

FAO – EUROFISH WORKSHOP ON
SEAFOOD SAFETY
Copenhagen December 2006

Best practice of HACCP audit system
by
Hans Henrik Huss, Professor, Dr. Sc.
EUROFISH

SUMMARY

Many Government inspection agencies have developed approaches and procedures for carrying out HACCP compliance auditing. These approaches have been adapted to the various rules, practices, specificities and regulations in the countries. The following presentation should be regarded as a case study and is based on personal experience in auditing a great number of fish processing establishments in many parts of the World.

Audit is “- a systematic and independent examination to determine whether activities, conditions and results comply with planned objectives”. In HACCP terms achieving the objectives means managing the production and distribution of safe products through the use of an HACCP based approach. Thus an audit should be distinguished from **Verification** (“-doing things right”) and **Validation** (“-doing the right things”).

An audit may be internal or external, but it is imperative, that the auditors are qualified, independent and knowledgeable on products, processes, food safety and regulations.

Basically the audit process consists of 3 parts:

1. Pre-assessment, - document review.
2. On site assessment, - opening meeting, on site document review, verification of process flow diagram and observations during processing, closing meeting.
3. Post assessment, - assessment report and follow up.

As is well known, a HACCP based food safety system is consisting of a pre-requisite programme and a HACCP programme.

The definition of the pre-requisite programme is: Practices and conditions needed prior to and during implementation of HACCP and which are essential to food safety. It consists of two parts:

1. Conditions, facilities and equipment related to the processing plant
2. Operational conditions and procedures during processing

The HACCP programme should of course include details of the 7 well known principles.

During audit of the entire HACCP system it is often useful to use a checklist and a pre elaborated form to fill in to ensure, that all parts of the system has been covered. A practical example of forms used will be demonstrated at the meeting. All aspects of the entire food safety system could be evaluated and rated according to the following criteria:

- A. Excellent, good or only minor deficiencies (no safety risk)
- B. Major or serious deficiencies, which could lead to a safety risk if not controlled. Any condition or situation rated as a B requires a plan or programme for rapid improvement. Repetitive or cumulative B-ratings can lead to a critical situation
- C. An unacceptable or critical situation representing a safety risk. Any C-rating requires immediate response and corrective action.

The audit report should provide evidence of the findings of the assessment – primarily what deficiencies has been identified in the HACCP system, the non-compliance notes, the recommended corrective measures and the timetable to implement them. During the audit follow-up, the auditor should ensure, that non-compliance are closed off, and corrective actions has been taken.

Assessment of Food Safety Programmes

The Assessment Process

1. Pre Assessment Document Review
 - process flow diagram with location of CCPs
 - product specifications
 - HACCP plan including worksheets and records
 - Pre-requisite plans including worksheets and records
2. Opening meeting
 - scope
 - process
 - schedule
 - amenities needed
3. On site verification of process flow diagram
4. On site document review and observations
 - product and ingredients specifications
 - previous audit reports and minutes of HACCP meetings
 - assessment of pre-requisite programmes and functions (form attached)
 - assessment of HACCP programmes and functions (form attached)
 - HACCP control chart verification
5. Closing meeting
6. Assessment Report
7. Assessment follow-up

On-Site Document Review and Observations

Assessment of HACCP Programme

<i>Name and address of establishment audited</i>	<i>Phone/fax/email</i>
<i>Facility Owner (company or person)</i>	<i>Date of audit</i>
<i>Products Concerned</i>	<i>Products - High or low risk</i>
<i>Name and Number of Inspector</i>	
<i>Name and Title of Accompanying Individual</i>	

HACCP	A	B	C	Note
HACCP team used was appropriate				
Flow diagram is written down and is accurate and complete				
Raw materials specifications defined and written down				
Product and ingredient specifications are defined and written down				
Product end use is defined and recorded (high or low risk product)				
Hazard analysis is written down and is accurate and complete (evidence of Hazard Worksheets)				
Identification of CCPs is documented and CCPs are appropriate for product and end use of product				
Critical limits have been established, documented and are appropriate for the CCP				
Monitoring procedures for each CCP are documented, are followed and records are kept				
Corrective actions identified and written down and are followed when critical limits exceeded. Records exist				
Verification procedures are documented and are followed. Records exist				
All necessary documentation exists and are available for inspection				

- A = excellent, good or only minor deficiencies (no safety risk)
- B = major or serious deficiencies, which could lead to a safety risk if not controlled. Any condition or situation rated as a B requires a plan or programme for rapid improvement. Repetitive or cumulative B-ratings can lead to a critical situation.
- C = an unacceptable or critical situation representing a safety risk. Any C-rating requires immediate response and corrective action.

Assessment of Pre Requisite Programmes

FACTORY CHECK				
Processing Plant	A	B	C	Note
<i>Outside</i>				
Condition of grounds outside the factory				
Condition of the factory outside wall - especially holes through to inside				
<i>Inside</i>				
Rooms - layout and flow of goods allows easy cleaning and no cross contamination				
Rooms - for clean and unclean areas are separated (including waste areas)				
Rooms - for non food items are separated e.g. packaging, chemicals, etc.				
Ceilings, walls, floors, doors and windows are well designed and maintained in good repair -				
- for areas directly affecting food product or primary packaging material				
- for other areas				
Drains - are well designed, sufficient and maintained in good repair				
Drains - there is protection against back-flow, back-siphoning, or other sources of contamination				
Lighting - is sufficient and lights are covered				
Pest control - exclusion devices (screens, mesh, etc) are well designed and maintained in good repair				
Pest control - no areas present to harbour or attract pests				
Ventilation - is sufficient, well designed and there is no condensation evident				
Facilities in Processing Plant	A	B	C	Note
Water - sufficient quantity of cold water available				
Water - sufficient quantity of hot water/steam available				
Ice - sufficient quantity available and storage facility well designed and kept in good repair				
Waste-water - leaves the property in a condition that meets environmental laws				
Hygiene - restrooms are sensibly located, are well designed and are kept in good repair				
Hygiene - toilets in sufficient numbers and kept in good repair				
Hygiene - Hand-washing and sanitising stations are well designed, well located and kept in good repair				
Hygiene - Hand-washing and sanitising stations are in sufficient numbers				
Equipment - containers made of appropriate materials, in proper repair and removed when necessary				
Equipment - machinery designed well, easy to clean and kept in good repair - Food contact surfaces				
Equipment - machinery designed well, easy to clean and kept in good repair - Non-food contact surfaces				

PROCEDURES				
Safety of water and ice	A	B	C	Note
Criteria are written down and are appropriate				
Monitoring procedure is written down, is followed and records are kept				
Corrective actions identified and written down and are followed when critical limits exceeded. Records exist.				
Cleaning and sanitation	A	B	C	Note
Cleaning methods (food contact and non-contact surfaces) are written down and are appropriate				
Monitoring procedure for cleanliness is written down, is followed and records are kept				
Corrective actions identified and written down and are followed when critical limits exceeded. Records exist.				
Personal observations in factory by auditor				
Personnel hygiene and health	A	B	C	Note
Personnel hygiene criteria (cleanliness, dress code) are written down and are appropriate				
Procedures to handle illness are written down and are appropriate				
Monitoring procedure for personnel hygiene and health is written down, is followed and records are kept				
Corrective actions identified and written down and are followed when critical limits exceeded. Records exist.				
Personal observations of personnel by auditor				
Prevention of cross contamination	A	B	C	Note
Criteria to prevent cross contamination are written down and are appropriate				
Monitoring procedure is written down, is followed and records are kept				
Corrective actions identified and written down and are followed when critical limits exceeded. Records exist.				
Personal observations in factory by auditor				
Maintenance of facilities for personal hygiene				
Methods to maintain personal hygiene facilities are written down and are appropriate				
Monitoring procedure is written down, is followed and records are kept				
Corrective actions identified and written down and are followed when critical limits exceeded. Records exist.				
Personal observations in factory by auditor				
Protection of food from adulterants	A	B	C	Note
Criteria to protect food from adulteration are written down and are appropriate				
Monitoring procedure is written down, is followed and records are kept				
Corrective actions identified and written down and are followed when critical limits exceeded. Records exist.				
Personal observations in factory by auditor				
Waste management	A	B	C	Note
Methods to handle sewage and processing waste are written down and are appropriate				
Monitoring procedure is written down, is followed and records are kept				
Corrective actions identified and written down and are followed when critical limits exceeded. Records exist.				
Personal observations in factory by auditor				

Recalls and traceability	A	B	C	Note
Methods to allow full traceability and recall of product are written down and are appropriate				
Monitoring procedure is written down, is followed and records are kept				
Corrective actions identified and written down and are followed when critical limits exceeded. Records exist.				
Personal observations in factory by auditor				
Training	A	B	C	Note
Training policy and programme are written down and are appropriate				
Monitoring procedure is written down, is followed and records are kept				
Corrective actions identified and written down and are followed when critical limits exceeded. Records exist.				
Personal observations of training in factory by auditor, if possible				
Pest Control	A	B	C	Note
Pest control procedures are written down and are appropriate				
Monitoring procedure is written down, is followed and records are kept				
Corrective actions identified and written down and are followed when critical limits exceeded. Records exist.				
Personal observations of training in factory by auditor				
Labelling and safe storage and use of toxic chemicals	A	B	C	Note
Toxic chemical handling, use and storage procedures are written down and are appropriate				
Monitoring procedure is written down, is followed and records are kept				
Corrective actions identified and written down and are followed when critical limits exceeded. Records exist.				
Personal observations in factory by auditor				
Specifications and supplier control*	A	B	C	Note
Specifications criteria are written down and are appropriate				
Monitoring procedure is written down, is followed and records are kept				
Corrective actions identified and written down and are followed when critical limits exceeded. Records exist.				
Personal observations in factory by auditor				
Transport and storage	A	B	C	Note
Temperature and cleanliness criteria for transport and storage are written down and are appropriate				
Monitoring procedure is written down, is followed and records are kept				
Corrective actions identified and written down and are followed when critical limits exceeded. Records exist.				
Personal observations in factory by auditor				

* often a CCP in HACCP plans

NOTES

Note number from form	Comment

SUMMARY

Totals numbers of each category				
<i>General comments from auditor</i>				
<i>General comments from establishment representative</i>				

SIGNATURES

<i>Signature of auditor</i>	<i>Date</i>
<i>Signature of establishment representative</i>	<i>Date</i>

FAO – EUROFISH WORKSHOP ON
SEAFOOD SAFETY

AN OVERVIEW OF SEAFOOD SAFETY HAZARDS

By

Hans Henrik Huss, Professor, Dr.Sc.
EUROFISH

SUMMARY

Food safety is a major concern facing the food industry today. Consumer awareness about food quality and safety is increasing, and there is extensive covering in the daily press of food safety issues. Despite great efforts in research, food borne diseases continue to present a major problem of both health and economic significance. The cost of food borne disease is huge (billions of \$), and some of this cost must be borne by industry and some by governments. It is overwhelmingly clear therefore, that all countries need an adequate food control programme to ensure a safe food supply to protect the consumer and promote international trade in foodstuff.

Seafood is the biggest cause of food poisoning in the United States, accounting for nearly 8% of all known causes in the period 1993 – 1997. In the EU alert notifications in the year 2000, fish and seafood made a total of 25%.

The seafood safety hazards are: pathogenic bacteria, virus, biogenic amines, aquatic biotoxins, parasites, chemical hazards and physical hazards. Not all of these are equally important in all fisheries and products.

A range of *pathogenic bacteria* is found naturally in the aquatic environment (*C. botulinum*, pathogenic vibrio spp., *Listeria monocytogenes*), and consequently these bacteria may also be found in low numbers on the raw fish. This is a potential hazard only, since growth is required to produce a risk and possibility to cause disease. In contrast the presence in water and in fish and shellfish of low numbers of pathogenic bacteria from the animal/human reservoir (pathogenic *E. coli*, *Salmonella*, *Shigella*) is a real hazard, if the seafood is to be eaten raw or uncooked.

The presence of *enteric virus* and aquatic toxins in shellfish caught in polluted waters is a major problem in many fisheries. Monitoring of exposed harvesting areas for possible faecal pollution and/or the presence of toxic algae is therefore essential.

It is well known, that fish may harbour *parasites* pathogenic to man. In colder climates it is mainly nematodes. However, in warmer waters in Asia, a large numbers of trematodes are found mainly in freshwater fish. It is estimated, that more than 50 million Asians are infected with trematodes.

One of the most common food poisoning caused by consumption of fish products is **histamine poisoning**. Histamine and other biogenic amines are formed in scombroid fishes, when stored at elevated temperatures. These toxic substances are heat stable and therefore not destroyed during cooking or autoclaving.

Fortunately the high seas are not yet polluted to any degree with **chemicals**. The risk from chemical contaminants in commercially harvested marine fish and shellfish is low. Potential risks are from freshwater fish, aquaculture products, subsistence and recreational fishing in certain coastal areas or polluted rivers.

Traditional **quality control** incl. sampling and microbiological testing of final products have been the main methods on controlling the safety of foods. However, it has been known for a number of years, that this approach has a number of limitations. In about 1980 a "second wave" of food safety management system was initiated by introduction and use of the **HACCP-principle**. This system aims primarily at preventing food borne illness and is a much more efficient system.