

## IFS FOOD VERSION 6: CONCEPTS AND PRACTICAL APPLICATION IN DAIRY INDUSTRY

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**Abstract:** Recent incidents related to food products led to falling consumer confidence in food safety, so as to regain it has become extremely important. The work is part of the current concerns of the researchers on ways to mitigate risks relating to food by placing prevention as a concept. In the case study, they have done research in order to determine the extent to which the quality management system IFS Food version 6 with its requirements is able to guarantee quality and food safety. Potential risks identified with the HACCP team, simultaneously taking place and establish the necessary corrective measures. It has been shown that to be used properly, IFS Food should be seen as a system whose purpose is to ensure that important details related to product security are fully controlled.

**Keywords:** food safety, quality control, hazards

### Introduction

In the past 50 years, food safety has been a concern and challenge at the same time, due to changes in the landscape ample food. Sources of contamination no longer have local character, especially due to globalization and the globalization of food markets.

The technologies are improving, tastes and requirements are refined, lifestyles, political, social, cultural changes, globalizing not only markets and sources of raw materials supply, and pathogens, mycotoxins, risks to consumer health - evidence and crises food: bovine spongiform encephalopathy (BSE) contamination of food ingredients derived from genetically modified organisms, avian flu, dioxin contamination, the need to differentiate products from those of conventional organic ...-bioterrorism.

Global vision regarding quality control has changed essentially. Forms of organization for quality have passed the stage of investigation, verification of compliance with specifications (standards, norms).

Control means to control today. To achieve this, the organization must have a quality policy and quality to develop a strategy for achieving the desired quality. The food problem that eventually is currently keeping under control the risks associated with food consumption.

Companies need to realize that at present there have been changes to the general risks associated with food.

The main standards recognised by GFSI and imposed by some networks supermarkets on their suppliers (especially those that produce their own brand) are: BRC (British Retail Consortium) Global Standard-Food, FSSC 22000 (Food Safety System Certification and IFS (International Food Standard). (1,4)

IFS Food is for producers who produce under the so-called "private brands" (private labels) and offer greater safety of retail chains products made by their suppliers

under the name brands them will be safe and comply with quality requirements and legal requirements .

IFS Food - International Standard for Food is meant to allow assessment of quality systems and food safety and applied at all stages of food processing immediately after the farmer directly and include detailed requirements relating to infrastructure, the environment in which plant foods , good hygiene practices and good manufacturing practices. (6)

The standard stipulates that the company based control system for food safety must be fully implemented HACCP system, systematically and comprehensively, based on the principles of Codex Alimentarius. Besides this system comes with a number of additional procedures to keep under control all the risks associated with food production, including bioterrorism.(3)

The aim of this study was to investigate in order to determine the extent to which the quality management system IFS Food version 6 with its requirements is able to guarantee quality and food safety. This case study was conducted in a private Romanian dairy factory.

### **Materials and methods**

To get an overview of the presence and evolution of contaminants, in this research it were analyzed for microbiological and toxicological feedstock, as a possible source of contamination, but microbiota surfaces, equipment and the environment, and the wholesomeness of the finished product.

The microbiological quality was evaluated by determining the total number of germs NTG (cfu / g), somatic cells, yeasts and moulds (cfu / g). In terms mycotoxicological, it was studied by ELISA specific micotoxine presence.

It was also studied the possible heavy metal contamination.. Raw milk is collected from collection centres, which were assessed by specific questionnaires.

Specific analyzes for raw material, finished product and sanitation tests were performed in laboratories Stefan cel Mare University of Suceava, the National Institute for Research and Development of Natural Bioresources (IBA) Bucharest and ANSVSA Suceava.

### **Results and discussion**

Food safety team has identified and recorded all food safety hazards predicted to occur at every stage of the process flow diagrams. For each of the identified food safety hazards determined, where possible, acceptable levels of food safety hazards in the final product.

Determined level took into account the requirements set by the regulator, customer requirements on food safety, experience and intended use by the customer. Hazard assessment and establish preventive control measure was done according to the seriousness (severity) of their adverse effects on health and the probability of occurrence.

For raw milk have been identified and assessed hazards in Table 1.

Table 1. Hazard identification for raw milk

The hazard identified	Type	It is a significant hazard?	Control measures	PRP, PC or Pl. HACCP
<b>Bacteria and bacterial toxins:</b> <i>Salmonella</i> , <i>E.coli</i> patogen, <i>Staphylococcus aureus</i> , <i>Listeria monocytogenes</i> , s.a.	<b>B</b>	<b>YES</b> G = high P = average <b>CR = 3</b>	Informing suppliers, collection centres and state veterinarian in the area that has been contaminated milk collected, inconsistent in case of problems noted at the reception	<b>PCC</b>
<b>Toxicogenic molds and yeasts:</b> <i>Aspergillus flavus</i> si <i>Penicillium granulatum</i>	<b>B</b>	<b>NO</b> G = average P = small <b>CR = 2</b>		<b>PC</b>
Antibiotics, pesticides, fertilizers, radionuclides, toxic metals, nitrates, substances of falsification of milk, cleaning substances, mycotoxins, growth hormones, tranquilizers. Enterotoxins bacteria	<b>C</b>	<b>YES</b> G = high P = average <b>CR = 3 YES</b> G = high P = average <b>CR = 3</b>		<b>PCC</b>

According to IFS Food standard requirements was done to identify and assess hazards and technological flow stages (Table 2).

As shown potential hazards have been identified from raw milk reception PCC1 and after risk analysis, critical limits have been established and acceptable under the legislation in force.

Following the risk analysis was drawn up an own checks program which provides sanitation planning of the test, laboratory analyzes for finished products, raw milk and water, according to the regulations in force.

By applying decision tree to determine the CCP was established HACCP plan which provides monitoring this antibiotics in milk reception and milk checking compliance under the sheets.

Raw milk is monitored for physical chemical and microbiological parameters for each collection centre in part. Reception of raw materials and ingredients is based on documents and laboratory analyzes. The results for milk are highlighted in Table 3 and Table 4.

Table 2. Identifying hazards in the reception

The hazard identified	Type	It is a significant hazard?	Control measures	PRP, PC or Pl. HACCP
Receiving inadequate milk with primary microflora. Contamination before acceptance.	B	YES G = high P = average CR = 3	Training of farmers; - Control the farm; checks at the reception; personnel performing - determinations must be trained to know the methods, be available and updated procedures for determining working methods; -laboratory equipment be calibrated and in good condition;	PCC
Receiving milk with improper temperature (developing secondary microflora)	B	YES G = high P = average CR = 3	Establishing optimal routes takeover milk; - Milk must be immediately brought to a temperature of not higher than 8 ° C, where it is collected every day, and 6 ° C, when the collection is not carried out every day.	PC
Receiving an inadequate milk with antibiotic residues. Contamination before Reception	C	YES G = high P = average CR = 3	Training of farmers; - Control the farm; - Quality assurance standard in the reception; - Testers for detection of antibiotics and substances neutralizing each collection route. - Refusing to processing milk with antibiotics or neutralizing substances.	PCC
Receiving inadequate milk with impurities containing pathogenic bacteria indirectly. Contamination before reception	F	NO G = average P = small CR = 2	Avoiding milk collection from suppliers unsure unrated.	PRP

The hazard identified	Type	It is a significant hazard?	Control measures	PRP, PC or Pl. HACCP
Contamination during reception	F	NO G = average P = small CR = 2	- Good working practices and hygiene operators during discharge	PRP

**Table 3.** Physical-chemical parameters for raw milk

Collection centre	Parameters analyzed						
	Fat, %	Dry matter, %	Density	Protein, %	H <sub>2</sub> O	antibiotics	Temperature
CCL1	32	12.8	1.032	3.4	0	negative	5 <sup>o</sup> C
CCL2	35	12.9	1.030	3.1	0	negative	5 <sup>o</sup> C
CCL3	36	12.8	1.029	3.1	0	negative	5 <sup>o</sup> C

**Table 4.** Microbiological parameters for raw milk

Collection centre	Parameters analyzed		
	NTG, ufc/ml	Somatic cells NCS/ml	Yeast and moulds
CCL1	47000	80400	<10ufc/g
CCL2	60000	76600	<10ufc/g
CCL3	52000	80000	<10ufc/g

Also, milk are monitored and OCL Pesticides, PCBs and piretoide GC-ECD results in accordance with Regulation EC 396/2005 and 1259/2011 CDE

Analyzing the data obtained it is noted that within the limits established by applicable law:

In order to check the efficiency of the sanitation hygiene tests are quick daily HACCP type IGIENOTEST which follows if you develop microorganisms that adversely affect food safety. Also make and quantitative tests results are highlighted in the analysis: Vessel clotting - *Coliforme bacteria* absent / 10cm<sup>2</sup>, NTG 11 cfu / cm<sup>2</sup> Crinta - *Coliforme bacteria* absent / 10cm<sup>2</sup>, NTG 8 cfu / cm<sup>2</sup> bench - *Coliforme bacteria* absent / 10cm<sup>2</sup>, NTG 9ufc / cm<sup>2</sup> Policy cheese - absent of *Coliforme bacteria* / 10cm<sup>2</sup>, NTG 8 cfu / cm<sup>2</sup>, shape cheese - absent of *Coliforme bacteria* / 10cm<sup>2</sup>, NTG 9 cfu / cm<sup>2</sup>.

Monitoring these parameters allows obtaining finished goods quality and safe for consumption, as outlined in Table 6.

**Table 6.** Microbiological parameters for finished products

Collection centre	Parameters analyzed		
	Listeria monocytogenes	Coagulate-positive <i>staphylococci</i>	Yeast and moulds
Hard cheese Rucăr	absent/25g	<10ufc/g	<10ufc/g
Hard cheese Dalia	absent/25g	<10ufc/g	<10ufc/g
White cheese	absent/25g	<10ufc/g	<10ufc/g

Through analyses are validated actually established HACCP plan (Figure 1).

Pericole identificate	Masura de control	Parametrul monitorizat	Limita critica	Proceduri de monitorizare			Corectii Actiuni corective	Resp. act. corective	Inregistrari
				Metoda	Frecventa	Respons.			
<b>Biologice:</b> Receptionarea unui lapte necorespunzator cu microflora primara. Contaminare Inaintea receptiei	-efectuarea verificarilor la receptie;	Incarcare microbiologica NTG, celule somalice, Aciditate, pH, Examen organoleptic	Conținutul de germeni la 30 °C (per ml): ≤ 100 000; Conținutul de celule somalice (per ml): ≤ 400 000	Determinari la laboratorul propriu sau la laborator extern Verificari ale medicului veterinar de stat pentru ruta respectiva	La fiecare receptie	Laborant	-se izoleaza laptele posibil contaminat; - separare containere -nu se receptioneaza lapte neconform. -Evitarea colectarii laptelui de la furnizori nesiguri, neevaluati.	Tehnolog	-Fisa control lapte la receptie
<b>Chimice:</b> Receptionarea unui lapte necorespunzator, cu reziduuri de antibiotice. Contaminare Inaintea receptiei	Teste pentru detectarea antibioticelor si a substantelor neutralizante pe fiecare ruta de colectare	Reziduuri de antibiotice Pesticide	Negativ	Teste rapide	Trimestrial sau ori de cate ori este cazul	Laborant	Se refuza de la prelucrare laptele cu antibiotice sau cu substante neutralizante.	Tehnolog	-Fisa control lapte la receptie

*Fig. 1.* HACCP plan for hard cheese

### Conclusions

Starting from the case study we can conclude that it is important and necessary:

1. Evaluation of raw materials and to determine all possible dangers through physicochemical and microbiological analyzes and in some cases even immunological
2. To be laid down by clear and concrete measures that can be taken to eliminate or reduce risks to an extent accepted for consumer safety
3. Control of security processes and manufacturing technologies by monitoring the flux of the process parameters and innocuousness ingredients, semi and finished products and implementation of corrective actions in real time
4. Validation flowcharts and results from monitoring by laboratory
5. The design and implementation of self-control plans for an effective restraint of quality water, ingredients, finished products and test an effective sanitation program.

### Bibliography

1. Global Food Safety Initiative: Vision, Missing, Objectives.
2. IFS Food Version 6-Cerințe pentru auditarea furnizorilor, 2006
3. **Rotaru, G., Moraru, C.**, 1997, HACCP – Analiza Riscurilor. Punctele critice de control., Ed. Academica, Galati
4. **R.R. Pant, Gyan Prakash , Jamal A. Farooquie**, A Framework for Traceability and Transparency in the Dairy Supply Chain Networks, Procedia - Social and Behavioral Sciences 189 (2015) 385 – 394
5. **Stephan Tromp**, IFS-more than a food standard, IFS Conference, Bucharest, 25 may 2016.