



CODE OF CONDUCT FOR THE WELFARE OF LIVE SEAFOOD

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CODE OF CONDUCT

1.0 MISSION STATEMENT

That no live seafood animals are subjected to undue stress or discomfort during transport, handling, storage or display and that the quality of all live seafood is maximised through good handling practices.

2.0 OBJECTIVES

The Code has the following objectives:

- 2.1 Establish a clear set of guidelines for the welfare of live seafood as a benchmark against which the practices of businesses that trade in live seafood can be judged.
- 2.2 Provide a standard of conduct for those individuals and businesses that trade in live seafood.
- 2.3 Provide consumers with an assurance that when they purchase live seafood it has been handled in a manner that is both humane, and maximises the quality and food safety of the product.
- 2.4 Confirm to consumers and the general public that the seafood industry is acting in a humane and socially responsible manner.

3.0 NATURE AND SCOPE OF THE CODE

The Code is applicable to all businesses that transport, store, display and sell live seafood in NSW. The Code is intended to address welfare and quality issues relating to live seafood from the farm gate or wharf to the consumer. This includes live seafood transporters, retailers, wholesalers and restaurants. The Code is not intended to apply to fishing or aquaculture operations although sections of the Code may be relevant.

By meeting the requirements set out in the Code businesses will be able to demonstrate their commitment to not only quality but also the humane treatment of animals. Adherence to the Code may also provide businesses with a defense against claims (from the public) of inappropriate practices.

4.0 GENERAL PRINCIPLES

All persons dealing with live seafood products must ensure that live seafood is not subjected to undue stress or discomfort, with particular care taken during transport, storage, display and killing.

Stress not only affects the well-being of live seafood but also ultimately diminishes the quality of the product.

Businesses that trade in live seafood must:

- Comply with all applicable laws and regulations governing their live seafood operations. Refer to Appendix 5.
- Take all reasonable measures to minimise distress or discomfort of live seafood.
- Handle all live seafood in a manner that will maximise the health, quality and safety of the product.

- Only purchase live seafood from reputable suppliers.
- Inform purchasers of live seafood of their obligation under the Code.

All live seafood offered for sale must:

- Be cared for in a humane and hygienic manner.
- Be safe for human consumption.
- Be healthy and robust.
- Comply with government regulations.

The five pillars for effectively managing the storage of live seafood are:

- **Visual inspection**
- **Monitoring ammonia**
- **Monitoring temperature**
- **Monitoring pH**
- **Record keeping. Refer to Section 8 and Appendix 7.**

5. TRANSPORTING LIVE SEAFOOD

Live seafood transporters must ensure:

- Transportation is undertaken in a manner that minimises stress (Sedation by cooling or anisiting will assist in minimising stress).
- Only compatible species are mixed. Refer to Appendix 8.
- Holding systems are of a size to prevent physical damage to animals.
- Finfish are provided with adequate filtration and aeration. This will depend on the species and stocking density.
- Buyers are notified of any significant delays experienced during transporting that may impact on the health and quality of the product.
- Transport records are kept including water temperature, time of collection and delivery, stock density and stock condition.

6. STORAGE AND DISPLAY

Live seafood may be stored in or out of water depending on the species and circumstances involved.

Details of the appropriate method of storage and display are provided in Appendix 8.

Display tanks that contain live seafood, which is not intended for sale, must meet the requirements set out in the Code.

6.1 Storing and Display of Live Seafood - OUT OF WATER

All live seafood stored or displayed out of water must be:

- Cared for by people who have the appropriate skills and knowledge to care for the species concerned.
- Maintained in a cool and moist environment.
- Kept out of bright light whenever possible.
- Kept away from unnecessary disturbance.
- Cooled to the appropriate temperature for the particular species but not allowed to come into direct contact with ice or any frozen surface. The appropriate temperature will depend on the particular species, refer to Appendix 8.

6.2 Storage and Display of Live Seafood – IN WATER

Maintenance of biological filter systems adequate for the intended purpose is the basis of good management of water based holding systems.

All live seafood held in water must be:

- Kept at a temperature slightly below the animals' normal temperature range (refer to Appendix 8). This reduces the need for oxygen as well as reducing the need to feed and minimises cannibalism. For finfish only feed as required to maintain condition. Uneaten food causes deterioration in water quality.
- Cared for by people who have the appropriate skills and knowledge to care for the species concerned.
- Kept in a holding system of suitable size for the animal(s) so as not to cause physical damage.
- Checked regularly for weak or damaged individuals. Such animals should be disposed of humanely or treated where practical, refer to Section 10.
- Only mixed with compatible species.
- Kept away from bright light if this is detrimental to their welfare.
- Kept away from unnecessary disturbance.
- Stored and displayed in compliance with all relevant legislation.

6.3 Storage and Display of Bivalves in Water

The preferred method for storage and display of bivalves is out of water due to food safety concerns. If stored in water, bivalves must be kept in accordance with NSW Food Authority Code of Practice for Wet Storage. Water based holding systems must be inspected by NSW Food Authority for compliance to Code of Practice.

7. HUMANE KILLING OF LIVE SEAFOOD

For humane reasons all finfish and large crustaceans must be killed prior to cooking or serving. All live seafood must be killed quickly and humanely. This must always be undertaken by an appropriately skilled person. This also maximises the quality of the final product and avoids toughening of the flesh, and loss of claws and legs in crustaceans. Chilling seafood prior to killing reduces stress and assists in maximising quality and makes handling easier.

NB: It is strongly recommended that live finfish and crustaceans should not be killed in public view as this may be distressing for some people.

7.1 Live Finfish

Live finfish must be killed by:

- Ike jime - spiked in the head with a narrow spike, or blade, to penetrate and destroy the brain or;
- A percussive blow to the head and severing of the arterial system at the base of the gills or;
- Stunning with an electrical current and severing of the arterial system at the base of the gills.

7.2 Crustaceans - Lobsters, Crabs, Prawns, Bugs and Yabbies

There are two acceptable methods for killing crustaceans:

- i) Stunning followed by dissection or cooking. This is the preferred method.
- ii) Killing without stunning by dissection and nerve destruction

i). Stunning followed by dissection or cooking

The most humane method of killing crustaceans is to effectively chill the animal(s) to produce insensibility, followed by killing through splitting and spiking to destroy the animal's nerve centers or cooking.

Crustaceans must be rendered insensible through chilling by either:

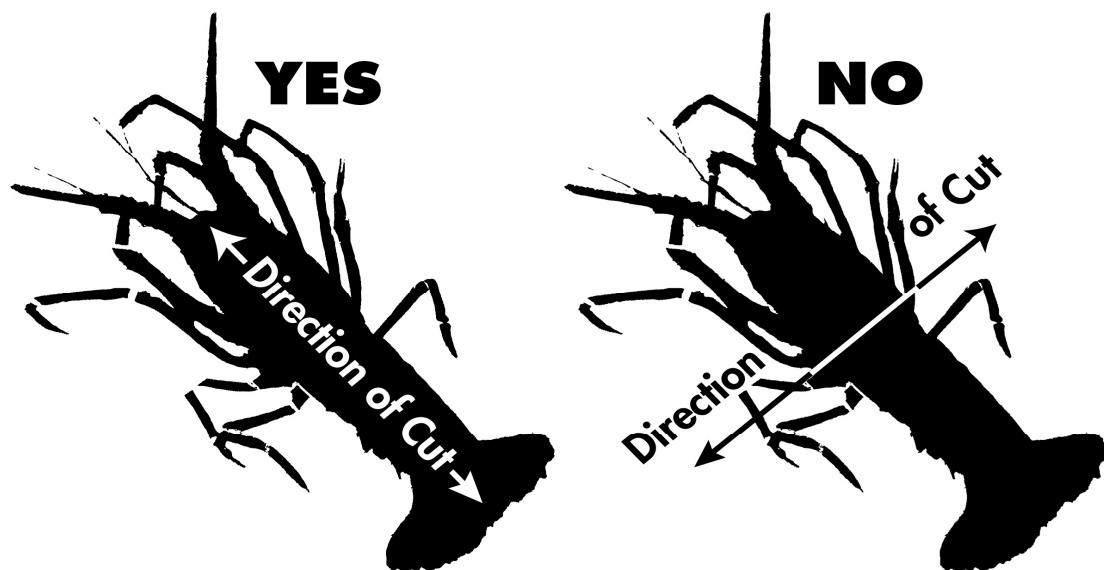
- Rapid refrigeration in air (in a refrigerator or freezer at a temperature below 4°C for a minimum 20 minutes) or;
- Immersion in an ice slurry, refer to Appendix 3. This method is only suitable for tropical marine species. Temperate species should not be chilled in this way, as these animals are likely to be affected by osmotic shock caused by the drop in salinity of the water by dilution with ice.

NB: Cooling should be of sufficient time (minimum of 20 minutes) and temperature to lower the body temperature until there is no detectable movement of the eyes, claws or tail when handled. This will in part depend on the type and size of the species.

ii) Killing (without stunning) by dissection and nerve destruction

Lobster

Lobsters can be killed humanely through splitting the body from head to tail longitudinally to destroy the nervous system. Refer to Diagram below.



NB: The whole procedure should take no longer than 10 seconds.

Crabs

Crabs can be killed humanely by:

- Rapid destruction of the front and rear nerve centres with a thick pointed, pithing instrument (*NB: The whole procedure should take no longer than 10 seconds*); or
- Immersion in clove oil.

Unacceptable practices:

Under no circumstances shall the following practices be undertaken due to the potential to cause prolonged pain or distress:

- **Transverse (separating the head from the chest) sectioning of crustaceans without first destroying the nerve centres;**
- **Cutting crustaceans into sections before destroying the front and rear nerve centres;**
- **Boiling of live crustaceans.**
- **Cutting tissue from a live animal.**
- **Serving of live crustaceans to diners.**

7.3 Molluscs (mussels, pipis, clams, vongole, etc.)

The body temperature of molluscs must be lowered (in a refrigerator or freezer at a temperature below 4°C for a minimum of 20 minutes) prior to processing to ensure humane death and to reduce bacterial contamination as the molluscs' immune systems cease to function.

7.4 Cephalopods (octopus, calamari, cuttlefish etc)

The body temperature of cephalopods must be lowered (in a refrigerator or freezer at a temperature below 4°C for a minimum of 20 minutes) prior to processing to ensure humane death. The brain stem should then be severed by inserting a sharp knife between the eyes or by separating the head from the body using a sharp knife.

8. RECORD KEEPING

All businesses that handle live seafood must keep accurate and up to date records. Keeping accurate and up to date records of maintenance programs is an essential part of demonstrating commitment to and compliance with the Code. Demonstrated compliance with the Code may also provide a defense in case of complaints or prosecution.

A record of the following must be kept:

i). Holding System maintenance

This must include details of:

- Holding tank identification.
- Species being inspected.
- Date and time of inspection.
- Who performed the inspection.
- Ammonia concentration.
- Temperature.
- PH.
- Identification of problem (if there is one).
- Action undertaken to rectify the problem (if required).

Refer to Appendix 7 for sample record sheet.

ii). Stock delivery record

This must include details of:

- When the product was delivered – time and date.
- Supplier details.
- Quantity of product supplied.
- Species of product supplied.

9.0 DEALING WITH UNHEALTHY STOCK

9.1 Responses to unhealthy stock

All live seafood must be inspected on a regular basis (at least daily) to check the health of the animals. The regularity of these inspections will depend on a number of factors including the particular species being kept, stock densities, the storage method and internal and external temperature conditions (more frequent inspections may be required during hot periods).

If, during an inspection, one or more unhealthy animals are detected then the following response is required:

- Immediately remove sick or injured animals.
- Kill or treat separately, if appropriate, all individuals exhibiting symptoms.
- Assess cause of problem and rectify.

NB: Chemical treatment of live seafood may only be undertaken with products approved by the Australian Pesticides and Veterinary Medicines Authority (APVMA) and withholding period must be adhered to. For more information contact APVMA or check www.apvma.gov.au.

9.2 Common indicators of unhealthy stock

- Swim bladder problem (i.e. floating / sinking / on side / coordination)
- Air breathing / gasping
- Flashing / rubbing
- Skin lesions
- Fin lesions
- White spot
- Hyperactivity

10. DISPOSAL OF ANIMALS, EFFLUENT AND PACKING MATERIAL

10.1 Disposal of Animals that are Unfit for Human Consumption

If animals suffer illness in transit or while awaiting sale they must be humanely destroyed. **Animals that die during transit or awaiting sale must be disposed of as they are no longer considered suitable for human consumption.**

All dead animals must be disposed of in a landfill site to prevent the possible transmission of disease-carrying organisms or the establishment of feral populations in our local waterways. Disposal must always be undertaken in accordance with local regulations.

10.2 Disposal of Effluent

All individuals dealing in live seafood must ensure liquid effluent from holding systems is disposed of via the sewer system. Do not disposed of via the storm water system or into the aquatic environment. Solids must be removed prior to disposal. All solid effluent should be disposed of in accordance with government regulations.

10.3 Disposal of Packaging Material

All packaging materials for live seafood (such as water and seaweed) that may contain living organisms must also be disposed of as detailed above to avoid introducing non-native species and disease.

11.0 REFERENCES

Bennison, S., Guidelines on Aquatic Animal Welfare for the Aquaculture Industry in Western Australia (Draft Copy), Aquaculture Council of Western Australia.

Fisheries Western Australia (2001) Guidelines for the Handling of Live Seafood (brochure).

NRE, 2000. *Guidelines on Fish and Crustacean Welfare – for marketing and preparation for human consumption*. Natural Resources and Environment (brochure).

NSW Agriculture. *Guidelines for Avoiding Cruelty in Shellfish Preparation*(brochure). Communications Unit, NSW Agriculture.

Olney, A., Yearsley, G. & Brown, F. (2000) *Australian Seafood Users Manual*, DPI Publication, Qld.

12.0 ACKNOWLEDGMENTS

The MFMA would like to thank the following people for their time and assistance in developing this document:

Ross Burton (NSW Agriculture, Animal Welfare Unit)
Steven Atkinson (University of New England)
Steve Coleman (RSPCA)
Bidda Jones (RSPCA)
Malcolm Shelley (Ozsea Aquaculture Systems)
Peter Sutherland (NSW Food Authority)
Chris Papageorge (Capitol Seafoods)
John Roach (Master Fish Merchants' Association)
Michael Kitchener (Master Fish Merchants' Association)

13.0 APPENDIX

Appendix 1 - GENERAL REQUIREMENTS FOR HOLDING SYSTEMS

Holding systems that are used to display, hold or transport live seafood products should be:

- Operated and maintained by people who have the appropriate skills and knowledge to care for the species concerned.
- Filtered using biological filtration systems that are suited to the requirements.
- Checked regularly for ammonia, temperature, pH levels.
- Kept within the biological holding capacity of the holding system at the time.
- Kept free of excessive slime and algal growth, especially in aquariums on public display (Although the buildup of algae may not necessarily affect the live seafood contained within this is recommended in the interest of culturing a positive public perception of the industry).
- Of a size to prevent physical damage to the animals contained.
- Only contain compatible species.

Appendix 2 - SEDATION OF LIVE SEAFOOD

Live seafood will at times need to be sedated in order to minimise stress during transportation and handling prior to sale. Live fin fish are commonly sedated by using clove oil/eugenol or by lowering the water temperature (warm water species only).

When sedating live seafood:

- Sedate only when required.
- Use the minimum amount of sedative (e.g. clove oil, eugenol, etc.) required so as to avoid over sedation and possible death.

Appendix 3 - MAKING AN ICE SLURRY

Ice slurries should be made of crushed ice and chilled salt water in a 3:1 ratio. The ice slurry should contain enough ice to maintaining a temperature of minus 1 degree Celsius. The level of the ice slurry must be monitored to ensure maintenance of the correct temperature and ratio of water to ice.

Ice slurries intended for marine species must contain appropriate salt levels. Salt may be added to ice slurries for freshwater species.

Appendix 4 - BIOLOGICAL FILTRATION SYSTEMS

The establishment of an adequate (for the intended purpose) biological filtration system is critical in maintaining the health of all live seafood kept in water. Biological filtration systems rely on beneficial bacteria to consume fish wastes and keep the holding tank clean.

The five pillars for effectively managing the storage of live seafood, detailed in Section 6 Storage and Display, will allow you to assess the efficacy of biological filtration systems.

Management of Biological Filtration Systems

The presence of ammonia in the holding tanks is probably the primary risk to the health of live seafood held in water. Any measurable amount of ammonia indicates either an overloaded aquarium (too many fish or too much food) or an inadequate filtration system.

Ammonia is also affected by the pH (dissolved hydrogen ions) of the water. When the pH is above neutral (greater than 7.0), it is primarily in the toxic or unionized form. If the pH is below 7.0, a significant portion of the ammonia will be ionized and not as toxic to the fish. Ammonia is especially harmful to marine fish since saltwater aquariums are almost always maintained at a pH of between 8.0 and 8.5.

Testing of Biological Filtration Systems

The state of the biological filtration system can be assessed through the use of ammoniac test kits. It is essential this be undertaken as part of a regular maintenance program, refer to Section 8 and Appendix 7.

Appendix 5 - LEGISLATION

Animal Welfare Legislation

- Prevention of Cruelty to Animals Act (1979)

Food Safety Legislation

- Food Act 1989
- Food Production (Safety) Act 1989
- Food Regulation Act 2001

Fisheries Legislation

- Fisheries Management Act 1994

Other Relevant Legislation

- Trade Practices Act

Appendix 6 - DEFINITIONS

Acceptable temperature range – The range in temperature that will result in the least discomfort or distress. Refer to Appendix 8 for species-specific temperature ranges.

Aquarium / tanks – form of holding tank.

Biological Filtration – the primary filter system for all holding tanks. The biological filter converts toxic material from animals into less toxic materials through the activity of bacteria.

Biological Load – the maximum number of animals that can be supported in a given holding system.

Chemical filtration – filtration system designed to remove unwanted chemicals and matter. Commonly involves the use of activated carbon, oxygenation and foam fractionation (Protein skimmers).

Crustacean– an invertebrate animal with a hard segmented outer shell, including lobsters, fresh water crayfish, prawns, crabs and bugs.

Filtration – method used to modify the environment within a holding system by removing unwanted dissolved chemicals and physical particulates. Three methods including – biological, physical and chemical.

Finfish – an aquatic cold-blooded vertebrate with gills and limbs in the shape of fins.

Food Safety – the assurance that a food will not cause harm as a result of physical, chemical or biological hazards to the consumer when it is stored, prepared and/or eaten according to its intended use.

Handling – any activity that involves touching, moving or storing live seafood.

Holding – the keeping of live seafood in a holding system

Holding System – a containment device used to store live seafood, either wet or dry.

Humane treatment – handling in a manner that avoids unnecessary distress or discomfort.

Ike jime – a technique use for killing live finfish using a narrow spike to penetrate the head and destroy the brain.

Insensible – the point at which there is no detectable movement of the eyes, claws or tail of live seafood animals when handled.

Killing – any method or technique that results in death.

Molluscs – an animal belonging to the phylum Mollusca. Characterised by soft bodies and hard shells, including oysters, abalone, pipis, mussels, clams, Vongoli etc.

Osmotic Shock – the rupturing of cells following a sudden change in osmotic pressure.

Person – any individual, partnership, corporation, association or other legal entity.

Quality – internal and external attributes of seafood that is required or stated as being necessary by a customer or standard. This may include eating quality (eg odour and texture), visual quality (eg colour) and nutritional quality (eg omega-3 content).

Sanitizer – a chemical disinfectant used to reduce the number of bacteria on a cleaned surface.

Seafood – all edible plants and animals that grow or live in freshwater or saltwater.

Significant delay during transportation – an unexpected delay, of a period, which may detrimentally impact the health of the animals being transported.

Skilled person – any individual who is capable of demonstrating awareness and understanding of the minimum requirement for maintaining live seafood in a humane manner as set out in Code.

Slime – a thick transparent film that occurs naturally on the surface of the skin. After a finfish dies and spoilage sets in the slime becomes milky and opaque, then thick and yellow. Slime left on finfish is food for unwanted bacteria.

Stress / Distress – condition resulting from pain or suffering.

Stunning – means of rendering finfish insensible by percussive blow or electric current.

Subtropical water species – animals that typically live in a temperature range of 18-20.

Temperate water species – animals that typically live in a temperature range of 13-15.

Time in transport – the period of time a product is in transit, from pickup to delivery.

Transport – any activity involved in moving live seafood from one location to another.

Transport Vehicle – any vehicle that is used to transport live seafood and which meets the regulatory requirements under Safe Food NSW.

Tropical water species – animals that typically live in a temperature range of 25-27.

Water quality – the characteristic of water that determines its suitability for a given use. Factors that impact on water quality include pH, ammonia, salinity, nutrient and bacterial load, dissolved oxygen etc.

Animal Welfare – All aspects relating to the care of captive animals that impact on their health and well-being.

Appendix 8 - Requirements for Live Seafood

		Requirements for Live Seafood							
		In water/Out of water	Max. Storage Time	pH	Temp Range	Salinity	Ammonia Level	Other Conditions	
Fin fish	Barramundi	In water	Several days to weeks	7.0-8.5	22-25C	3-5 ppt, but will tolerate a wide range. Salinity should not vary more than 2ppt.	0	<ul style="list-style-type: none"> • Avoid rapid changes in temperature and salinity. • Filtration and aeration essential. • Avoid over stocking. 	
	Silver Perch		Several days to weeks	6.5-7.5	15-18C	3-5 ppt, but will tolerate a wide range. Salinity should not vary more than 2ppt.	0		
	Reef Fish		Several days to weeks	7.0-8.5	23-25C	35 ppt	0		
Crustaceans	Kuruma prawn Most other species	Out of water	2-3 days 6 hours	NA	10-15C	NA	NA	<ul style="list-style-type: none"> • Store in package received in. • Keep moist. • Aerate and filtrate 	
	Black Tiger Prawns	In water		7.0-8.5	17-20C	35 ppt	0		
	Most tropical species	In water		7.0-8.5	15-20C	35 ppt	0		
	Mud Crabs	Out of water	3 days		NA	16-25C Longevity is increased at the lower end of the spectrum.	NA	NA	<ul style="list-style-type: none"> • Store in package received in. • High humidity (80-90%). • Cover with clean damp cloth. • Must not come into contact with ice, ice packs or melt water. • Avoid strong light.
		In water	1 week		7.0-8.5	17-25C	15-35 ppt	0	

Other Crabs	Out of water	6 hours	NA	Varies with species.	NA	NA	• As per for Mud crabs.
	In water	1 week	7.0-8.5	Varies with species.	35ppt or close to natural environment	0	• As per for Mud crabs.
Southern Rocklobster	Out of water	6 hours plus	NA	6-10 c	NA	NA	<p style="text-align: center;">Out of water</p> <ul style="list-style-type: none"> • Keep moist e.g. using a damp hessian cloth. • Must not come into contact with ice, ice packs or melt water. • Keep from direct contact • Keep in single layer. <p style="text-align: center;">In water</p> <ul style="list-style-type: none"> • Aerate and filtrate. • Check daily and remove dead or weak individuals.
	In water	One week in peak condition	7.0-8.5	6-10 C	Usually around 35 ppt.	0	
Western Rocklobster	Out of water	6 hours plus	NA	15 C	NA	NA	
	In water	One week in peak condition	7.0-8.5	15 C	Usually around 35 ppt.	0	
Tropical Rocklobster	Out of water	6 hours plus	NA	20-25 C	NA	NA	
	In water	One week in peak condition	7.0-8.5	20-22 C	Usually around 35 ppt.	0	
Balmain Bug	Out of water	12 hours	NA	6 C	NA	NA	
	In water	One week in peak condition	7.0-8.5	4.5-10 C	Usually around 35 ppt.	0	
Moreton Bay Bug	Out of water	12 hour	NA	12 -15 C	NA	NA	
	In water	One week in peak condition	7.0-8.5	17-20 C	Usually around 35 ppt.	0	<p style="text-align: center;">Out of water</p> <ul style="list-style-type: none"> • Leave in package received in. • Keep moist – add damp cloth material to bottom of box and cover with clean damp sack. • Must not come into contact with ice, ice packs or melt water.
Marron and Yabbies	Out of water	3 day	NA	12-20 C	NA	NA	
	In water	A few weeks	7.0-8.0	12-20 C	3-5 ppt	0	

	Redclaw	Out of water	3 days	NA	20-25 C	NA	NA	<ul style="list-style-type: none"> Take precautions to prevent escape. <p style="text-align: center;">In water</p> <ul style="list-style-type: none"> Aerate and filtrate. Check daily and remove dead or weak individuals. No light is best but for display purposes fluorescent lighting should be used.
		In water	A few weeks	7.0-8.0	20-25 C	3-5 ppt	0	
Molluscs	Abalone	Out of water	3-7 days	NA	Cool - actual temperature is dependant on species	NA	NA	<p style="text-align: center;">Out of water</p> <ul style="list-style-type: none"> Keep moist Pack on edge. <p style="text-align: center;">In water</p> <ul style="list-style-type: none"> Very efficient filter required. Avoid bright light. Check daily <p style="text-align: center;">Other</p> <ul style="list-style-type: none"> Small individuals store for longer than larger ones. When stored out of water, abalone may lose or develop an abnormal flavour.
		In water	7 weeks	7.0-8.5	As above	35 ppt.	0	
	Mussels (and other bivalves such as pipis)	Out of Water	5-6 days	NA	Cool (5-10 C) Depending on species	NA	NA	<p style="text-align: center;">Out of water</p> <ul style="list-style-type: none"> Keep moist Cover with wet hessian cloth.

	In water		7.0-8.5	Cool (5-12 C) Depending on species	Varies	0	
Pacific Oysters	Out of water	6-7 days	NA	5-10 C	NA	NA	<p>Out of water</p> <ul style="list-style-type: none"> • Keep moist • Cover with wet hessian cloth. • Store with cup half downwards. <p>In water</p> <ul style="list-style-type: none"> • Must adhere to SafeFood NSW Code of Practice for Wet Storage. • Must use water from an approved source to comply with food safety standards. • Must use UV sterilisers. • Efficient filter required. <p>Other</p> <ul style="list-style-type: none"> • Storage out of water is the preferred method for food safety reasons. • Different batches should not be mixed.
	In water		7.0-8.5	5 C	Depends on the origin of the oyster.	0	
Sydney Rock Oyster	Out of water	9-10 days	NA	10-15 C	NA	NA	
	In water		7.0-8.5	15 C	Depends on the origin of the oyster.	0	

Source: Olney, A., Yearsley, G. & Brown, F. (2000) *Australian Seafood Users Manual*, DPI Publication, Qld.

Information contained within table above is intended as a guide only.