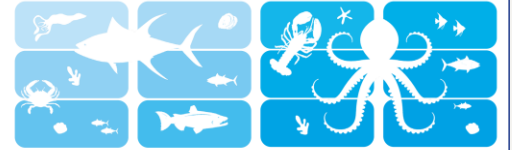




Food and Agriculture
Organization of the
United Nations



TRAINING ON THE
IMPLEMENTATION OF
HACCP



____ FOR FISHERIES AND AQUACULTURE ____

HACCP & Fishing Vessels

Ansen Ward, NFIMV, FAO

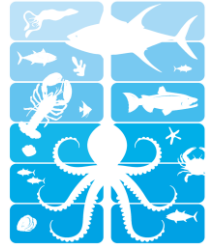
FISHING VESSELS

Definition

- Any vessel, boat, ship, or other craft that is equipped and used for fishing or in support of such activity.

<https://www.fao.org/faoterm/viewentry/en/?entryId=98389>

- Myriad of different types and sizes of vessel
- Most vessels limited in terms of space...
- Some vessels designed for GHP and good fish handling...other vessels not



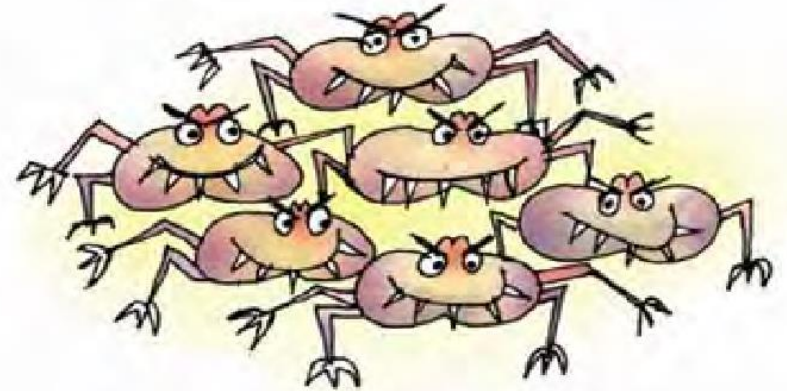
FOOD SAFETY HAZARDS

A biological, chemical or physical agent in food or the condition of food with the potential to cause an adverse health effect.



- Biological...
 - Scombrototoxin (Histamine) formation
 - Parasites
 - Pathogen growth & toxin formation (other than *Clostridium botulinum*) as a result of time/temperature abuse
- Chemical....
 - Oil, fuel...some vessels use fish holds or wells for storing fuel...
 - Cleaning chemicals,
 - Preservatives...sodium metabisulphite
 - Pesticides
- Physical....
 - Hooks
 - Paint
 - Dirt
 - Metal

BACTERIA



PRE REQUISITE PROGRAMMES (PRP)



A programme that is required prior to the application of the HACCP system to ensure that a fish and shellfish processing facility is operating according to the Codex Principles of Food Hygiene, the appropriate code of practice and appropriate food safety legislation.

Codex Code of Practice for Fish and Fishery Products

Fishing and harvesting vessel design and construction

- ease of cleaning and disinfection
- minimize contamination
- minimize damage to the fish, shellfish and other aquatic invertebrates

PRE REQUISITE PROGRAMMES (PRP)



Water

Calibration

Approved Maintenance
Compounds

Cleaning and sanitation

- Deck and Wells
- Start of fishing Operations
- During fishing days
- End of fishing Operations
- Amenities

Repairs & Maintenance

Temperature control and
records

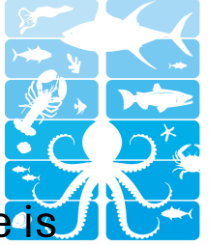
Standards for Personnel and
Training

Process inputs

Organoleptic assessment of fish
caught

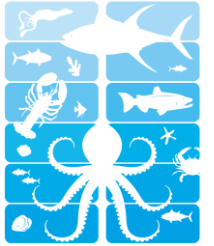
Pest Control Programme

HACCP ON BOARD



- Most HACCP manuals, guides and realities designed with land-based factories in mind where space is not at a premium.
- EU requirement is for a control system based on HACCP principles (not for HACCP per se)
- EU requirements for HACCP - **freezer vessels & factory vessels**
- Fishing vessels (and transport of unprocessed primary products to establishments) outside scope of the HACCP requirement
- HACCP and hygiene requirements in Annex 1 of 852/2005 and hygiene requirements for different kinds of fishing vessels in Section VII: Fishery Products of 853/2004

FREEZER VESSEL – PURSE SEINER



Aquatic Product Raw Material:	Albacore Tuna, <i>Thunnus alalunga</i> ; Skipjack Tuna, <i>Katsuwonus pelamis</i> ; Southern Bluefin Tuna, <i>Thunnus maccoyii</i> , Yellowfin <i>Thunnus albacares</i> , Bigeye <i>Thunnus obesus</i> ; Stripped Marlin, <i>Tetrapturus audax</i> , Mahi-mahi, <i>Coryphaena hippurus</i> ; Wahoo, <i>Achantocybium solandri</i>
Raw material harvest Area:	FAO area 71, WCPFC waters
Finished Product:	Whole frozen fish
Packaging:	None
Storage and distribution:	Stored and distributed frozen
Food additives, ingredients, processing aids:	Salt
Intended use:	Further Processing
Intended consumers:	Human consumption

Inputs

Raw fish, seawater and salt.

Outputs

Frozen Whole Pelagic Fish

FLOW DIAGRAM



Harvest ↓ Receiving ↓ Freezing ↓ Storage ↓ Load-out	Harvest and on board stowage perform under company specifications.
	Raw whole fish received on board
	Brine freezing at or below -9°C / (Freezing at -18 if applicable)
	Freezer at or below -9°C / (Storage at -18 if applicable)
	Load out direct from the wells
Frozen whole fish	

POTENTIAL HAZARDS



Potential species-related hazards:

- Scombrototoxin (Histamine) formation
- Parasites

Potential process-related hazards:

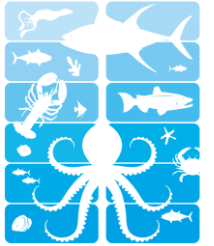
- Pathogen growth & toxin formation (other than *Clostridium botulinum*) as a result of time/temperature abuse

HAZARD ANALYSIS

(1) Ingredient/ Processing Step	(2) Potential Hazard Introduced or Controlled	(3) Is the Potential Hazard Significant	(4) Justification for Inclusion or Exclusion as a Significant Hazard	(5) Preventive Measure(s) for the significant Hazard from Column 3	(6) Critical Control Point (Yes/No)
Harvesting	BIOLOGICAL Scombrototoxin formation	Yes	Scombrototoxin (histamine) in toxic levels may be present due to temperature abuse	Temperature control. Vessels trip summary records	Yes
	BIOLOGICAL Parasites	No	Parasite presence for some small specimens these species is documented in abdominal cavity.	All species are to be frozen and further process/no direct HC	No
	CHEMICAL None	No	N/A	N/A	No
	PHYSICAL None	No	N/A	N/A	No
Receiving	BIOLOGICAL Scombrototoxin formation	Yes	Scombrototoxin (histamine) in toxic levels may be present due to temperature abuse prior freezing	Operation fits into Safe time and T ² parameters	No
	BIOLOGICAL Pathogen growth	No	Pathogen growth is not reasonably likely to occur.	Operation fits into Safe time and T ² parameters	No
	PHYSICAL None	No	N/A	N/A	No
Freeze	BIOLOGICAL Scombrototoxin formation	Yes	Scombrototoxin (histamine) in toxic levels is unlikely to be formed due to temperature abuse	Operation fits into Safe time and T ² parameters	No
	BIOLOGICAL Pathogen growth	No	Pathogen growth is not reasonably likely to occur.	Operation fits into Safe time and T ² parameters	No
	BIOLOGICAL Parasites	No	Parasites may be present in the abdominal cavity species	Freezing kill parasites (time at sea > 7 days)	No
	PHYSICAL None	No	N/A	N/A	No
Finished product storage	BIOLOGICAL Pathogen growth	No	Pathogen growth is not reasonably likely to occur.	Operation fits into Safe time and T ² parameters	No
	BIOLOGICAL Scombrototoxin formation	Yes	Scombrototoxin (histamine) in toxic levels is unlikely to be formed due to temperature abuse	Operation fits into Safe time and T ² parameters	No
	CHEMICAL None	No	N/A	N/A	No
	PHYSICAL None	No	N/A	N/A	No
Unload	BIOLOGICAL Scombrototoxin formation	Yes	Scombrototoxin (histamine) in toxic levels is unlikely to be formed due to temperature abuse	Operation fits into Safe time and T ² parameters	No
	CHEMICAL None	No	N/A	N/A	No
	PHYSICAL None	No	N/A	N/A	No

(1) Ingredient/ Processing Step	(2) Potential Hazard Introduced or Controlled	(3) Is the Potential Hazard Significant	(4) Justification for Inclusion or Exclusion as a Significant Hazard	(5) Preventive Measure(s) for the significant Hazard from Column 3	(6) Critical Control Point (Yes/No)
Harvesting	BIOLOGICAL Scombrototoxin formation	Yes	Scombrototoxin (histamine) in toxic levels may be present due to temperature abuse	Temperature control. Vessels trip summary records	Yes
	BIOLOGICAL		Parasite presence for some small	All species are to be	

HACCP PLAN



(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Critical Control Point (CCP)	Significant Hazard	Critical Limits for each Preventive Measure	Monitoring				Corrective Action(s)	Records	Verification
			What	How	Frequency	Who			
Freezing	Biological Histamine Formation	Records showing that: Fish were placed in freezer, as soon as possible after harvest, but not longer than 6 hours from the time of death;	Temperature and time	Visual	Every set	Chief Engineer or delegated	Well isolation of fish outside parameters when it happens Done by Chef Engineer	Vessel records Checklist	Review monitoring, corrective action and verification records weekly Copies of CA histamine tests showing product has less than 200 mg/kg Calibration of temperature recorders

Verification procedures are divided in two groups:

- I. *Internal:* HACCP Co-ordinator would review overall plan efficiency at least once a year or at any process change.
- II. *External:* Regulatory authority will establish their own frequency and share the data. If buyers perform histamine tests, copies would be sent

CHALLENGES

- Vessel design and space
- Lack of guidance (public domain)
- Crew training and culture
- Languages
- Inspectors not familiar with vessels
- Practicality of inspections



CONCLUSIONS



- HACCP MORE IN TUNE WITH MODERN VESSELS DESIGNED WITH GHP IN MIND
- EU REQUIRMENTS FOR FREEZER & FACTORY VESSELS
- MORE GUIDANCE REQUIRED



Thank you.