

Feeding concentrated colostrum ensures sufficient uptake of IgG in Holstein calves

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Introduction

Failure of passive transfer of IgG is one of the major reasons for increased morbidity and mortality among neonatal calves. This is mainly due to lack of a sufficient amount of high-quality colostrum (≥ 50 g IgG/L). By applying a modified processing method that concentrates IgG in low-quality colostrum, the total volume of high-quality colostrum can be increased. This pilot experiment are followed by further studies, evaluating short- and long-term effects on health and productivity when using processed and concentrated colostrum. A patent application on the processing method is pending.

Objectives

To investigate whether calves fed with processed concentrated low-quality colostrum (PC) within 0-2 h after birth attain a sufficient passive immunization compared to calves fed non-processed high quality (≥ 50 g IgG/L) colostrum

Materials and Methods

Animals

- 15 Holstein calves from birth to 3 d of age, housed in single pens
- Calves were removed from the cow immediately after birth

Colostrum treatments

- Calves were allocated 10% of their birth BW 0-2 hours after birth
- Colostrum from first milking post partum (CC: 57 g IgG/L, 13.5 % of DM protein, 3.9% of DM fat, and 3.3% of DM lactose)
- Processed Colostrum from first- and second milking post partum (PC: 56 g IgG/L, 17,1% of DM protein, 5.9% of DM fat and 3.2% of DM lactose)

Sampling

- Blood was drawn from the jugular vein, 1-3 d after birth

Results

- Birth BW, IgG intake from colostrum, and time of blood sampling did not differ between CC and PC (40 vs 39 \pm 1.5 kg; 219 vs 253 \pm 25 g IgG/calf; 60 vs 61 \pm 6.5 h after birth, respectively)
- A tendency for a delayed colostrum intake of PC ($P < 0,1$). This was 1.3 and 1.9 \pm 0,3 h after birth for CC and PC, respectively
- IgG in plasma and apparent efficiency of absorption did not differ between CC and PC (27.9 vs 29.1 \pm 3.7 g/L; 48.9 vs 46.6 \pm 4.2 %, respectively). See Figure 1 and 2

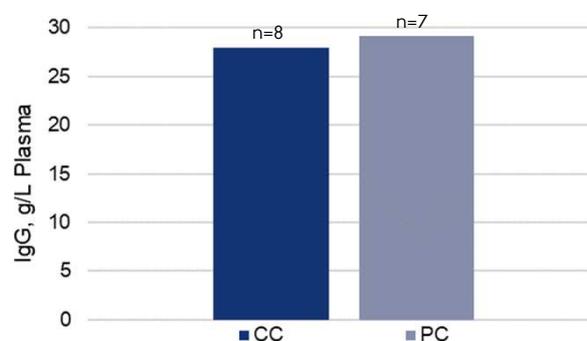


Figure 1. IgG in plasma (g IgG/L plasma) 1-3 d after birth

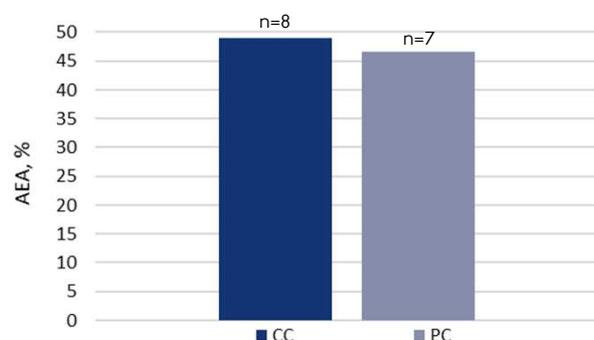


Figure 2. Apparent efficiency of absorption of IgG (%), 1-3 d after birth

Conclusions

- Calves fed PC obtained an equally high level of IgG in plasma compared to calves fed CC
- Processed low-quality colostrum concentrated to a well-defined high-quality (≥ 50 g IgG/L) can be used when lacking high quality colostrum
- The quantity of high-quality colostrum in the herd can be increased by processing colostrum from first and second milking and thereby ensure a higher rate of newborn calves achieving a sufficient passive immunization

