

# RATIONALE FOR THE APPLICATION OF THE HACCP SYSTEM IN THE PRODUCTION OF FUNCTIONAL FOOD PRODUCTS

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## **Abstract:**

*The purpose of the study was to assess the risk factors for contamination of confectionery products by developing and implementing a modern control system for critical points. The results of sanitary-hygienic and microbiological studies of finished products in confectionery enterprises in Tashkent and Gulistan were obtained, indicating that they did not comply with the accepted standards according to the criteria of KMAFAnM (the number of mesophilic aerobic and facultative anaerobic microorganisms), yeast and mold.*

*And for the oriental sweetness "Navvat" safety criteria have not been established. It has been established that the processes of formation of micro-biological safety of confectionery products determine the ways of managing it, i.e. determine the possibility of using any actions that allow you to change the quantitative and qualitative composition of the microflora when implementing the HACCP system.*

**Keywords:** HACCP, Confectionery product, hygiene, standards

**Relevance.** Confectionery products (sweets, sweets, sweet dishes) are high-calorie and easily digestible food products with a high sugar content, characterized by a pleasant taste and aroma.

Currently, the popular direction of the food industry is the production of functional food products [1].

Application of the international system HACCP (Hazards Analysis and Critical Control Point - assessment of risk factors at control critical points) in the food industry [2], incl. in the confectionery industry is the most important branch of the Agro-industrial complex of Uzbekistan. It develops confectionery products with high nutritional value and digestibility due to the use of various high-quality raw materials for their production: granulated sugar, molasses, dairy, egg and fat products, cocoa beans, nuts, fruits, flour, etc. of the raw materials used, the technology of its processing and the final product, all confectionery products produced at the enterprises in accordance with the State Standards "Confectionery products and semi-finished products of confectionery production.

Terms and definitions "are subdivided into: chocolate and cocoa products, sugary confectionery (sweets, caramel, .iris, halva, dragee, marmalade, marshmallow, marshmallow, and oriental sweets), flour confectionery (cookies, biscuits, crackers, waffles, cakes and pastries, muffins, rolls). Currently, the assortment of confectionery products includes more than 3000 items, which allows us to satisfy any needs of the population. At the same time, the possibility of reducing the threat to oral health with confectionery products by using the HACCP system has not yet been studied.

The impact on the state of teeth of national types of confectionery products - navvat, halva, pashmak, etc. has not been studied. Many confectionery products are nutritious products of long-term storage (navvat, halva, chocolate, biscuits, biscuits, etc.). For the manufacture of confectionery products from prescription ingredients, it is necessary to prepare semi-finished products, the amount of which depends on the type of product and ranges from 1 to 10 or more, and the number of types of raw materials used, as a rule, varies from 2 to 20 or more.

Each type of product has its own characteristics. They are formed in the course of technological processing of raw materials, as a result of changes in its chemical composition, properties, structure. At the same time, the greatest concern of specialists in epidemiologists and food hygiene is caused by confectionery products with perishable fillings, due to the high bacterial contamination [3]. Such products in hot climates often cause pathological changes in the oral cavity and sometimes food poisoning.

**Research goal.** The purpose of the study was to assess the risk factors for contamination of confectionery products by developing and implementing a modern control system for critical points.

**Objects and research methods.** The objects of research were 4 enterprises for the production of confectionery products in Tashkent and Gulistan. The generally accepted methods of hygienic and bacteriological research have been applied.

### **Research results.**

The main principles of application of the HACCP system are: characteristics of the technological process, product description and identification of critical points. It was revealed

that the existing in Uzbekistan hygienic requirements for the production of bread, bakery and confectionery SanPiN No. 0257-08 [4], is not based on the assessment and analysis of the risk of contamination of confectionery products. In this connection, the technological instructions and recipes adopted by manufacturers locally have no scientific justification and are introduced in the form of an arbitrary scheme.

The results of laboratory studies of raw materials and finished products on the content of toxic elements and radiological studies did not reveal any differences from the standards established by SanPiN No. 0366-19 "Hygienic standards for food safety [5].

According to microbiological indicators, significant differences in the safety criteria of finished products from the established standards were revealed (Table 1.)

**Table 1.** Microbiological indicators of finished products in the confectionery industry

Product name	Indicators	Permissible levels, mg / kg, no more	Research results
Unglazed candies and sweets: - fondant, dairy	Microbiological indicators:		
	QMAFAnM, CFU / g	$5 \times 10^3$	$5 \times 10^4$
	BGKP (coliforms) in 1.0g	not allowed	Not found
	pathogenic, incl. salmonella in 25g	not allowed	Not found
	yeast, CFU / g, no more	10	14
	mold, CFU / g, no more	50	55
Halva:-glazed	QMAFAnM, CFU / g	$1 \times 10^4$	$1 \times 10^5$
	BGKP (coliforms) in 0,01g	not allowed	Not found
	pathogenic, incl. salmonella in 25g	not allowed	Not found
	yeast, CFU / g, no more	50	55
	mold, CFU / g, no more	50	50
- unglazed	QMAFAnM, CFU / g	$5 \times 10^4$	$1 \times 10^6$
	BGKP (coliforms) in 0,01g	not allowed	Not found
	pathogenic, incl. salmonella in 25g	not allowed	Not found

	yeast, CFU / g, no more	50	60
	mold, CFU / g, no more	50	55
Eastern sweets: -kozinak	QMAFAnM, CFU / g	$5 \times 10^3$	$5 \times 10^4$
	BGKP (coliforms) in 0,1g	not allowed	Not found
	pathogenic, incl. salmonella in 25g	not allowed	Not found
	yeast, CFU / g, no more	50	60
	mold, CFU / g, no more	50	50
-navat	QMAFAnM, CFU / g	There are no norms	$5 \times 10^4$
	BGKP (coliforms) in 0,1g		Not found
	pathogenic, incl. salmonella in 25g		Not found
	yeast, CFU / g, no more		60
	mold, CFU / g, no more		50

As the results of bacteriological studies show, the finished product does not meet the accepted standards according to the KMAFAnM criteria (the number of mesophilic aerobic and facultative anaerobic microorganisms), yeast and mold. Safety criteria have not been established for the oriental sweetness “Navvat”.

### Conclusions:

1. Safety control methods are lengthy, and its control cannot fully ensure product safety. The safety of confectionery (CI) can be ensured only at the stage of production, by controlling the process of its formation. To do this, it is necessary to study the formation process in the course of the technological process.

2. The processes of formation of microbiological safety of CI determine the ways of its management, i.e. determine the possibility of using any actions that allow you to change the quantitative and qualitative composition of the microflora.

3. To implement the HACCP system, it is necessary to study the dynamics of microflora during the technological process, to determine at what stages of production there is a decrease or increase in the number of microorganisms, i.e. which processes contribute to the growth of microorganisms, and which ones stop their vital activity.

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