

STUDYING PHYSICOCHEMICAL AND BIOCHEMICAL PARAMETERS OF ORGANIC AND CONVENTIONAL MILK

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INTRODUCTION

In the framework of scientific and research work of the Institute of Food Resources, National Academy of Agrarian Science of Ukraine, at the premises of the Department of Analytical Research and Food Quality, the influence of different farming methods (organic and conventional) on physico-chemical and biochemical parameters of cow milk has been studied. The research was carried out from April 2015 to April 2016.

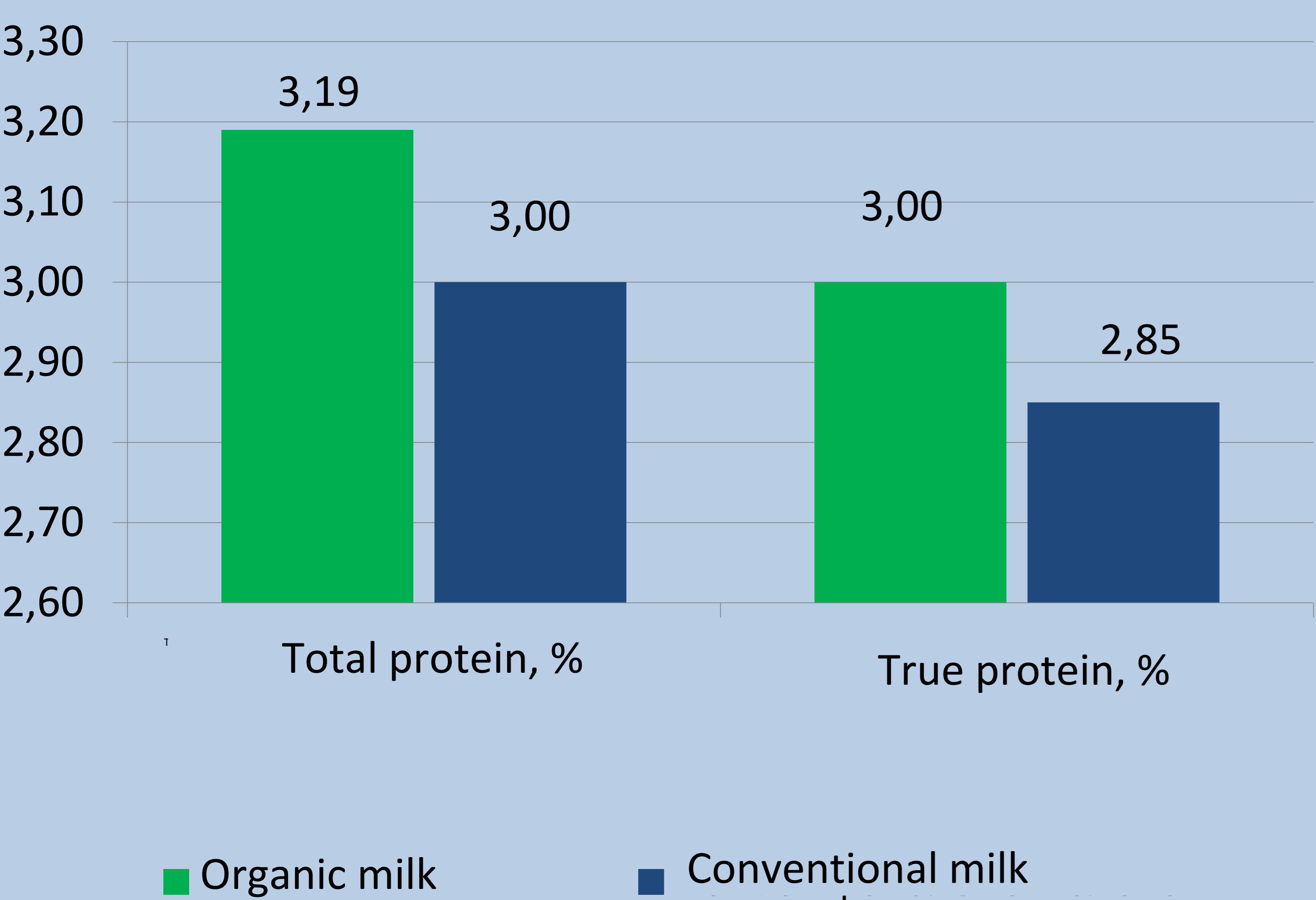
MATERIALS AND METHODS

The samples of organic milk were taken at the certified organic dairy farm of Galeks-Agro, PE in Zhytomyr region, and the samples of conventional milk – at the conventional dairy farm in Kyiv region. The milk was studied for solids content, total protein and non-protein nitrogen; fatty acid and amino acid composition were analyzed. During the housing period (November-April) the diet of cows at the organic farm was based on organic feed, 74% of which was hay, cereals and haylage and 26% - corn silage, dry and preserved corn. The diet at the conventional farm featured higher percentage of corn silage (42%), hay, haylage and other feed made 58%. During grazing period the cows on both farms grazed on pastures.

RESULTS

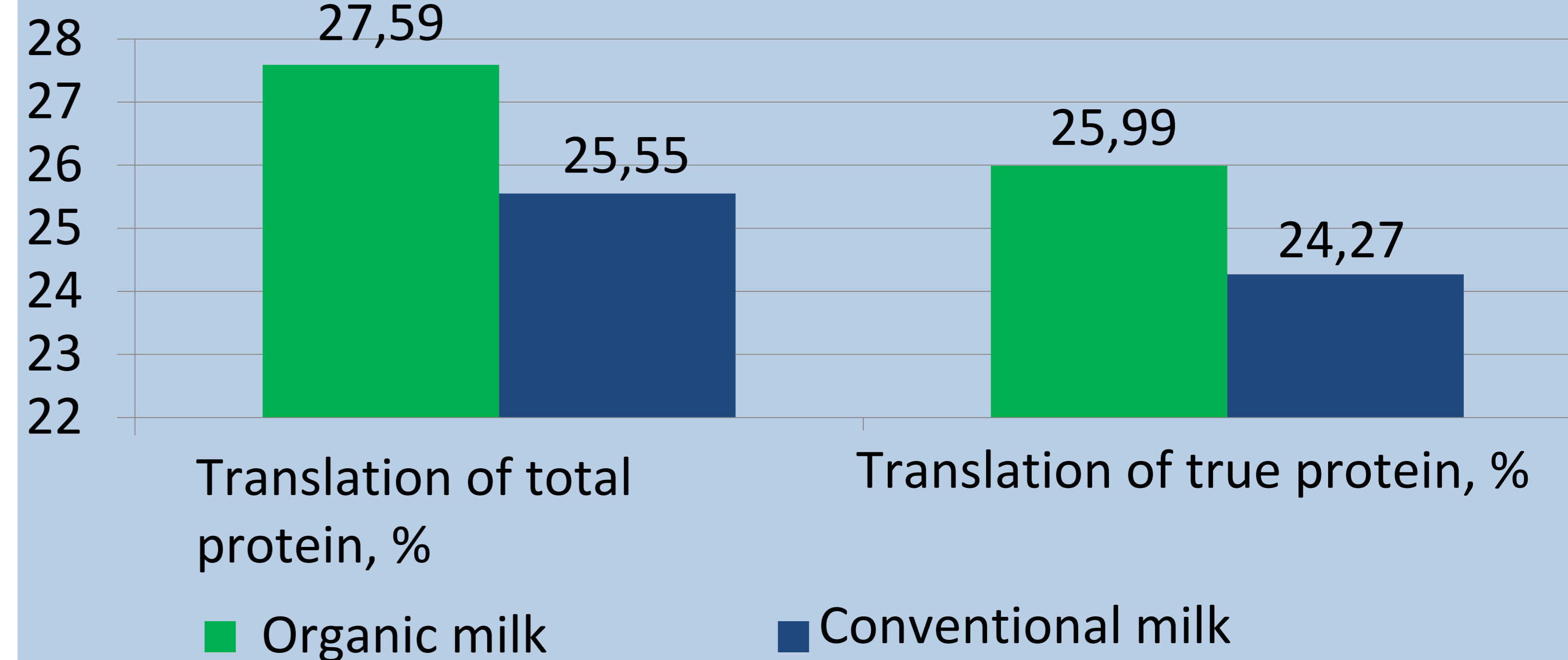
The analysis of nitrogen-containing fractures of milk showed higher value of total protein in organic milk (by 0.19%) (Hist. 1). The important parameter of milk is the content of the so called “true” protein, which is calculated by subtracting the fraction of non-protein components (urea, ammonia, etc) from the total protein value. This parameter characterizes the real content of casein and whey protein and plays an important role in technological processes, for example, in cheese making. In organic milk the value of true protein was 0.15% higher, which may mean the higher nutritive value of organic milk.

Truest.1 Protein and true protein content



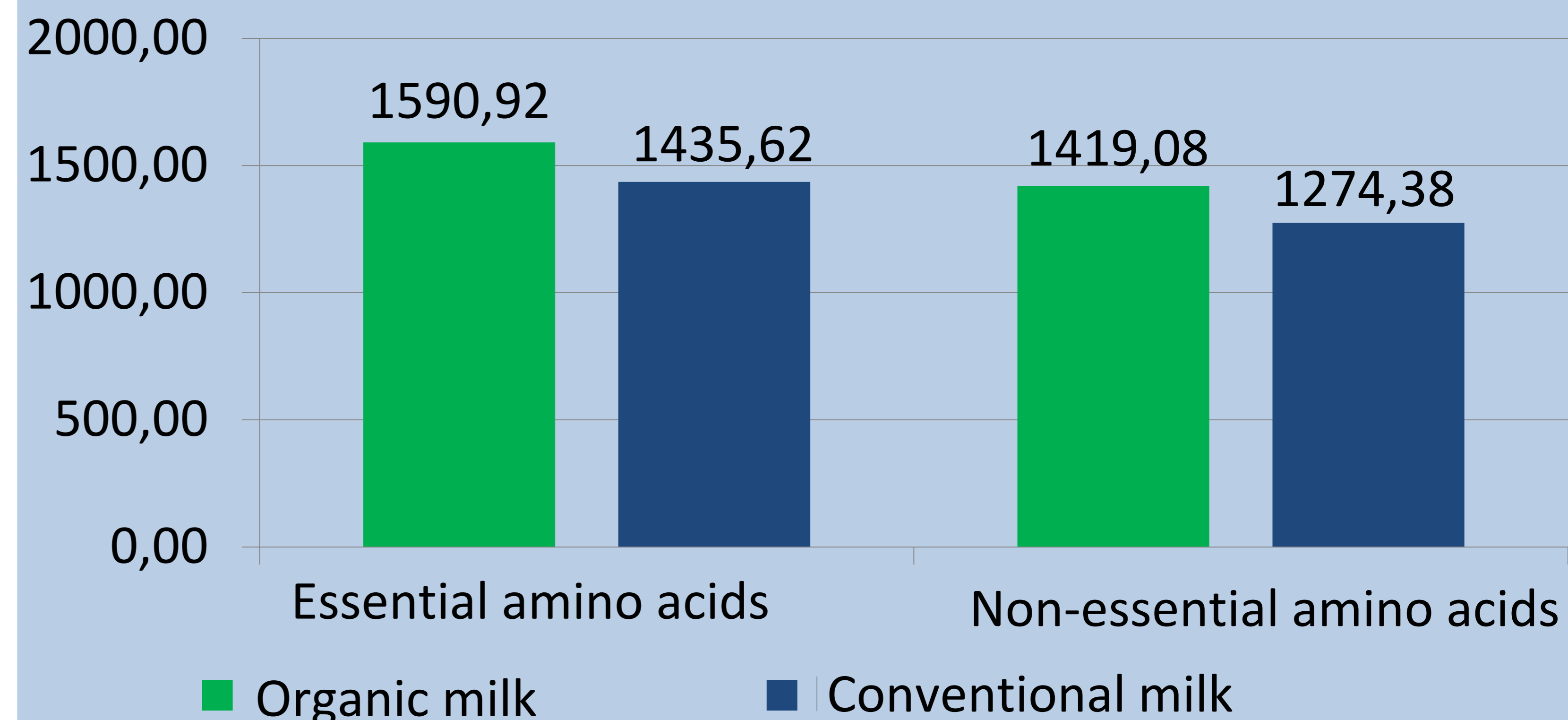
The translation of total protein and true protein values to solids content showed statistically significant difference ($p \leq 0,05$) between organic and conventional milk. Total protein in the structure of solids of organic milk was 2.04% bigger in weight part than that of conventional milk, and true protein was 1.72% bigger.

Hist.2 Translation of parameters to weight part of solids



The study of amino acid composition showed that essential and non-essential amino acid content was higher in organic milk than in conventional (by 10.8% and 11.2% correspondingly) (Hist.3).

Hist.3 Amino acid content, mg/100 g



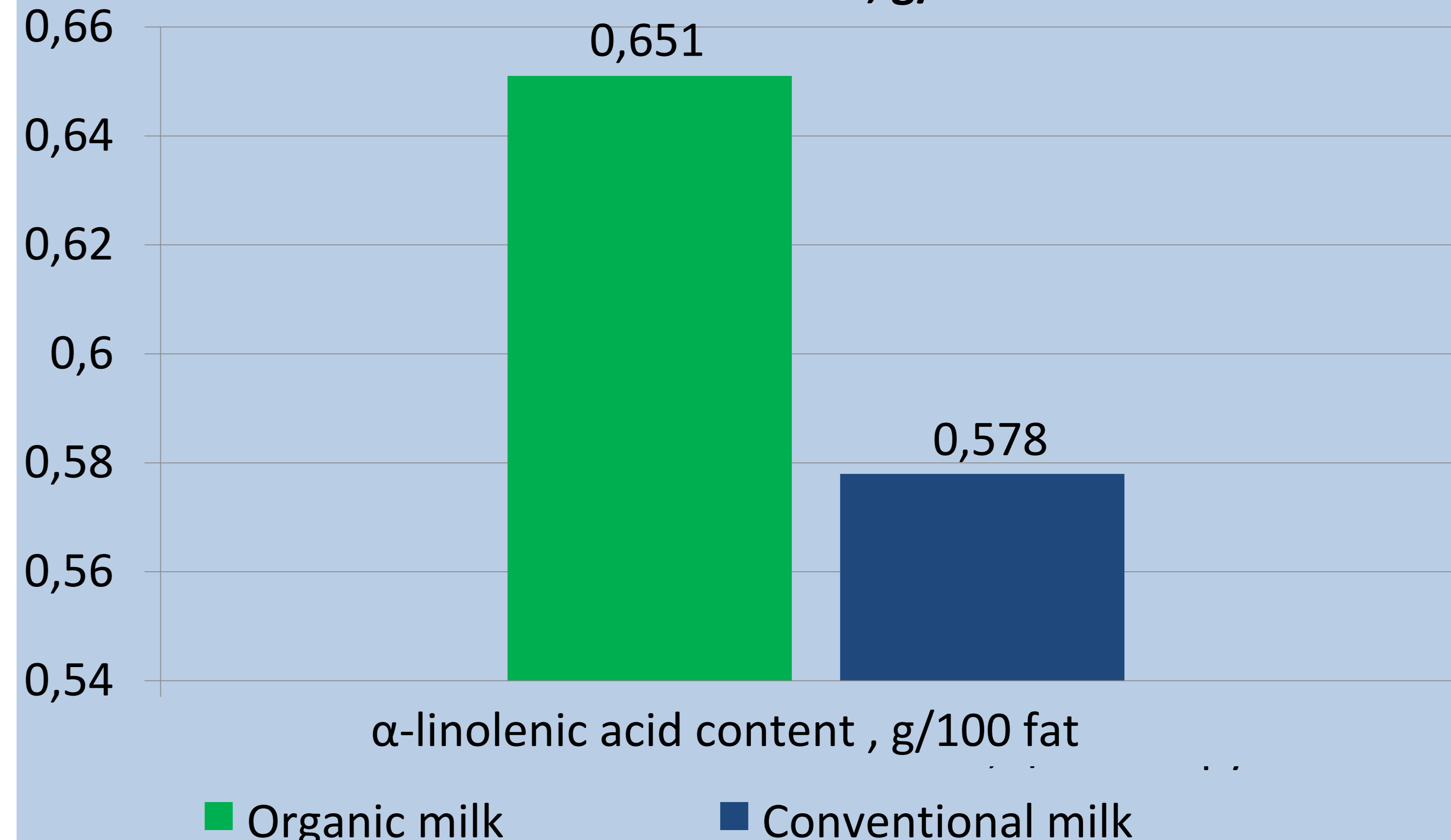
The content of important sulfur amino acids (SAA – methionine and cysteine) and aromatic amino acids (AAA – phenylalanine, tyrosine, tryptophan) was also higher in organic milk compared to the conventional one (by 10.4% and 2.5% correspondingly) (Table 1).

Table 1. Content of SAA and AAA, mg/100 g

	Organic milk	Conventional milk
SAA	51.86	46.45
AAA	344.62	336.05

Fatty acid analysis showed that the content of α -linolenic acid, important for human health, was 11% higher in lipid fraction of organic milk than in conventional.

Hist.4 α -linolenic acid content, g/100 fat



Conclusions

According to the research results, organic milk has higher content of total and true protein, their part is higher in solids structure of milk, higher content of essential, sulfur and aromatic amino acids per 100 g of milk and higher α -linolenic acid.