IOSR Journal of Business and Management (IOSR-JBM)
e-ISSN: 2278-487X, p-ISSN: 2319-7668. Volume 22, Issue 4. Ser. III (April. 2020), PP 53-66
www.iosrjournals.org

FSSC 22000 CERTIFICATION: Study of Implementation in a Brazilian Agroindustrial Cooperative located in the Southwest Region of the State of Sao Paulo

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Abstract:
Background*: Food safety is defined as the prevention of hazards carried by food at the time of consumption. FSSC 22000 consists of an international certification whose main objective is to ensure the supply of safe products to consumers all over the planet. This research aimed to map the main impacts of the implementation of the FSSC 22000 standards on the organizational structure of an agroindustrial cooperative located in the Southwest region of SaoPaulo. The Human Resources, Quality Assurance, Workplace Safety, Marketing and Production functional units were mapped.*
Materials and Methods*: A single case study approach was used, classifying it as exploratory / descriptive research. As an instrument of data collection, the interview based on a semi-structured script was used, using the snowball technique, supported by documentary research and complemented with systematic observation.*
Results*: The results point to several impacts, bringing as expected benefits the intensification of training / capacity building, performance evaluation, automation of processes, communication, standardization of procedures and monitoring, monitoring and surveillance, control of chemical products, signaling, storage of packages, segregation of waste, internal effort to prospect new markets, visual communication and consumer safety.*
Key Word*: Food Security; Organizational structure; Competitive advantage; Impacts; Agroindustrial Cooperative.*

Date of Submission: 28-03-2020 Date of Acceptance: 16-04-2020

I. Introduction

The growing demand for quality and safety in the products demanded by consumers, has imposed great pressure on organizations to obtain more effective measures, with regard to food safety and quality (Peretti & Araújo, 2010).

Coelho (2013) states that the production and distribution of the food industry has a global scale, making food security a concern also of international bodies such as the World Health Organization (WHO), United Nations Organization for the Food and Agriculture (FAO) and the European Commission (EC) itself.

The World Health Organization (WHO) and the Food and Agriculture Organization (FAO) (2009), define food safety as the prevention of hazards transmitted by food at the time of consumption. However, as the occurrence of hazards can occur at any stage of the food production chain, safety and quality have become a concern for the entire production chain, from primary production to the moment of distribution.

According to the Codex *Alimentarius* Commission (2011), to meet this growing demand for food security, a range of concepts and methodologies emerges that focus on preventing and anticipating situations of intentional contamination, fraud and food adulteration. One way for companies to demonstrate commitment to such a situation is through the search for certifications such as the Food Safety System Certification (FSSC 22000).

The FSSC 22000 standard is based on standards established by the International Organization for Standardization (ISO), focusing on food safety for the entire production chain, from ingredients and materials that have contact with foodstuffs to the final product, of animal and vegetable origin (Foundation FSSC 22000, 2016).

The realization of this research is justified as a contribution to the debate on the FSSC 22000 certification process in companies, notably with a focus on its impacts and, especially an analysis of the implementation in an agroindustrial cooperative.

In this sense, the study aimed to analyze the impacts on the organizational structure of an agroindustrial cooperative located in the Southwest region of the state of São Paulo from the implementation of the FSSC 22000 certification.

1. Literature Review

1.1 Cooperative Management

Lately, there is a growing interest and discussion of several theoretical and practical specialists in the issue of cooperative management and in the creation of cooperative relationships (Vodak et al. 2013). The quality of relationships arising from partnerships between the most diverse players is an important prerequisite for the success of any company and, in particular, of cooperatives in a market (Soviar and Zavodska, 2011).

According to the International Cooperative Alliance (ACI), cooperatives are voluntary associations, constituted and managed democratically by individuals who come together to fulfill their economic, social and cultural needs. Cooperatives are based on the fundamentals of participatory governance, being managed by the members themselves (ACI, 2010).

Agroindustrial cooperatives, through the insertion of small and medium producers in concentrated markets and adding value to their processes, play a relevant role in the economic and social development of their members (Chase, 2003). This type of organization has benefits related to vertical integration, with gains such as reduced costs through bargaining power in the acquisition of inputs, increased market share, economies of scale, efficiency gains from its management capacity, in addition to minimization of risks in joint actions (Souza & Braga, 2007).

The increase in the complexity of the management of cooperatives has resulted in the increase of their structures, a characteristic typical of large organizations. Cooperatives demand qualified managers to deal with complex agribusiness issues, and at the same time, there is a strong propensity to maintain the management body formed by cooperative members (Machado Filho et al. 2004). Therefore, a barrier to the increase of this complexity is the relationship with the cooperative members, because at the same time that they are customers, they are also suppliers and owners. Therefore, there is the emergence of conflicting interests, such as the difficulty of meeting the market demand in reducing the price of the final product, with the price paid for the raw material, coming from cooperative suppliers (Bialoskorski, 2001).

According to Machado Filho et al., (2004), cooperativism is a model that is difficult to manage due to its own regimental aspects. It is possible to observe this practice in decision-making, where the most economically active and active member has the same voting power, as the one who has little participation and is less active. In general, heterogeneous demands are met, increasing the political weight in the decision-making process, making governance very complex and focusing the managerial effort on it. In view of the complexity of interests, other management problems end up originating, under the risk of loss of focus and business competitiveness.

The management of cooperatives can be considered a set of approaches, methods, techniques and procedures used in company management that define the direction of business cooperation. To implement and execute cooperative management, it is necessary that the company has some results in the area that affect cooperative management. It is necessary to identify the current level of preparedness in order to find weaknesses and define recommendations to improve them (Lendel and Varmus 2012). However, it is also essential to have an adequate methodology to assess a company's readiness for the implementation and performance of cooperative management (Vodak et al. 2013.).

However, the competitive market environment tends to pressure cooperatives to adapt, both to their organizational structure and to the formulation of business strategies, implementing strategic management processes (Machado Filho et al. 2004).

1.2 Competitive advantage

According to Brito and Brito (2012), with the increase in research related to the area of strategic management, the theme of competitive advantage obtained a more scientific approach, moving from an occasional reference to one of the key concepts of the discipline.

Companies that compete in local markets and have the prospect of expanding their (global) markets must develop a strategy that allows them to take advantage of their resource portfolios and a competitive advantage over their competitors. Differentiation and cost leadership are two main business strategies commonly used to gain a competitive advantage (Barney et al. 2010).

Notably, each of these strategies requires different types and levels of resources in order to implement effectively, resulting in an advantage over competitors and obtaining positive returns (Sirmon and Hitt, 2009).

The most complete definition of competitive advantage is initially presented by Brandenburger and Stuart (1996), as the value interval created between the willingness to pay by the customer and the opportunity cost of the suppliers. This understanding, later deepened by other authors, implies that the analysis of

competitive advantage will take place in the context in which the company is inserted and in its relationships in the vertical chain (Adner & Zemsky, 2006).

Theories that discuss the topic, competitive advantage, are divided into two main axes (Table 1). The first is described as the theories that judge competitive advantage as a characteristic of positioning outside the organization, addressing the explanatory currents of structural analysis of industry and market processes. The second axis are those that judge superior performance as a consequence of internal characteristics of the organization, presenting the following theories: Theory of Resources and Theory of Dynamic Capabilities (Vasconcelos & Cyrino, 2000).

Table 1. Comparison of theories about competitive advantage.

	Industry Structure	**Resource Theory**	**Market Processes**	**Dynamic Capabilities**
Axis	Outside the Organization	Inside the Organization	Outside the Organization	Inside the Organization
Analysis Unit	Industry	Resources and competences	Market dynamics, cycles of creation and destruction, innovation, imitation and selection	Organizational processes and routines; flows of resources and specific skills
Source of Competitive Advantage	Attractiveness and positioning of the firm in the industry	Access to unique resources that are difficult to imitate	Innovation and "creative destruction"	Organizational routines and processes capable of regenerating the firm's resource base
Strategy	Searching for attractive industries, searching for the ideal position in the industry and defending this position by building barriers to competition	Development and exploitation of existing resources and competences	Continuous search for innovation opportunities and efforts to imitate successful innovations	Interaction between skills and market opportunities
Main Author	Mason (1959); Bain (1959); Porter (1980); Ghemawat, (1991); Shapiro (1989).	Selznick (1957); Penrose (1959;1963); Andrews (1980); Rumelt (1987); Wernerfelt (1984); Barney (1991); Peteraf (1993).	Schumpeter (1934;1955); Jacobson (1992); D'Aveni (1994).	Teece (1988; 1994; 1997); Nelson e Winter (1982); Teece et al. (1997); Prahalad e Hamel (1994); Dierickx e Cool (1989); Amit e Shoemaker (1993); Sanchez et al (1996).

Source: Prepared by the authors from Vasconcelos and Cyrino (2000).

Although the use of the term "competitive advantage" is constant and commonplace in the management literature in general, its definition is uncertain. The concept is clearly associated with a superior performance of companies, but this association has several approaches, depending on the authors and the context (Combs et al. 2005).

In the field of strategy, discussions about the relationship between organizational structure and strategy generally indicate that the structure follows the strategy (Chandler, 1962), or that the structure depends on the strategy. By its very nature, the strategy implies several coordination and control problems. Structural devices, such as centralization, division and so on, help to deal with these problems (Miller et al. 1988). Studies demonstrate that strategic decisions influence the characteristics of the organizational structure, in order to achieve a successful implementation of strategies (Chandler, 1962; Okumus, 2003; Claver-Cortés et al. 2012).

1.3 Organizational structure

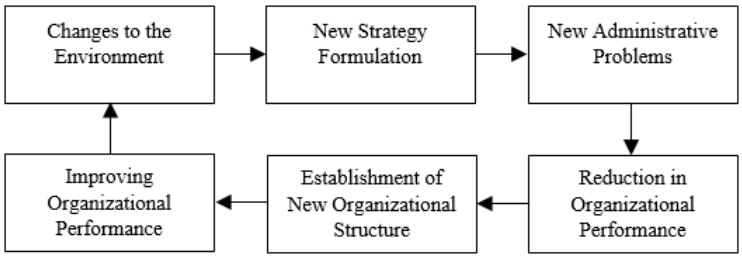
The organizational structure is an indispensable tool for companies and consists of the distribution and specification of authorities and activities, allowing the achievement of organizational objectives (Jabbour et al. 2012).

According to Cury (2000), it is essential that the organizational structure understands the disposition of the different units that make up the company, as well as the relationships between subordinates and superiors, covering duties, responsibilities, authorities and communication. Various situational or contingent factors influence the choice of these parameters, and vice versa, among them are: the age and size of the organization, its technical production system, characteristics of the environment (stability and complexity) and the power system (Almeida et al. 2006). In relation to this, according to research and debates in the literature, it was concluded that the most appropriate organizational structure is that linked to the organization's strategic planning (Oliveira, 2006).

According to Chandler (1998) and David (2002), changes in the organizational structure of organizations are motivated by changes in strategies that are linked to changes in the environment faced by

them. Thus, Chandler (1998) presented a structural order that is repeated as companies grow and change their strategies (Figure 1).

Figure 1. Chandler's strategy-structure relationship.



Source: Adapted from Chandler (1998)

As the company grows, the environment in which it is inserted begins to undergo changes, which ends up resulting in the need for a new strategy to deal with current opportunities, difficulties and competitors. However, when the company modifies its strategy, the existing organizational structure becomes ineffective, generating administrative problems and consequences on organizational performance. Thus, the company, in order to solve the problem, establishes a new structure that accompanies the strategy, increasing its performance again (David, 2002).

With regard to the communicational aspect, the adjustment in the organizational structure can greatly facilitate the coordination of individual actions, maintaining the balance between the need for intensive interactions between those who are connected by the process, avoiding coordination overload (Eppinger, 2001), which it can be measured by the frequency of e-mails, text messages, phone calls, use of intranet, meetings etc. (Zhang et al. 2018).

1.4 Food Security

Food has always been an important political focus for governments, and achieving sustainable global food security is one of humanity's contemporary challenges (West et al. 2014). History shows that those who have failed to provide enough food to their populations — whether they are kings, dictatorships or parliaments — have had no support in power (Fraser & Rima, 2010). But in recent decades, agricultural production has received relatively little attention compared to other political objectives, such as the search for other forms of economic and social development. Everything suggests that the apparent successes of the Green Revolution convinced decision makers that food security would take care of itself (Foresight, 2011).

Since the beginning of the second decade of this new millennium, this scenario has undergone significant changes. Price volatilities have revealed the vulnerability of millions of people worldwide to hunger (Oxfam, 2011). In addition, there is a growing recognition that a more sophisticated understanding of what "food security" really means (Fao, 2008).

At the same time that billions of people have energy-deficient diets, approximately the same number suffer from energy surplus diseases, while an estimated two billion suffer from 'hidden hunger' for micronutrient deficiencies. Thus, a considerable proportion of the seven billion people in the world can be found to be in some degree of malnutrition.

Environmental problems caused by the way food is produced and distributed not only compromise the ability to produce food, now and in the future (mainly contributing to climate change, with global implications for livelihoods and, in some cases, lives), but it also puts at risk the existence of a large part of the world's biodiversity (Foresight, 2011). Population growth and increased consumption per capita (Zhang & Anadon, 2014; Lu et al. 2015; Godfray et al. 2018), as people become richer, these problems increase and worsen (Lutz & Samir, 2010). How to guarantee food security has been the focus of many scholars (Conceição et al. 2016).

According to WHO and FAO (2009), food security is the guarantee of the production and supply of safe food according to the intended use.

Any physical, biological or chemical agent present in foodstuffs or animal feeds represents a risk for food safety, which may cause danger to the consumer (Regulation nº 178/2002).

Food-borne diseases can lead to a decrease in the health of individuals and, as a result, an increase in health expenses and a reduction in the availability of food due to microbial activity and, thus, economic losses in the food sector (Derreado, 2017). Therefore, more and more food security has become a central issue in the strategy of companies operating in the food sector.

Food security consists of a simple logical deduction of a set of premises: (i) it is virtually certain that the demand for food will increase dramatically in the coming decades and the increase in production must be

part of the answer (but not the only one) to guarantee food security ; (ii) the conversion of new land to agriculture would cause significant damage to the environment; (iii) reducing the environmental impact of food production is essential for future human well-being and prosperity; and (iv) the challenges are such that the tools of all forms of agriculture must be considered without prejudice (Godfray & Garnett, 2014).

Food security is related to the concept that indicates that food will not harm the health of the consumer when prepared and / or consumed according to the intended use (ABNT 2006). Thus, increasingly competitive strategies are developed by groups in the agrifood industry in order to win consumer confidence in quality, provenance and food safety (Vieira, 2009), ensuring that consumer health is not affected (Cantanhede et al. 2018).

In view of this growing demand for food safety, here understood total transparency in the production processes, adoption of rigorous standardized quality requirements, adequacy of norms and procedures with a focus on productive efficiency, zeal for the brand with the stakeholders, the company starts to seek the certification that guarantees a seal as a guarantee that it meets the highest standards required by the market (internal and external).

Thus, a range of concepts and methodologies is adopted by organizations, focusing on certifications in general and certifications in the field of food safety in particular (Codex Alimentarius Commission, 2011).

1.5 Certifications

Around the world, there is an increasing attention to food safety (Henson & Jaffee, 2007). Companies and agribusiness have been working hard to implement and improve food safety management systems (FSMS) in recent decades, since the Codex Alimentarius code of hygiene practices became the world reference. Currently, however, food products are sourced from around the world, transported over long distances, produced under different cultivation practices and climatic conditions, and are manufactured using various processing techniques, creating more possibilities for the incidence of risks to food security (Henson & Jaffee 2007; Jacxsens & van der Vorst 2010; Tirado et al. 2010).

Pons and Sivardière (2002), affirm that certification is the mechanism that offers a written guarantee from a determined organism that a product, process or service is in accordance with the established conditions. The certification of an organization, regardless of its size or sector of activity, then refers to the formal recognition by a certifying entity that the organization has an implemented management system that complies with the applicable standards.

The certification ensures that the company is looking for improvement in its administrative and productive processes (Arvanitoyannis & Kassaveti, 2009). Obtaining certification is a voluntary process for companies, however it is of great relevance taking into account that the adherence to management practice has an advantage mainly in the international market, because according to Soares (2013) the global market seeks a standard of quality of all products, processes and services offered by organizations.

Certification consists of standardized and universal practices. It has now become an essential form of coordination and control in the global market, contributing to and favoring globalization (Karapetrovic et al. 2010). According to Briscoe et al. (2005) and Chang and Lo (2005), certification offers advantages and disadvantages (Table 2).

Table 2. Advantages and disadvantages of certifications.

Advantages	**Disadvantages**
Awareness of company members	Costs of obtaining the certificate and maintaining it
Best management practices	Renewal of certificate and increase of internal bureaucracy
Savings in non-quality costs	Increased workloads and rising total costs
Increased quality and competitive advantage	
Increased customer satisfaction and better external image	

Source: Adapted from Briscoe et al. (2005) and Chang and Lo (2005).

The first advantage is the awareness of company members regarding the importance of quality. Then, improving management practices, such as improving processes, increasing productivity, better internal communication, well-defined authority and responsibilities, and improving audit and inspection systems. It also increases the quality of products, thus saving non-quality costs, that is, products with defects, promoting the competitive advantage of the organization. As a result of all these factors, there is an increase in customer satisfaction and a better external image of the company. The disadvantage is the cost of obtaining and maintaining certification, increasing bureaucratization with periodic audits and increasing the workload until its implementation.

Food safety certification can help satisfy consumers' expectations by informing them of the product's safety attributes. According to the Food and Agriculture Organization of the United Nations (Fao, 2006),

certification can be defined as a process by which third parties provide written documents to ensure that a product or process complies with established standards (Uggioni & Salay, 2012).

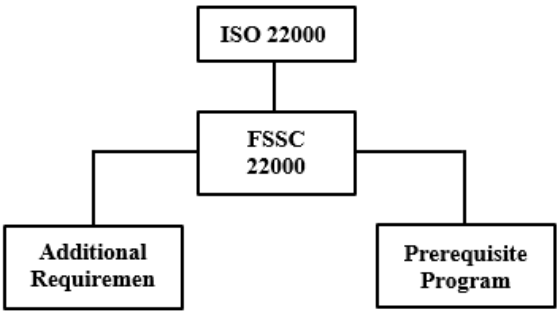
1.6 FSSC 22000 Certification

The Dutch non-profit entity FSSC, developed in 2009 the FSSC 22000 reference as a solution to the need to fill the gaps presented by the ISO 22000 food quality management standard. The Global Food Safety Initiative (GFSI) established that the ISO 22000 standard does not it was efficient in achieving approval. It obtained full approval in 2010 (Cantanhede et al. 2018). Thus, FSSC 22000 was created as a combination of ISO 22000: 2005 and Publicly Available Specification (PAS) 220: 2008, being approved and recognized as a food product certification reference for the food industry (Severino, 2016; Cantanhede et al. 2018).

The FSSC 22000 certification applies to public or private organizations, with or without profit, throughout the food chain. Its objective is to ensure the supply of safe products to consumers worldwide, establishing and maintaining an accurate and reliable record of certified organizations that have proven to be in compliance with established requirements (FSSC 22000, 2017a).

The requirements of the FSSC 22000 certification framework, consists of three components, ISO, Prerequisite Programs (PPR) and Additional Requirements, which must be audited as one (Figure 2).

Figure 2. Constituent components of the FSSC 22000 standard.



Source: FSSC 22000 (2017b)

ISO is an international organization, whose function is to develop international standards and norms in order to simplify commercial relations between countries (Coelho, 2013). In this way, ISO 22000, establishes the requirements for the development, implementation and maintenance of the food safety management system and in order to be successful in implementation, the operations must be specified, documented and verified. (FSSC, 2017b).

In clause 7.2 of the ISO 22000 Standard, there is a requirement for the selection and implementation of PPR's, which are responsible for integrating the basic activities and conditions necessary to maintain a hygienic environment throughout the entire production process.

Additional requirements have been included in the FSSC 22000 framework to ensure food safety control. According to FSSC 22000 (2017b), the additional requirements are: Service Management; Supervision of Personnel; Management of Materials Provided; Natural Resource Management (only for animal production); Food Defense; Food Fraud Prevention; Product Formulation (only for dog and cat food); Allergen Management; Product Labeling; Environmental management.

1.7 Certification Process

The audit process for obtaining FSSC 22000 certification is based on the ISO 22000 framework and takes place over a three-year period. It is carried out by a qualified entity, ensuring compliance with the FSSC 22000 requirements management system. During the certification period, surveillance audits are carried out at least once a year by this entity, followed by an audit of complete certification in three years (Severino, 2016).

The FSSC 22000 certification process consists of six steps to be followed by interested organizations (Table 3).

Table 3. Steps for the certification process.

Stage	Stage Description
1	Certification begins with a self-assessment of the company's current situation with the requirements of the scheme
2	Subsequently, the analysis and decision to proceed with the certification, and if the answer is positive, the company must choose a Certification Body approved by FSSC 22000

3	The audit is divided into two stages. The first refers to an on-site audit, which is subsequently issued with a report with the identified non-conformities and an action plan for correction
4	4.1. The action plan presented in the first stage has not been fully implemented or is unsatisfactory, and the issuance of the certificate has not been released. The organization returns to the initial audit phase 1; 4.2. The action plan was duly fulfilled, and the issuance of the certificate according to FSSC 22000 was released
5	After certification, an agenda with the dates of the maintenance audits must be stipulated to guarantee continuous improvement of the management system, with a minimum interval of one year between the audits
6	For the possibility of a recertification audit, a visit is carried out before the 3-year cycle ends

Source: FSSC 22000 (2017c)

The FSSC 22000 certification provides a series of advantages for companies looking to excel in food safety and customer satisfaction, resulting in a competitive advantage in the market. The advantages of FSSC 22000 certification are essentially the following (Eic, 2016):

a) Recognition by GFSI, being accepted globally, allowing access to the international market;
b) Increased confidence in the company;
c) Encouraging continuous improvement due to periodic audits;
d) Monetization of resources and;
e) Cost reduction.

II. Material and Methods

The present study is characterized as being of a qualitative nature, contemplating aspects of exploratory and descriptive research. The first has as its main objective the improvement of ideas in order to provide greater familiarity with the problem, making it more explicit or to build hypotheses, while the descriptive ones aim to describe the characteristics of a given population or phenomenon and the establishment of relationships between variables (Gil, 2010).

As for the approach, the research can be considered as a single case study (Young, 1960; Yin, 2005). The interview was based on a semi-structured script supplemented by the snowball sampling or "snowball" technique, which consists of a non-probabilistic sample used in social surveys where the initial participants of a study indicate new participants who in turn indicate new ones participants and so on, until the proposed objective (the "saturation point") is reached. The "saturation point" is reached when the new interviewees start to repeat the content already obtained in previous interviews, without adding new relevant information to the research (Wha, 1994). Therefore, snowball is a sampling technique that uses reference chains, a kind of network.

He also composed the methodological framework, the documentary research (Marconi & Lakatos 2015), followed by the analysis of the documents obtained during the visit to the organization (Cellard 2008; Sá-Silva et al. 2009). In addition, systematic observation was adopted to corroborate points raised in both interviews and documentary research.

The technique used to analyze the interviews after transcription was the content analysis as proposed by Bardin (2011). According to Chizzotti (2006), content analysis aims to critically understand the meaning of communications, its manifest or latent content, the explicit or hidden meanings.

Finally, the methodological triangulation, defined as a combination of different methodologies to analyze the same object of study, being a qualitative alternative for the validation of research that uses multiple research methods in order to ensure a deeper understanding of the phenomenon investigated (Flick, 2009), was decisive for the consolidation and greater robustness of the analysis of the research findings, enabling a more direct conversion to meet the proposed objective.

III. Result and Discussion

In 1953, a group of Dutchmen migrated to Brazil in search of land to raise cattle, and established themselves as a milk cooperative. In 1954, this cooperative joined with another, and soon became one of the most important properties that make up the region's dairy basin.

Currently, the corporation has Business Units divided into Operations (agricultural, meat, milk, potato, beans and administration) and industrial (meat, milk, potato and beer), with 3216 employees and 916 members.

The Business Unit, object of study of this research, was created in 2014 in the Southwest region of the state of São Paulo, with milk as the exclusive raw material for its operations. The cooperative was born from an industrial project between two cooperatives from Paraná and its location was strategically chosen close to the largest consumer center in the country.

The studied unit does not have a formalized and officially organized organizational structure in an organization chart. However, from the interviews, from the documentary analysis, corroborated by the systematic observation, the organizational structure outlined in Figure 3 was outlined.

It can be seen that the unit has a structure composed of seven (7) levels, namely: Board, Management, Coordination, Supervision, Analyst, Assistant and Assistant. As pointed out in the literature, there is a certain focus on the scope of coordination (Mintzberg, 1991).

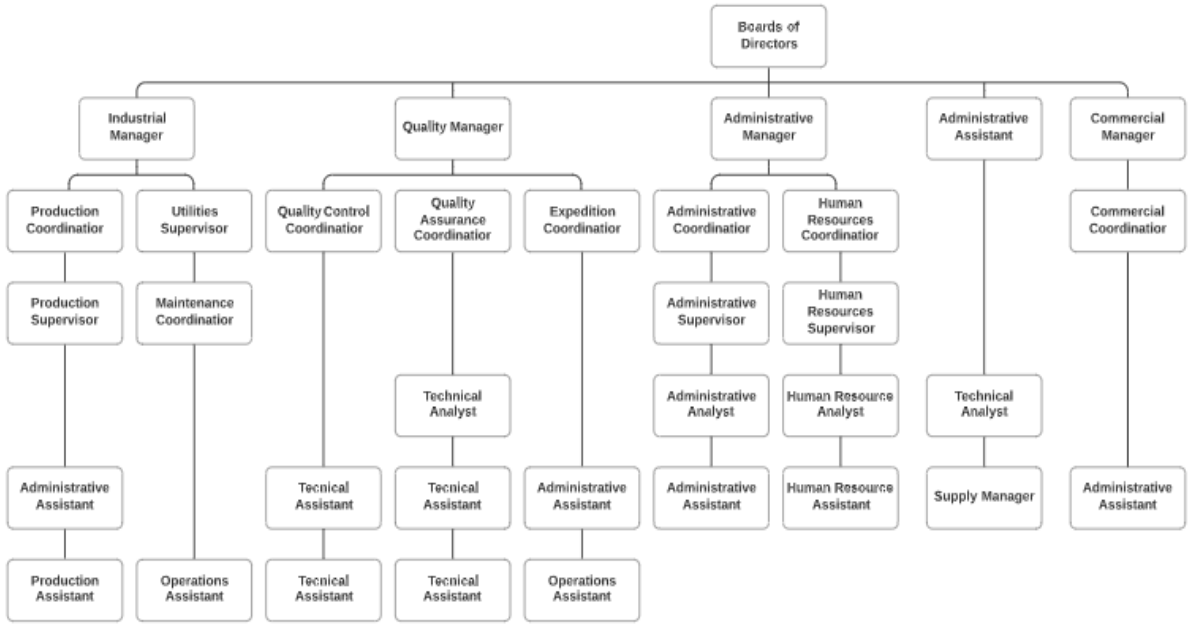


Figure 3. Cooperative organizational structure.

Source: Research data.

At the top of the structure is the general management, followed by the five managements: Industrial, Quality, Administrative, Supply and Commercial. Except Supply management, all others have coordinators.

Supervision is restricted to Industrial and Administrative management; Analysts, in turn, only in Quality, Administrative and Supplies.

Note that Assistants are present in all functional units. Finally, Technical Assistants, Operations and Production interconnected in Industrial and Quality.

It is inferred that situational factors have a strong influence on the choice of these parameters that make up the structure now outlined, among them, the time and size of the organization, its technical production system, the characteristics of the environment, as well as the power system, as points out studies by Almeida et al. (2006). Notwithstanding this, the parameter "time" or "age" does not seem to be configured in the organization under study, since it is only five years old.

The interview was conducted with four actors of significant relevance in the certification process. Table 4 provides the interviewees' position and length of stay.

Table 4. Interviewee information.

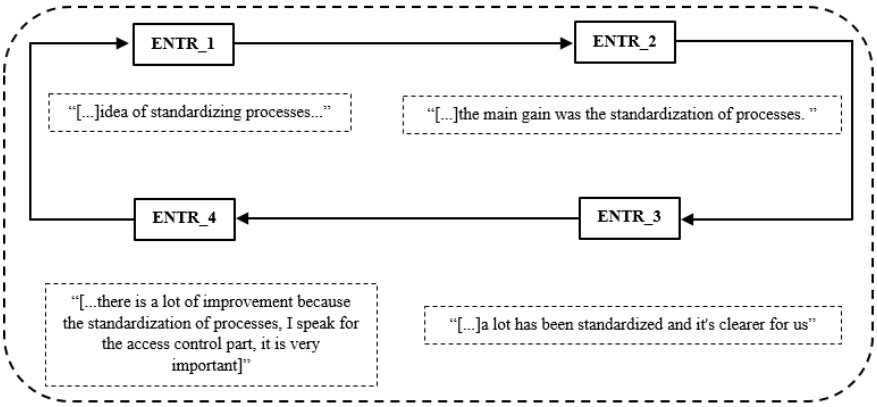
Interviewed	Office	Time in office
ENTR_1	Human resources assistant	5 years
ENTR_2	Technical Quality Assurance Analyst	1 year and 3 months
ENTR_3	Project Leader Implementation of FSSC 22000 certification	2 years
ENTR_4	Workplace safety analyst	1 year

Source: Research data.

The order of the interviews was the same as in Table 4, starting with ENTR_1 and ending with ENTR_4, with the indications being made successively. The "saturation point" was found in ENTR_4, when the subsequent interviewee started to repeat the content already obtained in previous interviews, however, not adding new information that was relevant to the research (Wha, 1994).

The extracts extracted from the interviews corroborate the statement, as shown in Figure 4.

Figure 4. Snowball methodological design.



The process of implementing the FSSC 22000 standard caused important changes already in the company's reception space. Before entering the industrial space, visitors are introduced to the new personal safety guidelines, the safety requirements of the quality of the raw material, in addition to the safety procedures for employees.

Table 5 systematizes the main aspects raised with the application of systematic observation.

Table 5. Relevant points observed.

	Observation Points	
Observed Items	Reception	Food safety and employees
	Identification form	Trainings
	Integration and instruction video	Uniformeds
	360º view of milk processing	Hazard signs

Source: Research data

The "identification form" makes it possible to collect information regarding aspects such as: use of controlled drugs; disease portability; use of makeup and other cosmetics; types of objects in the personal bag. The same document provided guidance on the mandatory use of closed shoes and hair up.

After this stage, the visitor is invited to watch an institutional video that, in addition to telling the company's history, reinforces all the procedures necessary for the security of both the visitor and the company. These results are in line with the proposition of WHO (2009) and FAO (2009).

Another relevant point is the system in which the visitor is able to have a complete view of the entire production process in the manufacturing area, walking through a corridor with transparent glass. The company calls this structure "360º structure". It is a system that allows its main stakeholders (customers, suppliers, society, among others) to have full knowledge of the processes, notably in terms of food hygiene and safety.

The concern with adapting to the safety guidelines of employees, food and visitors proposed by the certification is quite evident. Conducting constant training for employees, focusing on FSSC 22000 certification, with emphasis on how to deal with the changes imposed by it.

Employees use proper clothing (gloves, white clothes, caps, white PVC boots, etc.) aiming at total hygiene, food safety, as well as job security (Derreado, 2017). Finally, the entire signaling apparatus for restricted, private and danger areas, among other guidelines, is well outlined.

Table 6 presents the types of documents used to extract relevant and contributory information to the study.

Table 6. Types of documents and sources.

Documents	**Types of Documents**	**Sources**	**Content**
Forms	Physicist	Recepção	*Checklist*
Magazine	Digital / Online	*Website* corporativo	Technical / Informative
Institutional Website	Online	*Website* corporativo	Historic
Standards / Procedures / Business History	Audio-visual	Acervo da Empresa	Standards / Procedures
Staff List	Digital / E-mail Attachment	Setor de Recursos Humanos	Positions and Functions

Source: Research data

The online magazine and the corporate website contributed to the construction of the historical report and characterization of the studied unit. The systematization of the information obtained with the application of data collection and analysis techniques, made it possible to compare the steps of implementing the standard in the cooperative, with the steps described on the FSSC 22000' website.

As a rule, the steps taken by the business unit (Cooperative Agroindustrial) match those officially proposed by the certification standard, as found on the website itself. However, the unit under study presented additional steps such as the pre-audit and external audits carried out by consulting companies, in order to obtain assistance in the implementation of the requirements of the standard, meeting the proposition of Uggioni and Salay (2012).

The excerpts extracted from the interviews corroborate this statement. As stated by ENTR_1 *"[...] we also have the consultancy service that comes here that supports food safety*" and ENTR_2 *"[...] the pre-audits that we chose to do here, because the company can choose whether we want this pre-audit before. Then we chose to have a little more confidence with the certifying house* ".

The implementation of the standard began in May 2018 and ended in July 2019, a period of fourteen months. Currently, the organization is in step 5 of the implementation, working on the elaboration of an agenda with estimated dates for carrying out the maintenance audits aiming at guaranteeing the continuous improvement of the management system, being in compliance with the FSSC 22000 guidelines (FSSC 2000, 2017c).

That said, the application of the methodological set made it possible to map the main impacts on the functional units most affected by certification. Table 7 presents the main functional units and the most relevant impacts in each one.

Table 7. Main impacts on functional units due to the implementation of FSSC 22000 certification.

Functional Unit	Impacts	Systematic Observation	Document Analysis	Interviews
Human Resources	Training	Training room; *in loco* Training Session	Training / Qualification Request	*"[...] in my part, which is the training part, which there was a lot of value. "*
	Evaluation	Training Feedback	Audit forms	*"[...] demands a lot from us in terms of human resources in terms of training and evaluation. "*
	Automation	Hardware: Notebooks, Desktops, Printers, Network Cabling System Software: Integrated Management System	Service Provision Agreement Software Provider	*"In my sector it is really agility, because everything we already see the need to automate, so nowadays it is a system. "*
Quality Assurance	Communication	Meetings between Functional Units; Work Cells Divided by Glass	Digital Memos, E-mails, General Announcements	*"So we left everyone very involved, very close, because only one sector would not be able to have this result. "*
	Standardization of Procedures	Layout, Various Signs	Monitoring Worksheets	*"The main gain was the standardization of the processes ..."*
	Inspection	Data insertion in the GIS; Spreadsheet Information	Monitoring and Control Reports	*"[...] they need to give a lot more training and check if everything is being done. "*
Workplace Safety	Monitoring and Surveillance	Reception Processes	Forms, Checklist, Audiovisual Resource	*"[...] it starts with control from the outside, so you can prevent people from entering the company in any way ..."*
	Control of Chemicals	Signposts, Chemical "Islands"	List of Officials Authorized to Access the Private Location	*"[...] to have a control, you know about this chemical that nobody who is not authorized is taking it to use. "*
	Signaling	Traffic signs; Bulletin boards; Accident Rate Information Panels	Directional Signs, Frames, Panels, Murals, Folders	*"We also standardized the notices, a basic thing, notices and murals. "*
Production	Packaging Storage	Specific Storage Location	Packaging Control Record	*"[...] at the bottom of the factory to store all the packages"*
	Waste Separation	Identification of Waste Types	Inventory with types and quantities of waste	*"[...] then all the bay separated to a type of waste. "*
	Standardization of Processes	Machinery Operation; Performance of Employees in Production	Standards, Standard Operating Procedures (SOPs)	*"We had to standardize procedures. "*
Marketing	Search for New Customers	Joint effort to market prospecting	Website, Social Media and Folders	*"[...] you see that the company is recognized, right, by a globally recognized standard in food safety, so this also helps to bring more customers to us. "*

	Visual Communication	General Signage	Internal: Boards, Murals, Panels, Intranet, GIS External: Website, Social Media	*"[...] stand out in the food industries in the part of Brazil, which today I think has 20 or so in this range that has the certification ..."*
	Consumer Safety	Labeling, ISO 9000	FSSC 22000 Certification; ISO 9000 Certification	*"[...] this gives more seriousness and security to the consumer to consume your product. "*

Source: Research date

The Human Resources functional unit was the first to be analyzed. The main impacts identified were the intensification of training and investment in employee training followed by performance evaluation through the automation of processes. ENTR_1, Human Resources Assistant, reported in his interview that the standard required previous training, during and after implementation, as it covers all levels of the company, from operational to strategic (Vieira, 2009), as can be seen in the interviewee's excerpt *"[...] This standard requires 100% involvement from the factory, if we don't have 100% involvement from the factory, you cannot implement it, it is incomplete and you cannot be certified*."

Subsequently, performance evaluation is carried out as part of the results monitoring process. In addition, it is a phase required by audits carried out prior to certification.

Last but not least, it was the stage of automation of processes, directly affecting the modus operandi of the Human Resources sector. It is noteworthy that the adoption of the Integrated Management System, made organizational communication more intense and of a better qualitative level, demanding changes in the procedures previously adopted by employees, whose results can be supported by the findings of Zhang et al. (2018).

Quality Assurance is the department responsible for implementing the certification, therefore, its communication with all other departments has become essential, as it is responsible for transmitting the guidelines and instructions that must be carried out, as well as for monitoring them. The ENTR_2 (Quality Assurance Technician) mentioned that before they were tasked with creating the procedures, which required a lot of time and work, and currently, due to FSSC 22000, they are standardized, based on the automation of processes: "[...] *We had to have a standardization of procedures, because before this norm came we created everything, but there was no right standard for that* ...".

ENTR_4 (Workplace Safety Technician) highlighted three points of relevant change: i) monitoring and surveillance, ii) control of chemicals, iii) signaling. The first concerns everything that can represent, to a greater or lesser degree, a risk to the food produced, from the entry of people and merchandise into the place, to production.

Another highlight was the creation of chemical "islands" as a way of restricting controlled products and allowing access only to authorized employees.

Finally, the signage of restricted areas (exit in case of fire or other occurrences, meeting points, exclusive range of passers-by, etc.), notices of mandatory use of PPE's, access restriction, danger signs (electrical, chemical, contamination, toxic, among others) completes the most important changes adopted in the company since the implementation of the FSSC 22000 standard.

The Occupational Safety unit is extremely important, in view of the fact that the presence of risks is imminent in all spaces of the factory, especially in the Production sector. Therefore, as pointed out by WHO (2009) and FAO (2009), safety and quality have become a concern for the entire production chain, from primary production to the moment of distribution.

In Production, there were two main changes, the first being the organization and the second the standardization. Regarding the organization, an exclusive shed was built for the temporary storage of packages, with space for segregation of all residues from production such as metal, plastic, wood and others.

As for standardization, rigorous processes were implemented for all stages of production, from the entry of raw materials and inputs, to the exit of the finished final product, especially with a view to reducing non-quality operating costs and indirectly promoting competitive advantage (Briscoe et al. 2005; Chang& Lo 2005).

The standardization of processes in general was mostly possible through the automation of these processes, with a view to allowing a greater number of indicators with real-time monitoring. Consequently, there is a very positive result in management as a whole.

Nevertheless, the standardization process required more accurate records and the archiving of data with greater accuracy and storage capacity, making it possible to improve the cooperative's transparency and compliance. In addition, it enabled improvement in the internal sectorial communication process, since the sectors are audited and need this communicational alignment (Zhang et al. 2018).

The Marketing functional unit suffered positive impacts that, for the purpose of this study, can be divided into internal and external. As for internal marketing, the interviewees' expectations converged towards

attracting customers and, in the near future, serving the foreign market, since the certification seal transmits more security and quality to the market, in addition to allowing the standardization on an international scale of products.

As for the external aspects of marketing, there was a significant investment in the structure of visual communication, especially in the creation of advertising pieces (website, social networks, flyers etc.) giving wide publicity to the market in general of the achievement of the certification standard, a fact corroborated by Briscoe et al. (2005) and Chang and Lo (2005) when postulating that, in addition to increasing productivity, improving internal communication, well-designed authority and responsibility, improvements in auditing and inspection systems, there is a highly positive impact in increasing customer satisfaction as well as in improving the corporate image.

Table 8 summarizes the more general changes that have occurred in the studied agroindustrial organization, comparing them with the results obtained by Chang and Lo (2005) when analyzing data from the work of Chien (1999) with forty-eight Thai companies and Briscoe et al. (2005) whose study focused on the certification of American and Canadian companies.

Table 8. Comparison of the impacts of the FSSC 22000 standard on the cooperative with the studies by Briscoe et al. (2005) and Chang and Lo (2005).

	General Impacts	**Results of Briscoe et al. (2005) and Chang and Lo (2005)**
1	Standardization of Intrasectoral Processes	Process improvement
2	Transparency	Well-defined authority and responsibilities
3	Internal Communication	Better internal communication
4	Inspection	Improvement of audit and inspection systems
5	Food Safety Engagement and Culture	Awareness of company members
6	Competitive Advantage	Competitive advantage of the organization

Source: Research and adaptation data from Briscoe et al. (2005) and Chang and Lo (2005)

The comparison between the results obtained in the case study in the agroindustrial cooperative and the data from the studies by Briscoe et al. (2005) and Chan and Lo (2005) allowed listing six common impacts.

It is observed that the impacts occurred in the cooperative are in line with the impacts obtained by the studies by Briscoe et al. (2005) and Chang and Lo (2005). In this sense, it appears that the organization achieved its initial objective for certification, guaranteeing the quality and safety of food for its customers, in addition to improving its management processes (EIC, 2016).

The agroindustrial cooperative strongly signals to obtain a competitive advantage from the implementation of the FSSC 22000 certification. As pointed out by Vasconcelos and Cyrino (2000), the company is improving its internal processes in order to achieve superior performance, which will undoubtedly contribute to an organizational competitive advantage, corroborating the studies by Barney et al. (2010), Sirmon and Hitt (2009) and Claver-Cortés et al. (2012).

In the study by Vasconcelos and Cyryno (2000) regarding theories about competitive advantage, the cooperative points to the category of "Dynamic Capabilities" (Table 1) whose item "Axis" is presented as "Inside the Organization"; item "Analysis Unit" as "Organizational Processes and Routines, Resource Flows and Specific Skills"; item "Source of Competitive Advantage", such as "Routines and Organizational Processes capable of Regenerating the Firm's Resource Base"; item "Strategy" as "Interaction between Competencies and Market Opportunities".

Teece's studies (1988; 1994; 1997) support this theoretical apparatus; Nelson and Winter (1982); Teece et al. (1997); Prahalad and Hamel (1994); Dierickx and Cool (1989); Amit and Shoemaker (1993) and Sanchez et al. (1996) as the main reference models for the proposed study.

Strictly speaking, it is understood that the agroindustrial cooperative, from the implementation and execution of the policies arising from the FSSC 22000 certification, should maintain the process of delineating its organizational structure, considering the context in which it is inserted (Adner & Zemsky, 2006) directly linked to its market strategy (Chandler, 1962; Okumus, 2003; Pearce & Robinson, 2000) and, specifically to consumer health (Cantanhede et al. 2018).

IV. Conclusion

The present study aimed to map the main impacts on the organizational structure of an agroindustrial cooperative located in the Southwest region of the state of São Paulo, from the implementation of the FSSC 22000 certification.In the Human Resources functional unit, the main impacts were the intensification of training / qualification of employees, performance evaluation as a routine practice and automation of processes.

As for the Quality Assurance unit, significant changes were observed in the organizational communication processes, since this unit is responsible for disseminating the information inherent in the certification with the other functional units. In addition, standardization of procedures and monitoring were

significant changes.The Safety at Work unit had an impact on the monitoring and surveillance procedures, starting to be carried out in real time and with a greater level of coverage, in addition to signaling and control of chemical products.In Production, there was an improvement in the storage system for empty packaging and the finished product, as well as in the standardization of processes and segregation of waste.

Finally, the Marketing functional unit implemented processes for prospecting for new customers, including the international market, visual communication and consumer safety.

As a limitation of the research, it is possible to say that it is not possible to monitor and evaluate the gains from the implementation of the certification, especially regarding the increase in market share and the opening of the international market, in view of the fact that the certification was achieved less than five months.

On the other hand, as a future research agenda, the possibility of evaluating the effective results of the implementation of the standard is envisaged, especially with regard to gaining market share, exports and financial leverage, especially when completing at least one year of Implementation.

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Martins, BP etal. (2020). "FSSC 22000 CERTIFICATION: Study of Implementation in a Brazilian Agroindustrial Cooperative located in the Southwest Region of the State of Sao Paulo." *IOSR Journal of Business and Management (IOSR-JBM)*, 22(4): pp. 53-66.