Effect of age and stage of lactation on whey protein content in milk of cows of different breeds

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Abstract

The aim of the study was to determine the effect of age of cows, i.e. subsequent lactation and stage of lactation, on bioactive whey protein content in milk of dairy cows of six primary breeds kept in Poland. In all cases the significant correlations between lactoferrin concentration in milk and stage of lactation was stated. Its content gradually increased with the course of lactation but the changes in the content of this protein were highly dependent on breed of cows, what was indicated also by high interactions between breed and stage of lactation.

Key words: whey proteins, breed of cows, lactation, stage of lactation

Introduction

Nowadays, twelve breeds of cattle are in use in Poland, while the milk production is dependent mainly on the Polish Holstein-Friesian breed. In some regions of Poland (mountain, submountain, Bug River) local breeds of cattle dominate. The productivity of cows and physico-chemical parameters of milk are influenced not only by breed of cows and feeding system but also by physiological factors such as age and stage of lactation (Heck et al. 2009). The aim of the study was to determine the effect of age of cows, i.e. subsequent lactation and stage of lactation on bioactive whey protein content in milk of dairy cows of different breeds.

Materials and Methods

The research included 2,638 milk samples collected from five different breeds of dairy cows, i.e. three breeds with primary international importance (Black and White variety of Polish Holstein-Friesian – 719 samples, Jersey – 356 and Simmental – 629) and two local breeds (Polish Red – 497 and Whitebacked – 437). For further analyses the milk samples in which somatic cell count (SCC) did not exceed 400,000 cells/ml (Somacount 150) were taken. The content of whey proteins, i.e. α-lactoalbumin (α-LA), β-lactoglobulin (β-LG), bovine serum albumin (BSA), lactoferrin (Lf) and lysozyme (Lz), were determined by the RP-HPLC method. Evaluating the effect of subse-