DESIGN MODEL IMPLEMENTATION OF THE ISO 9001:2015 QUALITY MANAGEMENT SYSTEM, SENA AGROPECUARIO LA GRANJA-ESPINAL AGROINDUSTRIAL COMPLEX

IMPLEMENTAÇÃO DO MODELO DE DESIGN DO SISTEMA DE GESTÃO DA QUALIDADE ISO 9001:2015, COMPLEXO AGROINDUSTRIAL SENA AGROPECUARIO LA GRANJA-ESPINAL

DISEÑO MODELO IMPLEMENTACIÓN DEL SISTEMA DE GESTIÓN DE LA CALIDAD ISO 9001:2015, COMPLEJO AGROINDUSTRIAL SENA AGROPECUARIO LA GRANJA- ESPINAL

https://doi.org/10.56238/edimpacto2025.085-001

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ABSTRACT

The purpose of this study has the general objective to design a proposal for the implementation of the Quality Management System (QMS), Based on NTC's ISO 9001:2015, in agroindustrial complex of Centro Agropecuario la Granja" of Servicio Nacional de Aprendizaje SENA, located in El Espinal- Tolima, according to its agroindustrial projection and training. Specific objectives include assessing the organization's needs and goals, diagnosing the current state of its processes in relation to the requirements. SENA is at a critical moment that demands the implementation of a (QMS) to ensure continuity and improve its performance. The company faces shortcomings in its processes, such as lack of standardization, process losses and cost overruns, and product contamination, which limits its effectiveness with the adoption of a model (QMS) based on ISO 9001:2015, which would continuously improve processes, learning needs, customers and employers. It is expected that the regulation of this complex will achieve an effective integration of the strategic objectives of the center. This model will not only serve the agroindustrial complex of the La Granja Agricultural Center, it will be a guide for the other agroindustrial complexes in the Sena region of the country.

Keywords: Proposal. Implementation. ISO 9001:2015. Quality. Agroindustry.

RESUMO

O objetivo geral desta dissertação de mestrado é elaborar uma proposta para a implementação de um Sistema de Gestão da Qualidade (SGQ), baseado na norma NTC ISO 9001:2015, no "Centro Agrícola La Granja" do Serviço Nacional de Aprendizagem (SENA), localizado em Espinal, Tolima, um complexo conhecido por sua projeção agroindustrial e treinamento. Os objetivos específicos incluem avaliar as necessidades e metas da organização e diagnosticar o status atual de seus processos em relação aos requisitos. O SENA está em um momento crítico que exige a implementação de um SGQ para garantir a

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continuidade e melhorar seu desempenho. Enfrenta deficiências em seus processos, como falta de padronização, perdas e estouros de custos nos processos e contaminação de produtos, o que limita sua eficácia. A adoção de um modelo de SGQ baseado na ISO 9001:2015 melhoraria continuamente os processos, as necessidades de aprendizagem, os clientes e os proprietários do negócio. Espera-se que a regulamentação deste complexo alcance uma integração efetiva dos objetivos estratégicos do centro. Este modelo não atenderá apenas ao complexo agroindustrial do Centro Agrícola La Granja, mas também servirá como guia para outros complexos agroindustriais do SENA em todo o país.

Palavras-chave: Proposta. Implementação. ISO 9001:2015. Qualidade. Agroindústria.

RESUMEN

La presente tesis de Maestría tiene como objetivo general diseñar propuesta para implementación del Sistema de Gestión de Calidad (SGC), basado en la norma NTC ISO 9001:2015, “Centro Agropecuario la Granja” del Servicio Nacional de Aprendizaje Sena ubicado en el Espinal- Tolima, complejo destacado por su proyección y formación agroindustrial. Los objetivos específicos incluyen evaluar las necesidades y metas de la organización, diagnosticar el estado de sus procesos en la actualidad en relación con los requisitos. El Sena se encuentra en un momento crítico que demanda la implementación de un (SGC) para asegurar la continuidad y mejorar su desempeño. El cual enfrenta falencias en sus procesos, como la falta de estandarización, perdidas y sobrecostos en procesos y contaminación de productos, lo que limita su efectividad con la adopción de un modelo (SGC) basado en el ISO 9001:2015, mejoraría continuamente los procesos, necesidades de aprendizajes, clientes y empresarios. Se espera que la normativa de este complejo, logre una integración efectiva de los objetivos estratégicos del centro. Este modelo no solo servirá para el complejo agroindustrial del Centro Agropecuario la Granja, será guía para los demás complejos agroindustriales del Sena del país.

Palabras clave: Propuesta. Implementación. ISO 9001:2015. Calidad. Agroindustria.

1 INTRODUCTION

In recent years in Colombia, the National Learning Service (SENA) has shown an increase in its vocational training activities, which has meant a growth of the national order, this occurs very quickly, without giving time to implement changes in a controlled manner. Currently, there is no properly formulated and disclosed strategic planning, the activities of the processes are carried out without controls only in order to fulfill some orders, it has given rise to failures in the execution of the activities, the failures are reflected in the general performance of the Agroindustrial Complex, caused non-compliance with the requirements in terms of the product, in addition to customer and consumer dissatisfaction. These deficiencies hinder the optimal performance of the center, in addition to not complying with some current legal and regulatory aspects.

At present, there are no high quality standards, the processes are carried out without the proper quality standard parameters, from the ordering of raw materials and inputs, to the storage of finished products, there are no traceability guides, since the necessary tools have not been provided to comply with the production of orders, which has caused failures in the execution of the activities in the processes, all this is reflected in the general performance of the organization, this has implied non-compliance with the requirements of the product and dissatisfaction of consumers, there is no quality manual where the procedures and their respective responsible are evidenced, lack of results in acceptance rates, lack of control records and improvement in its processes, presenting some non-conformities, which are detected by the consumer and others in the company's orders before their departure, the latter delay the organization's processes and force more resources to be used to be able to comply to satisfaction.

The lack of an adequate Quality Management System (QMS) that allows the Agroindustrial Complex of the La Granja Agricultural Center not only to maintain, but to improve its quality and efficiency standards. The implementation of a QMS based on the NTC ISO 9001-2015 standard is presented as a viable solution to address these deficiencies and ensure a continuous improvement process within the complex. This thesis proposes to design a proposal model for the implementation of the QMS that can be replicated in other SENA centers with similar characteristics, thus strengthening the agro-industrial training and production network in the country.

Although the SENA La Granja Agricultural Center has an Integrated Management and Self-Control System (SIGA), it is clarified that in the Agroindustrial Complex of the La Granja Agricultural Center. It has never been implemented, the only thing that has been kept in the records are some formats, documents or procedures, none of which is included in the SIGA,

which is why it was determined and justified the need to make a proposal, not simply an improvement, but an Implementation.

2 THEORETICAL FRAMEWORK

2.1 QUALITY MANAGEMENT SYSTEMS (QMS)

2.1.1 Definition and components

A Quality Management System (QMS) is a set of policies, processes, and procedures necessary to plan and execute (produce/develop/serve) at the core of an organization (International Organization for Standardization, 2015). With this system, an operating map can be structured that integrates the various processes within an organization and promotes a quality approach to achieve results that mainly meet the customer's intention and satisfaction, in the same way it seeks to comply with the standards of service, quality and regulations in national law. The key components of a QMS include quality policy, quality objectives, quality planning, quality control, quality assurance, and continuous improvement (Hoyle, 2001).

More specifically, in our country, the ISO 9000 and ISO 9001 standards have been adopted as a reference for Quality Management Systems. According to the Ministry of Commerce, Industry and Tourism of Colombia (2012), the national government has recognized the importance of implementing quality management systems based on ISO 9000 standards to improve competitiveness and customer satisfaction in Colombian organizations.

According to Decree 3930 of 2010, companies in Colombia are required to implement Quality Management Systems that comply with recognized international standards to guarantee the quality of their products and services and improve competitiveness in the national and international market.

The Colombian Institute of Technical Standards and Certification (ICONTEC) is the one who regulates, verifies and certifies that companies and organizations comply with the standards required for these ISO standards. According to the Colombian Technical Standard NTC-ISO 9001:2015, certification according to ISO 9001 is widely recognized and valued by organizations in Colombia as a means to improve quality, efficiency and competitiveness.

2.1.2 Benefits and challenges

Implementing a QMS provides numerous benefits to organizations. Among the most prominent are operational improvement and processes that are developed in the facilities, customer satisfaction, cost reduction, and regulatory compliance (Goetsch & Davis, 2016). In the same way, there are certain challenges which present a window of opportunity depending

on how the organization develops the processes to improve internally, challenges from the costs of the proposal and application of a QMS, adaptation of personnel to the necessary requirements and changes in the processes required for the fulfillment of the QMS (Oakland, 2014).

2.2 NTC ISO 9001:2015

2.2.1 History and Evolution

ISO 9001, developed by the International Organization for Standardization (ISO), seeks to provide a framework of preventive and development processes, actions, and activities to ensure that organizations can consistently meet customer requirements and improve their performance.

The NTC ISO 9000-2015 standard says that the quality of an organization's products and services is determined by the ability to satisfy customers and by the intended and unintended impact on relevant stakeholders. The quality of products and services includes not only their function and anticipated performance, but also their perceived value and the benefit obtained by the customer. A quality-oriented organization promotes a culture that results in: behavior, attitudes, and processes that provide value by meeting the needs and expectations of customers and other stakeholders (Colombian Institute of Technical Standards and Certification, 2015). ISO 9001-2015 is the meeting point for numerous efforts to establish a common framework for Quality Management. In force since the 80s, it has incorporated improvements and advances according to the needs and, above all, the evolution of the concept of corporate quality (ISOTools, n.d.).

Quality is an ethical value, which generates permanent attitudes and behaviors in the work of individuals, groups and organizations. It consists of achieving the highest desirable standards in everything we do for the benefit of others, mainly customers. Quality represents total conformity with the use-purpose of the goods and services that are offered and the absolute satisfaction of those who receive them, consumers (apprentices, instructors, administrators) or users (visitors, creditors), at a cost that represents an adequate value for them.

Philip Crosby defines it as: compliance with the requirements and specifications of a product or service. Edward Deming points out that quality is the high degree of uniformity in production. Kaoru Ishikawa believes that quality is developing, designing, manufacturing and maintaining a quality product that is the most economical, useful and satisfactory for the consumer. Joseph Juran conceives it with suitability for use and compliance with specifications. (Sotomayor, 2001, p. 43)

2.2.2 Principles and requirements

ISO 9001:2015 is based on seven principles of Quality Management: customer focus, leadership, people engagement, process focus, improvement, evidence-based decision-making and relationship management (International Organization for Standardization, 2015). The requirements of the standard cover the context of the organization, leadership, planning, support, operation, performance evaluation, and continuous improvement. These principles and requirements are designed to help organizations achieve a high level of performance and customer satisfaction (Hoyle, 2001).

2.2.3 Total Quality Management

It is also called Total Quality Management or TQM (Total Quality Management). Developed by Armand Feigenbaum, it seeks to generate an improvement in the activities and processes of each area of the company or organization, seeking optimal results in the final satisfaction of the customer or consumer, this through continuous improvement in production, inspection and distribution issues, all while using resources appropriately. "It is a managerial practice for the continuous improvement of results in each area of activity of the company and at each of the functional levels, using all available resources and at the lowest cost" (Carrizo & Alfaro, 2018, p. 117), the needs of the customer become the primary priority of the company and organization and prioritize meeting these demands.

2.2.4 Quality management: evolution

According to ISOTools (n.d.) to talk about the concept of Quality Management, it is necessary to analyze since the 20s during World War I the work and labor force become relevant, taking into account the needs of countries to produce their resources on a large scale both for war and for the subsistence of their population. It is there where the production chain begins to require improvements to be more efficient and meet the required demands, within this process an inspector was chosen who is the person in charge of

Verify production processes and activities in order to guarantee the quality of work, the effectiveness and efficiency of workers and products.

In addition, it is proposed that there are 4 other stages that mark the development of this concept and names them according to the important aspects they contributed:

Statistical control. The second stage is between 1930 and 1950. Companies are no longer only showing their interest in inspection, but also in statistical controls. These processes were favored by the technological advances of the time. It went from inspection to a more global control. From the 80s to the mid-90s, quality was assumed as a strategic

process; First systems. Between 1950 and 1980, companies discovered that statistical control was not enough. It is necessary to break down the processes into stages and carry out an observation period and detect the failures that originate in them. In these years, the first quality systems emerged and companies no longer gave priority to the quantity of products obtained; now the emphasis is on quality; Strategies. From the 80s to the mid-90s, quality was assumed as a strategic process. This is perhaps one of the most significant changes that the concept has had, since from this moment on continuous improvement processes are introduced. Quality, which is no longer driven by inspectors but by management, is seen as a competitive advantage. The customer's needs are taken as the center of action. Management Systems are consolidated and staff involvement increases; Total quality. From the 90s to the present, the distinction between product and service disappears. There are no differences between the article and the stages that precede it; everything is part of a new concept that enters the scene: Total Quality, that is, the process as a whole. In addition, the figure of the customer acquires greater prominence than in the previous stage and their relationship with the item, which now even reaches the after-sales stages, becomes the main indicator of quality. Systems are refined and adapted. (ISOTools, n.d., p. 1)

The implementation of Total Quality Management depends on a full commitment that must be returned to the top management of the organization, which mainly translates into: Always giving the consumer what he wants, doing everything right from the first time and at the lowest possible cost, establishing a clear vision and mission within the organization, develop strategies, policies and tactics, develop and execute work plans, according to the challenges of the company, foster a pleasant environment of justice, honesty, trust, collaboration and camaraderie, to facilitate the absorption of the message of Total Quality, involve all the personnel who are part of the company. Create and promote teamwork, train, train and continuously improve all human resources, evaluate the performance of operations and establish incentives, recognitions and awards, for successes obtained, create a group that promotes the culture of an environment where continuous improvement, innovation, responding in time to the challenges that arise, to establish information and communication lines at all levels (ISOTools, n.d.).

2.3 MANAGEMENT MODELS APPLIED IN THE AGRO-INDUSTRIAL SECTOR

2.3.1 Success stories

In the agro-industrial sector, the implementation of Quality Management models has proven to be beneficial for organizations in terms of improving their processes, efficiency and

better use of resources. A notable example is that of an agro-industrial company in Spain that, after implementing an ISO 9001-based QMS, managed to increase its production by 20% and reduce customer complaints by 15%.

This is relevant because it is not only an example of the benefit of adopting a QMS according to the ISO 9001 standards of 2015, but also presents the possibility of measuring with verifiable evidence the percentages of improvement and the specific fields that can be positively affected.

2.3.2 Best practices

Good practices in Quality Management in the agro-industrial sector are important taking into account the importance of this sector not only in the agro-industrial and economic development of the country and the region but also the influence on the lives of the people who are the final recipients of the products and services of this type of organizations. the "Good Practices" actions include the standardization of processes, the continuous training of personnel, the implementation of quality control technologies, and the integration of environmental and food safety management systems (International Organization for Standardization, 2015). In addition, these practices improve the quality and efficiency of enterprises and contribute to the sustainability and social responsibility of agro-industrial enterprises.

2.4 THEORY OF CONTINUOUS IMPROVEMENT

2.4.1 Key Concepts

Continuous improvement is one of the most relevant pillars within the process of adopting a QMS and is important because it raises not only the need to constantly renew practices in order to advance towards optimal results, but also allows to be aware of the regulations and requirements with which the company is protected and a perception of interest in the processes is generated that is reflected in customer satisfaction. This is a core concept in quality management that involves a constant effort to improve processes, products, and services. This approach is based on the PDCA (Plan-Do-Check-Act) cycle, which provides a structured methodology for identifying areas of improvement, implement changes, evaluate results and standardize successes (Deming, 1986). Continuous improvement not only focuses on the quality of the final product, but also on the efficiency and effectiveness of all organizational processes (Goetsch & Davis, 2016).

2.4.2 Application in the agro-industrial context

In the agro-industrial context, continuous improvement is essential to maintain competitiveness and sustainability. Agribusiness companies that adopt this approach can better adapt to market fluctuations, changing regulations, and rising customer expectations. The implementation of techniques such as root cause analysis, process review, and the incorporation of customer feedback are common practices that facilitate continuous improvement in this sector (Oakland, 2014).

3 METHODOLOGY

This chapter describes the methodology used to carry out the research, in order to meet the main objective of designing a proposal model for the implementation of the Quality Management System (QMS) based on the NTC ISO 9001:2015 standard in the SENA Agroindustrial Center La Granja Agricultural Center.

3.1 RESEARCH DESIGN

The research design selected for this study is exploratory-descriptive, taking into account that the knowledge that is available about the research to be developed is limited, every advanced process will be an exploration that will allow to expand knowledge, develop hypotheses and generate a better understanding of the subject and seeks through observation and data collection to generate a description of the processes studied and the variables that yield results quantitative or qualitative, a qualitative and quantitative approach will be used, allowing an in-depth analysis of the needs and goals of the Agroindustrial Complex and a detailed assessment of the current state of its processes against the requirements of the ISO 9001-2015 standard (Creswell & Creswell, 2017).

3.2 DATA COLLECTION

Two types of instruments will be used mainly for data collection: semi-structured interviews and questionnaires. The interviews will allow obtaining detailed and qualitative information on the perceptions and needs of the different production units regarding the implementation of the QMS. The questionnaires will be designed to quantitatively assess the current level of compliance with the requirements of ISO 9001:2015 and perceptions about Quality Management in the Agro-industrial Complex (Creswell & Creswell, 2017).

The investigation procedure will be carried out in several stages:

1. Semi-structured interviews and questionnaires will be designed, ensuring the validity and reliability of the instruments.

2. Interviews will be conducted with the leaders of each production unit of the complex and key personnel. In addition, the questionnaires will be distributed among the trainees and users of the Agroindustrial Complex.
3. The interviews will be qualitatively analyzed to identify emerging patterns and themes. The quantitative data obtained from the questionnaires will be analysed using descriptive statistical techniques to assess the level of compliance with the requirements of ISO 9001:2015 and perceptions about quality management.

3.3 DATA ANALYSIS

The analysis of qualitative data will be carried out using the content analysis technique, identifying categories and differentiation from the interviews (Creswell & Creswell, 2017). On the other hand, the quantitative data will be analyzed to measure in percentages and numerical variables the compliance of the processes, the satisfaction of the workers (apprentices) with the processes and the satisfaction of the customers (apprentices, administrative instructors, visitors, creditors).

3.4 DEVELOPMENT OF THE METHODOLOGY

A presentation of the proposal would be made to the directors (deputy director, coordinators, leaders and managers of each area (meat, dairy, bakery, chocolate, Fruver, water, (SENA company) leader of the Agroindustrial Complex, of the La Granja Agricultural Center, verifying the needs and expectations that are presented and must be covered.

In the same way, complement customer satisfaction, through a survey that contributes to establishing a diagnosis of the current state of the processes carried out in the SENA Agroindustrial Center La Granja Agricultural Center, against the requirements of the NTC ISO 9001-2015 standard.

An evaluation will be carried out: how the Quality Management processes to be implemented are going, what standards are being implemented, which are already implemented, in order to verify their conditions? What do they need? Subsequently, the planning to be carried out in the respective process will be presented to the quality committee, awareness training of the Quality Management System will be carried out to all those in charge, leaders (work teams). This will help identify what is going well and what needs to be improved. "In the event that problems arise, the sooner they are identified, the more likely they are to be resolved without causing great damage" (Araujo, 2022, p. 2).

Once the documentation is complete and previously filled out such as: 1. Process map or value chain 2. Characterization of the processes 3. Procedures 4. Womb

of management indicators 5. Matrix of risk indicators 6. Quality Policy Matrix 7. Quality objectives 8. System scope 9. Quality Manual 10. Manual of Processes and Procedures 11. Manual of functions and competencies. The Matrix will be carried out to identify the relationship of coherence, relevance of the ISO 9001.2015 Quality Management model, in the same way, the respective methodology will be established for effective and efficient compliance in all quality dimensions. Ending with an analysis of the data previously collected.

Finally, the proposal model for the implementation of the Quality Management System based on the NTC ISO 9001 of 2015, for the SENA Agroindustrial Center La Granja Agricultural Center will be presented. Espinal, as a general letter of introduction of SGC for the other SENA Centers, which have an agro-industrial complex.

4 CONCLUSIONS

- It was found that some of the needs of the Agroindustrial complex have a direct relationship with the implementation of a Quality Management System
- Establish a methodology for effective and efficient compliance in all dimensions of quality, in the SENA Agroindustrial Center La Granja Agricultural Center. (This objective was not met).
- When establishing the diagnosis of the current state of the processes carried out in the SENA Agroindustrial Center La Granja Agricultural Complex, against the requirements of the NTC ISO 9001-2015 standard,
- It was found that there is a relationship of coherence and relevance of the Quality Management model with the strategic objectives of the Agroindustrial Complex.
- Analysis of QMS results at the SENA La Granja Agroindustrial Complex shows that, although there are clear areas of strength, there are also significant opportunities for improvement. Continuous implementation and staff training are very positive, but infrastructure and monitoring systems require attention to maintain and raise quality standards.
- The adoption of a QMS based on ISO 9001:2015 will significantly improve the operational efficiency of the Agro-industrial Complex, facilitating better management of resources and processes.
- The quality of the comprehensive vocational training provided would be significantly improved due to the progress in the training processes of personnel and the implementation of standardized pedagogical methods, permanently developing knowledge, skills and aptitudes.

- Present the proposal model for the implementation of the Quality Management System based on the NTC ISO 9001 of 2015 in the Agroindustrial Complex of the La Granja Agricultural Center, as a general letter of introduction of the QMS for the other SENA Centers with Agroindustrial Complexes.
- The participation and commitment of trainees in the development of a QMS is crucial to its success, demonstrating the importance of collaboration in quality management.
- The Quality Management system will provide confidence in the Agroindustrial Complex, as it will allow standardisation, marketing and positioning of the products generated, making them more reliable, increasing their credibility.
- The monitoring and evaluation system of the processes needs to be more robust. Although progress has been made, it is essential to implement more advanced tools to ensure that all areas of the complex maintain consistently high quality standards.
- This proposal model for the implementation of the Quality Management System based on the NTC ISO 9001 of 2015 in the Agroindustrial Complex of the La Granja Agricultural Center, will serve as support to the Agroindustrial Complexes, and as a general letter of presentation of the QMS for the other Sena Agroindustrial Centers of Colombia. once its use is considered appropriate.

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