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Possibilities for Integrating the Requirements of Food Quality and Safety Management Standards

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Running title: **Integrating Food Quality and Safety Management Standards**

Abstract
The paper makes an overview of the possibilities for integrating the requirements of ISO 9001:2015 on quality management and those of standards for food safety management. The aim of the study is to derive the similarities and differences between the legal requirements laid down in Codex Alimentarius and the private standards for quality management systems and food safety based on a comparative analysis. The methodology used is based on comparison of the requirements, identification of the common elements and the differences, as well as assessment of the compatibility and possibility for integration of these requirements. Based on the study, it may be suggested that the application of an integrated food safety system based on legal requirements and the private standards has the potential to improve product quality, to replace the need for separate introduction of the requirements, to demonstrate compliance with the legal requirements and to improve customer satisfaction.

Practical applications
The application of several standards through an integrated system is more cost-efficient and effective than the independent application of quality management and food safety standards. The concept of an integrated management system comprises the quality management system (QMS) and the responsibility for ensuring product safety on one hand, and on the other - the optimal mode of existence of the organisation in the context of dynamically changing conditions of the environment and increased competition.

Key words: ISO 9001:2015, Codex Alimentarius, food safety management system

Introduction

In the recent years, private food standards are playing an increasingly important role in determining market access in international trade. The scope and purpose of these standards include not only food safety, but also food quality, as well as social and environmental aspects related to food manufacturing. The term "private standards" is defined by the Codex Alimentarius Commission (CAC) as "standards of non-governmental organizations whose objective is the management of the supply chain within an increasingly globalized and competitive international food market" (Henson, 2009). Another term used in the present study is "integrated system for food quality and safety management" - a management system which combines a food safety management system and a quality management system.

It was found that the application of the process approach in the development of integrated management systems is a prerequisite for their success. The scientific literature shows many different models that can be applied for integration.

The most widely used reference models are specified in the guidelines issued by the International Organization for Standardization - Model IMS (Figure 1), in accordance with PAS 99: 2012 (BSI, 2012). This specification was developed in response to the need of a legal document for the implementation of an effective integrated management system. In 2012, the British Standards Institute published a new version of the PAS 99:2012, which is based on the structure of ISO Guide 83 and defines a common structure (Figure 1) to be followed by all standards for management systems. Many of the elements and terms used in the model structure are used in the standards for management systems. The model sets only the frame for the development of an integrated system – the general requirements of the management system, and each part should be examined in details in view of the requirements imposed both by the differences in the standards and the specific module application.

Many requirements of the standards/ specifications are common and they can be practically incorporated into a total management system. Therefore, the positive effect of combining two or more systems into an integrated one is attributed to the reduced duplications. This allows a significant reduction of the total management system and improves its effectiveness.

The present study explores the possibilities for integration of the latest version of ISO 9001 (ISO 9001:2015) with the requirements laid down in the internationally recognised standards and food safety legislation. Food safety management systems comprise of the following three elements: a quality management system (QMS) applied to food safety; Hazard Analysis and Critical Control Point (HACCP) and Good Manufacturing Practices (GMPs). The main internationally recognised document regulating the requirements for food safety has been developed by the Codex Alimentarius Commision in «General principles of food hygiene CAC/RCP 1-1969", which was revised in 2003. It is estimated that throughout the years the private standards for food safety have increased both in terms of their number and in terms of their strictness and complexity (Reardon, 2000; Jaffee, 2004). The reason for this is the development of standards at different levels (national, regional and international), which are often not harmonised.

The main factors for the wide adoption of these private food safety schemes include (1) clear and detailed definition of the legal liability in the food chain, (2) increasing globalization and complexity of the supply chain and (3) increased awareness of consumers and their role in food safety (Henson, 2011). The private standards introduced by retail consortia are often used to make these companies stand out on the market, although there is a general agreement that food safety shall not be used as a competitive instrument by the food industry. Although these standards are not mandatory, some research sources confirm that the market forces could make compliance with private standards mandatory in practice (Henson, 2008). The rapid development of private standards has raised serious concerns and has also had some adverse impacts (Havings, 2006; Havinga, 2008). The too demanding nature of the private standards, especially in certification by a third party should ensure compliance with complex rules and procedures at different points of the chain. The positive impact of private standards is related to the possibilities to supplement public regulations that have already been adopted or to serve as a substitute for public regulations that are less strict (Herzfeld, 2011). The impact of private standards on food safety is also related to the fact that they decrease the competitiveness of developing countries and their capacity to provide sustainable income for their people (Dolan, 2000). Other researchers take a radically opposite view as they believe that private standards are drivers toward increasing food safety, the level of quality and the

competition on the market (Jaffee, 2005; Soon, 2013). This calls for a comparative analysis of these requirements which can be used as a basis on which food companies could develop their management systems.

Materials and methods

Materials

The following materials were used for the comparative analysis:

• Codex Alimentarius: Food Hygiene (Basic texts) - Fourth edition (WHO, 2009);
• BRC Global standard food safety, Issue 7 (BRC, 2015);
• IFS Standard for auditing quality and food safety of food products, Version 6 (IFS, 2014);
• ISO 22000:2005 Food safety management systems - Requirements for any organization in the food chain (ISO, 2005);
• ISO 9001:2015 Quality management systems - Requirements (ISO, 2015).

Methods for analysis

The comparative analysis was used to evaluate the similarities and differences between the legal requirements and the standards for QMS. The methodology used is based on comparison between the requirements, identification of the common elements and the differences, as well as assessment of the compatibility and possibility for integration of these requirements (Nicolas, 2013). Results from the analysis are presented in the following sections based on the standards structure and requirements (***Table 1***).

The assessment of the compatibility between the standards is defined in four groups: fully compatible (FC); not fully compatible (NFC); partially compatible (PC); and incompatible requirements (IC).

Methodology used:

- Comparison of individual requirements
- Identification of similarities
- Identification of key differences and incompatibilities
- Assessment of compatibility between requirements of the different systems (expressed as percentage).

Results

Comparison between the requirements of the different standards is presented in the following sections 1-7.

Section 1: Managerial requirements

Food safety standards do not require identification of the context of the organisation, which includes analysis of the legal, social, political, regulatory, financial and economic environment. The effect of external factors that influence quality is completely eliminated both in the legal requirements and in the requirements of the private standards on food safety. All schemes require a documented food quality and safety management system applied in place, with references to documented procedures. None of the schemes defines any specific form of such documentation and the condition for proving conformity is to have an implemented system in place.

Section 2: Top management responsibility

All schemes require that the main responsibility of the top management is to provide leadership and guidelines for quality and safety management. The requirements for the establishment of strategic policies for food quality and safety management through leadership are also similar. IFS specifically demands the inclusion of environmental and social responsibility requirements.

Section 3: System planning

The innovative introduction of risk management in ISO 9001:2015, clause 6.1 "Actions to address risks and opportunities" replaced the existing preventive actions and reduced the need for subsequent application of corrective actions. Auditors assessing conformity with this clause should approve the risk assessment (assessment of the consequences of a given event and the related likelihood for such event) and the analysis of the possible actions to prevent, eliminate, reduce or mitigate the risks related to quality management. The food safety standards require that these risks are managed only in terms of food safety and do not require analysis of the risks resulting from changes in the external environment and the overall business context. The different approach to identification of risks is the main difference between the standards. All requirements related to the HACCP system overlap in the other standards.

Section 4: Support and implementation

Section 4.1: Resource management

A prerequisite for demonstrating compliance with the requirements is to create an adequate organisational structure and internal environment that is capable of motivating the staff to achieve the organisation's QMS objectives and tasks.

Almost all schemes require job descriptions detailing a clear commitment to the implementation and maintenance of an effective and continuously updated system. Some standards require the

appointment of a specific person to be in charge of the system and to serve as a representative. The possible actions for ensuring conformity may include: overcoming or mitigation of adverse effects; improvement in the effectiveness and efficiency of the QMS and implementation of effective corrective actions for eliminating the cause for the non-conformity. In contrast to the previous issue of ISO 9001, preventive actions have been removed in the current one. The main grounds for that are that the purpose of the management system is *prevention*. There are no preventive actions in the requirements of ISO 22000 either.

Section 4.2: Documentation

These requirements are related to adequately documented information replacing the requirements for procedures, documents and records used in the previous edition of ISO 9001. All schemes require procedures (with no specification on the form thereof) in order to prove conformity with the requirements and to demonstrate the effective management of the processes. Another common requirement is the secure storage of documents in a way that makes them available during periods of recall or product hold. BRC requires that the entire documentation is drafted in a language or languages used by the organisation's employees and that it is sufficiently detailed and, where applicable, visualised.

Section 4.3: Production environment "Prerequisite programmes" (PRPs) - Good practices

This chapter is to a large extent similar across all systems which require the management to provide sufficient resources in order to guarantee that the food quality and safety management system is effective and adequate for the fulfilment of the legal and customer's requirements, including the responsibility for the use of external services or activities.

Section 5: Operation control (quality control)

All standards require from the organisations that apply them to:

• have procedures for approval and continuous monitoring of suppliers with documented evidence.

• manage monitoring and measuring resources (MMR) necessary to ensure the product safety and quality and to apply adequate methods to verify that the respective devices are calibrated against a recognised standard.

• apply procedures, safely store information and securely identify, control and isolate any product that does not meet the specifications in order to prevent any accidental delivery and/or release of the product.

• apply an adequate system that can guarantee that the final product has been analysed to verify its conformity with the critical food quality and safety parameters.

• introduce procedures for identification of all batches, from the approval of raw materials and packaging to obtaining the final product and the next level of circulation.

• perform documented testing of the follow-up system on an annual basis and, in the event of unsatisfactory results, use this as the basis to improve the process.

• introduce an effective claim management system, including the undertaking of adequate actions for preventing any recurrence of a problem and for identification of the primary cause for the respective non-conformity.

The BRC and IFS schemes include additional requirements for risk assessment and identification of potential risks, which shall be used as criteria for approval of the supplied goods and services. The ISO 9001 and BRC schemes require more specific and enhanced control for approval and control on suppliers in the cases of outsourced processes. The BRC system requires application of a specific testing method through mass balance, the application of which shall be proven within 4 hours.

Section 6: Performance assessment

There is a common requirement for application of an adequate internal audit system at the site, which shall cover all systems and procedures that are crucial for the product quality and safety. There are some minor differences between the IFS and BRC schemes, which require both detailed audits as well as activities related to conformity assessment which should include sampling and analysis. The BRC scheme requires that the audit shall focus on the cases where the limit values have been exceeded or where there has been product withdrawal or recall. All schemes require Management Review for verifying the suitability, adequacy and effectiveness of the management system.

Section 7: Improvement

The necessary actions for conformity assessment mentioned in this clause are related to ensuring that the QMS can achieve the expected result (and) overcome or mitigate unwanted risks and achieve continuous improvement. Examples of improvement may be adjustment, corrective actions, continuous improvement, radical changes, innovations and restructuring.

Discussion

ISO 22000 and Codex have no requirements for quality control of the product and the introduction of specific requirements for good manufacturing practices because the cover the whole food chain. BRC and IFS are focused on production and have very strict requirements related to authenticity, adulteration and cross-contamination that are not covered so fully by other schemes. IFS and BRC are very similar, but not identical, half of the requirements of both schemes completely overlap, approximately one quarter of the requirements are almost identical, and a small part of the requirements have no similarity. IFS and BRC schemes establish requirements which are not specified in other schemes and which are related to control of heat treatment, contaminations and foreign body detection, control of the amount, effective management of cross-contamination with allergens, rotation of raw materials and finished products storage. A requirement only of BRC is associated with management of redundant products (4.13), aiming to ensure that the products granted to charities and food banks are safe. Only IFS and BRC have a requirement for the introduction of control and management of improper packaging, prevention of the use of wrong packaging or errors in printing the label, unintentionally changed product recipe or unconfirmed change of recipe.

The biggest differences between the schemes are observed in the risk assessment of raw materials vulnerability and in setting specific limits for acceptable and unacceptable production process and the establishment of a specific procedure to ensure product's suitability for consumption.

It was found that labeling errors are the most common cause of product recalls, therefore in the future is necessary for other schemes to also implement requirements for adequate control procedures.

The main differences between ISO 9001, which is partially supported by ISO 22000, and BRC is associated with the analysis of the external environment and communication with all stakeholders.

Instead of making complex analyzes at reception of raw materials in the production site, risk analysis of the external environment as a positive effect can eliminate or reduce the risk of purchasing counterfeit products.

The strict requirements of private standards enforce the development of systems with numerous requirements that are difficult to align, which could restrict the free access to markets.

Based on similarities, solution could be sought for limiting the excessively strict requirements towards manufacturers by developing integrated systems to be audited simultaneously, instead of individual application of the standards combined with numerous audits to assess conformity with the requirements of each individual standard.

Conclusions

A common requirement of all standards covered by this study is the need for adequate food quality and safety management systems which are subject to regular conformity assessment and continuous improvement. The organisations applying the private standards manage the quality and safety of foods in the food supply chain with increasing responsibility and scope. Private standards are fully compatible with the requirements established by Codex Alimentarius, which is internationally recognised. All schemes discussed in this study have their specific and unique features, as well as certain differences in terms of strictness and complexity of the requirements. The food safety standards that were studied are compatible with the latest version of ISO 9001:2015 and their application in integrated systems could not only protect the consumer interests by ensuring product quality and safety, but it could also improve the overall management system of organisations in the food sector.

References

BSI, 2012. PAS 99:2012 Specification of common management system requirements as a framework for integration. first ed. london: BSI.

BRC (2015). BRC Global standard food safety Issue 7. London, BRC

Dolan, C. &. H. J. (2000). Governance and trade in fresh vegetables: the impact of UK supermarkets on the African horticulture industry. *Journal of development studies*, 37(2): 147-176

Havinga, T. (2006). Private Regulation of Food Safety by Supermarkets. *Law and Policy*, 28(4): 515-533

Havinga, T. (2008). Actors in Private Food Regulation. *Nijmegen Sociology of Law Working Papers Series*, 1: 15-17

Henson, S. (2008). The role of public and private standards in regulating international food markets. *Journal of International Agricultural Trade and Development*, 4(1): 63-81.

Henson, S. H. J. (2009). The impacts of private food safety standards on the food chain and on public standard. Rome: FAO/WHO.

Henson, S. H. J. (2011). Codex Alimentarius and private standards. *Private Food Law*, 4 (1): 149.

Herzfeld, T. D. L. S. &. G. C. (2011). Cross-national adoption of private food quality standards. *Food Policy*, 36(3): 401-411.

IFS, 2014. IFS Standard for auditing quality and food safety of food products Version 6. Berlin: IFS

ISO (2005). ISO 22000:2005 Food safety management systems -- Requirements for any organization in the food chain. Genève: ISO

ISO (2015). ISO 9001:2015 Quality management systems - Requirements. Genève: ISO

Jaffee, S. H. S. (2004). Standards and agro-food exports from developing countries: rebalancing the debate. *World Bank Publications*

Jaffee, S. J. M. A. (2005). Food safety and agricultural health standards. Nairobi (Kenya), ILRI

Nicolas, L. (2013). An Introduction to Applied Data Analysis with Qualitative Comparative Analysis. *Forum: Qualitative Social Research*, 14(3): Art. 15

Reardon, T. (2000). Agrifood grades and standards in the extended Mercosur. *American Journal of Agricultural Economics*, 82(5): 1170-1176

Soon, J. M. B. R. N. (2013). Public and Private Food Safety Standards: Facilitating or Frustrating Fresh Produce Growers? *Laws*, 2(1): 1-19

WHO, FAO (2009). Codex Alimentarius: Food Hygiene (Basic texts). Fourth edition. Rome: Codex Alimentarius Commission WHO, FAO

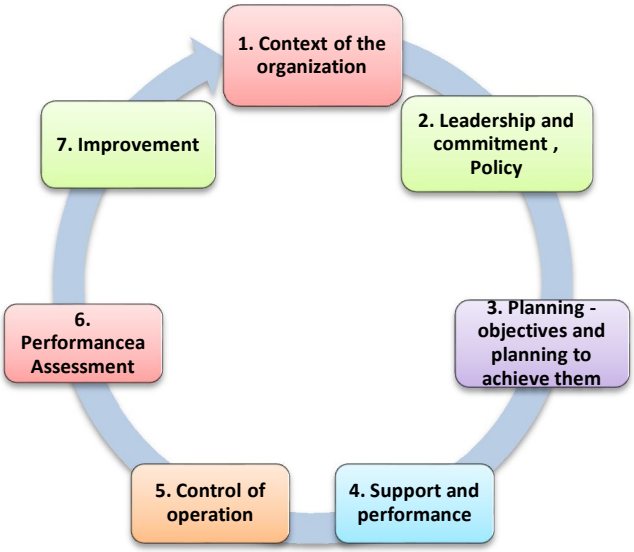

Figure 1. Model of an integrated management system complying to PAS 99:2012

Table 1. Comparison of the major standards setting requirements for Food Safety Management Systems

Clauses in the standards for management of the quality and the food safety						
Clauses	**Con-formity**	**CAC/RCP 1-1969**	**ISO 22000**	**BRC FOOD 7**	**IFS Food 6**	**ISO 9001:2015**
1. **CONTEXT OF THE ORGANIZATION** (managerial requirements)	IC*					4
GENERAL	IC	4	3	2; 2.1; 2.2.	4.4.	4; 4.1; 4.2.
Establishment and implementation of a FSMS/QMS	PC*	2.1.2	4.1.	3.1	2.1.1.1	4.3
Procedures for realization of safe products	PC		7.1.	2	2.2.1	8.1
Procedures for emergency preparedness	PC		5.7	3.11	6; 6.1; 6.2; 6.3; 6.4.	8.7
Establishment and implementation of HACCP system/quality system	PC		7.1	2	2.2.1; 2.2.3	6.1.
Establishment and implementation of Prerequisite Programs (PRPs)	PC		7.2; 7.2.2	2.2.	1.2.9; 4; 7.5	8.1.
Verification of the procedures' effectiveness by the food safety team	PC		7.8; 8.4.2.	5.6.	5.	8.6.
Design and development of products and services	IC			5.1; 5.1.1; 5.1.2; 5.1.3 5.1.4	4.3; 4.3.1-4.3.10;	8.3; 8.3.1-8.3.6;
Customer satisfaction	NFC*		5.6.1.	3.12; 3.6.3;	1.3; 1.3.1; 1.3.2	5.1.2; 9.1.2.

Complaint handling	NFC		7.	3.10; 3.12.	4.1.	8.2.1.
External communication	NFC		5.6.1.	1.1.6.	1.1.5.	7.4.
Internal communication	IC		5.6.2.	1.1.6.	1.2.10.	7.4.
2.TOP MANAGEMENT RESPONSIBILITY						
Food safety /quality commitment	NFC		5.	1; 1.1.	1.	5.1.
Definition of a food safety /quality policy	NFC		5.2.	1.1.2.	1.1.3; 1.1.	5.2.
Definition of responsibilities and authorities	NFC	5.6.	5.4; 6; 6.1;6.2	1.2	1.2; .2.1; 1.2.2; 1.2.3; 1.2.8	5.3
Designation of a food safety /quality team	NFC	2.1.1	7.3.2; 5.5	2.1	7.3.2; 5.5	-
3. SYSTEM PLANNING						
Planning of the FSMS/ QMS	PC		5.3	1.1.2 ; 3.6.4	1.1.3; 1.1.4	6.2 ; 6.3.
Food defense	PC		5.7; 7.	6.	6; 6.1; 6.2; 6.3; 6.4.	6.1.
Definition of the HACCP system scope	NFC	Annex 1	4.1.	3.1.	2.1.1.1.	4.3.
HACCP team	NFC	Step 1	7.3.2; 5.5;	2.1.	2.2.2; 2.2.2.1.	5.1.
Description of raw materials and product contact materials	IC		7.3.3.1; 7.3.3.2.	3.6; 3.6.1.	4.2.2; 4.2.2.1	8.2.3.
Description of finished products	NFC	Step 2	7.3; 7.3.3; 7.3.3.1; 7.3.3.2.	2.3.	2.2.3.1.	8.2.3.
Description of intended use of the end product	NFC	Step 3	7.3.4.	2.4.	2.2.3.2.	8.2.3.
Flow diagrams	NFC	Step 4	7.3.5.	2.5.	2.2.3.3.	6.1.
On-site confirmation of the flow diagrams	NFC	Step 5	7.3.5.1.	2.6.	2.2.3.4.	6.1.
Description of process steps and control measures	NFC		7.3.5.2.	2.6.	2.2.3.4.	6.1.
Hazard analysis implementation	NFC	Step 6	7.4; 7.3.5.2; 7.4.2; 7.4.3.	2.7.	2.2.3.5.	6.1.
Identification of critical control points (CCPs)	NFC	Step 7	7.6.2.	2.8.	2.2.3.6.	6.1.
Determination of critical limits for CCPs	NFC	Step 8	7.6.3; 8.2.	2.9.	2.2.3.7.	6.1.
System for the monitoring of CCPs	NFC	Step 9	7.6.4.	2.10.	2.3.8.	6.1.
Actions when CCP monitoring results exceed critical limits	NFC	Step 10	7.6.5.	2.11.	2.2.3.9.	6.1.
Verification of the HACCP /quality system	NFC	Step 11	7.8.	2.12.	2.2.3.10.	6.1.
Documentation of procedures and records	NFC	Step 12	7.6.; 4.2.1	2.13.	2.2.3.11.	6.1.
Updating of the HACCP /quality system	PC		7.7.	2.14.	5.6.8.	6.1.
4. SUPPORT AND PERFORMANCE						
4.1. RESOURCE MANAGEMENT						
Resources for the FSMS /QMS	NFC		6.1	1.1.5	1.2.7	7.1; 7.1.1
Human resources for the FSMS /QMS	FC*	10.1	6.2	7.1.2; 1.1.5; 7;7.	3.1; 3.2;	7.1.2
Personal training	FC	10.	6.2.2.	7.1; 1.2.6; 3.3; 1.2.4.	3.3; 1.2.9	7.1.6; 7.2
Resources for infrastructure	FC		6.3; 6.4	4; 4.1	4.8	7.1.3
Resources for work environment	FC		6.4; 7.2.3 e)	4.7; 4.6	4.17; 4.16; 4.6; 4.7	7.1.4
4.2.DOCUMENTATION	NFC					
FSMS /QMS documentation	FC	5.7.	4.1; 4.2	3	2.1.1	7.5
Food safety /quality manual	IC		-	3.1	-	
Control of documents	FC		4.2.2	3.2	4.2.2	7.5.1; 7.5.3
Control of records	NFC	5.7.	4.2.3	3.3	2.1.2 2; 2.3.8.3; 3.3; 4.2.3.	7.5.2
4.3.PRODUCTION ENVIRONMENT "PREREQUISITE PROGRAMMES" (PRPs) - GOOD PRACTICES						
Identification of the PRPs controlling relevant hazards at steps that are not covered by the CCPs management. General control measures for PRPs. Updating of the PRPs	NFC		7.4.4; 7.5; 7.7.			
Site location	NFC	4.1.1	7.2.3 a)	4.1.	4.6; 4.7.	7.1.3.
Perimeter and grounds maintenance	NFC		7.2.3 b)	4.3.	4.8; 4.9; 4.9.1.	7.1.3.
Design and layout of installations and	NFC	4.2.1	7.2.3 a)	4.4.	4.8; 4.9; 4.9.1.	7.1.3.
Walls; Floors; Ceilings/overheads; Windows; Doors; Working surfaces.	NFC	4.2.2.	6.4.	4.4.	4.9.2-; 4.9.7.	7.1.3.
Lighting	NFC	4.4.7.	6.4.	4.4.10.	4.9.7.	7.1.3.

Air conditioning/Ventilation	PC	4.4.6	7.2.3 c)	4.5.	4.9.8; 4.9.10.	7.1.3.
Supply of water	NFC	4.4.1; 5.5	7.2.3 c)	4.5.	4.9.9.	7.1.3.
Supply of energy	PC	5.5	7.2.3 c)	4.5	4.9.10	7.1.3.
Suitability of equipment	NFC	4.1.2; 4.3.1	7.2.3 e)	4.6	4.17	7.1.3.
Equipment for the temperature control	NFC	4.3.2; 4.4.5	8.3	6.4	5.4	7.1.5.
Equipment maintenance	NFC	6.1.	7.2.3 e)	4.6; 4.7.	4.16; 4.17.	7.1.3.
Employee facilities	NFC	4.4.4.	7.2.3 b)	4.8.	3.4.	7.1.3.
Waste and sewage disposal	NFC	4.3.3; 4.4.2; 6.4.	7.2.3 d)	4.12.	4.11.	7.1.3.
Transport facilities	NFC	8	7.2.3 f)	4.16.	4.15.	7.1.3.
Storage facilities	NFC	4.4.8	7.2.3 f)	4.15; 4.9.	4.14.	7.1.3.
Measures for prevention of cross contamination	NFC	5.2.4	7.2.3 g)	4.3.	4.8; 4.9; 4.9.1.	7.1.3.
Measures for prevention of physical and chemical contamination	PC	5.2.5	-	4.9; 4.9.1; 4.9.2; 4.9.3; 4.9.4; 4.9.5; 4.10; 4.10.1-4.10.5.	4.12; 4.12.1	7.1.3.
Housekeeping and cleaning	NFC	4.4.3 6.1 6.2	7.2.3 h)	4.11.	4.10	7.1.3.
Pest control	NFC	6.3.	7.2.3 i)	4.14.	4.13	7.1.3.
Management of surplus food	IC	-	-	4.13.	4.	8.1.
Verification of sanitation systems	NFC	6.5.	7.2.3 h)	4.11.	4.10.	7.1.3.
Personal hygiene	NFC	7	7.2.3 j)	7.2; 7.2.	3.2.1; 3.2.1.2	7.3; 7.1.2.
Medical screening	PC	7.1.		7.3.	3.2.3.	7.3; 7.1.2.
Protective clothing	PC	7.3.		7.4.	3.2.1.	7.3; 7.1.2.
5. CONTROL OF OPERATIONS (manufacture of the product)						
Management of purchased materials	NFC		7.2.3 f)	3.5; 3.5.1; 3.5.2; 3.5.3.	4.4; 4.4.1; 4.4.2; 4.4.3; 4.4.4; 4.4.5; 4.4.6.	8.4; 8.4.1; 8.4.2; 8.4.3.
Specifications for purchased materials	FC	5.3.	3.3.2.	3.6.	4.2.	8.2;
Control of purchasing processes	IC		3.5.4; 4.13.	3.5; 3.5.1; 3.5.2; 3.5.3; 3.5.4; 4.13.	4.2.1.	8.4.
Management of temperature/time	FC	5.2.1.	8.3.	6.4.	2.2.3.8.3; 4.	8.5.
Metal / foreign body detection	NFC			4.10.	4.12.1.	8.6.
Quantity control	FC			6.3.	5.5.	8.6.
Traceability system	NFC		7.9.	3.9; 3.9.4.	4.18; 4.18.1	8.5.2
Management of GMOs	NFC			5.4; 5.5; 5.6.	4.19.	8.5.4.
Management of allergens	NFC			5.3.	4.20.	8.5.4; 8.5.5.
Monitoring system	NFC		8.2.	1.1.4.	2.2.3.8.1	9.1.
Control and calibrating of monitoring and measuring devices	FC		8.3.	6.4.	5.4.	7.1.5.
Management of analyses	FC		8.4.2.	5.6.	5; 5.6.	9.1.3.
Product packaging	FC	5.4.	7.2.3 f)	5.5; 5.2; 6.2.	5.7.	8.6.
Finished product inspection	FC	9	8.4.2.	5.6; 5.7.	5.3.	8.6.
Management of incidents	FC		7.10.3.	3.11.	5.9; 5.9.2	8.7.
Control of non-conforming product	FC		7.10.	3.8.	5.8.	8.7.
Corrective action to eliminate cause of nonconformity	FC	5.6.	7.10.1; 7.10.2.	3.7.	5.11.	10.2.
6. PERFORMANCE ASSESSMENT						
Internal audits	PC		8.4.1.	3.4.	5.1; 5.1.1; 8; 5.2; 4.3	9.2
Management review	NFC	5.6.	5.8; 5.8.2; 5.8.3; 8.4.3.	1.1.3; 1.1.4.	1.4.	9.3.
7. IMPROVEMENT						
FSMS /QMS review	NFC		5.8	1.1.3; 1.1.4	1.4	9.3
FSMS improvement	PC		8.5.1; 7.7.	1.1	-	10; 10.3;
Updating of FSMS /QMS	PC		8.5.2	1.1	-	10.3

* FC - fully compatible, NFC - not fully compatible, PC - partially compatible, IC - incompatible requirements