

## **The functional milk**

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### **Abstract**

In addition to providing all the essential nutrients for the neonate, milk is also a vector of a wide range of immune effector molecules. It has been recently observed that milk IgA can be successfully used for prophylactic or therapeutic treatment against infections by *Candida albicans* and *Helicobacter pylori*, which represent serious risk for the health of the digestive system. IgA is the major immunoglobulin present in human milk, but it is 4-5 times less abundant in bovine milk. Since bovine milk is the most consumed worldwide, the detection of factors affecting the level of IgA in bovine milk offers great potential to add value to the dairy industry.

In the light of this, the present study aimed at evaluating the effect of day in milk and parity on IgA level in colostrum and milk of dairy cows.

Seven primiparous and 7 multiparous healthy Fresian cows were studied for 3 months after calving. All the cows were fed the same experimental diet, over the study period. On day 0, 1, 3, 7, 30, 60 and 90 of lactation, milk yield was recorded, colostrum and milk samples were taken. Colostrum and milk samples were obtained mixing morning and evening milkings and then tested for protein, fat, lactose, casein and urea content, somatic cell count and total bacterial count (TBC). Skimmed colostrum and milk were tested for IgA by ELISA. Data were evaluated by ANOVA.

Maximum milk production was observed on day 30 for multiparous cows (43.3 L/d) and on day 60 for the primiparous ones (40.5 L/d). In both groups, the highest levels of IgA were found at calving. The day after, colostrum IgA concentration dramatically decreased, remaining at low levels for the rest of the study period. On calving, IgA level was higher in the colostrum from multiparous than primiparous cows (782 vs. 640 µg/ml;  $P<0.01$ ). On day 0, 60 and 90, TBC was higher in milk from multiparous than primiparous cows ( $P=0.06$ ). Between 7 and 90 days of lactation, TBC was negatively correlated whether with milk IgA levels ( $r = -0.506$ ,  $P<0.01$ ;  $r = -0.396$ ,  $P<0.05$  for multiparous and primiparous cows, respectively) and with milk IgA daily yield ( $r = -0.504$ ,  $P<0.01$ ;  $r = -0.501$ ,  $P<0.01$ ).

This research gives a description of the pattern of IgA in colostrum and milk of dairy cows, during the first months of lactation, providing valuable information to maximize the positive effects of milk consumption on consumer health.