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WAYS OF EFFECTIVE UTILIZATION OF MILK WHEY

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ABSTRACT

Low consumption of vitamin and protein products in the human diet requires the integrated use of raw materials and the production of biologically complete food products with the prevention of losses during processing. Based on this, by creating a waste-free technology in the processing of milk, it is possible to increase the proportion of proteins, vitamins, micro- and macroelements in the human diet.

The main substances included in milk and their average amount are distributed as follows: total protein 3-3.3%; main protein (casein) 2-2.8%; the amount of whey proteins is 0.4-0.5%; protein nitrogenous substances 0.17-0.38%; lactose 4.4-5.0%; the amount of all dry matter in milk is 11.5-13%; fat content can be 3-6%.

Regardless of the type of enterprise, before receiving dairy products, the main parameters such as taste, color, smell, acidity, fat and protein content, as well as the degree of bacterial contamination are determined in the laboratory. In this case, the fat content of the milk should not be less than 3.2%, and the acidity should not be higher than 20°T (Turner). Based on these indicators, the milk is returned to the owner if it meets the requirements of GOST. The laboratory staff monitors the work of all workshops in the enterprise and the quality of the final product. In a special department of the laboratory, pure cultures are selected for the products produced by adding milk bacteria.

Therefore, the production laboratory plays an important role in milk processing enterprises.

Received milk is cleaned of mechanical impurities and pasteurized before storage or processing. Thermal pasteurization can be carried out in three different conditions: 1) continuous pasteurization - 30 minutes, 63-65°C; 2) short-term pasteurization - 15 minutes, 72-74°C; 3) momentary pasteurization at 82-85°C. In addition, methods such as electropasteurization, ultrasonic pasteurization, and ultraviolet pasteurization are also recommended. Pasteurized milk can be delivered to the consumer as a finished product in the same way as sterilized milk.

Storage conditions for pasteurized milk are selected depending on its storage period. Storage of milk and milk products is mainly carried out in a refrigerated state. Cooling milk prevents negative microbiological processes affecting it. At a temperature of 4-6°C, milk can

be stored for up to two days. Chilled milk is stored in cooling tanks of 2-10 thousand liters. Tanks are cooled using chilled or salt water.

Dairy products have the following content in %: water 82-88, dry matter 12-18, proteins 3-3.2, fats 3.3-6, carbohydrates (lactose) 4-7, salts 0.9-1 . [1]

Most dairy products have high energy value. Dairy products are mainly made from cow's milk, but goat, goat, and camel milk are also used.

In the process of processing milk and making cheese, curd, whey is separated as a secondary raw material. Despite the high biological and nutritional value of this raw material, it is practically not used in our country.

Whey is considered a rich food product, which contains components that strengthen the immune system; contains lactoferrin, immunoglobulin and a complete set of group B vitamins, as well as micro and macro elements such as vitamin C, nicotinic acid, vitamin A, vitamin E, Sa, K, R, Fe, Zn.

90% of liquid whey is water, and the remaining 10% is a large amount of useful substances. Dry whey powder is also available, which is a powder without excess liquid and is a good source of nutrients. You can add it to food, use it in cosmetics, dilute it with water and get liquid serum. This product contains calcium, potassium, phosphorus, glucose, lactose, beta-carotene, choline, citric, nucleic and lactic acids, amino acids and fatty acids.

The following table shows the chemical composition of whey produced during milk processing.

Table 1

Chemical composition of milk whey

Indicators	Amount of substances in whey, %		
	In the preparation of cheese	In the preparation of cottage cheese	Dry whey
Water	93,3	95,6	3-5
Dry matter	6,6	6,4	95-97
Protein	1	0,8	10-14
Oils	0,4	0,3	0,7-1.5
Lactose	5.,0	4,4	66
Ash content	0,5	0,6	6-9
Acidity	20	60-70	-
pH	6,1	4,7	-

From the analysis of the chemical composition of milk, it can be seen that whey contains all the main nutritional elements necessary for a person to maintain energy levels.

According to experts who promote nutritional standards and proper nutrition, in order to ensure the effective effect of whey on the human body, it is necessary to ensure the constant presence of whey drinks in the diet. Regular consumption of such a useful drink improves blood circulation, strengthens blood vessel walls, normalizes blood pressure, strengthens immunity, improves the functioning of the gastrointestinal tract, helps with colitis and gastritis, constant fatigue, prolonged stress, insomnia. helps and clears the skin.

Whey is very rich in vitamins A, E, C, B, and one liter of whey provides the daily calcium requirement of an adult and 40% of the potassium requirement. Whey also contains rare mineral salts such as phosphorus and magnesium. rich This liquid contains 200 biologically active substances, which have a positive effect on the activity of all organs in the body.

The table below shows the main indicators of whey obtained by various methods.

Table 2

The main indicators of whey

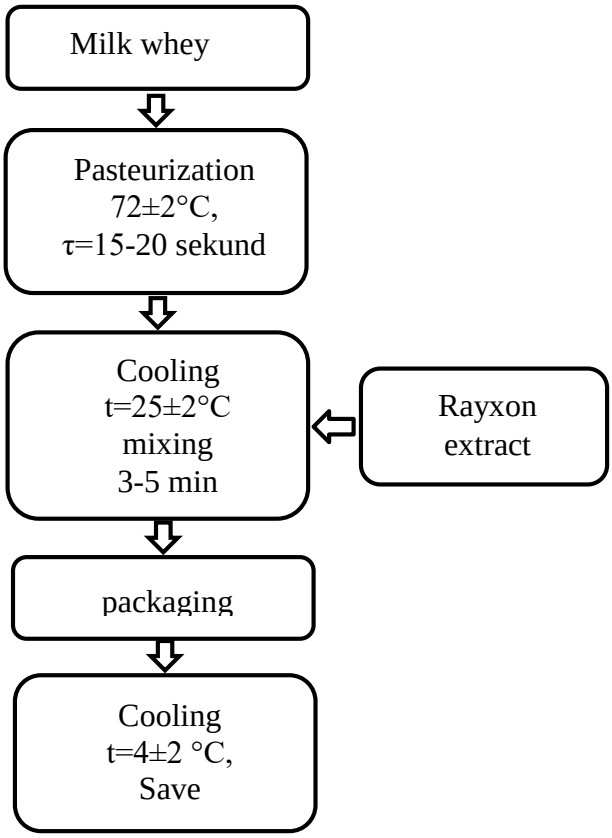
Indicators	Whey released during the procedures		
	Cheese in preparation	Cottage cheese in preparation	Casein in getting
Dry matter content %	4,5-7,2	4,2-7,4	4,5-7,5
Including:			
Lactose	3,9-4,9	3,2-5,1	3,5-5,2
Protein	0,5-1,1	0,5-1,4	0,5-1,5
Mineral substances	0,3-0,8	0,5-0,8	0,3-0,9
Milk fat	0,05-0,5	0,05-0,4	0,02-0,1
Acidity, oT	15-25	50-85	50-120
Density, kg/m^3	1018-1027	1019-1026	1020-1025

The indicators presented in the table show that the presence of lactose, protein, mineral substances, and milk fat necessary for the human body in the milk whey released during the production of cheese, cottage cheese and casein means that it is appropriate to use the whey for beneficial purposes.

Currently, partial processing of milk whey has been started in the world. However, there are still problems waiting to be solved in the processing of whey, and one of the most effective solutions is to utilize it as a soft drink.

In the production of cooling drinks based on milk whey, almost the entire complex of biological substances contained in whey is preserved in the drink. Such drinks are refreshing, quench your thirst, and are recommended for people who work in high temperatures. Whey flavor is often noted in whey. This may not please many people. Therefore, drinks prepared by adding mint and basil extracts to whey are distinguished by their aroma and consumption. The technology for making such drinks is simple, does not require special equipment and can be easily implemented in any dairy factory.

Below is a scheme of the technological process of making a cooling drink based on milk whey.



Technological scheme of making a cooling drink based on milk whey.

On the basis of the above information, it can be concluded that the whey produced during the production of dairy products in our Republic has energy and is useful for human health. It will be possible to use whey by producing natural beverages.

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