Quality control implementation in aquaculture industries: Certification norms and procedures

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Quality control implementation in aquaculture industries: Certification norms and procedures

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SUMMARY – Navarra Food, S.A. (Spain) with 70 employees and an annual production of 2,500 t is one of the largest producers of trout in Europe. Frozen trout exports account for 95% of sales. The evolution of Navarra Food, S.A. has involved both production and quality systems in order to meet internal and external requirements (customers, legislation, etc.). The firm's primary quality program was essentially based on end product testing, carrying out microbiological and sensorial analysis. Considering the limited number of samples, the quality guarantee turned out to be insufficient. With the publication of the R.D. 1437/1992 of 27 November settling the sanitary norms to be applied in production and commercialisation of seafood and aquaculture products the company started to implement the HACCP system. It followed the general HACCP principles, including the three types of hazards: microbiological, chemical and physical. The company met a series of difficulties, mainly related to documentation. On the other hand this system only covered prevention and detection of problems relating to food safety. In 1997 the company decided to implement a Quality Management System according to ISO 9002, which integrates HACCP. The scope is thus expanded to include all Quality Control measures in addition to those relating only to food safety. Implementation of an HACCP Plan requires a number of disciplines, which are also requirements of an ISO 9000 system. Particular attention should be drawn to the control of documentation and quality records, specifications, supplier control, non-conforming product, corrective and preventive action to be properly identified and implemented, the need to take care of equipment used for inspection and testing. All of this is driven through regular internal audits of the system and supported by training. In April 1999 Navarra Food, S.A. was awarded with the ISO 9002 certification.

Key words: Quality System, HACCP, ISO 9002.

RESUME – *"Mise en place d'un contrôle de qualité pour les industries aquacoles : Normes et procédures de certification". Navarra Food S.A. (Espagne) avec 70 employés et une production annuelle de 2 500 t, est l'un des plus grands producteurs de truite d'Europe. Les exportations de truite congelée représentent 95% des ventes. L'évolution de Navarra Food S.A. a nécessité des systèmes pour la production et aussi pour la qualité afin de répondre aux exigences internes et externes (consommateurs, législation, etc.). Le premier programme de qualité de la firme a été essentiellement basé sur le testage du produit final, en réalisant des analyses microbiologiques et sensorielles. En considérant le nombre limité d'échantillons, la garantie de qualité s'est avérée insuffisante. Avec la publication du R.D. 1437/1992 du 27 novembre établissant les normes sanitaires à appliquer en production et commercialisation des produits de la mer et de l'aquaculture, la compagnie a commencé à mettre en place le système ARPCC. De là sont résultés les principes généraux ARPCC, y compris les 3 types de risques : microbiologiques, chimiques et physiques. La compagnie a rencontré une série de difficultés, principalement liées à la documentation. D'autre part ce système s'occupe uniquement de la prévention et la détection de problèmes liés à la sécurité des aliments. En 1997 la compagnie a décidé de mettre en place un Système de Gestion de la Qualité selon la norme ISO 9002, qui intègre l'ARPCC. La portée en a donc été étendue pour englober toutes les mesures de Contrôle de la Qualité en plus de celles liées uniquement à la sécurité alimentaire. La mise en place d'un plan ARPCC fait appel à un grand nombre de disciplines, qui correspondent aussi aux exigences d'un système ISO 9000. Une attention spéciale devrait être accordée au contrôle de la documentation et des données de qualité, aux spécifications, au contrôle du fournisseur, aux produits non conformes, à une action corrective et préventive à déterminer et mettre en place de façon appropriée, au besoin de prendre soin des équipements utilisés pour l'inspection et le testage. Tout ceci est orchestré au travers d'audits internes réguliers du système et soutenu par la formation. En avril 1999 Navarra Food, S.A., a obtenu la certification ISO 9002.*

Mots-clés : *Système de qualité, ARPCC, ISO 9002.*

Navarra Food, S.A. with 70 employees and an annual production of 2500 tonnes is one of the largest producers and exporters of trout in Europe. Frozen trout has become our priority and exports account for 95% of sales.

All of the trout processed at our plant come from our own main fish farm located just a few hundred

meters away from the plant, where all trout from 80 grams to harvesting size are raised. All of our trout has been reared in one of the company's four fish farms. This will be an important point to consider in order to establish the quality controls on the raw material.

For a long time Navarra Food, S.A. has been evolving towards meeting internal and external requirements (customers, legislation, etc.).

Though a Good Manufacture Practice was being implemented, our primary quality program was essentially based on end product testing, carrying out microbiological and sensorial analysis. We also started with some registers: temperature measurements, chlorine level in water, but these were not included in appropriately written instructions or programs.

With the publication of the R.D. 1437/1992 of 27 November settling the sanitary norms to be applied in the production and commercialisation of seafood and aquaculture products, we started implementing the HACCP system. It also started to be a requirement from our customers. We followed the general HACCP principles, including the three types of hazards: microbiological, chemical and physical. We came across a series of difficulties, related mostly to documentation, since we were not used to working according to written procedures and instructions.

As this system only covered prevention and detection of problems relating to food safety and as we were seeing that we should advance in our wish to satisfy our customers and consumers we decided to implement a Quality Management System according to ISO 9002. This international Standard is one of three International Standards dealing with quality system requirements that can be used for external quality assurance purposes.

HACCP and ISO 9000 systems can be developed independently. However, each system can help to drive the development of the other. The operation of HACCP within any formal quality system will be stronger as its effectiveness relies on proper implementation and ongoing maintenance.

There is a synergy between the two systems, both HACCP and ISO 9000 are concerned with the prevention and detection of food safety problems. In the case of ISO 9000, the scope is expanded to include all Quality Control measures in addition to those relating only to food safety.

ISO 9000 can help to ensure that the criteria laid down in the product and process specifications are met, 100% of the time. ISO 9000 can greatly assist at the HACCP implementation stage.

Implementation of the HACCP Plan within such an environment is much easier. We use this plan exclusively for prevention and detection of problems relating to food safety. We followed the principles that state in any of the HACCP Guides *(Aplicación del sistema de análisis de riesgos y control de puntos críticos en productos pesqueros congelados, FIAB, Mº Sanidad y Consumo y Asociación de industrias de elaboración de productos del mar; Fish and Fishery Products Hazards and Control Guide, US Food & Drug Administration)*

The *ISO Norm 9000 requirements* could be classified in four groups: (i) elements of Organization (Management responsibility, Quality system and Training); (ii) elements of manufacture; (iii) elements of Maintenance of the System (Management review, Internal audits, corrective and preventive action); and (iv) elements of Documentation (Document and data control, Control of quality records).

Documentation constitutes an essential part of the quality assurance system (Fig. 1). Documents should be designed, prepared, reviewed and distributed with care, and be approved, signed and dated by appropriate and authorised persons. Documents should be regularly reviewed and kept up-to-date.

The *documentation* structure is:

(i) *Quality Manual*: Document stating the quality policy and what shall be done and by whom.
(ii) *Procedures*: Specify way to perform an activity. A written or documented procedure usually contains the purposes and scope of an activity; what shall be done and by whom; when, where and how it shall be done.
(iii) *Instructions:* Document detailing how the procedure shall be carried out applied to a given situation. Instructions are: Analysis method, work instructions.
(iv) Specifications.
(v) Norms.

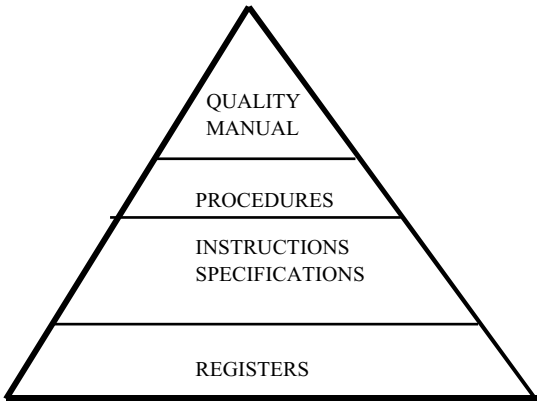

Fig. 1. Documentation structure.

Important documents for the quality control are *specifications*, documents stating requirements. Specifications describe in detail the requirements with which the products or material used or obtained during manufacture have to conform. They serve as a basis for quality evaluation.

In our case we made specifications of the final product, and of those material that are incorporated along the process; i.e. raw material (living trout) and packaging material. One will have to study this process (Fig. 2) and see what to incorporate in the process: raw material, additives, etc. The same principle will be for the fish-farm: eggs, fingerlings, feed, etc.

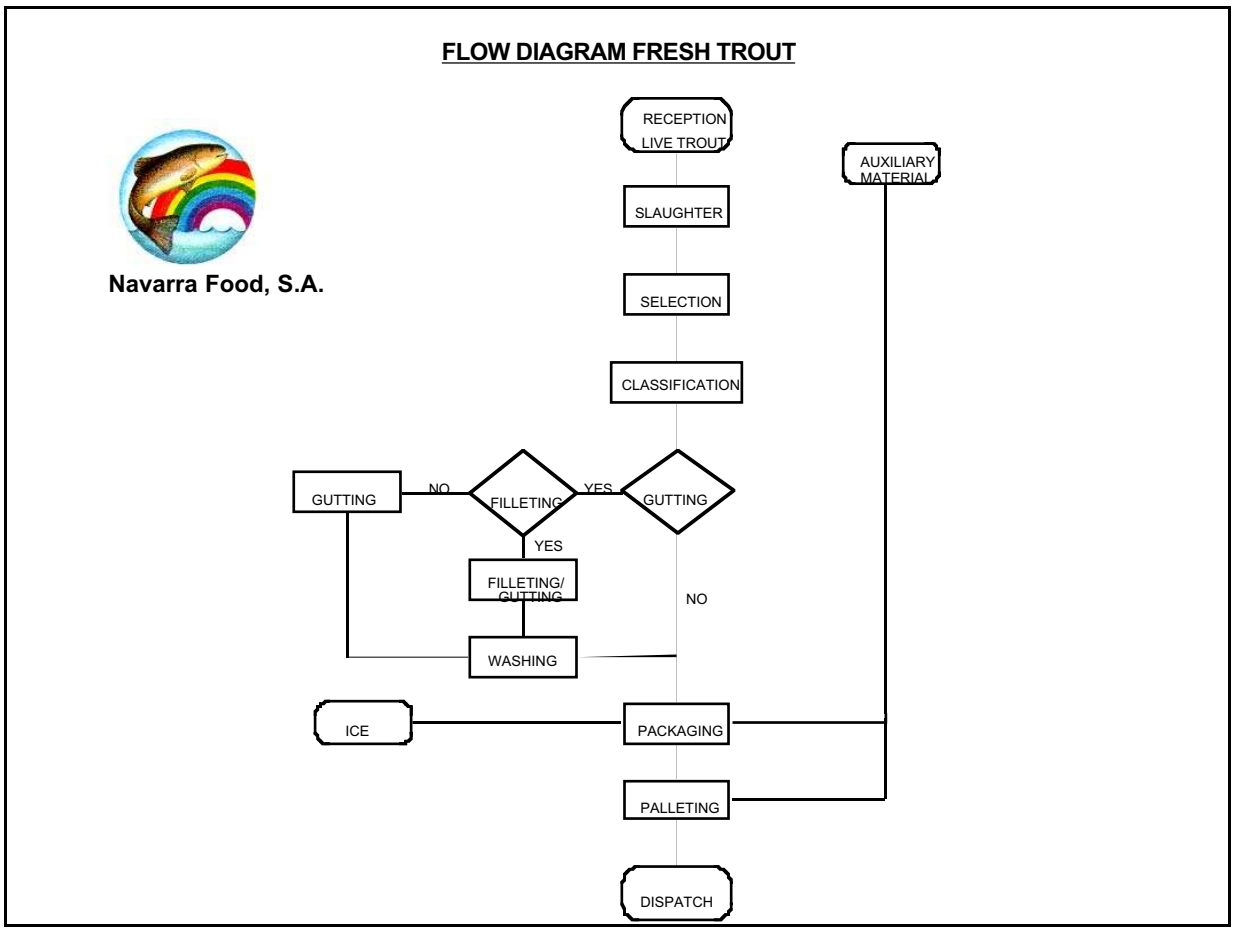

Fig. 2. Flow diagram.

We have a format for the final product (Fig. 3). The characteristics will be fixed according to legislation, customer requirements, internal requirements, etc. We complete this general final product specification with cards stating the packaging, the codification of lot number, composition of the pallet...

FINAL PRODUCT SPECIFICATION CÓD EPTXX

Navarra Food, S.A.

Denomination:

Description:

Characteristics:

Physico-chemical:

Organoleptic:

Microbiological:

Norms/Regulations

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Fig. 3. Format for the final product specifications.

Specifications for raw material, in our case living trout coming exclusively from our fish-farm, and packaging specifications.

This will be very important to elaborate the process and product control, the reception control of the purchasing material and the HACCP.

Process and product control plan

The Process and product control plan defines the controls to be carried out throughout the process, both relating to product characteristics and to process parameters, stating the control method, frequency, registers and who is to monitor and what to do when out of a scope of tolerance (Fig. 4).

Other requirements for both the ISO 9000 and HACCP systems are: (i) supplier control: to ensure that purchased product conforms to specified requirements, evaluation of suppliers, establish acceptable suppliers; (ii) product identification and traceability; (iii) control of inspection, measuring and test equipment; (iv) non-conforming products: product that does not conform to specified requirements is prevented from unintended use; (v) corrective and preventive actions (this concept is different in the HACCP and in the ISO 9000 Norm); (vi) training.

The implementation of a quality system according to Norm ISO 9001/2 can be certified by an external organism, and means the conformity of the quality system to the requirements of the Norm.

Navarra Food, S.A. is certified with ISO 9002 for the processing of fresh and frozen trout since April 1999.

PROCESS AND PRODUCT CONTROL PLAN COD: TYPE:

PHASE	PARAMETER	NOMINAL/ TOLERANCE	SAMPLE FREQUENCY	METHOD/ INSTRUCTION	RESPONS.	REG.	ACTION TO TAKE
Approved by: Production Manager Technical Master				Date:	REV.		Page

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Fig. 4. Format for the process and product control plan.

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