Scientific Papers. Series B, Horticulture. Vol. LIX, 2015
Print ISSN 2285-5653, CD-ROM ISSN 2285-5661, Online ISSN 2286-1580, ISSN-L 2285-5653

RESEARCHES REGARDING THE IMPLEMENTATION OF FOOD SAFETY MANAGEMENT SYSTEM ON THE FRUIT DRYING PRODUCTION PROCESS

Adrian CHIRA, Lenuța CHIRA, Elena DELIAN

University of Agronomic Sciences and Veterinary Medicine of Bucharest,
59 Mărăşti Blvd, District 1, 011464, Bucharest, Romania,
Phone: +4021.318.25.64, Fax: + 4021.318.25.67, Email: achira63@yahoo.com

Corresponding author email: achira63@yahoo.com

Abstract

HACCP was originally developed as a microbiological safety system in the early days of the US manned space programme in order to guarantee the safety of astronauts' food. Up until that time most food safety systems were based on end product testing and could not fully assure safe products as 100% testing was impossible. A pro-active, process-focused system was needed and the HACCP concept was born. HACCP is a system that identifies evaluates and controls hazards which are significant for food safety. It is a structured, systematic approach for the control of food safety throughout the commodity system, from the farm to the plate. It requires a good understanding of the relationship between cause and effect in order to be more pro-active and it is a key element in Total Quality Management (TQM). This paper aims to address this subject, basing the approach as closely as possible on the Codex Code of General Principles on Food Hygiene on the fruit drying production process, which emphasises the importance of GMP/GAP/GHP as sound foundations to incorporate the HACCP approach and develop a user friendly Food Safety Management System. The main identified hazards are moulds and mycotoxin, which can keep under control by adequate monitoring of CCPs – fruit drying and the end storage product.

Key words*: CCP, HACCP, food safety*.

INTRODUCTION

On the producer-user line (from manipulation to processing) there are a high number of factors that can affect fruits quality (Bonsi R., 2001).

Considering these products as primary product for the fruit dried 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 economic losses (Aversano, F 2006).

MATERIALS AND METHODS

The fruit dried product has been obtained in the Technological laboratory of the Faculty of Horticulture Bucharest, using an electrical oven and fresh fruits (apples from cultivars: Jonathan and Golden Delicious).

A HACCP study was performed 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 keep under control the relevant risks that could affect the safety of fruits dried products.

RESULTS AND DISCUSSIONS

Risk identified during the processing of fruit dried 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;
- Fruits drying, for the risks generated by yeast and moulds;

Table 1. Hazard analysis

Processing step	**Fruit dried products**				**Preventive /Control measures**
Fruit reception	HAZARD				- Training of the workers - Supplier assessment - Analytical analysis
	KIND OF HAZARD	**G**	**P**	**RC**	
	B) Clostridium sp.	high	low	3	
	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, mycotoxin	medium	low	2	
Fruit drying	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	

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

Data presented in Table 2, emphasis that for these risks, there were established the critical limits and the specifically parameters (product content of pesticides, nitrite and mycotoxin, 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 dried products and to grant an adequate product for the people consume.

Table 2. HACCP Plan

Nr crt	Pro-cess step	Relevant hazard	Control measures	Criti-cal con-trol point	Criti-cal limits	Monitoring			Correction/ Corective actions	Re-cords
						Responsa-bility	Frequency	Method		
1	Raw mate-rial recep-tion	Pesticide residues Myco-toxin Nitrate	Supplier assess-ment Labora-tory analysis	CCP 1	According Reg UE 1881/2006	Laborato-ry technician	2 weeks before purchasing	Cromato-graphic	Fruits rejection Supplier selection Personnel training	Test report
2	Fruit dry-ing	Yeast Bacteria Mould	Drying schedule	CCP 2	T= 60 –70 C degrees Product water content – max 12%	Drying operator	Continuous	Drying diagram	Product rejection Process resume Personnel training	Drying report

CONCLUSIONS

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

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

REFERENCES

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

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


EX·TERRA·AVRVM