PERCEPTION AND EVALUATION OF HACCP IMPLEMENTATION BY RESTAURANT MANAGERS

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Abstract

The design, implementation control and management of the HACCP system are crucial to the production of safe food products. The results of the direct questioner survey revealed that the managers know the HACCP system, being the major concern the legislation accomplishment. Generally, there is a concern to restore the buildings where the commercial business is. The employees have training in food hygiene and safety, which indicate a concern of the employer to have a staff with high skills. The majority of the restaurants have the HACCP implemented, and the suggestions of the HACCP team have influenced the modifications performed in the restaurants along the years. The work of the ACDV HACCP team is well recognized and define as essential, due to the promotion and improvement of the hygiene and insurance in the work place and the accomplished of laws, but not always convenient due to the daily records.

Key words: *food safety, direct question survey, HACCP, restaurants*

1. INTRODUCTION

The increasing awareness that foods can represent vehicles for health risk factors has caused scientists and public authorities to multiply their efforts to reduce these risks to within acceptable limits (Osimani, Aquilanti, and Clementi 2015). Over the past years, an increase in the frequency of the consumption of meals at dining facilities outside the home, as restaurants, has been reported. Accordingly, the attention of consumers has progressively become focused on the quality, rather than the quantity, of the food (Petruzzelli et al. 2014).

In the European Union, a milestone towards the containment of foodborne diseases was the introduction of the mandatory application of hazard analysis and critical control point (HACCP) principles with the EEC Directive 93/43. This directive introduced a novel approach focused on the food processing, storage and distribution/ serving, combined with the traditional inspective activities. In January 2002, the framework legislation was adopted in EC Regulation 178/2002; in April 2004, the EU drew up the three basic documents forming the "Food Hygiene Package": the EC Regulation 852/2004, EC Regulation 853/2004, and the EC Regulation 854/2004. Among these, EC Regulation 852/2004, on the hygiene of foodstuffs requires all food business operators to put in place, implement, and maintain a permanent procedure based on HACCP principles. The EC Regulation 2073/2005 was published, and subsequent amendments have been issued since 2006 (Petruzzelli et al. 2010).

The HACCP is a food safety management system that is recognized in the international food safety community as a worldwide guideline for controlling food borne safety hazards (Kafetzopoulos, Psomas, and Kafetzopoulos 2013). Despite the widespread implementation of HACCP in food companies, its effective application has not been deeply investigated (Taylor and Taylor 2004). Certifying the HACCP does not guarantee the optimum level of managing food safety hazards and consequently absolute food safety and the quality of the end product (Fotopoulos, Kafetzopoulos, and Psomas 2009). Many authors start to dough of the HACCP effectiveness mainly in small and medium sized enterprises and start to found which the causes are. Whilst it is widely accepted that food companies should apply HACCP, understanding of the factors impacting successful HACCP application is limited and this knowledge is important to the discovery of systems that will control all relevant food safety hazards (Wallace et al. 2014).

Implementation and continuous application of the HACCP systems in small and medium size food enterprises is quite difficult and has been limited (Ball, Wilcock, and Aung 2009; Fielding et al. 2011). Their difficulties are due to their lack of knowledge about HACCP, lack of financial resources (particularly in terms of investment in structure, equipment and staff), lack of time to establish and running a HACCP programmer, lack of focus, and management system. As a result, external specialists help is required in order to develop, implemented, and manage a HACCP system (Bas et al 2007, Tylor and Taylor 2004, Violaris et al. 2008, Walker and Jones 2002, Yapp and Fairman 2006).

The Associação Comercial do Distrito de Viseu (ACDV) is an association of shopping facilities since 1900 who works to the development of the sector in Viseu (Portugal) region. This association, beside other activities, supports members in the field of food safety management system, mainly HACCP. Based on European regulation and in Portuguese low, DL 113/2006, all the food shops, mainly restaurants, have to implement the HACCP system, in order to reach good hygiene practices. The ACDV has a great number of members, and to support the implementation and the permanency of this food safety system, it creates a team to support these activities among its members. The present study only focuses in restaurants, being the number of member of twenty eight.

The objective of the present work was to evaluate the perception and knowledge of the HACCP system by restaurant managers, and also evaluate the level of performance of the ACDV team that supports the HACCP system in those businesses.

2. MATERIAL AND METHODS

2.1. Data collection

The attitudes and opinions concerning the HACCP system had been determined based on a direct question survey of restaurant managers, question by an independent person. The evaluating questionnaire was divided in three parts: restaurant characterization; employees training; characterization of HACCP followed in the restaurants; importance of audits. The questionnaire was developed by an ACDV team, and it was applied to nineteen restaurants that are members of this association, with a sample universe of 68%. The content of this evaluating questionnaire is present in Table 1.

2.2. Statistical analysis

The technique used to evaluate the answers given by the restaurant managers was a descriptive statistical analysis, with frequency analysis for each answer, performed with SPSS version 22.

Table 1. Evaluation form of HACCP.

Restaurant characterization	
Restaurant type	Normal; Typical; Gourmet
How old is the building?	Range of years (New; < 5 years; ≥ 5 years; Don´t know)
The building was subject to changes/ modifications over time?	Yes; No If the answer was Yes, choose the range year of the last intervention (< 2010; ≥ 2010; Don´t know) 5
What were the reasons for the intervention?	Increased production capacity; Increased storage capacity; Legal requirements; Recommendations of the HACCP team; Other (specified)
Localization of the building area	Urban; Industrial; Rural
Year of opening	Range year (< 2010; ≥ 2010; Don´t know)
Employees training	
How many employees it has?	Range number (< 2; ≥ 2; Don´t know)
How many employees have training?	Range number (< 2; ≥ 2; Don´t know)
Areas of training	Food hygiene and safety; Hygiene and safety at work; Restaurant management; Barman/ waitress; Customer services; other (specified)
Certified training	Yes; No
Evaluation and perception of HACCP system	
Phase of HACCP implementation	Already implemented; Implementation phase
How long is the HACCP implemented?	< 1 year; ≥ 1 year; Don´t know
Who defines the quality/ food security policy?	Manager(es); Restaurant intermediate education level staff; Restaurant high education level staff; External consultant; Consulting company; HACCP team
Along the years, was the implementation always followed by the same person(s)/ company?	Yes; No If not (last question), why did you change? Coasts; Inadaptability to the restaurant/ person(s); Excess of demands; Lack of information
What do you understand by HACCP system?	Hygiene and food security; Hazard analysis and food contamination; Assurance of quality and save food; Food hygiene and hazards control
Choose two relevant results arising from the implementation of the HACCP.	Accomplish with the legislation; Satisfy customers; Improve working areas; Produce safety food and quality; Change the working methods; Greater responsibility and employee care; Evaluate food, water and surfaces; Security/ trust in the inspection; Other (specified)
Indicate two difficulties/	Hire a top or middle educational level person; Hire a consultancy

charges that HACCP brought to your restaurant.	service; Modify/ enlarge the restaurant; Modify/ replace the equipment; Modify/ purchase new utensils; More expensive raw materials; Increasing the number of employees; Complete control records; Microbiological and physicochemical analysis; Lack of skilled labour; Material / equipment absence; Other (specified)
Considering the following tasks, which ones have revealed difficulties?	Prepare daily records (raw materials, temperatures, frying oils, sanitation, etc.); Check and update records and documents; Change / replace infrastructure (walls, ceilings, floor); Change / replace equipment and utensils; Difficulties in guiding teams; Other (specified).
Are you aware of the laboratorial tests carried out in the establishment in the last year?	Yes; No If yes (last question), indicate which ones do you have knowledge: Employees; Surfaces; Water; Food/ meals; Other (specified)
How the laboratory tests influence the quality and safety of food in the restaurant?	Prepare safe food and with quality; Improve hygiene methods; Improve production methods; Improve storage conditions; Sensitization of workers; Other (specified).
Importance of audits	
As a result of an external auditing, the unconformities or critical points detected by the technical HACCP team where solved?	Yes; No
Faced with unconformities detected in the work places, did you immediately enforce improving actions/ eliminate them?	Yes; No
Do you think it is important the work done by the technical personal who perform audits to the restaurant?	Yes; No If no (last question), indicate the reasons
In what sense the work done by the HACCP team contributed to the hygiene and safety in your restaurant?	Improve the production of food safety and quality; Improve the practice rules of safety and quality in the workplace; Ensure the proper operation and organization of spaces; Help to accomplish with the legislation rules; Other (specified)
Are you satisfied with the work done by the ACDV HACCP team?	Yes; No If no (last question), indicate the reasons
Did you recommend the work of the ACDV HACCP team to another colleague?	Yes; No

3. RESULTS AND DISCUSSION

3.1. Restaurant characterization

Generally, the majority of the restaurants are located in urban areas (95%), and 5% in rural area. The restaurants are classified as normal (usual food services), 84%, and from the questionnaire application

no gourmet restaurant ("*haute cuisine*") was found (Figure 1). Most of the restaurants are in buildings over 5 year (74%) (Figure 1).

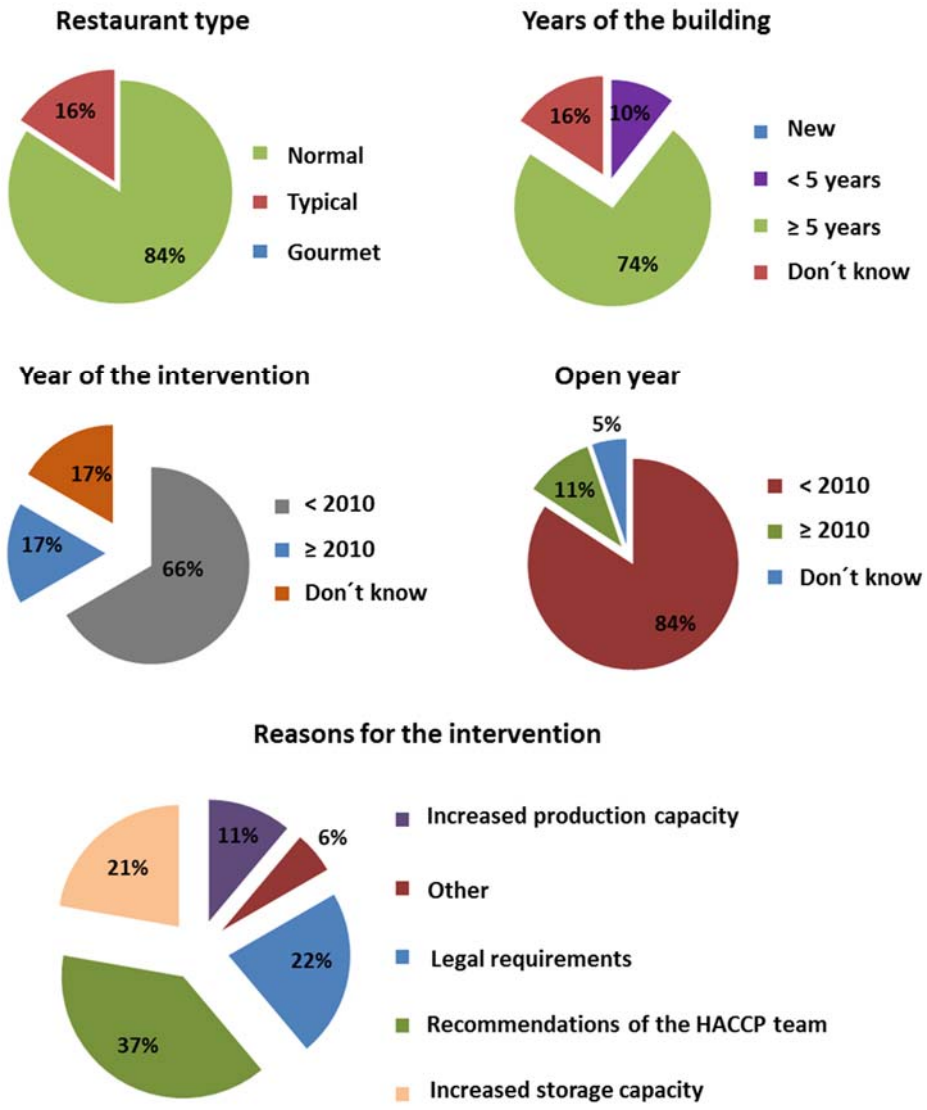

Figure 1. Restaurants characterization

The restaurants were subject to changes/ modifications over time in 63% of the cases, and 37% did not present any alteration/ changes, with 66% of these interventions done before 2010. The reasons for those modifications aroused due to the recommendations of the HACCP team (37%), legal requirements (22%), and increased of storage capacity (21%). The open year of the majority of the restaurants was before 2010, meaning that they have some maturity in the business.

3.2. Employees training

The number of employees by restaurant was in 84% equal or high than 2, associated with more than 2 employees with training (74%) (Figure 2).

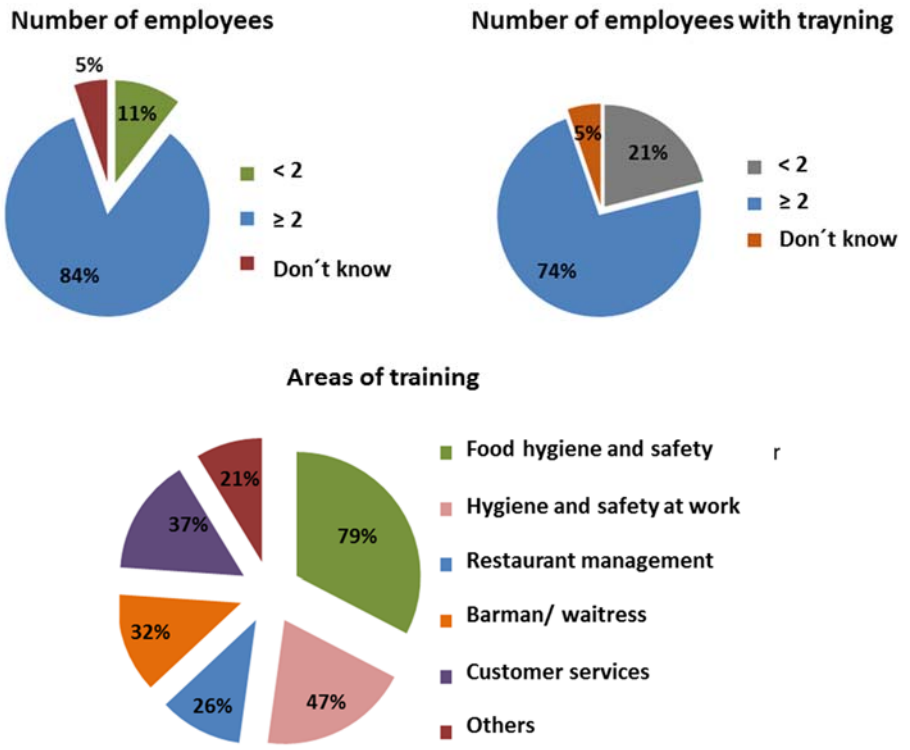

Figure 2. Employees training characteristics

The training areas are diversified, probably due to the different activities performed by the workers in the restaurant. The three most representatives are: 79% of the employees have training in food hygiene and safety (majority), 47% in hygiene and safety at work, 37% in costumer services (for example languages). It was also noticed that 58% of these training programmes was certificate.

It is very important to have workers with good training, in order to correctly put the HACCP procedures into daily practice it is necessary to have available and adequate level of human resources (Osimani, Aquilanti, and Clementi 2015).

Furthermore, reflecting the importance of worker attitudes and skills, most studies note the lack of appropriate training arrangements to improve worker awareness of food safety hazards and their skills in delivering enhanced controls as impedance to successful implementation of HACCP (Hearth and Henson 2010). Thus, it is important that food businesses ensure that their HACCP team members have the correct blend of training, skills and experience to take decisions about food safety hazard management (Wallace et al 2014).

3.3. Evaluation and perception of HACCP

The restaurant managers understand the HACCP as follow: 74% is a hygiene and food safety system, 42% assurance of quality and safe food, 37% food hygiene and hazard control, and 32% identification of hazards and food contamination (Figure 3). Those answers revealed that these managers have some knowledge about the meaning of HACCP, but they should be had more, because HACCP is all that activities. Moreover, some authors mention that there is a widespread consensus that hazard analysis and critical control point (HACCP) is an effective and economically efficient approach to food safety control, being based on risk assessment and process control (Worsfold and Griffith 2003). In spite of this, the knowledge of managers seems to be not enough for safe operations (Bánáti and Lakner 2012).

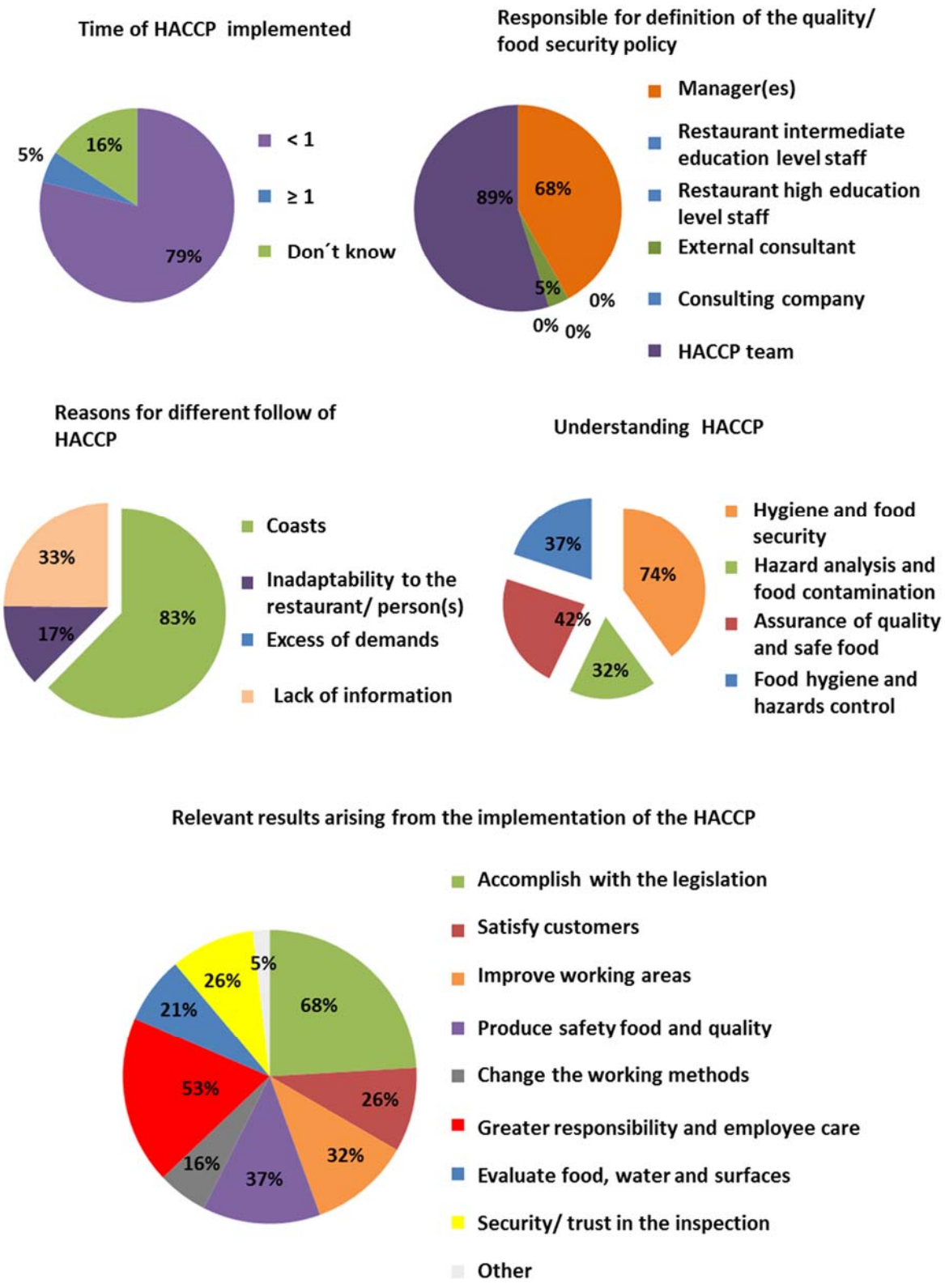

Figure 3. Characterization of HACCP methodologies

The majority of the restaurants have already the HACCP implemented (95%), and more than 1 year (79%) (Figure 3). The responsibility for the definition of the quality/ food safety policy in 89% of the cases is the HACCP team, followed be the restaurant manager (68%). In 68% of the restaurants the

implementation and subsequent support of HACCP activities are done by the same company (team), and in 32% of the cases there was a team change. The reasons for the choice of different team were: 83% coasts and 33% lack of information. The excess of demands were not pointed as a motive for the support of HACCP team/ company.

The most relevant results arising from the implementation of HACCP were: 68% accomplish with the legislation, and 53% related with the greater responsibility and employees care (Figure 3). The other reasons were also marked but with less importance.

The restaurant managers point the major difficulties/ charges of HACCP as follow: 37% complete daily control records, 32% hire consultancy service, and 26% modify/ replace the equipment (Figure 4). Concerning the tasks with more difficulties, the restaurant managers answer: 42% Change/ replace infrastructures, 37% check and update records and documents and change/ replace equipment and utensils.

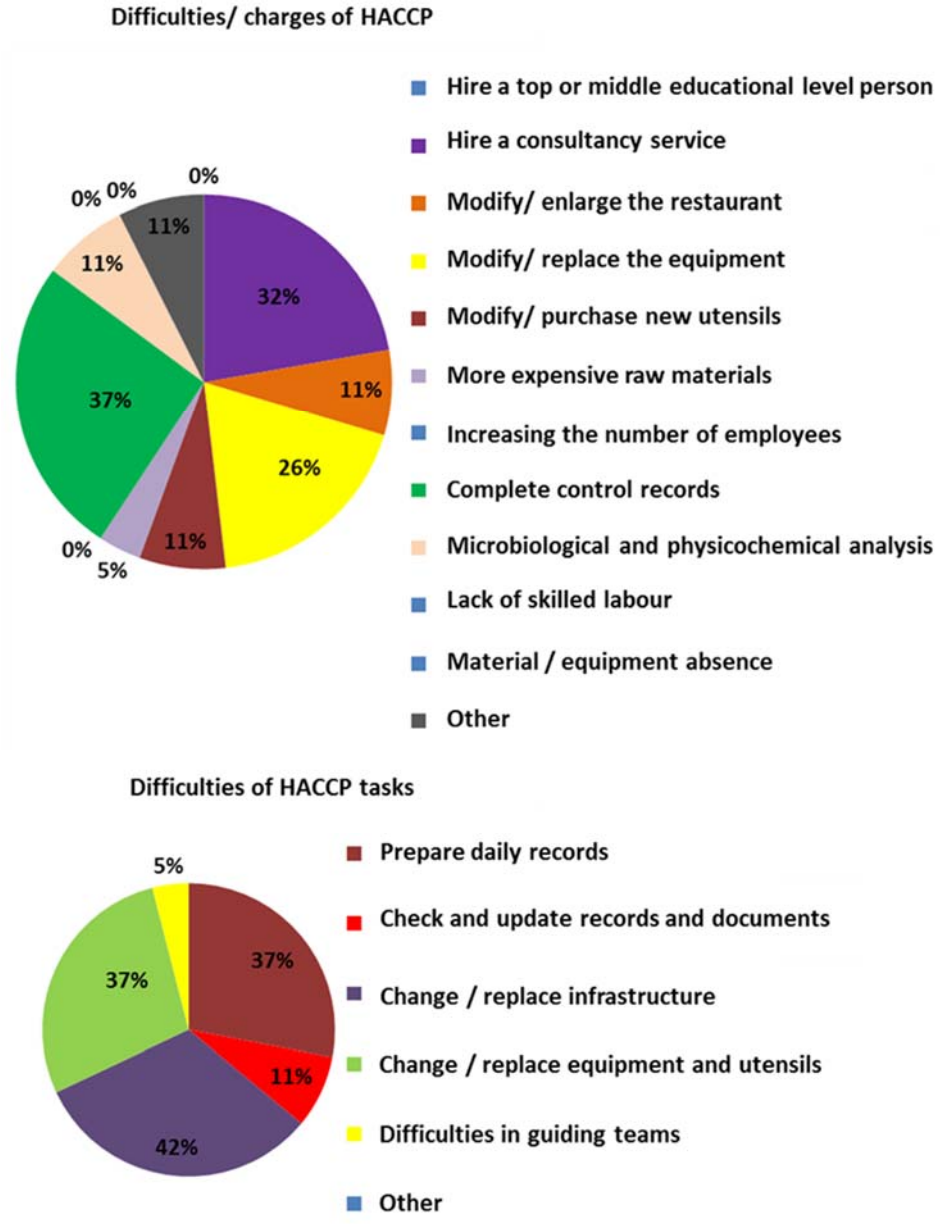

Figure 4. Difficulties/ charges of HACCP and related activities

Concerning the laboratory tests, all the managers know them, and the one that they know less was the employee's laboratory tests (79%) (Figure 5). Still about laboratory test and their influence in the restaurant activities, 79% of the restaurant managers stated that these test results improve the hygiene methods, and the way of preparation of safe food with quality. Furthermore, 53% of them mention that there was an improving in the production methods.

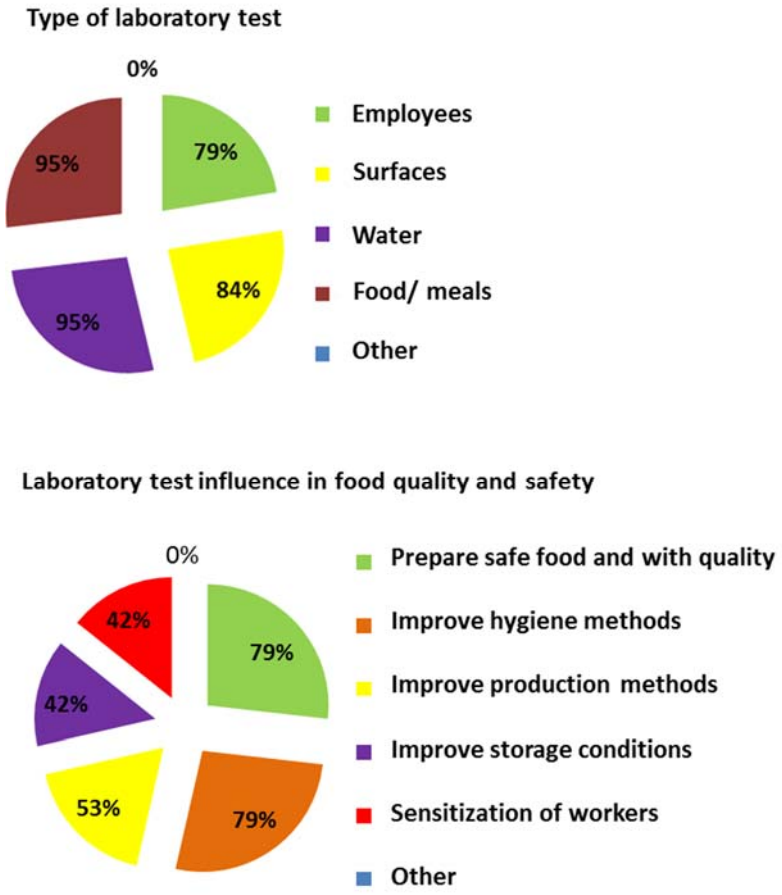

Figure 5. Knowledge of the laboratory tests

Jevsnik, Hlebec, and Raspor (2006) report the outcome of a meta-analysis of 12 studies that categorized the identified barriers to HACCP implementation, with around 50% related to training, human resources, planning, knowledge and competence, and management commitments. Furthermore, these authors mention that barriers are also related to work motivation, awareness, interest, familiarity with food safety controls, excessive documentation, lack of external support and resources.

3.4. Importance of audits

The restaurant managers answer that when it was detected a no conformity/ detection of a critical point, they acted immediately and solve them, in order to ensure that in the next auditing it is everything all right. In fact, 79% mention that they implemented immediately improving actions or eliminated the no conformities. Moreover, when they were asked about the importance of the work done by the technical personal that perform audits to the restaurant, and all of them agreed that this work is important. Furthermore, the work done by the HACCP team has a greater impact in the

improving of the practice rules of safety and quality in the work place (35%), and helping to accomplish with the legislation rules (Figure 6).

As mention before, there is an ACDV team that support all the restaurants in their HACCP activities, and when the restaurant managers were asked if they were satisfied with the work done by these team, all of them answer "yes". As well, all of them recommended the work of the ACDV HACCP team to another colleague.



Figure 6. Contribution of HACCP team

Considering all the survey done, it is important to notice that the HACCP system should not be considered as a system capable in itself of ensuring food safety but rather as a dynamic instrument whose application must be continuously subject to careful auditing and updating (Osimani, Aquilanti, and Clementi 2015).

4. CONCLUSIONS

HACCP system is a key element of modern food safety management practices, and it is a dynamic instrument whose application should be continuously object of auditing and updating. The study described in this was aimed at evaluated the knowledge and perceptions of restaurant manager, in Viseu district (Portugal), about the HACCP implementation in their business, considering the HACCP characteristics, demands, employees skills, support of HACCP team and audits. A direct questioner survey was applied and the answers were analysed. Generally, all the managers have good knowledge about HACCP methodologies and needs, and they have the HACCP system implemented, must of them followed by the same team since the beginning. The restaurants were subject to changes/ modifications over time in 63% of the cases, due to the recommendations of the HACCP team (37%), legal requirements (22%), and increased of storage capacity (21%). The majority of the personnel have certificated training in different areas, with 79% of them in food hygiene and safety. The major pointed difficulties were the daily control records (37%), and hire consultancy service (32%). When it was detected a no conformity/ detection of a critical point, they implemented immediately improving actions or eliminated the no conformities. It was noticed that the work done by the HACCP team has a greater impact in the improving of the practice rules of safety and quality in the work place (35%), and helping to accomplish with the legislation rules.

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