

Influence of Method of Colostrum Application on IgG Status, Incidence of Diseases, and Weight Gain in Neonatal Calves

A. Ebert¹, Dr. Med. Vet.; E. Heyn², Dr. Med. Vet.; M. Erhard², Dr. Med. Vet., Dr. Vet. Med. Habil.; W. Klee¹, Dr. Med. Vet., Dr. Med. Vet. Habil., Dip ECBHM

¹ Clinic for Ruminants, LMU Munich

² Chair of Animal Welfare, Ethology, Animal Hygiene, and Animal Housing; LMU Munich

Introduction

Drenching or tube-feeding of neonatal calves with colostrum has been advocated as a way to minimize the risk of failure of passive transfer (fpt) of immunoglobulins. The object of this prospective controlled study was to compare the effects of drenching and traditional feeding by nipple bucket on (among other parameters) immunoglobulin G (IgG) status, weight gain, and disease incidence in neonatal calves up to the age of two weeks.

Materials and Methods

262 newborn calves from 15 dairy farms in southern Bavaria that had experienced problems with neonatal calf diarrhea were enrolled. Sample size estimation was based on the intention to detect relevant reduction of the incidence of neonatal diarrhea from 0.6 (estimated prior probability) to 0.4 with a probability of 0.95 and resulted in a minimal total of 238. Calves were assigned by their owners to one of two treatment groups (drenching [Group "D"] or bucket feeding [group "B"]) in an alternating fashion. Blood samples for the assessment of IgG concentration were taken on the 3rd day of life. Calves were examined clinically (findings were recorded using a scoring system [with 1 as the worst, and 20 as the best possible score]) and weighed on their 3rd and 14th days of life. Outcome variables were IgG concentration, incidence of fpt, diseases (diarrhea, respiratory disease, navel ill), inappetence, cost of treatments, and weight gains.

Results

Mean (\pm SD) serum IgG concentrations were not significantly different (19.04 ± 11.06 g/L in group D vs.

17.16 ± 11.41 g/L in group B). Fpt occurred significantly more often in group B (32.1 vs. 19.4 %). Relative risk of fpt in group B was 1.66 (95 % CI 1.08 – 2.54) as high as in group D. There was no significant difference in the total clinical score assigned on day 3. On day 14, mean score of group B was slightly higher than in group D (19.3 ± 2.1 vs. 18.9 ± 2.6). No significant differences were observed between the groups concerning the incidences of the recorded diseases or of inappetence. Also, no significant difference was found between the groups concerning weight gain during the first 14 days. However, weight gain was positively correlated with serum IgG concentration on day 3. Thus calves with fpt had average daily gains of $.28 \pm .30$ kg between days 3 and 14, whereas calves with adequate passive transfer gained $.43 \pm .29$ kg/d during the same period. Costs for veterinary interventions didn't differ significantly between the groups.

Significance

The results of this study are interpreted as evidence that while drenching neonatal calves with colostrum may reduce the incidence of fpt, and may save time for the personnel, this procedure doesn't necessarily offer relevant advantages over conventional methods for feeding neonatal calves. Besides, introduction of the practice of drenching may tempt the persons attending calves to use this procedure in older calves that refuse to drink, which can lead to a vicious cycle of forced ruminal drinking and inappetence.