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SCIENTIFIC STUDY OF THE CHEMICAL COMPOSITION OF DAIRY PRODUCTS

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Abstract
The article provides scientific information about the biologically active components of dairy products, their nutritional value, and the correct use of pasteurized and sterilized milk in the food industry.

Keywords: Milk, chemical composition, protein, fat, solids, pasteurized milk, sterilized milk.

Introduction

Milk contains various vitamins. Of the 12 different vitamins in milk, vitamins A, D_1, D_2, B_2 and carotene are important. At the expense of milk and dairy products, a person can fully satisfy the body's need for vitamins A and B group, and partially satisfy the need for vitamins C and D. Summer milk contains a lot of vitamin A [1-3].

Of the various mineral salts in milk, the importance of calcium and phosphorus salts is important. These salts are present in milk in a proportion that can be well absorbed by the body. The presence of milk in the diet enhances the absorption of calcium salts from other products. The iron contained in milk is also easily digested (tables 1, 2, 3, 4).

Table 1. Chemical composition and caloric content of cattle milk

	Water	*In 100 g of milk, at the expense of gr*				*Calorie content, k/call in 1 kg of milk*
		dry matter	protein	fat	milk sugar	
Cow's milk	87.5	12.5	3.3	3.8	4.7	713
Goat's milk	87.0	13.0	3.5	4.1	4.6	758
Sheep's milk	82.1	17.9	5.8	6.7	4.6	1082
Horse milk	90.0	10.0	2.0	1.0	6.7	497
Camel milk	86.4	13.6	3.5	4.5	4.9	797

INNOVATIVE TECHNOLOGICA
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ISSN: 2776-0987 Volume 4, Issue 2 Feb. 2023

Table 2. Amount of amino acids in casein and β-lactoglobulin in cow's milk

Amino acids	*The content of casein, in %*	*Content of β-lactoglobulin, in %*
Alanine	1.85	7.1
Glycine	0.5	1.4
Cool	0.5	4.0
Threonine	-	4.9
Leucine and isoleucine	9.7	21.4
Lysine	6.3	12.6
Arginine	3.8	2.9
Sistine	0.31	3.4
Methionine	3.4	3.2
Valin	6.7	5.6
Aspartic acid	4.1	11.5
Glutamic acid	21.8	19.1
Oxyglutamic acid	10.5	-
Histidine	1.83	1.6
Phenylalanine	3.9	3.8
Tyrosine	6.5	3.6
Tryptophan	2.2	1.9
Proline	8.0	5.1

Table 3. According to the content of fatty acids

Fatty acids	*Amount, in %*	*In mole amount, in %*
Fatty acid	4.26	9.8
Caproic acid	1.64	4.1
Caprylic acid	1.16	1.6
Capric acid	1.19	3.5
Lauric acid	5.01	2.0
Myristic acid	16.43	19.6
Palmitic acid	14.83	23.4
Stearic acid	3.40	8.9
Dioxysteric acid	0.38	0.3
Oleic acid	44.42	27.0

INNOVATIVE TECHNOLOGICA
METHODICAL RESEARCH JOURNAL
ISSN: 2776-0987 Volume 4, Issue 2 Feb. 2023

Table 4. The amount of mineral substances in milk, in %

Substances/indications	*Ca*	*Mg*	*P*	*No*	*K*	*Cl*
The content of breast milk	16.7	2.2	7.3	5.3	23.5	16.5
The content of cow's milk	16.8	1.7	11.6	5.3	20.7	13.6

Freshly milked milk is full of value. It also has bactericidal properties, which means that it does not allow the bacteria to multiply and can even kill them [4-9]. To preserve the bactericidal properties of freshly milked milk, it is cooled. At a temperature of 30 ℃, the bactericidal property of fresh milk is preserved for up to 3 hours, at 15 ℃for about 8 hours, and at 10 ℃for up to 24 hours [10-17].

Dairy Processing Technology

Dairy plants sell pasteurized and sterilized milk. Pasteurized milk is prepared by heating raw milk to a temperature of 74-76 ℃for 15-20 seconds [15-24]. Raw milk is pasteurized in special equipment (intended to kill bacteria that have entered the milk). Pasteurized milk is cooled and placed in disinfected clean containers (bottles, bottles, paper bags with polymer coating). Pasteurized milk can be consumed without boiling.

Milk from pasteurized milk without cream (fat) is also called normalized milk, that is, milk with a certain amount of fat. It contains 3.2% milk fat. Skimmed milk is prepared by adding cream. Its fat content is up to 6%. Protein milk has less fat (1-2.5%) than skim milk, but more protein (up to 5.5%), milk sugar and other components. Protein milk, which is a mixture of skimmed milk and skimmed milk, is a dietary product mainly prescribed to patients with protein deficiency. Skimmed milk is obtained by passing skimmed milk through a separator (separating the cream). Fat in such milk does not exceed 0.05%. Vitamin C is added to non-vitaminized milk (1 kg prepared by adding 100 mg) to milk. Heated milk is prepared by boiling pasteurized milk in closed containers at 95-99 ℃for 3-4 hours. Heated milk is also considered fat-enriched milk [25-29]. Sterilized milk is made by heating raw milk under special conditions that not only kill the bacteria that got into the raw milk but also kill their spores. Milk is sterilized at high pressure and temperature of 125-145 ℃ for 2-10 seconds. Before

ISSN: 2776-0987 Volume 4, Issue 2 Feb. 2023

sterilization, the milk is homogenized, that is, the fat particles in the milk are crushed so that it does not retain creaminess and is well digestible. After sterilization, the milk is cooled and then packed in paper bags lined with polymer film and aluminium foil under sterilized conditions. If the milk is poured into bottles after cooling, its sterility is destroyed. Therefore, the mouth of milk poured into bottles is closed and re-sterilized at a temperature of 115-120 ℃ for several minutes (such milk is called "mojaiskoe").

Sterilized milk can be stored in a hermetically sealed container for a long time at any ambient temperature. Unsterilized milk is among perishable products; it is necessary to store it at a temperature of up to 6 ℃. It is not recommended to store milk at room (room) temperature for more than one day.

In addition to pasteurized and sterilized milk, dairy enterprises produce canned milk: milk condensed with added sugar, and dry milk (skimmed and skimmed). In conditions where the original properties of the product can be restored from dry milk, so-called reconstituted milk is prepared in dairies. Such milk does not differ from natural milk in terms of its main chemical parameters and nutritional value. The reconstituted milk is used for drinking and the preparation of various dairy products, such as kefir, cottage cheese and smoothies.

Milk purchased from the market must be boiled, because it may contain pathogens of tuberculosis, brucellosis, anthrax, typhoid, poliomyelitis, dysentery and other diseases. It is recommended to boil the milk in a sealed container so that the milk does not burn (does not stick to the bottom), it is necessary to rinse the container in which the milk is cooked in cold water. It is not good to store milk in an aluminium container for a long time, because its taste is nauseating.

In cooking, milk is used in the preparation of liquid and thick foods, sweet foods, sweet tea with milk, dough, etc. Shirhorda, shirguruch, jelly, ice cream, sweet sauces, and creams are very necessary foods for diet food and baby food in terms of easy digestion. For some diseases, it is recommended to consume skimmed milk. All other dairy foods, especially dairy desserts, are usually made with skim milk.

ISSN: 2776-0987 Volume 4, Issue 2 Feb. 2023

Milk-yoghurt products - yoghurt, kefir, kimiz, cream, sour cream, cottage cheese, cheese, and dried milk are widely used as food products. In particular, cheese is one of the most nutritious food products from which milk can be recycled. Due to the microbiological, enzymatic and other biological processes that take place in the preparation and processing of cheese, the quality of taste and nutrition is completely different from that of milk. It is a highly nutritious product due to the presence of a large amount of protein (up to 25%), milk, and fat (up to 30%). It also contains irreplaceable amino acids, vitamins A and B, PP group vitamins, pantothenic acid, calcium and phosphorus salts. Cheese is a healthy food for people of all ages, especially children. Almost all of its nutrients (98-99%) are absorbed by the human body. Depending on the content of fat and protein, the caloric content ranges from 2500 to 4500 kcal. The cheese is made from cow, sheep and goat milk. It has many varieties.

Conclusion

Depending on the quality of milk, its processing mode and cheese-making technology, various kinds of cheese are obtained that differ in taste, hardness or softness, and appearance. According to these signs, it has hard, soft, saltier, soft and lactic acid varieties. Cheeses are produced with 20-60% fat in dry matter (the amount of fat in the cheese can vary depending on the amount of water in it, so the fat content of the cheese is taken in relation to the weight of dry matter). To show the amount of fat in the hard glaze, a casein plate is placed on the rind or a stamp (stamp) is printed on the rind. Cheese with a fat content of not less than 50% has a square stamp, and those with a fat content of not less than 45% have an octagonal stamp.

In addition to the amount of oil, the number of the company that produced it, and the name of the district where the factory is located are also written on the stamp. The amount of fat in soft, soft and lactic acid cheeses is written on their packaging. Hard cheeses include Swiss, Dutch, Latvian, and rindless cheeses. The group of soft cheeses includes such things as dorogobuj, white dessert and Roquefort. Examples of lactic acid cheeses are green, Lithuanian, Klinkovy, as well as lyubitelsky sirok.

ISSN: 2776-0987 Volume 4, Issue 2 Feb. 2023

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ISSN: 2776-0987 Volume 4, Issue 2 Feb. 2023

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ISSN: 2776-0987 Volume 4, Issue 2 Feb. 2023

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