



A CONTRIBUTION TO THE ESTABLISHMENT OF A MANAGEMENT SYSTEM FOR FOOD SAFETY ACCORDING TO ISO 22000 FOR SALTED ANCHOVIES IN DRUMS (FACTORY LAFALUCA IN KENITRA, MOROCCO)

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Abstract

Throughout this work, we have tried to offer LAFALUCA company the means to demonstrate its ability to control the hazards related to food safety so as to produce safe products regularly. These means must satisfy the multiple customer's requirements and those of the food safety regulations that must be applied as well. This means that the establishment of a management system for food safety "SMSA" according to the requirements of the ISO 22000 standard was an indirect transition towards the total quality, while working on the various aspects of the standards: the pre-requisites (PRP), HACCP system, operational PRP, the traceability system and the management system. To make this work, we began first by analyzing the details with a standard based on ISO 22000 audit questionnaire and also a checklist of prerequisite programs separately from that standard. Next, we conducted an analysis of the situation of the company, the quality side, which gave us the permission to prepare the appropriate course of action. And finally, we have strictly implemented the management system of food safety in compliance with the ISO 22000 standard.

Key words: Management system of food safety, ISO 22000, PRP, HACCP system, operational PRP.

Introduction

Resembling some food companies in the world, some Moroccan companies of different products are becoming interested in ISO 22000. The marine fisheries sector is among the most relevant branches of industry. In fact, being aware of the rank which the Moroccan fishery products begins to take globally, these companies are now adopting ISO 22000 as a revolutionary solution for all problems concerning exportation, and the effective ways for competition.

This document is the result of the support of one of these companies in the installation of ISO 22000 through a check- list (ISO 22000 audit questionnaire) in the LAFALUCA society. The objective of this work is to assess the current state of compliance of the requirements of ISO 22000 of LAFALUCA (its activity: salted anchovies in barrels) installed in Kenitra (Morocco) while carrying out a study of the check-list which is established in general by the norm 22000 in the form of a

questionnaire.

Materials and Methods

Non-quality is a daily reality that costs a lot: it is estimated at 25 to 30% of the sales of a business case, and up to 50% of the budget of an administration. Thus, quality is the only way to gain more with less efforts (Blanc D. 2006).

Our work, in this regard, requires an assessment of the existing facilities and also an analysis of the situation of the company (quality side) for a better vision. Following this analysis, an action plan was produced.

Assessment of the situation of the company against the requirements of ISO 22000.

Because the company has not yet installed the quality management system, only the assessment of the prerequisite programs is needed. Indeed, the job is to move from an initial level of quality to the total quality assured by the installation of ISO 22000 with the consideration of the "fault" of the definition of "non-

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compliance” (Mami and Benhabib, 2004). According to him, failure is a non-satisfaction of the requirements of the intended usage. It is the gap or the absence of one or more quality characteristics against the requirements of the intended usage. On the contrary, non-compliance, they say, is the failure to meet the specified requirements. It is the gap or the absence of one or more quality characteristics or of a quality system element relative to requirements.

The evaluation was made by using a “checklist which meets the requirements of ISO 22000”. Following this inspection, we examine the compliance of resources and business practices with the ISO22000 requirements and those of Moroccan standards. The result of this diagnosis will of course make us identify the nonconformity of practices, and subsequently to propose corrective actions.

To simplify this work, the principles of ISO2000 requirements and those of Moroccan standards were taken and rearranged in an assessment grid (Table 1) which consists of four columns. In the first column, we have the ISO 22000 requirements; in the second, we have the current state of satisfaction (satisfied, partially satisfied or not satisfied) and in the last column, the review of each requirement. When the requirement is fully respected, we check the “satisfactory” box (S); when it is partially met, we check the box “partially satisfactory” (PS); and if it is not respected at all then it is the box “unsatisfactory” (NS) which is checked. This grid, according to (ASAP, 2007), takes the form of a table where the items are listed in the table below.

The conservation of results in the numerical values is done by marking the satisfaction to every requirement for a score ranging from 0 to 10: when the box “satisfactory” is checked, the assigned rating will be 10; and when the criterion is “partially satisfactory”, the assigned grade is 5, otherwise the score will be 0 by taking the calculation of the percentage of satisfaction of the standard requirements as shown by the following relationship.

Percentage (%) * Satisfaction =

$$\frac{(Number\ S * 10 + PS\ Number * 5 + Number\ NS * 0)}{Total\ number\ of\ criteria * 10}$$

Results and Discussion

This part of results and discussion is devoted to the various points raised throughout the diagnosis inside the company. A follow up of interpretation is reserved later.

The final results of this work involve the evaluation of the current state of the factory. However, we must

ensure that all sections of the ISO 22000 standards are met by the announced methodology.

Assessment of the situation of the company with the requirements of the ISO 22000 standard

Diagnostic results of the ISO 22000 standard

We notice in the Fig. 1 that there is a percentage of 40 percent of management’s responsibilities in relation to the current state of meeting the requirements of the ISO22000 standard, which means that there is a deficiency at several other elements. It must implement all the human, material and financial means which are necessary for the maintenance of adequate working environment and for the provision of equipment which are in their turn necessary for controlling the production as well as the establishment, implementation and improvement of a quality assurance system according to the HACCP principles. Also, in terms of security policy, the company must be built on: security, compliance staff, protection of the environment, the customer permanent listening (to satisfy their demands by adapting the products to their current and future needs), the day on compliance with quality objectives set by management and the preparation of reviews of management.

Moreover, the company showed that there is an HACCP plan which is going to be in realized and which equally needs the multidisciplinary of the HACCP team. Concerning the educational level of Foodstuffs Safety team which must be appropriate (check the training, qualifications and experience), we notice that there is a lack of the required knowledge for the appropriate posts. As for the internal and external communication, we observe that the internal communication is characterized by some weakness at the administrative and the social level while the external communication is characterized by some improvement especially the suppliers.

On the other hand, the resource management is defined by a percentage of satisfaction of 58.33%. There are many features of this percentage among which there is a deficiency of staff’s skills, which has a negative impact on the product therefore it is highly recommended that the company must support some training on goods’ hygiene practice and good manufacturing practice for workers. There is also a lack of training and a lack of verification of the training of people who have already undergone training to carry out internal audits.

Regarding the product specification, we notice that the company has reached the level of 63.63% of satisfaction. There is a deficiency in several elements including analysis of salt for the specifications of intended use since the company does not know the intentions of

Table 1: Checklist ISO22000.

Assessment criterion as a questionnaire of ISO 22000	Current state of satisfaction			Comments
	S	PS	NS	
Requirements				
1- Criterion 1				
2- Criterion 2				
3- Criterion 3				

the usage and there is no segmentation of the market to target the intended category.

The product of the process reached 92.85% of satisfaction but there is only a deficiency in the changing parameters.

The analysis of hazards and risks and also the Control Critical Points CCP reached 75% of satisfaction. Concerning the hazards' analysis, the company adopts a preventive policy before approaching the risks but unfortunately this policy is not effective enough due to the lack of objectivity. Risks are identified in general and their recurrences (biological, chemical, physical, and allergenic) are identified by observation only. On the other hand, we could not identify the control critical points CCP in certain stages.

The critical limits reached 62.50% of the satisfaction and they are not well identified as long as not mentioned in the Quality Manual because of the lack of references.

The procedure for monitoring reached 75% of satisfaction in which the equipment of control and

measurement are not in good condition though the product traceability is clearly identified. There is also a lack of traceability in ingredients. Regarding the monitoring personnel, we notice that they lack their ongoing training.

The corrective actions have a serious deficiency in the management of non-compliant products and there is no recording of these corrective actions. They reach 42.85% of satisfaction. That is why there are no changes of the processes or the HACCP plan in case of exceeding the critical limits continuously.

The procedure of checking reaches 72.72% of satisfaction. It lacks the equipment calibration of mastering and recording because there is a lack of continuing training for the audit staff. There is also a lack of procedures that include the evaluations of customers and their complaints.

The document control and records reached 81.80% of the satisfaction in which we notice that there is not a retrieval from documentation of all the HACCP activities and the HACCP records are not clearly identified because there are problems in the manual that will need some improvement.

As for training, it reaches 33.34% of satisfaction. This deficiency is due to the lack of several necessary requirements to comply with the ISO 22000 standard and the absence of a procedure for identifying the training needs and the staff training and also the absence of verification the effectiveness of training.

Moreover, the company has not made a training plan

Table 2: Evaluation results of the requirements of the standard ISO 22000.

The norm elements		Nb of criteria S	Nb of criteria PS	Nb of criteria NS	Nb of criteria Total	Current state of satisfa- -ction %	Objective
1	Management Responsibilities	1	6	3	10	40%	100%
2	Management of resources	1	5	0	6	58.33%	100%
3	Specification of product	5	4	2	11	63.63%	100%
4	Process	6	1	0	7	92.85%	100%
5	Hasards and risks analysis	5	5	0	10	75%	100%
6	Critical control Points (CCP)	1	1	0	2	75%	100%
7	Critical limits	2	1	1	4	62.5%	100%
8	Monitoring procedures	5	2	1	8	75%	100%
9	Corrective actions	3	0	4	7	42.85%	100%
10	Verification procedures	8	0	3	11	72.73%	100%
11	Master of documentation and records	8	2	1	11	81.82%	100%
12	Training	0	4	2	6	33.34%	100%
13	Recalls	6	1	1	8	81.25%	100%
14	Complaints	1	1	4	6	37.5	100%
15	Sanitation control procedures	20	17	17	54	52.77%	100%
16	Internal audit of HACCP	0	2	7	9	14.28%	100%
TOTAL		72	52	46	170	57.64	100%

despite its existence and has not encouraged enough staff to be trained in HACCP principles and internal audit.

The average recall reaches 81.25% of satisfaction which is a pretty good average but there is a deficiency which is a little severe at the level of responsibilities and authorities which are not well defined. There is certainly a recall procedure but it lacks efficiency.

As long as complaint is concerned, we notice a serious deficiency in terms of satisfaction since it reaches only 37.50%. This deficiency is expressed by the unclear definition of the procedure of the mastery of customer and the consumer complaints and also the responsibilities and authorities. Despite the existence of complaints about the product, the company lacks documentation and recording.

In the sanitation control procedure which prevails in our work, we see that it reaches 52.78% of satisfaction because of a relatively large loss. The latter is due to the fact that the company does not have enough mastery of the procedures which do not cover all the aspects of health and hygiene. It is very insufficient according to the scale of ISO 22000 which requires to select and implement appropriate programs of good hygiene practices prior to HACCP (ProCert, 2005).

Moreover, the company is testing the quality of water with an annual frequency but at the same time the treatment with chlorine is not done regularly and without enough oversight.

Regarding the condition and cleanliness of the surface of contact with foodstuffs, it is noticed that some workers bears no gloves or aprons, and the plans are not adequate and the cleaning of the workplace is not adequate. There is also a lack of employee training at the level of the personal hygiene.

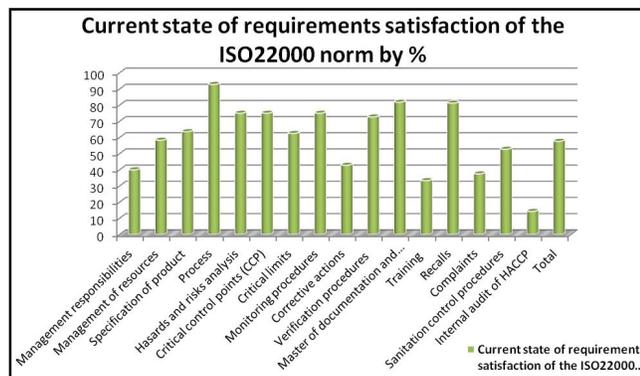


Fig. 1: Graphical representation of the results of the evaluation by the percentage of satisfaction of the requirements of the ISO 22000 standard (Personal fieldwork research, 2015).

As for the prevention of cross-contamination, we notice that the layout, the flow of materials and personnel is not sufficient for the prevention of cross-contamination, which means that there is an appearance of cross-contamination.

Regarding the maintenance of the washing places and toilets, we see that some doors are missing handles and their closure is not automatic. We also notice that in the protection of foodstuffs, packaging materials and contact surfaces with food there is a lack of cleanliness of the barrels and the store is narrow and not respecting the distance of spacing, which is a cause of condensation of stock.

As for labeling, storage and use of toxic chemicals, we notice that the agency does not name the staff who must be responsible for toxic products (cleaning products, pesticides, etc.) and that toxic chemicals are not clearly labeled for their identification and there are no instructions for use and the handling of these products and the control of employee health conditions are not implemented. Insect mastery also shows that there are certain doors which are not sealed and there is a lack of mosquito nets in the windows.

The construction and the control of the places for wastes show that corners are not concave and the walls of the storage drawers do not contain tiles which prevents cleaning, and the total absence of the floors slope do not allow the flow of liquids to siphon referrals.

As for the management of the company in the waste, we notice that there is a remarkable deficiency due to the investment in plastic and then the dejection in waste. These methods do not comply with the legal requirements. Consequently, the company must develop and implement the following prerequisite programs: Local, transportation and warehousing, equipment, utensils, personnel, sanitation and fight against pests, traceability system and withdrawals (PIAQ, Release 01 (June 2007)).

Regarding the HACCP internal audit, we notice that there is a serious deficiency of satisfaction which translates into 14.28%. This means that the company does not ensure that the audit program covers all aspects of the HACCP system while the responsibilities and audit requirements are not defined. This also means that the company is going to establish a plan to improve its internal audit.

According to this profound description, we notice that the average total of 57.64% of satisfaction is very low since it allows to install and properly perform the standard ISO 22000. This is why we find that the company needs to do more efforts to improve the lack of requirements,

which in its turn increases the profitability and the productivity to satisfy customers (Table 2 and Fig. 1).

Conclusion

Our work aims at understanding and improving the quality initiatives in agribusiness in general and in the production units of salted fish in barrels in particular.

Indeed, the installation of ISO 22000 is now evidence of effective management of the management system of food safety.

Designing a suitable product which meets the explicit and the implicit needs of the customer is a combination of activities using various and dispersed resources. It requires the establishment of a management style open to uncertainties and contingencies which implements processes and management procedures. This method, thus, creates the need to keep operational contacts with all business partners in a constantly changing environment.

The implementation of ISO 22000 in LAFALUCA is a direct path towards total quality, which aims to mobilize all company stakeholders to meet the needs of all stakeholders (customers, staff, shareholders) (Ababouch, 1997).

Our work, on the one hand, informs the management of the company about all elements of the management

system of food safety by the introduction of the first prerequisites and then the implementation of HACCP and operational PRP, the establishment of the traceability system, the establishment of the management system and finally the initial training. And on the other hand, it shows all the four phases of certification which are the preparation on site, the needs' analysis, certification's decision and certification audit on site (AFNOR, 2006).

References

- Ababouch, L.H. (1997). Quelle démarche pour les industries agricoles et alimentaires. *Le pôle alimentaire*, **8**: mars-avril. Casablanca, Maroc.
- AFNOR. (2006). Système de management de la sécurité des denrées alimentaires ISO 22 000: Présentation de la norme, 25 mars 2006.
- Blanc, D. (2006). ISO 22000 : de l'intention à la réalisation. ISO Management Systems, mai -juin 2006, 5 p.
- Mami, E.F., A. Benhabib (2004). Symposium International : Les coûts de non-qualité. Qualité et maintenance au service de l'entreprise Tlemcen, 20 p.
- Norme ISO 22000 v 2005.
- PASA. (2007). Grille d'évaluation pour l'audit des programmes préalables PASA, Manuel du PASA - Annexe II, 50 p.
- PIAQ. (2007). Vérification des Programmes Préalables, 1, 9 p.
- Pro Cert. (2005). ISO22000 et HACCP : Quelles adjonctions au Codex ?, *ProCret certification and training*, **42**: p. 2.