Effect of Calf Management Practices in Buffalo to Manage Calf Mortality

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ABSTRACT

The present study was conducted to assess the effect of calf management practices in buffalo to manage calf mortality. Trial was conducted on 40 buffalo calves of same breed selected from village-Sangteda, Block- Kotputli, District- Jaipur, Rajasthan. Buffalo calves were divided in two group; 20 buffalo calves were kept in each group viz. control (T_1) and treatment group (T2). Two buffalo calves of each farmer were selected to maintain similarity in management practice. Treatment group (T_2) calves were cut naval cord and treatment with tincture iodine, colostrums feeding with in 1 hour of calving @ 10% of calf body weight, de-worming with albendazole at 7 and 21 days after caving whereas the control group (T_1) was not adopted these practices. The data were recorded by the farmers daily and by the researcher at fortnightly interval. Analysis of data revealed that adopted calf management practices decrees calf mortality 25 percent in treated group as well as average daily body weight gain of calves 22.43 percent more in treatment group. The B:C ratio of adopted calf management practices observed 1: 34.24 under farmer management practices. These findings may suggest that adoption of cut naval cord and treatment with tincture iodine, colostrums feeding with in 1 hour of calving @ 10% of calf body weight, deworming with albendazole at 7 and 21 days after caving enhanced daily body weight gain and reduces calf mortality for getting higher return and sustainable profit from buffalo farming.

HIGHLIGHTS

◉ Calf management practices immediate after caving are crucial for their life and productivity.

◉ These practices decreased calf mortality by 25 percent, increased average daily body weight by 22.43% with B:C ratio of 1: 34.24.

India ranks first in the world in milk production, which went up from 17 million tonnes in 1950-51 to 198.4 million tonnes in 2019-20 (Economic Survey, 2021) and 49% of milk in India is produced by buffaloes. Livestock sector in India has emerged as an important sector for employment generation and providing a stable source of income to rural farmers. In India majority of the ruminants are reared by small, marginal and landless farmers and most of them do not follow general management practices (Kumar *et al*., 2021) specifically for buffalo calves. The calves form the future herd (Kumar *et al*., 2017) and economic return can be optimized by reducing calf mortality and adopting better management and husbandry practices. Poor management practices leads to economic losses to the farmers in terms of higher calf mortality, poor growth rate, delayed maturity and poor productivity. Further, not or imbalance feeding of colostrum to new born calves reduces the immunity of calves and makes them susceptible to the diseases (Lopez and Heinrichs, 2022). Scientific management of calf rearing plays a crucial role in dairy development. The success of dairy enterprise

depends on better managemental practices and survival of the calf crop produced. High survival rate in a dairy farm helps to increase the selection pressure which is one of the main factor controlling genetic gain and profitable returns. Calf care is not only essential for sustenance of the dairy herd, but also essential in the wake of preserving and maintaining proven germ plasm. Mortality of calf is an important trait both for breeding and economic point of view in dairy enterprise. The first month of the Buffalo calf's life is very crucial and it is found that the calf mortality is as high as 19.5% (Sreedhar *et al.*, 2010). The major approximately 30% mortality in calf is recorded due to gastrointestinal infection (Nehru *et al.*, 2017). Calf mortality was associated with the type of housing, feeding, managemental practices, weather conditions, external and internal parasitic infestation and bacterial infections especially those causing septicemia and enteritis (Patbandha *et al.*, 2017). Calf plays an important role in the development and profitability of a dairy farm and dairy farmers, as the future of the dairy herd solely depend on the successful raising of the young calves. Important aspects in calf rearing are health management and proper nutrition (Kumar *et al.*, 2021). Large numbers of calves die causing heavy drain on the economics of livestock production. It is estimated that 20% neonatal calf mortality can reduce net profit by 38% (Shakya *et al.*, 2017). Studies revealed the poor condition of calves in the villages wherein the farmers were not much aware about the scientific calf management practices. Kumar *et al.* (2021) reported that in commercial dairy farms, the main cause of high buffalo mortality is the inadequate feeding and health facilities like colostrum feeding, improper milk feeding, navel cord disinfection and timely treatment of disease. Heavy buffalo calf mortality has been reported particularly during first few months of their postnatal life (Patbandha *et al.*, 2017). Navel ill or omphalitis is one of the most common diseases of newborn calves. The infection leads to inflammation of umbilical cord causing hot and painful swelling. Besides omphalitis, the infection may also spread to joints and other organs via haematogenous route causing joint ill and other serious complications. This spread of infection to different body organs enhance the mortality rates many fold in calves. Umbilical vein and urachus remain open for few days after birth as compared to umbilical arteries predisposing to navel ill in calves. Colostrum feeding practice was followed; however, only 28.3% owners fed colostrum within 2 hours of birth i.e. ideal time of colostrum feeding to calf for maximum passive immunity. Umbilical dipping with antiseptic solutions reduce the chances of navel ill. Tincture of iodine (7% w/v) is most commonly used navel antiseptic dip solution (Kharb *et al.*, 2021). Calf mortality is a major concern at farmer level as well as at organized farm. High mortality rate of buffalo calves indicates that farmers were not following scientific management practices due to lack of knowledge and awareness. Therefore, the present study was conducted to assess the effect of calf management practices in buffalo to manage calf mortality at farmer's field in rural areas under a semi-intensive management system in Jaipur district of Rajasthan State, India.

MATERIALS AND METHODS

The present study was conducted under on-farm trial laid out during 2018-19 and 2019-20 in village-Sangteda, Block- Kotputli, District- Jaipur, Rajasthan to evaluate the effect of calf management practices in buffalo to manage calf mortality. Every year, twenty buffalo calves were selected from Sangteda village to carry out this study. A total of 40 buffalo calves of murrah breed were selected of 20 farmers. Buffalo calves were divided in two group; 20 buffalo calves were kept in each group viz. control (T1) and treatment group (T2). Two buffalo calves of each farmer were selected to maintain similarity in management practice. Treatment group (T_2) calves were cut naval cord and treatment with tincture iodine, colostrums feeding with in 1 hour of calving @ 10% of calf body weight and milk feeding @ 10% of calf body weight per day, de-worming with albendazole (30ml) at 7 and 21 days after caving whereas the control group (T_1) was not adopted these practices. The data were recorded by the farmers daily and by the researcher at fortnightly interval. A training programme was conducted for the farmers before starting the experiment to educate them for correct method of data recording on different parameters. The trail was conducted for a period of 120 days. The data were tabulated and analyzed as per ANOVA generalizes the linear model (GLM). The BCR for all two groups were calculated. The data were analyzed statistically in a completely randomized design and the significances of the difference means was determined by using generalizes the linear model.

RESULTS AND DISCUSSION

The results and discussions of the present study have been presented under following sub heads:

Body weight gain

Body weight gain parameters of buffalo calf in the treated group (T_2) and control group (T_1) have been presented in table 1. The pooled 120 days total Average body weight gain during the trial period was observed 64.40±0.46 and 52.60±0.53 kg/buffalo calf in treated and control group, respectively. It indicates that the average body weight gain of buffalo calf in demonstrated group was significantly higher ($P<0.01$) as compared to control group. The pooled Average body weight gain in per day was observed 536.67 gm and 438.83 gm/buffalo calf in treated and control group, respectively. Average daily body weight gain was found higher in demonstrated group over control group by 22.30 percent. The trends of average daily gain among the groups was similar to total weight gain. Body measurement of calves: The body measurement (cm) of buffalo calves, viz. body length, height at withers and heart girth. The present results indicating that calves were cut naval cord and treatment with tincture iodine, colostrums feeding with in 1 hour of calving @ 10% of calf body weight and milk feeding @ 10% of calf body weight per day, de-worming with albendazole (30 ml) at 7 and 21 days after caving could increase body weight gain. Almost similar results were reported by Bharti *et al*., 2018, the average daily gain in control, T_1 and T_2 was 0.501, 0.409 and 0.458 kg, respectively and by Pramod S. 2018, the average daily gain observed was 0.595 Kg and 0.612 Kg in male and female calves respectively. Similar findings were also observed by Rana *et al*. (2000), the animals of treatment group received significantly higher daily weight gain compared to control group and higher average body weight at 90 days of age was reported from a sample of male & female Murrah calves by Kumar *et al*. (2017).

Calf mortality

Calf mortality of buffalo calves in the treated group (T_2) and control group (T_1) have been presented in table 2. Mean buffalo calf mortality during the trial period was observed 0.0 and 25 percent in treated and control group, respectively. Mean buffalo calf mortality percent was found lesser in demonstrated group over control group by 25.0 percent. High mortality rate of buffalo calves indicates that farmers were not following scientific management practices. Calf mortality was mainly due to poor management like lack of minimum care of naval cord

Table 1: Effect of calf management practices on buffalo calf body weight gain

Treatment	Average 120 day total body weight gain (Kg/calf)			Average body weight gain (gm/day/calf)		
	2018-19	2019-20	Pooled	2018-19	2019-20	Pooled
T_1 (Control group)	53.43	51.88	52.60	445.25	432.33	438.83
SEM	0.85	0.60	0.53			
T_2 (Treated Group)	65.00	63.80	64.40	541.67	531.67	536.67
SEM	0.71	0.54	0.46			
P value	<0.01	<0.01	<0.01			

* $P<0.01$.

Table 2: Effect of calf management practices on buffalo calf mortality (%)

Treatment	Calf mortality (%)		
	2018-19	2019-20	Mean
T_1 (Control group)	30	20	25
T_2 (Treated Group)	0	0	0
Decrease calf mortality %	30	20	25

Table 3: Economics of calf management practices on buffalo calf

Para meters	T₁ (Control group)			T₂ (Treated Group)		
	2018-19	2019-20	Mean	2018-19	2019-20	Mean
Average body weight gain (kg/calf)	53.43	51.88	52.60	65.00	63.80	64.40
Average body weight gain (gm/day/calf)	445.25	432.33	438.83	541.67	531.67	536.67
Rearing cost (₹/day/calf)	120.00	120.00	120.00	121.00	121.00	121.00
Gross return (₹/day/calf)	155.83	151.30	153.57	189.58	186.08	187.83
Net return (₹/day/calf)	35.83	19.79	27.81	68.58	65.08	66.83
B:C	1.30	1.26	1.28	1.57	1.54	1.56
Body weight gain increase over control (%)				21.65	22.98	22.43
Additional body weight gain (gram / day)				96.42	99.34	97.84
Value of additional body weight/day (₹)				33.75	34.77	34.24
Cost of albendazole and tincture iodine (₹/day/calf)				1	1	1
B:C ratio for management practices and deworming				33.75	34.77	34.24

disinfection, untimely colostrums feeding, and not proper use of de-worming, insufficient milk feeding and not giving timely treatment (Tiwari *et al.*, 2007). Major causes of mortality were improper management, malnutrition, worm load, cold etc. as observed during data collection and reported by buffalo owners (Shakya *et al.*, 2017). Buffalo calves died due to lack of proper attention towards the care of calves, this shows that dairy farmers ignoring the prophylactic measures and improved husbandry practices for rearing of calves (Kumar *et al.*, 2013). Similar results were also reported by Kharkar *et al.* (2017) and Shakya *et al.* (2017).

Economics of calf management practices

A partial budget analysis measures was used in those items of expenditure and income. Therefore, the cost of milk, concentrate feed, tincture iodine and dewormer have been considered. The cost of labour was not considered for calculation because it was same in both groups as family members were used in management of buffalo calf. The buffalo calf has been estimated @ ₹ 350/kg live weight.

Economics of effect of calf management practices on buffalo calf in the treated group (T₂) and control group (T₁) have been presented in Table 3. Economic analysis of the data showed that effect of calf management practices enhances the mean body weight gain by 22.43% per calf in treated group. The mean rearing cost of per day of buffalo calf was slightly higher (₹ 121.0) in treated group as compared to control group (₹ 120.0). Average gross return (₹/day/calf) was 187.83 and 153.57 treated and control group, respectively and mean net return was found higher in treatment group (66.83 ₹/day/buffalo calf) than control group (27.81 ₹ /day/buffalo calf). The mean benefit-cost ratio was also found higher in treated group (1.56) as compared to control (1.28). It was observed that buffalo calf rear farmer getting mean additional body weight gain per day 97.84 gram and ₹ 34.24 additional per day by calf management practices and mean benefit-cost ratio of calf management practices was 1: 34.24.

CONCLUSION

It can be concluded from the present study that calf management practices to buffalo calves under field conditions not only increases the body weight gain, but also reduce calf mortality and consequently improving socio-economic conditions. Hence, it is needed to awareness created among the dairy farmers to calf management practices to their animals to get more profit from dairy animal farming.

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