

Optimizing the Performance of Jersey Crossbred Calves by Modifying Raising Practices at NDRI, ERS Cattle Yard

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Abstract—The study is conducted to observe the performance of crossbred calves due to some modification in raising practices such as feeding synbiotics (probiotics- *Lactobacillus rhamnosus* NCDC 298; prebiotic- Fructo oligosaccharide) in milk and comparison in housing the calves either in pairs or groups at NDRI, ERS- Kalyani cattle yard. During the initial one month of feeding synbiotics, faecal dry matter % was less ($P<0.01$), faecal score was higher ($P<0.05$), microbial load count (CFU/ml) in faeces was higher and body weight (kg) was lower than the group that was not fed synbiotics. But, from the second and third month (post feeding period of synbiotics) up to 90 days improvement in faecal dry matter, faecal score ($P<0.01$), microbial load count in faeces and body weight ($P<0.01$) was observed than those not fed synbiotics. Similarly group housing of calves proved to be better than paired ones in terms of THI and dry matter intake. The calves were healthier and behavioural observations showed that they socialized more quickly than the ones housed in pairs. It is also observed that the post feeding period of synbiotics brought significant improvement on the faecal score and body weight of calves.

1. INTRODUCTION

Raising calves can be a difficult task if one does not understand the different elements of calf management. The main objective of raising the newborn calf up to weaning age is to optimize its growth and minimize health problems. It is estimated that 75% of perinatal mortality happens within the first hour postpartum (Nagy, 2009). Though there are many different ways to raise calves, it depends on the available resources, natural environment and daily operation of the farm. There is no right or wrong way to raise calves. However, the objective of study is to accelerate calf performance by altering some of the routine management practices such as feeding synbiotics (Probiotics- *Lactobacillus rhamnosus* NCDC 298; Prebiotic- Fructo oligosaccharide) in milk and comparing the raising the calf in groups vs pair right from birth to weaning age of 90 days.

2. MATERIALS AND METHODS

Animals: The calves are selected and divided into two groups. The experimental period is upto 90 days of age. In control group (C) the calves managed in routine way as per the farm

practices. When the animal is sick antibiotics are used to restore the normal health of the calves. In treatment group (T), the calves are fed synbiotics (*Lactobacillus rhamnosus* NCDC 298 with *Fructooligosaccharides* FOS) since one day of birth. Further another group of calves is raised in groups of more than four and another in pairs in well ventilated enclosures and separation is done in such a way that it prevents contact by moving the calf to another building or by physical and visual separation. Milk feeding was done by bottle feeding @ 1/10th of the body weight twice daily in the morning and evening. *Ad libitum* supply of calf starters and good quality green fodder was introduced very early so as to help in rumen development. Observation was taken on the health aspects on weekly basis as well as the amount of stress on calves for both the parameters in both the group of calves.

Climatic study: In order to evaluate the stressor effect of temperature indices such as THI have been taken into account. Rectal temperature was also measured using rectal thermometer at 8.00hrs, 13.00hrs and at 18.00hrs. Temperature humidity was calculated with the formula given by NOAA, 1976. In each of the housing types ambient temperature and relative humidity have been recorded daily by thermometer and hygrometer respectively. **Health:** Calves were weighed in the morning before offering milk or feed and health scored weekly and various disease incidences were recorded by the attending veterinarian.

Behavioural observation: Behavioural observation is taken visually for 45.00 minutes twice in a week. The behaviour such as eating of feeds and fodders, visit to feeder and waterer, drinking, standing, resting (sleeping or lying down) were observed during the day time as well as during the feeding period. Other oral behavioural activities were also recorded in frequency.

Statistical analysis: The data obtained in the obtained in the study was analysed statistically in SPSS software (version 16.0) as per the methods outlined by Snedecor and Cochran (1994).

3. RESULTS AND DISCUSSION

The study conducted to observe the effect of synbiotic (probiotics- *Lactobacillus rhamnosus* NCDC 298 and prebiotic- Fructo oligosachharide) feeding on health performance of weaned Jersey crossbred calves maintained at NDRI, ERS- Kalyani. During the initial one month of feeding synbiotics, faecal dry matter (%), faecal score, microbial load count in faeces (CFU/ml) and body weight (kg) was significantly better ($P < 0.01$) in control than in treatment group. But, from the second and third month (post feeding period of synbiotics) up to 90 days significant ($P < 0.01$) improvement in faecal score and body weight was found in the treatment group when compared to the control group. Therefore it is seen that post feeding period of synbiotic brought significant improvement on the faecal score and body weight of calves. Similarly Morrison *et al.*, 2010 found that use of probiotics and prebiotic supplement (mannan oligosaccharide and streptococcus faecium) showed no improvement in growth but reduced the faecal scores in calves since *Lactobacillus rhamnosus* survived intestinal transit in young calves (Ewaschuk *et al.*, 2004)

Regarding the microclimate of the houses where calves were kept, THI was above 72 (range: 72.1-84.14) in 67% of the study duration in groups and 64% in pair houses with high rectal temperature in grouped animals. This may be due to direct heat received by the grouped animals housed in semi closed houses. DMI in group increases leading to exponential rise in BW in grouped animals. Disease incidence was more in paired group. The most common disease was Diarrhoea > Bloody Diarrhoea > Pneumonia where paired calves reported more incidence. Also, presence of parasites in faeces was higher in the months of Sept and Oct in grouped calves than that of paired ones. Investigative behaviour and social behaviour was better in grouped animals while anomalous behaviour like aggression and cross suckling was higher in the paired group. To support the findings Warnick *et al.*, 1976, reported that social housing increased concentrate intake resulting in greater weight gains after weaning. It is speculated that these benefits was due to social weaning. Alternately dairy calves housed in larger groups had higher risk of mortality compared with individual housing system but smaller groups of 6-9 fared better (Svensson and Liberg, 2006). Social facilitation and better cross ventilation in calves housed in groups have helped in better performance of the calves.

Similar behavioural observations have been found by Abdelfattah *et al.*, 2014 in calves housed in large groups of 4-8 calves/pen.

4. CONCLUSION

The calves fed synbiotics (probiotics- *Lactobacillus rhamnosus* NCDC 298 and prebiotic- Fructo oligosachharide) had better faecal microbial load count as well as higher faecal dry matter percentage and body weight. Similarly, calves housed in groups performed better in the body weight, dry matter intake with lesser incidences of health problems than those calves housed in pairs.

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