Studii şi Cercetări Ştiinţifice
Chimie şi Inginerie Chimică, Biotehnologii, Industrie Alimentară
2024, **25** (4), pp. 455 – 482
https://doi.org/10.29081/ChIBA.2024.627
Scientific Study & Research
Chemistry & Chemical Engineering, Biotechnology, Food Industry
ISSN 1582-540X

REVIEW

INSIGHT INTO THE IMPLEMENTATION OF THE IFS FOOD VERSION 8 REQUIREMENTS IN THE FOOD SAFETY MANAGEMENT SYSTEM: KEY STEPS AND BENEFITS

Mariana-Liliana Păcală*, Ciprian Căpățână, Simona Oancea

"Lucian Blaga" University of Sibiu, Faculty of Agricultural Sciences, Food Industry and Environment Protection, 7-9 Dr. Ion Rațiu St., 550012 Sibiu, Romania

*Corresponding author: mariana.pacala@ulbsibiu.ro

Received: December, 11, 2024
Accepted: December, 17, 2024

Abstract: Food safety is essential throughout the entire food chain. An efficient Food Safety Management System (FSMS) establishes a robust foundation for ensuring food safety by identifying and reducing risks, enhancing operational efficiency, and supporting the continuous adaptation to emerging hazards and control methods. This research focused on the implementation and updating of the FSMS in accordance with the requirements of the latest version of the IFS (International Featured Standards) Food standard, version 8 (v8), an internationally recognized standard for food safety, quality, and compliance in the supply chain. The study employed the action research method, combining the theoretical analysis of specialized literature with practical application in a food company, with the aim of facilitating the implementation process by identification of the key steps for the successful implementation of IFS Food v8 requirements. A case study is presented that analyzes the evolution of the FSMS in a food company, starting with the implementation of a Quality Management System (QMS) compliant with the ISO 9001:2000 standard. This system was gradually adapted and improved in line with changes in food safety standards, ultimately achieving certification in accordance with the requirements of IFS Food v8. Addressing relevant aspects has enabled us to highlight and classify the principal benefits of this implementation. This study contributes to the documentation aimed at enriching perspective and addressing multidisciplinary challenges in the field of FSMS. Also, it provides valuable insights for companies interested in implementing the IFS Food v8 standard, and easier access to emerging business opportunities in the food market.

Keywords: *FSMS, food chains, food quality, food safety, food standards, IFS Food, implementation, requirements, risks*

INTRODUCTION

Food safety cannot guarantee the complete elimination of risks; however, it is achieved through rigorous control measures at each stage in the food chain, with the aim of minimizing risks to public health; it is the result of the complex and multidisciplinary concept of food safety. This involves identifying risks and implementing preventive controls to mitigate them, in order to prevent contamination, non-compliant handling, and other hazards that could affect consumer health [1 – 3]. Food safety is achieved through control at each stage of the food chain [4 – 8], aiming to identify the production, contamination or non-compliant handling of food products that can put at risk the consumers' health [1]. The definition of the food chain is given by the sequence of processes through which the food product passes from the raw material to the finished product reaching the final consumer [4, 9, 10].

Ensuring food safety requires collaboration across all stages in the food chain, including manufacturing companies, both those involved in primary production, which adhere to specific standards for food safety compliance, and those in processing, consumers, as well as regulatory authorities responsible for food safety [2, 11]. The IFS Food v8 standard is a product of IFS Management GmbH, a Franco-German joint venture headquartered in Berlin, Germany. It is an internationally recognized standard for food safety, quality, and compliance in the supply chain, designed to ensure the safety and integrity of food products. The standard evaluates the processes and systems of food companies, focusing on key aspects such as hygiene, traceability, and risk management. It is endorsed by leading food retailers and suppliers and is widely used to verify compliance with global food safety regulations, including those of the European Union. The implementation of IFS Food v8 requirements within an FSMS marks a significant evolution in the management of food safety and quality across the food industry. An important role is also played by certification bodies [11 – 14], which, through the audits conducted in these companies, certify the compliance of the FSMS with the requirements of applicable standards, ensuring that processes meet the relevant food safety requirements [15 – 17]. The IFS Food v8 standard was developed based on general aspects of the food quality and safety management system, such as safety, quality, legality, authenticity and compliance with specified customer requirements. These represent the pillars on which consumer confidence is built regarding the production process and products, ensuring that no risk is generated for the health of consumers [18, 19].

Food safety is based on measures designed to prevent, eliminate or reduce to an acceptable level the potential risks due to biological, chemical and physical hazards. According to the IFS Food v8 standard, food is considered "safe for consumption and does not present risks to the health of consumers when prepared and/or consumed according to their intended use" [18].

Food Companies are fully engaged in ensuring food safety [20 – 22], because the production, marketing and distribution of unsafe food products can lead to dangerous consequences for both consumers and the company. Unsafe food can cause food-borne illnesses, poisoning, severe allergies, and in severe cases can even lead to death, especially among vulnerable people, such as the elderly, children and those with poor immunity. The consequences of such events will lead to immediate action, often at considerable financial expense, since consumer health is of crucial importance, and any food safety incident can have severe effects on their health. These are followed by

identifying the causes and documenting and implementing appropriate corrective, preventive and control measures [23]. Immediate actions include ceasing the production and distribution of the identified batches, immediate internal investigation to ascertain the root cause. The process of product withdrawing from the market must be efficiently organized, while the authorities and other interested parties must be promptly and transparently informed about the identified risks. This information is provided either through the company representative or by facilitating access to the Rapid Alert System for Food and Feed (RASFF) reports on the online portal [24 – 26]. The FSMS procedures are reviewed to prevent occurrence of similar incidents. The RASFF, a tool used in the European Union (EU), allows rapid exchange of information between national authorities and the European Commission (EC) on public health risks related to food and feed [24, 25, 27, 28].

Safety incidents may constrain the company to withdraw or recall the unsafe products from the market, to enter into legal disputes, to pay damages claimed by consumers, to retreat from contracts, all these resulting in decreased or lost sales, which will negatively impact the company finances [29, 30]. These food safety incidents can be caused not only by inadequate FSMS but also by incorrect implementation. This highlights the importance not only of an appropriate FSMS, but also of its rigorous implementation within the organization. Depending on the severity and history of the food safety incident, legal sanctions can be applied to the company, such as fines, court cases and even closing the business, if the state authorities believe that the health of the consumer has been put at risk; the food safety incident is made known to the companies involved and the consumer through the RASFF system [5, 24, 31, 32].

The company that registered a food safety incident has the obligation to notify the certification body, which will trigger the specific procedure, mainly by conducting an emergency audit to measure the severity and act accordingly [12]. It can lead to suspended IFS Food certificate for a period, which leads to the cessation of deliveries to retailers or the imposition of additional restrictions and, mandatorily, the documentation and implementation of corrective actions.

The importance of implementing the requirements of IFS Food v8 within the FSMS is given by:

- *Conformity through standardization:* Every FSMS is unique, as every company in the food industry is unique, but by implementing the requirements of IFS Food v8, the standardization of its documentation is ensured. Thus, in addition to the specific documented rules, the procedures will also include rules generally valid in all organizations in the food industry. This is essential for demonstrating compliance and facilitates compliance with the IFS Food v8 standard.
- *Efficient Risk Management:* The focus of the IFS Food v8 standard on risk management in all technological processes of food production is based on the identification, analysis, evaluation and management of potential risks within the FSMS. The aim is to minimize threats to food safety, thus protecting consumers from possible food hazards, consumer expectations in this regard being very high [18].
- *Credibility and confidence:* Achieving this objective gives the organization increased credibility, which becomes important in relationships with business partners, customers and final consumers, as it demonstrates the firm commitment of the company to ensuring food safety. By complying with the rigors of IFS Food v8, the organization builds confidence in its products and its ability to deliver products that

are safe and compliant with international standards. Thus, it ensures the maintenance and expansion of long-term business relationships, strengthening the company reputation in the market, as result of the built trust, which must be preserved.

- *Access to international markets:* It is facilitated by implementation and certification according to the IFS Food v8 standard, due to the strict requirements imposed by it on food safety. These open opportunities for expansion and development of new businesses in global food trading markets.
- *Reducing legal and financial risks:* Compliance with the requirements of IFS Food v8 helps to minimize the legal and financial risks caused by food safety non-conformities. Companies can thus avoid lawsuits, fines and penalties, financial damage, costly product recalls and reputation damage caused by food safety incidents. However, it is important to emphasize that, although an FSMS significantly contributes to reducing risks, it cannot completely eliminate the possibility of incidents or litigation in the event of harm to consumers. The research presented in this article was driven by the identified needs of food companies to implement and update their FSMS in accordance with the latest standards in the field, specifically the new version of the IFS Food standard, v8, launched in 2023, as well as other international standards such as BRC version 9 and ISO 22000:2018. These standards contribute to strengthening food safety, quality, and consumer trust based on the benefits they can bring to organizations [18, 30, 33, 34].

Consequently, this study aimed to identify and characterize, from a theoretical and practical perspective, the key steps required for the successful implementation of the IFS Food v8 requirements. Moreover, a case study related to the applying of these steps for the implementation of the IFS Food v8 requirements within a food company, is presented. Finally, the benefits associated with this approach were formulated and categorized. This paper is addressed both to industry specialists and companies involved in the re-evaluating of their operations to ensure the supply of safe food products to consumers [18, 34, 35].

RESEARCH METHODOLOGY

The research method employed in this study was action research, an approach that combines theoretical investigation with the practical integration of information. The method aims to investigate how an organization in the food industry implements new food safety standards and how processes can be optimized [36, 37]. The present study focused on the implementation of IFS Food v8 requirements within FSMS [36 – 39]. A central challenge of the research was that each new standard introduced additional or different requirements compared to the preexisting ones, necessitating the revision and updating of internal procedures to ensure continued compliance.

The motivation for this research also resulted from the observation that previous implementations of new standards did not always follow a structured and efficient initial plan, defined as a clear set of necessary key steps for integrating the requirements, including comparative analysis, updating documentation, staff training, implementing changes, and validating compliance [36, 37, 39]. However, with the introduction of each new standard, a defined set of steps is outlined that the organization must follow to effectively integrate the requirements. Identifying and documenting this set of key steps formed the foundation of this research.

The research strategy materialized in a comparative analysis of the requirements of each new standard with the existing ones, aimed at identifying the necessary changes in organizational procedures and ensuring the most effective involvement of the food safety team in collecting data and observations regarding the perception and management of changes [38].
The analysis of the data collected repeatedly during the implementation of each new standard aimed to update the FSMS documentation to align with the new requirements, train personnel for the new procedures, and ensure the correct implementation of changes in organizational processes [38]. This analysis will lead to the identification of key steps for the successful implementation of the IFS Food v8 standard within the FSMS, as well as to the formulation and classification of the main benefits of this implementation, providing a comprehensive understanding of its importance [40].

RESULTS AND DISCUSSION

Current State of the Art in Food Safety Standards

Implementation of food safety standards in a food industry organization is essential to ensure compliance with legal regulations and to protect the health of consumers [20 – 22]. Currently, specialized literature offers the following standards that can be implemented, namely:

- *ISO (International Organization for Standardization) 22000:2018*, is an international standard that specifies the requirements for a FSMS. It applies to any company in the food chain, from the farm to the final consumer [41, 42]. This standard integrates the Hazard Analysis and Critical Control Points (HACCP) principles [43] and the measures established by the *Codex Alimentarius Commission* [20, 21]. It combines the requirements for documenting the HACCP plan with prerequisite programs (PRPs) [42]. The PRPs encompass all essential conditions and activities necessary to maintain a hygienic environment within the food chain, suitable for the production, logistics, and supply of safe food products. Also, the ISO 22000:2018 standard provides an alternative for food manufacturers who do not implement the ISO 9001:2015 standard [44], but who want an effective FSMS. ISO 22000:2018 does not meet the Global Food Safety Initiative (GFSI) benchmarking requirements and, as a result, is not recognized as "GFSI approved." However, it is part of the Food Safety System Certification 22000 (FSSC 22000) scheme [45, 46], which complies with the GFSI Benchmark requirements [19].
- *FSSC 22000 version 6*, this combines ISO 22000 with PRPs and additional requirements specific to the food industry [45, 46]. It is recognized by the GFSI and is frequently used by food companies asking for a globally recognized certification [47-51].
- *HACCP*, is an FSMS that, based on its principles, requires the identification, analysis, evaluation, and control of hazards relevant to food safety [43, 52]. HACCP is not a certification standard, but HACCP principles are included in many certification standards such as ISO 22000, FSSC 22000, IFS Food and British Retail Consortium (BRC) Food [20, 21, 46, 53, 54].

- *BRCGS (British Retail Consortium Global Standard) Food Safety Standard*, is a global standard created and requested by the BRC, recognized for food safety. It provides requirements for FSMS and is used by food chain companies, food manufacturers, food processing companies and food suppliers to validate safe and responsible food processing. Numerous chain stores, supermarkets, hypermarkets and other types of retailers around the world that sell products directly to end consumers have accepted this standard. Similar to other standards applicable to the certification of the FSMS, BRCGS Food Safety contributes to the improvement and optimization of the procedural processes within the framework of the FSMS, the elimination or reduction of risks to an acceptable level, and the increase of consumer confidence [12, 16, 53].
- *IFS (International Featured Standards) Food* is a standard recognized and adopted for the auditing of companies producing and supplying food, IFS Food is a recognized standard adopted for auditing companies that produce and supply food, mainly retailers in Europe, but also around the world. The implementation and compliance with the standard requirements demonstrate that a company adheres to food safety, quality and legal regulations, which leads to the supply, processing and placing on the market of compliant food products [53, 55]. The standard has been developed by the GFSI, which is administered by IFS Management GmbH. External audits are carried out by qualified auditors of certification bodies accredited by IFS Management GmbH, in order to assess the conformity of a documented FSMS according to the requirements of IFS Food v8 (last version, 2023), implemented and functional in a company [47, 18]. IFS Food v8 certification allows companies to consolidate their reputation and access to international food trade markets, proving their allocation of material, time, human and financial resources to eliminate and reduce food safety risks and to improve processes [12, 52, 56].
- *SQF (Safe Quality Food)* is an Australian initiative established to meet European standards in food safety. Currently, it is administered by the Food Marketing Institute (FMI) in Arlington, USA. The SQF not only focuses on food safety, but also ensures product quality and promotes continuous improvement strategies [57]. The primary objective of SQF is to monitor and control the entire supply chain. However, SQF recognizes that a single standard could not suit all types of companies, and that most existing standards are primarily designed for large enterprises. Procedures related to these standards are often considered too complex and difficult for small businesses. In this context, SQF has developed two distinct standards, SQF 1000 (targets primary producers in the agricultural sector, such as farmers or growers) and SQF 2000 (applies to the processing and distribution sectors of the food supply chain).
- *GlobalGAP (Global Good Agricultural Practices)* was created in 2007 through the transformation and expansion of EurepGAP (Euro-Retailer Produce Work Group Good Agricultural Practice), responding to the need to cover international markets and include a wider variety of agricultural products [58]. While sharing similar objectives with EurepGAP, GlobalGAP places a particular emphasis on global applicability. The standard covers a broad range of agricultural products and includes regulations for diverse crops, aquaculture, flowers, livestock, and biofuels. This international certification program is recognized globally and adopted by producers targeting international markets, being requested by retailers worldwide to ensure the safety and quality of agricultural products. Following its rebranding to GlobalGAP, the standard gained global recognition, surpassing the initial boundaries and limitations of

EurepGAP. Accordingly, for agricultural practices there is three main certification products: LocalGAP (standard designed for small- and medium-sized producers, primarily in local markets), GlobalGAP, and GlobalGAP+ (enhanced version of the standard GlobalG.A.P., which is widely used for ensuring good agricultural practices, focusing on food safety, environmental protection, and worker welfare).

In 2000, the GFSI was established as a non-profit international organization that promotes high-quality, uniform private food safety standards worldwide [19]. The GFSI began developing and promoting internationally recognized certification standards, such as FSSC 22000, BRC, IFS, SQF, and GlobalGAP, to create a more uniform and efficient system of food safety assurance. The GFSI does not directly provide food safety certifications but recognizes various certification programs that meet the strict standards established through its benchmarking. These programs are essential to retailers and other purchasers around the world, who consider GFSI-recognized certification as a sign of the highest food safety standards. Thus, food industry companies that obtain these certifications benefit from greater confidence and expanded access to global markets, consolidating their presence in all regions of the world [19].

The classification of food safety standards helps stakeholders select appropriate standards based on the specific needs of sectors within the food industry and the relevant regulatory environments [59]. The classification criteria can be: scope and focus, geographical application, sector-specific standards, mandatory vs. voluntary standards, etc. As a result of the literature reviewed and the assessment of the applicability of essential standards for ensuring the safety and quality of food products in the global market, these can be classified into two main categories: international standards and private standards [29, 60, 61].

International standards, such as HACCP and ISO 22000, are developed by international organizations such as the *Codex Alimentarius Commission* and the ISO. These standards are globally recognized and adopted by various governments and organizations to ensure a uniform regulatory framework for food safety worldwide [20 – 22].

Private standards, such as BRC, FSSC 22000, SQF, IFS, and GlobalGAP, are developed by trade organizations or consortia of retailers and are not issued by international governmental or intergovernmental bodies. These standards are designed to meet the specific requirements of the market and the food industry and are widely recognized; however, they remain under the control of the organizations that created them. They are often more detailed and oriented towards the practical needs of the food sector, providing customized solutions for ensuring the safety and quality of products [62].

Regulatory norms issued by a national authority have also been identified. These consist of a set of requirements, specifications, and guidelines that are typically formulated in the form of orders, resolutions, or laws, and are imposed by a governmental or regulatory institution at the national level. Their purpose is to ensure compliance with quality, safety, and consumer protection.

These norms are mandatory for organizations and entities within their scope and are intended to regulate and standardize practices, products, or services within the respective country, thereby contributing to the maintenance of a minimum level of performance and safety in the market. These norms applied in the food sector do not allow companies to differentiate their products based on quality and food safety characteristics, which hinders their ability to strengthen their position in national and regional markets [63]. As a result, private standards have been developed to cover these gaps and to respond to changes in

legal regulations. They tend to be increasingly detailed and more rigorous than those with minimum requirements set by national authorities. Private standards, which are relatively recent, are not yet uniformly implemented alongside regulatory standards, although they are increasingly prevalent in food companies.

Considerations on the implementation of IFS Food v8 standard requirements within the FSMS

The implementation of the IFS Food v8 standard requirements within the FSMS documentation is ensured by the food safety team (FST) of a company appointed by the top management. The FST is responsible for implementing, monitoring, and improving the application of the requirements of the standard, as well as ensuring their compliance in operational processes. The members of the FST are employees with relevant experience in the company's field of activity. The essential role of FST is to ensure that all products obtained by the company are safe for consumption and comply with legal and regulatory requirements. The dynamic and complex feature of food safety development requires an integrative and collaborative approach, so that the FST may include external members, persons outside the company, or a third-party organization with deep knowledge and proven professional skills, who become loyal, sometimes indispensable partners for documenting, implementing, maintaining and improving food safety standards. Without being limited to the examples below, external members of the FST may include: food safety consultants, food industry associations or professional organizations, researchers and food experts from universities or research institutions, representatives of regulatory authorities and inspectors, representatives of suppliers of food safety equipment and technologies, laboratories specialized in testing and food analysis and even independent external auditors accredited by certification bodies [13, 14].

The professional training and skills acquired during the activities of FST members in the company must be supplemented with training for the application of the IFS Food v8 standard, responsibility for knowing the legislation, and the ability to manage risks and resolve non-conformities [18, 22, 56, 59]. These capabilities of the FST team will lead to the achievement of the authenticity and integrity of the organization's FSMS. Among the key duties of the FST is the responsibility to document, implement, maintain, and improve policies, procedures, and prerequisite programs. This includes updating and revising these elements as necessary. Another crucial responsibility of the FST is to coordinate the implementation and management of the HACCP system. This involves identifying hazards, analysing potential risks to food safety at each stage of food production, establishing critical control points (CCPs), and determining the appropriate control measures [43, 64].

The implementation of IFS Food v8 standard requirements demands a clear and complete understanding of them by the personnel involved in the adaptation of policies, procedures and prerequisite programs to achieve compliance [13, 22]. Compliance must be a primary focus of top management of a company, which establishes responsibilities, timelines for implementation, and allocates the necessary resources.

The policies, procedures and prerequisite programs that form the basis of a documented, implemented, operational and upgradeable FSMS must meet the IFS Food v8 standard requirements. This can be achieved by developing and documenting new procedures, as well as by revising or updating the existing ones, ensuring that they are clear, well defined, precise and detailed and easily understood and respected by all employees.

Evolution and performance of the IFS Food v8 certification

Adopting and complying with the requirements of private international food safety standards, such as BRC, IFS Food and SQF, has been a significant challenge for food manufacturing organizations. These standards impose strict requirements that have a profound impact on how manufacturing processes, quality assurance, and food safety of products are managed.

Referring specifically to the IFS Food standard, but applicable to other GFSI standards as well, its requirements have significantly impacted organizations in the food sector. The implementation of the IFS Food standard requires thorough review and modification of existing manufacturing and management processes. This means that organizations must adapt and enhance the way they conduct their operations to ensure compliance, including the revision and updating of procedures or the documentation of new ones, the acquisition of more advanced production equipment, and the implementation of high-performance measurement and monitoring systems. These measures are crucial for maintaining real-time control of quality, food safety, and hygiene processes.

The IFS Food standard has constantly evolved to align with the best practices and current food safety requirements. From the first version to the most recent one, it has been updated to reflect industry changes and regulatory requirements. The number of requirements of the IFS Food standard has increased from the first version (2003: 120 requirements) to the latest version (2023: 210 requirements), demonstrating the increase in complexity and detail of requirements over time. Each version of the IFS Food standard has been designed to adapt to the evolving requirements of the food sector, thereby ensuring the safety and quality of food products on a global scale (Table 1).

Table 1. *Model The specific issues regarding the update of the IFS Food standard from the first version up to the present one*

IFS Food version (year)	Features
IFS Food v1 (2003)	- established the basic requirements for the safety and quality of food products.
IFS Food v2 (2005)	- introduced updates to improve food safety requirements and quality control, based on *feedback* evaluation and previous experiences.
IFS Food v3 (2007)	- added additional requirements and made updates to reflect changes in the food industry and current regulations.
IFS Food v4 (2010)	- included more detailed risk control and hygiene requirements, improving the specificity and applicability of the requirements.
IFS Food v5 (2012)	- enhanced risk management practices and integrated stricter requirements for audits and continuous monitoring.
IFS Food v6 (2014)	- brought new requirements for transparency and accountability, placing a stronger emphasis on risk management and rigorous supplier assessment.
IFS Food v6.1 (2017)	- minor update of the previous standard's requirements.
IFS Food v7 (2020)	- introduced significant revisions to align the standard with the latest regulations and industry trends, with a particular focus on risk assessment and quality control.
IFS Food v8 (2023)	- compared to previous editions, it introduced numerous updates and significant improvements.

The current version of the IFS Food standard, v8, marks a significant advancement in the evolution of food safety requirements, ensuring that organizations within the food industry remain aligned with the latest best practices and regulations. This standard shape the standardized framework, with its requirements designed for ease of implementation and monitoring. Additionally, the standard addresses key aspects of sustainability, environmental responsibility, and social accountability [18, 65]. Thus, it is explained the interest of food companies for the implementation and certification according to the IFS Food v8 requirements as early as 2023 the transition deadline being January 1, 2024. After this date, certifications under version 7 are no longer possible, and organizations are required to comply with version 8 to maintain IFS Food certification.

Food companies that passed the certification audit after the certification process version 8 in 2023, especially those certified at a high level, demonstrated their commitment and understanding of the documentation importance by the food safety team and staff, as well as implementing the IFS Food v8 requirements to achieve of the IFS Food v8 certificate.

The concern of food companies regarding the implementation of IFS Food v8 is also influenced by the food scope to which their consumer-supplied products belong. The food scopes for the year 2023 were as follow: Red and white meat, poultry and meat products (1); Fish and fish products (2); Egg and egg products (3); Dairy products (4); Fruits and vegetables (5); Grain products, cereals, industrial bakery and pastry, confectionery, snacks (S6); Combined products (7); Beverages (8); Oils and fats (9); and Dry products (10), other ingredients and supplements. The food scope: Pet Food (11), was added in 2024 [18].

Several justifications, which may help provide a clearer understanding of why certain product categories may show greater or lesser interest in IFS Food v8 certification, according to the authors of the article, could be as follows:

- Food scope 5 (Fruits and Vegetables) may determine the highest level of interest among food companies because products in this category are essential for a healthy diet and have high market demand, particularly as consumers increasingly gravitate toward healthy and natural food options. Additionally, the strict quality and food safety requirements for fruits and vegetables, often consumed raw, make IFS Food certification crucial for companies in this sector, as it facilitates their access to major retailers.
- Food scope 6 (Grain products, cereals, industrial bakery and pastry, confectionery, snacks) may be of significant interest because these products are widely consumed and integrated into the most daily diets, which makes them highly relevant in the market. IFS Food v8 certification ensures that these products meet high safety and quality standards, which are essential aspects for consumers and retailers.
- Conversely, companies producing foods in scope 3 (Egg and egg products) and 4 (Dairy products) may show less interest because these categories, although important, face specific challenges, such as contamination risks (e.g., *Salmonella* for eggs) and market demand fluctuations. Additionally, these products are often subject to strict national regulations and standards, which can reduce the perceived need to obtain additional international certifications, such as IFS Food. It can be presumed that there is a low number of certified food companies in these areas of production.
- Food scopes 9 (Oils and fats), 10 (Dry products, other Ingredients, and supplements), and 6 (Grain products, cereals, industrial bakery and pastry, confectionery, snacks) could comprise companies with the highest percentages of passed audits at a higher

level, as implementation and training processes in these sectors of the food industry tend to be more effective. This can be attributed to the specific technological processes and the characteristics of the finished products.

- For scope 11 (Pet food), the lowest rank at the higher level could be estimated for audits conducted and passed in 2024, not due to a low interest, but because of its recent inclusion within the IFS Food v8 standard. This requires a longer adjustment period to achieve maximum performance.

Although the IFS Food v8 standard is complex, food companies that managed to integrate its requirements into their FSMS documentation in 2023, certainly demonstrated a good level of compliance. However, it is important to note that the rapid implementation of the IFS Food v8 standard, combined with the limited time available to audited companies, may have been a key factor influencing the variations in the rate of the audit passed, particularly regarding the achievement of a higher level. In many cases, companies probably did not have sufficient time to fully assimilate and integrate the new requirements, which could explain why some of them were unable to reach the superior performance level.

The limited time for implementation also impacted companies' ability to enhance infrastructure, technology, measurement and monitoring systems. These aspects are critical for ensuring compliance with the IFS Food v8 requirements and have also made it more challenging to achieve a higher level in audits. Additionally, the efficiency and effectiveness of the training programs designed to support the integration of the IFS Food v8 standard may not have been fully realized. These programs are essential to ensure that staff properly understand and apply the new requirements; any shortfall in this area could contribute to variations in audit results.

The distribution of IFS Food v8 certifications is globally, reflecting not only the need for compliance in various and key markets, but also the regional and national trends in food safety and quality. This requirement is largely influenced by the expectations of retailers and the demands of regulatory authorities, who play a crucial role in establishing food safety standards. For retailers, the adoption of IFS Food v8 by suppliers ensures compliance with strict regulations and serves as a means to increase consumer trust. At the same time, food processors recognize the direct benefits of adopting this standard. Implementing IFS Food v8 allows them to optimize internal processes, reduce risks associated with non-compliance, and strengthen their position in global markets. This duality, external requirements and internal benefits, is essential in accelerating the global distribution of IFS Food v8 certifications. As the IFS Food v8 standard continues to be widely implemented, it is expected that the distribution and trade model associated with it will expand and strengthen, thereby supporting international trade and consumer confidence. Certainly, until this moment, although many food companies successfully passed the audit and achieved a high level of compliance, the full integration of the IFS Food v8 standard's requirements remains one of the significant challenges for them.

The audit results reflect both the achievements and challenges of food companies, highlighting the importance of continuous improvement and efficient adaptation to the requirements of IFS Food v8. Moreover, regular staff training is necessary to ensure competence and compliance with the standards. Regular internal audits should be conducted such as to identify and address potential deficiencies, and effective corrective actions must be implemented to respond to non-conformities and maintain a consistent standard of food safety.

In line with the content and observations made in this subsection of the article, it is indeed justified to outline the key steps for a successful implementation of the IFS Food v8 requirements into the FSMS, not only based on the implementation of food safety standards.

Key steps identified for a successful implementation of IFS Food v8 requirements in FSMS

An effective implementation of the requirements of IFS Food v8 into a company's FSMS, requires a defined path consisting of several steps to be performed by the entire FST team, or by the FST team leader who can delegate specific responsibilities to team members.
Personnel involvement in applying the IFS Food v8 requirements is crucial to the success and effectiveness of an organization's FSMS, based on the following key issues:

- Informed and educated personnel contribute to maintaining long-term compliance with IFS Food requirements, reducing the risk of non-conformities and penalties;
- In the event of non-conformities, well-trained personnel can respond quickly and effectively to resolve issues and prevent their recurrence;
- Personnel involvement promotes a deep commitment to food safety and clear responsibility in adhering to necessary practices and procedures.

The authors of this article, by consulting the standards and the specialized literature in the field, and the implementation of standards have identified nine key steps for the successful implementation of the requirements of the IFS Food v8 standard in the FSMS of food companies [18, 41, 42, 59, 60, 61, 66, 67]. These steps are listed and described, in the author's version, in the Table 2.

Table 2. *Key steps for the successful implementation of the requirements of the IFS Food v8 standard in the food company FSMS*

Step titles, Activities/Strategies and Expected outcomes
STEP 1 - Knowing the requirements of IFS Food v8
The strategies for knowing the requirements are multiple, from studying the IFS Food v8 standard in detail to the latest training methods for a complete and accurate understanding of the requirements.
1.1. Identification of training materials: - IFS Food v8 standard, the official version on the IFS website at IFS Certification (IFS Database); - manuals, guidelines and videos explaining the requirements of IFS Food v8 and the way to implement them; - *online* learning platforms where courses and tests about IFS Food v8 can be accessed; - databases with well-structured and easily accessible resources, continuously updated, as a single source for information.
1.2. Carrying out theoretical training and workshops: - initial training related to the requirements of IFS Food v8; - organization of workshops for discussions and the specific way of IFS Food v8 requirements implementation.
1.3. Carrying out practical training: - simulations and practical exercises, in a real context, to help the staff to implement the requirements; - training through physical visits to the company, for knowing the "situation on the ground".
1.4. Carrying out continuous information: - by consulting the newsletters with the latest updates and interpretations of the IFS Food v8 standard, coming from official sources and from the IFS website, distributed internally to the company members.
1.5. Carrying out an external training:

Step titles, Activities/Strategies and Expected outcomes
- training with specialized consultants in IFS Food v8, to provide specialized support; - attending conferences and seminars on IFS Food v8, to learn from food industry experts.
1.6. Evaluation of the knowledge acquisition and feedback: - evaluation of knowledge level through periodic tests (e.g. of test questions: "How would you identify and assess a specific risk within the production process? Provide an example."; "How is the traceability of a food product ensured within the FSMS, and how is it monitored according to IFS Food v8?"); - identifying weak points, modifying strategies and optimizing the performance of the learning process through constant feedback from the trained staff.
1.7. Carrying out periodic sessions for training evaluation: - regular meetings to identify the level of assimilation of IFS Food v8 requirements through training, to resolve the questions that have arisen, and to revise the training strategy, if necessary; - establishing working groups focused on specific aspects of training related to the requirements of IFS Food v8.
Expected Outcomes STEP 1: Full understanding of IFS Food v8 requirements and ability to effectively apply them within the company's context.
STEP 2. Assessment of the real situation of FSMS
2.1. Carrying out the FSMS assessment at the time it is decided to implement the IFS Food v8 requirements, to evaluate if the existing system can meet the requirements of the standard. - carrying out an internal audit based on an updated questionnaire with the requirements of the IFS Food v8 standard.
2.2. Identifying the differences between the requirements of the IFS Food v8 standard, considered non-conformities, and the existing policies, procedures and prerequisite programs at the time of the assessment of the actual situation. - drawing up/writting a report highlighting these non-conformities.
Expected Outcomes STEP 2: Awareness of current compliance level and identifying gaps between FSMS and IFS v8 requirements.
STEP 3. Planning the implementation of IFS Food v8 requirements
3.1. Defining the way of implementation: - drawing up an implementation plan consisting of clearly defined objectives, responsibilities, deadlines and allocated resources.
3.2. Dissemination of the implementation plan to the involved personnel: - organizing of meetings for training during the implementation, focusing on each person responsibilities and efficient working; - providing communication channels for the dissemination of documentation, questions and feedback.
Expected Outcomes STEP 3: Structured implementation of IFS Food v8 requirements with clear responsibilities for staff.
STEP 4 - Reviewing/updating FSMS documentation
4.1. Updating the food safety policy to reflect top management's commitment to the requirements of the IFS Food v8 standard.
4.2. Implementation of the requirements of IFS Food v8 in the procedures and prerequisite programs.
4.3. Reviewing/updating the HACCP study to identify hazards and control associated risks, in accordance with the requirements of IFS Food v8.
Expected Outcomes STEP 4: Complete documentation aligned with IFS Food v8 requirements.
STEP 5 -Training and awareness of employees with the reviewed FSMS documentation
5.1. Establishing a program for carrying out personnel training with the reviewed documentation.
5.2. Evaluating the effectiveness of the training, to eliminate the situations in which there is the "habit" with the old procedures and prerequisite programs.

Step titles, Activities/Strategies and Expected outcomes
5.3. Carrying out short tests or assessments, including question-answer type questions or practical scenarios.
5.4. Organizing interactive sessions, where employees can ask questions and discuss practical aspects or situations of application of the documentation. Direct interaction can help clarify any ambiguities and strengthen understanding of reviewed/updated documentation.
Expected Outcomes STEP 5: Staff trained and aware of changes implemented in FSMS.
STEP 6 - Practical implementation of reviewed/updated documentation
6.1. Distribution of the reviewed/updated documentation (*STEP 4*) to the personnel involved in its implementation.
6.2. Defining the communication channels: process owners who documented the policies, procedures and prerequisite programs, online platforms and work sessions where the employees can request clarifications in case of possible misunderstandings.
6.3. Carrying out implementation monitoring through internal evaluations, especially represented by planned internal audits on processes or units to identify compliance, by direct observation of the implementation of processes according to the new documentation and by collecting employee opinions that may reveal elements that are not clear or that does not work as intended.
6.4. Motivation of the personnel involved in the practical implementation which can be achieved by recognizing and appreciating the efforts made, including rewards or other forms of professional recognition.
Expected Outcomes STEP 6: Correct application of updated procedures by employees.
STEP 7 - Verification and validation of the implementation of the reviewed/updated documentation
7.1. Carrying out a program of complete internal audits after a period of at least 3 months of operation of the new FSMS, to verify compliance, validate operation and identify opportunities for improvement.
7.2. Carrying out a detailed analysis by the top management on the operation and performance of the new system, which will be the basis of the required improvement decisions.
Expected Outcomes STEP 7: Verification of compliance with IFS standard and improvements in implemented processes.
STEP 8 - Preparing for the certification audit
8.1. Carrying out a full internal audit, to verify the fulfillment of all requirements of the IFS Food v8 standard and to assess the preparation for the certification audit [12].
8.2. Identifying and documenting non-conformities, closing non-conformities by implementing the required corrections, corrective and, sometimes, preventive actions.
8.3. Ensuring that all departments are prepared and personnel know and comply with the requirements of the IFS Food standard v8 implemented in the FSMS documents, in order to successfully complete the certification audit.
Expected Outcomes STEP 8: System ready for IFS Food v8 certification.
STEP 9 - Continuous improvement
9.1. Continuous updating of the FSMS documentation in order to document and apply any changes and to introduce improvements compliant to the requirements of the IFS Food v8 standard.
9.2. Continuous improvement through management review, implementations of identified improvements of FSMS, with the aim of maintaining compliance with the requirements of the IFS Food v8 standard and to optimize the performance indicators of the FSMS system.
Expected Outcomes STEP 9: Continuously updated FSMS to comply with IFS v8 and optimize performance.

Case study: Implementation of IFS Food v8 requirements within FSMS in a food industry organization

Context definition

The investigated company, a leader in the Romanian food industry, with extensive experience in product quality assurance, has implemented a Quality Management System (QMS) according to the international standard ISO 9001:2000, since 2004 [66]. This system, based on documented procedures and rigorous practices, has allowed the constant offering of high-quality products, satisfying the demands and expectations of its customers. The food industry organization implemented, in stages from 2004 to 2023, the requirements of food safety standards DS 3027 E:2002 [67], ISO 22000:2005 [41], ISO 22000:2018 [42].

Objective and approach strategy

The aim was to implement the requirements of IFS Food v8 by identifying the requirements underlying the documentation of FSMS procedures. This entails a detailed analysis of how these requirements are integrated into both existing and newly documented procedures. It also involves evaluating the benefits that arise from applying the IFS Food v8 requirements within the FSMS system. Throughout the evolution of the FSMS in the selected company, it has been demonstrated that compliance with the key steps led to an efficient and easy implementation, while ensuring full compliance with the requirements of the IFS Food v8. Therefore, a robust and functional FSMS was created.

Collection, analysis and implementation of relevant data

Based on the QMS documentation according to the reference standard ISO 9001:2000, the organization carries out its activity in accordance with its object of activity, aiming at the implementation of well-structured and efficient processes. The management of the organization found that the standardization and procedure of activities are not only essential to ensure compliance with legal and regulatory requirements, but also to obtain high quality products according to the requirements of the food industry market.

Also, the management of the organization admitted that the documentation and rigorous implementation of the procedures was a difficult process, encountering various obstacles. In this context, it was considered necessary to establish a clear implementation strategy to overcome these challenges and ensure an effective and sustainable compliance process.

The columns 1, 2, 3, and 4 of Table 3 show the 2004 list of procedures documented according to the requirements of the ISO 9001:2000 standard, with each requirement of the standard being documented in system, operational, GMP, and technical procedures.

Before the ISO 22000 standard gained global prominence, one of the standards based on HACCP principles, was DS 3027 E:2002 [67] which has been used to ensure food safety in the Danish food industry since the 1990s. The edition of the DS 3027 E: 2002 was adopted in several European countries, including Romania.

This standard was structured around HACCP principles, designed to assist organizations in identifying and controlling food safety risks through a systematic approach to documenting and monitoring production processes, assessing risks, and establishing critical control points.

To align with the new food safety requirements, top management decided to implement the DS 3027 E standard from 2002, specific to the food industry. This implementation

has led to the improvement of technological processes and the assurance of a higher level of product quality and safety.
The implementation process of DS 3027 E included the development of new procedures to cover the specific requirements of this standard, but also the updating with the aim of revising the existing procedures in the QMS based on the ISO 9001:2000 standard. These revisions were essential to ensure the efficient integration of the new standard and to optimize the production flows so as to respond as best as possible to the challenges of the food industry in the year 2002.
The update carried out by the HACCP team [60, 61] by verifying and evaluating the procedures led to the following two situations: either the procedure received a new revision, when the changes were minor, or it received a new edition, when the changes were sufficient to justify a major change, or a new requirement was implemented.
Through this initiative, the organization has demonstrated its commitment to quality and product development, thereby supporting continuous improvement and maintaining customer trust in the company's brand. Thus, Table 3 shows the list of documented FSMS procedures and comments related to the integration of the requirements of the DS 3027 E:2002 standard.
In 2005, ISO developed the standard ISO 22000:2005 [41], that specified the requirements for an FSMS when an organization in the food chain needs to demonstrate its ability to control food safety hazards in order to ensure that food is safe for human consumption. Consequently, the organization's management established that this standard should also be implemented and certified. In this case, new procedures were documented and existing ones were reviewed. Table 3 shows the list of procedures documented according to the requirements of ISO 22000:2005 [41].

Table 3. *List of documented procedures according to the requirements of ISO 9001:2000 correlated with the requirements of DS 3027 E:2002, ISO 22000:2005, ISO 22000:2018, and IFS Food v8*
Adapted from [18, 41, 42, 66 ,67]

Procedure code/PRP	**Procedure title/PRP**	**Documented ISO 9001:2000 requirement**	**Documented DS 3027 E:2002 requirement**	**Documented ISO 22000:2005 requirement**	**Documented ISO 22000:2018 requirement**	**Documented IFS Food v8 2023 requirement**
1	**2**	**3**	**4**	**5**	**6**	**7**
	SYSTEM PROCEDURES (*SPs*)				**GENERAL PROCEDURES (*GPs*)**	
SP-01/ PG-01	Process of developing, managing, and controlling documented information	4.2.3.	4.3.	4.2.2.	7.5.	2.1.1.
SP-02/ PG-02	Control process of records of documented information	4.2.4.	4.7.1.	4.2.3.	7.5.	2.1.2.
SP-03/ PG-03	Control of non-conforming products. *Review of procedure title:*	8.3.	4.7.2.	7.10.3. ***Procedure review:*** Requirement 8.3. of ISO 9001 requires the identification of how to treat the	8.9.; 10.1. ***Procedure review:*** Requirement 7.10.3. of ISO 22000:2018 requires the identification of	5.10.

Procedure code/PRP	Procedure title/PRP	Documented ISO 9001:2000 requirement	Documented DS 3027 E:2002 requirement	Documented ISO 22000:2005 requirement	Documented ISO 22000:2018 requirement	Documented IFS Food v8 2023 requirement
1	2	3	4	5	6	7
	Control of non-conformities, non-conforming, and potentially unsafe products			non-conforming product. Requirement 7.10.3. of ISO 22000:2005 requires the identification of actions also when the product is potentially unsafe.	actions to be taken when the product or process is determined to be potentially unsafe.	
SP-04/ PG-04	Internal audit of quality, environment, and food safety	8,2; 8.2.2; 8.2.3; 8.4.	4.8.3.	8.4.1; 8.4.2; 8.4.3.	5.1.; 5.2.; 9.2.	5.1.
SP-05/ PG-05	Preventive and corrective actions *Review of procedure title:* Corrective actions	8.5.2.; 8.5.3.	4.5. *Revised procedure* concerning the activities undertaken when monitoring results demonstrate that critical limits have been exceeded or established procedures have not been followed.	7.10.1.; 7.10.2.	10.1. ISO 22000:2018 standard no longer refers to preventive actions because it is considered that the processes to prevent the occurrence of non-conformities are the PRPs in requirement 7.2.3.	5.11.
SP-06/ PG-06	HACCP study and FSMS validation	There is no explicit requirement	4.2.1.; 4.2.2.; 4.4.; 4.5. New documented procedure.	5.5.; 7.3.; 7.4.; 7.6.; 7.7.; 8.5.2.; 8.1.; 8.2.	4.3.; 4.4.; 8.5.	2.2.; 2.3.; 5.3.
SP-07/ PG-07	Management of incidents, notification and withdrawal	There is no explicit requirement	4.7.3. New documented procedure.	5.7.; 7.10.4.	8.4.; 8.9.5.	5.9.
PG-0 8	Organizational context and interested parties	There is no explicit requirement	There is no explicit requirement	There is no explicit requirement	4.1.; 4.2. New procedure has been documented based on the requirements of ISO 22000:2018	1.1.1.; 4.1.1.
PG -09	Risk management.	There is no explicit requirement	There is no explicit requirement	There is no explicit requirement	6.; 6.1.; 6.2. The new procedure has been documented based on the requirements of ISO 22000:2018	2. 3.
PG- 10	Process of establishing, analyzing and	There is no explicit requirement	There is no explicit requirement	There is no explicit requirement	9.; 9.1.; 9.3.; 10.2; 10.3.	1.1.1.; 5.

Procedure code/PRP	Procedure title/PRP	Documented ISO 9001:2000 requirement	Documented DS 3027 E:2002 requirement	Documented ISO 22000:2005 requirement	Documented ISO 22000:2018 requirement	Documented IFS Food v8 2023 requirement
1	2	3	4	5	6	7
	evaluating KPIs (Key Performance Indicators)				The new procedure has been documented based on the requirements of ISO 22000:2018	
PG-11	Study of vulnerability	There is no explicit requirement	There is no explicit requirement	There is no explicit requirement	There is no explicit requirement	4.20. New procedure has been documented based on the requirements of IFS Food v8.8
	OPERATIONAL PROCEDURES (*OPs*)				**PROCESS PROCEDURES (*PPs*)**	
OP-01/ PP-01	Responsibility of management and FST. Analysis performed by management. Data analysis and improvement	5.6.; 8.4.; 8.5.1.	4.1.3.	5.8.; 8.5.1.	9.3.; 10.2.	1.3.
OP-02/ PP-02	Internal and external communication process	5.5.3.; 7.2.3.	4.8.1.; 4.8.2.	5.6.; 5.6.1.; 5.6.2.	7.4.	1.1.1.; 1.1.2.; 3.2.11.; 4.1.2.; 5.1.3.; 5.9.1.
OP-03/ PP-03	Human resources, skills, training, and awareness	6.2.; 6.2.1; 6.2.2.	4.1.2.4.	6.2.; 6.2.1; 6.2.2.	7.1.2.; 7.2.	2.3.1.2.; 2.3.9.2.; 2.3.9.3.; 3.1.; 3.3.; 4.10.3.; 4.10.4.; 4.13.3.; 4.14.4.; 5.6.5.
OP-04/ PP-04	Infrastructure and work environment	6.3.; 6.4.	4.2.3.; 4.6. Procedure disseminated in GMP procedures.	6.3.; 6.4 The OP-04, documented to implement the requirements of ISO 9001:2000 and 22000:2005, has been disseminated in the PRPs required by requirement 7.2 of the standard. GMP P coding has been changed to PRP.	7.3.; 7.4.	4.6.; 4.7.; 4.8.
OP-05/ PP-05	Planning process of food production	5.4.; 5.4.2.; 5.5.; 7.; 7.1.	There is no explicit requirement	5.3; 8.5.2; 5.3.; 5.4.; 5.5.; 7.7.1.	7.1.3.; 7.1.4.	1.1.; 3.; 4.
OP-06/ PP-06	Processes related to customer relationship and customer satisfaction	7.2.; 7.2.3.; 5.2.; 8.2.1.	There is no explicit requirement	5.6.1. ;5.7.	8.1.	1.1.1.; 1.3.1.; 4.1.1.; 4.1.2.; 4.2.1.2.; 4.2.1.5.; 4.4.1.; 4.5.1.

Procedure code/PRP	Procedure title/PRP	Documented ISO 9001:2000 requirement	Documented DS 3027 E:2002 requirement	Documented ISO 22000:2005 requirement	Documented ISO 22000:2018 requirement	Documented IFS Food v8 2023 requirement
1	2	3	4	5	6	7
OP-07/ PP-07	Design - development	7.3.; 7.3.1; 7.3.2.; 7.3.3.; 7.3.4.; 7.3.5.; 7.3.6.; 7.3.7.; 7.5.2.	There is no explicit requirement	5.6.2.; 7.3.; 7.4.; 7.5.; 7.6.; 7.8.; 8.2.; 8.4.2; 8.5.2.	4.2.; 5.1.; 7.4.2; 8.4.; 8.9.5.	4.2.; 4.3.
OP-08/ PP-08	Identification and traceability	7.5.3.	There is no explicit requirement	7.9.	8.5.; 8.8.	4.18.
OP-09/ PP-09	Sourcing process and supplier evaluation	7.4.	4.2.3	7.3.	8.3.	4.4.
OP-10/ PP-10	Handling complaints	7.2.3.; 8.5.2.	There is no explicit requirement	5.6.1.b); 7.10.2.	7.1.6.; 8.2.4.	5.8.
OP-11/ PP-11	Product preservation	7.5.5.	4.2.3.	7.2.	7.4.2.; 7.4.3.;	4.14.
OP-12/ PP-12	Process of controlling measuring and monitoring devices. Equipment maintenance.	7.6.	4.7.4	8.3.	8.9.3.; 9.3.2.	5.4.; 5.5.
OP-13/ PP-13	Process of controlling, monitoring and measuring the processes and the product	7.5.; 7.5.1.; 8.1.; 8.2.3.; 8.2.4.	There is no explicit requirement, there is requirement 4.5. only for the control of relevant hazards	7.2.; 7.6.1.; 8.1.; 7.6.4.; 8.2.4.	8.2.4; 8.5.1.2.; 8.5.1.3.	2.3.; 5,5.; 5.6.; 5.7.
OP-14/ PP-14	Customer property	7.5.4.	There is no explicit requirement	There is no explicit requirement	7.1.5.	4.1.2.; 4.2.1.1.; 4.2.1.2.; 4.4.4.; 4.5.3.; 4.18.5.
OP-15/ PP-15	Personal performance evaluation	6.2.2.	There is no explicit requirement	6.2.2.	7.2.; 7.3.	2.3.1.2.; 3.1.; 3.3.; 4.13.3.; 4.14.4.; 5.6.6.; 4.21.1.
OP-16/ PP-16	Development approval and modification (revision) of product specifications	There is no explicit requirement	There is no explicit requirement	7.3.3.1.; 7.3.3.2. The new procedure was documented based on the requirements of ISO 22000:2005	8.5.1.	4.2.
	***GMP* PROCEDURES (*GMP Ps*)**			**PREREQUISITE PROGRAMS (*PRPs*)**		
GMP P-01/ PRP-01	Construction and location of buildings	6.3.; 6.4.	4.2.3.; 4.6.	6.3; 6.4; 7.2.3.a)	8.2.4.a)	4.6.; 4.7.; 4.8.; 4.9.; 5.2.
GMP P-02/ PRP-02	Layout of premises and workspaces	6.3.; 6.4.	4.2.3.; 4.6.	7.2.3.b)	7.1.3.; 7.1.4.; 8.2.4.b)	4.6.; 4.7.; 4.8.; 4.9.; 5.2.
GMP P-03/ PRP-03	Management process for air, water and energy sources	There is no explicit requirement	4.2.3.; 4.6. New documented procedure	7.2.3.c)	8.2.4.c); d)	4.9.7.; 4.9.8.; 4.9.9.; 4.9.10.

Procedure code/PRP	Procedure title/PRP	Documented ISO 9001:2000 requirement	Documented DS 3027 E:2002 requirement	Documented ISO 22000:2005 requirement	Documented ISO 22000:2018 requirement	Documented IFS Food v8 2023 requirement
1	2	3	4	5	6	7
GMP P-04/ PRP-04	Waste and wastewater. Disposal Process.	There is no explicit requirement	4.2.3.; 4.6. New documented procedure	7.2.3.d)	8.2.4.c); d)	4.11.; 4.12.
GMP P-05/ PRP-05	Cross-contamination prevention process	There is no explicit requirement	4.2.3.; 4.6. New documented procedure	7.2.3.g)	8.2.4.h)	3.2.1.; 3.2.3.; 3.4.; 4.7.; 4.8.; 4.9.; 4.10.; 4.11.; 4.12.; 4.13.; 4.14.; 4.15.; 4.16.; 4.19.; 4.20.
GMP P-06/ PRP-06	Management of purchased materials process	There is no explicit requirement	4.2.3.; 4.6. New documented procedure	7.2.3.f)	7.1.6.; 8.2.4.f)	4.4.
GMP P-07/ PRP-07	Cleaning, disinfection, and sanitization process	There is no explicit requirement	4.2.3.; 4.6. New documented procedure	7.2.3.h)	8.2.4.i)	4.10.
GMP P-08/ PRP-08	Pest control and eradication process	There is no explicit requirement	4.2.3.; 4.6. New documented procedure	7.23.i)	8.2.4.d)	4.13.
GMP P-09/ PRP-09	Maintenance of equipment and vehicle fleet	6.3.; 6.4 .	4.2.3.; 4.6.	7.2.3.e)	8.2.4.e)	4.16.; 4.17.
GMP P-10/ PRP-10	Health, hygiene, and facilities for personnel. Visitors.	There is no explicit requirement	4.2.3.; 4.6. New documented procedure	7.2.3.i)	8.2.4.i)	3.2.; 3.4.; 4.10.
GMP P-12/ PRP-11	Foreign bodies management	There is no explicit requirement	4.2.3.; 4.6. New documented procedure	7.2.3.k)	8.5.; 8.9.; 8.2.4.l)	4.12.
GMP P-11/ PRP-12	Chemical process management	There is no explicit requirement	There is no explicit requirement	There is no explicit requirement	There is no explicit requirement	4.10.; 4.12.3. The new procedure was documented based on the requirements of IFS Food v8
	TECHNICAL PROCEDURES (*TPs*)					
TP-01	Laboratory quality technical control process	7.2.2.; 7.3.; 8.2.3.; 8.2.4.	There is no explicit requirement	7.3.3.1.; 7.3.3.2.; 7.4.4.	8.; 10.2.; 10.3.	2.2.3.; 5.6.; 5.7.
TP-02	Manufacturing process	7.1.	There is no explicit requirement	7.1.; 7.2.	8,1.; 8.2.; 8,5.; 8,7.; 9.1.; 10.1.	4.

According to the requirements of the ISO 22000:2005 standard, the system procedures were transformed into general procedures and, as the process-based approach was introduced to emphasize the interconnection between the various processes in an

organization, the operational procedures were also changed into process procedures. The PRPs have also been documented to meet requirement 7.2. of the ISO 22000:2005 standard [41]. In general, ISO reviews its standards every five years to determine whether revisions are necessary, ensuring that the standards remain current in terms of their applicability and legality. This process aims to ensure the relevance of the standards, keeping them aligned with technological advancements, industry requirements, and updated legal regulations.

The transition to ISO 22000:2018 [42] marked a significant update from the previous version, ISO 22000:2005, introducing several essential changes and improvements. Among the most notable features is the alignment with the High-Level Structure (HLS), also known as Annex SL, which facilitates the easier integration of ISO 22000 with other management standards, such as ISO 9001:2000 [67]. As a result, the investigated company redefined the procedures. Therefore, the system procedure was defined as a general procedure, and the GMP procedures were defined as PRPs.

During the three-year transition period, the organization implemented the requirements of the ISO 22000:2018 standard. In this process, a clear approach to the Plan-Do-Check-Act (PDCA) cycle was adopted, and documented and implemented, as required by 6.1. and 6.2., a new general risk management procedure. This describes how organizational risks can be managed through concrete plans and actions, thereby transforming potential threats into opportunities (Table 3).

Requirement 10.1. of ISO 22000:2018 no longer refers to preventive actions, because it is considered that the processes that prevent the occurrence of non-conformities are the PRPS in requirement 7.2.3. Thus, both the content of the general procedure PG-03 and its title have been revised (see Table 3).

Requirements 4.1. and 4.2. involves an understanding of the organization's context, considering relevant external and internal aspects. These include, but are not limited to, legislative, technological, competitive, market, cultural, social and economic aspects. Additionally, cyber security, food fraud, food protection and intentional contamination, as well as the knowledge and performance of the organization at different levels (international, national, regional or local) were considered. An understanding of the needs and expectations of stakeholders relevant to the SMSA is also required. All this was documented and implemented into a new general procedure, Organizational context and interested parties, code PG-09.

The new general procedure Process of establishing, analyzing and evaluating Key Performance Indicators (KPIs), code: PG 11, meets the requirements of 9.1.; 9.3.; 10.2.; 10.3. from the chapters newly introduced in ISO 22000:2018, according to Annex SL. After completing the revision and updating of the documentation, along with the implementation and effective operation of the system, the organization obtained the certification of the Food Safety Management System (FSMS) according to the ISO 22000:2018 standard, in 2020.

The implementation and certification in the company of the FSMS according to ISO 22000:2018 [42] represented a solid foundation for ensuring the quality and safety of its food products. However, as market demands and customer expectations have evolved, it has become a strategic opportunity to further integrate the IFS Food v8 standard from 2023 to expand into new markets. The opportunity to adopt IFS Food v8 arose in response to the strict demands of customers and, particularly retailers operating in international markets, where IFS Food certification is a key factor in establishing trade partnerships.

Top management has set its medium-term strategic goal, access to hypermarket networks and expansion into international markets.
The company management team is convinced that, in the long term, the integration of the IFS Food v8 standard will not only open access to new markets, but also improve operational efficiency by adopting the best practices and procedures. Thus, starting from 2023, the organization began implementing the requirements of the IFS Food v8 standard.
As a result of the significant efforts made by the food safety team [26, 68, 69], supported by the human, time, technology and financial resources allocated by the management of the case study company, the review of the existing documentation and the documentation of new procedures was carried out.
Table 3 provides a detailed correspondence between the requirements of ISO 9001:2000, correlated with the requirements of DS 3027 E:2002, ISO 22000:2005, ISO 22000:2018 and IFS Food v8, and the procedures documented within the FSMS. This table reflects the organization's progress in implementing these standards over time. In 2024, the organization obtained IFS Food v8 certification and managed to access two large hypermarket networks. Within this process of implementing IFS Food v8, two new procedures were documented, according to requirement 4.20.: General Procedure Study of Vulnerability, code PG-12, and according to requirements 4.10. and 4.12.3.: PRP Chemical Management Process, code PRP-12. These requirements were not explicitly provided for in the ISO 22000:2018 standard.
An important challenge of the IFS Food v8 standard was the implementation, within the company's FSMS, of the requirements: 1.3.3.; 3.2.1.; 3.2.3.; 3.2.4.; 3.2.5.; 3.2.10.; 3.4.5.; 4.4.1.; 4.4.2.; 4.4.3.; 4.5.; 4.6.1.; 4.9.9.2.; 4.9.10.1.; 4.10.1.; 4.10.7.; 4.12.1.; 4.12.5.; 4.12.8.; 4.13.2.; 4.14.1.; 4.15.5.; 4.19.1.; 4.19.2.; 4.19.3.; 5.1.1.; 5.2.1.; 5.6.1.; 5.6.2.; 5.6.5. and 5.10.1, which needed detailed identification of compliance, and their implementation based on a rigorous risk analysis, which led to a significant revision of the existing documentation.
As can be seen from Table 3, the requirements covered by an existing procedure at the time the FSMS was documented and certified according to ISO 22000:2018 are now reflected in a significantly larger number of requirements from the IFS Food v8 standard. For this reason, the objective of implementation and certification was a far-reaching one, requiring strict compliance with the implementation steps identified and presented in this article.

Final results and perspective

The case study highlights the importance of implementing food safety and quality management systems in accordance with applicable standards. The organization demonstrated a strong commitment to process standardization, essential throughout successive implementations, when critical steps were identified. Following and updating them led to the definition of nine key steps to address the challenges of documentation and review. This rigorous approach resulted in effective implementation, leading to FSMS certification to the IFS Food v8 standard.
The attainment of this certification confirms the organization's commitment to high standards of quality and food safety, reinforcing consumer confidence in the products offered while simultaneously opening opportunities in international markets.

Benefits of implementing IFS Food v8 requirements within FSMS

Considering the relevant issues addressed in this study, it has been demonstrated that the implementation of IFS Food v8 requirements within the FSMS generates substantial benefits in efficiency, quality, food safety, and risk management. The positive impacts of this implementation on company operations are significant and can be categorized into the following three areas of influence (Table 4).

Table 4. *Benefits of implementing IFS Food v8 requirements within FSMS*

Area of influence	Characteristics	Benefits/Positive impact
Operational improvement	Process Optimization	- Thorough analysis and optimization of processes lead to the reduction of non-productive processes and downtime in production. - Strict and constant monitoring of resource management processes reduce losses and optimize their use, continuously maximizing production yield.
	Increased Productivity	- Standardization of procedures contributes to ensuring the repeatability of processes as they become better organized and less prone to non-conformities, leading to increased productivity.
	Continuous Process Development and Improvement	- Identifying new methods and technologies for the development and enhancement of processes to meet the continuously changing market requirements.
FSMS documentation and IFS Food certification	Unified and Integrated Documentation	- Following the implementation of IFS Food v8 requirements, the FSMS documentation becomes cohesive, integrated, easily coordinated, and efficient structure.
	Simplified Process Control and Enhanced Communication	- The systemic approach to FSMS documentation simplifies process control, facilitates monitoring, and ensures compliance. - It improves inter-departmental communication and ensures rapid adaptation to regulatory changes and market demands, contributing to continuous development and maintaining high standards of quality and food safety.
	Transparency and Consumer Trust	- Transparency in the operation of FSMS within a company is established through the implementation of certification rules. - On the IFS website, authorized users, such as clients and business partners of certified companies, can access certification reports, audit results, and other relevant information that attests to the company's compliance with the IFS Food v8 standard. - This transparent openness not only improves consumers' trust in the products, but also encourages companies to adopt a proactive approach in the continuous improvement of the FSMS.
	Competitive Advantage	- Implementing IFS Food v8 requirements in the FSMS, followed by certification, provides the company with a

Area of influence	Characteristics	Benefits/Positive impact
	through Certification	competitive market advantage by enhancing its image and reputation, leading to an expanded portfolio of clients and business partners.
Personnel Involvement	Commitment to Food Safety Culture	- An organizational culture focused on food safety, as mandated by the IFS Food v8 standard, is another key benefit. - All personnel commit to following the practices and procedures required to ensure food safety, which is a major objective of the company's management.
	Preventive Mindset and Risk Management	- A strong food safety culture is essential in encouraging personnel to adopt a preventive mindset, allowing them to anticipate and manage potential risks before they occur, rather than reacting only after issues have manifested.

CONCLUSIONS

The research objectives, represented by identifying and documenting the essential steps for the implementation of the IFS Food v8 requirements in the FSM and the presentation of the benefits generated by this implementation, have been completed. Compliance with these steps leads to the clear and rigorous implementation of the requirements of the IFS Food v8 standard within the FSMS, thus ensuring that the products of food industry companies comply with the highest standards of food quality and safety. It also ensures that the processes, procedures and practices used in food production are standardized and well controlled.

Certification according to IFS Food v8 becomes a trusted mark, globally recognized that gives stakeholders, including consumers, access to detailed and verified information about how a company manages and ensures food safety. The present paper highlights the importance, benefits and positive impact of implementing the IFS Food v8 requirements in a company's FSMS, delivering confidence, operational efficiency and compliance to the standard throughout the organization. Additionally, it provides a detailed insight into the methodology of transposing the requirements of the IFS Food v8 standard into the procedures of an FSMS, emphasizing its importance for future implementations.

The research results demonstrate that the IFS Food v8 standard is not only a framework for certification, but also a powerful tool for strengthening transparency and credibility in the global food industry, ensuring that consumers benefit from safe and high-quality products.

Also, with respect to the significance of the IFS standard, new research directions can be opened, such as investigating the impact of the implementation of the IFS Food v8 standard on the supply chain and the benefits related to product traceability and supplier compliance with the standard, with an emphasis on compliance with food safety requirements throughout the entire process of supply. In a broader current context, it would be relevant to study the role that the IFS Food v8 standard can play in supporting sustainability objectives in the food industry, how this standard can contribute to the reduction of food waste, more efficient management of resources and environmental protection.

ACKNOWLEDGMENTS

This research was funded by "Lucian Blaga" University of Sibiu, research grant number 41/2024.

REFERENCES

1. Hofman-Bergholm, M.A.: Transition towards a Food and Agricultural System That Includes Both Food Security and Planetary Health, *Foods*, **2023**, **12**, 1-12;
2. Alexandri, M., Kachrimanidou, V., Papaposolou, H., Papadaki, A., Kopsahelis, N.: Sustainable food systems: The case of functional compounds toward the development of clean label food products, *Foods*, **2022**, **11**, 2796;
3. Badia-Melis, R., Mishra, P., Ruiz-García, L.: Food Traceability: New Trends and Recent Advances. A Review, *Food Control*, **2015**, **57**, 393-401;
4. Jin, S., Zhou, L.: Consumer Interest in Information Provided by Food Traceability Systems in Japan, *Food Quality and Preference*, **2014**, **36**, 144-152;
5. Kim, Y.G., Woo, E.: Consumer Acceptance of a Quick Response (QR) Code for the Food Traceability System: Application of an Extended Technology Acceptance Model (TAM), *Food Research International*, **2016**, **85**, 266–272;
6. Mainetti, L., Patrono, L., Stefanizzi, M.L., Vergallo, R.: An Innovative and Low-Cost Gapless Traceability System of Fresh Vegetable Products Using RF Technologies and EPCglobal Standard, *Computers and Electronics in Agriculture*, **2013**, **98**, 146-157;
7. Violino, S., Pallottino, F., Sperandio, G., Figorilli, S., Ortenzi, L., Tocci, F., Vasta, S., Imperi, G., Costa, C.: A Full Technological Traceability System for Extra Virgin Olive Oil, *Foods*, **2020**, **9**, 624;
8. Shew, A.M., Snell, H.A., Nayga, R.M., Lacity, M.C.: Consumer Valuation of Blockchain Traceability for Beef in the United States, *Applied Economic Perspectives and Policy*, **2022**, **44**, 299-323;
9. Du Plessis, H.J., Du Rand, G.E.: The Significance of Traceability in Consumer Decision Making towards Karoo Lamb, *Food Research International*, **2012**, **47**, 210-217;
10. Latino, M.E., Menegoli, M., Lazoi, M., Corallo, A.: Voluntary Traceability in Food Supply Chain: A Framework Leading Its Implementation in Agriculture 4.0., *Technological Forecasting and Social Change*, **2022**, **178**, 121564;
11. https://www.foodchainid.com/certification/accredited-food-safety/, FoodChain ID - Company for certification, testing, and technical services to ensure food safety, quality, and compliance with industry standards and regulations, accessed July 05, **2024**;
12. https://certification.bureauveritas.com/needs/retail-network-audits, Bureau Veritas Certification Bodies, accessed July 05, **2024**;
13. ISO/IEC 17021-3:2017 - *Conformity assessment. Requirements for bodies providing audit and certification of management systems - Part 3: Competence requirements for auditing and certification of quality management systems*, International Organization for Standardization, Geneva, Switzerland, **2017**;
14. ISO/IEC TS 17021-13:2021 - *Conformity assessment. Requirements for bodies performing audit and certification of management systems. Part 13: Competency requirements for auditing and certification of compliance management systems*, International Organization for Standardization, Geneva, Switzerland, **2021**;
15. Qian, J., Ruiz-Garcia, L., Fan, B., Robla Villalba, J.I., McCarthy, U., Zhang, B., Yu, Q., Wu, W.: Food Traceability System from Governmental, Corporate, and Consumer Perspectives in the European Union and China: A Comparative Review, *Trends in Food Science & Technology*, **2020**, **99**, 402-412;
16. ISO 22003-1:2022 - *Food safety - Part 1: Requirement for bodies providing audit and certification of food safety management systems*, International Organization for Standardization, Geneva, Switzerland, **2022**;
17. ISO 19011:2018 - *Guidelines for auditing management systems*, International Organization for Standardization, Geneva, Switzerland, **2018**;

18. IFS Food, version 8:2023 - *Standard for auditing product and process compliance in relation to food safety and quality*, IFS Management GmbH, Berlin, Germany, **2023**;
19. https://mygfsi.com/, Global Food Safety Initiative (GFSI), accessed June 06, **2024**;
20. FAO, WHO - *General Principles of Food Hygiene. Codex Alimentarius Code of Practice*, No.CXC 1-1969, Codex Alimentarius Commission, Rome, Italy, **2023**;
21. FAO, WHO - *Codex Alimentarius Commission Procedural Manual*, 28th ed. revised, Codex Alimentarius Commission, Rome, Italy, 220 p., **2023**;
22. FAO Guidance Materials - Food safety risk management-Evidence-informed policies and decisions, considering multiple factors. Publisher: Food and agriculture organization of the United Nations, Rome, Italy, **2017**;
23. Mehannaoui, R., Mouss, K.N., Aksa, K.: IoT-Based Food Traceability System: Architecture, Technologies, Applications, and Future Trends, *Food Control*, **2023**, **145**, 109409;
24. https://food.ec.europa.eu/safety/rasff_en, European Commission (EC) for Food Safety: Rapid Alert System for Food and Feed (RASFF), accessed June 19, 2024;
25. https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX%3A32011R0016, European Commission (EC) Regulation no. 16/2011 of 10 January 2011, laying down implementing measures for the Rapid alert system for food and feed. Text with EEA relevance, accessed June 19, **2024**;
26. http://data.europa.eu/eli/reg/2002/178/2022-07-01, European Commission (EC) Regulation no. 178/**2002**, Regulation of the European Parliament and of the Council laying down the general principles and requirements of food law, establishing the European Food Safety Authority and laying down procedures in matters of food safety, accessed June 20, **2024**;
27. Kasza, G., Izso, T., Langsrud, S., Vrbos, D., Veflen, N., Ueland, Ø., Scholderer, J., Münter, L., Eszter Csenki, E., Szakos, D., Ramsay, J., Süth, M.: Institutional food safety risk communication – A self-evaluation tool and its interpretation, *Trends in Food Science & Technology*, **2024**, **150**, 125-142;
28. ISO 22005:2007 - *Traceability in the feed and food chain - General principles and basic requirements for system design and implementation*, International Organization for Standardization, Geneva, Switzerland, **2007**;
29. Lee, J.C., Neonaki, M., Alexopoulos, A., Varzakas, T.: Case Studies of Small-Medium Food Enterprises around the World: Major Constraints and Benefits from the Implementation of Food Safety Management Systems, *Foods,* **2023**, **12**, 3218;
30. Stoyanova, A., Marinova, V., Stoilov, D., Kirechev, D.: Food Safety Management System (FSMS) Model with Application of the PDCA Cycle and Risk Assessment as Requirements of the ISO 22000:2018 Standard, *Standards*, **2022**, **2**, 329-351;
31. Bertolini, M., Bevilacqua, M., Massini, R.: FMECA Approach to Product Traceability in the Food Industry, *Food Control*, **2006**, **17**, 137-145;
32. Dabbene, F., Gay, P. Food Traceability Systems: Performance Evaluation and Optimization, *Computers and Electronics in Agriculture*, **2011**, **75**, 139-146;
33. Sasikumar Nair, S., Mazurek-Kusiak, A.K., Trafialek, J., Kolanowski, W.: Assessing Food Safety Compliance in a Small-Scale Indian Food Manufacturer: Before and after Certification of the Food Safety Management System and Foreign Supplier Verification Program, *Applied Sciences*, **2023**, **13**, 12190;
34. López-Santiago, J., García, A.I.G., Gómez-Villarino, M.T.: An Evaluation of Food Safety Performance in Wineries, *Foods*, **2022**, **11**, 1249;
35. Wysokińska-Senkus, A., Górna, J., Kaźmierczak, M., Mielcarek, P., Senkus, P.: CARVER+Shock and Business Process Management in Improving Food Safety of Primary Production, *Agriculture*, **2022**, **12**, 1018;
36. Reason, P., Bradbury-Huan, H.: *The Sage Handbook of Action Research: Participative Inquiry and Practice*, Sage Publications Ltd, London, **2013**, 210-468;
37. Coghlan, D., Brannick, T.: *Doing Action Research in Your Own Organization*, 4th ed., Sage Publications Ltd, London, **2014,** 90-125;
38. McNiff, J., Whitehead, J.: *Action research: Principles and Practice*, 2nd ed., RoutledgeFalmer-Taylor &Francis, London and New York, UK and USA, **2011**, 69-102;
39. Cohen, L., Manion, L., Morrison, K.: *Research Methods in Education*., 5th ed., RoutledgeFalmer-Taylor &Francis, London and New York, **2005**, 181-190, 226-244;
40. Burns, D.: *Systemic Action Research: A Strategy for Whole System Change*, Bristol University Press, Bristol, UK, **2007,** 42-146;
41. ISO 22000:2005 - *Food safety management systems. Requirements for any organization in the food chain*, International Organization for Standardization, Geneva, Switzerland, **2005**;

42. ISO 22000:2018 - *Food safety management systems - Requirements for any organization in the food chain*, International Organization for Standardization, Geneva, Switzerland, **2018**;
43. https://www.fda.gov/food/guidance-regulation-food-and-dietary-supplements/hazard-analysis-critical-control-point-haccp, FDA (Food and Drug administration), U.S.: Hazard Analysis Critical Control Point (HACCP). Principles & Application Guidelines, accessed June 06, **2024**;
44. ISO 9001:2015 - *Quality management systems – Requirements*, International Organization for Standardization, Geneva, Switzerland, **2015**;
45. https://www.fssc.com/schemes/fssc-22000/, FSSC 22000 - Certification Scheme for Food Safety Management Systems, accessed June 19, **2024**;
46. FSSC 22000 version 6:2023 - Scheme food safety management system certification;
47. Bomba, M.Ya., Susol, N.Ya.: Main requirements for food safety management systems under international standards: BRC, IFS, FSSC 22000, ISO 22000, Global GAP, SQF, *Scientific Messenger LNUVMB. Series: Food Technologies*, **2020**, **22**, 9304;
48. ISO/TS 22002-1:2009 - *Prerequisite programmes on food safety-Part 1: Food manufacturing*, International Organization for Standardization, Geneva, Switzerland, **2009**;
49. ISO/TS 22002-2:2013 - *Prerequisite programmes on food safety-Part 2: Catering*, International Organization for Standardization, Geneva, Switzerland, **2013**;
50. ISO/TS 22002-4:2013 - *Prerequisite programmes on food safety-Part 4: Food packaging manufacturing*, International Organization for Standardization, Geneva, Switzerland, **2013**;
51. ISO/TS 22002-5:2019 - *Prerequisite programmes on food safety-Part 5: Transport and storage*, International Organization for Standardization, Geneva, Switzerland, **2019**;
52. https://www.fda.gov/food/food-safety-modernization-act-fsma/full-text-food-safety-modernization-act-fsma, FDA (Food and Drug Administration), U.S.: Food Safety Modernization Act (FSMA), accessed July 25, **2024**;
53. BRCGS Food Safety, issue 9:**2022**. British Retail Consortium Global Standard Food Safety. https://www.brcgs.com/product/global-standard-food-safety-issue-9/p-13279/;
54. García-Díez, J., Moura, D., Nascimento, M.M., Saraiva, C.: Performance Assessment of Open-Access Information about Food Safety, *Journal of Consumer Protection and Food Safety*, **2018**, **13**, 113-124;
55. Narsimhalu, U., Potdar, V., Kaur, A.: A Case Study to Explore Influence of Traceability Factors on Australian Food Supply Chain Performance, *Procedia - Social and Behavioral Sciences*, **2015**, **189**, 17-32;
56. ISO 31000:2018 - *Risk management concept*, International Organization for Standardization, Geneva, Switzerland, **2018**;
57. https://www.sqfi.com/, Safe Quality Food Standard (SQF), accessed May 25, **2024**;
58. https://www.globalgap.org/, Good Agricultural Practices Standard (GlobalG.A.P.), accessed May 25, **2024**;
59. ISO/IEC Guide 51:2014 - *Safety aspects. Guidelines for their inclusion in standards*, International Organization for Standardization, Geneva, Switzerland, **2014**;
60. Chen, H., Liu, S., Chen, Y., Chen, C., Yang, H., Chen, Y.: Food safety management systems based on ISO 22000:2018 methodology of hazard analysis compared to ISO 22000:2005, *Accreditation and Quality Assurance*, **2020**, **25**, 23-37;
61. Chen, H., Liou, BK., Chen, CS., Chuang, PT.: Risk analysis method used in small- and medium-sized food enterprises implementing ISO 22000:2018 and HACCP to conditionally determine "inspection-acceptance" as a critical control point, *Accreditation and Quality Assurance*, **2020**, **25**, 339-354;
62. Pop, S.Z., Dracea, R., Vlădulescu, C.: Comparative Study of Certification Schemes for Food Safety Management Systems in the European Union Context, *Amfiteatru Economic*, **2018**, **20** (47), 9-29;
63. Smith, G.: Interaction of Public and Private Standards in the Food Chain, *OECD Food, Agriculture and Fisheries Working Papers*, **2009**, **15**, OECD Publishing, Paris;
64. ISO 10012:2003 - *Measurement management systems-Requirements for measurement processes and measuring equipment*, International Organization for Standardization, Geneva, Switzerland, **2003**;
65. https://www.ifs-certification.com/en/about-ifs, International Featured Standards Food (IFS Food), accessed June 3, **2024**;
66. ISO 9001:2000 - *Quality management systems – Requirements*, International Organization for Standardization, Geneva, Switzerland, **2000**;

67. DS 3027 E: 2002 - *Management of food safety based on HACCP (Hazard Analysis and Critical Control Points) – Requirements for a management system for food producing organizations and their suppliers*, DS - Dansk Standard, Danish Standards Foundation, Copenhagen, Denmark, **2002**;
68. Wallace, C., Holyoak, L., Powell, C., Dykes, F.: Re-thinking the HACCP team: an investigation into HACCP team knowledge and decision-making for successful HACCP development, *Food Research International*, **2011**, **47** (2), 236-245;
69. Azanza, P., Zamora-Luna, M.: Barriers of HACCP team members to guideline adherence, *Food Control*, **2005**, **16** (1), 15-22.