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## **ISOLATION AND IDENTIFICATION OF LACTIC ACID BACTERIA FROM COW'S MILK**

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Recently, in Kazakhstan, along with the production of industrial raw materials, measures for the development of the agricultural sector are developing and moving in different directions. Among the various food substances, the importance of milk and dairy products that are important for human life, as well as its benefits, are separately studied. On the one hand, milk is one of the main sources of essential amino acids and valuable proteins for the human body, and on the other hand, the lack of these substances in the diet can negatively affect the growth and development of the body and lead to various diseases.

Milk from dairy cows is a staple dietary component for humans all over the world. Regardless of whether milk is consumed in its purest, unaltered form or as high-end products such as fine cheese or ice cream, it needs to be of high quality when taken from the cow, produced at a low price and produced in a system that consider aspects such as animal health, animal welfare and sustainability [1].

And cow's milk necessarily contains lactic acid bacteria. Lactic acid bacteria are widely used for the production and preservation of various products. Lactic acid bacteria are a group of microaerophilic gram-positive microorganisms that ferment carbohydrates to form lactic acid as one of the main products. The classification of lactic acid bacteria is not sufficiently developed. The signs of bacteria can vary significantly, which makes it difficult to classify them. Depending on the nature of the products formed, during the fermentation of hexoses, lactic acid bacteria are divided into homofermentative and heterofermentative [2].

According to the classification, lactic acid bacteria include the species *Lactobacillales* (for example, *Lactococcus lactis* or *Lactobacillus acidophilus*). This group includes bacteria that are mainly used in the fermentation (large-scale production) of dairy products. Their important role is especially great in the dairy industry. One of the forms of specific control of biochemical processes in the internal environment of the body is carried out by fermented dairy products obtained with the help of lactic acid microorganisms. Due to their lack, there is a violation of pathogenic and conditionally pathogenic microorganisms in the

intestines. To obtain lactic acid products, sterilized milk or cream is fermented by introducing pure cultures. They are called "starter yeast" [3].

One of the most important criteria is to obtain new strains found in cow's milk, to determine their improved organoleptic properties; to determine the shelf life of antagonistic properties of microorganisms contained in cow's milk; to complete the experimental work by a comparative study of the microflora properties obtained from cow's milk. It is carried out on the basis of obtaining pure cultures of microorganisms that have a positive effect on human health. For this purpose, bacteria with a high growth rate and acid-forming activity are used, which produce antimicrobial, aromatic compounds, polysaccharides, vitamins, enzymes and other biologically active compounds.

Therapeutic and preventive drugs - probiotics and fermented dairy products based on lactic acid microorganisms are widely used in medicine, veterinary medicine, the food and pharmaceutical industry to maintain the optimal intestinal microflora and prevent dysfunctions of the gastrointestinal tract of the host organism. Currently, in the development of microbial biotechnology, special attention is paid to the identification of new, promising strains of lactic acid bacteria for the production of fermented dairy products. One of the main properties of the resulting new strains is its high antagonistic activity against pathogenic and conditionally pathogenic microorganisms. The antagonistic relationship between lactic acid bacteria and bifidobacteria of pathogenic microorganisms is observed in the process of competition for the production of nutrients, adhesion sites and inhibitory substances [4,5].

Lactic acid bacteria begin to come into contact with other microorganisms in the process of growth, development and formation of acidity. The antagonistic activity of lactic acid bacteria is characterized by their zone of destruction of saprophytic microorganisms.

For many years, great importance has been attached to the mechanism of antagonistic activity of lactic acid bacteria in the production of organic acids, which have a destructive, rotting and inhibitory effect on the pathogenic microflora of the intestine. Many strains of lactic acid bacteria are salmonella antagonists, and *Pseudomonas*, *Staphylococcus*, *Enterococcus*, *Yersinia*, *Bacillus*, *Clostridium*, *Campylobacter*, *Klebsiella*, *Gardnerella*, etc. are known to inhibit the growth of bacterial species. It was found that lactic acid bacteria can produce bacteriocins – substances of a peptide–protein nature that have an antibiotic effect on pathogenic and conditionally pathogenic microorganisms.

In many studies, the antagonistic properties of lactic acid bacteria have been studied in order to find new cultures, since lactic acid bacteria have antimicrobial properties that improve the quality of food (acidophilic milk, kefir, etc.). In this regard, a lot has been written in the literature about the antagonistic properties of lactic acid bacteria.

The antagonism of lactic acid bacteria has been studied against *Escherichia coli*, *Proteus*, pathogenic microbes, and cultures that cause food spoilage.

Lactic acid bacteria are also effective in treating intestinal infections, providing the right alternative to using antibiotics, or reducing the symptoms of

diarrhea. Probiotic bacterial cultures modulate the growth of the intestinal microbiota, destroy harmful bacteria, and strengthen the body's natural defense mechanisms. In addition to being beneficial to human health, lactic acid bacteria can improve various aspects of the reproduction and productivity of livestock and poultry, as well as control unwanted microorganisms in their animals that come with food. While it has been widely proven that fermented milk products are the best probiotic delivery matrix, there is more evidence of the possibility of obtaining probiotic products from non-lactic acid matrices. Today, various microorganisms, usually lactic acid bacteria, have been valued for their probiotic potential and are used as auxiliary crops in various types of food or medicinal preparations. Therefore, it is devoted to the general characteristics, taxonomy, role in fermented foods of this important group of lactic acid bacteria, their health benefits, selection criteria and the mechanism of their action on food and human health [6].

The breakdown of lactic acid bacteria is carried out by using various sources (self-fermented dairy products, plants, vegetables, fruits, food waste, etc.). It includes a number of stages, including the creation of a sow in a liquid and dense nutrient medium for the enrichment of milk microflora and the isolation of pure skill, the preservation of a pure crop, the study of the biological properties of selected strains, their identification and the determination of production efficiency are among the mandatory stages.

Bacteria belonging to the species *Bifidobacterium*, *Lactobacillus*, *Lactococcus*, *Streptococcus*, *Pediococcus* and *Leuconostoc* have the greatest practical value for use. The *Lactococcus* species is closely related to food production, being one of the most important [3].

Table 1 - Chemical composition of cow's milk

Animal	Mass fraction, %			Water share, %
	fat	lactose	dry skimmed milk residue	
Cow	3.7-4.4	4.8-4.9	10	22

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