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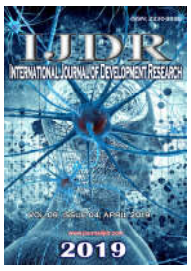

REVIEW ARTICLE OPEN ACCESS

QUALITY MANAGEMENT TOOLS IN THE FOOD INDUSTRY

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ABSTRACT

To become more competitive, meet the demands and requirements of the market, reducing waste and rework, increasingly, companies and their managers are looking for systems management. With the main objective to investigate general elements, involving the implementation and performance of the tools of quality management, applied in food industries, a literature search was performed providing understand aspects of the management of production and quality management, relevant research and on the top seven quality tools. This research seeks to broaden the researches in the implementation of quality management in food industries.

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INTRODUCTION

The new global competition requires, with the new processes, quality levels high, and that companies are committed to the improvement of its products, services, processes and their collaborators, being necessary methods to be used by all. Various tools are used for quality control in the production of food, but few are applied or described for the production of food. Therefore, this work aims to raise as the performance indicators influence the tools of quality management to ensure that the process and the product to become compatible with the standard of quality required by law and by the consumer. Thus, it has been, for issue of the project, the following question: how the quality tools can contribute to improve the management of quality in the production of food?

We found that in addition to the price, consumers seek also for food quality and safety, i.e., a food that does not cause damage to health.

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With this, the food industries are changing, because they realize the limitations of traditional quality programs, such as the inspection of production and controls of the final product, especially in industries of regional products, whose processes are poorly described in literature and in their majority are small businesses, which do not have a structure (physical and operational) for most current programs. From this new vision of management of the quality of the food, the use of tools such as good manufacturing practices, implementation of standardized operating procedures, 5S, control charts, among others are of great value to obtain the quality desired by the consumer and meet current legislation. To be answered these laws, the company must employ the use of quality tools and performance indicators, starting these controls already at the beginning of the productive process to get to the end of the process, a product harmless and with the quality expected by the consumer. The study is justified by the high number of small units producing food in the country and little bibliography about the sector, being some of these production units considered of low qualification in the activity you develop. And, to ensure that such quality reaches acceptable

levels, you should invest in a better quality management, with the use of indicators and tools that guarantee the quality of the production process, as well as of the final product. This study may assist in the generation of new knowledge about the use of these tools, allowing a new vision of researchers regarding its use. The objective of this study is to propose quality tools in the productive process of food for improvement of performance indicators for the company, in addition to list the points in the productive process, able to influence the quality of the final product; implement quality tools that can influence the improvement of the production process and identify, by means of microbiological analysis, the critical control points in the production process of the food. The methodology that was used for the construction of this study is the literature, since it is a theoretical-conceptual work, in which the matter will be researched bibliographically in other papers, articles, books, documents, among others. Among the elements that form the set of processes necessary to achieve the purposes of research are the bibliographical researches, descriptive, historical and documentary. Second Cervo, Bervian and da Silva (2007), the bibliographical research "constitutes the basic procedure for the monographic studies, by which to search the area of the state of the art on a given topic."

PDCA Cycle: The PDCA is a method of managing processes, is the way to achieve the targets assigned to products of enterprise systems. It helps in the diagnosis, prognosis and analysis of organizational problems, being extremely useful for the solution of problems. It is a method quite effective in pursuit of improvement and continuous improvement, in order that it leads to systematic actions that accelerate the achievement of better results with the purpose of ensuring the survival and growth of organizations (QUINQUIOLO, 2002). According to Andrade (2003), the PDCA cycle is divided into four phases as well defined and distinct, can be described as follows:

- **Plan:** establish the organizational goals and processes necessary to deliver results in accordance with the diverse customer requirements and organizational policy.
- **Do:** implement the processes, i.e., perform the actions established in the plan of action defined in the previous phase, being held on schedule and determined.
- **Check:** at this stage must be carried out to check the effectiveness of the actions taken in the previous phase. Using for this comparison of results (planned and executed).
- **Action:** this phase is responsible for the standardization of the procedures implemented in "phase", being the satisfactory result should standardize these actions, transforming them into standard procedures.

Quality Management

Which leads consumers to choose a product among many others is the value that the consumer will assign. The value can be defined as the ratio between what the consumer gives is that you assign. The value can be defined as the ratio between what the consumer gives and what he receives, in other words, customers receive benefits from the acquisition of the product and bear with the monetary costs, cost of time, energy. In this way, the value is given by the ratio between benefits and costs (MARCY PAVORD, 2010). This ratio between benefits and costs of product is an alternative way of expressing the degree of customer service the needs and expectations of the customer from a global perspective of the product. Customers will always seek products that have a greater value (benefits/costs) or that best meet their needs and expectations (MARCY PAVORD, 2010). The total quality management originated in Japan in the years 50 and 60 and brought great revolution in the business world. In recent decades, numerous studies have been developed in this area, generating several concepts, which have been applied primarily in manufacturing and, subsequently, in the area of services. Due to the special features of services, several authors have proposed specific concepts for quality in this sector. The most quoted is what defines how the relationship between the expectations of customers, before the purchase of service and their perception during and after the provision of the same. When the client's perception surpasses expectations, the service is considered of high quality. (Isosaki; nakasato, 2009).

For quality assurance of a food product, there are tools and programs that can be used to achieve success in the activity. According to Silva (2005), among the tools deserve the famous 5' s, Hazard Analysis and Critical Control Points (HACCP), certifications, among others. As to the programs, one of the most important is the Safe Food Program (SBP), which is designed to ensure the production of safe food for health and consumer satisfaction, strengthening the aggregation of values in the process of generating jobs, services, income and other opportunities, for the benefit of society. The program "5S" is used to evaluate each sector of the company in the aspects of selection, sorting, cleaning, well-being and self-discipline. The program "5S" was created in Japan, in the post-war period, inspired by the need that had to put some order into confusion that has reduced the country after his defeat. The program proved to be as effective as the reorganizing companies and the economy itself which even today is considered the main instrument of management of quality and productivity used in that country. In Brazil, was released only in 1991 through the Foundation Christiano Ottoni (SILVA, 2005). According to Silva (2005), the 5S program aims to combat losses and wastes in companies and industries, educate employees directly involved with the activities to improve and maintain the quality system.

Quality Management Tools: The work of planning, analysis and search for solutions can be facilitated with the use of techniques called quality management tools. They are techniques used to define, Measure, analyze and propose solutions to the problems that interfere with the proper performance of work processes. It should be noted that there is no gold standard tool able to solve all problems; each professional should combine as many tools as are necessary for the development of a specific project (Isosaki & nakasato, 2009).

Second Isosaki & nakasato (2009) the quality tools have the following objectives listed below

- facilitate the visualization and understanding of problems;
- synthesize the knowledge and the conclusions;
- develop creativity;
- allow the knowledge of the process;
- provide elements for the monitoring of processes;
- allow the improvement of processes.

Quality in the food industry: The concept of quality of food, in view of the consumer, is nothing more than the satisfaction of characteristics such as flavor, aroma, appearance, packaging, pricing and availability (WURLITZER, 2007). On a scale of values, the quality allows you to evaluate and, consequently, approve, accept or refuse a certain type of product through sensory evaluations, microbiological, physicochemical and standardization. Juran (1991) reports the definition of quality as:

"Produce quality is a great activity that always involves a large number of variables that alone requires continuous analysis of the process. In addition, it is an action essentially dynamic, i.e., there are always new elements that arise in the internal environment (technological innovation, for example) or external (change of habit of consumption, for example). " Some of the main reasons for the existence and necessity of this quality in the food industry, we can mention the validity of the product, the risks that can cause and the conservation of its original characteristics like flavor. Currently, the management of the quality is being one of the biggest concerns of the companies, whether they are geared toward the quality of products or services. The awareness for the quality and the recognition of its importance, has the certification of the quality management systems essential for the micro and small companies from all over the world. In a competitive industry products and services, the quality is becoming one of the major weapons to obtain advantages in the market of recent years. With the increasing concern of consumers in relation to the quality of the food there was an increase in competition between the industries and intensification of the activities of the official organs of inspection. The quality of the food available for consumption is of utmost importance to ensure the satisfaction of nutritional needs and the health of the population. Due to the growing industrial competitiveness and consumer awareness about their rights, the attentions have turned increasingly to the quality of the products marketed. (Oliveira, 2005). The foods are susceptible to contamination by various etiologic agents, which may lead to the development of diseases, affecting human health caused by pathogenic microorganisms and their toxins. It should be emphasized that all foods should be objects of microscopic examinations and/or microbiological. These analyzes reflect the hygienic conditions involving the production, storage, transport and handling to elucidate the occurrence of foodborne diseases. The problems encountered can be minimized through systematic quality control and health education programs. (Livera *et al*. 1996; Tavares; Lobanco & Sakuma, 1996; Steps & kuaye apud grandson; Silva & Stamford, 2002). In the food industry, multiplication and survival of microorganisms must be controlled in raw materials, on the surfaces of equipment and utensils, processing environments, in food handlers in packaging, distribution and final product. The correct monitoring of the sanitization procedures assists the production of food with the microbiological quality recommended by current legislation (Andrade, 2009).

Good Manufacturing Practices: Good practices are rules of procedures to achieve a certain standard of identity and quality of a product and/or service in the area of food science, whose efficiency and effectiveness should be evaluated through inspection and/or research (Silva, 2008). The Good Manufacturing Practices (GMP) address the principles, procedures and basic means favorable to the production of food with acceptable quality. Already the Good Hygiene Practices (BPH) describe the basic hygiene measures that the establishments must keep the what are the pre-requisites for other systems, in particular the Hazard Analysis and Critical Control Points (HACCP) (Forsythe, 2002). The Good Practices (BP) have a broad approach and cover many operational aspects of plant and personnel. The standard procedure of Operational Safety (PPHO) and Standardized Operating Procedure (POP) are procedures used by food processing companies to achieve the overall goal of maintaining the BP in food production (SENAC/DN, 2004). In a service of nutrition when it comes to quality, besides the issue of management, a fundamental point is food safety, with the adoption of preventive measures against the placement of pathogenic agents and good practices (Isosaki & nakasato, 2009). Each segment of the food industry must provide the conditions necessary to protect the food while they are under your control. This has been accomplished by the application of GMP as a prerequisite for the implementation of the HACCP system (PAHO, 2001). One of the tools used to achieve the good practices, is the connector of inspection or check-list for the area of food science. It is allows us to make a preliminary evaluation of the hygienic-sanitary conditions of a producer of food. This initial evaluation allows lifting items not conforming and, on the basis of collected data, establish 26 corrective actions for adaptation of the requirements seeking to eliminate or reduce physical, chemical and biological risks, which may undermine the food and health of the consumer (Genta; Mauricio & Matioli, 2005). The hygienic and sanitary control of food is a paramount factor for the prevention of foodborne diseases allowing you to prevent the diseases that can reach the man. Thus, the deployment of Good Manufacturing Practices is necessary to ensure the provision of safe food for consumers' health.

Final considerations

This study explored the implementation of quality management tools for small industries. The literature review addressed information on the management of production and the importance of managing the implementation and integration of processes, on the management of the quality and importance of the implementation of tools that help to control and organization of activities. From data collected through exploratory interviews, we observed some obstacles encountered in the implementation of quality management systems, through the deployment of quality tools. In the cases observed, the main difficulties were due to lack of knowledge or training and understanding of how to use the correct way and what benefits the use provides. It was also observed reasons that make some industries seek for management systems, and the benefits that these companies enjoy due to application of quality tools, such as greater organization and financial growth. This study explored information concerning the importance, barriers and benefits in the deployment of quality tools and can be used as a first step in a more in-depth study, applying these quality tools in companies that do not use and making more detailed follow-up of the items raised in this article.

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