

## **Guidelines for the Implementation of a Quality Management System based on the International Standard ISO 9001, for the Agro-Industrial Pig Slaughter Chain of the city of Riobamba**

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### **Abstract**

The main objective of the research was to design the guidelines for the implementation of a Quality Management System based on the International Standard ISO 9001: 2015, for the agro-industrial chain of the Municipal Slaughter Center of the Riobamba Canton through the Design of a Quality Manual for pig slaughter processes. In the first instance, an evaluation of the initial organizational diagnosis was carried out through unstructured observation and documentary review, a descriptive statistic and a comparison of the results with the requirements of the International Standard were applied, in addition, with a quality record as a means of verification of the activities carried out. When applying the various criteria established within the reference regulations, it was determined that the existing documents in the Slaughter Center are duly authorized having a compliance of 80%. Likewise, 80% of the operators know the functional organization chart to fulfill the functions that are entrusted and ensure the quality of the product. The Municipal Slaughter Center, has an infrastructure in accordance with the provisions of the Standard since 100% compliance is observed as well as it is appreciated that the entity is governed by the INEN 1218 standard and Ley of Mataderos 502 for the provision of the service with a compliance of 70%. A very important aspect is that a record is left of the procedure that is taken when the animal is confiscated with 90% compliance. It was possible to develop standards, instructions, formats, process manuals and procedures in the design of the quality management system of the Municipal Slaughter Center of Riobamba that has a Manual of Functions for each

of the administrative and production areas, however, for management reasons it is not disseminated, much less socialized among the staff of the Slaughter center.

**Keywords:** *QUALITY MANAGEMENT; ISO 9001:2015; FIRING ORCINO; REGULATORY COMPLIANCE; AGROINDUSTRY CHAIN.*

## **Introduction**

To manage an agro-industrial organization successfully, it is necessary to plan in a sustainable way the technical, economic and current environmental and social resources, based on the principles of quality management. Worldwide there is the importance of designing the quality management system to achieve the sustainability of the company, and this is due to the change that is experienced daily in society, since the client is aware of the importance of the quality of agro-industrial products of animal origin in the physical aspects, chemical and biological, which is increasingly required of manufacturers (Nebrera, 2016 p. 42)

Reflecting a competitive and demanding context in global agribusiness that needs to know all aspects related to the design of quality systems for their implementation and subsequent certification, it is intended that customers can be sure of optimal compliance with technical, legal and environmental standards. required in the processes of elaboration, distribution and delivery of the product or service provided by a food agribusiness that is certified (Bello, 2001 p. 19)

In Ecuador, the agro-industrial sector has increased vertiginously, so there is a need for the implementation of quality, environmental and safety management systems that will effectively plan its production processes and interactions in a way that optimizes technical, human, financial, legal, environmental and occupational health and safety resources. to improve the conditions of the final product, thus achieving customer satisfaction through the continuous improvement of the process

Those that do not have a management system will not achieve the optimization of the aforementioned resources, (ISO, 2015 p. 5)

The Municipal Slaughter Center of the Riobamba Canton, Province of Chimborazo, is in charge of the management of cattle of all kinds to supply mainly this Canton with meat products. Having different production lines for each type of animals that are slaughtered in that place. At present the plant is operational, but does not have a quality management system, which has the following policies, (Andújar, 2013 p. 52)

Slaughter and deliver pork that meets the expectations in quality of service created in external customers, with the trained human talent responsible for the quality of their work. Public agribusiness, offering food products of good physicochemical and organoleptic quality is characterized by its timeliness and legal compliance and its firm orientation towards the full situation of the needs of its customers and its interested parties (Agrocalidad, 2012 p. 74)

For this reason, this research focuses on the processes of slaughter and slaughter of pig meat, whose meat products are intended for human consumption both locally and nationally, so that these activities are carried out safely, to avoid the loss of meat quality and provide the final consumer A product suitable for feeding minimizing any potential danger due to numerous diseases and other pollutants both physical, chemical and biological, that may arise at the time of its industrialization and thus ensure the population the consumption of a product that does not put public health at risk , .(Venegas, 2014 p. 25).

On the other hand, the objectives set in the research to be met were: Design a Quality Management System for its implementation based on the International Standard ISO 9001:2015 for the agro-industrial chain Municipal Slaughter Center of the Riobamba Canton; To develop a documentary and conceptual framework of agribusiness to support the guidelines of the design of a quality management system for its implementation based on the International Standard ISO 9001:2015, for the pig slaughter line in the Slaughter Center Municipal of the Canton Riobamba.

### **Type and design of research**

The present research was descriptive, since the pig slaughter system that is currently applied in the Municipal Slaughter Center of the Riobamba Canton was verified through the collection and analysis of observed data.

### **Experimental design**

Due to the fact that the present research is descriptive, deductive methods are applied to analyze this research study since it is proposed to adapt the International Standard ISO 9001:2015 to the production process of slaughter through an individual study from which general conclusions were obtained, and so it was spoken of the generalized theme and the creation of the Design of the Quality Management System based on the international standard ISO 9001 for its implementation from a non-participative observation

### **Results and Analysis**

#### **Scope of the study**

The scope of this research work was to design a quality management system for the implementation of a sustainable management model under the normative criteria of the

International Norm ISO 9001:2015, based on schematic representation and continuous improvement of the pig slaughter process, achieving the use of resources and increased profits for the public agro-industrial company.

### **Evaluation criteria**

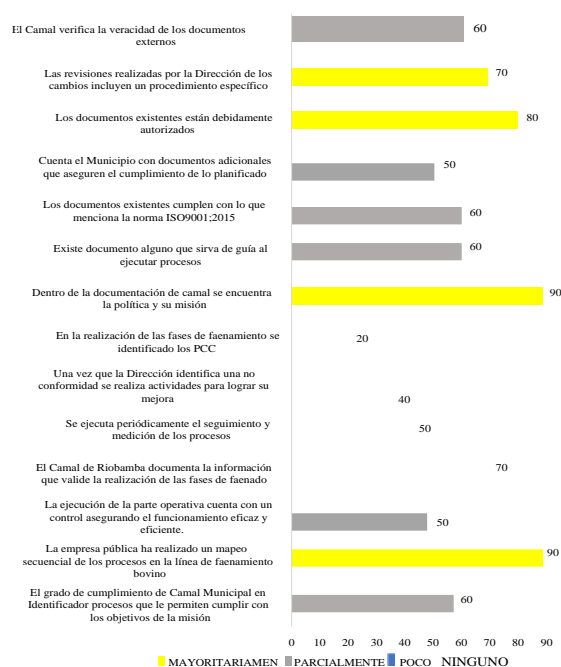
The following criteria were established: Context of the Organization, Leadership, Planning, Support, Operation, Performance Evaluation, Improvement, which are the clauses of the international standard ISO 9001, which must be in the first instance designed for its subsequent implementation in the agro-industrial organization under study.

### **Context of the organization**

To analyze the context of the organization in the execution of a Quality Management System based on the International Standard ISO 9001:2015 for the pig slaughter line in the Municipal Camal of the Riobamba Canton, the following clauses of the Standard were taken into account:

Understanding of the organization and its context; Understanding the needs and expectations of stakeholders; Determination of the scope of the Quality Management System and Quality Management System and its processes, as shown in Figure 1.

**Figure 1: Context of the organization based on the International Standard ISO 9001:2015**



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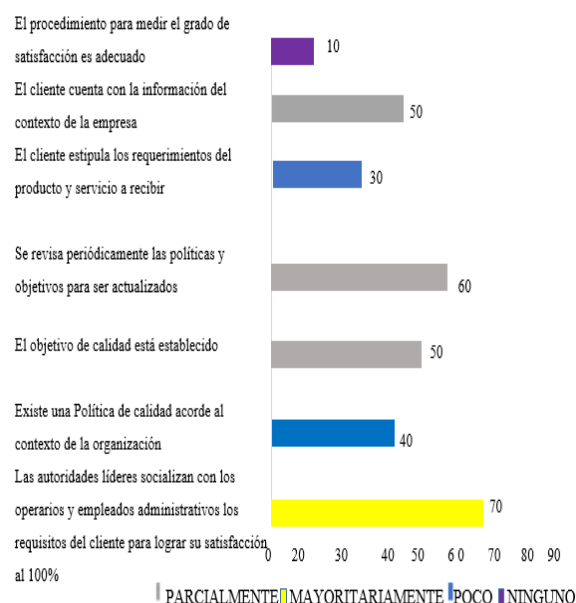
Figure 1 shows that some of the requirements are not being met. As: in the realization of the slaughter phases the PCC was identified, 20% was evidenced in so it is in the documentation vision and mission of the camal 90% with the mapping of slaughter processes in 90%

### Leadership

The Riobamba Municipal Slaughter Center has not established the quality policy, in addition they do not have a manual of procedures that allows them to improve the performance of both the productive processes and the work of all the individuals that make up this type of agribusiness to strengthen the public institutional image by delivering a healthy product that meets the customer's need, this because the agro-industrial company lacks good leadership by senior management. Therefore, it is necessary to design a quality

management system based on current regulations, as can be seen in graph 2 below, (Varnam, 2015 p. 21).

**Figure 2: Organizational leadership based on ISO 9001:2015**



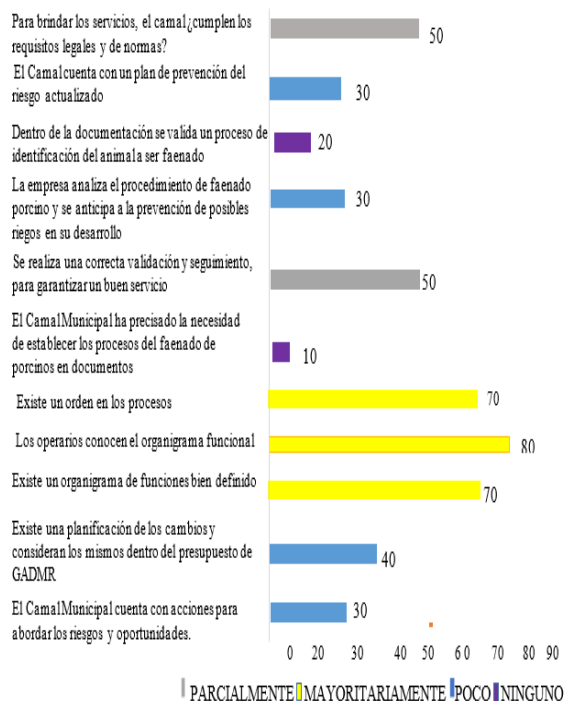
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As for the leadership by the agro-industrial organization, where it can be noted that some of the requirements are not being met. As can be verified in whether a procedure is recorded to measure the degree of satisfaction, that evidence is 10%.

### Planning

The main Administrator of the Municipal Slaughter Center of the Riobamba Canton will be in charge of the planning of the Quality Management System to ensure the achievement of the proposed objectives and comply with the requirements of the International Standard ISO 9001: 2015 and those of the client, for the improvement processes, and correct functioning of the company agro-industrial, as shown in figure 3 (Espinoza, 2004 p. 42)

**Figure 3: Organization planning based on ISO 9001;2015**



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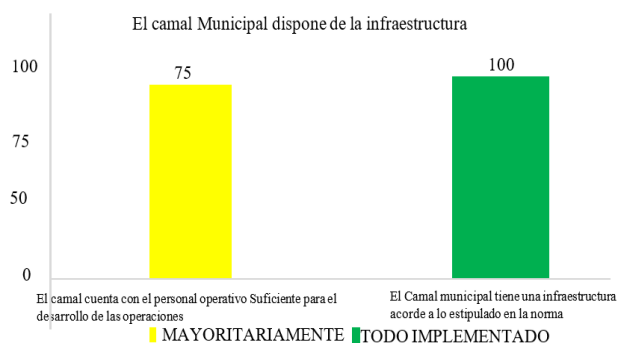
In this graph you can see that some of the requirements are not being fully met. As can be verified in if the Slaughter Center Municipality of the Riobamba Canton evidences the phases of the slaughter in a document is evidenced 10%

### Support

In this section the High Determination of the Municipal Slaughter Center of the Riobamba Canton, must commit in writing to deliver the economic resources, which are necessary for the implementation and improvement of the effectiveness of the Quality Management System and its processes, in addition to increasing customer satisfaction by meeting their requirements, as well as, provide all the materials and supplies necessary for an adequate cleaning and disinfection of the work areas, additional methodologies can be

established to achieve this indicator such as the 5S order and cleanliness (graph 4).

**Figure 4: I support organization based on ISO 9001;2015**



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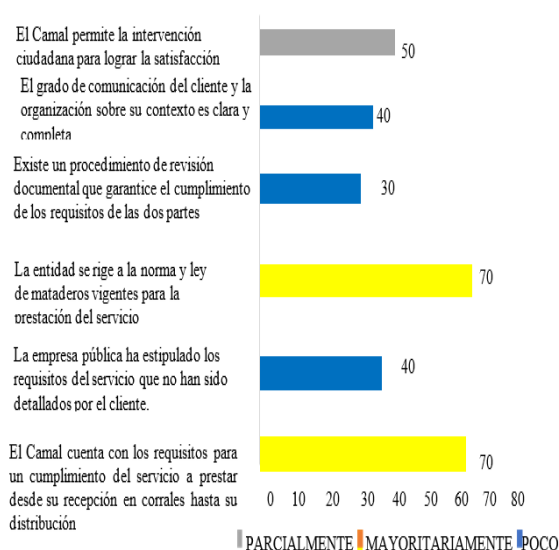
The graph shows that in Infrastructure it meets the requirements 100% while the criteria of operating people and environment for the manipulation of processes does not meet some requirements and 75% compliance is evidenced.

### Operation

The Municipal Slaughter Center of the Riobamba Canton must establish a system of control of the planning processes, based on the elimination of possible direct and indirect causes of lack of quality, such as errors in the actions carried out that affect the production activities in the agro-industrial organization. this involves standardizing its production processes under the international ISO standard.

In the same way, it must know and apply the processes established in the (National Slaughterhouse Law and INEN 1218 Standard) and Plan what should be done, How should it be done, with what means and the suitable personnel to do it?, for the efficiency in the provision of the service, (graph 5). (INEN, 2015 p. 10)

**Figure 5: Customer-related process Operation based on ISO 9001;2015**



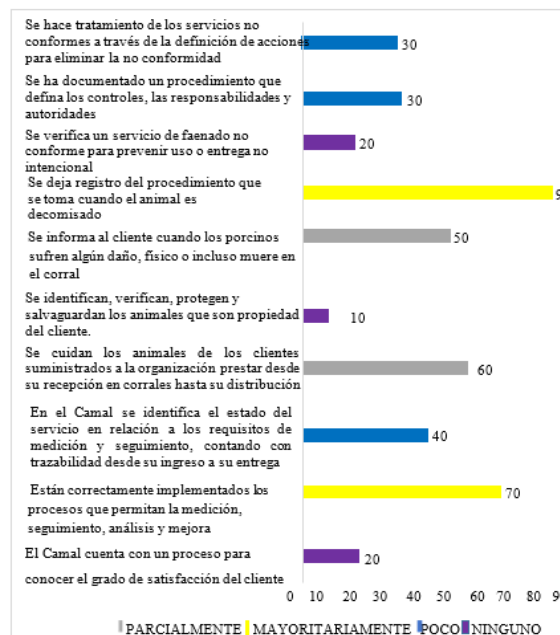
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In the graph you can identify that some of the regulatory requirements are not being met. As in the verification that there is a documented review procedure that guarantees compliance with the requirements of the 2 parties, 30% is evident.

### Performance evaluation

According to this criterion, the administration of the Municipal Slaughter Center of Riobamba is proposed from time to time to analyze the data collected to verify the effectiveness of the management system, in the same way, to carry out an audit of how the quality standards of the product that is provided to its direct and indirect customers are. This evaluation must be reviewed and in case of presenting any anomaly take the respective corrective actions that guarantee the quality of the product or service offered by the Municipal Public Company. (figure 6).

**Figure 6: Evaluation of the performance of the organization, based on ISO 9001-2015**



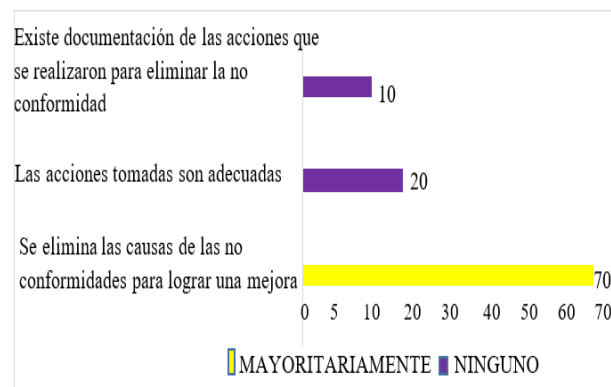
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As can be seen in the graph, it can be identified that some of the requirements are not being met, only if the procedure that was taken when an animal is confiscated with different causes including poor health status is 90% met. What is not done if the animals owned by the client are safeguarded is recorded 10% since in pens this technical procedure is not carried out to improve this evaluation criterion, since it is the same owner of the specimens that performs this activity in the resting pens of the animals.

### Continuous Improvement

To establish a continuous improvement in the effectiveness of the quality management system, the Senior Management of the Municipal Slaughter Center of the Riobamba Canton, must be based on the planned Quality Policy and Objectives, the results of the audits, data analysis, corrective and preventive actions. such as management review. As illustrated in figure 7:

**Figure 7: Organizational improvement based on ISO 9001:2015**



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Figure 7 identifies that some of the requirements are not being fully met. As in the documentation of the actions that are carried out to eliminate the nonconformity, it is evidenced in 10%

Graph 8: Proposal for the "Design of a Quality Management System based on ISO 9001-2015 for the pig slaughter line in the Municipal Camal de Riobamba"

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### Context of the organization

Within the context of the organization, the Quality Management System Design extends to all areas of work inside and outside the institution, based on the requirements established according to the UNE-EN ISO 9001:2015 Standard. (ISO, 2015 p. 8)

### Understanding the Organization and its context

The table below indicates the context of the organization in the execution of a Quality Management System based on ISO 9001-2015 for the pig slaughter line in the Municipal Camal of the Riobamba Canton, as indicated in Table 1.

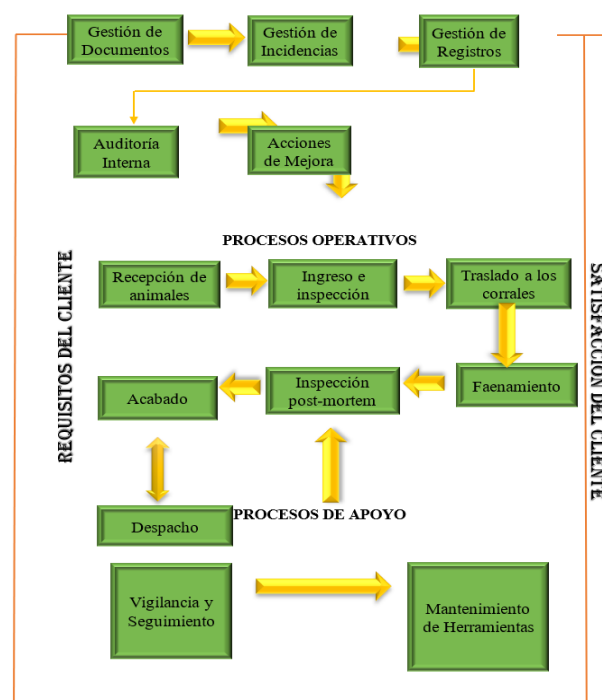
### Determining the scope of the quality management system

It was established that the scope of the quality management system should cover all areas of work of the Municipal Camal de Riobamba, based on ISO 9001:2015.

### Quality management system and its processes

In order to meet the objectives established in the Municipal Camal de Riobamba, a map was designed which allowed identifying the strategic, operational and support processes that are carried out within the organization.

**Figure 1: Map of the process system of the Municipal Camal de Riobamba**



### Overview of the ideology

The Senior Management Camal Municipal of Riobamba, must demonstrate its commitment to the development and implementation of the quality management system, as well as to the continuous improvement of its effectiveness,

being responsible for the effectiveness of it, (Rojas, 2014 p. 47)

### **Customer Focus**

Senior management must ensure that customer requirements are determined and met for the purpose of increasing customer satisfaction by setting goals and strategies.

### **Quality policy**

#### **Establishment of the quality policy**

The quality policy established in the Municipal Slaughter Center of the Riobamba Canton, must be appropriate to the purpose of the agro-industrial organization, which includes a commitment of Senior Management to comply with the requirements and to continuously improve the effectiveness of the quality management system, to establish and review the quality objectives raised in planning.

#### **Communication of the quality policy**

Senior Management should participate in the development of the system and should be responsible for socializing the quality policy, quality objectives, and quality management system. It should also ensure regular monitoring of the operation of the system and seek ways to improve it.

#### **Roles, Responsibilities Authorities in the Organization.**

Municipal Slaughter Center of the Riobamba Canton, has a hierarchical structure, headed by the Decentralized Autonomous Government of the Riobamba Canton, through the Department of Service Management, who are responsible for providing the service to the population, and execute actions that allow evaluating, measuring and proposing alternatives for improvements in operation. Senior Management, together with all the technical

staff of the Agroindustrial company, ensures the delivery of top quality products that raise the levels of satisfaction of the general population.

### **Planning**

#### **Actions to address risks and opportunities**

The Directorate of the Municipal Slaughter Center of the Riobamba Canton, together with the head of production are obliged to monitor the production processes, in order to make appropriate decisions taking into account the possibility of future events and effects that may affect the quality of products and services and apply corrective and preventive actions necessary to be able to prevent them.

#### **Quality objectives and planning to achieve them**

The Senior Management of the Municipal Slaughter Center of the Riobamba Canton must ensure that quality objectives are established for the relevant functions and levels of the organization. The quality objectives must be measurable and consistent with the quality policy, including a commitment to continuous improvement. Quality objectives shall include those that are necessary to meet the requirements of the product.

Planning to achieve objectives is the responsibility of senior management, who must ensure that the processes and resources necessary to achieve quality objectives are identified and planned.

#### **Planning for changes**

Planning must ensure that changes are made in a controlled manner and that the integrity of the Quality Management System (QMS) is maintained during the change.



## **Support for quality policy**

### **Resources**

The Senior Management of the Municipal Slaughter Center of the Riobamba Canton must commit in writing to deliver the resources (economic, technological, financial, among others) that are necessary for the implementation and improvement of the effectiveness of the Quality Management System and its processes, in addition to increasing customer satisfaction.

### **People**

The Senior Management of the Slaughter Center of the Riobamba Canton will be responsible for raising awareness and training the personnel under their charge, on the proper use of the resources provided by the Institution for the performance of their functions.

### **Infrastructure**

The Municipal Camal must have facilities, equipment, machinery and tools necessary to carry out the processes and support services.

### **Environment in the operation of processes**

The Senior Management of the Municipal Slaughter Center of the Riobamba Canton must create strategies to involve the work environment with the conditions under which the slaughter is carried out, which includes environmental, physical, chemical and biological factors that guarantee the occupational safety and health of the personnel in their productive activities.

### **Monitoring and measurement resources**

The Municipal Slaughter Center of the Riobamba Canton must plan the monitoring and measurement procedures to ensure that the Quality Management System is effective and continuously improved. For this reason, the

degree of customer satisfaction must be known through their suggestions and complaints, as well as through evaluations, surveys and interviews with direct and indirect actors. In the same way, Internal Audits must be carried out in order to verify compliance with the Quality Management System once it has already been implemented.

### **Competence**

The competition encompasses the necessary skills for the personnel that is part of the Municipal Slaughter Center of the Riobamba Canton to develop high performance, empathy, teamwork, innovation, creativity, in the fulfillment of their scheduled functions.

### **Internal and External Communication**

The Alta Dirección of the Municipal Slaughter Center of the Riobamba Canton, must establish internal and external communication based on its business organizational structure, which is managed internally, and will have the responsibility of identifying, capturing and communicating any change or modification of the quality management system, this communication must be made verbally and in writing to the main actors of the organization.

## **Documented information**

### **General**

The documented information of the Quality Management System of the Municipal Slaughter Center of the Riobamba Canton, Basically, is divided between the documents that establish the information where the company intends to reach (vision) and the records that show the results of previously executed processes.

## **Operation**

### **Planning and operational control**

The High Determination of the Municipal Slaughter Center of the Riobamba Canton, must plan and have defined the operational procedures to select them, and control that the products comply with the requirements specified in the standard.

### **Communication with the client**

The company must establish communication links with the client in relation to: the service it provides, queries, claims, complaints and modifications of its products.

### **Determination of requirements for products and services**

Within the Municipal Slaughter Center of the Riobamba Canton, the Central Administration will be responsible for complying with the requirements that the client needs, this could be done through a survey, which in turn must be filed in the customer satisfaction records or the records related to the product; these records will be complied with according to what the Commercial Management Procedure indicates.

### **Review of requirements for products and services**

The review of the requirements generated, for the elaboration of the product to be in charge of the Administrator of the Municipal Slaughter Center of the Riobamba Canton, its objective is to guarantee that the requirements demanded are within the framework of the (Law of Slaughterhouses and Standard INEN 1218) and the resources are available for the provision of the service.

### **Changes in requirements for products and services**

Senior management shall document and communicate to all staff as well as its range of customers changes made to product or service delivery requirements.

### **Control of externally supplied processes, products and services**

The system for monitoring planning processes will make it possible to determine the causes and effects affecting quality in the implementation of activities and to define the methods for the execution and supervision of the various operations for the slaughter of animals.

### **Type and scope of control**

The senior management of the Municipal Slaughter Center of the Riobamba Canton must draft and document the scope of the system, which must include sufficient information to determine what each of the processes of the Quality Management System covers. It is important to specify what is included and what is not, to clearly justify the non-applicability of any requirement.

### **Production and provision of service**

The Senior Management of the Municipal Slaughter Center of the Riobamba Canton, must collect and analyze the data obtained to detect the presence of errors and initiate an appropriate corrective action, in order to maintain the quality of the products and services provided by the agribusiness under study, in accordance with the standards established for production to achieve complete customer satisfaction, as well as an increase in organizational productivity.

### **Identification and traceability**

The Municipal Slaughter Center of the Riobamba Canton, must provide all the necessary information to know all the elements

that have entered the production process, as well as the routes that have been traced for their sale and commercialization of the products.

#### Preservation

The main objective of this process is to protect the products during the different procedures to which they must be subjected (slaughter operation, handling, storage, distribution), trying to minimize any damage caused to it, which alters the established quality limits for which it will be destined.

#### Control of non-compliant outputs

In case of receiving a notification of unsuitable product, you have to assume the commitment to change the product for a suitable one, assuming the necessary costs as soon as possible and ultimately suspend the product or service.

#### Performance evaluation

Monitoring, measurement, analysis and evaluation

For its part, the Senior Management of the Municipal Slaughter Center of the Riobamba Canton must plan and implement the monitoring, measurement, analysis and improvement processes necessary to: a) demonstrate conformity with the product requirements, b) ensure the conformity of the quality management system, and c) continuously improve the effectiveness of the quality management system.

#### Customer Satisfaction

As one of the measures of quality management system performance, the organization must track information regarding customer perception regarding compliance with its requirements.

#### Internal Audit

Within the Municipal Slaughter Center of the Riobamba Canton, a commission must be formed which will be responsible for carrying out the internal audit, taking into consideration the state and importance of the production processes.

#### Management review

##### General

The Administration of the Municipal Slaughter Center of the Riobamba Canton, must review the quality management system of the organization, at planned intervals, to ensure its convenience, adequacy and continuous effectiveness in the quality of the processes.

##### Management Review Entries

Input information for management review should include audit results, as well as customer feedback and product process commitment.

##### Departures from management review

In this process the Administration must include the improvement of the quality management system and its processes and the mechanisms in the product in relation to the customer's requirements.

##### Improvement

The Alta Dirección of the Municipal Slaughter Center of the Riobamba Canton, will select and determine the opportunities for improvement by implementing the necessary actions for the fulfillment of the client's requirements, increasing their satisfaction.

##### Non-Conformity and Corrective Action

The Municipal Slaughter Center of the Riobamba Canton must take corrective actions to eliminate the causes of the non-conformities

presented in order to avoid their repetition. The Corrective Action Procedure will indicate the methodology to be followed.

#### Continuous improvement

The organization must continuously improve the effectiveness of the quality management system through the use of quality policy, quality objectives, audit results, data analysis, corrective and preventive actions and management review.

Through the investigation carried out, it can be determined that the Municipal Slaughter Center of the Riobamba Canton does not comply with the provisions of the INTERNATIONAL STANDARD ISO 9001-2015, since it does not have a procedures manual that allows senior management to control how the slaughter processes are carried out, in addition to guaranteeing customers that they will receive a quality service. coming from a process of normalization and the search for continuous improvement.

In the same way it can be observed that it presents an inadequate internal control in most of the processes, because these are not well defined, in addition it becomes evident the lack of control to the operators involved in the slaughter process which causes that disagreements originate, due to the incorrect application of said processes of slaughter of the meat affecting the image of the agro-industrial company.

For this reason and due to the need to provide consumers with a quality product, the need arises to create and implement within the Municipal Slaughter Center of the Riobamba Canton, a Quality Management System through which all the work processes of the company are perfectly documented, guiding the staff in the fulfillment and application of the

processes as expressed in the system, to ensure that production is obtained in a standardized way, ensuring the homogeneity of the results, evaluating and analyzing these processes to improve their efficiency.

#### CONCLUSIONS

By establishing a documentary and conceptual framework for the agro-industrial company of Municipal Slaughter of the Riobamba Canton, the Quality Management System is defined based on the International Standard ISO 9001: 2015, for the continuous improvement of the pig slaughter line.

When applying the various criteria established within the reference regulations, it was determined that the existing documents in the Municipal Slaughter Center of the Riobamba Canton are duly authorized having a compliance of 80%, in addition to periodically reviewing the policies and objectives to be updated with a compliance of 60%. As well as 80% of the direct actors know the functional organization chart to fulfill the functions that are entrusted and ensure the quality of the product.

The Municipal Slaughter Center of the Riobamba Canton, has an infrastructure according to the stipulations of the standard since 100% compliance is observed as well as it is appreciated that the entity is governed by the standard and law of slaughterhouses in force for the provision of the service with a compliance of 70%. An important aspect is that the procedure taken when the animal is confiscated is recorded with 90% compliance.

It was possible to develop non-normative, instructions, formats, process manuals and procedures for the design of the QMS system of Quality based on ISO 9001: 2015 Standards, for

the pig slaughter line in the Municipal Slaughter Center of the Riobamba Canton

## RECOMMENDATIONS

The commitment of all the people who work in the Municipal Slaughter Center of the Riobamba Canton is vital for the development of this agro-industrial activity, the implementation and management of the quality management system must be socialized by the staff of the administrative area in each of the areas, for which the design of a training plan is recommended to create awareness in all the actors of the process Agro-industrial production.

Continuous training by the technical staff is recommended to the direct actors of the Municipal Slaughter Center of the Riobamba Canton, knowing the manual of operations and functions this will prevent errors from occurring, achieving compliance with the standards required for both the product and consumers.

It is recommended that the people who work in the municipal agro-industrial company have total commitment since, by complying with the guidelines established for the pork slaughter area, it will significantly help improve the processes of transformation of raw materials.

It is recommended to propose a series of trainings to primary pig producers in order to raise awareness of the proper sanitary management of herds to avoid confiscation and thus assume responsibilities for the actions taken by the staff of the municipal slaughter center.

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