

Review article

Antioxidants and Antioxidant Capacity of Human Milk

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SUMMARY

Milk contains plenty of enzymatic and non-enzymatic antioxidant components that probably account for the vital antioxidant protection of the infants at early stages of life against the development of complications induced by oxygen free radicals. Indigenous milk enzymes play a key role in regulating lactogenesis, including active involution of mammary gland. Moreover, they are essential constituents of antioxidation and the innate immune system of milk. Among antioxidant enzymes, superoxide dismutase, catalase and selenium-containing glutathione peroxidase have been demonstrated in human milk. Mainly, the enzyme content of colostrum is higher than that in corresponding mature milk. Beside lipophilic antioxidant in human milk, tocopherols, carotenoids and vitamin A are of great interest. Those components demonstrate the highest levels in colostrum and decline during early lactation, despite the fact that total lipids increase. The complete list of active antioxidant components in human milk is not yet known.

This review reports the main findings of enzymatic and non-enzymatic antioxidants, as well as antioxidant capacity of human milk. Synergism of action of several antioxidants helps to eliminate free radicals in newborns. Bearing in mind that milk contains a number of antioxidants, many reactions are possible and it is difficult to define the exact contribution and function of each antioxidant. Besides qualitative and quantitative analysis of human milk antioxidants, the measurement of total antioxidant capacity could be a useful tool for examination of this dynamic, complex fluid.

Key words: human milk, enzymatic antioxidants, non-enzymatic antioxidants, oxidative stress, antioxidant capacity

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