

Effect of feeding pooled high quality colostrum on the health and performance of dairy calves

John Barry and Emer Kennedy

Teagasc, Animal & Grassland Research and Innovation Centre, Moorepark, Fermoy, Co. Cork

Summary

- Feeding pooled colostrum did not affect calf health or performance during the pre-weaning period.
- Only colostrum with >50 mg/ml IgG from animals with a clean health status should be used.
- A risk of disease transfer exists when pooling colostrum, and herd health status should be assessed before application.

Introduction

The structure of the bovine placenta prevents transfer of immunity between the cow and calf *in-utero*. Passive immunity must therefore be acquired by calves through the ingestion and absorption of antibodies (predominantly IgG) found in colostrum. Successfully acquiring passive immunity is influenced by a number of factors, which include the IgG content of colostrum, timing of feeding, as well as the volume provided. Failure to achieve passive immunity has negative implications, both short and long term, which include increased risk of health issues, as well as reduced growth rates and survival rates. A recent study by Teagasc Moorepark found that feeding pooled colostrum (i.e., combining colostrum from a number of cows) is commonly practiced (> 35% of commercial Irish dairy farms). Pooling colostrum can reduce the labour requirement during the calving season, as providing each calf with colostrum from a single cow can be laborious. Combining colostrum from a number of cows could increase the risk of both the spread of disease (e.g., Johne's) and failure of passive transfer occurring. Currently there is limited information available on the effect of pooled colostrum feeding on calf health and performance within seasonal calving systems. To investigate this, a study was conducted at Teagasc Moorepark.

Sixty calves (Holstein-Friesian (HF) and HF x Jersey) were enrolled in the study and assigned to one of three treatment groups; 1) received colostrum from their own dam, 2) received colostrum for a single cow which was not the dam, and 3) received colostrum pooled from three different cows using equal volumes from each. Cows from which colostrum was used were selected based on known immune status. Each calf received a volume of colostrum equivalent to 8.5% of their birth bodyweight, provided by stomach tube. Only colostrum with an IgG concentration >50 mg/ml, determined by Brix refractometer ($\geq 22\%$), was permitted for use in a feeding treatment. Colostrum samples were collected prior to feeding, while blood samples were taken from all calves immediately after birth and again at 24 hrs to assess passive immunity levels. During the pre-weaning period (0 to approx. 76 days of age), calves were examined twice daily and all cases of morbidity, and mortality, were recorded. Weighing was carried out immediately after birth, but also on a weekly basis up to weaning. The herd within which this study was conducted operates to the highest standards for maintaining herd health. This includes the application of comprehensive vaccination programs, as well as conducting disease testing on a regular basis, with any Johne's positive cows being culled immediately.

Results

No difference was found between the IgG concentration of colostrum provided to each of the treatments, which was almost twice that of the recommend threshold (≥ 50 mg/ml) for each group. Similarly no differences existed between birthweight, weaning weight and 24 hr serum IgG concentration between calves in each of the three treatment groups, which are summarised in Table 1.

Table 1. Mean colostrum IgG concentration, 24 hr serum IgG concentration, birthweight and weaning weight of calves that received colostrum from their own dam, from another dam, or pooled from a number of cows

Treatment group	Colostrum IgG (mg/ml)	24 hr serum IgG (mg/ml)	Birthweight (kg)	Weaning weight (kg)
Own dam	99.4	52.0	33.3	93.7
Other dam	95.2	55.6	34.3	91.7
Pooled	100.7	53.0	34.0	94.0

The number of calves which experienced health issues, and required treatments was not different among the groups, and there were no cases of mortality during the course of the experiment. The reported findings are from year one of the experiment, which will be repeated for a second year.

Preliminary findings indicate that when colostrum quality is assessed prior to feeding, and using only that with ≥ 50 mg/ml IgG, pooling did not reduce the IgG concentration through a dilution effect. Findings also indicate that there were no associated impacts on health and performance of calves fed pooled colostrum, within a high health status herd. In such settings, feeding pooled colostrum could improve labour efficiency without any negative impact on calf health and performance. It must be noted, however, that this experiment was conducted in a controlled environment using a high health status herd (Moorepark Research Centre), where calf health was monitored regularly and prompt treatments provided where necessary.

Conclusions

Feeding pooled colostrum had no effect on calf health or performance, when only colostrum with ≥ 50 mg/ml IgG was included. This is a feeding strategy which could be used to reduce the labour demand associated with calf rearing. It must however, only be conducted using colostrum from animals with a clean health status to prevent disease transfer within the herd.