ISSN: 0975-8585

Research Journal of Pharmaceutical, Biological and Chemical Sciences

Development and implementation in food safety management system by ISO 22000 in beet sugar production.

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ABSTRACT

The essence of the HACCP system is the identification and control of "critical points" in production. This can be done in different ways; it all depends on the specifics of an enterprise. Also, the very sequence, certain "steps" to implement this system are also determined individually for each enterprise. The article considers modern approaches to ensuring food safety, with reference to the production of granulated sugar. Using the risk analysis method of the diagram, potentially dangerous factors for the production of granulated sugar were identified and analyzed, and two critical control points (CCPs) were identified. The first CCP is defined at the stage of the raw materials acceptance process: chemical hazard (content of toxic elements, pesticides) as a result of non-verification (absence) of accompanying documents (certificates of conformity, test reports of the 3rd party). The second CCP arises at the stage of the drying department, the packaging of granulated sugar, the microbiological dangerous factor (infecting the group of mesophilic microorganisms KMAFAiM, CGBP, colibacillus, a group of pathogenic microorganisms, salmonella) is critical. For each CCP, a monitoring system, preventive actions, a list of documentation for recording data from each CCP, a HACCP plan was developed.

Keywords: HACCP, risk analysis, monitoring system, corrective actions, sugar.

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ISSN: 0975-8585

INTRODUCTION

The introduction of a food safety management system is a fundamentally new step in the quality management system. All basic principles of the methodology are used in production. First of all, this is the definition of control and critical points in the technological chain, conducting risk analysis, corrective actions, including monitoring, accounting and preparation of all necessary documentation [6, 7]. To use the security system, an enterprise needs to investigate its product and its production methods, and also apply this system and its recommendations to raw material suppliers, the selection of additional materials, and to retail and wholesale trade networks [4].

MATERIAL AND METHODS

The research was carried out at the Balashov sugar factory in the Saratov region. The object of the study is the development of a security management system at the enterprise.

RESULTS AND DISCUSSION

To develop the system, a working group was formed from employees with different specializations, possessing relevant knowledge about the specific products, work experience, and also the way to develop an effective plan for implementing the system at the enterprise under study.

Table 1: Selection of critical control points (CCP)

Stage (stage) of the process	Description, source. Cause of the hazard	Risk assessment (probability, severity, consequences)	Is the rea CCP (yes or no)	If so, why?	Preventive actions
Acceptance of raw materials	Chemical (content of toxic elements, pesticides). Not checking (absence) of accompanying documents (certificates of conformity, test reports of the 3rd party).	1) The probability of occurrence is minimal (D); 2) The class of danger off ailure - class 1 - catastrophic. Danger of spoilage of raw materials, in ability touse for their intended purpose. 3) Consequences at occurrence - level 5 - catastrophic	Yes CCP 1.	This is CCP, becauseifthereisanexcessofthelimitlevelofindicatorsandnoverificationorlackof a certificate, nosubsequentprocessproceduresswillreducethepollutiontoanacceptablelevel.	Mandatory control of the presence and evidence of a certificate of conformity or a test report of the 3rd party. Sampling and contamination by chemically dangerous elements.
Drying compartment. Packing of sugar.	Microbiological hazard factor. Infection with a group of mesophilic microorganisms KMAFAiM, CGB, colibacillus, a group of pathogenic microorganisms, salmonella.	1) The probability of occurrence – the minimum (D) 2) Risk class off ailure - 3 average Danger of product damage; possible partialuseas intended; corrective actions are not possible. 3) Consequences of occurrence Level 4. Critical	Yes CCP 2.	This is CCP, because at violation of the temperature and humidity regime, sanitary and hygienic requirements. Production facilities and personal hygiene of personnel, exceeding the allowable level of contamination, subsequent process procedures will not reduce the m / b contamination acceptable level. It is	Systematically, at least 1 time per shift, cleaning, washing, disinfection of production facilities, personal hygiene control.

	Possibility of manifestation and development in case of non – observance of the temperature and humidity regime, sanitary and hygienic requirements in the production premises, violation of the personal hygiene requirements of the personnel.			necessary to reject the products.	

Based on the technological scheme of production, ranking of indicators for conducting risk analysis was conducted. Critical control points (CCPs) to be managed through the HACCP plan.

CONCLUSION

Based on the results of the data obtained, the last stage is the HACCP plan, which provides detailed information on the detection of a hazardous factor at each stage of the process, indicating its critical limits, the monitoring procedure, the elimination actions, and the document to which the testimony is recorded (Table 2).

Table 2: HACCP

The danger of P.P. subject to management in the CCP	Control measures	Critical limits	Monitoring procedure	Correction, corrective actions	Distribution of responsibilities and authority	Record keeping
CCP 1. Chemical hazards (excess of toxic elements in raw materials (beetroot).) Possibility of manifestation of hazardous factors. Withoutverificationofaccompanyingdocumentsforrawmaterialsortheirabsence	Obligatory control of accompanying documents, availability of certificates of conformity or test reports of the 3rd party. If necessary, sampling, follow-up of raw materials for compliance with necessary documentation	GOST 30178-96 GOST 26930-86 GOST 26-927-86 GOST 30349-96 MUK 411125-4.11395-03 MUK 2.6.11194-03 MU - 5048-89	Control of the mandatory inspection of accompanying documentation. If it is necessary to sample and test in coming raw materials	If there is a discrepancy between the raw materials, the rejection and return to the supplier. Conducting the next briefing of personnel employed at the acceptance of raw materials	Head of laboratory. Head. Ware house, quality and safety manager.	CKT Parameter Control Log

CCP 2. Microbiological. If the sanitary and hygienic regime of industrial premises is not complied with, personal hygiene of the personnel. Violationofthetemperatureandhumidityconditionsofthemediumandtheproduct. Possible contamination by groups of bacteria KMARA and M, CGB, pathogenic salmonella	Carry in gout of cleaning, washing, disinfection of industrial premises, equipment, observance of personal hygiene of the personnel, the control of maintenance of a temperature-humidity mode of environment and production. Room cleaning daily. Control of the concentration of dust in the air - constantly	The temperature of the medium is not more than 25° C. humidity is not more than 70%. The moisture content of the product is not more than 0.14%. Cleaning is at least 1 time per day. Control of the concentration of dust in the air - constant	Control of the temperature-humidity regime of the medium and the product 1 time per shift. Periodicity control and evaluation of the effectiveness of cleaning, washing industrial premises 1 time per day. Control of the concentration of dust in the air is constant.	If a discrepancy is found, it is possible to partially use it for its intended purpose. If necessary - rejecting a part of the product. Testing (instruction) of personnel at the site.		CKT Parameter Control Log

The introduction of a quality management system based on the principles of HACCP and obtaining a certificate at the enterprise allowed the organization to gain certain leading positions in the sales markets, ensure the production of safe products based on systemic control at all stages of production and increase the demand for food products by building consumer confidence in the quality and safety of the produced products.

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