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## Development Of HACCP For Meat And Sausage Products.

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### ABSTRACT

Due to the fact that food products are considered to be potentially dangerous, in the food industry of all countries, the development and use of such management systems that would guarantee the safety of food products for the consumer, and also provide the necessary and stable quality of products is becoming more important. One of the main problems facing Russian enterprises today is their successful adaptation to the conditions of a market economy. The solution of this problem is a necessary condition for their survival and further development. At present, the survival rate of any firm, its stable position in the market of goods is determined by the level of competitiveness. In turn, competitiveness is associated with the level of prices and the level of product quality, labor productivity, saving of all types of resources. This is possible with a proven quality system in the enterprise [1]. The relevance of the issue under study is related to the importance of the results of the activity on the formation of the quality system. The purpose of this work is the development and implementation of a quality management system and food safety for compliance with the requirements of GOST R ISO 9001-2015 and the HACCP principles at the "Pishevik" Saratov Agrarian University. N.I. Vavilov.

**Keywords:** HACCP, quality, standard, safety, sausages.

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**INTRODUCTION**

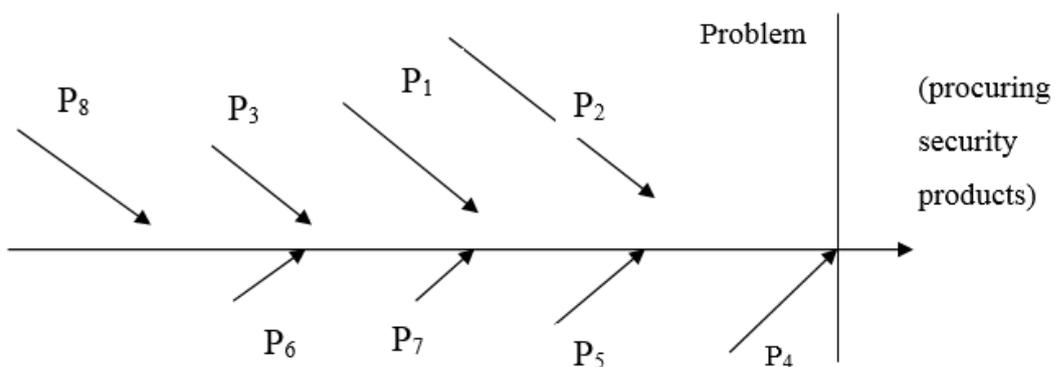
Hazards are the effects of substances, factors or conditions associated with food that could lead to illness, injury or death of people. These risks are identified and eliminated through the HACCP system, which, from 2015, must be introduced in all food production. A classification of management activities has been developed, and criteria for the effectiveness of their implementation have been established. Taking into account the developed system, approbations of formulations and technologies have been carried out, the regulated indicators of quality and safety of products have been determined [2].

The production of meat and sausage products is considered to be the most potentially dangerous industry of the food industry [3, 4]. Therefore, the issue of development and implementation of quality systems at such enterprises is becoming more urgent.

Enterprises often face the choice of implementing a system based on the application of the HACCP principles, which is only one of the possible ways of ensuring safety, and the quality system for the requirements of ISO 9000 series. However, it should be noted that the requirements of ISO 9000 series regulate only the elements of the organization of the system, the need for implementation formal and special procedures. They do not contain descriptions of the technical means used, instructions for setting relative quality assurances, and the requirements of the HACCP system allow for certain effects on the product or process in the production process. Therefore, the application of these systems in the meat industry provides an excellent opportunity to create and maintain an effective and efficient quality and safety system [5].

**MATERIAL AND METHODS**

We studied the technology of production of meat and sausage products, hazardous production factors, as well as a system of documentation with the help of general scientific, statistical and sociological research methods. For the development of the food safety management system, the stages of the technological process (processes) were ranked and the most priority stages from the point of view of the manifestation of dangerous factors were identified.



**Figure 1: Cause - effect diagram of analysis the technological factors affects to product safety**

As can be seen from the analysis (Table No. 1, Figure 1), technological factors, or P2, have the greatest impact on the safety (hazard) of the product; P1; P3; P8 and P4:

**Table 1: Ranking of indicators, technological factors affecting the production of products**

Technological factors (stages)	Experts ranks					Amount of ranks	Coefficient of significance,%
Acceptance and storage of raw materials	7	8	8	6	7	36	P <sub>1</sub> 19
Processes of thermal processing of products (t ≥ 80 °C)	8	7	7	8	8	38	P <sub>2</sub> 20
Sanitary measures (cleaning, washing, disinfection) of premises, equipment, inventory	6	5	6	7	6	30	P <sub>3</sub> 16
Personal hygiene activities	5	4	4	3	4	20	P <sub>4</sub> 11
Packing of finished products	4	2	3	5	2	16	P <sub>5</sub> 9
Storage of finished products	3	1	1	2	3	10	P <sub>6</sub> 5
Measures to ensure the safety of products during transport	2	3	2	1	5	13	P <sub>7</sub> 7
Measures to ensure product safety during its implementation	1	6	5	8	1	21	P <sub>8</sub> 13
Total						184	100

**Table 2: HACCP plan**

Danger to be managed in the CCP	Control measures	Critical limits	Monitoring procedure	Correction, corrective actions	Responsibility and authority	Record keeping
CCP 1. Chemical dangerous factor. Unchecked or inadequate inspection of accompanying documentation (certificates of conformity, test reports of the 3rd side of raw materials (beef, pork, poultry).	Obligatory control of the accompanying documentation (certificates of conformity of raw materials, test reports of the 3rd party, sanitary-veterinary certificates)	TR CU 021/2011 "On the safety of food products" (Appendix No. 3, point 3); TR CU 034/2013 "On the safety of meat and meat products (Appendix No. 4)	Control of accompanying documentation. If necessary, sampling raw materials and conducting independent tests for compliance	If there is a discrepancy between the raw materials and the safety requirements, it is the rejection and return to the supplier. Extraordinary briefing of personnel employed at the acceptance of raw materials	Technologist	Journal of acceptance the raw materials
CCP 2. Microbiological	Obligatory control of the	TR CU 021/2011 "On	Control of accompanying documentation. If	If there is a discrepancy	Technologist	Journal of acceptance the raw materials



<p>hazard factor. The possibility of contaminating raw materials.</p>	<p>accompanying documentation (certificates of conformity of raw materials, test reports of the 3rd party, sanitary-veterinary certificates)</p>	<p>food safety" (Appendix No. 2, Table 1).</p>	<p>necessary, sampling of raw materials and conducting independent tests for compliance with contamination</p>	<p>between the raw materials and the safety requirements, it is the rejection and return to the supplier. Extraordinary briefing of personnel employed at the acceptance of raw materials</p>		
<p>CCP 3. Products: Semi-finished products without heat treatment. Procedure. Debarking, lining, preparation of forcemeat by forming. Microbiological PF. Preliminary sanitary and hygienic measures (cleaning, disinfection of production areas, equipment and inventory After each production cycle, once a</p>	<p>Inadequate conducting of preliminary sanitary and hygienic measures (cleaning, disinfection of production areas, equipment and inventory.), Non-observance of the rules of personal hygiene of employees.</p>	<p>Rules of personal hygiene of employees, Working instructions on sanitary treatment of equipment</p>	<p>Constant monitoring of the effectiveness of sanitary and hygienic measures. If necessary, monitoring the washings from the surface of the equipment to match the parameters of the microbiological hazard.</p>	<p>Correction if a discrepancy is found repeating the operation.</p>	<p>Technologist</p>	<p>Journal of the control of the production process</p>



week. Sanitaryday.						
CCP 4. Products: Sausage products. Procedure: Heat treatment.	Microbiological PF. Non-observance of temperature and time of heat treatment	GOST R 52196-2011; TU 9213-003-96574898-11; GOST R 55455-2013; GOST 31785-2012; TU 9213-001-96574898-10; TU 9213-038-54899698-08; TU 9213-009-40155161-2003.	Control of temperature and time of sterilization	If there is a discrepancy, take a decision: 1. Recycle 2. To work out	Technologist	Journal of the control of the production process
CCP 5. Products: All kinds of products. Operation: Certification of samples of products in an independent laboratory once every three years.	Physical Facility Chemical PF Microbiological OB Non-compliance with safety requirements	TR CU 021/2011 "On food safety".	Selection of test samples for compliance with safety requirements.	If there is a discrepancy, analyze the reasons, develop and implement measures to eliminate the causes of non-compliance.	Chief Technologist Quality and safety manager	Certificate of conformity

**RESULTS AND DISCUSSION**

Thus, critical limits are set for monitoring for each CCP. Critical limits are set so that when monitoring the indicators of the CCTS, it is possible to establish a violation of the regime (if the parameters of the CCP have exceeded the established limits) and take the necessary corrective actions to restore an acceptable level of danger. Within the food safety management system, all types of hazards for raw materials, including biological (microbiological), chemical and physical, have been identified. For each potential factor, a risk analysis was carried out taking into account the probability of occurrence of the factor and the significance of its consequences. Based on the block diagram of the process for the production of meat and sausage products, hazardous production factors have been identified. To identify critical control points, the decision tree method was used. As a result of using this method, critical control points were identified.

In accordance with GOST R 51705.1-2001, clause 4.4.3, the working group to reduce the number of control points without compromising safety did not take into account the points for which the warning effects regulated in the Sanitary Rules and Norms in the maintenance system and repair of equipment. Critical limits for each CCP, corrective actions, monitoring were presented in the form of a HACCP plan.

### **CONCLUSION**

Summing up, we can conclude that the security system allows us to focus the company's attention on the critical points of production, thereby minimizing the risk of manufacturing low-quality products. With the help of the system, the company is given the opportunity to conduct microbiological and chemical testing of both raw materials and final product. To prevent the danger can be at every stage of production, which significantly reduces material costs, improves product quality [6].

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