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THE IMPLEMENTATION OF FOOD SAFETY MANAGEMENT SYSTEM IN THE HORTICULTURAL PRODUCTS PROCESSING COMPANY

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Abstract

HACCP is the abbreviation for the English phrase "Hazard Analysis Critical Control Points". In order to obtain high – quality and safe products, capable of meeting the consumer's demands and complying with the food safety standards, certain risk-prevention and control methods should be applied (Bonsi R.,2001). In the horticultural products' processing company, 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.. Starting with the fact that the raw materials come from the farms, there are major concerns regarding the microbiological aspects, the level of pesticides and other chemical contaminants, the maintenance of hygiene during harvesting, the handling, the processing, the storage, and commercialisation (Aversano, 2006). 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). Therefore, this paper contains a HACCP study, characteristic for horticultural processed products and explains the main steps in order to prevent or control the significant hazards for food safety, as presented in the HACCP plan.

Key words: *CCPs, food safety, HACCP, standard*

INTRODUCTION

On the producer-user line (from manipulation to processing) there are a high number of factors that can affect fruits quality (Bonsi, 2001). Considering these products as primary product for the fruit canned products or as finite product in the case of their fresh consume, the major preoccupations are in relation with pesticides level and others chemical contaminants (fertilisers), as well as to preserve the hygiene during harvesting, manipulation, processing and storage. To reduce these risks, it is necessary that the small producers, as well as the high-specialised companies, to apply prevented methods as HACCP type and not those based on the end control of products (that can affect the consumer healthy) and can induce significantly economical losses (Aversano, 2006).

MATERIALS AND METHODS

The fruit canned products has been obtained by an automated technological flux, with the aid of the Materazzi equipment in the SC Contec Food Company Tecuci, Galati county, using fresh fruits (apples from cultivars: 'Jonathan' and 'Golden Delicious'), having as destination, the processing.

A HACCP study was perform, based on the following working stages:

1. the presentation of the specifications about product;
2. the production technological flow description;
3. the potential risk identification and evaluation;
4. the critical control points (CCP) determination;
5. establish the critical limits;
6. the monitoring of the CCP parameters;

7. corrective actions, implemented if the critical limits in CCP have been excelled.

The laborious study was finished by elaboration of the HACCP Plan, a base document, which represents a guide to follow, with a view to maintain under control the relevant risks, that could affect the safety of fruits canned product.

RESULTS AND DISCUSSIONS

Risk identified during the processing of fruit canned products is concerned especially to: pesticides residue provided from the fruits, as a consequence of the chemical treatments, nitrates provided by the excessive fertilization and micro-organisms (yeast, moulds) presented on the fruits or on the technological equipment, because of the inadequate hygiene (Table 1).

As a consequence of this study, there were identified two Critical Control Points:

- Primary matter reception, for the risks generated by the pesticides and nitrates;
- Sterilization of the product, for the risks generated by yeast and moulds;

Data presented in Table 2, emphasis that for these risks, there were established the critical limits and the specifically parameters (product quantities, temperature or NTG) were controlled.

HACCP system, predicts also the critical limits surpass situation, therefore, there were predicted the corrective actions too, to determine the effect removing and the elimination of the causes which generated the manifested risk.

To assure the product traceability on all the production and selling process, it acts to register in specifically forms, which are useful as well to HACCP system revision.

To apply the HACCP Plan, as it was realized, determines to maintain under control the relevant risks, for the food safety of the fruit canned products and to grant an adequate product for the people consume.

Table 1. Hazard analysis

Processing step	Fruit canned products				Preventive / Control measures
	HAZARD				
	KIND OF HAZARD	G	P	RC	
Fruit reception	B) Clostridium sp.	high	low	3	- Training of the workers - Supplier assessment - Analytical analysis
	B) E. Coli	medium	low	2	
	B) Aspergillus flavus	medium	low	2	
	C) pesticides residue	high	low	3	
	C) heavy metal	medium	low	2	
	C) nitrit	medium	low	2	
Sterilization	B) Salmonella sp.	high	low	3	- Training of the workers - Analytical analysis - Process monitoring
	B) Clostridium	high	low	3	
	B) E. Coli	medium	low	2	
	B) Aspergillus flavus	medium	low	2	
	B) Bacillus sp	medium	low	2	
	B) Staphyloccocus	high	low	3	
	B) E. Coli	medium	low	2	
	B) Aspergillus flavus	medium	low	2	

B = biological C = chemical F = physical G = gravity
P = probability RC = risk class

Table 2. HACCP Plan

Nr crt	Process step	Relevant hazard	Charac-teristics	Critical control point	Critical limits	Monitoring			Correction/ Corective actions	Records
						Responsa-bility	Freq-uency	Method		
1	Raw material reception	Pesticide residues Nitrate	-lindan -diazinon -diclorvos -etion -paration $-NO_3$	CCP 1	< 1 mg/kg < 0,3 mg/kg <0,1 mg/kg < 0,5 mg/kg < 0,5 mg/kg < 60 mg/kg	Laboratory technician	2 week before provide	Cromato-graphic	Fruits rejection Supplier selection Personnel training	Test report
2	Sterili – zation	Yeast Bacteria Mould	Sterili-zation schedule	CCP 2	T=120C degree t=10-30min	Sterili-zation operator	Conti-nously	Sterili-zation diagram	Product rejection Process resume Personnel training	Sterilization report

CONCLUSIONS

On the fruits canned products technology, there have been identified two Critical Control Points: at primary raw material reception and at the sterilization step.

The established monitoring system allows maintaining the relevant risks under control, for the hygienically quality of the analyzed product.

REFERENCES

Aversano F., Pacileo V., 2006. Prodotti alimentari e legislazione. Edagricole Bologna.

Bonsi, R., Galli C., 2001. Il Metodo HACCP. Calderini, Edagricole, Bologna.