Full title: Comparison of colostrum proteins between the first and third day of lactation after calving using proteomic analysis

Short title: Proteomic analysis of colostrum proteins

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Summary

Colostrum proteins represent an important energy source for newborns and improve the innate immune systems of newborns. Recently, interest regarding the health benefits of colostrum has arisen, and many colostrum-derived products are present in dietary supplements. Here, we compared the enriched proteins in the colostrum between the first and third day after calving using a proteomic analysis, and determined which of these proteins may be of interest for the dietary supplement industry. In this study, cows in the experimental group were fed a standard composition of feed for 12 months, after which we collected the colostrum on the first and third day after calving. Several factors, including beta-lactoglobulin, fibrinogen gamma-B chain, complement C3, zinc-alpha-2 glycoprotein, bP47 protein, beta casein, and alpha-S2 casein were enriched in the third day colostrum, whereas immunoglobulin gamma 1 and beta-casein A2 were enriched in the first day colostrum. These results suggest that the composition of the colostrum is time-dependent, and that the first day colostrum is important for establishing the primary specific immune system, whereas the third day colostrum might regulate the non-specific immune system and increase nutrition using casein. Moreover, the third day colostrum might be utilized in dietary products for supporting the immune system.