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SAFETY OF PRODUCTS PRODUCED IN THE DAIRY INDUSTRY OF AZERBAIJAN, THE INTRODUCTION OF THE HACCP SYSTEM IN THEIR PRODUCTION, AND IDENTIFICATION OF CRITICAL CONTROL POINTS

Summary

The introduction of HACCP standards presupposes the creation of organizational, resource, methodological and sociolocial conditions to ensure the quality of products in accordance with the recommendations and requirements of the standards. Milk safety has traditionally been considered a top priority for any economic system. The domestic dairy industry is no exception here as it is industry with a long history and a developed structure. Requirements for the quality of milk and the quality of dairy products are spelled out in various standards, milk is controlled by sanitary and veterinary services.

Key words: *dairy industry, safety, HACCP, control, identification*

Introduction

The expansion of the consumer market, economic relations between states, exports, and imports of various products in the food industry contributes to the imposition of more stringent measures for product safety and the need to produce products that meet world generally accepted standards.

Ensuring safety and quality management is becoming a topical issue for food industry enterprises in Azerbaijan, including for medium-sized businesses. The attention of the media, private entrepreneurs, and state control bodies is increasingly turning to the problems of guaranteeing the quality and safety of finished products by the manufacturer and to the methodologies that make it possible to systematize and regulate the work in this area. This information is becoming more accessible and widely disseminated, thereby increasing consumer culture and consumer interest in the activities of enterprises in the field of quality.

So, by social research materials in developed countries, more than 70% of buyers prefer the quality of goods to its price and most often purchase products from large or well-known manufacturers, as well as using their own experience (second purchase) or recommendations of friends. At the same time, at present, most Azerbaijani food products do not meet HACCP standards, except for products of large companies: Azersun Holding, Milla, Atena, since standards are violated at all stages of food production - from growing in the field to transport, processing and manufacturing of the final food product. In Azerbaijan, a small amount of food products meets world accepted standards.

Quality management has now become widespread in the world and has become a means of successful entrepreneurship. The quality management system occupies one of the most important places in the management of the organization, along with the management of finances, production, supply, personnel, and so on. In foreign practice, the presence of a certificate for the quality management system of an authoritative accredited certification body has long been a kind of access to the market and a guarantee of the good quality and safety of the finished product, since it is food safety that is one of the most significant problems on a global scale today. For example, for the countries of Europe, Japan, USA, Canada, product safety certificates are required.

When developing and manufacturing food products, special attention is paid to quality and safety. The level of safety is assessed in the finished product and is taken into account at the initial stage of the selection of raw materials and auxiliary materials (incoming inspection). However, most of the properties characterizing the quality of finished products (microbiological, physicochemical, organoleptic, and other

indicators) are formed as a result of the technological process. It is the most important criterion that determines the quality of products, aimed at minimizing the possibility of hazardous situations that negatively affect the quality (Аронов, 2003:10-12).

According to the World Health Organization (WHO), three to four million cases of various intestinal infections and severe poisoning caused by poor-quality food are registered annually. The real number of victims significantly exceeds the indicated figures, since not all seek qualified medical care. In Azerbaijan and other CIS countries, where counterfeit food products are an order of magnitude higher than in other European countries, 780-950 thousand diseases of acute intestinal infections of various etiologies, including those associated with the use of alimentary food products, are annually recorded.

Types of risks and their definition. The concept of "risk" in the HACCP system is defined as "a biological, chemical or physical property due to which a food product, when consumed, may be dangerous to humans." Unfortunately, when it comes to health, it is in principle impossible to achieve complete elimination of risk, and therefore, when searching for risks, it inevitably arises the need to assess risk, to quantify the likelihood of its occurrence and the consequences of possible violations In the category of biological risks, the main contamination by microorganisms comes from people, rodents, insects and birds. Recently, there has also been growing concern in society about the use of genetically modified plants as food raw materials, changes caused by radiation, as well as food allergens that affect some people. These aspects are still not well understood and are very closely related to production technology (Karthikeyan, 2015:5). To resolve such issues, the technologist must be familiar with the modern literature and know who to consult to be sure that this or that product is being used correctly. Chemical risks are contamination of a product in production with detergent chemicals, poisons used to control rodents, insects, lubricants, etc. There are also health risks from toxins from the previous growth of 23 microorganisms, pesticide residues in raw materials, residues of chemical fumigants, heavy metals from water, excess amounts of certain fats in the diet, salt, sulfur dioxide, and leaching from packaging materials. The technology for identifying them is a very complex and often controversial field and the chief technologist who neglects it runs very high risks. Physical risks are much more obvious and are probably the main source of problems. This includes random splashes of glass, metal, wood, as well as human hair, buttons, pieces of plastic, stones, paint flakes, etc.

Technical regulation of dairy products. Providing the population of the country with high-quality dairy products is one of the main and socially significant tasks, the solution of which depends on both milk producers and the processing industry. The constantly expanding range of dairy products and the saturation of the domestic market with imported goods create competition between milk processing enterprises and require the production of high-quality and inexpensive products (Фрейдина, 2012:185).

The best quality products at the lowest cost can only be produced from good raw milk. And today, milk should have a whole range of quality indicators required by the dairy industry: a high mass fraction of protein and fat, good sanitary and hygienic indicators, specific qualities that allow the production of one or another type of dairy product, that is, be technologically suitable for production. It is necessary to pay the utmost attention to ensuring the safety of such an important component of the diet.

The need for high quality agricultural products is an integral sign of today's times. It is an urgent problem of increasing the economic and social efficiency of social development.

Today, the level of product quality is the most important criterion for the development of any country in the world community, also for Azerbaijan and a kind of visiting card for the penetration of goods into the international market in conditions of the most intense competition, ensuring the expansion of export opportunities in the world market of goods (Tamime, 2013:9).

Technical regulation in the sphere of circulation of dairy products is based on the following principles:

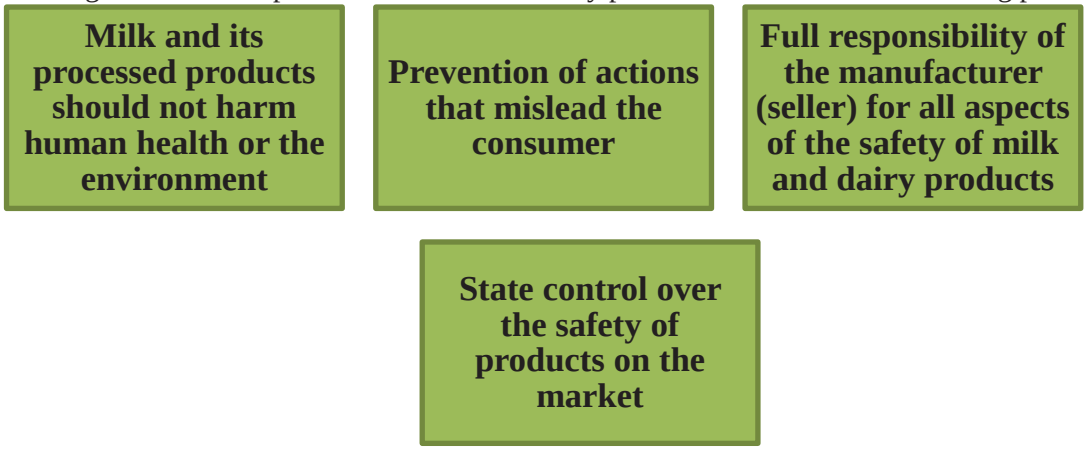

Figure 1. Technical principles of dairy products

Product quality management is understood as a constant, systematic, purposeful process of influencing at all levels the factors and conditions that ensure the creation of products of optimal quality and their full use. For high-quality assurance of a product and its competitiveness, it is important not so much to identify poor quality as to prevent it. Quality assurance means guaranteeing a level of product quality that allows the consumer to buy it with confidence for a long time, and this product must fully satisfy the consumer's requirements (Tamime, 2013:10).

Modern quality management at an enterprise, regardless of the form of ownership and the scale of production activities, should optimally combine actions, methods and means that ensure, on the one hand, the production of products or the provision of services that satisfy the current demands and needs of the market, and on the other, the development of a new product or service capable of meeting future needs and future market demands (Воскобойников, 2013:34). The principle scheme of the quality management mechanism should organically interact with marketing research and include a block for developing a policy in the field of quality.

Milk safety of Azerbaijan. One of the key opportunities for Azerbaijan, which seeks to achieve one of its strategic goals, such as food and milk security, is to cooperate in partnership with global organizations. We have to admit that the initial steps were entrepreneurship. Another 18 years ago, Azerbaijan acceded to international conventions (1996). This year, 173 countries joined the document, called the Roman Declaration on World Food Security. The document states that the population of our country will continue to take global measures to ensure food security and safety (Давыдов, 2010:236). Joining the international conventions, Azerbaijan has also achieved significant success in its efforts to maintain a worthy place in the rankings and reports on the safety of food products in the world and continues to do so. In this way, I would like to single out two reports to assess the current situation. One of them is the Global Food Safety Index.

In order to determine the level of food security in 2012, the ranking of world countries was announced. The Global Food Security Index includes an analysis of three leading food safety indicators: the level of availability and consumption of food products; level of safety and quality of food products and availability of milk products.

These criteria cover 28 indicators, the values of which are measured in 2 years.

Azerbaijan in the ranking of countries in terms of milk security for 2019.

Rating	A country	Index
43	Russia	63.8
44	Belarus	63.5
56	Kazakhstan	56.8
58	Azerbaijan	56.6
59	Ukraine	56.1
64	Uzbekistan	53.6

Table 1. Ranking of countries

Source**: http:// gtmarket.ru/ratings/global-food-security-index/info**

Azerbaijan took 58th place among 109 countries, and it should be noted that our country in this rating is ahead of such agricultural countries as Ukraine, and practically equaled with Kazakhstan. At the same time, the report notes a number of weaknesses in the field of milk security in Azerbaijan. These include a lack of spending on agricultural research, limited food security programs, low food spending on household goods compared to other goods, and small gross domestic product per capita. One way to tackle food security is the fact that it is important to score well on the Global Food Security Index in the 2019 report Azerbaijan was part of the "relatively prosperous countries" (Давыдов, 2010:236).

The manufacturer and the enterprise are responsible for every stage from the introduction of the raw material to the consumption of the product by the consumer. Besides, if the consumer of the product is a consumer group with high risks such as children, elderly people, and patients, then this should be expressed. In general, there are four types of microbiological hazards in the HACCP system:

1. The presence of microorganisms, pathogenic microorganisms and/or toxins and microbial metabolites of these microorganisms that cause deterioration in raw materials or additives.
2. Microorganisms are transmitted from potential sources during the production, processing, storage, and distribution of food.
3. Failures in removing these microorganisms from the environment with appropriate technological production techniques (GMP)

4. Incorrect and erroneous practices that allow microorganisms to maintain their viability and reproduce at stages such as food production, processing, storage, and distribution.

Control Criteria, hazards in the HACCP system, activities, and practices necessary to prevent, eliminate, or reduce food safety hazards to acceptable limits. The manufacturer and the enterprise are responsible for every stage from the introduction of the raw material to the consumption of the product by the consumer. Besides, if the consumer of the product is a consumer group with high risks such as children, elderly people, and patients, then this should be expressed. In general, there are four types of microbiological hazards in the HACCP system (Tamime, 2013:10):

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Control Criteria

I Control Measurements: Bacterial Hazards
- Temperature / time control
- Heating and cooking processes
- Cooling and freezing
- Fermentation and / or pH control
- Addition of salt or other preservatives
- Draining
- Source control

II Control Measurements: Viral Hazards
- Cooking process

III Control Measurements: Parasitic Hazards
- Inactivation

- Heating
- Drying
- Freezing

- Zoom out

IV Control Measurements: Chemical Hazards
- Source control
- Production control
- Labeling control

V Control Measurements: Physical Hazards
- Source control
- Production control

Determination of Critical Control Points. Critical Control Point (CCP)-is mandatory to prevent, eliminate or reduce food safety hazards to acceptable limits, these points can be any stage, or process (Аронов, 2003:12).

For a point to be a CCP, the danger must be prevented. For some products and transactions, the following situations may apply:

- Pathogens or drug residues can be prevented by controls at the acceptance stage (e.g. declaration of product supplier)
- Chemical hazards can be prevented by controls during the formulation phase or the substance addition step.

Pathogen development in the final product can be prevented by controls during the formulation or additive phase (eg pH adjustment or addition of preservatives)

- Propagation of pathogens can be prevented by cold storage or freezing.

In order for a point to be a CCP, the danger must be drawn to acceptable limits. For some products and transactions, the following situations may apply:

- Foreign matter can be minimized by manual classification and automatic collector

• Some biological and chemical hazards can be minimized, for example by the use of shellfish caught in permitted waters

Control Point

Control Point - Any stage, or process where biological, chemical or physical factors can be controlled

CCP and Control Points

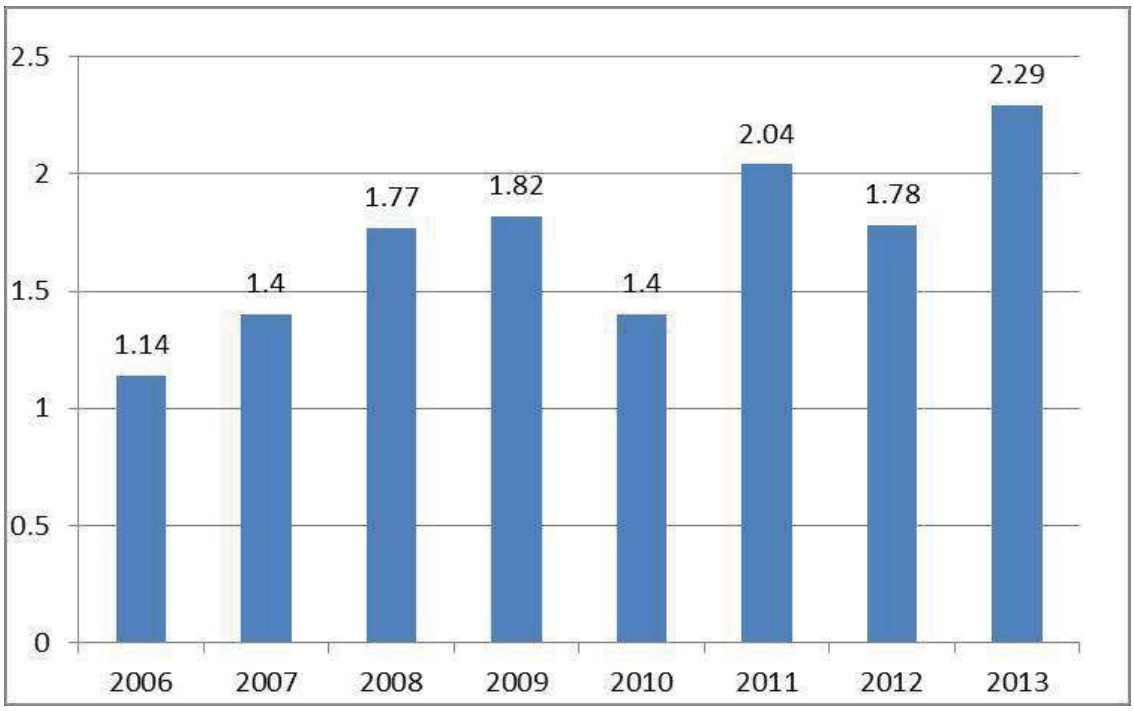
• Control Points

- Quality factors can be controlled
- These are the points that can be controlled without the need for HACCP regulation.

CCP

- Points where food safety hazards can be controlled (Fox and McSweeney, 2016:95).

Safety of dairy products. The modern consumer wants to be confident in the complete safety of food products, making high demands on the quality of products. HACCP and ISO 22000 contain the necessary set of measures aimed at ensuring safety at every stage of the production process. The reference to the certificate should give the buyer a sense of confidence in the manufacturer. To date, there is no more perfect model of quality management and food safety. HACCP systems are used in almost all civilized countries of the world as reliable consumer protection (Шевелев, 2014:6).



Source:https://www.google.com/Safety/of/products/produced/in/dairy/industry/Azerbaijan/

HACCP is not a usual standard, it is a system that is developed by each company independently following with the peculiarities of its production, can be flexibly changed and adapted. This system is specially designed for the food industry and is based on the following principles:

1. Conducting hazard analysis - through the process of assessing the significance of risks and their level of danger at all stages of life production cycle.
2. Determination of critical control points.
3. Setting critical limits for each CCP - defining a criterion that shows that the process is under control.
4. Development of a monitoring system to ensure control of critical control points based on planned measures or observations.
5. Determination of corrective actions to be taken when monitoring results indicate a lack of control at a specific CCP.
6. Development of a verification procedure to confirm the effectiveness of the HACCP system.
7. Development of documentation for all procedures and records that comply with the principles of HACCP and their application (Воскобойников, 2013:34).

Application of the HACCP principles consists of the following tasks:

1) create a HACCP working group;
2) describe the product;
3) determine the scope of use;
4) build a diagram of the technological process;
5) confirm the process flow diagrams at the facility;
6) list all potentially dangerous factors, conduct a hazard analysis, consider the possibility of control measures;
7) determine the critical control point;
8) identify the specification of critical pre-business for each CCP;
9) creation of a monitoring system for each cash register;
10) establish measures to eliminate deficiencies;
11) establish procedures for verification (verification);
12) create and maintain records (documentation) (Тимохин, 2008:32).

The presence of the HACCP system gives the enterprise some of advantages:

- the competitiveness of the enterprise itself and its products increases;
- consumer confidence in the company's products is growing;
- an opportunity to enter new markets, expansion of existing sales markets opens up;
- the number of complaints is reduced due to the provision of stable product quality;
- the reputation of a manufacturer of quality and safe food is created.

HACCP has become an original system thanks to the idea to focus on those stages of processes and production conditions, the lack of control of which is critical for food safety, and to give guarantees that food products will not harm the consumer (Fox and McSweeney, 2016:95). Therefore, HACCP is fundamentally different from the previous systems used in the food industry, which were built on “quality control” (only purchased raw materials and finished products were controlled)

At the agricultural enterprises of the region, there are currently no product quality departments, but the sales departments have specialists who are involved in the quality of products and the development of the HACCP system at their enterprises. The very technology of dairy production, like the technology of production of dairy products, implies the presence of control points. Therefore, the introduction of HACCP standards at dairy enterprises should not create big difficulties for business, but it will bring a lot of benefits (Hanson, 2009:59).

Conclusion

In fact, HACCP is a system for preventing errors, regulations, and a sequence of actions of the technological process. A clear procedure for the actions of each employee at each technological process is developed. The system allows you to anticipate risks in the production process itself, and not only to control the output product. The benefits of the system appear overtime when the company receives customer loyalty and a recognizable brand as a bonus. Today it is impossible to enter any foreign market without a security management system. Although product safety is not a novelty for Azerbaijan.

To ensure food, also milk security, first of all, it is necessary to achieve high productivity in agricultural production. If we compare with European countries, we see that our productivity lags behind them 2 times. While in Europe the average tomato yield is about 80 kg, this figure is 30 kg in Azerbaijan. As a rule, low productivity in the post-Soviet republics is a common fact. Scientists are still debating - when it comes to milk security, what criterion should we take as a basis? A number of factors have been identified that determine the country's milk supply, among which the following can be considered more important:

- the current level of milk production;
- the state of milk supplies
- profitability of milk production;
- milk prices;
- real incomes and purchasing power of the population.

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