

Application of the dictionary of activities to the food safety management system

Aplicação do dicionário de atividades ao processo de gerenciamento da inocuidade nos serviços gastronômicos

Aplicación del diccionario de actividades al proceso de gestión de la inocuidad en servicios gastronómicos

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Abstract: Food has become a tourism product of high consumption thus requiring an appropriate food safety management system. Undoubtedly, the quality of the product is more important than the decoration, the service and even the prices. Food safety management has been implemented in many contexts, through the application of the HACCP system, but research on the topic focusing on the management of processes have been very scarce; hence, the objective of the present study is the application of the dictionary of activities to food safety management in a restaurant in the tourism destination of Varadero, Cuba. The importance of food safety for the customers justifies this study. Food safety and quality affect the consumers' intention of return and their opinion about the tourism destination. This study draws on the methodology of Nogueira (2002) for the process improvement and on Trischler's (1998) for the added value analysis. Different tools were applied like the survey, brainstorm, process map, AS-IS analysis, and process sheet. The study took place in a restaurant in the tourism destination of Varadero, Cuba, from January to May. The research revealed many activities that do not add value to food safety guarantee, and enabled to put forward three indicators to assist the restaurant management. It is concluded that the use of the dictionary of activities improved the food safety and quality management process. The dictionary allows the identification of the activities that add value to the safety management system, contributing to process effectiveness, and this is the main contribution of the research.

Keywords: Food safety. Process. HACCP. Dictionary of activities.

¹ Matanzas University (UM), Cuba. Conception; data acquisition; analysis and data interpretation; redaction.

² Matanzas University (UM), Cuba. Conception; methodological design; data analysis.

³ Matanzas University (UM), Cuba. Data treatment; conclusions; critical analysis.

⁴ Matanzas University (UM), Cuba. Orientation; critical review.



Resumo: A restauração no turismo transformou em um produto de consumo alto e próximo a isto a necessidade de uma administração de inocuidade apropriada, desde mais importante que a atmosfera, o serviço e até mesmo os preços, está sem lugar a dúvidas a qualidade do produto. A administração da inocuidade foi implementada em enredos diversos, por meio da aplicação do sistema APPCC, mais as investigações no tópico com um foco na administração por processos estiveram muito escasos. É por isso que o **objetivo** deste artigo é a implementação do dicionário de atividades para a gestão da inocuidade num restaurante do polo turístico de Varadero, Cuba. O estudo **justifica-se** pela relevância da garantia de segurança dos alimentos para os clientes, tendo uma elevada incidência no seu retorno ao restaurante e em sua opinião sobre a qualidade do destino turístico. O estudo tomou como base as **metodologias** propostas por Nogueira (2002) para a melhora de processos y Trischler (1998) para o análise do valor adicionado; onde foram aplicadas distintas ferramentas como *survey*, *brainstorming*, mapa do procesos, diagramas As-Is y carta do processo. A pesquisa realizou-se num restaurante do destino turístico de Varadero, Cuba; durante os meses de janeiro-maio. No estudo detectou-se a existência de um alto numero de atividades que não aportam valor á garantia da inocuidade, ademais possibilitou á proposta de 3 indicadores como soporte para o gerenciamento do restaurante. **Conclui-se** que à aplicação do dicionário de atividades constitui uma ferramenta que melhora o processo de gestão da inocuidade. A concepção do dicionário facilita a indentificação de as atividades que somam valor em termos da inocuidade o que tributa à eficiência do processo e constitui o aporte da pesquisa apresentada.

Palavras-chave: Inocuidade. Processo. APPCC. Dicionário de atividades.

Resumen: La restauración en el turismo se ha convertido en un producto de alto consumo y junto a ello la necesidad de una adecuada gestión de inocuidad, puesto que más importante que la ambientación, el servicio e incluso los precios, es sin lugar a dudas la calidad del producto. La gestión de la inocuidad ha sido implementada en diversos escenarios, mediante la aplicación del sistema APPCC, pero las investigaciones sobre el tema con un enfoque en la gestión por procesos han sido muy escasas; por lo que el objetivo de la presente investigación consistió en implementar el diccionario de actividades a la gestión de la inocuidad en un restaurante del polo turístico de Varadero, Cuba. El estudio se justifica en la relevancia de la garantía de la inocuidad de los alimentos para los clientes, teniendo una elevada repercusión en su retorno al restaurante y en su opinión sobre la calidad del destino turístico. La investigación asumió como bases metodológicas las propuestas de Nogueira (2002) para la mejora de procesos y de Trischler (1998) para el análisis del valor añadido; donde fueron aplicadas distintas herramientas como la encuesta, *braimstorming*, mapa de procesos, diagramas As-Is y la ficha de proceso. El estudio se llevó a cabo en un restaurante del polo turístico de Varadero, Cuba durante los meses de enero a mayo. La investigación detectó en el estudio la existencia de un alto número de actividades que no aportan valor a la garantía de la inocuidad, además posibilitó la propuesta de 3 indicadores como soporte a la gestión del restaurante. Se concluye que la aplicación del diccionario de actividades constituye una herramienta que mejora el proceso de gestión de la inocuidad. La concepción del diccionario facilita la identificación de las actividades que aportan valor en términos de inocuidad, lo que tributa a la eficiencia del proceso y constituye el aporte de la presente investigación.

Palabras claves: Inocuidad. Proceso. APPCC. Dicionario de actividades.

1 INTRODUCTION

A growing population increases the demand for food and leads the food industry to look for alternatives (use of new technologies, the massive use of chemical products, the genetic modification, among others) for its development and survival in a globalized

and competitive market. According to Krause and Bahls (2016) the act of feeding has evolved in parallel with man's technological development. At the same time, the consumers are more demanding and better informed about the products; however, that does not mean that food safety issues have disappeared.

Food safety refers to the existence of risks associated with consumption, that can happen at any point of the food chain. Thus, it is essential that an appropriate level of quality control be maintained through the whole process. The handling of the food during preparation and sale, particularly, is one of the most common sources of contamination by pathogenic microorganisms making food inedible for human consumption. Sometimes this happens when the food is not cooked at the appropriate temperature or the required storage conditions are not satisfied (Calaña, 2009).

Food-related health risks are a worldwide growing problem, such as the increase of the incidence of foodborne diseases (FBD) (Zhunio, Armendáriz & Monge, 2012; Palomino Camargo & González Muñoz, 2014; Zhan & Liu, 2014; OMS, 2007, 2009, 2015; García Pulido & Parra Ferié, 2015; García Pulido & Medina León, 2016, 2016b) with negative impact on business (Casquinha Lopes da Cruz, 2014; Sousa de Lima, 2012; Trigueiros Soares de Aragão 2015). The World Health Organization (WHO, 2015b) estimates that in 2010 there were between 420 and 960 million FBD cases, resulting in 420,000 deaths. For example, diarrhoeal diseases caused by food or water resulted in the death of 160,000 to 320,000 people a year, a third of which are children (WHO, 2015). Kay Folk (2008) refers that in the United States FBD surpass 76 million cases a year.

A food safety management system details step-by-step the necessary requirements to ensure that the products are adequately prepared and harmless to human beings.

The Hazard Analysis and Critical Control Point (HACCP) system addresses food safety from a preventive perspective. It is a management tool that appeared in the 1960s in the United States with the purpose of identifying, evaluating, and controlling systematically the hazards associated with food production processes (Celaya Carrillo, 2004).

The HACCP system has been widely implemented in many food production and services companies with the aim of ensuring food safety, especially since it has been promoted and recommended by the Codex Alimentarius and the Food and Agricultural Organization (FAO), which has led to its rapid expansion and acceptance (García Pulido, 2014).

For the tourist sector, food safety management is fundamental, because food is a basic consumption item for visitors. In addition to harming the health of consumers, FBD can also damage destination image and the future development of the sector. The increase of trips in recent years, led both national and international authorities to pay more attention to the aspects linked to the safety of tourists. At the same time, governments try to offer local authentic products ensuring their edibility and safety.

In Cuba, the number of visitors has grown significantly over the last four years, reaching the figure of 3,524,779 in 2015, according to the National Office of Statistical and Information (ONEI, 2016); therefore, the country should continue improving the sanitary safety, especially in the tourism sector through the agreement between the Ministry of the Tourism (Mintur) and the Ministry

of Public Health (Minsap). Food safety concerns in the tourism industry is due to the negative impacts that food safety problems can have on destination image, being the provision of food one of the key services in the conception of a tourism destination according to Añaña and Pereira (2016).

ISO 22000:2005 specifies food safety management standards for the entire food chain, from food producers to service; including the packaging.

In Cuba there is the normative NC 453:2006 with respect to mandatory sanitary requirements for mass catering based on the HACCP system; the NC 143:2007 refers to the code of general principles-practices of food hygiene applicable to the whole value chain of the food production, including the private

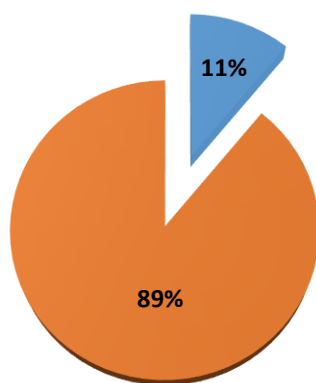
sector, recommending also its implementation focusing on the HACCP system and lastly NC 136:2007 about the HACCP system and guidelines for application, which appears recommended into in the two aforementioned normative (García Pulido, 2014).

Health safety is addressed in an integrated manner by Cuban institutions and it has received the attention of FTO giving rise to specific approaches for inspection activities in the country (Hill, 2007).

In the restaurant under study, belonging to the chain of state establishments, we determined the general index of compliance with the health and safety requirements - IGHSm- proposed by García Pulido (2014). The findings show that there are a series of indicators that compromise the food safety in the establishment.

Figure 1 - Percentage of non-compliances with the requirements.

■ Non-compliances ■ Compliances

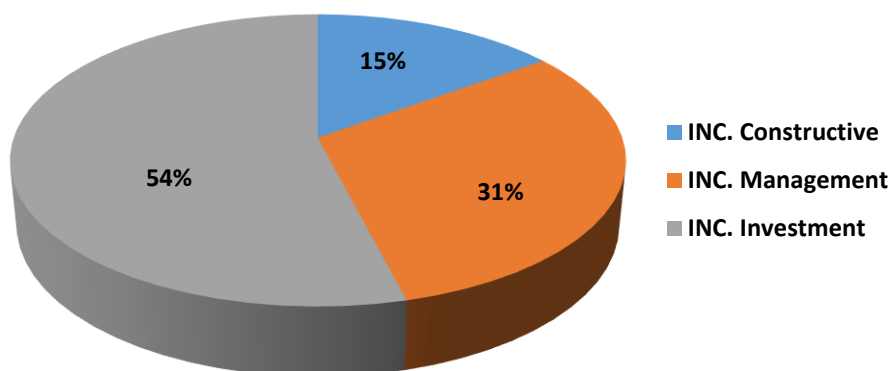


Source: Elaborated by authors

Figure 1 shows that 11% of the assessed indicators do not meet the requirements that compromise consumer health. Also, 31% are related to management criteria,

which are solvable in the short term, because they result from wrong ways of doing things or deficiencies in the management control.

Figure 2 - Percentage of non-compliances by type of indicator



Source: Elaborated by authors

The above-mentioned justified the decision of applying the dictionary of activities to the process of food safety management in the restaurant. The close relationship between the measured indicators and the actual activities that should be carried out in the establishment justifies the use of the selected tool; it allows the prompt identification of the steps where food safety management should be improved.

This study is relevant since it stresses the need for protecting consumer health, not only in terms of nutrition, but also in terms of food safety that visitors take for granted; with impact on destination image and marketing. Also, the study is important for Cuba given the contribution of tourism to its economy.

To carry out this study we firstly identified the theoretical and practical framework related with food safety management in the tourism services from a process perspective.

2 THEORETICAL AND PRACTICAL FRAMEWORK

The Process Management (PM) approach considers the organization like a network of processes that contribute to the customer satisfaction. This approach is characteristic of innovative companies, especially those that have a Total Quality Management system because it provides the bases for continuous improvement and innovation, key elements for competitiveness (Ordoñez Mejías, 2009).

According to Zariatégui (1999) the success of the organization depends more and more on the alignment of processes with its strategy, mission, and objectives. Before achieving a goal, a set of activities are carried out, becoming part of the process. The main analysis point is, in fact, the management of the company based on the processes that comprises it. Therefore, the process approach, after many years of application, is currently acknowledged as a powerful tool for its capacity to contribute in a sustained way to the results, whenever the company designs and structures its processes focusing on its customers.

Process management is part of those denominated "good management practices" In this sense, it can be pointed out that it represents one of the 35 perspectives of the Balanced Scorecard (BSC), it is one of the standards of the EFQM Excellence Model of Total Quality Management and it represents one of the five key benchmarks. According to Heizer and Render (1997) world-class producers use their process strategy as a competitive weapon.

In turn, Amozarrain (1999) considers that PM gains more and more prestige,

among other reasons because companies are as efficient as their processes.

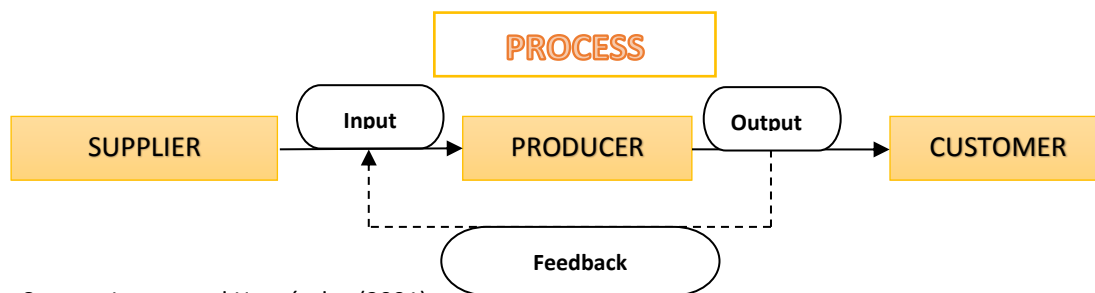
The processes are considered the operative base of most organizations and, gradually, became the structural base of a growing number of them (Zariatégui 1999).

2.1 Process approach

The definition of a process has been widely addressed from various perspectives and fields of knowledge; however, it is acknowledged that there are a set of inputs that will become product and/or service with an added value that is satisfactory to the consumer.

On the other hand, Nogueira et al. (2004) propose a quite complete definition when they outline that a process is the orderly sequence and logic of repetitive activities that a person, group, or department (or technology) perform, with the ability to transform some inputs in outputs, for a recipient (inside or outside the company who has requested it and that are the customers of each process) and with an added value.

Figure 3 - General outline of a process



Source: Lemus and Hernández (2001)

Also, Nogueira (2002) refers that the processes have two outstanding characteristics that justify the need to study them:

- ❖ The variability: each time the process is repeated there are slight variations in the different activities performed which, in turn, generate variability in the outputs. "Two outputs are never the same".
- ❖ The repetitiveness: the processes are created to produce a result and to achieve it repeatedly. This characteristic allows to work on the process and to improve it. "The more repetitions, the more experience".

The main objective of PM is to increase the results of the company through achieving higher levels of customer satisfaction. On the other hand, Santiago Pérez (2014) refers that PM also incorporates additional low cost service activities whose value is easily perceived by the customer (e.g., information) and to increase the productivity by:

- ❖ Reducing unnecessary internal costs (non-value-added activities).
- ❖ Shortening the delivery times (reduce cycle times).
- ❖ Improving the quality and the perceived value by customers so that it is pleasant to work with the supplier.

Regarding the first position is inherent to PM to analyze the execution of non-value-added activities since they slow-down the service and generate unnecessary costs.

In other words, it is necessary to work toward process efficiency.

Concerning the types of organizational processes, several authors consider that they can be classified as: key, essential flow, missionary or operational; strategic; and support: Amozarrain (1999); Nogueira (2002); Negrín Sosa (2003); Galiano Ibarra, Yáñez Sánchez and Fernández Agüero (2007); Hernández Nariño (2010) and Giner Fillol and Ripoll Feliu (2011).

According to Beltrán Sanz (2002), the processes can also be classified into:

- ❖ **Strategic processes** are those processes within the scope of the management's responsibilities, mainly long term. They refer specially to planning processes and others that are linked to key or strategic factors.
- ❖ **Operational processes** are those processes directly linked to the realization of the product and/or the provision of service. They are "line" processes.
- ❖ **Support processes** are those processes that support day-to-day operations. They usually refer to processes related to resources and measurements.

More recently, Alonso Becerra et al. (2013) provided another definition of strategic processes as transcendental to directly guide the rest of the organization processes; the key processes as those related to the results to be achieved and those of support, as the ones that provide the organization with the necessary resources.

The classification of the processes in-

to strategic, key and support, will be determined by the strategic projection of the organization, i.e., its mission, vision, and policies. Thus, a process in an organization can be key, while the same process in another organization is of support (Alarcón Ortiz, 2014).

Nogueira (2002) refers that most research focuses on the study of key processes; i.e., in those with significant impact on the strategic objectives and on customer expectations, or consume a significant amount of the company's resources. The author points out that the key processes have only one responsible and can be improved, either in a gradual way, by adopting a philosophy of continuous improvement, in line with Ishikawa (1998); Deming (1989); Lorino (1993); Goldratt (1995a) and (1995b); Stoner (1995); Grieco (1997); Harrington (1997); Suárez Mella (2001), or by means of radical changes in case that significant improvements are required, applying process re-engineering techniques as describe by Hammer and Champy (1994); Krajewski and Ritzman (2000).

The processes approach can be applied to any organization, company, or business. On its part, the food safety management system is appropriate when food preparation and service is a process that from several inputs seeks customer satisfaction with service delivery. Likewise, most of the tools used in food safety management require the drawing of process flows, a feature inherent to the process approach wherein the first step is its representation. Hence, PM provides an adequate framework for the food safety management system.

2.2 Food safety management

Currently, food safety management has become an indispensable process within food services; it is more important than the infrastructure, prices or even the service itself in the restaurant, cafeteria, or any food and beverage establishment, since it directly affects consumers' health.

Table 1 – Definitions of food safety

| Author | Definition |
|---------------------------------|---|
| ISO 22 000:2005 | Sequence of stages and operations involved in the production, processing, distribution, storage and handling of food and its ingredients from primary production to consumption. |
| Puñales (2005) | Similarly, the integration of all procedures that intervene in food safety, with a systemic approach and with the essential and explicit objective of ensuring the safety of food production or services has been called Safety Management. |
| Martell (2005) | The food safety is a lengthy chain with numerous ramifications that ensures the quality in the production and preparation of food products. |
| Feldman (2006) | It is one of the four basic groups of characteristics that, together with nutritional, organoleptic, and commercial features, make up food quality, considered as: food condition that ensures that it will not cause harm to the consumer when it is prepared and / or consumed according to the intended use. |
| Espinosa Manfugás et al. (2010) | A set of conditions and measures necessary to the production, processing, storage, distribution, and preparation of food to ensure that, once ingested, food does not present a significant health risk. |
| Martell (2011) | Safe food is food free of any substance, object or matter foreign to its composition, which presents microorganisms at permissible levels and presents optimal organoleptic properties and nutritional value. |
| Guada Barral (2011) | Ibidem Espinosa Manfugás (2010). |
| Fuentes Rodríguez (2014) | Food safety management is the integration of all the procedures that take part in the food safety, with a systemic approach and with the essential objective of ensuring the safety of food production or service. |

Source: The authors

Based on the Table 1, food safety can be understood as the set of measures adopted from the primary production of the product until the moment of its consumption, necessary to avoid potential health risks.

Food safety, sometimes referred to as the not perceived quality of the product, is the most important because it is related with the safety of consumers. Customers do not value food for the absence of a pathogen or

toxin, because they take that for granted and it is the primary responsibility of each food preparer (Ramos Alfonso, 2007)

According to Álvarez González (2008) the key to achieve food safety and quality is strengthen all links in the food chain up to the consumer or end user, including growing, harvesting, processing and production, packaging, distribution, sale, transportation, and intermediate storage; so that each of these stages constitute processes associated with

safety.

Cruz (2007) considers that ensuring food safety can be divided into two stages: empiric stage, wherein the practices, knowledge and standards are based mainly on observation and experience; and a scientific stage, in which disciplines such as chemistry or biology contribute to the understanding of food and to the development of effective methods to ensure quality.

The lack of food safety in many cases can lead to adverse health effects for consumers, mainly foodborne diseases.

2.3 Food safety management standards

In order to regulate food safety there are a series of international standards. The most known are the following:

The International Organization for Standardization (ISO) is the international organization that in the 2005 published the ISO 22000 standard for Food Safety Management System. This standard specifies the requirements for a system that combines the following generally recognized key elements to ensure food safety through the food chain to the end consumer (ISO 22000: 2005):

- ❖ Interactive communication
- ❖ System management
- ❖ Prerequisite programs
- ❖ HACCP principles

International Food Standard (IFS) has been developed for all types of distributors (all sizes of businesses, independent or not) and wholesalers with similar activities (e.g. cash and carry). They all must ensure the safety of their own-brand products. IFS helps to meet all legal safety requirements and

common and transparent standards for all affected suppliers, as well as a concrete and firm response to the customers' high safety expectations (IFS, 2014).

British Retail Consulting (BRC) according to the ACMS group (2014), the BRC standard for food safety was developed by the British retail distribution. It is a specific standard for the agri-food industry. It is composed of 7 chapters (team commitment and continual improvement, the food safety plan HACCP, food safety and quality management system, site standards, product control, process control, and personnel).

According to Espinosa Manfugás et al. (2010), tourist food establishments in Cuba are monitored through the health and safety guidelines established by the Ministry of Public Health. It includes every aspect to be inspected and elements of the General Code of Hygiene Practices of the Codex, the guide for the implementation of the HACCP system, the Cuban Standard System, British Airways Holidays standards, the Thomson firm, and WHO / PAHO Safe Food Handling.

Within the Cuban norms there are the NC 453: 2006, general health requirements for mass catering, NC 455: 2006, food handling and their general health requirements, and CN 136: 2007, Hazard analysis and critical control points system (HACCP) and guidelines for its implementation.

Food safety management is an implicit process of food production and service, as is quality, price formation, the marketing mix, among others. Ensuring safety is perhaps the most concrete example of thinking about the customer and adapting to their needs. Hence, its study is key in contexts

where food plays a leading role.

The tourism boom in recent decades has mobilized many fields of knowledge that in different ways converge in its management, however there is still few research on food safety management linked to tourist services or tourist consumption such as mass catering.

3. METHODOLOGY

The application of the dictionary of activities to food safety management required the combination of process management tools and methodologies for process improvement, used in the selection of the process to be studied. The construction of the process sheet, which included its representation and detailed description; made possible the design of the dictionary of activities, facilitating the identification of activities that add value to food safety management, as a basis for the subsequent analysis of the results.

We used the methodology proposed by Nogueira (2002) to identify the process. This methodology has been widely adopted in the last years for process improvement, with reliable results and application in the tourism sector; we demonstrate in stages the importance of processes in companies. Its objectives are:

1. To create processes that respond to the strategies and priorities of the company.
2. To ensure that all members of the organization focus on the appropriate processes

3. To improve the effectiveness, efficiency, and flexibility of the process to make the work better, faster, and more economical.
4. To create a culture that makes process management an important part of the values and principles of all members of the organization.

The methodology in question presents:

Stage I. Process analysis

1. Formation of the team and project planning
2. Listing of the processes of the company
3. Identification of relevant processes
4. Selection of the target processes
5. Naming the person responsible for the process

Stage II. Process design

6. Constitution of the work team
7. Definition of the business process
8. Making the As-Is Diagram
9. Analysis and improvement of processes
10. To establish indicators

Stage III.

11. Implementation, monitoring, and control (take steps 4 and 1)

Once the list of the processes of the company is obtained, it was presented to the management for its revision and approval.

The verification of the concordance in the selection of the relevant processes was carried out using the Kendall coefficient method. With the results, the table was formed with the values (A_{ij}) representing the criterion on the variable or characteristic (i) given by the expert (j), considering that (L) is the number of characteristics evaluated and (M) the quantity of experts who issued criteria.

Once the expert's valuations were made, the following values were determined for a better understanding of the results:

Sum of the criteria of the experts on the characteristics:

$$\sum_{i=1}^L A_{ij}$$

Deviation of the expert's criterion on the variable (i) [Δ] and the average value of the order of priority given by the experts on the variable (i) [T]:

$$\Delta = \sum_{i=1}^L (A_{ij} - T)$$

$$T = \frac{\sum_{i=1}^L \sum_{j=1}^M A_{ij}}{L}$$

Quadratic deviation of the criterion of the group of experts on the variable (i) [Δ^2].

For the selection of the key processes, the strategic objectives / impact matrix was applied to customers and processes, where a new dimension was incorporated related to the possibility of short-term success. The following aspects were taken as reference:

- ❖ **Impact of the process:** For each process, an assessment of its importance was made considering its link to the strategic objectives and / or goals of the organization.

- ❖ **Impact on the customer:** The decisions of a company have a direct or indirect impact on customers. This effect is considered in the definition of the strategic objectives, but it is recommended a specific consideration for each process about the consequences that would have on the customers of the organization a possible redesign, and allows to know the impact of each one in customer satisfaction.

- ❖ **Possibility of short term success:** It is recommended that those processes that are most likely to achieve success in the shortest time possible are the first to be addressed.

The correlation established as a weighting variable in the matrix was: high (10 points), medium (5 points) and low (1 point). After calculating the total scores for the relevant processes, the most significant ones were selected taking as reference the maximum score. It is proposed to design or redesign all relevant processes (one by one), starting with first order key processes, which will be those in the following interval:

$$T.P. \geq V_{med I} * R_{max} * E_{max} * N.O.$$

Where:

T.P.: Total score of the process.

N.O.: Number of strategic objectives.

V_{med I}: Average value of impact on the process.

V_{max I}: Maximum value of impact on the process.

R_{max}: Maximum impact on the customer.

E_{max}: Short term success.

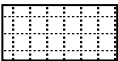
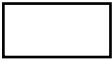
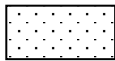
Once the target process was defined, its characteristics were summarized in a Process Sheet with the aim of gathering all those relevant characteristics to the control of the activities defined in the diagram, as well as for the management of the process.

The information to be included in the process sheet may be diverse and it should be selected by the organization, however it

should be sufficient to allow its management (Beltrán Sanz, 2002).

The sheet included the As-Is diagram of the process that represented graphically the work or information flow. This diagram maps out the steps to produce the output and to inform policy, procedures, and work instructions in use (Trischler, 1998).

Table 2 - Classification of the activities of an As-Is diagram

| Identification of symbols | Surface | Meaning |
|---------------------------|---|---|
| Weft surface |  | Step that does not add value |
| White surface |  | Step that adds value |
| Spotted surface |  | Step in which an external entity intervenes |

Source: The author, adapted from Trischler (1998)

Finally, the added value of the process was analyzed, considering that process improvement methods have the common goal of helping managers maximize the use of organizational assets and minimize or eliminate waste (Trischler, 1998). Value-added analysis techniques represent a fundamental component of the activity-based costing (ABC) approach, value analysis of a process, continuous improvement process and cycle time reduction.

The analysis of added value was based on the following questions:

- ❖ Does the process step add value to the customer? Does it contribute to satisfy their needs? Is it something the customer is willing to pay for?

- ❖ Does the process step add value to the company? Does it contribute to achieve some of the strategic objectives?
- ❖ Does the process step add value to the process? Does it help managers in their decision-making, carrying out their planning and prevention tasks?

3.1 Dictionary of activities

According to Trischler (1998) it is necessary to identify the actions that do not add value from the very stage of elaboration of the As-Is diagram in such a way that the results can be improved in a detailed analysis. Non-value-added activities are those that do

not have any value to the group of interest to whom they are aimed.

The purpose of the dictionary is to contribute to the analysis of the actions used to describe the activities of the processes and to identify those that for food safety management are non-value-added activities.

Based on the above, we defined as NVA the non-value-added activities and NVAGI those actions that do not contribute to the food safety management system.

4 DISCUSSION OF THE RESULTS

4.1 Characterization of the entity under study

The methodology was applied in a state restaurant located in the tourist destination of Varadero, from January to May 2016. This restaurant specializes in Italian and international food. It offers services in three different spaces: dining room, terrace, and private room, with a total of 94 places.

It presents satisfactory results with a sales index in the months of January of \$ 20, 927.68 with a compliance of 78.5% of the

monthly plan, February \$ 17,426.25 with 65% compliance, March \$ 18,758.80 also with 65%, April \$ 18,246 with 68.8% and up to May 22 \$ 13,288.7 with 87.3%. The operations have approximately an average of 160 clients / day in the high season and 70 clients / day in the low season.

Its main customers are domestic tourists, which is the key market for the facility and the Canadian market, represented almost entirely by senior customers.

4.2 Application of the methodology for the improvement of processes associated with food safety management

After assessing the level of knowledge in the food service and the years of experience in the sector, we selected 7 experts that perform different functions in the establishment. They had an average experience of 23 years.

Table 3 shows the list of restaurant processes after brainstorming and individual work sessions with staff members, detailing the activities or sub-processes for each process.

Table 3 – Restaurant processes

| A+B process | Sub processes |
|----------------------------|---|
| Customer service | Mise en place of the Restaurant Setting the tables Preparing the sideboards Information meeting Greeting customers Clearing the tables Mise en place. |
| Food preparation | Preparation of dishes in the cold food area. Preparation of dishes in the hot food area. Service to the server. Control of inputs. |
| Bar service | Mise en place of the Bars. Service to the customer. Closing of the Bar. |
| Management of the quality | Evaluation of customer satisfaction. Food safety management. Risk management. Organization of work. Training and development. |
| Human Resources Management | Performance evaluation. Needs planning. Reception and remuneration. Safety and health. |
| Purchasing management | Selection and control of suppliers. Placing orders. Buying process. Purchasing control. |
| Storage | Storage of raw materials and products in general. Distribution of raw materials properly and on time. Control of losses due to deterioration, shortage, or reduction. Timely warehouse stock rotation. |
| Economic-financial | Set sales prices. Establish datasheets. Results of sales. |

Source: The authors

Through the application of the Kendall coefficient we verified the concordance in the selection of the relevant processes, resulting as relevant processes, for a value of $w = 0.9591$:

- ❖ Customer service
- ❖ Food preparation

- ❖ Management of the quality
- ❖ Economic-financial

Once we defined and verified the relevant processes the matrix of strategic objectives/ impact on the customer / short-term success was applied.

Table 4 - Matrix of strategic objectives / impact on the customer / short-term success

| Strategic objectives | 1 | 2 | 3 | 4 | 5 | 6 | | | | |
|--|---|---|---|---|---|---|----------------|------------------------|--------------------|-------|
| 1) To strengthen and to consolidate the political and ideological work. | | | | | | | | | | |
| 2) To encourage an internal control environment and prioritize the audits, surprise checks and self-control. | | | | | | | | | | |
| 3) To achieve the economic and financial efficiency. | | | | | | | | | | |
| 4) To increase the effectiveness of the promotion and marketing. | | | | | | | | | | |
| 5) To guide the development and investment activity toward the new scenarios. | | | | | | | | | | |
| 6) To develop and manage the human capital. | | | | | | | Process impact | Impact on the Customer | Short-term success | Total |
| Relevant processes | | | | | | | | | | |
| 1) Customer service | 1 | 5 | 5 | 0 | 5 | 5 | 31 | 10 | 0 | 100 |
| 2) Food preparation | 1 | 1 | 5 | 0 | 0 | 0 | 37 | 10 | 10 | 700 |
| 3) Management of the quality | 5 | 0 | 0 | 5 | 5 | 1 | 36 | 10 | 1 | 60 |
| 4) Economic Financial | 1 | 1 | 0 | 1 | 0 | 1 | 24 | 1 | 5 | 20 |

Source: The authors

$$PT \geq Vmed * RCmax * ECPmax * NO$$

$$PT \geq 1 * 10 * 10 * 6$$

$$PT = 600$$

The matrix allowed to identify as key processes Customer service and Food preparation. We selected the Food preparation process to continue this study because it had the highest score and it is the most relevant

to the entity's management since the menu offer is the core product of any food establishment. Also, it is key to analyze food safety management and has high impact on the customer satisfaction and on the financial management of the restaurant.

The work team was formed by selection of experts:

Table 5 - Results of the experts' evaluation

| | E1 | E2 | E3 | E4 | E5 | E6 | E7 |
|---|--------------|--------------|--------------|-------------|--------------|--------------|--------------|
| a | 0.88 | 0.9 | 0.92 | 0.76 | 0.82 | 0.624 | 0.76 |
| c | 0.644 | 0.665 | 0.711 | 0.48 | 0.686 | 0.453 | 0.619 |
| K | 0.762 | 0.782 | 0.816 | 0.62 | 0.753 | 0.539 | 0.698 |

As presented in Table 5, 3 of the experts did not have competency to undertake the activity, they are not in the range $0,7 \leq K \leq 1$, in agreement with Santiago Pérez (2014). A cashier clerk, the manager of the entity and a cook composed the expert team.

For the definition of the business process, the Process Sheet was elaborated which includes the most important key process according to the strategic objectives matrix.

The Process Sheet allowed a detailed description of the key elements that describe or characterize the process under study. Its elaboration is essential to carry out the improvement, not only because it includes the flow of the process, but also allows to visualize those steps involved in the food safety management, the referring regulations, and the associated risks.

Table 6 – Food preparation process sheet

(continue)

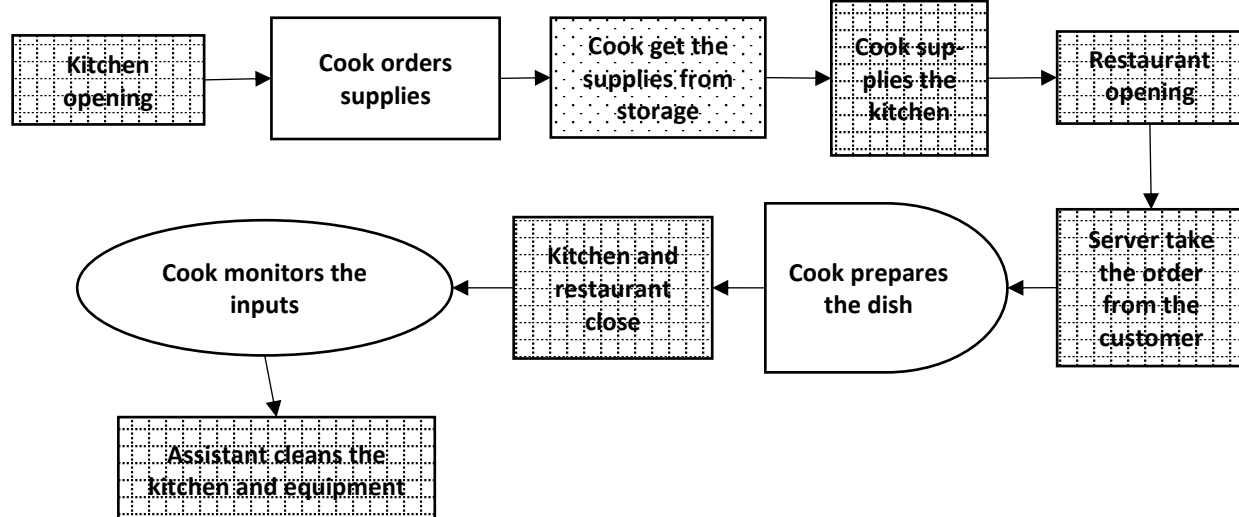
| | | | |
|---|---|---|---|
| Name of the process: Food preparation | Sub process: 1. Mise en place. 2. Preparation of the dishes in the Cold Area. 3. Preparation of the dishes in the Hot Area. 4. Service to servers. 5. Control of Inputs | Responsible or owner: Administrator | Code: 05 |
| Type of process: Operational | Mission: Provide an efficient service to domestic and international customers, based on the professionalism of staff. | | |
| Scope: Beginning: Opening of the kitchen. Includes: Cook, servers, kitchen assistant, customers. End: Kitchen cleaning and equipment. | | | |
|  | | | |
| Objective: To achieve customer satisfaction through service excellence. | | | |
| Service offer: Italian and international cuisine. | | | |
| Inputs: Staff Information Work equipment Supplies Required documentation Utensils and tools | Suppliers: Central warehouse of Palmares. | Outputs: Prepared dish Information Process waste | Target / Customers: Customers |
| Used documentation: Purchase orders Orders Cost Records IPV Control of perishable products | Legal aspects: NC -126:2001 Resolution 60/2011 NC-38-00-05-86 NC-38-01-01-86 NC-143-2007 NC-453-2006 NC-455-2006 NC-492-2006 NC-ISO 14001:2004Requirements NC-ISO 22000:2005 | Records and forms: Request ticket Delivery and refund coupon Preparation report Transfer coupon Inventory of stock in the kitchen Inventory record | |

Table 6 – Food preparation process sheet

(conclusion)

| | | |
|--|---------------------|---------------------|
| Other important information for the process: Risks: Violation of procedures. Poor handling and / or processing of food. Non-compliance with hygiene standards and categorization. Inconsistencies in the primary documentation that supports physical consumption (diversion of resources) Failure to comply with customer satisfaction index Skills required: Speed, concentration, teamwork Computer applications: Not existent. Interest groups associated with the process: restaurant customers, suppliers, employees, managers, Mintur delegation, Government, PCC, Minint, Minfar, Minsap Proposed indicators: 1-IGHSm 2- Customer satisfaction index 3-Results of inspections 4-Operation of the equipment | | |
| Made by: | Reviewed by: | Modified by: |
| Date: | Date: | Date: |
| In the case of alterations please include a summary of the alteration: | | |

Once the main process was detailed the As-Is diagrams were made for each of the sub-processes, which allowed its analysis with more graphical information of the work flow.

The above-mentioned made possible having the necessary information for the identification of the activities that add value to the process according to the requirements of the customers and to define which add value to food safety management. Thus, it is easier to exclude the activities that do not have impact on customer satisfaction or on

safety, and are a loss of time and / or resources in most of the cases.

The development of the dictionary of activities resulted in 32 identified activities, of which 12 add value to the process (37.5%) and 5 add value to food safety management (15.6%), highlighting that in both cases the activities that add value do not match; thus, it is necessary to work on the alignment of the process and its activities, considering that instead of eliminating them, their duration could be shortened, because they are key to achieve the final product.

Table 7 - Dictionary of activities

| No. | Action | Evaluation | | Symbol | Category |
|-----|--------------|-------------------|--|--------------|-----------------------|
| | | VA to the process | VA to GNI | | |
| 1 | To open | NVA | NVAGI | Rectangle | Movement and Handling |
| 2 | To file | NVA | NVAGI | Triangle | Storage |
| 3 | To close | NVA | NVAGI | Rectangle | Movement and Handling |
| 4 | To cook | VA | NVAGI | Rectangle | Preparation |
| 5 | To count | NVA | NVAGI | Rectangle | Control Process |
| 6 | To control | VA | NVAGI | Ellipse | Control Process |
| 7 | To cut | VA | NVAGI | Rectangle | Execution |
| 8 | To check | VA | NVAGI | Ellipse | Control Process |
| 9 | To decorate | VA | NVAGI | Rectangle | Execution |
| 10 | To discard | NVA | VAGI | Rectangle | Defect handling |
| 11 | To elaborate | VA | NVAGI | Rectangle | Execution |
| 12 | To deliver | NVA | NVAGI | Rectangle | Movement and Handling |
| 13 | To stretch | NVA | NVAGI | Rectangle | Execution |
| 14 | To scrub | NVA | VAGI | Rectangle | Prevention |
| 15 | To store | NVA | VAGI | Triangle | Storage |
| 16 | To bake | VA | NVAGI | Rectangle | Preparation |
| 17 | To clean | NVA | VAGI | Rectangle | Execution |
| 18 | To proceed | NVA | NVAGI | Rectangle | Preparation |
| 19 | To assemble | NVA | NVAGI | Rectangle | Movement and Handling |
| 20 | To offer | VA | NVAGI | Rectangle | Execution |
| 21 | To request | VA | NVAGI | Rectangle | Preparation |
| 22 | To weigh | NVA | NVAGI | Rectangle | Control Process |
| 23 | To portion | VA | NVAGI | Rectangle | Preparation |
| 24 | To prepare | VA | NVAGI | Rectangle | Execution |
| 25 | To preserve | VA | VAGI | Triangle | Storage |
| 26 | To receive | NVA | NVAGI | Rectangle | Movement and Handling |
| 27 | To rest | NVA | NVAGI | Half ellipse | Storage |
| 28 | To season | VA | NVAGI | Rectangle | Preparation |
| 29 | To select | NVA | NVAGI | Rectangle | Control Process |
| 30 | To serve | NVA | NVAGI | Rectangle | Execution |
| 31 | To provide | NVA | NVAGI | Rectangle | Movement and Handling |
| 32 | To verify | NVA | NVAGI | Ellipse | Control Process |
| | | VA | Add value | | |
| | | NVA | Do not add value | | |
| | Legend | VAGI | Add value to food safety management | | |
| | | NVAGI | Do not add value to food safety management | | |

Source: The authors, adapted from Trischler (1998)

5 CONCLUSIONS

We have identified 20 activities that do not add value to the process and 27 that do not add value to food safety management; this results in delays in the workflow, employment of staff in activities that do not generate profits - with the consequent deteriora-

tion of efficiency - as well as the need to employ more staff than necessary. This significantly hinders the achievement of the mission of the entity and the proposed strategic objectives.

The application of the dictionary of activities showed a lack of alignment between the activities necessary for the success

of the process and those that ensure the food safety management and are essential for customer satisfaction, according to Espinosa Manfugás et al. (2010). Due to the importance of food safety management, the small number of activities to ensure customer safety is worrisome, and also because of the negative impact of non-compliances on the restaurant's business.

It is therefore necessary to carry out a detailed analysis of the organization of the actions to optimize the processes; to that end, we proposed that:

1. The kitchen staff together with the administration should demand the improvement of the quality of the products that are received from the central warehouse, due to their impact on the quality demanded by the customers.

2. In the high season, a third cook must be hired, since the work load delays the delivery of the orders.

This last aspect directly affects the food safety because the volume of work is among the leading causes of errors in the compliance with the regulations and disregard of hygienic practices to ensure that food will not cause harm to the consumer.

Likewise, process improvement and the monitoring and control of the proposed actions to ensure safety, it is suggested to apply the overall index of compliance with the health and sanitary prerequisites periodically, in addition to the use of the indicators proposed by Santiago Pérez (2014).

Table 8 - Indicators proposed for the process

| Indicator | Measurement mechanism | Interpretation |
|---|---|---|
| Overall index of compliance with hygiene-sanitary prerequisites | Application of the instrument with a biannual frequency | Level of compliance with the prerequisites that support food safety management |
| Satisfaction of external customers | Customer and complaint book | Level of satisfaction with the new added values |
| Results of inspections | Inspections and audits | Information obtained through the inspections |
| Appropriate operation of the equipment needed to carry out the processing service | Analysis of the equipment | Necessity that the equipment in kitchen is in perfect condition to be able to provide an excellent service. |

Source: The authors, adapted from Santiago Pérez (2014)

The use of the dictionary of activities based on the methodology proposed by Nogueira (2002), not only allowed the improvement of the analyzed process, but also

provided a theoretical and methodological framework for the selection of the relevant processes, which ensured the improvement in those processes that have a decisive impact on the core business of the entity.

On the other hand, the use of the process sheet summarizes the essential characteristics and relevant elements of the processes, enabling their study, as well as an overview of their particularities. Hence, the use of the process sheet not only contributes to the improvement, but can also be used in the process management itself, providing the administration with an excellent framework for the implementation of regulations, management manuals and decision making.

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