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STUDIES REGARDING THE IMPLEMENTATION OF FOOD SAFETY MANAGEMENT SYSTEM ON TOMATO PROCESSED PRODUCTS

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Abstract

HACCP is the abbreviation for the English expression "Hazard Analysis and Critical Control Points". To obtain high – quality products, capable of meeting the consumer's demands and complying with the Food safety standards, it is recommended that certain risk-prevention and control methods should be applied. In the tomato product processing, the application of a HACCP system allows the identification of the key-elements of the technological process. The system analyses the hazard related to the product and the process, indicating the critical control points to the hygienic quality of the product. During the technological process, there are a large number of factors affecting the safety of the horticultural products. Starting from the fact that these products are highly requested there are major concerns regarding the level of pesticides and other chemical contaminants, as well as the maintenance of hygiene during harvesting and handling.
In order to prevent or reduce the above-mentioned hazards, the big specialised companies and small producers must apply HACCP prevention methods, not methods based on the final product control (which may affect consumer's health and may lead to important economic loss). In order to keep under control the tomato processed product were identified the following CCPs: CCP1- Heat treatment and CCP2 – Sorting of end product.

Key words**:** CCPs, HACCP, food safety, tomato processed products

INTRODUCTION

The sanitary status of tomato processed products is a foremost quality attribute, even though it is among the less discernible traits for the consumer. Tomato processed products can contain chemical, physical, and microbial hazards and contaminants or some synthetic pollutants (residues of fertilizers, herbicides and pesticides). Food safety management systems like ISO 22000:2005 and Hazard Analysis Critical Control Point (HACCP) can secure food safety by preventing potential hazard at source points of the process.
In order to guarantee tomato processed products safety, it would be desirable to structure the production according to HACCP principles. In the tomato processed products, the critical control points can be detected mainly for microorganisms.

MATERIAL AND METHOD

The studies were developed on the processing of tomato processed products, according the flow diagram described in Fig.1.
For each step of the process was performed the risk analysis, in order to identify the chemical, physical and biological hazards correlated to the product and process and also the preventive actions and control measures which are necessary to keep under control these hazards.
In order to the CCPs in all steps where it's possible to implement specific control measures regarding food safety, the CCP decision tree was applied. The control of each CCP, according HACCP principles are planned in HACCP

plan and the implementation of the control measures and shown by specific records.

RESULTS AND DISCUSSIONS

The safety of food products which are processed by means of conservation is higher than that of fresh products.

In comparison with fresh horticultural products or minimally processed ones, which have an increased metabolic activity and are microbiologically vulnerable, tomato cans (tins), due to the fact that they have been treated under heat, are stable as far as microbiological aspects are concerned.

The inconvenience of conserved (canned) products is the fact that through their exposure to high temperatures a part of the vitamins is lost and, furthermore, the product's colour is also altered.

According to the HACCP conception, the purchasing of the quality row material, phased transport and in adequate circumstances as well as its input into the production flow in a time interval as short as possible represent good manufacturing practices (GMP) which have major impact on food safety.

In order to keep control of the microorganisms it is important to respect the sterilization diagram which corresponds to each and every product.

Starting from these aspects, in the table 1 are presented the process step and related potential hazards including the preventive actions and the control measures, from which one of the most important is the temperature control.

Table 1. Hazard analysis regarding the processing of tomato processed products

Process step	Hazard	Preventive actions/Control measures
1. Receiving of row materials	B- Pathogenic micro organisms C- Pesticides residues - Heavy metals - Fertilizers Ph – Foreign matter	Visual control Supplier assessment Product analysis
2. Storage	B - Idem	Sanitation programme Regular maintenance FIFO system Temperature control during storage
3. Washing Preparation	B- idem Ph – Metal piece from cutting machine	Cleaning programme Right equipment Personal hygiene rules
4. Boiling	B – idem	Cleaning programme Right equipment Personal hygiene rules Process control (time/temperature)
5. Filling /closure	B – idem Ph – Foreign bodies	Cleaning programme for equipment Personal training
6. Heat treatment	B – idem	Process control (time/temperature) Personal training
7.Closure check	B - idem	Regular maintenance of equipment Visual control Personal training
8.Storage of end product	B – idem	Storage parameters control GMP measures GHP measures
9. Sorting	B - idem	Visual control Personnel training GMP measures GHP measures
10. Labelling		
11. Delivery	C – chemical residues	Right transportation vehicles Cleaning programme; Personnel training

Table 3. HACCP plan regarding the processing of tomato processed products

Process step	CCP Nr.	Critical limits	Monitoring process				Corrective action	Corrective action responsable
			Responsable	Method	Frequency	Records		
Heat treatment	CCP 1	Temp=100 - 120° C Timp = 10-30 minute Pres=1,6-1,7 bari	Termical treatment worker	Visual control of parameter	Each lot	Sterilization diagram	Maintenance equipment Personal training	Technical manager Production manager
Sorting of end product	CCP 2	Without no clossing recipient Without mould	Storage worker	Visual control	Each recipient	Sorting register	Removal of nonconforming products Personal training	Storage responsable

By using the CCP decision tree, in table 2 are presented the two CCPs identified, which, are focused to keep under control the microorganisms.

Table 2. CCP determination during processing of tomato processed products

Process step	Hazard	Decision tree questions				PCC Nr.
		Q1	Q2	Q3	Q4	
1.Heat treatment	B – Pathogenic organism	Yes	Yes	-	-	PCC1
2. Sorting of end products	B – idem	Yes	Yes	-	-	PCC2

The HACCP Plan (Table 3) is one of the most important document from food safety management system, which contain the mainly information necessary in order to implement the control measures and keep under control the identified CCPs.

As we know, the monitoring of finished food product is no guarantee of safety because Unsafe samples may be not analysed. For that, the HACCP system is a structured approach to the identification, associated with the processing of tomato canned products.

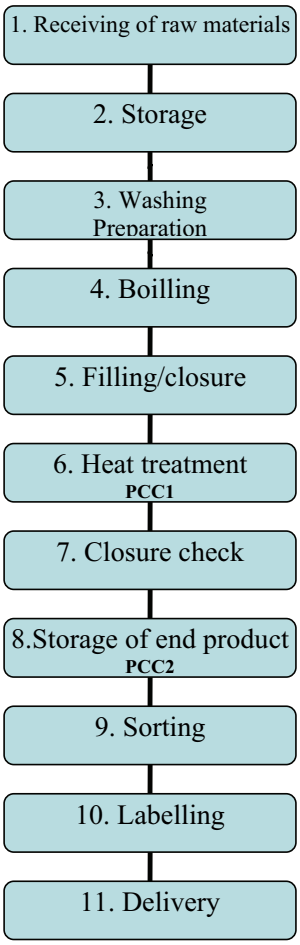

Fig. 1. Flow diagram - tomato canned products

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