



# **TECHNICAL UNIVERSITY OF THE NORTH**

**ENGINEERING FACULTY OF APPLIED SCIENCE**

**INDUSTRIAL ENGINEERING**

**SCIENTIFIC ARTICLE**

**THEME:**

**QUALITY MANAGEMENT BASED ON ISO 9001: 2008, IN THE MICRO-  
ENTERPRISE DAIRY PRODUCTS FRONTERA. CASE STUDY**

**AUTHOR:** Wilson Oswaldo Cuasés Chamorro

**COAUTHOR:** Ramiro Saraguro (ENGINEER)

**IBARRA – ECUADOR**

**2016**



## QUALITY MANAGEMENT BASED ON ISO 9001: 2008, IN THE MICRO-ENTERPRISE DAIRY PRODUCTS FRONTERA. CASE STUDY

Ciudadela Universitaria, Av. 5-21 July 17 City Ibarra, Imbabura Province

**Author:** Wilson Oswaldo Cuasés Chamorro, [wilson.cuases@gmail.com](mailto:wilson.cuases@gmail.com)

### Abstract.

*Currently due to globalization industries they are becoming more aware of the importance of good governance and changing economic and business scenarios.*

*Any organization that aspires to sustainable business success needs a coherent strategy to address not only the quality of their products and services but also processes and human talent. In this sense, the research was conducted in the Micro - enterprise Dairy Frontera order to meet the need for a governance models to improve business management and focus to meeting the requirements for customers, legal, organizational and regulatory ( CLON ) . ISO 9001 ; 2008 Management Systems ( QMS ) - Requirements , proposes a model that meets these needs , resulting design Quality Manual , Procedures Manual , Sheets Characterization of the processes , records , forms and work instructions that the SGC makes necessary .*

*The results obtained were compared using a hypothetical documentary compliance with ISO 9001; 2008 internal audit methodology was used ISO 19011: 2011 criteria weighting Anderi Sourí, achieving an improvement of 37.20 % and a reduction in the gap of default to 52, 98 %, plus strategies and established Indices management indicators that will serve as a tool for measuring and improving the QMS and therefore of the company.*

### Keywords

*Quality Management System, ISO 9001: 2008 Norm.*

### 1. Introduction

Until a few years ago business management focused on acting almost exclusively on economic, financial and administrative aspects of its operation. However, in light of increasing competition, the need to implement other management systems or forms of governance such as: ISO 9001: 2008, Integrated management system or management model Malcolm Baldrige who are models that strengthen better the different areas of business, as in the case of small and medium enterprises (PYMES). (Universidad Nacional Experimental del Táchira, 2011)

The purpose of this research is to design a governance model based on ISO 9001: 2008 to improve business management by complying with the requirements for Clients, Legal, Organizational and Regulatory (CLON) in the micro - enterprise Dairy Frontera which it is part of (PYMES) in Ecuador.

Having a strong organizational structure in current economic scenarios is vital because it provides the necessary guidelines and allows the proper administration management and control of all activities should be aimed at providing processes, products and quality services in a market that becoming more dynamic, turbulent and unpredictable. (Itesm, 2011)

Globalization has had a positive commercial effect in our country, as shown by the economic results in terms of volume of foreign trade, private capital flows, involving investments worldwide and participation in formal domestic economy, so that PYMES account for 4.3 % of all businesses that create jobs in an amount of 24% and sales 15.9%; however at the level of these exports they have decreased two points in relation to previous years as a result of the measures of protection to the domestic industry. (Universidad Estatal de Milagro, 2016)

According to figures from GlobalSTD Certification 2014, the quality management system and ISO 9001: 2008 in 2014 was certified by 1,138,155 companies worldwide, in relation to Central and South America 50256 companies America and in Ecuador by 1369 companies, where the dairy sector is showing us in this way, the level of importance of defining a model of administration and governance in organizations. (Prisma Consultoría SAs, 2014)

The (PYMES) in Ecuador have begun to worry about the need for good corporate governance, the environment each day forced to become more competitive. (Universidad Estatal de Milagro, 2016), currently the Ecuadorian PYMES do have a stake in the global market, the effect of the new measures adopted by the government under the philosophy of good living that seeks to create development opportunities for a better quality of life for all inhabitants

Ecuador commercially characterized their SMEs can take advantage of such opportunities multilateral agreements, member of the World Trade Organization (WTO), Customs Unions (Andean Community), Partial Scope Agreements (including MERCOSUR), together with this

trade policies anti-dumping , intellectual property rights , investment, services and technical barriers to trade. (Universidad Estatal de Milagro , 2016 )

The new Matrix Production of Ecuador and the New National Plan of Good Living 2013 - 2017 , states that SMEs should be oriented sectors such as food, chemicals and plastics hence the importance and relevance of the research to the organization Dairy Frontera. (Universidad Estatal de Milagro , 2016 )

In the productive core of the dairy sector PYMES they are of obvious importance, according to the INEC 2014 89.6 % of companies are micro, small 8.2%, 1.7% and 0.5% medium large. (INEC, 2014), This allows us to interpret this business segment has significant potential to contribute significantly to the creation of employment, wealth generation and also meet needs in certain markets that are unattractive to large companies.

International experience has shown that companies that have a quality management system under this standard have a competitive advantage as in the case of China , establishing himself as the first country with more certifications ISO 9001 : 2008 in 2014 with a total of 342,800 companies and forming the group of 10 countries with better growth remaining is 5, 767 annual. (GlobalSTD Certification , 2014) Having this type of systems or ways leading to have benefits such as compliance with requirements in both processes, care and customer service, working conditions, human talent, leadership, facts and data, suppliers and continuous improvement through management, administration and control of specific performance clauses. (Instituto Andaluz de Tecnología , 2002)

In our country the quality depends on the Ecuadorian Quality System (Correa, 2014), no doubt all public and private organizations are regulated by the government agency, Dairy Frontera, being producer and marketer of food products subject to mandatory comply related to the Customer, Law / Legal, Organizational and Regulatory habits, otherwise it will be subject to penalties as well as temporary or permanent suspensions. To meet this need the model or quality management system is designed, directing it towards these organizations and thus make the input elements become results to benefit directly the company as such , suppliers , customers and other stakeholders.

## 1.1 Methodology

It starts with the determination and organization of the theoretical foundation, then an analysis of the current situation by SWOT Matrix, Porter's Five Forces and the first part audit to ISO 9001: 2008.

Subsequently, the proposed design of quality management system in which Macro process, Processes and Threads (Strategic, Key, Support and Monitoring and Evaluation) is identified is established. The Quality Manual,

Procedures Manual, instructional, records and formats that the system creates and makes necessary specified.

Finally a hypothetical documentary analysis of the results of the initial diagnosis with the results of the proposal is made. Here the development Improvement Plan which shows that the organization has just the practice of continuous improvement of the quality of its processes is emphasized.

## 1.2 Tools and Methods

The tools and methods used for research development are shown below:

### Tools:

- SWOT Matrix
- Benchmarking
- Continuous Improvement Cycle Deming
- Histogram
- Flow Chart
- Responsibility Matrix

### Methods:

- Reengineering
- Percentage Calculation Gap ( Anderi Souri )
- Methodology according to ISO 9001 : 2008 management systems (QMS ) - Requirements
- Methodology ISO 19011: 2011 Guidelines for auditing management system.

## 1.3 SWOT Analysis

It was conducted in three distinct areas: Administrative and Management Area which comprises the Senior Management and General Management , Operations Area composed of Plant Operators and support area formed by the Shipper and Gatherer.

The combination of strengths and opportunities are offensive strategies (FO), strengths and threats lead to defensive strategies (FA); the combination of weaknesses and opportunities generate strategies reorientation (DO) and finally the weaknesses and threats lead to survival strategies (DA). (Wheelen & Hunger, 2013)

The following are strategies identified: See Table 1, Table 2 and Table 3.

STRATEGIES FOR ADMINISTRATIVE AND MANAGEMENT AREA	
Offensive strategies	Márketing empowerment in the school market
	Propose the creation of new products
	Allocate resources for advertising and márketing.
	Promote a culture of good treatment and customer service
	Socialize possible trading conditions to suppliers or customers



	Promote the implementation of the POA at the beginning of each year.
Defensive strategies	Perform internal audits prior assessments
	Propose hiring an unbiased directory
Reorientation strategies	CLON manage requirements to the satisfaction of the requirements of the (establishment, staff, customers, suppliers and other stakeholders).
	Improve corporate quality through an administrative model based on the international standard ISO 9001 : 2008
Survival strategies	Expedite operating permits and health records for the missing products

Table 1: Strategies for management and administrative area

STRATEGIES FOR OPERATIONAL AREA	
Offensive strategies	Promote a culture of quality in the realization of products to meet the legal requirements, health and quality.
	Promote training programs in health, safety and welfare of workers.
	Provide transportation services for all activities associated with the distribution of finished product and supply needs of raw materials and inputs.
Defensive strategies	Train operational staff on technical issues (use of measuring equipment, temperatures importance of processes dairy products).
Reorientation strategies	Establish incentive program
	Promote interpersonal measurement programs
	Perform manual of procedures for all processes of the organization
	Train all staff on issues of customer service and good treatment
	Design and implement a QMS

Table 2: Strategies for the operational area

STRATEGIES FOR SUPPORT AREA	
Offensive strategies	Strengthen knowledge in use of instruments and editing equipment and its importance
	Socialize policies negotiating potential customer
Defensive strategies	Strengthen communication providers milk with the organization of health problems in animals
Reorientation strategies	Promote a program selection, evaluation reassessment of staff
	The collector staff awareness on the importance of measuring and controlling the quality of milk at your reception.

Survival strategies	Promote the purchase of a vehicle with cold chamber
---------------------	---

Table 3: Strategies for support area

In Table 1 , 2 and 3 the strategies are shown for each of the areas specified above which are summarized in strategies related to the responsibilities of management and general management strategies related to human talent as well as improvement strategies logistics , transportation, communication and information management respectively. These strategies are aligned with the levels of the policy and quality objectives to give as a result indexes and indicators of control.

### 1.4 Analysis of Competitive Forces of Michael Porter

The analysis of Porter's Five Forces through a holistic diagnosis in terms of profitability, which determines the analysis is performed: ( Ediciones Díaz de Santos, 1997)

- bargaining power with buyers
- bargaining power with suppliers
- Threats Potential competitors
- Threat of substitute products
- level of rivalry in the sector

In figure 1 the results of the analysis of competitive forces Porter shown.

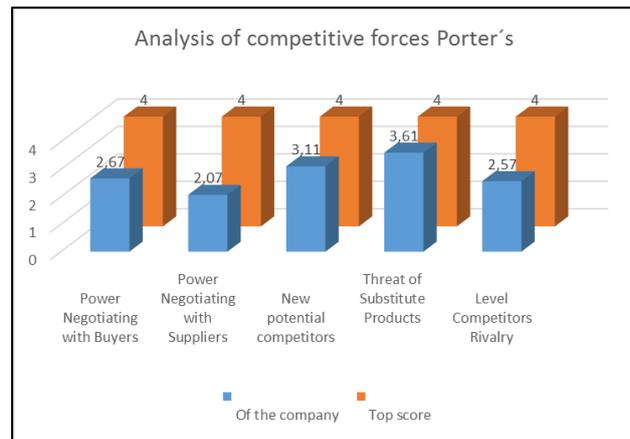


Figure 1: Analysis of Competitive Forces Porter

The organization maintains a high power on negotiating with buyers and suppliers. Threats Potential competitors, substitute products and level of rivalry in the sector are high and exert a contradictory power to favorable conditions to maximize resources, overcome competition, be unique in the market and provide a unique and innovative product proposal or service. (Moreira, 2015)

## 1.5 Internal Audit ISO 9001: 2008

An internal audit is scheduled first part to meet compliance requirements of ISO 9001: 2008.

The audit was carried out following the criteria weighting Anderi Souri mentioned the following:

1. Sub clauses values obtained through quantization criteria for evaluation of diagnostic Anderi Souri is averaged for each clause.
2. Averaging the results of the clauses and sub - clauses of each section of the standard.
3. Averaging the values obtained from each section of the standard. This procedure will yield results in the application level or percentage (%) of NVC- compliance with the ISO 9001: 2008.
4. Subtracting compliance with the standard (100 %); necessary to qualify for certification requirement; with the value obtained in the previous step (% compliance with the standard). (Chacon, 2010)

As also made use of the audit criteria specified in ISO 19011: 2011 Guidelines for auditing management systems. (Organización Internacional para la Estandarización ISO, 2008)

The results are as follows: see Figure 2

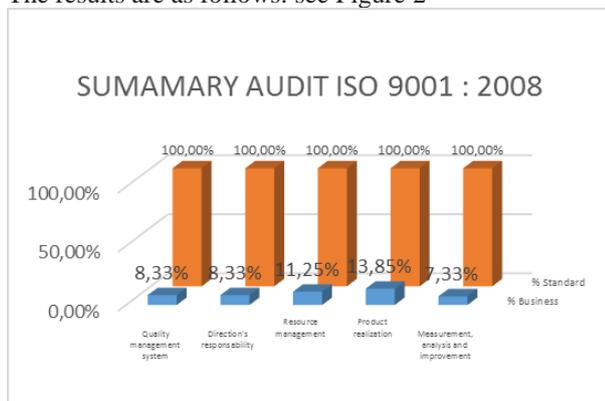


Figure 2: Summary Audit ISO 9001: 2008

*Resume compliance with the clauses, sub clauses and postulates of the standard. It is appreciated that item 7 Product Realization has a performance of 13.85%, followed by item 6 Resource Management with 11.25%, while the item 4 of quality management system and 5 Management responsibility sets a value of 8.33%, with the lowest compliance in item 8 Measurement, Analysis and Improvement with 7.33%.*

$$x = \frac{8,33\% + 8,33\% + 11,25\% + 13,85\% + 7,33\%}{5}$$

$$x = 9,820 \%$$

The gap of default is calculated, the results of the difference is used between 100% which is the highest score and the result of the items it gives each point obtained in the initial diagnosis. Getting as total non-compliance with the following standard.

$$x = \frac{91,67\% + 91,677\% + 88,75\% + 86,15\% + 92,67\%}{5}$$

$$x = 90,18\%$$

(Chacon, 2010)

This reveals that the organization must design a quality management system appropriate to their reality and needs to become more competitive and give full compliance to the requirements CLON.

## 1.6 Model ISO 9001: 2008

ISO 9001 : 2008 , suggests a process-based approach which seeks organizations to articulate their processes, procedures , tasks and resources systemically , bringing an improvement in the quality of processes and thus achieved is ensures quality and continuous improvement of the product or service. (Organización Internacional para la Normalización)

According to paragraph 4.2.1 of ISO 9001: 2008 indicates that the documentation of quality management system should include:

- Documented statements of a quality policy and quality objectives.
- A quality manual
- Documented procedures and records required by this International Standard , and
- Documents, including records determined by the organization that are necessary to ensure the effective planning, operation and control of its processes. (Organización Internacional para la Normalización)

QMS documentation can describe how an organization's activities are organized with the aim of ensuring quality in the realization of the product and / or service provision and therefore the total satisfaction of its customers. (Organización Internacional para la Normalización)



Figura 3: Pirámide Documental según ISO 9001: 2008

Referencia: (Organización Internacional para la Estandarización ISO, 2008)

Documentation suggested in ISO 9001 is as follows: 2008 ordered according to the importance of each document.

The Quality Manual is the document in which the set of activities that the organization must perform so that the quality management system detailed function effectively. (National Government of Ecuador, 2015) This document describes the process map, quality policy, and quality objectives, inventory procedures required by the standard procedures, records and instructions detailing such procedures. (Organización Internacional para la Normalización)

A procedure is the detailed guide that shows sequentially and orderly how two or more people performing work. It describes how, what, who, when, where and why the activities are performed. (Torres, 2006)

For the layout of the procedures it was made using a process mapping software. The process map and process characterization is used as types of diagrams.

The organization must have at least the procedures required by ISO 9001: 2008 in which it states that it is mandatory to have documented procedures for the following activities: document control, control of records, internal auditing, product control or nonconforming, implementation of corrective action and implementation of preventive action. In addition, those required by the organization for the proper development of processing and marketing of dairy products. (Organización Internacional para la Estandarización ISO, 2008)

The instructions are documents collected in an orderly and systematic policies, criteria and focused on standardization and compliance by those activities of the organization. (Departamento Administrativo de la Función Pública, 2007)

In addition, they describe how a task it is said that the way the procedures are similar, but differ from these in your fund performs. (Departamento Administrativo de la Función Pública, 2007)

Records are considered a special type of document. They are established and maintained to provide objective evidence of conformity of activities performed or results achieved with the requirements and the effective operation

of the QMS. (Organización Internacional para la Normalización)

They shall remain legible, readily identifiable and retrievable. The organization shall establish a documented procedure to define the controls needed for the identification, storage, protection, retrieval, retention and disposal of records. The backup records stored electronically is also part of the management of records. (Organización Internacional para la Normalización)

The comparative analysis is based on the strategic assessment of the quality check list used in the initial audit , then by a final audit based on the proposal generated or actions taken for the development of the activities involved the QMS be verified compliance or not each of the items of ISO 9001: 2008.

Improvement Plan or Improvement Plan is the set of control elements, which consolidate the improvement actions necessary to correct deviations found in the internal control system and management of operations, which are generated as a result of processes self-evaluation, independent evaluation and formal observations from the supervisory bodies. (BRAVO, 2011)

In this plan strategic actions on the changes that must be made to the quality management system to provide a product and service that meets all expectations of stakeholders are integrated.

Necessary for implementation support and commitment of all those responsible for the processes that interact in the SGC.

The improvement plan has Frontera Dairy preventive, corrective and improvement actions applied to non-conformities detected in the comparative analysis and thus comply with the requirements of the ISO 9001: 2008 in terms of continuous improvement. (Bravo, 2011)

## 2. Results and Discussion

### 2.1 Proposed Quality Management System

In the first instance, as a result we have the Process Map (Figure 4), Quality Manual, which contains all documentation relating to the SGC.

The manual contains the following information:

- Scope of quality management system , including details of and justification for any exclusions
- Process Map
- Description of the points of the Standard
- Quality Policy
- Quality Objectives
- Documented procedures required by ISO 9001: 2008, among others. (Organización Internacional para la Normalización)

Under the concept of process approach: the Procedures Manual which is divided into four phases consisting of the main processes of the quality management system adapted to the requirements of the ISO 9001: 2008 standard was also developed.

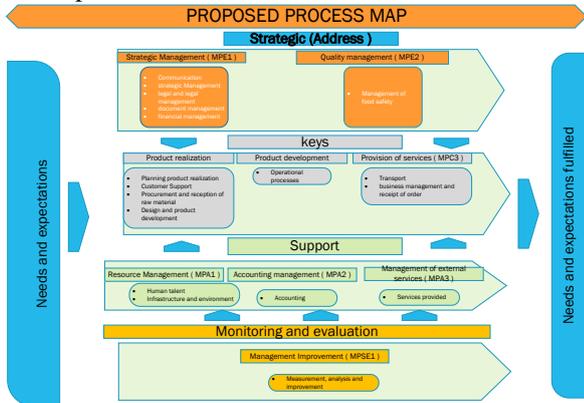


Figure 4: Proposed Process Map

As advances in research inventory process that is reflected in the list of processes and procedures for the proper development of Macro process of the Organization (Table 4, Table 5 and Table 6) it is made. In addition, here you can identify those responsible for each process, thread and the product or result may be generated.

**Macro- processes / Processes and Procedures Strategic**

Inventory Processes and Procedures							
Macro - processes			Processes			Procedures	
CO D.	NAME	RESPON SIBLE	CO D.	NAME	RESPON SIBLE	COD.	NAME
MP E1	Strategic direction	Shareholders' Meeting	MP E1.1	Communication organizational	QMS technician and food quality	PRO-MPE1.1-1	Internal and external communication
			MP E1.2	addressing strategic	General Manager	PRO-MPE1.2-1	organizational strategic direction
			MP E1.3	Legal and legal management	General Manager	PRO-MPE1.3-1	legal and legal advice
			MP E1.4	document management	QMS technician and food quality	PRO-MPE1.4-1 PRO-MPE1.4-2	Control documentation Control records
			MP E1.5	financial management	General Manager	PRO-MPE1.5-1 PRO-MPE1.1-2	Forecast and Budget Allocation Bank management
MP E2	Quality management	General Manager	MP E2.1	Management of food safety	QMS technician and food quality	PRO-MPE2.1-1 MPE 2.1-2	Staff training Evaluation of current legislation, ARCSA, Agrocalidad and Ministry of labor relations

Table 4: Macro- processes, Strategic and procedures

Table 4 can identify processes that are linked to the area of responsibility of management and especially the long term. It refers primarily to the planning and others that are

considered related to key or strategic factors. (Sanz, Calvo, CarrascoPérez, Zapata, & Panchano)

**Macro- processes / Processes and Procedures Keys**

MP	Product realization	Plant Manager	MP C1.1	Planning product realization	General Manager	PRO-MPC1.1-1 PRO-MPC1.1-2	Product Plan Forecast resou	
MP C1	Product realization	Plant Manager	MP C1.2	Customer-related processes	General Manager	PRO-MPC1.2-1	Selection of sup	
						PRO-MPC1.2-2	Handling complai suggestions and recc nonconforming	
						PRO-MPC1.2-3	Direct sells	
						PRO-MPC1.2-4	Review of require related to the produ	
						PRO-MPC1.2-5	Determination of req related to the produ	
						PRO-MPC1.2-6	Customer Supp	
	MP C1.3	Design and product development	Plant Manager	MP C1.3	Design and product development	General and technical manager at QMS and food quality	PRO-MPC1.3-1	General procedu product realization
							HP-MPC1.3-1	Making Fresh ct
							HP-MPC1.3-2	Ricotta Cheese M
							HP-MPC1.3-3	Making yogurt coo
							HP-MPC1.3-4	Making yogurt t
							PRO-MPC1.3-6	Design and pro development
							PRO-MPC1.3-7	traceability
							PRO-MPC1.4-1	Shopping Inform
PRO-MPC1.4-2	Verification of pur product							

Table 5: Macro- processes, key processes and procedures

Table 5 shows the processes that are directly linked to the realization of the product and / or service delivery is. Processes are "line". (Sanz, Calvo, CarrascoPérez, Zapata, & Panchano)

**Macro- processes / Processes and Procedures Support**

MPA1	Resource management	General Manager	MPA1.1	Human talent	General Manage	PRO-MPA1.1-1 PRO-MPA1.1-2 PRO-MPA1.1-3 PRO-MPA1.1-4	Recruitment and staff selection Induction Training Evaluation and performance
MPA1	Resource management	General Manager	MPA1.2	Infrastructure and work environment	General Manage	PRO-MPA1.2-1	Plant maintenance
						PRO-MPA1.2-2	Hiring Maintenance of equipment
						PRO-MPA1.2-3	Maintenance and calibration of equipment
MPA2	Financial and accounting management	Accounting	MPA2.1	Accounting	Accounting assistant	PRO-MPA2.1-1	Billing and retention
						PRO-MPA2.1-2	Payment
						PRO-MPA2.1-3	Portfolio Management
MPA3	Management of external services	General Manager	MPA3.1	Services provided	SGC technician and food security	PRO-MPA3.1-1	Hiring outside labor
						PRO-MPA3.1-2	Maintenance services

Table 6: Macro- process, Processes and Procedures Support

Table 6 processes that support business processes shown, usually related to resources and measurements. (Sanz, Calvo, CarrascoPérez, Zapata, & Panchano)

**Macro- processes / Processes and Procedures for Monitoring and Evaluation**

MPSE1	Management improvement	QMS technician and food quality	MPSE1.1	Measurement, analysis and improvement	QMS technician and food quality	PRO-MPSE1.1-1	Corrective actions
						PRO-MPSE1.1-2	Preventive and improvement actions
						PRO-MPSE1.1-3	Customer satisfaction
						PRO-MPSE1.1-4	nonconforming products
						PRO-MPSE1.1-5	Analysis of data
						PRO-MPSE1.1-6	Verification of product requirements
						PRO-MPSE1.1-7	Internal audits
						PRO-MPSE1.1-8	Tracking QMS processes

Table 7: Macro- processes, Processes and Procedures for Monitoring and Evaluation

Table 7 shows the processes that let you monitor them, measure them, analyze them and establish improvement displayed. It is in line with item 8 of the reference standard. (Sanz, Calvo, CarrascoPérez, Zapata, & Panchano)

characterization of processes where the distinctive lines of each is determined is also performed , internal or external processes is identified, the inputs and outputs of processes, purpose and scope , managers , suppliers and customers, process controls and indicators , records and documents.

It was also developed, the Procedures Manual containing 12 of them and as an added value and to meet the needs of the plant operation pattern Formulas of the four products made and marketed was developed.

**2.2 Comparative Analysis between Initial and Final Audit**

Once determined the results of the initial internal audit and the results achieved with the proposal of the quality management system (QMS ), then the comparative analysis of the documentation requirements presented the ISO 9001 is performed: 2008.

This analysis consists of two parts, one focused on each of the items of the standard and the other focused on the overall results of compliance.

**First part**

Comparison of the results of the initial audit regarding the results of the audit of the proposal and required by the standard.

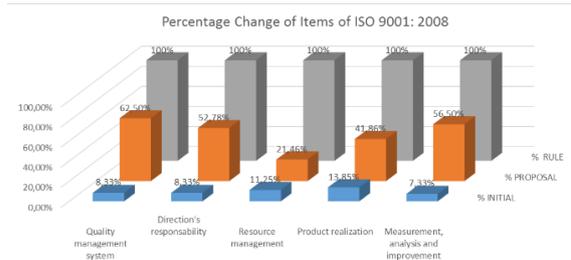


Figure 5: Percentage Change of Items of ISO 9001: 2008

In Figure 5, the percentage change of the items shown in the initial diagnosis, the proposed and which suggests the standard is 100% compliance.

Using audit criteria Anderi Souri and the checklist of relevant evidence-based standard, the initial audit throw results such as shown in the table of percentage change of the items of ISO 9001: 2008.

VARIATION OF ITEMS OF ISO 9001 : 2008			
Quality management system			
	% Initial	% Proposal	% Standard
➤ 4.1 General Requirements	8,3	62,50	100%
➤ 4.2 Documentation Requirements	3%	%	
Direction's responsibility			
➤ 5.1 Management Commitment	8,3	52,78	100%
➤ 5.2 Customer Focus	3%	%	
➤ 5.3 Quality Policy			
➤ Planning 5.4			
➤ 5.5 Responsabilidad, Authority and Communication.			
Resource Management			
➤ 6.1 Provision of Resources	11,	21,46	100%
➤ 6.2 Human Resources	25%	%	
➤ 6.3 Infrastructure			
➤ 6.4 Work Environment			
Product Realization			
➤ 7.1 Planning of Product Realization	13,	41,86	100%
➤ 7.2 Customer-related processes	85%	%	
➤ 7.4 Purchasing			
➤ 7.5 Production and / or Service Delivery			
➤ 7.6 Control Devices 7.6 Monitoring and Measurement.			
Measurement, analysis and improvement			
➤ 8.1 Generalities	7,3	56,50	100%
➤ 8.2 Monitoring and Measurement	3%	%	
➤ 8.3 Control Product and / or nonconforming			
➤ 8.4 Data Analysis			
➤ 8.5 Improvement			
<b>TOTAL</b>	<b>9,8</b>	<b>47,02</b>	<b>100%</b>
	<b>2%</b>	<b>%</b>	

Table 8: Percentage Variation of Items of ISO 9001: 2008

Table 8 summarizes the results obtained in the initial audit, the audit of the proposed system and suggesting the rule is to reach 100 % stresses.

**Second part**

In the following graph the total variation of the results of the QMS that emerged from the initial audit and the final audit with a view to full compliance with the standard is presented.

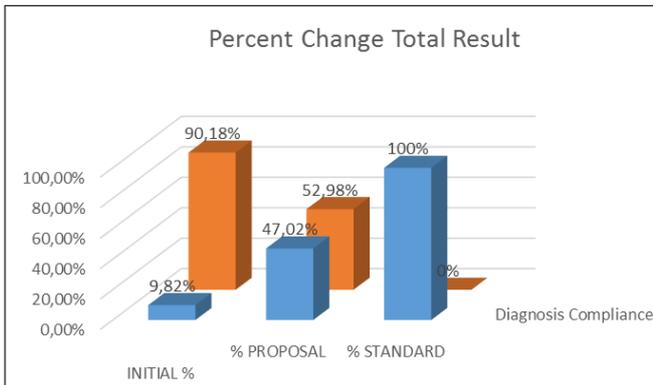


Figure 6: Percent Change Total Result

Diagnostic results of compliance with the standard range of 9, 82 % to 47, 02% which shows us a 37.20 % improvement of the QMS. Furthermore the variation of the gap diagnosis is 90, 18 % to 52.98 %.

## 2.3 Improvement Plan.

The Improvement Plan is the set of control elements, which consolidate the improvement actions necessary to correct deviations found in the internal control system and management of operations, which are generated as a result of the processes of self-assessment, evaluation independent and formal observations from the supervisory bodies. (BRAVO, 2011)

Therefore the improvement plan where preventive, corrective and improvement applied to nonconformities in the comparative analysis emphasizes action is performed.

The strategic plan was made focus primarily on the following:

### 1) STRATEGIC PLANNING

**Description:** Dairy products should raise Frontera strategic planning for the next period, which contains the implementation of the POA and the implementation of the QMS.

**Root Cause Analysis:** It is considered vital organizational strategic planning. The implementation of the completion of the Annual Operating Plan (POA) and the SGC will give you many more options assertive decisions.

**Action Plan:** The activities are detailed developed to eliminate the detected nonconformity.

- Implement the quality management system and socialize the processes that have been identified (mission, vision, policies, annual targets).
- Perform organizational strategic planning earlier this year (POA and analysis of quality objectives at least).
- You should implement a culture of continuous improvement to identify situations where the organization stronger and more competitive.

- Define organizational communication channels

### 2) PROCESSES RELATED TO CLIENTS

**Description:** With regard to the review of the requirements of the products and services offered by this organization, this SGC does not ensure that the requirements are well defined.

**Root Cause Analysis :** It is because the establishment , documentation, implementation and maintenance of quality management system is a new proposal , therefore , still no revisions to the requirements related to the product and / or service is performed.

- Define techniques and tools to clearly identify the requirements of stakeholders.
- Review the requirements of the products and / or services in defined periods

### 2.3.1 Measurement Analysis and Improvement

**Description:** is detected in the control equipment monitoring and measurement, the organization does not perform any treatment to improve and ensure the quality of measurements and data obtained with teams despite being an organization of criticality (food processing).

**Root Cause Analysis:** The organization has identified that the measuring equipment are not calibrated not have a procedure for metrology activities.

- Establish a calibration procedure and management for each of metrology measuring equipment
- Propose a training program the correct use of measuring equipment and emphasize the importance of the data obtained.

### 2.3.2 Resource Management

**Description:** It is detected in terms of resource management, top management is not committed enough, provision of resources, skills and training

**Root Cause Analysis:** Dairy Frontera to not having a POA and whether to implement a QMS, has disadvantages in the allocation of financial resources in terms of contingency in machinery, personnel, and infrastructure events. Also it has drawbacks in the selection of staff and skills.

- Planning Independent financial resources for the management of resources in the POA
- Perform the selection process, evaluation and induction of person (define profiles of operational and administrative posts)
- Perform instructions for the use of existing machinery. (The technical specifications should be included )



- Manage the work environment (identifying and mitigating irrigation situations )

### 3. Conclusions

- With determination and organization of the theoretical foundation could direct the development of this research in the Micro-enterprise Dairy Frontera, resulting in a solid foundation in knowledge of Systems Quality Management.
- Tools and methodologies of quality such as was used in the initial diagnosis : SWOT matrix , the initial internal audit checklist , the criteria for Anderi Souri and application of Porter's five forces , resulting in the identification a low rate of compliance with the requirements under ISO 9001 : 2008 was 9 , 82 % with a gap of default of 90 , 18 %.
- Management System ISO 9001: 2008 was designed, which started from the development processes of 1 map, 16 characterizations of processes, quality manuals 1, 1 manual procedures as well as 4 and 34 instructional formats that the system is necessary. As an added value a site for interaction and use of SGC and leaves Formula pattern as a complement to operational processes performed
- The evaluation of the degree of documentary improvement, it made taking into account the results of the initial audit with the results of the audit of the management system proposed , this allows to demonstrate the potential degree of impact that will be achieved by implementing this work , taking as full diagnosis result of compliance with the standard varied from 9 82 % 47 02 % which shows us a 37.20 % improvement of the QMS and on the other hand the change in diagnosis of the gap is 90 , 18 % to 52.98 % .

### Thanks

Thanks to the Micro - enterprise Dairy Frontera and all staff that form, for giving me the opportunity to share knowledge and let me do my job grade.

### 4. Bibliography

Ediciones Díaz de Santos. (1997). *La ventaja competitiva*. Madrid: Ediciones Díaz de Santos. Obtenido de <https://books.google.com.ec/books?id=MQYxXL Y00hUC&printsec=frontcover&dq=ventaja+competitiva&hl=es&sa=X&ved=0CBsQ6wEwAGoVC hMI04WB5u6IyQIVx->

wmCh1EdgyR#v=onepage&q=ventaja%20competitiva&f=false

- Bravo, D. C. (2011). *Manual de control interno herramientas para la buena administración*. Obtenido de [http://sanmarcos-sucre.gov.co/apc-aa-files/64333930366138313434653633356136/MANUAL\\_DE\\_CONTROL\\_INTERNO\\_2011.pdf](http://sanmarcos-sucre.gov.co/apc-aa-files/64333930366138313434653633356136/MANUAL_DE_CONTROL_INTERNO_2011.pdf)
- Chacon, K. A. (Noviembre de 2010). *Implementación de un sistema de gestión de la calidad en la unidad regional de postgrado, UNEXPO, Vicerrectorado Puerto Orzas* . Obtenido de <http://www.monografias.com/trabajos-pdf4/implementacion-sistema-gestion-calidad-postgrado-unexpo/implementacion-sistema-gestion-calidad-postgrado-unexpo.pdf>
- Congreso Nacional del Ecuador . (14http://www.controlsanitario.gob.ec/wp-content/uploads/downloads/2014/04/LEY-ORGANICA-DE-SALUD1.pdf de Febrero de 2012). *Ley Orgánica de Salud* .
- Correa, E. E. (9 de Junio de 2014). *Reglamento general a la ley del sistema ecuatoriano de la calidad*. Obtenido de <http://www.industrias.gob.ec/wp-content/uploads/2015/04/A2-LEY-DEL-SISTEMA-ECUATORIANO-DE-LA-CALIDAD.pdf>
- Departamento Administrativo de la Función Pública. (2007). *Guía de Diseño para Implementar el Sistema de Gestión de la Calidad bajo la Norma Técnica de Calidad para la Gestión Pública NTCGP 1000:2004*. Bogotá. Obtenido de [http://portal.dafp.gov.co/form/formularios.retrieve\\_publicaciones?no=410](http://portal.dafp.gov.co/form/formularios.retrieve_publicaciones?no=410)
- Farías, E. B. (Junio de 2012). *Procesos administrativos* . Obtenido de <http://www.letrak.com.co/alejandro/material/adm/planeacion.pdf>
- GlobalSTD Certification . (2014). *Estadísticas ISO 2014* . Obtenido de <https://www.globalstd.com/certificacion/estadisticas-iso-2014>
- Gobierno Nacional del Ecuador . (10 de Septiembre de 2015). *Ministerio del Trabajo del Ecuador* . Obtenido de El ministerio de relaciones laborales es una Institución rectora de políticas públicas de trabajo, empleo y del talento humano del servicio público, que regula y controla el cumplimiento a las obligaciones laborales mediante la ejecución de procesos efica
- INEC. (2014). *Directorio de Empresas y Establecimientos*. Obtenido de <http://www.ecuadorencifras.gob.ec/documentos/w eb->

- inec/Estadisticas\_Economicas/DirectorioEmpresas /140210%20DirEmpresas%20final3.pdf
- Instituto Andaluz de Tecnología . (30 de Junio de 2002). Obtenido de <http://www.centrosdeexcelencia.com/dotnetnuke/portals/0/guiagegestionprocesos.pdf>
- ISOfocus - Revista de la Organización Internacional de Normalización. (Noviembre de 2015). *¡ Recien Publicadas! ISO 9001 e ISO 14001*. Obtenido de [http://www.iso.org/iso/es/isofocus\\_113.pdf](http://www.iso.org/iso/es/isofocus_113.pdf)
- Itesm, E. (2011). *La importancia de la gestión empresarial* . Obtenido de <http://www.normas9000.com/importancia-gestion-calidad.html>
- king, H. J. (2012). *Estudios industriales de la micro, pequeña y mediana empresa*. Quito : FLACSO.
- Moreira, M. D. (25 de Abril de 2015). *Las cinco fuerzas de Porter*. Obtenido de [https://www.youtube.com/watch?v=EvGLMMeCFyk&ab\\_channel=MarcosDelgadoMoreira](https://www.youtube.com/watch?v=EvGLMMeCFyk&ab_channel=MarcosDelgadoMoreira)
- Organización internacional para la estandarización . (15 de Noviembre de 2008). Obtenido de [file:///C:/Users/acer/Downloads/ISO\\_9001-2008\(ES\)%20\(1\).pdf](file:///C:/Users/acer/Downloads/ISO_9001-2008(ES)%20(1).pdf)
- Organización Internacional para la Estandarización ISO. (2008). *Norma internacional ISO 9001; 2008 Sistema de gestion de la calidad- Requisitos*. Suiza.
- Organización Internacional para la Normalización. (s.f.). Compendio de la norma ISO sistemas de gestion de la calidad. Obtenido de [WWW.INTERCAMBIOSVIRTUALES.ORG](http://WWW.INTERCAMBIOSVIRTUALES.ORG)
- Prisma Consultoría SAs. (31 de Octubre de 2014). *Último informe ISO 9001 para Latinoamérica*. Obtenido de <http://prismaconsultoriasas.blogspot.com/2014/10/ultimo-informe-iso-9001-para.html>
- Sanz, J. B., Calvo, M. A., CarrascoPérez, R., Zapata, M. A., & Panchano, F. T. (s.f.). *Guía para gestión basada en procesos*. Sevilla. Obtenido de <http://www.oviedo.es/documents/12103/f8e7f4c1-a7ba-4fb5-87d7-c95335c79b22>
- Torres, M. G. (2006). *Manual para elaborar manuales de políticas y procedimientos*. Mexico: Panorama Editorial. Obtenido de <https://books.google.com.ec/books?id=YnhdFdUDnVIC&pg=PA35&dq=Un+procedimiento+es+la+gu%C3%ADa+detallada+que+muestra+secuencialmente+y+ordenadamente+c%C3%B3mo+dos+o+m%C3%A1s+personas+realizan+un+trabajo&hl=es&sa=X&ved=0CBoQ6AEwAGoVChMImf7TtJP3yAIVQekmCh1yh>
- Universidad Espiritu Santo UEES. (11 de enero de 2016 ). *Boletín economía y PYMES, estudio y análisis* . Obtenido de <http://uees.me/wp-content/uploads/2016/04/Rev-2-Econom%C3%ADa-y-Pymes-Ene-16.pdf>
- Universidad Estatal de Milagro . (17 de Junio de 2016 ). *Una mirada a la globalización: PYMES ecuatorianas* . Obtenido de <http://www.eumed.net/coursecon/ecolat/ec/2016/py mes.html>
- Universidad Nacional Experimental del Táchira . (11 de Diciembre de 2011). *Procedimientos integrados, técnicos y administrativos en el control de la calidad* . Obtenido de <http://controldecalidadingindustrial.blogspot.com/p/articulo-cientifico.html>
- Wheelen, T., & Hunger, D. (2013). *Administración estratégica y política de negocios*. (Decimotercera ed.). Bogotá, Colombia: Delfin Ltda.

## About the Author

Cuasés Wilson, was born in the city of Angel, Espejo, Carchi Province on October 19, 1992.

Primary studies were conducted at the " Educational Unit Garcia Moreno " in the parish of the same name belonging to Bolívar Carchi Province ; high school in the " Educational Unit Angel " later joined the Technical University North of the city of Ibarra was a student of the School of Industrial Engineering.