

# A Study Of Implementation Food Safety Management System Iso 22000 In Local Food Products Company

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## ABSTRACT

Implementation of food safety management systems (FSMS) in Iraqi food companies is recent entrances since a lot of years ago. A few number of medium and big size food companies have been selected to implement FSMS such as ISO 22000 after excessive training to Iraqi stakeholders received from FAO/WHO, besides to the individual effort taken by the top management of some Iraqi food companies. The study comes to highlight the adoption of local food companies to implement the international standard ISO 22000, determine factors that influence in the implementation and the certification of FSMS through four types of questionnaires A, B, C, and D prepared for this purpose.

Seventy (70) food companies participated in the survey divided into fifty (50) food companies from big size and twenty (20) food companies from medium size. Survey results demonstrated that motivations for implementation ISO 22000 in big food companies which implemented and certified ISO 22000 were, improving food safety and quality (5/15), and organizational reasons (5/15) have been 66.6% of the motivation for implementing ISO 22000, followed by reducing food borne diseases 20% (3/15), and promoting international trade 13.3% (2/15) respectively. In medium size companies, which implemented and certified ISO 22000, improving food safety and quality (2/5), and reducing food borne diseases (2/5) have been 80% of the motivation for implementing ISO 22000, followed by organizational reasons 20% (1/5). From total of seventy 70 food companies participated in the survey, the results demonstrated that 38 about 54.2% of food companies not implemented any FSMS from its establishing. Respondents from food companies' referred that there are different factors hinder the implementation of any FSMS included ISO 22000 in their companies. About half of respondents (44.7%) 17/38 indicated that the costs of the

implementation and certification FSMS ISO 22000 hinder to implement it, mentality of top management and its business culture (26.3%) 10/38, deficient experience in FSMS and specialists (13.1) 5/38, standard ISO 22000 not a matter for the consumers and the market (10.5) 4/38, and finally, inadequate infrastructure and facilities (5.2%) 2/38.

**Keywords:** Food companies, ISO 22000, food safety, management system, implementation.

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## 1. Introduction

Industry activity in general, and food industries in particular, occupies an important position among the economic activities in many countries, and plays in the same time a special role in the process of economic development, in the development of other economic sectors, and in the manpower employment. Thus, food industries contribute to the total national production. The number of big-size food companies operating in Iraq in 2019 reached (203), distributed between (196) private sectors, (6) public sectors, and (1) mixed sector, while the number of

medium-size food companies in 2018 reached (81), distributed between (66) manufacturing food products and (15) beverages [1].

After the international trade movement expanded in the field of importing and exporting food commodities, and their products. The food chain has become global, and the problem of food safety has branched out more than before, so food companies operating in the food chain became in need to intensify food safety activities by implementation of one of safety food management systems such as ISO 22000, to ensure safe food, compliance with food regulation and legislations, and specifications, and gaining confidence and consumer satisfaction [2].

Food inspection is considered as the main element in food control, based on this, on the national food legislation system, which contributes in reducing food poisoning and foodborne diseases [3]. However, food inspection facilities are specified in describing the food safety situation in a specific time and date [4]. When food inspection, including risk assessment, the administrative bodies responsible for food control will receive an added value of information that enhances the efficient harmony of human resources participating in the on-site food inspection process [5]. Risk assessment procedures take into account multiple factors in the classification of food companies based on the level of risk associated with them, and

this classification is calculated in a standard manner for the number of annual inspection visits, and then calculating the wages paid for these visits, and increasing or reducing these wages according to the level of risk identified [6]. So, it is recommendable for local food companies the implementation of one of the food safety management systems, and the most common at present is ISO 22000 [7].

Life development and the increasing of individual's level of living, and the change in lifestyle have led to a steady increase in his consumption in all aspects of life, most notably the significant increase in food consumption, a change in dietary habits, and a trend towards more processed foods rather than fresh food [8]. This increase and change has been accompanied by a major development in the food industry. Unfortunately, this great development has not been matched by the necessary care to raise the level of measures that guarantee and emphasize the prevention of health risks that arise from food handling and consumption [9]. Statistics indicate that diseases transmitted to humans through food affect at least 10% of the population in developed industrial countries. In the absence of records and statistics in developing countries, it is believed that infections in these countries are much higher than, that as a result of poor adherence to health conditions, lack of health education among citizens and weak supervision [10].

Studies related to the methods of occurrence and spread diseases have proven that a large number of diseases resulting from food are the result of poor food hygiene procedures in food establishments, which reflects a flaw in the procedures followed to maintain the safety of food products [11]. Due to the increase in the demand for high-quality and health-safe food, it has become necessary to identify the risks of food contamination may be exposed, analyze these risks and assess the degree of their negative impact on food safety, and then define control procedures to protect food in the different stages of preparation, manufacturing and trading [12].

In case of Iraq, the importance of food safety concern has been increased in last years from food control authority, food industry, and consumer's organizations, after the great effort taken by the World Health Organization (WHO) and the Food and Agriculture Organization (FAO), and lastly, training programs presented by FAO/WHO to establish meetings, seminars, and training to stakeholders, in order to support Iraq to join to the World Trade Organization (WTO) [13]. Due to these efforts, some local food companies has been started slowly to implement FSMS such as Hazard Analysis Critical Control Points (HACCP),

and the International Food Safety Management System ISO 22000. Food companies in Iraq have

been started lately to adopt FSMS such as HACCP and ISO 22000. There are not any legal statistical data of the number of FSMS certifying company in Iraq, either food companies which implementing FSMS, the number given in this research depend on the personal

contact with food companies and Iraq specialists in food safety to gather data used in the research. Due to the multiplicity of HACCP methodologies in the world, and the lack of recognition by some countries of the HACCP methodology for other countries, in addition to the lack of this system for the administrative base to ensure the management of potential risks, the International Organization for Standardization issued a special system for food safety management in September of 2005 under the name "ISO 22000: 2005" [14], which advises the combined efforts of all parties involved in the food chain to achieve food safety. This chain includes producers of animal feed, producers of raw materials, manufacturers, transporters, storehouses, retail stores, and food service outlets. Indirect relationship such as producers of equipment, packaging materials, sanitation materials, and food additives and their ingredients. This system includes the known elements important for ensuring food safety throughout its production chain until its final consumption: effective information exchange and communication, system management, prerequisite programs, and HACCP basics [15].

ISO 22000 is an international standard, developed by the International Organization for Standardization, for Food Safety Management Systems. This standard defines what an organization must do to control risks and make sure that their products are safe for consumption [16]. Therefore, first, it is necessary to consider the benefits of implementing ISO 22000 as a question of health and safety. In addition, these benefits reach not only companies throughout the entire food chain, but also consumers and even the communities in which these companies operate. For example, governments benefit from the resulting scientific and technological knowledge, which contributes to economic development [17].

For their part, health systems also obtain a tangible benefit by minimizing the negative impacts of food processed, packaged, transported, distributed, and served in poor hygiene and sanitation conditions [18].

This International Standard ISO 22000 is concerned with requirements that enable Iraqi food

companies to:

-Plan, implement, operate, maintain, and develop a food safety management system with the aim of obtaining safe products for the consumer according to the purpose for which they were made.

-Clarify the response to the requirements of legislation and the requirements of food safety laws.

-Evaluating the customer's requirements and conforming to his requirements for food safety in order to satisfy the consumer.

Effective exchange of information on food safety with suppliers, customers, and interested parties interested in the food chain.

## 2. Materials and methods

To evaluate the implementation and certification of the Food Safety Management System ISO 22000 in local food products company. Questionnaires have been carried out, depending on data collection, reviewing the national food standardization and legislation, as well as the previous contacts with the stockholders. The questionnaires have been structured by collaboration and comprehensive discussion with three experts specialized in the issue of food

safety and quality management systems in local food companies. Four questionnaires have been established for this purpose, and grouped as questionnaire A, B, C, and D:

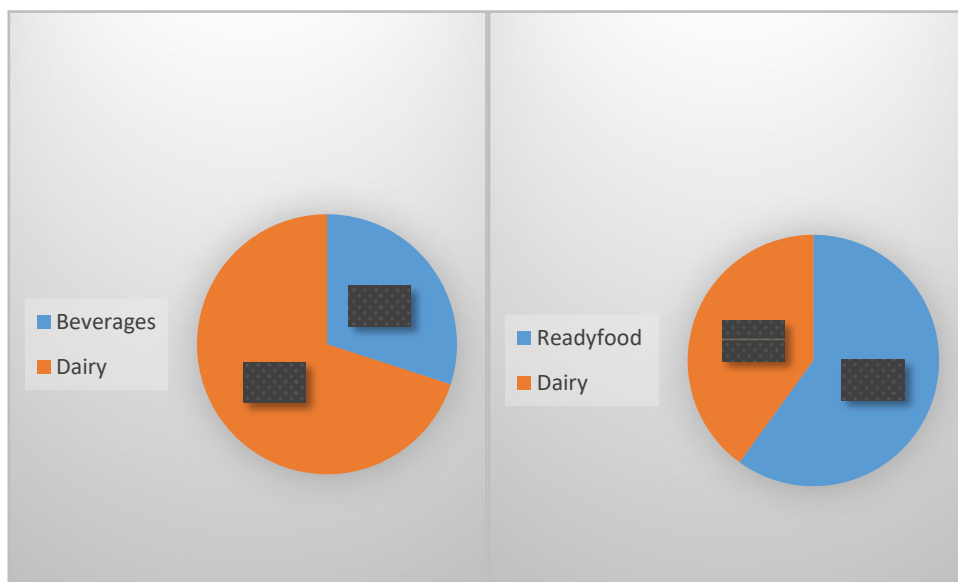
Questionnaire A: addressed to food companies that have been implemented the standard ISO 22000.

Questionnaire B: addressed to food companies that are implementing the standard ISO 22000. Questionnaire C: addressed to food companies that have not implemented any standard, included the ISO 22000.

Questionnaire D: addressed to Specialists in food safety and quality management systems.

The questionnaires have been sent to registered companies operating in Iraq. The size of the company is also considered in selecting food companies participating in the survey. Two sizes of local food companies have been selected to participate in the survey, the first one is medium-size companies (from 10 to 20 employees), and the second is big-size companies (more than 30 employees). Twenty (20) food companies from medium-size have been selected randomly to participate in the survey divided between dairy 40% and ready-to-

od60%. For the big-size companies, fifty (50) food companies selected randomly, divided between dairy 70% and beverages 30% (Figure 1, and 2). A total number of 70 local food companies have been participated in the survey during the period July-September 2020.



**Figure 1. Big food companies participated in the survey.**

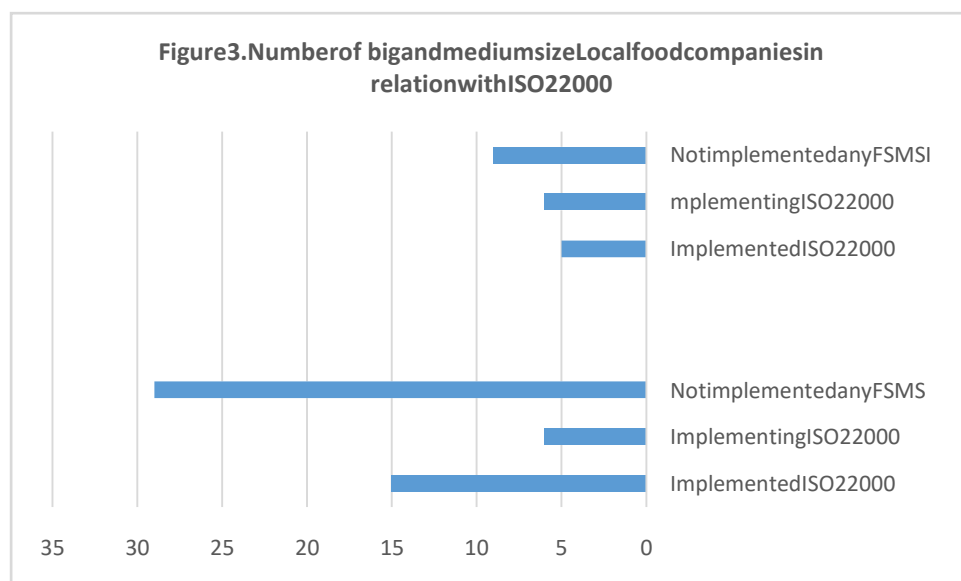
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**Figure 2. Medium food companies participated in the survey.**

### 3. Results and discussion

#### 3.1. Classification of food companies

Local food companies participated in the survey have been classified into three sectors: dairy and beverages as main sectors, and ready food as subsequent sector. These two main sectors can be considered as the most common food manufacturing sectors operating now in Iraq especially after the policy of goods dumping occurrence in Iraq since 2003. Among twenty (20) medium-size food companies participated in the survey, there are only (5) companies implemented and certified ISO 22000, (6) companies are implementing ISO 22000 without having the certificate yet, and (9) companies haven't implemented any standard included ISO 22000. From the fifty (50) big-size food companies participated in the survey, there are only (15) food companies implemented and certified ISO 22000, (6) companies are implementing ISO 22000 without having the certificate yet, and (29) companies haven't implemented any standard included ISO 22000 (Figure 3).

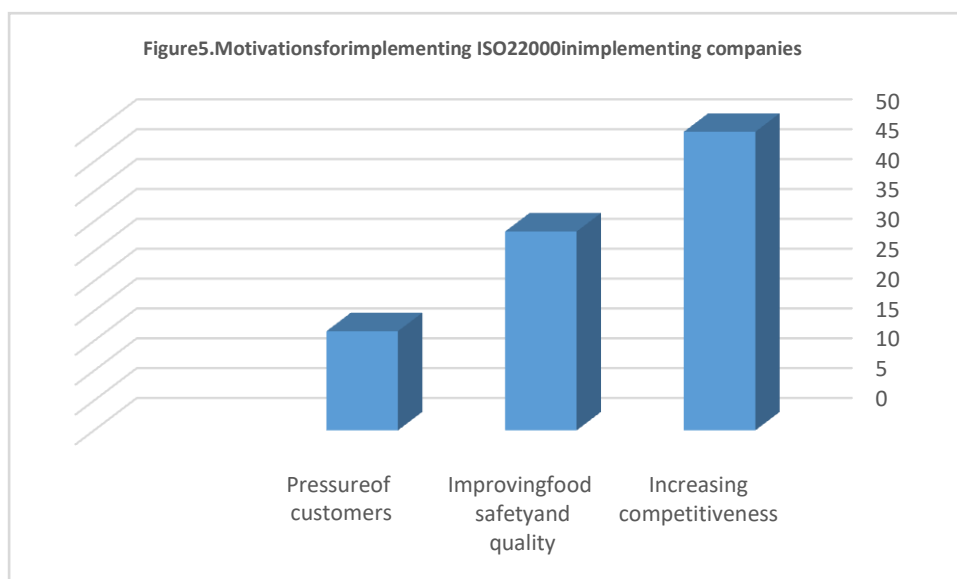
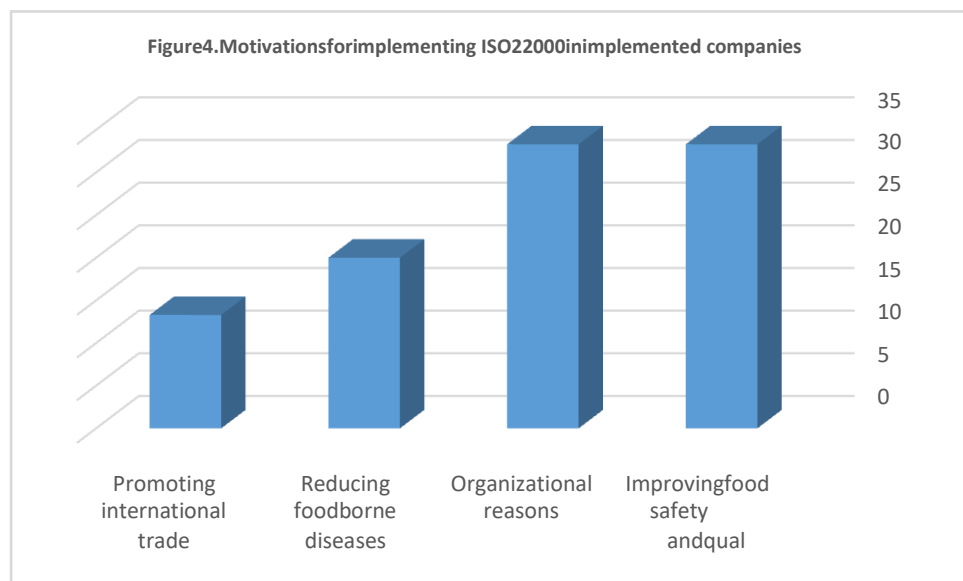


### 3.2. Motivations for implementation ISO 22000 in local food companies

Business organizations have been, to a large extent, the element of knowledge and dissemination of quality assurance models, either through communication or training for companies that have implemented ISO 22000 were 40%. In this sense, practically all of the respondents 85% of the companies that have implemented the FSMS ISO 22000 have received training in this regard, although it is worrying that 52.2% qualifies as being generalist or little practice [19].

In big food companies which implemented and certified ISO 2000, improving food safety and quality 33,3% (5/15), and organizational reasons 33,3% (5/15), have been 66,6% of the motivation for implementing ISO 22000, followed by reducing food borne diseases 20%(3/15), and promoting international trade 13.3% (2/15) respectively. For companies which are implementing ISO 22000, the half of respondents companies answers that increasing competitiveness 50% (3/6) were the most motivation for implementing ISO 22000 in their companies, followed by improving food safety and quality 33.3% (2/6), and pressure of customers 16.6%(1/6) respectively (Figure 4 and 5).



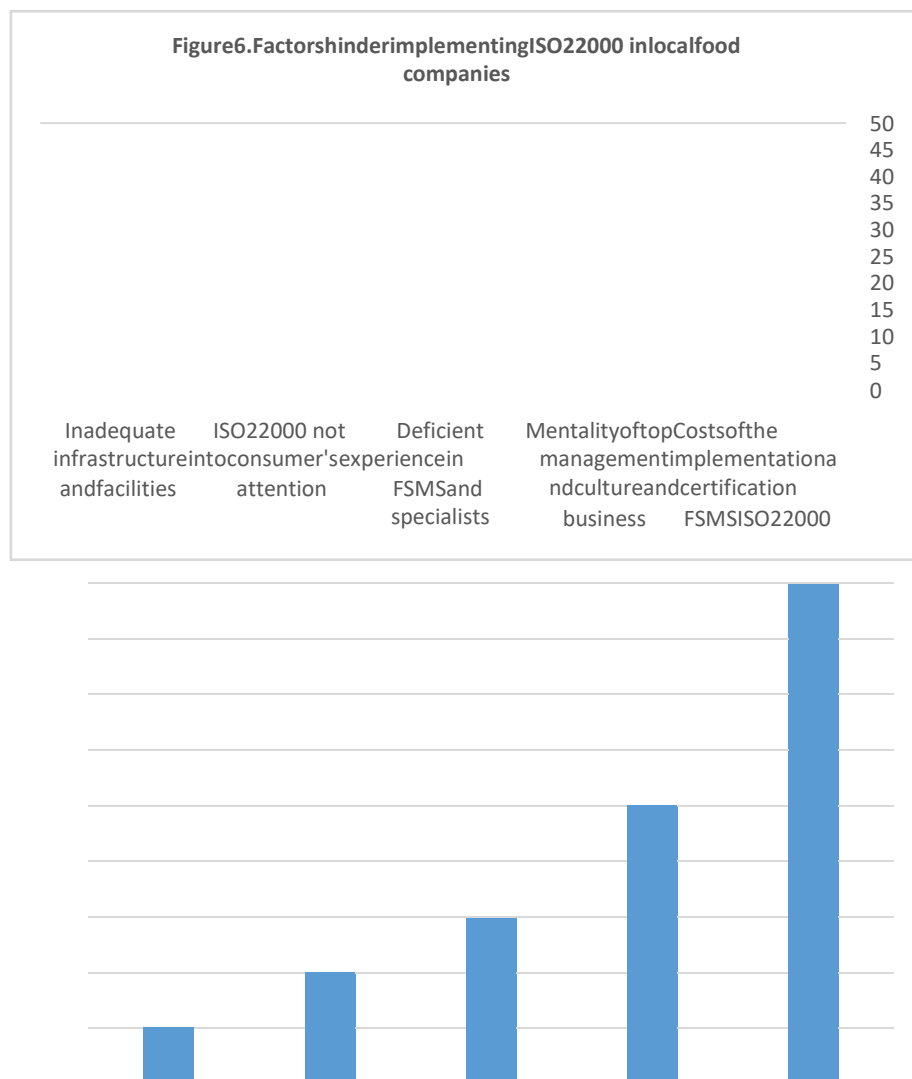


In medium companies, which implemented and certified ISO 22000, improving food safety and quality (2/5), and reducing foodborne diseases (2/5) have been 80% of the motivation for implementing ISO 22000, followed by organizational reasons 20% (1/5). For companies which are implementing ISO 22000, the half of respondents companies answer that increasing competitiveness 50% (3/6) were the most motivation for implementing ISO 22000 in their companies, followed by reducing foodborne diseases 33.3% (2/6), and improving food safety and quality 16.6% (1/6) respectively.

### 3.3. FactorshinderimplementingISO22000inlocalfoodcompanies

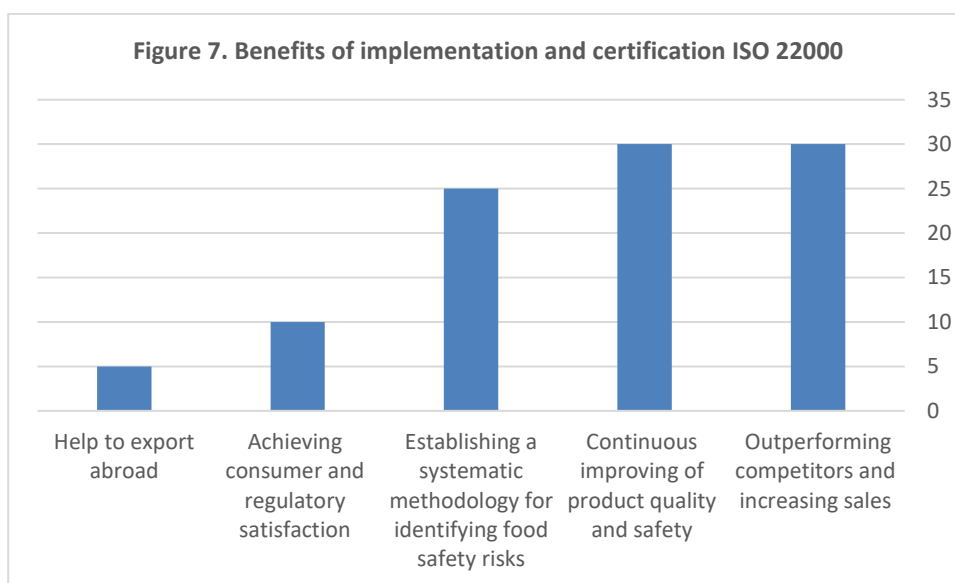
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ofrespondents(44.7)17/38indicatedthatthecostsoftheimplementationandcertificationFSMS ISO 22000 hinder to implement it, mentality of top management and its businessculture (26.3) 10/38, deficient experience in FSMS and specialists (13.1) 5/38, standard ISO22000not into consumer's attentionandthemarket 10.5% 4/38,andfinallyinadequateinfrastructureand facilities5.2% 2/38 (Figure6).



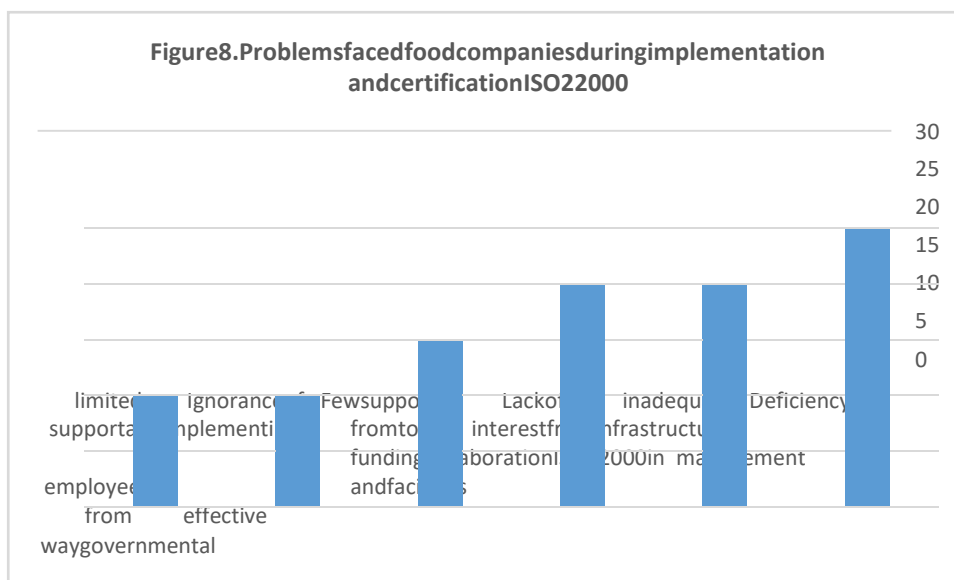
### 3.4. Benefits achieved of food companies implemented ISO 22000

Respondents from food companies implemented and certified ISO 22000 (twenty companies medium and big size) demonstrated their satisfaction about the implementing of the standard, they indicated that a lot of benefits gained: Outperforming competitors and increasing sales 30%(6/20), continuous improving of product quality and safety 30%(6/20), establishing a systematic methodology for identifying food safety risks and developing and implementing preventive measures for them 25%(5/20), achieving consumer and regulatory satisfaction 10%(2/20), and finally helping the local food company to export its products abroad 5%(1/20) (Figure 7).



### 3.5. Problems faced food companies during implementation and certification ISO 22000

From a total of seventy 70 food companies participated in the survey, the results demonstrated that only 20 companies (28.5% implemented and certified ISO 22000), divided into 15 big size and 5 medium, and this refers that the standard ISO 22000 is more selected by big size companies than the small size, due to the fact that the standard consists of more requirements which cannot be followed by medium food companies. Respondents from implemented food companies described problems faced during implementation and certification. Deficiency of funding due to extra production cost 25% (5/20), inadequate infrastructure and facilities 20% (4/20), lack of interest from employees to follow ISO 22000 requirements 20% (4/20), few support from top management of food company 15% (3/20), ignorance of implementing ISO 22000 in effective way 10% (2/20), and limited support and collaboration from governmental authority related with the topic of implementation and certification FSMS 10% (2/20) (Figure 8).



### 1.1. Estimated time and cost required for implementation and certification ISO 22000

The majority of Respondents 15/20 (75%) from food companies which implemented ISO 22000, demonstrated that the estimated time required to implement and certified ISO 22000 have been between 18-24 months. The time included employees training, establishing all documents required for the system, intern and extern auditing and the following all stages of the expedition of the ISO 22000 certification. Five respondent 25% referred that they take more than two years for getting the certification due to diverse reasons, the most relevant was the changing in the infrastructure of the food company to be suitable to implement the standard. Also the respondent referred that the cost of implementation and certification ISO 22000 in local food company in Iraq is about between 15.000-20.000 US dollar.

### 1.2. Specialist's opinion

According to specialist's opinion, the food company which desire implement ISO 22000 want to ensure its future 24%, worry about safety and quality 19%, and getting more customer confidence 18%. They also consider that, in relation to the industrial group, the strength points in the food sector are in the safety and quality of the product; it is certain that 50% of the respondents consider that safety and quality is not included in the strategic objectives

of the company, more than 72% think that top management of food companies have not awareness about food safety management systems. By asking them, on a scale of 1 (very low) to 5 (very high), their opinion about the degree of difficulty of the implementation the requirements of ISO 22000 in the food industry, they answered that the requirements refer to the food safety management system and internal communication would be the most difficult [20].

The specialists believe that the attitude of the people 74%, the mentality of the management 68% are important changes in the implementation of the food safety management system, which are at the same time considers as difficulties, and should be avoided when the decision of implementation of FSMS have been taken. Specialists think that the certification is

fundamentally improvement of the company image 85%; they believe that in nearest time will be a requirement to access to the new markets 80% [21]. They consider that consumers 81% are unaware of the value and importance of certification according to ISO 22000. They demonstrated that the certification process faced difficulties due to costs 19%, business culture 20% and auditing 21%; the maintenance of FSMS is hampered by bureaucracy and no participation or motivation.

#### 1.1. The future of food safety management system implementation and certification in Iraq

Participants from local food companies that have implemented and certified ISO 22000 stressed the importance of identifying the main procedures and strategies to address current and future challenges of food safety because of their importance for the future of food safety in Iraq, and this was determined through the questionnaire distributed to them and included many questions that were answered on Likert scale from 1 to 5, where 1 disagreed and 5 very agreed, in order to know their perception of the future of food safety in Iraq after their implementation of the ISO 22000 system in their companies.

#### About

80% of respondent from implemented food companies (16/20) believe that the implementation of FSMS ISO 22000 will encourage the diffusion the culture of food safety among Iraqi companies, and then using ISO standards, like ISO 22000. 60% of respondent from implemented food companies (12/20) believe that Implementing FSMS will develop new methods of controlling food in local food companies. 75% of respondent from implemented food companies (15/20) refer that implementing ISO 22000 will increase the importance

of food safety aspects among Iraqi consumer. 80% of respondent from implemented food companies (16/20) believe that the implementation of FSMS ISO 22000 will encourage Iraqi food control authority to update food regulations and legislations. 90% of respondent from implemented food companies (18/20) believe that the implementation of FSMS ISO 22000 will increase the skills and experience of food safety specialists in Iraq. 85 % of respondent from implemented food companies (17/20) think that implementation of FSMS in local food companies will increase the enforcement the role of the Center of Standardization and Quality Control in Iraq. 90% of respondent from implemented food companies (18/20) believe that implementation and certification ISO 22000 among local food products companies will open the way to export national food products to abroad. And finally, the majority of respondents 95% (19/20) believe that implementation and certification ISO 22000 will

increaseofthecredibility of food safety aspects to local food companies (Table1).

Question	1	2	3	4	5	%
ImplementingISO22000encouragesfoodsafety standarddiffusion inIraqifoodcompanies				16/20		80
ImplementingFSMSwilldevelopnewmethods of controlling food in local food companies			12/20			60
Increasingof theimportanceoffoodsafety aspects among Iraqi consumer			15/20			75
EncouragingIraqifoodcontrolauthorityto updatefoodregulationsandlegislations.				16/20		80
Increasingskillsandexperienceoffoodsafety specialistsinIraq.					18/20	90
EnforcementtheroleoftheCenterof StandardizationandQualityControlinIraq.					17/20	85
Openingtheway toexportIraqifoodproductsto abroad.					18/20	90
Increaseofthecredibilityoffoodsafetyaspects tolocalfoodcompanies.					19/20	95

Table1.Respondent'sopinionoffoodsafetyfutureinIraq

## 2. Conclusion

More than half of local food companies participated in the survey demonstrated that they did not have any FSMS implemented in their companies included ISO 22000 in place, due to various reasons, most notably, the costs of the implementation and certification FSMS ISO 22000, and mentality of top management of local food companies, which did not give priority for implementation and certification any FSMS, due to not following a correct business culture. It has been observed also, that a few number of local food companies have been started to give more importance to the food safety issue ultimately, so they began to hire specialist in food safety to implement one of FSMS in their companies, such as ISO 22000, they felt that the competence between local food companies in the Iraqi market has been appeared, in addition to the opening to the international market, which required ISO certification for exporting food products, so they believe that the time came to give an attention to ISO implementation and certification company.

It can be considered the local food companies operating in Iraq become awareness to the importance of implementation FSMS such ISO 22000, so, some companies implemented and certified ISO 22000 believing that the way for successful, gaining consumers satisfaction, reducing cost and time, having good competitiveness with the others, and opening the way to the international markets is coherence with implementation and certification food safety management system standards.

## Acknowledgment

The author thank the Department of Nutrition and Food Science in the University of Granada, Spain. Also a special thanks to Dr. Rosa Maria Blanca Herrera for supporting this research during one year.

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