Colostrum from primiparous Holstein cows shows higher antioxidant activity than colostrum of multiparous ones

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Running Head: Antioxidant potential of bovine colostrum

Abstract

Antioxidant components of colostrum prevent oxidative cell damage caused by free radicals that could harm calf's development. High concentrations of immunoglobulin determine typically a high quality colostrum, but the relationship between this variable and other colostrum proteins are not well defined. This work aimed to determine the antioxidant potential of colostrum from primiparous and multiparous Holstein cows, relating it to immune quality. Samples from the first milk secretion from primiparous (first lactation, n=8) and multiparous (second and third lactations, n=8) Holstein cows were collected after birth of calves for determination of immune and antioxidant factors. First milk secretion after birth from primiparous and multiparous cows differed in the ceruloplasmin activity, oxygen radical absorbance capacity (ORAC) and transferrin saturation index (TSI) ($P<0.05$). Considering $P=0.06$, transferrin and total iron binding capacity (TIBC) also differ between the groups. Concentration of proteins, immunoglobulin G, and activity of lactoperoxidase, lysozyme, glutathione peroxidase and catalase, in turn, did not differ ($P>0.05$). Metabolic differences between primiparous and multiparous cows may have affected the antioxidative status of colostrum, since ORAC values was twice higher in first lactation cows. Lower values of transferrin and TIBC and higher TSI in colostrum from primiparous cows suggests a relationship between lower iron stock and higher antioxidant activity. Thus, this work indicates an important role of the antioxidant potential of colostrum for neonates from first-lactation cows. Additionally, the iron stock may be directly related to the higher antioxidant potential of the colostrum from primiparous cows, and further investigations are required.