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CHEMICAL COMPOSITION OF DAIRY PRODUCTS

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ABSTRACT
So, for example, in the production of cheese, fat-soluble vitamins are excreted into the serum, but the concentration of calcium does not change. In terms of digestibility and amino acid composition, milk proteins are considered very valuable. If the nutritional value of an egg is taken as 1, then for milk this indicator will be 0.9. There is less cysteine and methionine in milk, but there are a lot of them in whey.

Keywords: water, fat, protein, lactose, ash, triacylglycerols, 1,2-diacylglycerols, monoacylglycerols, free fatty acids, phospholipids, cholesterol.

INTRODUCTION

Milk is a nutrient fluid produced by the mammary glands of female mammals during lactation [1]. The natural purpose of milk is to feed offspring (including those of humans), which are not yet able to digest other food. Milk is a multicomponent polydisperse system in which all constituent substances are in a finely dispersed state, which provides milk with a liquid consistency [2].

Cow's milk has a rather complex structure. Its usual composition looks like this:

• water - 86.6%;
• fat - 4.1%;
• protein - 3.6%;
• lactose - 5%;
• ash - 0.7%.

However, the concentration of these substances depends on the breed of the animal, which determines its metabolism, as well as diet and other individual characteristics. Most often, the milk of different cows differs in fat content, and the protein composition remains more or less stable [3]. At the same time, in recent years, approaches to cattle breeding have changed: previously they tried to breed breeds that give as much fat milk as possible, and today the emphasis is on a high protein content [4].

Milk proteins. 1 liter of milk contains on average 30–39 g of proteins. They are of two types:

• caseins - alpha-S-caseins, beta-casein, kappa-casein;
•whey proteins-alpha-lactalbumin, beta-lactoglobulin, blood albumin, immunoglobulins.

Caseins, the number of which reaches 80% of the total volume of milk proteins, are presented in the form of stable compounds with calcium phosphate - casein micelles [5]. Determination of the amino acid composition of milk proteins shows that caseins and whey

proteins have significant differences. So, in caseins there is more proline and phosphoserine, but little cysteine, which is more in whey proteins [6].

Fats in cow's milk. In the milk of cows, the following complex fats (lipids) are determined:

• triacylglycerols;
• 1,2-diacylglycerols;
• monoacylglycerols;
• free fatty acids;
• phospholipids;
• cholesterol;
• cholesterol etherLipids are in the form of globules. At the same time, over 400 different fatty acids are present in cow's milk, however, the value of the indicator can fluctuate significantly, since it strongly depends on the quality of the feed [7].

Salts, sugars and enzymes in milk. Milk contains salts of sodium, potassium, calcium and magnesium in the form of chlorides, phosphates, citrates and bicarbonates. Of the carbohydrates, lactose is the most - milk sugar in alpha and beta form [8]. It is this compound that forms the characteristic milky taste and smell. There are few enzymes in cow's milk:

• oxidoreductase (xanthine oxidase);
• transferase (ribonuclease);
• hydrolases (proteinases);
• lyases (carboxylic anhydrase).

Nutritional properties of milk: Dairy products are included in the daily diet of many people around the world. According to statistics, people get a certain amount of useful substances from milk [9]. Average values from the daily diet:

• 25% protein;
• 76% calcium;
• 36% phosphorus;
• 3% iron;
• 12% vitamin A;
• 10% thiamine (B1);
• 44% riboflavin (B2);
• 2% niacin (B3);
• 3% ascorbic acid.

Conclusions: In many developed countries, milk is additionally enriched with vitamin D3. In skimmed milk, the concentration of fat-soluble vitamins decreases, but the density of other important components increases. So, for example, in the production of cheese, fat-soluble vitamins are excreted into the serum, but the concentration of calcium does not change. In terms of digestibility and amino acid composition, milk proteins are considered very valuable. If the nutritional value of an egg is taken as 1, then for milk this indicator will be 0.9. There is less cysteine and methionine in milk, but there are a lot of them in whey. At the same time, caseins are easier to digest. Modern approaches to milk processing make it

an even more versatile food product. There are many new dairy products in stores, such as lactose-free milk.

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