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Effects of Anthropogenic Environmental and Food Safety.

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ABSTRACT

At the present stage of development social production, the natural environment is subject to radical transformation. The scale of human activity have become comparable with the effect of global natural processes. For the development and implementation of effective measures for environmental protection are necessary to have a clear idea about the impact of ecosystem ties of the planet to safety food products, taking into account the anthropogenic factor. Conducted a systematic analysis of the planet's ecosystem ties with taking into account anthropogenic factor and adaptation to food. Improving food quality and safety is one of the most important and priority tasks carried out on the basis of strengthening and improving internal production control, taking into account the biological, chemical and physical risks. The most difficult and dangerous factors in food production are biological, as the abundance of pathogens has broad limits adaptation capabilities to adverse environmental conditions. The scientifically proved solutions for reduction microbial contamination of raw milk before to biotechnology processing by the requirements of European Economic Community and World Trade Organization.

Keywords: ecosystem pollution, food production, anthropogenic factor, microbiological contamination, milk, biotechnology

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INTRODUCTION

At the present stage of development of social production, our civilization radically changing the environment, and the scale of human activity have become comparable with the effect of global natural processes. In this regard, the increased risk of uncontrolled and irreversible changes in the environment and as a consequence - a threat to existence in the world living organisms, including man himself, require resolute practical measures for the protection and protection of nature [8].

However, for the development and implementation effective measures for environmental protection, whose ultimate goal is the perpetuation of life, health and sustainable development of humanity, it is necessary to have a clear idea impact of ecosystem relationships planet to food safety, taking into account the anthropogenic factor, because the nutrition is the relationship of organism with the environment [15].

MATERIALS AND METHODS

The main method of this study is to model environmental phenomena in nature and society, which is widely used in the study of the biosphere, taking into account four main components: the driving forces, properties, flow and interaction.

The main methodological approach in this study is to examine food safety issues on the example of raw milk, as a complex multifactorial system including physical, chemical and biological risks.

RESULTS AND DISCUSSION

Cyclic processes of transformation and movement of substances in the nature are support circulation of substances on Earth. With the emergence of life on Earth a huge role in the circulation of substances began to play live organisms. Global, comparable with geological processes influence to cycling of matter has impact of human activity, which resulted in both emerging and changing established in nature the paths of migration of substances, appearance new substances. Anthropogenic effects appear in a variety forms of the impact human activity to nature and may reflect as positive and negative character, requiring assessment and monitoring [14]. One of the manifestations negative anthropogenic impact is pollution of ecosystems, which includes a number of factors, which can be divided into four large groups: ingredient's pollution (mineral and organic components); social pollution (soil erosion, quarrying, construction, urbanization, etc.), parametric pollution (light, heat, noise, radiation and electromagnetic interference); biocenotic pollution (violation balance of populations as a result unregulated collection herbs, trapping of animals, spontaneous introduction of species, poaching, deforestation and fires).

As a result of anthropogenic impacts on the environment into the edible raw materials appear and accumulate extraneous materials and bacteria that convert into food products [1]. This leads to biological, chemical and physical risks, which requires a special approach to the organization of food production based on HACCP system (Hazard Analysis and Critical Control Point), which provides "systematic identification, assessment and control of hazards, substantially affecting the safety of product" It has spread in the world, approved by reputable organizations [13]. Biological risks, which usually are bacterial (Table. 1), can lead to food poisoning (food poisoning or toxicosis) and infectious diseases [10, 12]. Pathogens of acute intestinal infections can enter the human body not only with the food, poisoning can occur through the water, infected dishes, dirty hands, etc. Humanity itself activates the process adaptation microorganisms: the world of bacteria evolutionary develops mechanisms to preservation their forms of life into conditions of increased adverse effects (antibiotic resistance, thermo-resistance, toxicopathy as a kind of microbial antagonism) [2].

Chemical hazards can also cause disease in humans, associated with food, although on a smaller scale. Chemical hazards - materials used in livestock and crop production, industrial chemicals, natural toxicants, substances that may pollute the environment, and some substances used in the food industry. The main sources of chemical factors are: chemical used in agriculture, chemicals used in the enterprise, natural toxins, chemical substances used in the preparation of food, materials which pollutants environment [10]. Physical risks are a group of factors that can be defined as any physical material that is not a usual part of food, that can cause illness or cause injury to a person who consumed the food. Physical factors are a set of materials that fall under the definition of "foreign material" or "foreign matter or objects." Various foreign

matter can get into food at any stage of production [10]. The main physical hazard of factors for food industry are glass, metal, stone, wood and plastic [16, 17].

Between the hazard factors and critical control points is a connection. The analysis of hazard factors, elicitation into technological process the parameters , that are critical and establishing preventive actions helps to ensure the consumer a safe product.

Extensive research of influence biocenosis of environment on natural-focal infections allowed to justify solutions to the problem of reducing microbiological contamination of raw milk before biotechnology processing. Conducted complex research in a directed and controlled process of soft heat treatment of raw milk and whey [2, 3, 5, 11, 18]. Developed a method of heat treatment cow's milk raw material to improve its microbiological and technological properties with increased storage time (Fig. 1) for reservation before to use in the technological processes on the basis of double heat treatment with the shutter speed without cooling [7, 9]. The number of mesophilic aerobic and facultative anaerobic microorganisms (MAFAM) raw milk is reduced to requirements of European economic community and World Trade Organization. The method is implemented into normative-technical documentation and adapted to system through HACCP analysis critical control points.

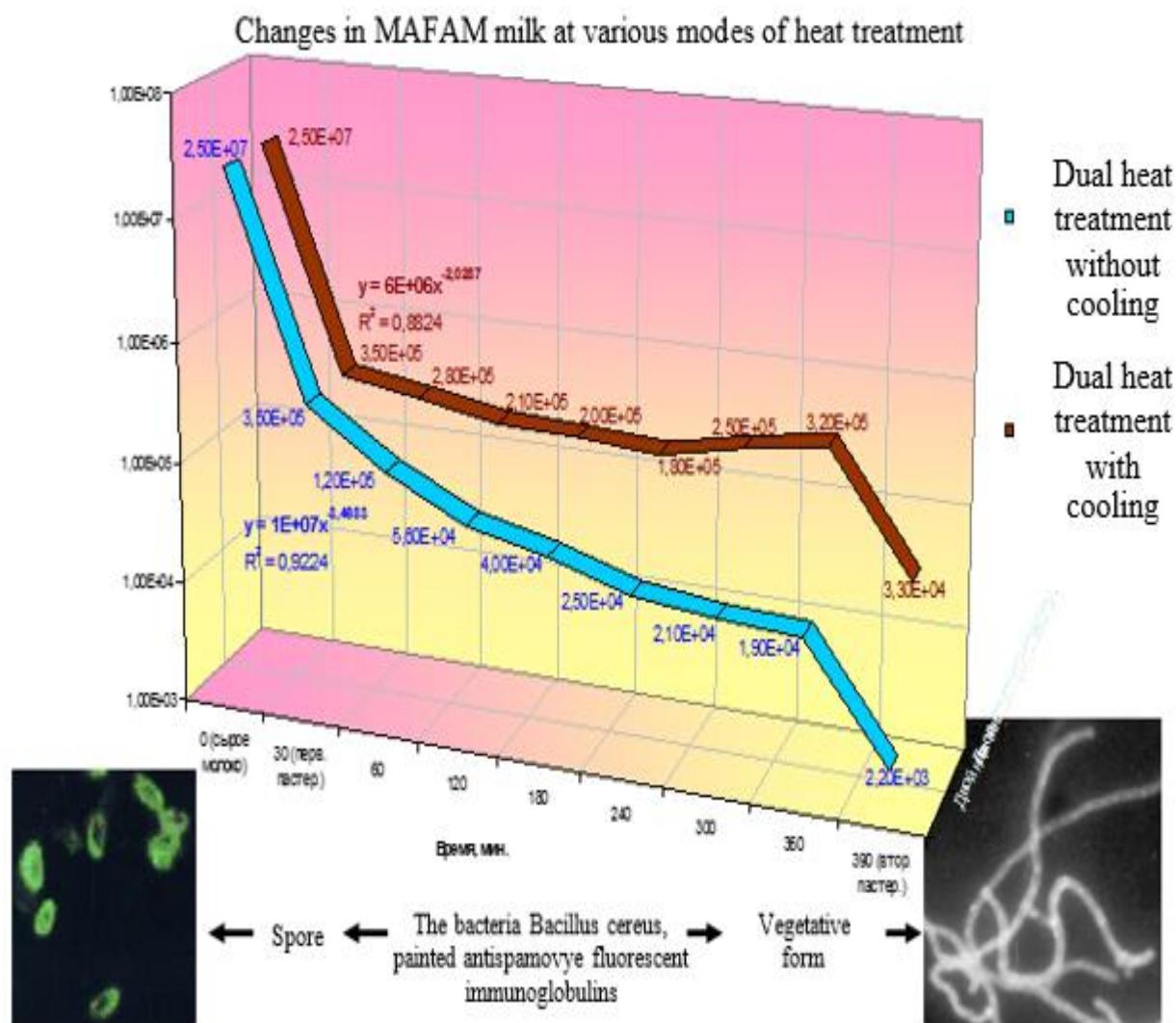


Figure 1: Bacterial sanitation of raw milk by heating

Table 1: Diseases of various etiologies transmitted through milk

| Disease | The main sources of infection | | |
|--|-------------------------------|--------------|-------------|
| | Human | Dairy cattle | Environment |
| Anthrax | - | + | + |
| Botulinumtoxin | - | - | + |
| Brucellosis | - | + | - |
| Cholera | + | - | + |
| Pathogenic E. coli | + | + | + |
| Infection Clostridium perfringens | - | - | + |
| Diphtheria | + | - | - |
| Enteritis* | + | + | + |
| Leptospirosis* | - | + | - |
| Listeriosis* | - | + | - |
| Paratyphoidfever | + | + | - |
| Salmonellosis (except typhoid and paratyphoid) | + | + | - |
| Shigellosis | + | - | - |
| Gastroenteritis caused by staphylococcal enterotoxin | + | + | - |
| Staphinfection | + | + | - |
| Tuberculosis | + | + | - |
| Fever | + | - | - |
| Adenoviruses* | + | - | - |
| Enteroviruses (with the exception of Polio, and Coxsackie viruses) | + | + | - |
| The FMD virus | - | + | - |
| The virus of infectious hepatitis* | + | - | - |
| The tick-borne encephalitis virus | - | + | - |
| Balkaninfluenza | + | - | - |
| Amoeba* | + | - | - |
| Toxoplasma* | + | + | - |

Note: * Transfer via milk is not always proven, however epidemiologically possible or such an opportunity is imply

CONCLUSION

The level of human activities become comparable with the global natural processes. In this regard, the increased danger of uncontrollable and irreversible changes in the environment and consequent threat to the existence of living organisms, including humans, require a strong, practical measures for the protection and conservation of wildlife.

Environmental conditions, nutritional status and health are major factors in determining the level of strategic security of all mankind. In this situation, improving the quality and food safety is one of the most important and priority tasks based on strengthening and improving internal production control.

The most difficult and dangerous factors in food production are biological, as the abundance of pathogens have a wide adaptation possibilities to adverse environmental conditions.

Against the background of global changes in environmental conditions, is increase susceptibility of people to infectious agents. The globalization of trade, contributes to large geographical spread of pathogens,

integration and consolidation of agricultural and industrial production leads to a risk of spread in a single source of products from a large central enterprises and the emergence of mass food poisoning.

Proposed the variants to solutions the problem of reducing microbiological contamination of raw milk before biotechnology processing. Developed a method of heat treatment milk-raw material to improve its microbiological and technological properties with an increased shelf life for reservation to use in technological processes.

REFERENCES

- [1] Donchenko L.V., Nadykta V.D. Food Safety. M., 2001. 528 p.
- [2] Emelyanov S.A. Microbiological aspects of the heat treatment of raw milk // Bulletin of Saratov State Agricultural University. 2006. № 6. p. 15-20.
- [3] Emelyanov S.A. Review of the effectiveness of alternative methods of bacterial sanitation of raw milk // Herald of the North Caucasus State Technical University. 2006. № 1 (5). p.66-70.
- [4] Krikun T.I. Adaptation of existing sectoral regulatory framework with international standards and EU regulations // Dairy Industry. 2003. № 12. p. 25-27.
- [5] The need for bacterial sanitation of raw milk / A.G. Hramtsov [et al.] // Dairy Industry. 2006. № 2. p. 18-21.
- [6] Netrusov A.I., Kotova I.B. Microbiology. M., 2006. 352 p.
- [7] Ensure the microbiological safety of the milk / S.N. Slipchenko [et al.] // Dairy Industry. 2007. № 3. p. 36-37.
- [8] Onishchenko G.G. Specifics of preventive vaccine-preventable diseases // epidemiology. and infectious. bolez. 2003. № 4. P. 4-8.
- [9] Find ways to remove the spore forms of microorganisms from raw milk / SA Emelyanov [Et al.] // Bulletin of the North Caucasus State Technical University. 2007. № 1 (10) p. 75-79.
- [10] Hazard Analysis and Critical Control Point definition: HACCP / HACCP. State US and Russian standards. M., 2003. 594 p.
- [11] Smirnov E.R., Emelyanov S.A., Evdokimov I.A. Low temperature processing serum: technological and microbiological aspects // Dairy Industry. 2007. № 8. p. 53-55.
- [12] Sheveleva S.A. Principles of safety assessment of foods microbiological risk analysis products // Processing of milk. 2004. № 7. p. 8-9.
- [13] Bryan F.L. Hazard Analysis Critical Control Points Evaluations : A guide to identifying hazards and assessing risks associated with food preparation and storage // World Health Organization. Geneva : Switzerland, 1992.
- [14] Pospelova O.A., Mandra Y.A., Stepanenko E.E., Okrut S.V., Zelenskaya T.G. Identification of technogenic disturbances of urban ecosystems using the methods of bioindication and biotesting // Biosciences Biotechnology Research Asia. Volume 12, Issue 3, December 2015, Pages 2241–2251.
- [15] Trukhachev V.I., Sadovoy V.V., Shlykov S.N., Omarov R.S. Development of technology for food for people with hypersthenic body type // Research Journal of Pharmaceutical, Biological and Chemical Sciences. 2015. Volume 6. Issue 2. P. 1347–1352.
- [16] Esaulko, A.N., Gorbatko, L.S. The biologizatoin of fertilizer is the way of development of sustainable agriculture // Sustainable agriculture and rural development in terms of the re-public of Serbia strategic coals realization within the Danube region – preservation of rural values, 2012, P. 180-196.
- [17] Shipulya A.N., Volosova E.V., Pashkova E.V., Glazunova N.N. Bezgina J.A. Synthesis and study of composite organic silica sorption materials // Oriental Journal Of Chemistry. 2016. Vol. 32, No. (1): P. 227-234.
- [18] Natal'ja Jur'evna Sarbatova, Vladimir Jur'evich Frolov, Olga Vladimirovna Sycheva and Ruslan Saferbegovich Omarov. Res J Pharm Biol Chem Sci 2016;7(2):534-538.