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IMPLEMENTING THE HACCP SYSTEM IN STRUCTURELESS MEAT PRODUCTS

IMPLEMENTAREA SISTEMULUI HACCP ÎN CAZUL PRODUSELOR DE CARNE FARĂ STRUCTURĂ

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This paperwork presents a HACCP system implementation in a structureless meat products manufacturing factory study. The steps that were followed in order to provide the consumer with safe preparations are emphasized, from the hazard analysis to establishing Critical Control Points (CCP) and critical limits to be monitored, until the corrective action and verification procedures establishment. Finally, the documentation concerning all procedures and records appropriate to these principles and their application was established.
Key words: HACCP system, structureless meat product, CCP, hazard, monitoring, corrective actions

Introduction

Meat processing industry has an important share of the food industry and it is characterized by a set of features related to both *raw matter* and *equipment* used.

Raw matter quality is decisive in a healthy nutrition since it not only passes on calories to the finite products but also different substances – from proteins to vitamins – all of which ensure a good functioning of the biological processes within human nutrition.

On the other hand, *equipment* and technology quality used in the process guaranty a positive use of the resulting foods, with no risk of side-effects that could be not only aggressive to human body but also sickening.

Meat product suppliers and processors' attitude toward food safety is a true index of civilization since it supplies humans with the necessary elements while guaranteeing a proper life, which is indicative of fundamental human rights respect.

In the production of meat products (*parizer* – thick, raw sausage made of boiled minced meat, and Praguer sausages) they use previously processed meat under the form of semi-preparations such as bradt, grits, as well as auxiliary materials such as drinking water, salt, protein derivatives, pre-jellied starch, nitrates and nitrites, and natural and artificial membranes.

The development of the food industry knows, at present, a particular swing due to both the diversification of technologies opportunities in the valorising of meat from different animal sources and to the technical progress in the design of equipments contributing to the quality of foods.

Technological systems that are determining in meat processing cover the entire interdependent element range making up an organized entity ensuring the respect of certain technological stages with energy consumption, processes, methods, procedures, and operations capable of turning meat and meat products (possibly also in combination with other edible or auxiliary materials) after well defined recipes to obtain the desired final food product.

Productive structures in food industry destined to the processing of meat represent those constructive-functional configurations representing both functioning schemes and the principles underlying their internal cohesion, with a view to obtain foodstuffs based primarily on meat from animal sources.

Materials and Methods

With Romania's adhesion to democratic structures, the issue of food safety becomes a priority since foodstuff trade must be done in full confidence and safety.

The need for proper programmes to be applied to get safe foods for all consumer groups, from children and young people to aged, ill, or deficient people asks for the implementation of a safety system that ensure foodstuffs safety, a system that implies the identification, assessment, and control of all the risk incurred by food processing.

The Hazard Analysis Critical Control Points (HACCP) system can reach this desideratum and, if applied and maintained properly, it provides the expected results.

From practical reasons, applying the HACCP system is extremely useful since producers cannot allow nor are able to control finite products in totality.

Hygienic production implies the manufacture of a foodstuff in *maximum safety* conditions, i.e. reaching sanitation parameters within limits avoiding or diminishing the risk of morbid situations through the consumption of such products.

The success of applying the HACCP system asks for a lot of work and involvement from all the employees, including managers of foodstuff producing units, which also asks for a team approach.

General principles are the fundament for food hygiene guaranty. This accompanies the alimentary chain from primary production to consumer, emphasising hygiene key controls at each stage and recommending the use of the HACCP system to increase food safety.

Applying the HACCP system implies foods obtained in safe conditions and consumed in safe conditions through the control of all the processes involved from the farm to the consumers' table.

The Hazard Analysis Critical Control Points system is a systematic approach of the desideratum concerning food safety and it consists of applying the seven basic principles below:

Principle 1: Assessing the risks associated to raw matter and ingredients, to the processing, handling, storing, distribution, culinary preparation, and consumption of foodstuffs.

Principle 2: Determining the critical points in the control of the identified risks.

Principle 3: Establishing the critical limits to observe in each critical control point.

Principle 4: Establishing the critical control points monitoring principles.

Principle 5: Establishing corrective actions to apply when detecting any abatement from the critical limits during the monitoring of the critical control points.

Principle 6: Organising an efficient system for the keeping of records constituting the documentation of the HACCP plan.

Principle 7: Establishing the procedures necessary to check the proper functioning of the HACCP system.

Results and Discussions

1. Evaluation of associate risks

Table nr. 1

Hazard analysis

TECHNOLOGICAL PROCESS PHASES		*RISK*	*POTENTIAL RISK*	*CONTROL PROCEDURES*
1.	Meat reception	Microorganism multiplication	Microbiologic, chemic, physic contamination	Verify of meat temperature
2.	Carving, deboning, choosing	Impurity contamination	Microbiological, chemical, and physical contamination	Establishing the time interval for the proper cleaning of the work tables and equipments
3.	Bradt preparation	Multiplication of microorganisms in the meat	Microbiological, chemical, and physical contamination	Checking the temperature of the composition
4.	Maturation	Multiplication of	Microbiological,	Periodical

		micro organisms	chemical, and physical contamination	checking of maturation storehouses and of the pallets
5.	Mix preparation	Microorganism multiplication	Microbiological, Chemic, physic contamination	Permanent verify of nitrogens, bone fragments or other strange materials
6.	Filling	Contamination with impurities	Microbiologic, chemic, physic contamination	Identification of time interval for filling machine cleaning
7.	Warm smoking	Contamination with smoke impurities	Microbiologic, chemic, physic contamination	Identification of time interval for machine cleaning
8.	Pasteurization	Spor-former and high temperature resistance bacteria	Microbiologic, chemic, physic contamination	Verify of term diagrams, daily control of the kettle
9.	Cooling	Recontamination with cooling water	Microbiologic, chemic, physic contamination	Periodic analyze of the cooling water, assurance of machines integrity
10.	Packaging	Recontamination through equipment and packages	Microbiologic, chemic, physic contamination	Decontamination of packages, monitoring the hygiene works
11.	Storage	MO development when the storage temperature grows up	Microbiologic, chemic, physic contamination	Verify of thermographs, monitoring the storage time

2 Identifying critical control points

It is essential in a HACCP plan. Any phase in the technological process in which one can control hazards of physical, chemical, and biological nature is a critical control point (CCP). Determining a CCP is eased by applying the decision-making tree which allows a logical approach and that can be adapted to the nature of the operation. Before applying it, we should check if all the hazards identified

are completely under control by applying the good manufacturing practices (GMP) and the good hygiene practices (GHP).

Table nr. 2

Identification of critical control points

NR.	***PROCESS PHASE***	***RISKS***	***NUMBER OF QUESTION FROM THE DECISIONAL ARBORE***				***CCP/CP***
			Q1	Q2	Q3	Q4	
1.	Meat reception	Microorganism multiplication	Yes	No	Yes	Yes	CCP
2.	Carving, deboning, choosing	Impurity contamination	Yes	No	Yes	Yes	CCP
3.	Bradt preparation	Multiplication of microorganisms in the meat	Yes	No	Yes	No	CCP
4.	Maturation	Multiplication of microorganisms	Yes	Nu	Yes	No	CCP
5.	Mix preparation	Microorganism multiplication	Yes	No	No	-	CP
6.	Filling	Contamination with impurities	Yes	No	No	-	CP
7.	Warm smoking	Contamination with smoke impurities	Yes	No	No	-	CP
8.	Pasteuri-zation	Spore-former and high temperature resistant	Yes	Yes	-	-	CCP
9.	Cooling	Recontamination through cooling water	Yes	No	Yes	Yes	CCP
10.	Packaging	Recontamination through equipment and package	Yes	Yes	-	-	CCP
11.	Storage	Mo development when storage temperature grows up	Yes	Yes	-	-	CCP

3. Establishing critical limits for the critical control points

For each stage of the process will be established the critical limits in case of microbiologic, chemic, or physic contamination

Table nr. 3

Critical limits for the critical control points

NO.	***STAGE OF THE PROCESS***	***CCP CRITICAL LIMITS***
1	Reception of the meat	Temperature and moisture of the reception areas
2	Carving, deboning, choosing	Temperature in the facility
3	Bradt preparation	Temperature on the meat preparation
4	Maturation	Temperature and moisture of the storage areas
5	Mix preparation	Temperature and moisture of the meat
6	Filling	Temperature and moisture of the meat preparation
7	Warm smoking	Temperature and moisture of the meat preparation, pH, duration of the smoking process
8	Pasteurization	Duration and temperature of pasteurisation
9	Cooling	Temperature of cooling
10	Wrapping	Temperature of the products upon wrapping, duration, void, modified atmosphere (inert gases in the wrapping)
11	Storage	Temperature and moisture of the storage areas, duration of storage

4 Identification of corrective actions

Table nr. 4.

Identification of corrective actions

NR.	***PROCESS PHASE***	***RISKS***	***EVENTUAL RISKS***
1.	Meat reception	Deny of unsuitable lots	-
2.	Carving, deboning, choosing	Deny of unsuitable lots	-
3.	Bradt preparation	Resumption operation	Verify of temperature and moisture of the preparation meat
4.	Maturation	Deny of unsuitable lots	Verify temperature and moisture of the storage areas
5.	Mix preparation	Deny of unsuitable lots	Verify of cooling temperature and time
6.	Filling	Refill	Cleaning of the injection system
7.	Warm smoking	Modify of the process	-
8.	Pasteurization	Deny of unsuitable lots	Verify of pasteurization temperature and time
9.	Cooling	Modify of the cooling temperature	Improve monitoring methods
10.	Packaging	Modify of the process, denied of bed products	Improve monitoring methods
11.	Storage	Modify of the storage process	Improve monitoring methods

5 Storage of data and documentations

The application of the HACCP system means to introduce a system of documents and dates which contains all the dates and informations about the products security.

Conclusions

The HACCP is an important element in the general quality management and of food protection since it helps:

- Integrating modern procedures of risk analysis and of the concept of preventing from the ppint of view of consumer health protection in the existing management system;
- Higher safety of the product and low risks in guaranteeing the product;
- Significant improvement of the communication and the increase of the trust level between clients, suppliers, and surveillance authorities;
- Systematic analysis, carrying out safe and efficient processes with a view to secure foodstuffs, and directing processes to identify potential risks concerning hygiene that can endanger consumer health;
- Preventing the problems that could occurr in guaranteeing products;
- Helping food industry companies to ebcome competitive on the international markets.

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