ON-BOARD FISH HANDLING PROCEDURES

FOR WFOA VESSELS

VESSEL STANDARD OPERATING PROCEDURES

FISHING VESSEL

APRIL 2002

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VESSEL STANDARD OPERATING PROCEDURES

These Vessel Standard Operating Procedures (VSOP) are not destined to upset normal on board working practices, but simply describe methods that are normally already applied on-board. You are not legally bound to put these VSOP in place. However, it is strongly recommended that they be followed, that the information be recorded, and that these documents are archived for at least two years. Nonetheless, you have an obligation to use Good Manufacturing Practices in the handling of your fish.

1.0 PROCESS OPERATING PROCEDURES

(i) Prepare the Deck

Objective:

To minimise the time fish is on the deck thus reduce the risk of contamination and the time temperature quality degradation of fish.

Recommendations:

Clean and sanitize the landing area and the slush ice tank or brine tank daily using detergent and water followed by a dilute solution of household chlorine bleach (one teaspoon per gallon of water).
Have the slush ice tank, brine chilling tank or blast freezer ready to receive fish.
Drain melt water from the ice slush tank and add seawater after the first strike.
Chilling/freezing systems should be at the recommended temperatures when the first fish is landed.
Have all handling equipment at hand and clean (including knives, sharpening tools, gaff, and spiking tool or club.
Use a landing mat (a piece of carpet) to reduce scale loss and bruising.

(ii) Landing

Objective:

To land the fish as quickly as possible after it is hooked. Prolonged struggle will result in higher body temperature and reduced quality.

Recommendations:

If you use a gaff, gaff the fish in the head or through the lower jaw, never in the body or you will destroy and contaminate the edible flesh.
Keep fish in a single layer on deck rather than stacking them like cordwood.

(v) Stunning (optional)

Objective:

To stun the fish immediately after it comes on board to eliminate scale loss and bruising.

Recommendations:

It is easier to stun the fish when it is still on the gaff or the hook remover.
Club the fish with a modified bat, mallet, or lead filled steel pipe on the soft spot right above the eyes.

(iii) Brain Spiking (optional)

Objectives:

Another option is to immobilize the fish immediately after, or instead of stunning, by destroying the brain. Spiking the brain is a required procedure for production of sashimi grade tuna worldwide. Brain destruction also helps to stop the production of heat and acid, and the loss of energy rich compounds.

Recommendations:

Position yourself so you are balanced with the fish positioned on its belly, and the spiking tool (an ice pick or a sharpened screwdriver) firmly in one hand and the fish's tail in the other.
Do not attempt spiking without complete control of your balance, the spiking tool, and the fish.
Place the spike at the soft spot above the eyes at a 30-degree angle to the horizontal.
Push the spike quickly into the skull maintaining the 30-degree angle while holding the tail.
Move the instrument from side to side to destroy the brain.
If not done properly the fish can shudder violently creating the potential for personal injury, and further scale loss and bruising to the fish.

(vii) Bleeding (optional)

Objective:

To improve the appearance of uncooked tuna loins and may help initially to reduce fish temperature on deck. It is essential for sashimi grade fish. Fish should be bleed for 10-15 minutes after stunning (brain spiking) and then immediately chilled. Bleeding is most efficient when done immediately after the fish is landed, and when the heart is left intact to take advantage of it's pumping action.

Throat Latch

This cut involves cutting the blood vessel between the heart and the gills. This can be done two ways

(i) With the fish on it's back or side cut the 'V' shaped nape between the gill covers and the body of the fish to the artery just below the surface.

(ii) Cut a shallow cut just inside the point of the 'V' of the nape, lift the artery with your finger, and cut. This leaves the head firmly on the body.

Recommendations:

Take care not to sever the heart or you will loose the pumping action the heart provides. Find the heart and the artery running between the heart and the gills in your first fish or two, and find what is easier for you.
Rinse the fish to remove any blood residue.

Pectoral Cut

With the fish on its side measure 1.5 to 2 inches from the base of (under) the pectoral fin along the midline. Make a shallow cut about 1/8 to ¼ inch wide and ¼ inch deep along raised ridge near the midline using a clean, sharp knife with a narrow blade. Flip the fish over and repeat the cut on the other side.

Recommendations:

If the cut is too wide, usable flesh can be destroyed and reduce the fish's value.
Rinse the fish to remove any blood residue.

(iii) Freezing

Objective:

Albacore should be placed into a chilling or freezing system within 15 – 20 minutes of capture to ensure the delivery of high quality product without histamine. As a general rule, one day of shelf life is lost for each hour left on the deck.

Repeated freezing and thawing results in low quality product unsuitable for some markets.

Recommendations:

Match capture rate with your refrigeration capacity
Freeze as soon as possible
Chill fish that are unable to be loaded into the freezer in less than 1 hour by putting them into ice slurry tanks to reduce body temperature.
Ensure your freezer system has adequate space and can hold constant temperature.
Take precautions to prevent the introduction of heat to the fish hold when adding fish from the deck eg. a false hatch that temporarily seals the opening to the deck while working below.
To eliminate metal stain, avoid any corrosive metals (copper or aluminium) in the refrigeration system (pumps and tubing) and the hold, and consider replacing with stainless steel or plastic.

Air Blast Freezing

Recommendations:

Air systems must be maintained at 0°F or colder (prefer –20°F or colder).
The air blowing over the albacore in a blast freezer should be –20°F to - 40°F (-28.3 °C to –40 °C) and should move at a velocity greater than 400 feet per minute (12,192 cm/minute).
Fish should be transferred to a separate storage area at –20°F (-28.3 °C) or below, with no air movement, after the core temperature reaches –5°F (-20.5 °C).
In addition to storage in still air, glazing and or bagging can also minimise dehydration.

Monitor the temperature of the blast freezer every 4 hours.

Spray Brine Freezing

Recommendations:

Spray brine systems should maintain a temperature of 10ºF (-20.5ºC) or below to prevent excessive absorption and produce a high quality product.
Brine temperatures should run at –5ºF to 10ºF (-20.5 ºC to 12 ºC) with a salinity of 80-85º.
Hold temperature can be adjusted by degree salinity of the brine solution.
Fluctuations in temperature are the biggest cause of salt uptake in brine and oil leaching to the surface and must therefore be minimised.
As salt absorption is linked directly to increased temperature, the refrigeration system must be run continuously 24hr a day.
Dependant on the capacity of the freezer system, some vessels may consider a deck brine box to prechill the catch before introducing fish into the hold thus maintaining the hold temperature.
Monitor the temperature of the brine freezer every 4 hours.

(viii) Unloading

Objective:

To unload the fish from the hold as quickly as possible and to reduce any damage to the fish.

Recommendations:

Make sure the van is clean and free from wood and metal filings before loading the fish
Ensure vans are prechilled before loading fish
Hand product with care and do not throw it.
Do not leave fish sitting on the wharf waiting for loading as it will thaw and be exposed to physical and microbial damage.

(v) Buying Station

Objective:

To check all product time temperature records and ensure vans adhere to loading requirements.

Recommendations:

Check vessel time temperature records to ensure that the fish has been processed to specification.
Take a core temperature of the fish
Ensure the van has been prechilled.
Ensure the van is clean and there is no wood (EU requirement)
Limit the time from unload (ex vessel) to stuffing.
Monitor stuffing to ensure no product damage occurs during packing.

2.0 STANDARD OPERATING PROCEDURES

(i) Employee Health Conditions

Objective:

To ensure any crewmembers showing signs of infection (open sores or wounds) or having a medical condition (verified by medical exam or simple on-board observation) are excluded from any operations that could lead to product contamination.

To ensure that crew working in direct contact with fish and fish surfaces, will conform to general hygiene practices that prevent product contamination.

Recommendations:

Ensure crewmembers have regular medical checkups.
Any staff or visitor who has or suffers from a communicable disease is not permitted to handle fish products until a doctor gives a medical certificate.
All injuries are to be reported, cleaned and if possible covered up to prevent product contamination.
Provide crew with adequate training on hygiene practices
Wet weather and or protective clothing is to be worn when handling fish. Personal clothes are not to come into contact with the fish.
Wash and disinfect hands before each production run, after handling contaminated materials and after using the toilets
Disallow jewellery which could drop onto product
Gloves must be sanitized after each production run.
No smoking, eating, spitting or chewing gum when handling fish.

(x) Water Quality

Objective:

To prevent any biological or chemical contamination of the product.

Recommendations:

Fresh water ice should be manufactured using an approved public water source (eg. Papeete city water).
Clean seawater can be used to rinse fish and all surfaces.
When using seawater, pollution indicators or public health notices of problems shall be heeded.
Common sense and personal observation should also be used.

(xv) Fish Handling

Objective:

Fish should be handled with care, kept clean, washed and chilled as quickly as practicable, so as to limit possible histamine formation. Contamination should also be prevented from knives, saws, work surfaces, hands or pests.

Recommendations:

Handle fish gently. Do not throw or stand on the fish.
Do not over pack the well – keep the fish loose
Do not catch more than you can process properly.
Do not stow the fish until it is properly frozen
Kill the fish quickly to prevent the live fish from flopping around the deck.
When handling offal, reject material and /or cleaning, wash hands and gloves prior to handling product for human consumption.
Implement a pest control program.

(xxiii) Cleaning and Disinfection

Objective:

To ensure all surfaces coming into contact with product are cleaned and disinfected as often as needed in order to prevent microbial, chemical and physical contamination.

Recommendations:

Clean, wash and disinfect all work surfaces and materials at least twice a day.
Clean and disinfect holds after each trip.
Clean and disinfect decking materials (carpets, foam mattress etc) after each trip.
Hands are to be washed after handling chemicals
Store all cleaning and disinfecting agents, all other chemical and maintenance products (eg. oils etc) in lockers or separate storage areas to reduce contamination.
Store in original containers with legible labelling.
Gloves and safety gear must be worn when handling chemicals and washed clean after use.

SUMMARY

Albacore have tremendous potential for a variety of markets. Producing albacore of consistent high quality and free of histamine is the most critical step for maintaining cannery markets and building new ones. Eliminate corrosive metals from your refrigeration system and hold area. Retrieve fish as quickly as possible after they strike and stun or kill the fish immediately to preserve quality and to eliminate bruising and scale loss. Bleed fish to improve the flesh appearance. The most important step in delivering high quality albacore is to chill or freeze the catch to 40oF or below to prevent decomposition and the formation of histamine. Measure the chill, freezing and holding temperature of your fish throughout each trip to identify weak points in the system.

HAZARD ANALYSIS CRITICAL CONTROL POINTS

1.0 HACCP ANALYSIS (PRODUCT RELATED)

The following outlines the potential species hazards and the control mechanisms that are required onboard

Potential Hazard	Analysis	Control	CCP
Parasites	All products are frozen colder than 0°F (-17.7 °C)	Freezing onboard, labelling.	No
Biogenic Amines	Albacore may have the potential to produce histamine (scombrotoxin formation). However, rapid processing controls the hazard and freezing prevents the formations of high levels of histamine.	Time and Temperature Controls	No
Preformed Toxins	Toxin formation (other than histamine) in wetfish species is not likely.	Not considered significant enough to warrant any type of control measure	No
Pathogens	No evidence available of any known pathogens (such as Clostridium , Type E and pathogenic Vibrio) harvested.	Not considered significant enough to warrant any type of control measure	No
Metal Stain	Metal stain occurs primarily with fish that have been frozen in a freezing system that has exposed copper parts or sources of copper.	Check freezing system on board contains no copper or brass or bronze components.	No
Chemical contamination	Chemical contamination from harvest area is not reasonably likely to occur. Hydraulic leaks or hose breakages may occur.	Fish reception Freezer Refrigeration Records	No
Fuel contamination	Fuel contamination is not likely to occur.	Stop fishing immediately, do not take any fish on board if fishing.	No
Foreign matter	Foreign material that is considered harmful to human health is not likely to present in the harvest area or in the product.	Fish reception	No
Pathogen growth	Pathogen growth (Listeria, Salmonella etc) are not likely due to time and temperature abuse during processing on board due to the nature of the operation and the intended use by the consumer.	Storage and Unloading Cleaning and sanitation	No

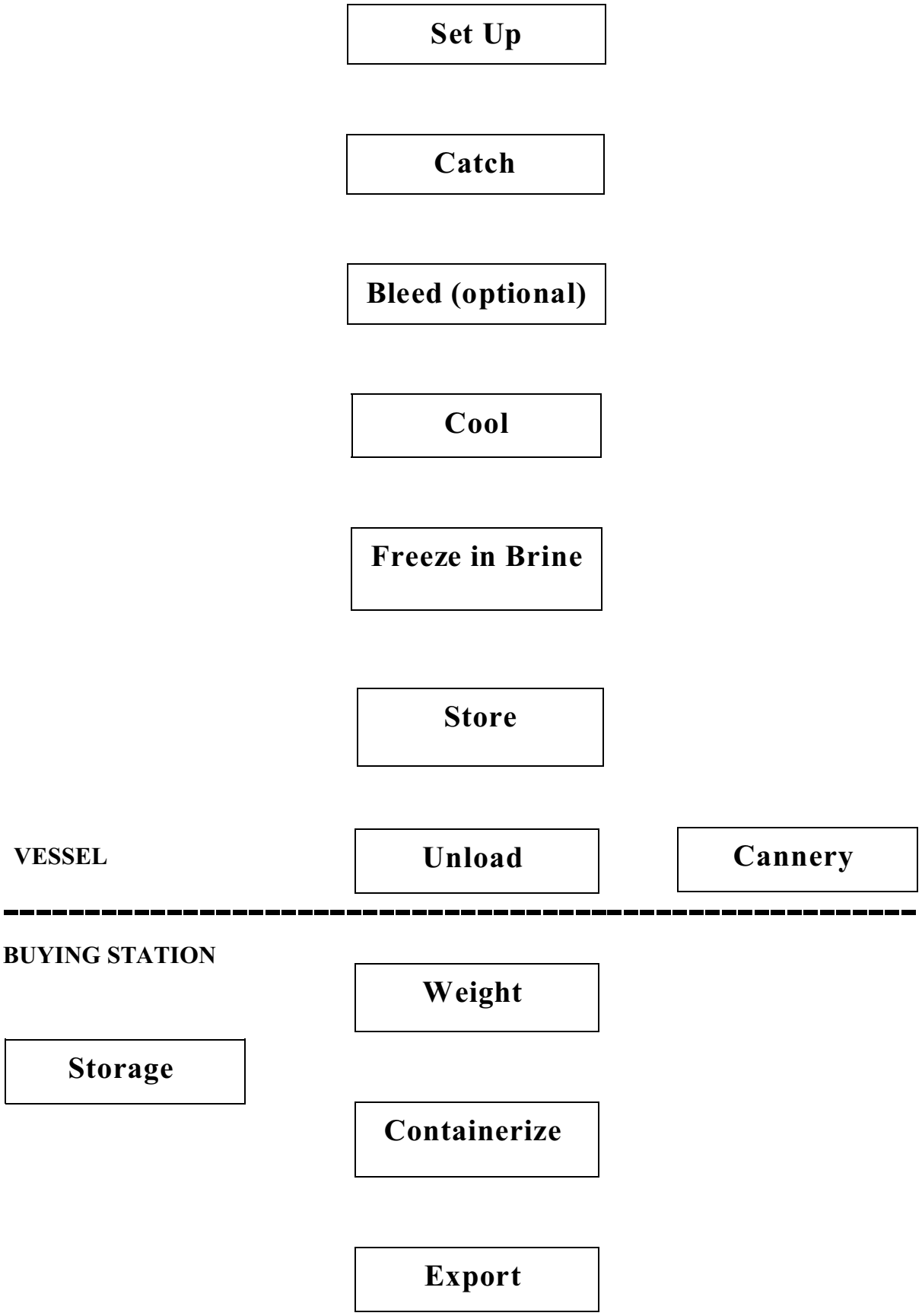
1.1 HACCP ANALYSIS (PROCESS RELATED)

The following outlines the potential process hazards and the control mechanisms that are required onboard

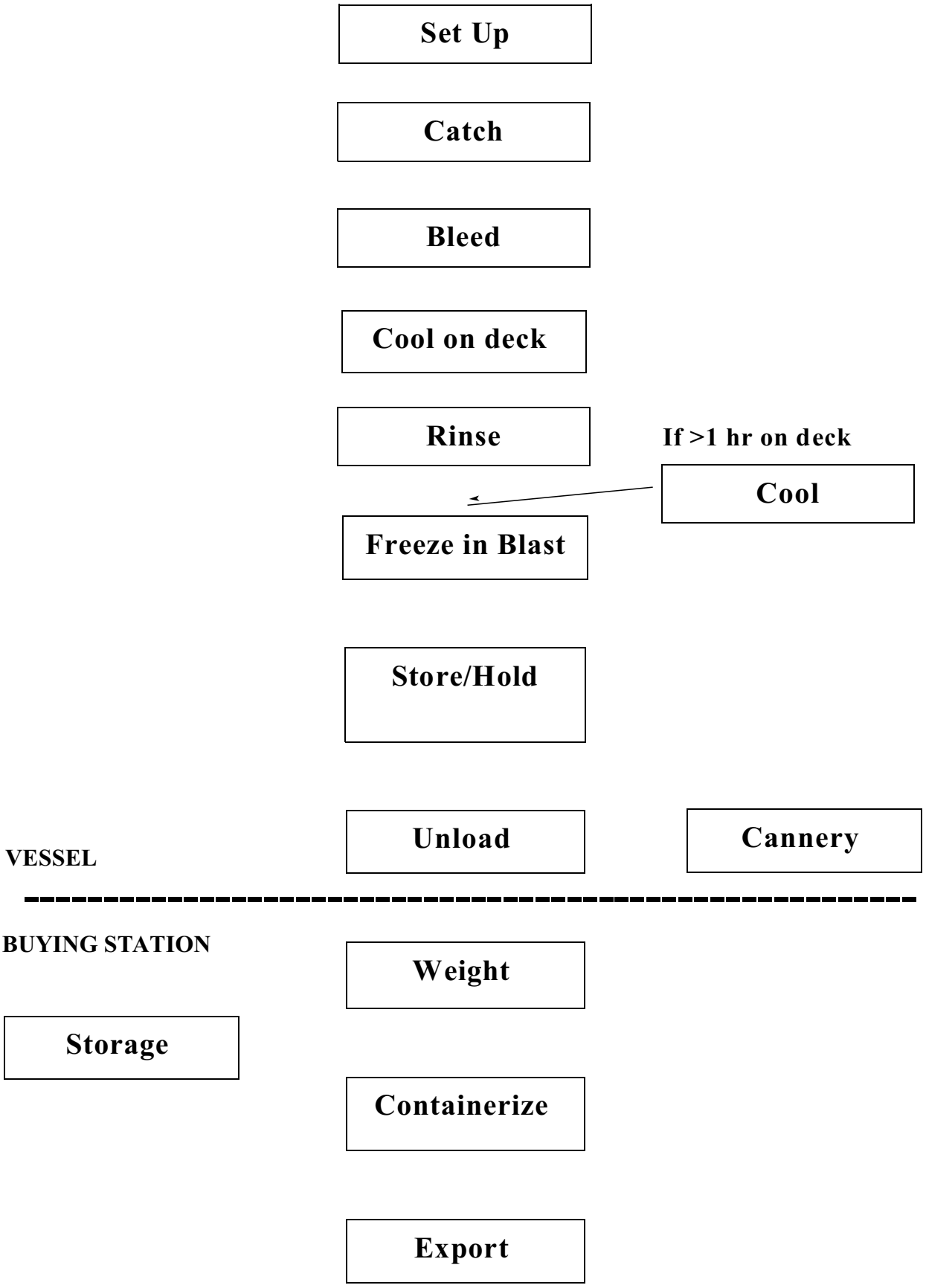
Potential Hazard	Analysis	Control	CCP
Reception	Physical, chemical and signs of spoilage can be detected here. Fish should be chilled within 15-20 minutes (ie. maximum deck time).	Visual Reception Check. Contaminated product and excessive spoilage product must be isolated for disposal when landed.	No
Chilling	Chill tanks on deck may become to warm	Add more ice periodically	No
Freezing	Rapid freezing is required to ensure the quality of the product	Vessel Refrigeration Records (records product and refrigeration temperatures). Calibration Records. Internal Compliance Checksheet (corrective action log)	Yes
Air Blast	If freezing slower than normal	Check blast freezers are not overloaded or if there is excessive ice build up. Check with engineers that refrigeration plant is operating correctly.	No
Spray Brine	If freezing slower that normal	Check freezer is not overloaded and all product is being sprayed with brine. Check with engineers/controller that refrigeration plant is operating correctly. Check salinity of brine.	No
Sanitation	Cleaning and sanitation should be carried out daily.	Internal Check Sheet If cleaning not carried out properly inform person responsible and repeat cleaning process.	No
Unloading	Thawing can occur while unloading.	Monitor unloading and stuffing of van to ensure product does not sit around at ambient temperature.	No

APPENDIX

BRINE PROCESS FLOW DIAGRAM



BLAST PROCESS FLOW DIAGRAM



CLEANING AND SANITATION PROGRAMME

Area/ Equipment to be cleaned	Frequency	Work Instructions
Reception Area	Daily	Hose deck with salt water
	Weekly	Hose clean Scrub with cleaning solution Leave for 10 minutes and hose clean
Blast Freezers and area	Bi-weekly	Hose deck with salt water
	End of Trip	Hose clean Scrub with cleaning solution Leave for 10 minutes and hose clean
Gumboots, wet weather gear, gloves	End of each production run	Hose clean Scrub with cleaning solution and hose clean
Hands	After using toilet, before each production run, eating and handling chemicals and pests.	Wet hands and dispense soap onto them. Lather hands and forearms. Rinse and wipe clean.
Changing room (Floor and sinks)	Daily	Mop floor clean with cleaning solution. Allow to dry. Wet sinks and wipe down with cleaning solution and wipe dry.
Toilets	Daily	Mix chemical solution and wash areas down. Leave five minutes and then wipe clean.
Shower	Daily	Mix chemical solution and wash areas down. Leave five minutes and then wipe clean.
Bilge and Engine Room	As required	Hose clean Scrub with cleaning solution Leave for 10 minutes and hose clean

TIME TEMPERATURE RECORDS

Instructions for Staff: Check refrigeration temperatures **every 4 hours**. Fill out any corrective actions below and sign when complete. Add temperature when checking. Sign each reading.

	TARGET	ACCEPTABLE RANGE
BLAST TEMP:	-55°F	20-40°F (-28.3 – **40 ºC**)
BRINE TEMP:	0°F	-5 -10°F (-20.5 - 12 **ºC)**
SALINITY	82º	80-85°

Date	Time	Blast Temp	Brine Temp	Salinity	Correction Action	Sign

INTERNAL COMPILANCE CHECKLIST **Month:**

Instructions for Staff: Check process, staff and environment against the standards below. Fill out any corrective actions below and sign when complete. Tick or cross when checking. Daily checks are completed daily and weekly checks once per week on any day. Sign each day.

Daily Checks		M	T	W	T	F	S	S	M	T	W	T	F	S	S	M	T	W	T	F	S	S	M	T	W	T	F	S	S	M	T	W	T	F	S	S
Personal Hygiene	Health																																				
	Product Handling																																				
	Hygiene																																				
Cleaning	Reception area, work surfaces																																				
	Gumboots, wet weather gear, gloves																																				
	Changing Rooms																																				
	Toilets																																				
	Shower																																				
Temperatur e	Check records OK																																				
Weekly Checks																																					
Cleaning	Blast Freezer (Bi weekly)																																				
Pests	Nil activity or signs of vermin																																				
Chemical	Storage of																																				
	Handing																																				
Water	Check desalination OK																																				

When required																																			
Water source	No visible contamination																																		
Signature																																			

CORRECTIVE ACTIONS

Date	Issue – what is the problem?	Solution – how can the problem be fixed?	Timeframe for Solution	Sign when complete

"DOLPHIN SAFE" CERTIFICATION

The undersigned, authorized agent for Western Fishboat Owner's Association, expressly guarantees and warrants to _____ that no part of the catch of tuna described in this certificate was:

1. Caught by a tuna purse seine vessel operating in the Eastern Tropical Pacific on a fishing trip during which the vessel at any time knowingly or intentionally deployed its net to encircle dolphin.

2. Caught with drift or gill nets.

All tuna caught by a purse seine vessel operating in the Eastern Tropical Pacific shall have
(a) certificates signed by the captain and a representative of either the United States National Marine Fisheries Service (United States flagged vessels) or the Inter-American Tropical Tuna Commission (foreign flagged vessels) confirming that, at all times, a qualified NMFS or IATTC observer was on board and that at no time during the fishing trip did the vessel knowingly or intentionally deploy its net to encircle dolphin, or
(b) an NMFS or IATTC statement confirming that the purse seine vessel is not capable of fishing "on dolphin."

Vessel Name	Fishing Method	Registry Number	Flag of Registry	Area of Catch	Trip Dates	Species	Est. short Tons
						TOTAL	

Name of Supplier:
Western Fishboat Owners Association
P.O. Box 138
Eureka, CA 95502
(707)443-1098 phone
(707)443-1074 fax

By: _____ Date:_____
Wayne Heikkila, Executive Director

BUYING STATION CHECKLIST: **Date:**

Instructions for Staff: Check each van that is loaded. Fill out as each van is checked recording vessel name and van number. Check remaining areas are completed or checked and tick appropriately. Do not load van if any of the following are not correct.

Vessel ID	**Van ID**	Checked Vessel Temp Records (y/n)	Fish Core Temp	Prechilled Temp	Clean (y/n)	No wood (y/n)	Carefully stuffed (y/n)