lack of milk fed to them due to high price of buffalo milk in market. Due to this reason, there are more mortality in the calves and also results in delayed puberty. There are many factors like management, nutrition and health of the calves which directly affect the growth of the calves (Heinrichs et al., 1995). Feeding of milk replacer to the dairy calves can save milk for human use, which is also a profitable job. (Bamn, 2002).

Those animals which, grow up rapidly and attain puberty at a younger age they become productive earlier. The use of calf milk replacer instead of fresh milk is also helpful to grow earlier. The composition of the calf milk replacer, amount of feeding and feeding method directly affect the health, performance and behavior of the new born calves (Brown et al., 2005; Khan et al., 2007). Calf Milk replacer is a good quality liquid feed for calves. Calf milk replacer is very cost-effective as compare to whole milk. It can also be handled more easily by labor (Heinrichs et al., 1995). The overall aim of the study is to determine the effect of feeding fresh milk, fresh milk + milk replacer and milk replacer on the performance (dry matter intake, average daily weight gain and FCR) of Nili-Ravi buffalo calves.

Objectives

- To observe the comparative effect of feeding milk replacer and whole milk on dry matter intake, average daily gain and FCR in Nili Ravi Buffalo calves
- To check the effect of feeding different level of milk replacer on health status of Nili Ravi Buffalo calves.

MATERIALS AND METHODS

The experiment was conducted at Livestock Research and Development Station Paharpur, Dera Ismail Khan. Eighteen newborn Nili Ravi buffalo calves were used in the experiment. The buffalo calves were kept in separate pens having rice straw (Paddy straw) as bedding material. The buffalo calves had free access to calf starter ration and fresh water. Colostrums were fed to the calves for three days. The whole milk was fed to the newborns @ 10 % during adjustment period of fifteen days.

Buffalo calves were divided into three experimental treatment groups (A, B and C).

The animals in treatment group A were fed whole milk @ 10% of their body weight.

Buffalo calves in treatment group B were given 50% whole milk: 50% milk replacer (150 grams dry milk replacer was mixed in 01 liter of warm water (60 °C) @ 10% of their body weight.

Buffalo calves in treatment group C were fed calf milk replacer (150 grams dry milk replacer was mixed in 01 liter of warm water (60 °C) @ 10% of their body weight. The green fodder and calf starter ration were given ad libitum to the buffalo calves.

Table 1. Chemical composition of calf milk replacer and calf starter. (% dry matter).

INGREDIENTS	MILK REPLACER	CALF STARTER RATION
Dry matter	95.0	90.0
Crude protein	22	19
Crude Fat	18	4.0
Ash	08	09

Liquid diet was offered two times a day up to the age of 120 days, through calf feeder fitted with soft rubber nipple. The calf feeder was washed using detergent after each feeding and dried in sun light. Liquid diet was fed to all the calves for the first 8 weeks @ 10% of their body weight. Liquid diet was decreased @ 1 % decline every week up to weaning at 120th day of the experiment. As decline in the liquid feed started, the green fodder was offered after eight weeks. For the calculation of intake of green fodder and calf starter ration, feed refusal was calculated on daily basis.

Weight of the calves was measured at the start of experiment and then at weekly interval. Feed conversion ratio was calculated as the ratio of dry matter intake to live weight gain (Lamb, 2009). FMD and HS vaccination were done to all the calves at the age of one month. Deworming was done at day 25 of age. Calves were kept under observation for any change in the behavior and they were treated accordingly.

Collected data were analyzed using ANOVA technique using Completely Randomized Design by using SAS 9.1. Differences among treatment means was tested through LSD test (Steel et al, 1997).

2. RESULTS

The performance parameters of buffalo calves fed either milk, milk replacer or the blend are shown in Table 2.

Table .2 Performances of Nili-Ravi buffalo calves raised on whole milk and on milk replacer.

Parameters	Treatment A (Whole Milk)	Treatment B (50% WM+ 50%MR)	Treatment C (Milk Replacer)
Total DMI (g)	1540.5a ± 2.0936	1534.7ab ± 2.5386	1529.2b ± 1.5366
Average Daily weight Gain (g)	442.00a ± 6.6933	438.50a ± 0.7638	401.17b ± 2.3863
FCR	3.4895b ± 0.0561	3.4998b ± 5.306E-03	3.8125a ± 0.0225

WM= Whole milk, MR= Milk replacer. DMI= Dry matter intake. FCR=Feed conversion ratio.

The least square mean of total dry matter was higher ($P<0.05$) in treatment of whole milk group than milk replacer treatment group, while it was related ($P>0.05$) between treatment of whole milk group and 50% whole milk + 50% milk replacer group. There was also non-significant ($P>0.05$) difference in 50% whole milk + 50% milk replacer treatment group and treatment of milk replacer group. Slight increase in the dry matter intake was observed in the buffalo calves in the whole milk treatment group. This might be due to higher fat contents of whole milk. Average daily weight gain was higher ($P<0.05$) in whole milk treatment group than milk replacer group, while daily weight gain was observed similar ($P>0.05$) between whole

milk treatment group and 50% whole milk + 50% milk replacer group. The difference between Treatment group A and treatment group C might be due to more DMI in treatment A than that in Treatment C. The Feed conversion ratio is a valuable tool to assess the effects of diet value, environmental and manage mental practices on effectiveness in growing calves. Better ($P<0.05$) FCR was observed in group of treatment A than that in treatment C group. FCR was observed similar ($P>0.05$) between groups of treatment A & Treatment B. 65% and 35% animals and vegetable sources were used in the composition of milk replacer respectively. The improved FCR in treatment group A may be due to healthier palatability of whole milk as animal source ingredients are more palatable than vegetable source.

3. DISCUSSION

The findings of non-significant difference ($P>0.05$) in the dry matter intake of the two treatments: Treatment A and treatment B are similar to those observed by Hill et al., 2008a. It was narrated that dry matter intake was similar by the use of more fat in liquid diet. The average daily gain of calves raised on treatment A, B and C liquid diets was 442.00, 438.50 and 401.17 gm/day. These findings are in line with the finding of Hill et al., 2008b who observed average daily gain of calves were 0.437 kg/day, 0.380kg/day and 0.375 kg/day raised on different liquid diets. The findings of average daily gain are not in line with the finding of Hill et al., 2008a who observed the average daily gain of calves on milk replacer was 368gm/day. The findings of FCR for treatment A, B and C were 3.48, 3.499 and 3.812, respectively. These findings were same as observed by Lee et al., (2008). They observed 3.9 FCR on high protein diet and 4.2FCR on high energy diet.

IMPLICATIONS

It was concluded that Nili Ravi buffalo calves gained more on whole milk and 50% whole milk + 50% milk replacer diet. There is non-significant difference in the average daily weight gain of calves raised on these two treatments. So, It can be concluded from this study that 50% whole milk can be replaced with milk replacer in daily milk allowance of the Nili Ravi calves without effecting the growth rate and dry mater intake, with better feed conversion ratio.

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