

QUALITY AND SAFETY OF MILK AND MILK PRODUCTS

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Abstract. *A balanced diet is one of the most important factors determining the immune status of the body. The availability of products that meet the quality and safety requirements established in the diet is not only basic, but also a necessary condition for human health. Many radionuclides, toxins and pathogens can enter our bodies through food.*

Keywords: *antibiotics, sulfonamides, nitrofurans, pesticides, surfactants, chlorine-containing disinfectants, hydrogen peroxide, formaldehyde and acetic acid in milk.*

Relevance of the research topic. The production of milk that meets the requirements of sanitary and hygienic standards and processing enterprises is one of the priorities of the dairy industry. Solving this problem is important in terms of providing people with safe and nutritious food. In this regard, today large processing enterprises receive milk taking into account both traditional indicators and a number of other requirements, paying special attention to product safety indicators.

In order to control and manage quality, the Technical Regulations for Milk and Dairy Products oblige the milk producer to develop and implement a production control program for compliance with the sanitary and epidemiological well-being of the enterprise, based primarily on the principles of HACCP (HACCP - Hazard Analysis and Critical Control Points).)

This concept is comprehensive in food industry enterprises and includes control procedures and measures at all stages of the production cycle, identification of critical points, as well as documents and resources necessary to implement and ensure the organizational structure in this system.

Of particular danger are antibiotics and sulfonamides, nitrofurans, pesticides, surfactants, chlorine-containing disinfectants, hydrogen peroxide, formaldehyde and acetic acid in milk.

With regular consumption of foods containing residual amounts of antibiotics, the human body develops resistance to their effects. Residual amounts of antibiotics and some drugs in milk can cause allergic reactions and dysbiosis in humans.

Residual concentrations of antibiotics are dangerous not only for human health, but also pose a serious problem for the dairy industry, as they can disrupt the technological process, sharply reducing the number or suppressing the viability of starter microflora. As a result, a serious economic problem arises.

Possible sources of ingress of inhibitory substances are non-compliance with the deadlines for milk rejection when treating animals; use of low-quality feed and feed additives containing antimicrobial agents as growth stimulants; non-compliance with the parameters of sanitary processing of dairy and milking equipment. In livestock farming, antibiotics are widely used in the production of whole milk substitutes. When cows receive excess amounts of certain microelements into their bodies, their concentration in milk increases, which can also increase the level of inhibitory substances in the product.

Disinfectants used in dairy farming, as a rule, do not pose a risk from the point of view of the formation of residues in dairy products. However, disturbances in the concentration of these substances should not be allowed, as this may pose a threat to human health.

Positive reactions to the presence of inhibitors in milk are possible after cows are vaccinated during lactation. When animals are treated with antibiotics, sulfonamides and drugs containing nitrofurans, residual amounts of these substances also enter the milk [76]. In addition, at the end of the course of treatment, there is an individual period of cumulative action of each drug in the cow's body, indicating a certain prolongation of the therapeutic effect. During this period

Almost all antibiotics have an immunosuppressive effect on the body. There are also many cases of intoxication caused by the consumption of milk containing the antibiotic. The effect of antibiotics on microflora, on the one hand, is manifested in a change in its composition, and on the second hand, the properties of microorganisms change, and antibiotic resistance often manifests itself.

The presence of inhibitory substances in milk can be influenced by the feeding of cows and the quality of feed, in particular, the preservation of silage using chemicals. The use of preservatives directly for milk consumed as food is prohibited, therefore, in order to preserve it, heat treatment (pasteurization, sterilization), drying and adding sugar are used. However, quality management requires that milk producers regularly and timely receive all the necessary information about its composition and properties, and therefore preservatives can be used to conduct chemical studies of milk

These rules are mandatory for breeding farms and breeding reproducers. To implement a milk quality control system in order to obtain accurate data, milk samples are taken, to which special preservative substances (potassium dichromate, formalin, hydrogen peroxide, chloroform, sublimate) are added during long-term storage. The most reliable, environmentally friendly and simple way to preserve milk for testing is to use. Inhibiting factors in some cases may be the effects of physical factors, in particular electromagnetic radiation, on raw milk and starter cultures for lactic acid fermentation products.

Due to the specific sensitivity of some bacteria, the effect of an inhibitor on microorganisms can also have a stimulating effect, which manifests itself in the activation of crop growth. This should be taken into account when choosing valuable strains for the production of starter cultures for the production of fermented milk products.

Studying the differentiated effects of inhibitors on the microflora of milk will help solve many technological problems, in particular those related to the effect of antibiotics on the formation of milk curds. If inhibitory substances are detected in milk, it is classified as unsorted, which leads to large economic losses, therefore the manufacturer is obliged to ensure the safety of raw milk and strictly control the regulated tolerance levels, and it is more expedient to ensure the complete absence of residual amounts of inhibitory, detergent, disinfectant and neutralizing substances in it, animal growth stimulants (including hormonal drugs), medicines (including antibiotics) used in livestock farming for the purpose of fattening, treating livestock and/or preventing its diseases.

The degree of development of the topic. The problem of improving the quality and safety of milk is paramount in the process of its production, processing and storage. However, the issues of the differentiated effects of various inhibitors (antibiotics, preservatives, electromagnetic

radiation) on the growth and development of dairy microflora, quality indicators of milk and dairy products have not been well studied, in particular, there have been no in-depth studies of the impact of EMR on the metabolism and growth kinetics of individual cultures of lactic acid bacteria.

The purpose of the work is to identify the nature of the differentiated effects of inhibitors on the chemical composition, microbiological parameters and technological properties of raw milk, starter cultures and fermented milk products to improve their quality and safety.

To achieve this, the following tasks were set:

1. To study the specific influence of various types and concentrations of antibiotics on the chemical composition, microbiological parameters and technological properties of raw milk, starter cultures and fermented milk products;

2. Determination of the effect of EM processing on the chemical composition, microbiological parameters and technological properties of raw milk, starter cultures and fermented milk products;

3. Analysis of the specific effects of preservatives on the chemical composition and microbiological parameters of milk;

4. Establish the strength of influence of individual factors (duration and temperature of milk storage, type and concentration of antibiotic, EM treatment, type of preservative) on changes in the chemical composition and development of milk microorganisms;

5. Characterize the effect of various inhibitors on the quality of fermented milk products (yogurt);

6. Identify the effect of the studied inhibitors on pure cultures of lactic acid microorganisms.

Scientific novelty. For the first time, the nature of the differentiated influence of inhibitors (antibiotics, preservatives, electromagnetic radiation) on milk microorganisms, the chemical composition and quality of milk, starter cultures and fermented milk products at different storage times and temperatures was studied.

Theoretical and practical significance of the research. Knowledge of the differentiated effects of inhibitors on milk and fermented milk products will make it possible to control their production processes, produce products with specified quality and safety indicators, as well as conduct timely and high-quality analysis of milk to use these data in the selection process.

The results obtained can find their application in the field of theoretical and practical work on the technology of milk production and processing, in microbiological studies of milk and dairy products. Experimental research data on the effect of preservatives on milk can be used in the process of organizing production and use of breeding products in breeding work.

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