

Handbook

**for On-board
Handling of**



**Demersal
& Gillnet
Longline
Catch**



Australian Government
Fisheries Research and
Development Corporation

WA SEAFOOD QUALITY
SQMI
MANAGEMENT INITIATIVE



WAFIC
Western Australian Fishing
Industry Council Inc.

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1. Introduction

The **Handbook for On-board Handling of Demersal Gillnet and Longline Catch** describes some general practices for the handling of fish caught by demersal gillnetting, which should assist fishers in producing a high-quality fish product on-board their vessels. The handbook is designed to generate a level of simple documentation that will allow industry to meet requirements of discriminating buyers of quality fish.

Developed after at-sea observation of the WA Demersal Gillnet and Demersal Longline Fishery, in consultation with its fishers, the handbook provides guidelines for carrying out harvesting and on-board processing and chilling of shark and scale fish. By adopting these simple procedures, crew should be able to improve the freshness, shelf life and value of their catch.

This handbook provides a checklist for typical processing and chilling practices on existing gillnet fishing vessels, using refrigerated seawater and ice slurries. These practices may need to vary slightly, according to the design, refrigeration and storage capacities of individual vessels.

Although adoption of these guidelines is not mandatory, the Western Australian Fishing Industry Council (WAFIC) recommends their use, as does the WA Department of Fisheries and its Seafood Quality Management Initiative (SQMI). Pending national food legislation is directed toward harvest activities and may result in the need for these activities to be documented.

The ability and willingness of fishers to follow these simple but important procedures to improve the quality of their catch can

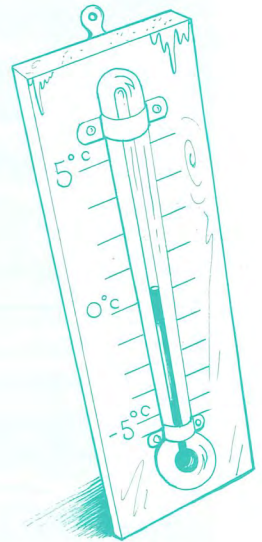


directly influence the financial returns to each boat and crew member. The improved quality will result in a long-term benefit to fishers, processors, retailers and consumers.

2. Fish quality and deterioration

For fish, the two very critical components of food safety and shelf life are hygiene and temperature control. Any deterioration and loss of quality can be minimised by:

- **Controlling temperatures** - fish should be kept at a temperature level between -1°C and $+4^{\circ}\text{C}$, right the way though from their harvest until they reach the consumer. This results in control of bacterial growth and biochemical spoilage, minimising any deterioration of product quality. If fish are intended for sale as 'fresh' they should be kept in this temperature range - if their temperature drops below -1.5°C , their flesh will begin to freeze.
- **Preventing physical damage** to the fish (e.g. avoiding bruising, cuts to the skin, gaff and knife damage).
- **Preventing contamination** through good vessel design and construction, a hygienic working environment, and proper handling practices.



3. A guide for demersal gillnet skippers

- *Ensure that all your crew have read this handbook and follow the recommended handling and hygiene practices while on-board the vessel.*

As the 'manager' of a fishing vessel, it is the skipper's responsibility to ensure that all crew are aware of the need to follow good hygiene and fish handling practices while on-board. If crew are feeling unwell, they should notify the skipper.

It is wise to make a member of the crew responsible for taking care of the catch after it arrives on the deck - remember those fish are going to be somebody's dinner at the end of the voyage. Ultimately, the quality of the catch is the responsibility of the skipper.

- *Ensure all crew maintain a high standard of personal hygiene whilst handling seafood or the equipment/containers used in its holding and processing.*



The hands - and gloves - of the crew should be thoroughly washed before handling seafood. Gloves need to be replaced regularly. Smoking, drinking and eating should be prohibited in the processing area, storage holds and refrigeration compartments - or wherever fish are being handled. Pets should never be allowed on-board a fishing vessel, as they can contaminate fish product.

Always wear clean clothes and protective gear (apron, hats and gloves), cover any cuts you have sustained, and do not cough or sneeze on fish or equipment that may come into contact with fish. Wash your hands regularly, using an anti-bacterial detergent, for your own health and that of the fish product.

- *Make sure that the vessel is fully equipped for safe and efficient operations.*

It is vital that there is sufficient cleaning and sanitising equipment on-board to keep the vessel free from bacteria - especially in the areas where the catch is landed, processed and stored - and that any insulated storage, refrigerators and freezers are well maintained and working efficiently.

- *Make sure the vessel is clean before leaving port, especially all surfaces likely to be in contact with fish, including the deck, brine tanks, gutting table, pound boards, fish bin, chiller, and deck gear.*
- *Monitor fishing times and fish condition. Ideally, set a 12- hour maximum duration for net soak times, even when catches are light. Minimise net soaking, where practical, and avoid long soak times based on a prearranged schedule or traditional practices.*

The flesh of a fish starts to 'spoil' as soon as the fish dies. Death often occurs soon after fish become trapped in a net and from this point a continual and irreversible deterioration in quality begins. The level of deterioration is directly related to the length of time and the temperatures that the fish are exposed to and held at.

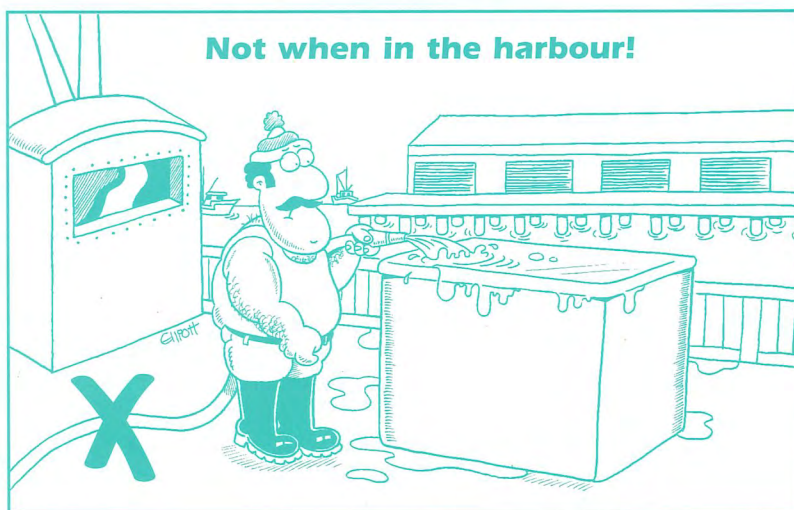
- *Ensure that proper records are kept of each day's fishing. Failure to do so can result in significant financial costs if a food quality-related problem is identified in connection with a particular catch.*

Catch records should identify the fishing area (by its coordinates), the species of fish caught, their weight, the date/time they were caught, the suitability of fish for use as food when landed, storage details of the catch (to allow for the efficient tracing of any suspect or faulty 'product'), and any general comments. Any unusual or significant fishing or handling factors that might affect catch quality should be noted in the records and communicated to buyers. The Code of Practice for the WA Demersal Gillnet and Longline Fishery has examples of documents you may find useful.



4. Whilst travelling to the fishing grounds

- Do not fill the brine tanks, ice-boxes, fish bin or use the deck hoses for cleaning until clean water is available. Water pumped from a harbour is not appropriate for these purposes.



Clean water is absolutely vital for food safety. If you need to use water whilst still in harbour, then use fresh water from a clean source not the surrounding water – or wait until clean water is available.

- When clear of the harbour, be sure to drain any water from the holding tanks and scrub the ice-boxes, fish bins and the deck with a detergent, then sanitise them. Depending on the type of sanitiser used, it may be necessary to rinse the deck and equipment with clean seawater afterwards.

- *After rinsing, fill the brine tanks, ice-boxes and fish bins with clean seawater, and an appropriate anti-bacterial agent for your conditions (if one is normally used).*
- *Store containers for the catch in a clean and dry place. Start the catch refrigeration system in good time, so that brine tanks or cool rooms are at the appropriate temperature before the first fish comes on-board.*

Allow the containers to dry in the sun on-deck before storing, taking care to avoid any chance of airborne contamination, i.e. from seagulls or other seabirds landing on them.

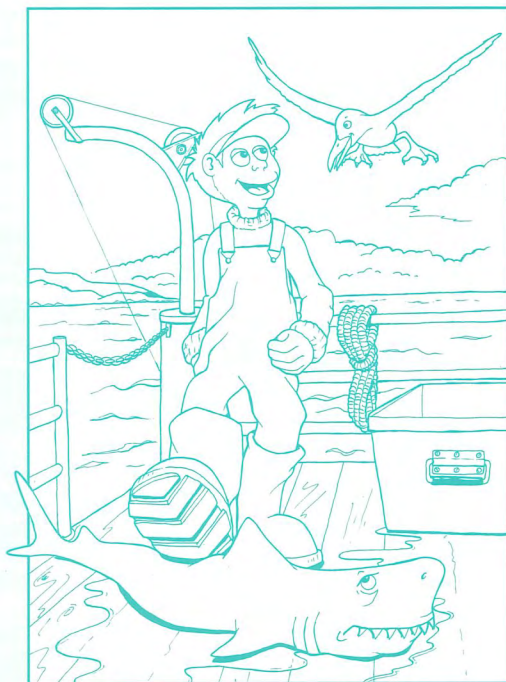
5. Fish handling on-deck

- *Make sure that the deck, the fish holding areas and the gutting tables are cool, cleaned and sanitised before placing or processing fish on them.*

Using a deck hose, cool down your deck and fish handling areas to avoid raising the temperature of landed fish. Preferably, these areas should be shaded from the sun - placing fish on a hot deck will quickly reduce their quality and shelf life.

Use a rubber or other non-porous mat on the deck, or spread ice under and over any fish waiting to be processed. Do not leave fish exposed to the elements. Never walk over, trample or kick fish as this is not only cruel behaviour, but leads to bruising/deterioration in their appearance and can reduce the value of the catch.





- *Remove all fish trapped in the net before making any repairs to it. Take care not to bruise or damage fish when removing them from the net. Gently return any unwanted catch to the ocean immediately.*
- *Live scale fish should be spiked and bled (using the 'iki-jimi' method), then put into an ice slurry or refrigerated seawater. Dead scale fish should be processed (gilled, gutted and rinsed) and placed into an ice slurry or refrigerated seawater immediately.*
- *Dead shark must be processed immediately - for details, see the following section.*

6. Processing sharks

Dead and live sharks should both be processed in the following manner:

a) Bleeding

If the shark is still alive, then immediately carry out 'iki-jimi' by spiking it toward the rear and top of the head, OR a knife cut across the rear of the top of the head will accelerate bleeding and death. Sever the tail fin of the shark and place it in circulating water so it can bleed. Bleeding often requires ten to fifteen minutes to complete, during which time the shark should be immersed in circulating water.

It should be noted that the above process of 'iki jimi' followed by bleeding a shark, is arguably the quickest, most practical and humane way to euthanise it. It also serves to maximise the flesh quality of the fish.

b) Finning

Depending on the species of shark, remove and trim the dorsal, pectoral and lower caudal fins. Rinse the fins and chill them without undue delay.

c) Dressing

Remove all the viscera and entrails (guts), taking care not to puncture the flesh of the fish. Thoroughly clean the gut cavity with a brush before rinsing thoroughly, including flushing the blood from the tail of the shark. Put the shark's trunk into an ice slurry, or refrigerated seawater. Avoid keeping trunks at ambient temperatures, as this will cause a rapid deterioration.

d) Checking the condition

Check the condition of each trunk, especially for ammoniation. A strong ammonia smell is a sign of early deterioration and a



shortened shelf life. Avoid storing ammoniated trunks with high-quality shark trunks, as the former can lead to accelerated deterioration of the latter.

Sorting the catch on deck should be completed as quickly as possible in order to minimise exposure to the sun and wind. Thorough washing of fish will minimise the number of bacteria (on the fish) that go into - and potentially contaminate - the ice slurries or refrigerated seawater the catch is kept in.

The deck, gutting table, holding areas, fish bins, and other equipment should be hosed down and scrubbed regularly throughout the course of each day's fishing and processing.

7. Chilling

- *Place all wanted fish into a bin/tank of circulating water*, an ice slurry, or refrigerated seawater within 10 minutes of landing them on deck. This should allow bleeding, rinsing and pre-chilling to occur without contaminating the main ice slurry or the refrigerated seawater tanks. When the water in this bin/tank needs replacing, it can be done without losing a great volume of water that cannot be readily replaced.*

NOTE: * If the water is not iced or refrigerated, the fish should be left in the 'slop bin' for no more than 10 minutes before being removed and chilled.

Processing the fish 'product' and reducing its temperature is the first priority – above all else. Net repairs or onboard maintenance should not be allowed to delay the chilling of fish. The core temperature of fish must be reduced as soon as possible to 0° C, in order to slow bacterial action and preserve the quality of the product.

- *Recirculating tanks or fish bins for temporarily storing processed or unprocessed demersal gillnet and longline catch should be kept clean by regularly replacing the water in them.*
- *The water temperature of ice slurries or refrigerated seawater should be maintained between -1°C and $+1^{\circ}\text{C}$ - before and after fish are immersed in them. Check water temperatures regularly, and either add ice or keep the refrigeration system running to keep the water and the product in it within the correct temperature range.*

As well as its temperature, the cleanliness of the brine/ice slurry should be monitored at least two or three times each day. This ensures that each batch of fish is rapidly cooled in optimum conditions. If the brine/ice slurry becomes noticeably discoloured (indicating contamination from earlier loads of fish) or has a strong smell, it must be replaced.

- *Fish core temperature should be regularly monitored and ice added as required to bring them down to around -1°C to $+4^{\circ}\text{C}$ within an appropriate time (the length of this time can vary, according to the size of the fish, or catch).*

8. Storage

Any ice build-up on the refrigeration plates/coils in the chill tanks should be physically removed. This may necessitate switching the power to the refrigeration system off briefly while this done, but care should be taken that the temperature inside the tanks does not rise substantially above 0°C .

- *Fish should be transferred into refrigerated holds or ice slurries within 10 - 15 minutes of being processed or otherwise placed*



into a temporary ice slurry or ice bin. Do not leave processed fish or fish trunks in ambient seawater for more than 10 - 15 minutes, as bacteria will rapidly multiply, increasing deterioration and reducing shelf life of the product.



Fish should be transferred carefully into ice slurries or chilled holding rooms. Never throw or drop fish product into a hold (apart from the obvious reasons, fish flesh bruises easily and damaged flesh becomes easier for bacteria to attack). The transfer of fish into holds should be conducted quickly, so as to avoid warming-up either the holds or fish product. Care should be taken to avoid contamination of fish product through contact with dirty surfaces.

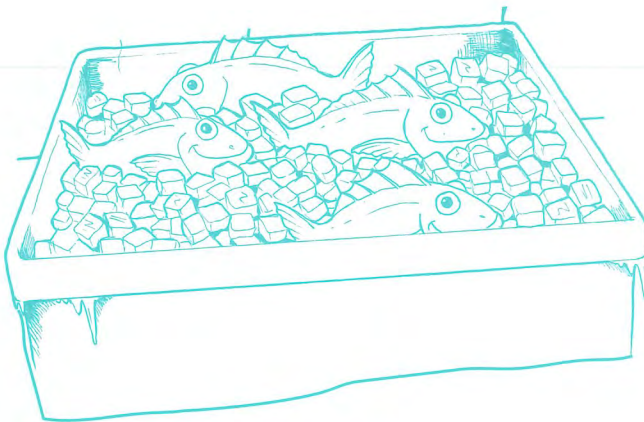
- *Regularly monitor and record temperatures of brine tanks, holding rooms and fish. Ensure that correct temperatures are maintained.*
- *If fishing is being carried out for longer than one day, be sure to separate each day's catch using pound boards, coloured tags or a system that allows identification of catch date. It is also important for purposes of traceability that fish can be identified by their date of landing. For this purpose, containers of fish should be labelled with the fishing area (by its co-ordinates), the species of fish caught, their weight, the date and time they were caught, the suitability of fish for use as food when landed, storage details of the catch (to allow for the efficient tracing of any suspect or faulty 'product'), and any general comments. Any unusual or significant fishing or handling factors that might affect catch quality should be noted in the records and communicated to buyers.*

9. Packing fish

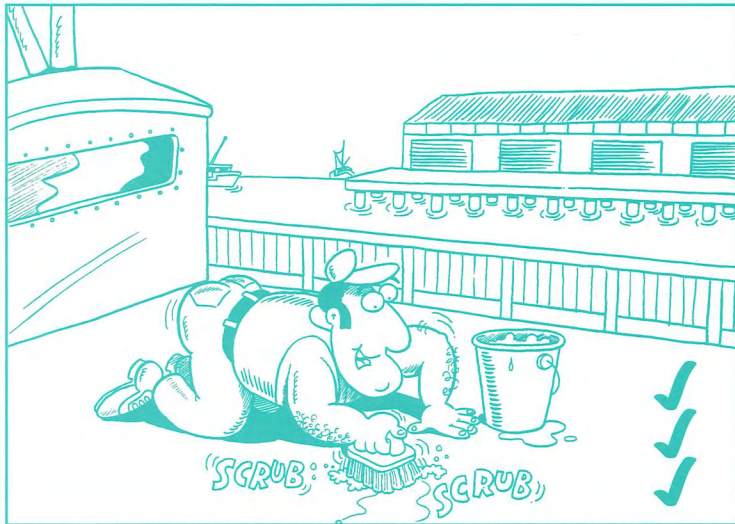
Processed fish should be placed gently and neatly into holds or ice slurries, belly down and parallel to each other. Avoid squashing the fish on the bottom of the hold/ice slurry by using barriers to separate layers of fish (i.e. pound boards, fish lugs) and support their weight. Fish that are bent stiffly, (due to rigor mortis), should not be straightened out. Always use clean protective gear (apron, hats and gloves) while packing and handling processed fish. Never smoke or eat while packing fish.

- *Packing fish in ice is recommended for both financial and quality reasons, helping to keep the fish moist. By stopping dehydration in this manner, fish lose less weight and retain their quality, which means higher financial returns from the catch. Be sure to allow any melted water to run-off.*

When catches of fish are labelled or date-coded, they can be processed, marketed and distributed in order of the time that passed since their capture, on the basis of “first in, first out” (sometimes referred to in the industry as “FIFO”). The freshest fish either goes to the more distant markets or is processed last.



10. On completion of fishing



- *Clear and clean all deck areas and equipment thoroughly, using a high-powered deck hose (a high pressure nozzle can help dislodge unwanted and stubborn debris and viscera). Clean these areas from top to bottom for effective cleaning.*
- *Use a detergent to scrub all deck areas and equipment. Rinse thoroughly with clean seawater. Now apply an alkaline (pH 7.5-8.5) sanitiser to these areas to kill off any bacteria.*
- *Check holding room and ice slurry temperatures and appearance. Drain and refill any ice slurries that have become discoloured. Avoid any airborne contaminants (i.e. bird droppings).*
- *Clean and sanitise all knives, brushes, spikes, mats, aprons, gloves, boots and cloths using detergents/sanitiser. Dry these in the sun and store in a dry and dust-free area.*

At the end of each trip (or, preferably, each day of the trip), all fish-handling equipment and utensils should be thoroughly cleaned, as follows:

STEP 1:

Hose all surfaces/equipment with clean seawater or freshwater.

STEP 2:

Scrub all surfaces with a brush, using a solution of alkaline detergent.

STEP 3:

Rinse with clean seawater or freshwater and apply sanitiser (crates and tubs can be scrubbed, washed and sanitised in preparation for use in the next catch).

STEP 4:

Turn off the water supply to all deck hoses and ice machines before entering the harbour to avoid the intake of any contaminated water.

STEP 5:

Clean the remainder of the vessel (daily), including toilets, shower, and wash-basins.



11. Unloading

- *Unload the catch quickly, trying to avoid the hottest time of the day. Unloading during the cool of the day can help reduce the chances of increasing the temperature of the catch, especially if there are any delays.*

Unloading of a fishing vessel should only commence once all the necessary equipment, containers, the catch and personnel are ready, and all preparatory work is completed.

- *Check and record fish product temperatures, as it is placed onto the road transport.*

Check the transport for the catch is clean and pre-chilled prior to loading. If this is not the case, be sure to load the fish with ice and appropriate packaging that are adequate to keep them cool until reaching the destination. Note that in between loading each container of fish onto the transport, the latter's door should be closed to control temperature and avoid contamination.

- *Thoroughly clean and sanitise the holding room or refrigerated compartments on the fishing vessel using fresh water (not from the deck hose, unless you have access to clean seawater), paying particular attention to corners and fittings.*

Check holding room and iceboxes, etc, for cracks and other damage to the walls, floor, etc. Report any damage - these are potential bacteria traps - to the skipper, who should make arrangements for repairs as required. Holding rooms and storage facilities should be allowed to dry and then closed/locked to avoid contamination.

- *Ensure that containers brought aboard for the next trip are clean and fit for use. Reject any dirty, damaged or unsuitable containers - the former should be placed to one side to be cleaned and sanitised so they can be used for processing fish in the future.*

12. Use of detergents and sanitisers

Before any sanitising of equipment/surfaces, etc, is carried out, it is vital that these are thoroughly cleaned with detergent.

Scrubbing surfaces with a detergent and a brush is a critical and essential part of cleaning areas used for fish processing. If organic material such as blood, slime and gut is not removed, it rapidly combines with - and neutralises - the disinfecting ability of any sanitiser solution.

Simply soaking fish baskets, crates, knives and processing equipment in a sanitiser is ineffective. This equipment must be first scrubbed with a stiff broom or brush and an appropriate detergent. Scrubbing equipment with a detergent and then using a sanitiser on it is the only way to maintain a proper level of cleanliness in an environment that is naturally loaded with organic materials and bacteria.

It is important to ensure that all cleaning or sanitising chemicals used on a fishing vessel are food grade, used in accordance with the manufacturer's instructions and comply with government regulations.



Useful contacts

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Seafood Services Australia

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WA Department of Health, in case of food-borne emergency (24hrs)

Phone: (08) 9480 4960
Website: www.health.wa.gov.au

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A project of the Minister for Agriculture, Forestry and Fisheries

Funded through the Development and Better Interest Fund



WAPIC
Western Australian Primary Industries Council

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May 2004

ISBN 1 877098 43 4



Department of Fisheries



Fish for the future