CSFs for IFS Quality System Adoption: A case study in the fish industry

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Abstract
Implementation and certification with Food Safety Management Systems (FSMSs) is considered a key driver for food companies to improve the quality and safety control of their products and the confidence to suppliers, retailers, and consumers. The FSMSs are applied in order to direct and control a company with regard to the Hazard Analysis and Critical Control Points (HACCP) – based food safety programs such as ISO 22000: 2005 and BS PAS 220: 2008, and other standards containing food safety elements, such as BRC (British Retail Consortium) and IFS (International Food Safety). Till now, critical success factors for implementing the IFS Standard V6: 2014 in small enterprises have not been investigated systematically. Currently, it is not common for Greek enterprises to adopt IFS V6: 2014, except for some export ones. Existing studies consider the critical success factors mainly for ISO 22000: 2005 implementation. Thus, the present study, which is an attempt to bridge this gap in the literature, explores how the transition from the existing ISO 22000: 2005 to IFS Version 6 (2014) food standard of a small family company with salted, smoked and marinated fish can be achieved, what are the difficulties that the company may face, as well as the benefits that occur from this change.

Keywords: critical success factors, ISO 22000, IFS, fish industry, HACCP, food safety management system

Introduction

Over the last 10 years, European Union (EU) consumers have faced many food scandals such as Bovine Spongiform Encephalopathy (BSE), dioxin problems and food - borne diseases caused by salmonella, listeria, and cholera threats. Private and public sector were obliged to implement new measures, tougher food and monitoring requirements and new food safety legislation. Moreover, food companies are bound to implement Quality Management Systems (QMSs) or Food Safety Management Systems (FSMSs) in order to immunize food quality and safety, since these two notions are linked in the consumer's mind (Van Rijswijk and Frewer, 2008). Moreover, the implementation of a FSMS is a mean for food companies to remain competitive in the market (Kafetzopoulos and Gotzamani, 2014). Despite the advantages of food safety systems, there are many factors affecting their successful implementation. These, so called Critical Success Factors (CSFs) have been widely studied by many authors, who have described both barriers and motives that food companies may face in their attempt to be certified with a food quality and safety standard.

Fish trade has significantly grown over the last three decades due to consumer's demand. Fish and fish products are very important in human diet because of the presence of high quality proteins rich in the amino-acids methionine and lysine. Furthermore, fish lipids are rich in long chain polyunsaturated fatty acids (PUFAs), mainly eicosapentaenoic acid (EPA) and docosahexaenoic acid (DHA) (omega - 3 acids) which have been associated with many health benefits such as reduced risk of cardiovascular disease, regulation of cholesterol triglyceride levels, neurological development in infants and protection against Alzheimer disease and dementia. However, along with the above mentioned benefits, there are imminent risks from the consumption of fish and fish products in terms of food - borne disease, infection with parasites or dangerous levels of toxic substances such as biotoxins, heavy metals, Polycyclic Aromatic Hydrocarbons (PAHs) or dioxins (FAO, 2014). On account of these hazards, seafood safety becomes imperative given the fact that international fish trade has significantly grown. In the EU the approach taken in the legislation is to harmonize food control across the member – countries. One basic element of the legislation is that all food and feed business operators are responsible for ensuring that food available in the EU market, meets the required food safety standards. Cormier *et al.* (2007), during an eleven - year study, showed that the implementation of HACCP (Hazard Analysis and Critical Control Points) - based programs in fish and seafood companies eliminated the microbial counts of *Listeria monocytogenes* in the final product. Therefore, seafood companies seek to implement a HACCP – based FQMS, such as the International Organization for Standardization standard (ISO 22000), the Safe Quality Food (SQF), the British Retail Consortium's global food safety standard (BRC) or the International Food Standard (IFS), in order to protect consumer's health (Mensah and Julien, 2011).

IFS Food is a quality and food safety standard for retailer branded food products. It is intended to allow the assessment of suppliers' food safety and quality systems in accordance with a uniform approach. Its current version (version 6) was launched in July 2012 and revised in April 2014. Compared to ISO 22000: 2005, IFS provides a standard management, has the ability to quickly adapt to new laws and technical developments, it can be applied by any company whatever its size is, gives clear and uniform requirements about the degree and the level of the implementation achieved, satisfies the requirements of the GFSI (Global Food Safety Initiative) Guidance Document, specifies the assessment strategy and the layout of the audit reports, it has a complete integrity program to ensure the quality and integrity of performed audits and it determines requirements to maintain auditors' qualification (http://www.ifs-certification.com).

The present study is an attempt to bridge the gap in the literature, concerning the transaction of a small, family company of fish products from an ISO 22000 standard to an IFS V6 food standard, by determining the factors that are essential for the effective implementation of the later.

Case study

Current situation

"M" Company is situated in Lakkoma, Chalkidiki, Northern Greece. It is a small, family business which was founded in 1996 and is dedicated to fish and fish products trade. "M" Company has around 15 employees and produces around 300 tons of fish products which are channeled into the local market, supermarkets and some countries aboard such as Cyprus, Romania, Bulgaria, Germany and Belgium. The company applied for many years the ISO 22000: 2005 food standard, with the support of an external quality consultant. Due to the last 5 years' crisis, Greek companies try to find new ways out to develop their business activities. In this context, "M" Company after participating in an automatic award procedure came in agreement with a large Greek company with branch stores around the country. In order to validate this agreement, "M" Company had to be certified with the IFS V6 Food standard.

Research Design

The research was performed from January to June 2014 and involved the participation of the researcher, the employees, the production manager, the sales manager, the accounting manager and the external quality consultant.

From January to March 2014, the researcher conducted a literature review concerning the FSMSs in general and the IFS more specifically as well as the existing legislation concerning fish and fish products. After the completion of the literature review, the researcher conducted an initial meeting with the external quality consultant of the company in order to establish a timetable with the changes required by the IFS standard. Changes in retained records would be made by the researcher in collaboration with the external quality consultant, while staff training would be carried out exclusively by the external quality consultant. Then a meeting was held in which the production, the sales and the accounting manager but also the head of the delicatessen section were present. The purpose of the meeting was to inform the above mentioned executives about the upcoming changes. The IFS audit was fixed for June 10, 2014, so there was no time to waste. Table 1 shows the steps followed by "M" company in order to achieve the innovation.

Table 1: Steps followed by "M" company towards the innovation (overview and timing)

Steps	Researcher	"M" company
Step 1: Review of the literature: January – March 2014	Research question: is the company able to replace easily ISO 22000: 2005 with IFS V6: 2014?	Awareness level of IFS V6: 2014 and its requirements.
Step 2: March 2014	Research design.	Decision to interact with the researcher by planning to give interviews and to complete questionnaires.
Step 3: March 2014	Interviews with the sales, the production, and the accounting manager.	Participating into the interviews and the completion of the

	Completion of questionnaires by the employees.	questionnaires.
Step 4: April 2014	Data analysis, establishing the foundations for the innovation.	Awareness of possible ways to make a smooth transition from ISO 22000: 2005 to IFS V6: 2014.
Step 5: April 2014	Feedback to the senior management of "M" company.	Feedback from the researcher regarding the innovation.
Step 6: April – May 2014	Planning the innovation with constant collaboration with the employees, the senior management and the quality assurance consultant.	Planning the innovation in collaboration with the researcher.
Step 7: May 2014	Participative observation of the working groups by the researcher.	Activities within the company according to the work plan.
Step 8: June 2014	Collaboration with the employees, the senior management and the quality assurance consultant for the upcoming audit of IFS.	Receipt of IFS V6: 2014 Certificate.

Data Collection

The data were collected in three stages. The first one, involved face – to – face interviews of the researcher with the production, the sales and the accounting manager. The second one, involved questionnaires answered by the employees. Finally, the third one concerned the study of documents and the researcher's personal observation.

Interviews

Face – to - face interviews took place in March 2014. The questions intended to identify the expectations that the company had from the implementation of IFS, what were the main problems and drawbacks the company would face and how the managers were willing to overcome them, what were the objectives of the change from ISO 22000 to IFS and finally what were the current weaknesses and strengths of the company.

Questionnaire Design

For the questionnaire, a 5 - point Likert scale was employed, with "1" representing "Disagree"; "2" representing "slightly disagree"; "3" representing "Neutral"; "4" representing "Slightly agree" and "5" representing "Agree". "O" was used for "Not applicable/Do not know". The questionnaire was divided into 8 sections: 1) Awareness of the current quality program in "M" Company, 2) Perceived benefit of the quality program, 3) Quality success drivers, 4) Training needs, 5) Perceived success factors, 6) Perceived strength of "M" Company, 7) Organizational commitment level 8) The impact of the IFS certification on the company and the food safety. The questionnaire also included personal data such as length of service, job grade, gender, age and educational level. These would help ascertain employees' attitude pattern among various different demographic groups within the company. The questionnaires were self – completed, anonymous and were received back until the end of March 2014, except from section 8 which was completed until the end of June after the IFS certification.

Documents and personal observation
The researcher observed the current situation of the company and studied very carefully the existing organizational documentation and pointed out some difficulties the company would encounter while implementing IFS V6. Relevant documents were obtained and analyzed. The relevant documents included research reports, financial reports and information concerning the organizational and technical structures and the already applied standard.

Results and Discussion

Face – to – face interviews

The overall aim of the interviews was to understand how the company's key executives conceptualized the experience of the upcoming innovation in their organization, and how willing they were to support this venture. Fig. 1 and 2 show the motives and barriers, respectively, which emerged from the interviewers. Thus, according to the results, as barriers in the implementation of IFS V6 the top executives mentioned the lack of resources, the high cost of implementation and maintenance and large bureaucracy. These comments and concerns come in agreement with the findings of other studies. Limited resources has already been mentioned as a barrier of implementing an FSMS in small companies (Aggelogiannopoulos *et al.*, 2007; Lo and Humphreys, 2000). Furthermore, cost is another significant issue that small companies have to deal with, since it does not comprise only setting up, implementing and maintaining a FSMS, but also personnel training, purchase of new equipments, keeping the sample plan and doing the necessary analysis, registration fees because of a third party which conducts the certification and internal audits (Fouayzi *et al.*, 2006). Especially concerning IFS, Gawron and Theuvsen (2009) refer that its large bureaucracy is one of the systems' important disadvantage and it may be constricts for a company to adopt it.

On the other hand, the perceived benefits of complying with IFS V6 are noteworthy: it will help the company to comply with the laws, to increase its prestige and reputation, to enter to new markets, to acquire a competitive advantage and to increase its turnover. These findings agree with previous literature reports. Mensah and Julien (2011) in a survey conducted in UK, demonstrated that implementing a FSMS facilitated compliance with regulatory requirements and improved the firm's image, while Trienekens and Zuurbier (2008) claimed that once a company has adopted an assurance system, it acquires a competitive advantage. Taylor (2001) reports that a HACCP – based food system gives a clear advantage to companies who are seeking to expand their markets.

Questionnaires

From the analysis of the questionnaires, demographic information related to the employees' characteristics was revealed (data not shown). Most of the employees (62.5%) worked for 5-8 years in the current position, a fact that shows that the company uses experienced personnel and it does not need to train new ones perpetually. Furthermore, most of them were laborers (62.5%), male (62.5%), middle – aged (43.75%) and most of them (75%) had finished high school, while only the 25% had attended College.

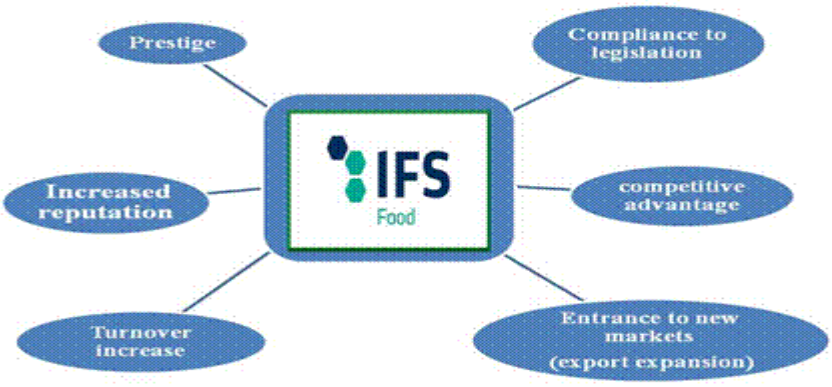

Figure 1: Motives of IFS V6 implementation according to the interviews

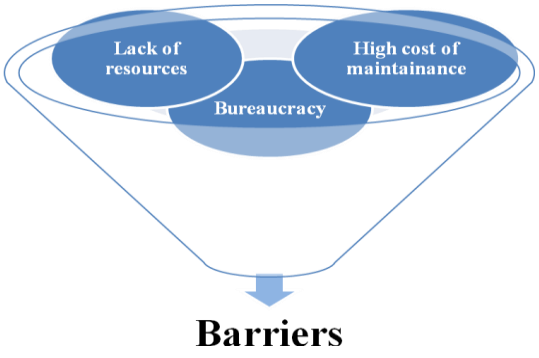

Figure 2: Barriers encountered during IFS V6 implementation in "M" Company

As mentioned above, "M" company was already certified with ISO 22000. Table 2 shows the critical success factors based on the employees' statements concerning the ISO 22000. From their answers, the researchers could reveal information about the existing quality system. ISO 22000 is a popular standard among Greek food companies and "M" company had adopted it in order to ensure the food safety of its products.

As shown in Table 2, according to the employees, the most important factors that dominated and ensured the ISO 22000 FSMS, were six. The first was "customer's satisfaction" followed by "marketing". Customer satisfaction is one of the main factors that lead to increased market benefits (Psomas and Fotopoulos, 2010). Third came "costs control" while fourth "employees / motivation". According to Yapp and Fairman (2006), personnel of small and medium - sized enterprises show lack of motivation regarding food safety issues. So companies should establish the appropriate incentives, rewards and motives in order to help their employees to be more efficient and productive. "Company's reputation", "personnel management and training" and "sales" were also among the predominant factors leading to a successful FSMS. Training is one of the basic problems food industry faces. It is the top management's responsibility to train and educate its staff so as to achieve improved organizational performance (Aguinis and Kraiger, 2009). "Commitment and support of the top management" is also one important factor for a successful FSMS implementation. For a fully operational FSMS, having only the employees participating into the

programs is not enough for implementation to occur. Several interviewees and focus group participants identified management commitment as being an important factor for a proper FSMS implementation. The above findings of the present analysis support these of Panisello and Quantick (2001), who mentioned that HACCP – based systems are built on four "pillars": management commitment, education and training, availability of resources and external pressures. Therefore, to be sustainable a food system needs internal pressure and support.

Table 2: Critical Success Factors of ISO 22000 for "M" Company – before IFS certification.

CSFs	Rank	Total	Average	Standard Deviation
Customer satisfaction	1	80	5.0	0.00
Marketing	2	80	5.0	0.00
Costs control	3	80	5.0	0.00
Employees' motivation / rewarding	4	80	5.0	0.00
Company's reputation	5	80	5.0	0.00
Personnel management	6	80	5.0	0.00
Personnel training	7	78	4.87	0.34
Sales	8	77	4.81	0.40
Infrastructure, equipment, and production technology	9	76	4.75	0.45
Product Design	10	73	4.56	0.51
Management skills/	11	72	4.50	0.52
Commitment and support of the top management	12	67	4.19	0.65
The adopted quality system	13	59	3.69	1.66
Quality control / audits	14	46	2.87	1.93

Table 3 illustrates the areas were the IFS implementation and certification had more impact based on the answers of the employees. According to the respondents, IFS helped the company to make better contracts (4.44%), forced it to ameliorate the image of factory's exterior (4.73%), to reduce the risk of foreign material, broken glass and wood, to better monitor and control pest (4.62%), GMOs and allergens (4.75%), it had a good impact concerning the receipt of goods and the storage procedures (4.75%) but also the equipment (4.5%) and the cleaning and disinfection procedures (4.37%). As mentioned in the introduction session, fish is a food with high initial microbial levels which may cause contamination during processing or cross-contaminate products during various stages of preparation, compromising the safety of the final product. Therefore, it is essential to optimize the receipt and storage conditions, including the thorough monitoring of foreign material, broken glass and wood and the pest control, in order to reassure the safety of the final product by applying an appropriate FSMS (Luning *et al.*, 2011). Additionally, the factory environment may affect the product safety and quality and thus it should be kept tidy and clean. According to Vasconcellos (2004), food manufacturers should take all the necessary measures to avoid any potential source of contamination i.e. insects,

rodents and pests. The factory's exterior condition is an issue in which IFS puts great emphasis. Moreover, according to Ball *et al*. (2010), well-maintained equipment may influence positively the employees' behavior since it gives them the sense of control.

On the other hand, the implementation of IFS had no significant impact on traceability (2.87%), plant layouts and process flows (3.37%), waste disposal (3.37%) or repair and maintenance (3.31%). The IFS did not help the company to expand to their exports (1.87%), at least not at the time where this study was conducted.

Table 3: Benefits from IFS V6 implementation for "M" company - after IFS certification

Benefits	Total	Average	Standard Deviation
IFS has improved image and reputation of the company	55	3.44	2.10
IFS has helped to expand exports	30	1.87	2.10
IFS has contributed to the legislation	72	4.50	0.91
IFS brought about significant improvements in:			
a) Senior Management Responsibility	58	3.62	1.59
b) Documentation requirements and record keeping	57	3.56	1.67
c) Better implementation of HACCP	51	3.37	1.89
d) Resources management	64	4.00	1.37
e) Contract agreements	71	4.44	0.73
f) Product specifications and formulas	60	3.75	0.93
g) Modification of production	58	3.62	0.96
h) Purchasing	64	3.93	0.89
i) Product packaging	68	4.20	0.93
j) Factory exterior	76	4.73	0.58
k) Plant layout and process flows	54	3.37	0.81
l) Constructional requirements for production and storage areas	64	4.00	0.97
m) Cleaning and disinfection	70	4.37	0.88
n) Waste disposal	54	3.37	0.83
o) Risk of foreign material, metal, broken glass and wood, Pest monitoring/Pest control	74	4.62	0.83
p) Receipt of goods and storage	76	4.75	0.70
q) Transport	62	3.87	0.91
r) Maintenance and repair	53	3.31	0.72
s) Equipment	72	4.50	0.91
t) Traceability (including GMOs and allergens)	46	2.87	0.35
u) GMOs and allergens	76	4.75	0.70
v) Measurements, Analysis, Improvements	68	4.25	1.01
w) Food defense	68	4.25	0.71

Documents and personal observation

Except the face – to - face interviews and the questionnaires, the researcher had the opportunity to participate in the working groups and observe some problems that were arising during the operation of the "M" company. Below are given the most important difficulties, as emerged after three months (February – April 2014) of personal

observation:

- Lack of coordination between the company's departments.
- The majority of the employees were foreigners and many times they refused to comply with hygiene and food safety rules.
- Lack of resources required to carry out maintenance work or to purchase advanced technological equipment.
- Often refusal of the senior management to conform to the regulations and /or the legislative requirements.
- Improper procurement planning.

Such barriers have been mentioned by other researchers when implementing Quality Assurance Systems (QAS) in small food enterprises. Such barriers include lack of financial resources, human resource limitations (due to insufficient skills or qualifications), resistance of top executives to change and comply with legislation, and resistance of employees to change and comply to food safety rules (Aggelogiannopoulos *et al.*, 2007; Briscoe *et al.*, 2005; Solis, Rao, & Ragu-Nathan, 2001).

Furthermore, after reviewing the existing documents of "M" Company, the researcher revealed some documents which were not included in ISO 22000 but were completely exclusive in IFS V6, so they had to be included in the system's documentation. Table 4 depicts all the mandatory documents which the company should establish corresponding to the specific IFS V6 requirements.

Table 4: Documents needed according to IFS V6:2014 requirements (not required by ISO 22000: 2005).

IFS Requirement	Implementation
Senior Management Responsibility **§ 1.3** Customer focus **1.3.1** A documented procedure shall be in place to identify fundamental needs and expectations of customers. **1.3.2** The results of this procedure shall be evaluated and considered to determine quality and food safety objectives.	Establishment of a questionnaire / survey regarding customers' needs and expectations
Senior Management Responsibility **§1.4.4** The company shall identify and review regularly (e.g. by internal audits or on-site inspection) the work environment needed to achieve conformity to product requirements. This shall include, as a minimum the following: – staff facilities – environmental conditions – hygienic conditions – workplace design – external influences (e.g. noise, vibration). The results of the review shall be considered, with due	Establishment of a relevant form concerning fortnightly inspection of facilities, staff and external areas

consideration to risk for investment planning.	
Senior Management Responsibility **§1.4.3** The company shall identify and review regularly (e.g. by internal audits or on-site inspection) the infrastructure needed to achieve conformity to product requirements. This shall include, as a minimum, the following: – buildings – supply systems – machines and equipment – transport. The results of the review shall be considered, with due consideration to risk, for investment planning.	Establishment of an Internal Audit form based on the requirements of the IFS
Food Safety Management **§2.2.2.1** Assemble HACCP team (CA Step 1) The HACCP team shall be multidisciplinary and include operational staff. Personnel appointed as HACCP team members shall have specific knowledge of HACCP, product and process knowledge and the associated hazards. Where competent knowledge is not available, external expert advice shall be obtained.	Establishment of a "service contract" between the company and an external expert
Food Safety Management **§2.2.2.3** The HACCP team shall have strong senior management support and shall be well known and established across the whole facility.	Establishment of a form recording the results that were deduced from the monthly meetings of the HACCP team
Planning and Production Process **§4.1** Contract agreement **4.1.1** The requirements which are defined between the contract partners shall be established, agreed upon and reviewed concerning their acceptability before a supply agreement is concluded. All clauses related to quality and food safety shall be known and communicated to each relevant department. **4.1.2** Changes of existing contractual agreements shall be documented and communicated between the contract partners.	Establishment of written supply agreements with customers
Planning and Production Process **§4.2.1.2 KO N° 4:** Specifications shall be available and in place for all raw materials (raw	✓ Specifications must be available for all raw materials, ingredients, additives, packaging materials and rework

materials/ ingredients, additives, packaging materials, rework). Specifications shall be up to date, unambiguous and be in compliance with legal requirements and, if existing, with customer requirements. **§4.2.2.1 KO N° 5:** Where there are customer agreements in relation to the product formula/recipe and technological requirements, these shall be complied with.	✓ Establishment of agreement between the contract partners concerning specific technological requirements and/ or formulas.
Planning and Production Process **§4.3.** Product development/Product modification/Modification of production processes.	Establishment of processing procedures for product development, including hazard analysis, shelf - life tests, organoleptic tests, special requirements of export countries (if they exist)
Planning and Production Process **§4.5** Product packaging	Descriptions of which kind of packaging material is used for the final products
Planning and Production Process **§4.19** Genetically modified organisms (GMOs)	Documentation of GMOs' status
Measurements, Analysis, Improvements **§5.2.1** Factory inspections shall be planned and carried out (e.g. product control, hygiene, foreign material hazards, personnel hygiene and housekeeping). The frequency of inspections in every area (including outdoor areas) and every single activity shall be based on hazard analysis and assessment of associated risks and on the history of previous experience.	Establishment of site inspections protocol
Measurements, Analysis, Improvements **§5.5** Quantity checking (quantity control/filling quantities)	✓ Evidence for sufficient amount of measurements ✓ Dealer evidence (proof that purchased products comply with legal requirements) ✓ Calibration protocols and certificates
Measurements, Analysis, Improvements **§5.6.8** Based on hazard analysis, assessment of associated risks and on any internal or external information on product risks which may have an impact on food safety and/or quality (incl. adulteration and fraud), the company shall update its control plan and/or take any appropriate measure to control impact on finished products.	Establishment of a form regarding the quality control of the products, after their expiry date

Measurements, Analysis, Improvements **§5.8** Management of complaints from authorities and customers	Establishment of complaint handling procedure
Food defense and external inspections **§6.1.2** A food defense hazard analysis and assessment of associated risks shall have been performed and documented. Based on this assessment, and based on the legal requirements, areas critical to security shall be identified. Food defense hazard analysis and assessment of associated risks shall be conducted annually or upon changes that affect food integrity. An appropriate alert system shall be defined and periodically tested for effectiveness.	Establishment of a form regarding the product's protection from intentional malicious actions – VACCP (Vulnerability Assessment and Critical Control Point System) plan.

KO: Knock Out requirement (KO means that if during the audit the auditor establishes that these requirements are not fulfilled by the company, this results in non-certification).

Conclusions

The present study was an attempt to imprint the barriers and motives of the implementation of an IFS food safety standard by a small family business which already practiced an ISO 22000: 2005 food quality system. Based on data collected through face – to – face interviews, questionnaires, personal observation of the researcher and documentation review, the main problems that the small company faced, during its effort to evolve and acquire a competitive advantage in the markets, were the economic obstacles, the refusal of the employees to comply with the food standards' requirements mainly due to their low educational level, the high cost of adoption and maintenance, and the large bureaucracy. Another drawback was the little available time the company had to shift from ISO 22000:2005 to IFS V6: 2014. It has been mentioned that employees may perceive greater control and fewer obstacles with a new FSMS if it is implemented gradually, allowing them time to adapt to procedures (Ball *et al.*, 2010). On the other hand, several benefits occurred from the implementation of an IFS V6 food standard in the company since it proved to be a great tool to enhance access to markets, compliance to food safety legislation, to increase the company' reputation and to improve the organizational management. Furthermore, documentation which is not included in ISO 22000 but is exclusive in IFS should be incorporated in the system if a company wishes to be certified with the IFS Food Standard. Despite the numerous studies which have been conducted concerning the implementation of FSMS in various food sectors, there is limited information about the implementation of IFS Food standard. Therefore, this study may prove a helpful guide for food companies that are already certified with an ISO 22000 FSMS, to shift to IFS V6 although each food company is unique and the implementation of a FSMS has to be studied separately.

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