

## CHANGES IN THE FATTY ACID PROFILE OF COW'S MILK WITH DIFFERENT SOMATIC CELL COUNTS DURING LACTATION

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**Abstract.** The objective of this study was to determine the effect of lactation stage and the hygienic quality of cow's milk on the fatty acid profile of milk. The experimental materials comprised samples of milk from 56 Polish Holstein-Friesian (PHF) cows. In the 1<sup>st</sup>, 5<sup>th</sup> and 10<sup>th</sup> months of lactation, milk samples were collected for analyses from each cow. Using the MilkoScan FT 120 apparatus, every sample of fresh milk was assayed for proximate chemical composition and the BactoCount apparatus was used for somatic cell count (SCC). The percentage shares of 43 fatty acids (FAs) in the total fatty acid pool were determined by gas chromatography. Ten most common functional FAs were identified. Fatty acids were also divided into the following categories: saturated (SFAs) and unsaturated (UFAs) fatty acids, including monounsaturated (MUFAs) and polyunsaturated (PUFAs) fatty acids, desirable hypocholesterolemic fatty acids (DFAs) and undesirable hypercholesterolemic fatty acids (OFAs). The following ratios were calculated: UFA/SFA, MUFA/SFA, PUFA/SFA and n-6/n-3PUFA.

The obtained results suggest that the stage of lactation affected the concentrations of the analyzed functional FAs in cow's milk. Milk produced by early lactation cows had the most desirable fatty acid profile with respect to FAs delivering health benefits and FA groups, which indicates that milk collected at the first stage of lactation has the best functional properties. SCC had a significant ( $P \leq 0.05$ ) effect on MUFA concentrations, including C 4:0, and on the MUFA/SFA ratio in cow's milk. Increased levels of the majority of functional FAs and FA groups, and higher values of their ratios were noted in milk containing more than 400,000 somatic cells per ml, which could be indicative of mastitis.

**Keywords:** fatty acids, somatic cell count, mastitis, stage of lactation