

Safe Seafood Australia

2nd Edition April 2006

A guide to the Australian Primary Production
and Processing Standard for Seafood



FOOD STANDARDS
Australia New Zealand
Te Mana Kounga Kai - Ahitereiria me Aotearoa

Safe Seafood Australia

Guide to Standard 4.2.1

*Primary Production and Processing Standard
for Seafood*

**Chapter 4 of the Australia New Zealand Food Standards Code
(Australia only)**

Second Edition, April 2006

Food Standards Australia New Zealand
Canberra

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Status of the guide

This guide has been developed by Food Standards Australia New Zealand (FSANZ) as one of its functions under section 7(1)(c) of the Australia New Zealand Food Authority Act 1991 and is intended to help with the interpretation of Standard 4.2.1 Primary Production and Processing Standard for Seafood in Chapter 4 of the Australia New Zealand Food Standards Code (the Code).

There are other requirements in the Code, for example labelling requirements, that apply to seafood and these are briefly summarised in this guide.

Standard 4.2.1 is provided in the guide. The Code is available on the FSANZ website at www.foodstandards.gov.au.

This guide is intended primarily for use by government agencies responsible for enforcing the requirements in the Code relating to seafood. If there is uncertainty about what is meant by a requirement in Standard 4.2.1, reference can be made to this guide for clarification. While this guide has been developed in consultation with enforcement agencies, it is not intended to be a prescriptive or binding document for enforcement agencies.

The guide includes examples where they are helpful in explaining the meaning of a clause. It must be emphasised that neither the explanations nor the examples in the guide are legal requirements on seafood businesses. The legal requirements are in the standards.

The Code is part of state and territory legislation. Enforcement officers seeking further clarification of definitions or requirements in the Code should approach the relevant agency in the state or territory.

The guide may also be useful to seafood businesses. It does not specify ways in which seafood businesses must comply with the requirements but the explanations and examples may help them to comply.

Seafood businesses seeking guidance on compliance with the standard or the Code should contact their local enforcement agency for advice. A list of contacts is provided at the end of the guide.

This second edition of the guide will be reviewed and amended as necessary. Readers are invited to contact FSANZ if they have suggestions that would improve the guide or believe that additional explanation should be included. Feedback should be sent to the addresses on the facing page.

Food Standards Australia New Zealand disclaims liability for any loss or injury directly or indirectly sustained by any person as a result of relying on this guide. Food businesses should seek independent legal advice if they have any queries about their legal obligations under food standards.

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Standard 4.2.1

Primary Production and Processing Standard for Seafood

Standard 4.2.1

Primary Production and Processing Standard for Seafood

(Australia only)

To commence on 26 May 2006

Purpose and commentary

This Standard sets out food safety and suitability requirements for seafood generally from pre-harvesting production of the seafood up to, but not including manufacturing operations. Chapter 3 of this Code applies to seafood manufacturing and retail sale activities.

Under this Standard, a seafood business must identify potential seafood safety hazards and implement controls that are commensurate with the risk.

Additionally, this Standard requires primary producers and processors of certain bivalve molluscs to implement a food safety management system. This particular requirement also extends to manufacturing activities relating to bivalve molluscs.

For primary producers and processors of bivalve molluscs, the food safety management system incorporates conditions on the areas from which the product may be harvested or harvested for depuration or relaying, along with conditions on the water used for wet storage.

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Clauses

Division 1 – Preliminary

1 Application

- (1) This Standard applies to seafood businesses and seafood handlers in Australia but not in New Zealand.
- (2) Unless the contrary intention appears in this Standard, Chapter 3 of this Code applies to seafood manufacturing and retail sale activities.

Editorial note:

This Standard applies to primary production and processing activities as defined in clause 2. The definition of ‘processing of seafood’ includes activities such as the killing, gutting, filleting, brining and shucking of seafood and the depuration of shellfish. However, other than the food safety management system requirements for bivalve molluscs, this Standard does not apply to manufacturing activities.

Manufacturing of seafood is defined in clause 2 as the canning, smoking or crumbing of the seafood or the addition of other foods to the seafood and other like activities.

Under the Imported Food Control Act 1992, Standards in this Code apply to imported food. However, this Standard does not fall within the scope of the ‘Agreement Between the Government of Australia and the Government of New Zealand Concerning a Joint Food Standards System’. Accordingly, this Standard does not apply to food businesses in New Zealand. Furthermore, the Trans-Tasman Mutual Recognition Arrangement and the Australian and New Zealand legislation giving effect to that Arrangement apply to imported food.

This Standard does not apply to persons who harvest or catch seafood for recreational, cultural or traditional purposes, provided the activity does not come within the definition of a ‘seafood business’ – that is, the seafood harvested or taken is not intended for sale.

Clause 3 of this Standard does not affect the operation of Standard 3.2.1.

2 Interpretation

(1) Unless the contrary intention appears, the definitions in Chapter 3 of this Code apply for the purposes of this Standard.

(2) In this Standard –

control means a measure that prevents, eliminates or reduces to an acceptable level, a food safety hazard.

deuration means a process using a controlled environment to reduce the level of certain pathogenic organisms that may be present in live shellfish and crustaceans.

harvesting means the capture or taking of seafood and includes the capture or taking of seafood from an enclosure or pond used in aquaculture.

inputs includes any feed, chemicals or other substances used in, or in connection with, the primary production of seafood.

live seafood premises means a premises used for the primary production of live seafood, and includes sea cages.

manufacturing of seafood means the canning, smoking or crumbing of seafood or the addition of other food to seafood and other like activities.

primary production of seafood means the –

- (a) growing, cultivation, picking, harvesting, collection or catching of seafood; or
- (b) growing on of seafood; or
- (c) transportation or delivery of seafood; or
- (d) holding of live seafood;

and includes processing of seafood.

processing of seafood includes –

- (a) the killing, dismembering, filleting or cutting into portions, gill or gutting, or skinning of seafood; and
- (b) the deuration of shellfish and crustaceans; and
- (c) the shucking or peeling of seafood; and
- (d) the cooking, including steaming or boiling, of crustaceans; and
- (e) the brining of seafood; and
- (f) the packing, treating, washing, freezing, refrigeration or storing of seafood; and
- (g) other similar activities.

Editorial note:

The definitions of ‘primary production of seafood’ and ‘processing of seafood’ operate for the purposes of this Standard and do not affect the definition of those terms in State and Territory Food Acts. The definitions in this Standard do not affect the legislative or administrative arrangements in the States and Territories concerning the administration and implementation of legislative schemes.

seafood means all aquatic vertebrates and aquatic invertebrates intended for human consumption, but excludes amphibians, mammals, reptiles, and aquatic plants.

seafood business means a business, enterprise or activity that involves the primary production of seafood intended for sale.

seafood handler means a person who engages in or supervises the primary production of seafood, for a seafood business.

seafood premises means any premises including land, vehicles, parts of structures, tents, stalls and other temporary structures, vessels, pontoons, and any other place declared by the relevant authority to be a premises under the Food Act, kept or used for the primary production of seafood (exclusively or otherwise), regardless of whether the premises are owned by the proprietor, including premises used principally as a private dwelling.

temperature control means maintaining seafood at a temperature of –

- (a) 5°C, or below if this is necessary to minimise the growth of infectious or toxigenic micro-organisms in the food so that the microbiological safety of the food will not be adversely affected for the time the food is at that temperature; or
- (b) another temperature – if the food business demonstrates that maintenance of the food at this temperature for the period of time for which it will be so maintained, will not adversely affect the microbiological safety of the food.

Division 2 – Seafood safety requirements

3 General seafood safety management

A seafood business must systematically examine all of its primary production and processing operations to identify potential seafood safety hazards and implement controls that are commensurate with the food safety risk.

Editorial note:

The ‘controls’ referred to in this clause should include –

- a. Measures to control hazards from air, soil, water, bait and feedstuffs, fertilizers (including natural fertilizers), pesticides, veterinary drugs and any other agent used in primary production of seafood; and
- b. Controls to protect food sources from faecal and other contamination.

4 Contamination and handling

(1) A seafood business must take all necessary steps to prevent the likelihood of seafood being or becoming contaminated.

(2) A seafood business must take all reasonable measures to ensure that seafood handlers handle seafood or surfaces likely to come into contact with seafood in a way that is not likely to compromise the safety or suitability of seafood.

5 Inputs and harvesting areas

(1) A seafood business must take all reasonable measures to ensure inputs do not adversely affect the safety or suitability of the seafood.

(2) A seafood business must not harvest seafood in an area if it is known, or ought reasonably be known at the time, that the seafood, if harvested in the area, may not be safe or suitable when sold for human consumption.

6 Seafood storage

(1) A seafood business must, when storing seafood, other than live seafood, store the seafood under temperature control and have a means of monitoring the temperature of the seafood.

(2) A seafood business must, when storing live seafood, store the seafood in such a way that the conditions under which it is stored will not adversely affect the safety or suitability of the seafood.

7 Seafood transportation

(1) A seafood business must, when transporting seafood, other than live seafood, transport the seafood under temperature control and have a means of monitoring the temperature of the seafood.

(2) A seafood business must when transporting live seafood, transport the seafood under conditions that will not adversely affect the safety or suitability of the seafood.

Editorial note:

For clauses 6 and 7 –

The term ‘temperature control’ is defined in clause 2 of this Standard.

8 Seafood packaging

A seafood business must, when packaging seafood –

- (a) only use packaging material that is fit for its intended use; and
- (b) only use packaging material that is not likely to cause contamination of the seafood; and
- (c) take all reasonable measures to ensure that the seafood does not become contaminated.

9 Seafood for disposal

(1) A seafood business must ensure that seafood for disposal is held and kept separate until it is –

- (a) destroyed or otherwise used or disposed of so that it cannot be used for human consumption; or
 - (b) returned to its supplier; or
 - (c) processed in a way that ensures its safety or suitability; or
 - (d) ascertained to be safe and suitable for sale.
- (2) A seafood business must clearly identify any seafood that is held and kept separate in accordance with subclause (1) as returned seafood, recalled seafood, or seafood that is or may not be safe and suitable.

Editorial note:

‘Seafood for disposal’ has the same meaning as ‘food for disposal’ as defined in Standard 3.2.2, clause 11 – that is – the seafood is subject to a recall, or has been returned, or is not safe or suitable, or is reasonably suspected of not being safe or suitable.

10 Seafood receipt

- (1) A seafood business must take all reasonable measures to ensure it only accepts seafood that is protected from the likelihood of contamination.
- (2) A seafood business must, when receiving seafood, other than live seafood, take all reasonable measures to ensure it only accepts seafood that is under temperature control.
- (3) A seafood business must, when receiving live seafood, take all reasonable measures to ensure that it receives seafood that has been transported in such a way that has not or will not adversely affect the safety or suitability of the seafood.

11 Seafood tracing

A seafood business must maintain sufficient written records to identify the immediate supplier and immediate recipient of seafood for the purposes of ensuring the safety of the seafood.

12 Skills and knowledge

A seafood business must ensure that seafood handlers have –

- (a) skills in food safety and food hygiene; and
- (b) knowledge of food safety and food hygiene matters;

commensurate with their work and the food safety risks.

13 Health and hygiene requirements

- (1) A seafood handler must exercise personal hygiene and health practices that are commensurate with the food safety risks and that do not adversely affect the safety or suitability of the seafood.

- (2) A seafood handler who –
- (a) has a symptom that indicates the handler may be suffering from a food-borne disease; or
 - (b) knows he or she is suffering from a food-borne disease; or
 - (c) is a carrier of a food-borne disease;

must not engage in any handling of seafood where there is a reasonable likelihood of seafood contamination as a result of the disease.

- (3) A seafood business must take all reasonable measures to ensure that seafood handlers exercise personal hygiene and health practices that are commensurate with the food safety risks and that do not adversely affect the safety or suitability of the seafood.

14 Seafood premises and equipment

- (1) A seafood business must ensure that seafood premises, including live seafood premises, and equipment used in the primary production of seafood are –
- (a) so far as is reasonably necessary, kept clean; and
 - (b) designed, constructed, maintained and operated;

such that the safety or suitability of the seafood will not be adversely affected.

- (2) For the purposes of subclause (1), a seafood business must comply with –
- (a) Division 5 of Standard 3.2.2 and Standard 3.2.3 of this Code; or
 - (b) a set of requirements recognised by the Authority.

Editorial note:

Where the cleaning of equipment such as fishing nets and oyster racks would not affect the safety or suitability of the seafood, the cleaning of this equipment will not be necessary to meet the requirements in paragraph 14(1)(a).

Division 3 – Specific requirements for bivalve molluscs

15 Interpretation

In this Division –

approved means approved by the Authority.

area means an area where bivalve molluscs are grown or harvested.

ASQAP Manual means the Australian Shellfish Quality Assurance Program Operations Manual – Version 3 of 2002.

Authority means the State, Territory or Commonwealth government agency or agencies having the legal authority to implement and enforce this Division.

batch means a quantity of bivalve molluscs which is harvested, depurated or handled from the same lease number and with the same harvest date.

bivalve molluscs include cockles, clams, mussels, oysters, pipis and scallops intended for human consumption, but excludes scallops and pearl oysters, where the only part of the product consumed is the adductor muscle, and spat.

growing on means the process where juvenile bivalve molluscs are translocated to a classified area for a sufficient period to enable their development prior to sale.

relaying means the transfer of bivalve molluscs from one area to another for the reduction of contaminants in the bivalve molluscs.

spat means juvenile bivalve molluscs taken for the sole purpose of growing on.

Editorial note:

If spat are harvested for human consumption then the product falls within the definition of 'bivalve mollusc'. In that case, the requirements in this Division for bivalve molluscs apply to the product.

wet storage means the temporary storage of bivalve molluscs from an area in containers or tanks containing natural or artificial seawater for purposes other than depuration.

16 Food safety management systems for bivalve molluscs

(1) A seafood business that engages in the primary production or processing of, or manufacturing activities concerning, bivalve molluscs must implement a documented food safety management system that effectively controls the hazards.

Editorial note:

'Hazard' is defined in Standard 3.1.1 as a biological, chemical or physical agent in, or condition of, food that has the potential to cause an adverse health effect in humans.

Under subclause 1(2) of this Standard, the requirement for a food safety management system in subclause 16(1) does not apply to retail sale activities concerning bivalve molluscs.

(2) A seafood business is taken to comply with subclause (1) if it implements –

- (a) a food safety program set out in Standard 3.2.1; or
- (b) a food safety management system set out in the Commonwealth Export Control (Processed Food) Orders; or
- (c) the Codex Alimentarius Hazard Analysis and Critical Control Point System (HACCP) for food safety management set out in Annex C to CAC/RCP 1-1969, revision 4 (2003); or

- (d) any other Hazard Analysis and Critical Control Point (HACCP) based food safety management system recognised by the Authority.
- (3) For the purposes of subclause (1), a seafood business must comply with –
- (a) the conditions of the ASQAP Manual specified in the Schedule to this Standard; or
 - (b) conditions recognised by the Authority.

Editorial note:

The ASQAP Manual is the National guideline for managing risks in the harvesting, relaying, depuration and wet storage of shellfish.

Subclause 16(3) does not require producers or processors of bivalve molluscs to classify or close harvesting areas. Under the ASQAP Manual the classification of these areas is the responsibility of the State Shellfish Control Agency (SSCA).

The Australian Shellfish Quality Assurance Advisory Committee (ASQAAC) maintains the ASQAP Manual.

‘HACCP’ has a technical meaning commonly understood by the food production and manufacturing industry.

17 Co-mingling of bivalve molluscs

A seafood business must ensure that each batch of bivalve molluscs harvested must be separated in a manner that prevents co-mingling of batches.

SCHEDULE

ASQAP MANUAL CONDITIONS

Column 1 Activities	Column 2 Conditions
Activity 1 Harvesting	<p>The area -</p> <ul style="list-style-type: none"> (a) has been classified by the Authority as – <ul style="list-style-type: none"> (i) approved; or (ii) conditionally approved; or (iii) approved as remote; or (iv) offshore; and (b) is subject to a Marine Bio-toxin Management Plan; and (c) has an open status; or (d) is undergoing classification and is approved by the Authority subject to conditions, if any, specified by the Authority.
Activity 2 Harvesting for deuration or relaying	<p>The area –</p> <ul style="list-style-type: none"> (a) has been classified by the Authority as – <ul style="list-style-type: none"> (i) approved; or (ii) conditionally approved; or (iii) approved as remote; or (iv) restricted; or (v) conditionally restricted; and (b) is subject to a Marine Bio-toxin Management Plan; and (c) has an open status for the purposes of deuration or relaying; or (d) is undergoing classification and is approved by the Authority, subject to conditions, if any, specified by the Authority.
Activity 3 Post harvest temporary wet storage	<p>The water used must be –</p> <ul style="list-style-type: none"> (a) sourced from an area that satisfies the conditions for Activity 1 (other than Condition (d)); or (b) of a quality that will not adversely affect the safety and suitability of the bivalve molluscs; <p>and</p> <ul style="list-style-type: none"> (c) effectively disinfected or maintained during the course of the wet storage in such a way that it continues to satisfy the conditions for Activity 1 (other than Condition (d)).

Using the guide

Standard 4.2.1 *Primary Production and Processing Standard for Seafood* in Chapter 4 of the Australia New Zealand Food Standards Code (the Code) is provided in this guide. The requirements set out in this standard are legal requirements for seafood businesses.

Each clause of Standard 4.2.1 is included in bold type throughout the guide. Clause, subclause and paragraph numbering and lettering are the same as in the standard.

Terms in the standard are explained under the interpretation clauses and the clauses where they are used. An alphabetical listing of defined terms, including applicable definitions from Chapter 3, is in the Glossary.

The intended outcome of each clause is set out in the shaded text that precedes the explanation for that clause.

The intent of each requirement is explained.

Examples to illustrate the explanations are set out in boxes in the text.

The standard refers to Standard 3.2.2 *Food Safety Practices and General Requirements* and Standard 3.2.3 *Food Premises and Equipment* in Chapter 3 of the Code. These requirements are explained in the Food Standards Australia New Zealand (FSANZ) guide *Safe food Australia*, which is available on the FSANZ website www.foodstandards.gov.au or can be purchased from the Anstat Group.¹

The standard also refers to Standard 3.2.1 *Food Safety Programs*. A guide to Standard 3.2.1 is under development. It will be available on the FSANZ website.

1 Anstat Pty Ltd, PO Box 447, South Melbourne, Victoria 3205; phone +61 3 9278 1144; fax +61 3 9278 1145 or online at www.anstat.com.au.

Introduction to this guide

About this guide

The guide explains the requirements of Standard 4.2.1 *Primary Production and Processing Standard for Seafood* in Chapter 4 of the Code and includes a list of requirements in Chapters 1, 2 and 3 of the Code that apply to seafood.

The Australia New Zealand Food Standards Code

Standard 4.2.1 *Primary Production and Processing Standard for Seafood* is a standard in Chapter 4 of the Code. The Code contains standards to regulate food sold in Australia and in New Zealand. Chapter 1 contains standards that apply to all foods and Chapter 2 contains standards affecting particular classes of food. Except for certain specific requirements, these Chapters apply in Australia and New Zealand.

Chapters 3 and 4 contain controls for production and processing of food, and requirements for premises and vehicles used for food production to ensure that food is safe and suitable. These Chapters do not apply in New Zealand. Information about seafood regulation in New Zealand is available on the New Zealand Food Safety Authority's website at www.nzfsa.govt.nz.

The food standards in the Code are incorporated into state, territory and (with exceptions) New Zealand legislation and are legal requirements on food businesses. Because food standards are given legal effect by state, territory and New Zealand legislation, the Code must be read in conjunction with the relevant legislation.

The Code is developed by FSANZ, a bi-national statutory authority that works in partnership with the Australian government, state and territory governments and the New Zealand government. FSANZ engages industry, consumers and public health professionals in the development of food regulatory measures.

The Code, and information about the Code, are available on the FSANZ website at www.foodstandards.gov.au. Information can also be obtained from the FSANZ Information Officer on (02) 6271 2241, or email info@foodstandards.gov.au.

Chapter 4 Primary Production and Processing Standards

A whole-of-government approach to managing food safety is now being taken in Australia. Governments have agreed that food safety should be maximised by introducing minimum effective regulation throughout all parts of the food supply chain. Chapter 4 is a new Chapter in the Code and includes standards for primary production and processing of food. Initially these are for seafood, dairy products and poultry meat, but will extend to other primary products in the future.

FSANZ develops primary production and processing standards using scientific risk analysis and widespread stakeholder consultation, and having regard to policy advice from the Australia and New Zealand Food Regulation Ministerial Council. To help in the

development of primary production and processing standards, FSANZ establishes a Standard Development Committee for each primary production and processing sector considered. The Standard Development Committee members are representatives from industry, consumer bodies, research organisations and governments.

Standard 4.2.1 Primary Production and Processing Standard for Seafood

Standard 4.2.1 comes into effect in the Code, for Australia only, on 26 May 2006 and, under the provisions of Standard 1.1.1 *Preliminary Provisions—Application, Interpretation and General Prohibitions*, seafood businesses have until 26 May 2007 to comply, provided the seafood otherwise meets the requirements of the Code.

Application dates may vary between states and territories as they enact legislation to apply the standard to seafood businesses.

Division 1 of Standard 4.2.1 sets out application and interpretation provisions. The standard does not apply to retail activities in regard to seafood. Also, the standard does not apply to manufacturing activities apart from clause 16 **Food safety management systems for bivalve molluscs**. Retail and manufacturing activities must comply with Chapter 3. The application of Chapters 3 and 4 is explained under the Application clause.

Division 2 sets out general food safety and suitability requirements for seafood businesses in Australia. These general provisions apply to seafood businesses from pre-harvest production of seafood up to, but not including, manufacturing and retail activities.

The standard requires seafood businesses to:

- identify potential seafood hazards and implement controls that are commensurate with the risk to food safety
- comply with controls at specific steps, such as storage and transport, in seafood operations
- maintain seafood traceability records
- follow appropriate health and hygiene practices intended to protect seafood from contamination and prevent the spread of food-borne illness
- comply with requirements for premises and equipment.

Division 3 of the standard also contains specific provisions for businesses that handle bivalve molluscs. Seafood businesses that handle bivalve molluscs, up to the point where they are available for manufacturing or retail sale, must prevent their co-mingling.

Also, seafood businesses that handle bivalve molluscs, including those that carry out manufacturing of bivalve molluscs, must:

- implement a documented food safety management system
- include, in the food safety management system, specified conditions of the *Australian Shellfish Quality Assurance Program operations manual* (or conditions recognised by the state, territory or Australian government agency or agencies having legal authority to enforce Division 3 of this standard) in regard to bivalve harvesting areas and wet storage of bivalve molluscs.

Unsafe and unsuitable seafood

'Unsafe' and 'unsuitable' are the terms used in state and territory food legislation to describe food that is not fit for human consumption. These terms are used throughout this standard to qualify the extent, or degree, to which a potential hazard must be controlled. In applying the requirements of Standard 4.2.1, enforcement agencies must consider whether the operations carried out by seafood businesses will not adversely affect the safety or suitability of the seafood.

Therefore, correct interpretation of these two terms is important. For the purpose of this guide, the definitions in the Model Food Bill² (in bold below) are discussed. These are not materially different from the definitions in Standard 3.1.1 *Interpretation and Application*.

Meaning of 'unsafe' food

For the purposes of this Act³, food is unsafe at a particular time if it would be likely to cause physical harm to a person who might later consume it, assuming:

- (a) it was, after that particular time and before being consumed by the person, properly subjected to all processes⁴ (if any) that are relevant to its reasonable intended use, and**
- (b) nothing happened to it after that particular time and before being consumed by the person that would prevent its being used for its reasonable intended use, and**
- (c) it was consumed by the person according to its reasonable intended use.**

The intention of the definition is that safe food is food that will not cause illness or other physical harm to a person eating it, provided that the food is used as it is intended to be used. For example, it is possible that raw fish that is not intended to be eaten raw could contain pathogenic micro-organisms. However, at the point of sale it is considered safe because the seafood business intends the customer to cook it. Therefore, the presence of pathogenic micro-organisms on seafood that is to be processed to destroy those micro-organisms does not make the seafood unsafe. Conversely, if seafood is intended to be eaten raw, for example sashimi, then the seafood business must ensure that it is safe to be eaten in that condition.

If a person is harmed when consuming food, such as choking on a piece of food, this does not mean that the food is unsafe. If the person chokes on foreign material in the food, the presence of that foreign material in the food may make that food 'unsuitable'.

2 The Model Food Bill can be accessed from the FSANZ website www.foodstandards.gov.au.

3 The reference to an 'Act' would be the state or territory Food Act based on the Model Food Bill.

4 'Processes' include processes involving storage and preparation.

However, food is not unsafe merely because its inherent nutritional or chemical properties cause, or its inherent nature causes, adverse reactions only in persons with allergies or sensitivities that are not common to the majority of persons.

Some people suffer allergic reactions to seafood. The definition makes it clear that the presence of allergens that do not affect the general population does not make that food unsafe.

Meaning of ‘unsuitable’ food

For the purposes of this Act, food is unsuitable if it is food that:

- (a) is damaged, deteriorated or perished to an extent that affects its reasonable intended use, or**
- (b) contains any damaged, deteriorated or perished substance that affects its reasonable intended use, or**
- (c) is the product of a diseased animal, or an animal that has died otherwise than by slaughter, and has not been declared by or under another Act to be safe for human consumption, or**
- (d) contains a biological or chemical agent, or other matter or substance, that is foreign to the nature of the food.**

Some foods are not considered to be acceptable for consumption even though consuming them may not cause illness or other harm. These have been listed as (a) to (d) above. For example, an insect that has been cooked in seafood is unlikely to cause illness but the seafood would be considered unsuitable. The definition includes seafood that is damaged, deteriorated or perished, provided that the state of the seafood has affected its reasonable intended use.

Seafood that is diseased or has died other than by slaughter is not considered suitable for human consumption and is specifically defined as unsuitable, for example, dead fish washed up on the beach or ‘live seafood’ that has died during transport.

‘Slaughter’ means to kill or butcher for food and includes harvesting and stowing fish in the hold, and practices which kill fish, such as spiking.

Food that contains unintentional foreign material is not acceptable, for example insects, nails, string and other material occasionally found in food.

However, food is not unsuitable for the purposes of this Act merely because:

- (a) at any particular time before it is sold for human consumption it contains an agricultural or veterinary chemical, or**
- (b) when it is sold for human consumption it contains an agricultural or veterinary chemical, so long as it does not contain the chemical in an amount that contravenes the Food Standards Code, or**

- (c) **it contains a metal or non-metal contaminant (within the meaning of the Food Standards Code) in an amount that does not contravene the permitted level for the contaminant as specified in the Food Standards Code, or**
- (d) **it contains any matter or substance that is permitted by the Food Standards Code.**

The above definition states that food that contains permitted agricultural and veterinary chemicals and contaminants is not to be classed as unsuitable only because it contains those substances. This permits the presence of substances that have been assessed and permitted for use by the Australian Pesticides and Veterinary Medicines Authority and are present in levels that do not exceed permissions in the Code. It also permits seafood to contain other substances, for example seafood that contains the amount of histamine permitted by Standard 2.2.3 *Fish and Fish Products* cannot be considered unsuitable.

Clause-by-clause interpretation of Standard 4.2.1 Primary Production and Processing Standard for Seafood

The following pages contain a plain English interpretation of the legal requirements in Standard 4.2.1. The legal requirements are in bold type and the explanation is in plain type. It must be emphasised that neither the explanations nor the examples in this guide are legal requirements on seafood businesses.

Introduction to the standard

Standard 4.2.1 sets out food safety and suitability requirements for seafood generally, from pre-harvesting production of the seafood up to, but not including, manufacturing operations. Chapter 3 of the Australia New Zealand Food Standards Code applies to seafood manufacturing and retail sale activities.

Under this standard, a seafood business must identify potential seafood safety hazards and implement controls that are commensurate with the risk.

Additionally, this standard requires primary producers and processors of certain bivalve molluscs to implement a food safety management system. This particular requirement also extends to manufacturing activities relating to bivalve molluscs.

For primary producers and processors of bivalve molluscs, the food safety management system incorporates conditions on the areas from which the product may be harvested, or harvested for depuration or relaying, along with conditions on the water used for wet storage.

Division 1 – Preliminary

1 Application

The businesses and persons that must comply with this standard are specified.

1(1) This Standard applies to seafood businesses and seafood handlers in Australia but not in New Zealand.

Seafood businesses

A 'seafood business' is defined in clause 2 as a business, enterprise or activity that involves the primary production of seafood intended for sale.

'Primary production of seafood' is defined in clause 2 as the following activities:

- growing, cultivation, picking, harvesting, collection or catching of seafood, or
- growing on of seafood, or
- transportation or delivery of seafood, or
- holding of live seafood

and includes the processing of seafood.

'Growing on', which is defined in clause 15, means moving juvenile bivalve molluscs from one area to another to allow them to grow to marketable size.

'Processing' is defined to include:

- killing, dismembering, filleting or cutting into portions, gill or gutting or skinning of seafood
- depuration of shellfish and crustaceans
- shucking or peeling of seafood
- cooking, including steaming or boiling, of crustaceans
- brining of seafood
- packing, treating, washing, freezing, refrigeration or storing of seafood
- other similar activities.

Therefore, businesses undertaking any of the above activities are seafood businesses and must comply with this standard, that is, they may be undertaking primary production activities or processing activities, or a combination of activities on both lists.

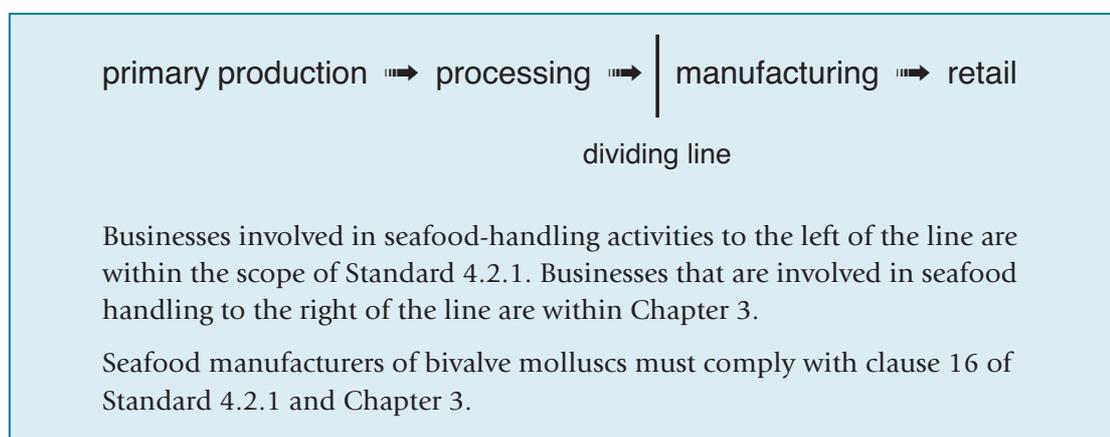
The standard applies to activities regardless of whether the activities take place on shore, on natural water or by aquaculture, on land or on fishing vessels.

The standard does not apply to any primary production activity where the seafood is not intended for sale or is not sold for human consumption, for example, any person who fishes for recreational, cultural or traditional purposes and does not intend to sell the seafood for human consumption is not required to comply with the standard. An editorial note stating this is included in the standard.

Application to manufacturers and retailers

The application to seafood businesses must be read with subclause (2), which limits the activities to those that are **not** manufacturing or retail activities except, in the case of manufacturing, where explicitly stated. Manufacturers of bivalve molluscs have to comply with clause 16 **Food safety management systems for bivalve molluscs**. 'Manufacturing' is defined and means canning, smoking or crumbing of seafood or the addition of other food to seafood and other like activities.

Chapter 3 applies to manufacturing and retail activities. The following diagram illustrates the application of Chapter 3 and Standard 4.2.1.



Manufacturing activities not covered by the standard

A manufacturer of crumbed fish products purchases frozen filleted fish, portions the fish, crumbs the fish, packages it and sells it at wholesale level for sale in supermarkets. The activities of this business are not covered by Standard 4.2.1. Instead the business must comply with Chapter 3.

A manufacturer of cold-smoked fin fish is covered by the provisions of Chapter 3. Smoking is specifically included in the definition of manufacturing and therefore excluded from the standard. A manufacturer of dried fish is also outside the scope of this standard and within Chapter 3 standards.

Retail activities not covered by the standard

A seafood restaurant business buys bulk fish fillets, repacks the fillets into smaller portions and freezes them in its freezer. The activities of this business are not covered by Standard 4.2.1. Instead the business must comply with Chapter 3.

Application to transporters

Seafood businesses within the scope of the standard that transport seafood must ensure that their transport operations comply with the specific transport requirements in clause 7 and with the general requirements, for example, for controlling hazards under clause 3 and requirements for vehicles under clause 14.

Some businesses may be seafood businesses because they only transport seafood and do not grow, harvest or otherwise produce or process seafood. These businesses are within the scope of the standard for transport from primary production to manufacturers or to retailers.

Seafood businesses that transport bivalve molluscs, including as part of manufacturing activities, must control any hazards associated with transport as part of the food safety risk management system under clause 16.

Businesses that transport seafood as part of retailing activities are not within the scope of the standard.

Also, transport from a manufacturer to retail or from retail to customer is not covered by this standard.

Where a transport activity is outside the scope of this standard it is covered by Chapter 3 requirements.

Transport activities covered by the standard

A fishing company transports its catch from the jetty to its premises and, after sorting and packing, delivers the seafood to the fish market.

A seafood wholesaler buys seafood at the market and delivers it to a processor and to retail shops.

Example

Transport activities not covered by the standard

A seafood retailer purchases seafood from the fish market and transports the seafood to its retail shop.

The same business also delivers seafood from the shop to customers.

Application to wholesalers

Seafood wholesalers must comply with this standard. Wholesaling involves the storage of seafood, which is included in the definition of processing.

Examples

Wholesale activity covered by the standard

A wholesale business buys seafood from the fish market and stores the seafood at a cold store before distribution to its customers, several retail shops and restaurants. As the business is a wholesaler it must comply with the standard.

Activity not covered by the standard

A manufacturing business buys seafood from the fish market and stores the seafood at its cold store before manufacture into fish cakes and other seafood products. The business undertakes manufacturing activities and, unless these activities involve bivalve molluscs (as defined), does not have to comply with the standard. The activity is covered by Chapter 3.

Application to importers

Importers of seafood have obligations under imported food legislation to ensure that imported food meets the requirements of the Code.

Under Standard 4.2.1 seafood importers are seafood businesses because their food handling meets the criteria for 'processing'.⁵ Exceptions to this are importers that sell imported seafood direct to consumers, that is, importers that are retailers or manufacturers, because manufacturing and retailing are not within the scope of the standard (except as required under clause 16 **Food safety management systems for bivalve molluscs**).

Under the standard, seafood importers must comply with requirements that apply to their activities in Australia, for example, temperature control requirements for stored seafood and protecting food from contamination. Specific examples include:

- Clause 3 **General seafood safety management** requires the importer to ensure that it identifies and controls hazards. The business has to identify hazards in its primary production and processing activities, which, for an importer, is likely to be confined to receipt, refrigeration, storage, transport and packing of seafood. Therefore, the importer must ensure that hazards that arise in these activities are controlled.

⁵ The definition of processing includes the freezing, refrigeration or storing of seafood.

- Clause 7 **Seafood transportation** requires the importer to have a means of monitoring the temperature of seafood.

For some requirements the activity may involve an overseas company, for example:

- Clause 10 **Seafood receipt** has requirements for receiving seafood which may be from a business in another country.
- Clause 11 **Seafood tracing** requires the seafood business to maintain sufficient records to identify the immediate supplier of the seafood (which may be an overseas company).

There are also references to importers later in this guide.

There are additional requirements for importers of bivalve molluscs. Clause 16 requires importers, including manufacturers, to have documented food safety management systems. The importer must also comply with requirements to prevent co-mingling of bivalve molluscs once the product is in Australia.

Application of Chapter 3 standards to importers

Importers are food businesses under Chapter 3 of the Code and enforcement agencies should ensure that importers are aware of obligations under this Chapter, particularly where there are specific requirements, for example, for recall systems in Standard 3.2.2 *Food Safety Practices and General Requirements*. Importers of bivalve molluscs must comply with Chapter 3 requirements in addition to clause 16.

Seafood handlers

A 'seafood handler' is defined in clause 2 **Interpretation** and means a person who engages in, or supervises, the primary production of seafood, for a seafood business. Examples include crew of fishing vessels and staff of seafood wholesale businesses.

There are specific obligations on seafood handlers in subclauses 13(1) and (2) in regard to their personal health and hygiene practices.

Application of the standard to New Zealand

Subclause 1(1) and an accompanying editorial note clarify that the standard does not apply to food businesses or food handlers in New Zealand. While there is an agreement between Australia and New Zealand to establish one joint food standard-setting system for the two countries, the agreement specifically excludes food safety provisions. New Zealand maintains and develops its own food safety regulatory measures.

There are special conditions for food imported into Australia from New Zealand under the terms of the *Imported Food Control Act 1992* and the Trans-Tasman Mutual Recognition Agreement.

1(2) Unless the contrary intention appears in this Standard, Chapter 3 of this Code applies to seafood manufacturing and retail sale activities.

Chapter 3 of the Code applies to seafood manufacturing and retail activities unless there is a specific expression in a requirement that this is not the case.

Clause 16 requires specified businesses to have food safety management systems and specifically includes manufacturing of bivalve molluscs. However, this clause does not create a contrary intention and Chapter 3 still applies to manufacturing activities involving bivalve molluscs. 'Manufacturing of seafood' is defined in clause 2 to mean the canning, smoking or crumbing of seafood or the addition of other food to seafood and other like activities.

'Retail sale' is not defined in the standard and should be given its ordinary meaning. It is sale to the public, that is, to the household or to the final consumer, and is not sale to wholesalers, caterers or to businesses that on-sell.

2 Interpretation

Terms are defined. In the absence of a definition, the definition in *The Macquarie dictionary* (latest edition) should be used.

2(1) Unless the contrary intention appears, the definitions in Chapter 3 of this Code apply for the purposes of this Standard.

Definitions are contained in Standard 3.1.1 *Interpretation and Application* where the term is used in more than one standard in Chapter 3, and in the individual standards where they only appear in that standard. An alphabetical list of relevant definitions from Chapter 3 and definitions from Chapter 4 are included in this guide.

The following definitions in Chapter 3 apply in Standard 4.2.1.

Term	Definition	Reference in Standard 4.2.1 and explanation
adequate supply of water	means potable water that is available at a volume, pressure and temperature that is adequate for the purposes for which the water is used.	Paragraph 14(2)(a) refers to Standard 3.2.3. The term is used in Standard 3.2.3 for requirements for water suitable for use in food businesses.
carrier of a food-borne disease	does not include a person who is a carrier of <i>Staphylococcus aureus</i> .	Subclause 13(2). Many healthy persons carry <i>S. aureus</i> as part of the normal microflora of the nose, throat, perineum or skin. While carriers may contaminate food with this food-borne pathogen it is only a food safety hazard if the contaminated food is able to support the growth and the food is kept at temperatures that will support growth for enough time for sufficient quantities of toxin to be produced to cause illness.

Term	Definition	Reference in Standard 4.2.1 and explanation
clean	means clean to touch and free of extraneous visible matter and objectionable odour.	<p>Clause 14.</p> <p>The definition clarifies that ‘clean’ is not about the microbiological standard of the surface but about a standard that can be assessed by sight, touch and smell.</p>
contaminant	means any biological or chemical agent, foreign matter, or other substances that may compromise food safety or suitability.	<p>Used in the definition of ‘contamination’.</p> <p>Biological agents include bacteria, viruses, moulds and parasites. Chemical agents include toxins, metals, pesticides and other chemicals that can contaminate seafood. Foreign matter includes material that may be unintentionally present in the seafood, such as cigarette butts and glass. Material that is intentionally and ordinarily included such as string tying live crabs would not be considered foreign matter. Other substances are included to ensure that all materials that could contaminate food are within the scope of the standard.</p>
contamination	means the introduction or occurrence of a contaminant in food.	<p>‘Contaminated’ appears in clauses 4 and 8, ‘contamination’ in clause 8 and subclauses 10(1) and 13(2).</p> <p>Contamination has occurred if any of the contaminants referred to above are in the seafood.</p>
equipment	means a machine, instrument, apparatus, utensil or appliance, other than a single-use item, used or intended to be used in or in connection with food handling and includes any equipment used or intended to be used to clean food premises or equipment.	<p>Clause 14.</p> <p>The intention is that all equipment used in the production and processing of seafood is covered by the requirements. Single-use items are those that are intended by the manufacturer of the item to be used only once in connection with food handling, and include disposable gloves. The requirements in clause 14 do not apply to single-use items although it would be expected that if a business did use these items that they be clean when used and protected from contamination during storage.</p>

Term	Definition	Reference in Standard 4.2.1 and explanation
food-borne disease	means a disease that is likely to be transmitted through consumption of contaminated food.	Used in the definition of 'carrier' and in subclause 13(2). There is some discussion of this term in this guide but for a comprehensive interpretation refer to the guide to Standard 3.2.2 in <i>Safe food Australia</i> .
food for disposal	means food that: (a) is subject to recall; (b) has been returned; (c) is not safe or suitable; or (d) is reasonably suspected of not being safe or suitable.	Subclause 9(1). The term is explained under clause 9. Information in <i>Safe food Australia</i> may assist.
food safety program	means a food safety program that satisfies the requirements of clause 5 of Standard 3.2.1.	Clause 16. Food safety programs are referred to in clause 16. The term is explained under clause 16.
handling	of food includes the making, manufacturing, producing, collecting, extracting, processing, storing, transporting, delivering, preparing, treating, preserving, packing, cooking, thawing, serving or displaying of food.	'Handle' in subclause 4(2); 'handling of seafood' in subclause 13(2). The definition is intended to cover seafood operations only to the extent of the scope of the standard. It is not restricted to the activities listed.
hazard	means a biological, chemical or physical agent in, or condition of, food that has the potential to cause an adverse health effect in humans.	Clause 3, clause 16 and in the definition of 'food safety program'. A seafood business must identify potential seafood safety hazards that might reasonably be expected to occur in that business's seafood operation. These hazards may be biological, chemical or physical hazards in the seafood. A hazard may be material which is part of the seafood but which is unacceptable in the final product because it could cause harm, for example fish bones in fish cakes. Fish bones in whole fish

Term	Definition	Reference in Standard 4.2.1 and explanation
		<p>would not be considered a 'hazard' because consumers expect fish to contain bones and take action to avoid harm.</p> <p>The definition also covers biological, chemical or physical conditions of the seafood that might cause harm, for example, fish known to be poisonous, such as species of toadfish.</p>
monitoring	includes checking, observing or supervising in order to maintain control.	<p>Used in subclause 6(1) and 7(1). It is also used in the definition of a food safety program.</p> <p>'Monitoring' is the term for actions by the business to check that procedures put in place to control hazards are, in fact, in place and working. The term is not restricted to the actions listed.</p> <p>Monitoring may be by observation, for example:</p> <ul style="list-style-type: none"> • visually checking that containers for seafood are clean before they are used • visually checking the temperature on coolroom temperature gauges. <p>Monitoring may be by measurement, for example:</p> <ul style="list-style-type: none"> • the temperature of seafood in a coolroom • salinity levels in estuary water. <p>Monitoring may also include supervision of staff, for example to ensure that:</p> <ul style="list-style-type: none"> • they follow hygiene practices that are aimed at preventing seafood contamination • they place sufficient ice in water used to chill prawns • chemical products are used according to directions. <p>Monitoring may be a continuous process, for example, using data loggers to record temperature during transport and</p>

Term	Definition	Reference in Standard 4.2.1 and explanation
		checking that the temperatures remained within predetermined limits. It may also be periodic monitoring, that is, at predetermined intervals, for example daily checks of coolroom temperatures.
potable water	means water that is acceptable for human consumption.	Used in Standard 3.2.3 and therefore is applicable to paragraph 14(2)(a). There is discussion on water suitable for use with seafood under clause 14.
sewage	includes the discharge from toilets, urinals, basins, showers, sinks and dishwashers, whether discharged through sewers or other means.	Used in Standard 3.2.3 and therefore is applicable to paragraph 14(2)(a).
symptom	means diarrhoea, vomiting, sore throat with fever, fever or jaundice.	Subclause 13(2). The term is explained under clause 13. Information on symptoms and food-borne illness in <i>Safe food Australia</i> may assist.

2(2) In this Standard –

The following definitions are included in Standard 4.2.1.

Term	Definition	Reference in Standard 4.2.1 and explanation
control	means a measure that prevents, eliminates or reduces to an acceptable level, a food safety hazard.	Clauses 3 and 16. Clarifies that measures under clauses 3 and 16 are those that will prevent, eliminate or reduce to an acceptable level the potential hazards in the primary production operations. An editorial note after clause 3 advises that measures should control hazards from: <ul style="list-style-type: none"> • air (for example dust, dirt, chemical spray), soil, water • bait and feedstuffs, fertilisers (including natural fertilisers),

Term	Definition	Reference in Standard 4.2.1 and explanation
		<p>pesticides, veterinary drugs and any other agent used in the primary production of seafood</p> <ul style="list-style-type: none"> • faecal and other contamination.
depuration	means a process using a controlled environment to reduce the level of certain pathogenic organisms that may be present in live shellfish and crustaceans.	<p>'Processing of seafood' includes depuration.</p> <p>Also used in the definition of 'batch' and in the Schedule to Standard 4.2.1.</p> <p>Depuration is intended to reduce the number of pathogenic bacteria that may be present in live shellfish harvested from waters with moderate to low risk of pollution to make them safe for consumption without further processing. Pathogenic bacteria of concern are <i>Salmonella</i>, pathogenic <i>E. coli</i>, <i>Campylobacter</i>, <i>Yersinia</i> and <i>Shigella</i>. Enteric viruses such as noroviruses and hepatitis A are also of concern, but depuration is of limited effectiveness as a control measure for viruses.</p>
harvesting	means the capture or taking of seafood and includes the capture or taking of seafood from an enclosure or pond used in aquaculture.	<p>Used in the definition of 'area', 'batch', 'primary production', subclause 5(2), clause 17 and in the Schedule.</p> <p>The definition clarifies that 'harvesting' includes harvesting fish from aquaculture such as from sea cages for salmon.</p>
inputs	includes any feed, chemicals or other substances used in, or in connection with, the primary production of seafood.	Used in subclause 5(1) and is discussed under that clause.
live seafood premises	means a premises used for the primary production of live seafood, and includes sea cages.	<p>Used in clause 14.</p> <p>An example is an oyster-holding shed.</p>

Term	Definition	Reference in Standard 4.2.1 and explanation
manufacturing of seafood	means the canning, smoking or crumbing of seafood or the addition of other food to seafood and other like activities.	The term is used in clause 1 and clause 16. The definition helps to clarify the scope of the standard and the application of the requirement in regard to food safety management systems for bivalve molluscs.
primary production of seafood	means the – (a) growing, cultivation, picking, harvesting, collection or catching of seafood; or (b) growing on of seafood; or (c) transportation or delivery of seafood; or (d) holding of live seafood; and includes processing of seafood.	The definition has been discussed under clause 1. An editorial note states that the definitions of ‘primary production of seafood’ and ‘processing of seafood’ operate for the purposes of this standard and do not affect the definition of those terms in state and territory Food Acts. The definitions in this standard do not affect the legislative or administrative arrangements in the states and territories concerning the administration and implementation of legislative schemes.
processing of seafood	includes– (a) the killing, dismembering, filleting or cutting into portions, gill or gutting, or skinning of seafood; and (b) the depuration of shellfish and crustaceans; and (c) the shucking or peeling of seafood; and (d) the cooking, including steaming or boiling, of crustaceans; and (e) the brining of seafood; and (f) the packing, treating, washing, freezing, refrigeration or storing of seafood; and (g) other similar activities.	The inclusion of (g) is to ensure that unforeseen and similar activities to those in (a) – (f) are included in processing.

Term	Definition	Reference in Standard 4.2.1 and explanation
seafood	means all aquatic vertebrates and aquatic invertebrates intended for human consumption, but excludes amphibians, mammals, reptiles, and aquatic plants.	<p>Establishes the scope of the businesses that must comply with the standard.</p> <p>Aquatic vertebrates include those with cartilaginous skeletons (for example sharks, skates and rays) and true bone skeletons (for example finfish such as sardines, trout, salmon, bream and eels).</p> <p>Aquatic invertebrates include molluscs (for example oysters, scallops, abalone, Pearl Oysters) and cephalopods (for example squid and octopus), crustaceans (for example crabs, lobsters and prawns) and echinoderms (for example sea urchins).</p> <p>Excluded from the scope of the standard are amphibians (for example frogs and salamanders), mammals (for example seals and whales), reptiles (for example crocodiles) and aquatic plants (for example edible seaweeds).</p>
seafood business	means a business, enterprise or activity that involves the primary production of seafood intended for sale.	The definition of 'seafood business' establishes the scope of the standard, just as 'food business' sets the scope for the Chapter 3 standards.
seafood handler	means a person who engages in or supervises the primary production of seafood, for a seafood business.	<p>There are specific obligations placed on seafood handlers in clause 13 in regard to their health and hygiene. The term is also used in subclause 4(2).</p> <p>The definition covers all people involved in primary production activities, including people who handle seafood used in the production of seafood or who supervise these people.</p>

Term	Definition	Reference in Standard 4.2.1 and explanation
seafood premises	means any premises including land, vehicles, parts of structures, tents, stalls and other temporary structures, vessels, pontoons, and any other place declared by the relevant authority to be a premises under the Food Act, kept or used for the primary production seafood (exclusively or otherwise), regardless of whether the premises are owned by the proprietor, including premises used principally as a private dwelling.	<p>'Seafood premises' are referred to in clause 14.</p> <p>The definition includes all types of structures that are used by seafood businesses, including temporary premises such as stalls.</p> <p>It covers boats, ships and other fishing vessels, whatever their size or extent of onboard equipment, and also includes private dwellings where the premises are used for business purposes.</p>
temperature control	<p>means maintaining seafood at a temperature of –</p> <p>(a) 5°C, or below if this is necessary to minimise the growth of infectious or toxigenic micro-organisms in the food so that the microbiological safety of the food will not be adversely affected for the time the food is at that temperature; or</p> <p>(b) another temperature – if the food business demonstrates that maintenance of the food at this temperature for the period of time for which it will be so maintained, will not adversely affect the microbiological safety of the food.</p>	<p>Used in clauses 6 and 7. In addition, businesses may use temperature and time as controls under clause 3 and clause 16 in their food safety management systems.</p> <p>During storage and transport businesses must keep seafood at temperatures that will minimise the growth of pathogenic bacteria to prevent these bacteria growing to unsafe levels or producing toxins at levels that will be unsafe.</p> <p>Further information is provided immediately after this table.</p>

Further information on the definition of 'temperature control'

'Temperature control' is a time-temperature relationship. The definition provides the food business with two options:

- The seafood can be stored and/or transported at a maximum temperature of 5° C if this temperature is sufficiently low to prevent the growth of pathogens or production of toxins for the intended storage and transport times of the product. Temperatures lower than 5° C will extend the length of time that seafood can be stored and transported, or
- The seafood can be stored and/or transported at temperatures above 5° C if the business can demonstrate that the seafood will remain safe for the time that the seafood is at this temperature. The time is cumulative, that is, the time that seafood is stored and transported, and the time that it is above 5° C at any steps before or afterwards, must be included in the total time.

The second option allows businesses that use very short transport times, or that hold seafood before packing, filleting or similar activities, to hold that seafood above 5° C. However, the perishable nature of seafood means that businesses should use ice and/or refrigerated storage and transport, and keep seafood at ambient temperatures for as short a time as practicable.

In using the second option the business must be able to demonstrate that the time the food is above 5° C is safe. The requirement to do this is in Standard 3.2.2 clause 25 **Alternative methods of compliance**. Clause 25 provides some options for demonstrating this, which is explained in *Safe food Australia*. Options include a food safety program; a process that, according to documented sound scientific evidence, is a process that will not adversely affect the microbiological safety of the food; and a process set out in written guidelines based on sound scientific evidence that are recognised by the relevant authority. *Safe food Australia* and the FSANZ guide to the temperature control requirements in Chapter 3 *Food safety: temperature control of potentially hazardous food* also provide advice.

Division 2 – Seafood safety requirements

3 General seafood safety management

The seafood business controls food safety hazards commensurate with the risk the hazards pose to seafood safety.

3 A seafood business must systematically examine all of its primary production and processing operations to identify potential seafood safety hazards and implement controls that are commensurate with the food safety risk.

This clause applies to all primary production operations (including processing) of the seafood business. The intent is to control potential food safety problems at all stages of production appropriate to the risk that the problem presents to the consumer.

A seafood business must do three things:

- in a systematic way, examine all of its primary production and processing operations and identify potential food safety hazards that could reasonably be expected to occur in these operations
- analyse each of the hazards to decide the level of risk that each poses
- implement a control measure for each hazard that is commensurate with the risk.

Businesses that handle bivalve molluscs are required to have a documented food safety management system under Clause 16. Other businesses are not required to document their system of controls but it is recommended.

Systematically examine

‘Systematically examine’ means that the business should look at each main step of its processes and identify hazards that could occur at that step, beginning with (in the case of sea fishing) deciding where to fish and finishing when the fish are no longer the responsibility of the business. The business should check the likelihood of hazards arising from people, premises (for example boats, equipment, chemicals used, the environment) and processes (for example fishing, gutting, transporting) at each of the main steps.

Potential food safety hazards

‘Hazard’ is defined in Standard 3.1.1 to mean a biological, chemical or physical agent in, or condition of, food that has the potential to cause an adverse health effect in humans. The business only has to identify hazards that affect the safety of seafood, not the suitability. The business may choose to include suitability hazards if it wishes.

Potential hazards are those that the business could reasonably expect to occur if no action was taken to prevent them. In other words, they are foreseeable and likely to occur in the type of operations carried out by the business.

The editorial note clarifies that hazards from air, soil, water, bait and feedstuffs, fertilisers, pesticides, veterinary drugs and any other agent used in primary production, and from

faecal and other contamination are to be considered by the business. Water is discussed under clause 14 **Seafood premises and equipment**.

Seafood businesses should be expected to have some knowledge and understanding of potential hazards that could occur in their seafood-handling operations. Skills and knowledge in food safety are required under clause 12.

Table 1: Examples of potential hazards

Type of hazard	Potential hazard
Biological	<p>Viruses in oysters and mussels.</p> <p>Ciguatoxin in some subtropical and tropical marine fish such as Spanish Mackerel and Coral Trout caught in certain waters.</p> <p>Wax esters in fish such as Orange Roughy and Escolar.</p> <p>Pathogenic bacteria in cooked prawns from failing to use clean seawater for cooling.</p>
Chemical	<p>Spilt fuel contamination of fish on board boats.</p> <p>Food additives that exceed permitted levels, such as excess sodium sulphite use with prawns.</p> <p>Chemical contamination from polluted waterways.</p> <p>Presence of veterinary residues above permitted levels.</p>
Physical	Glass, metal and stone fragments in seafood.

Control measures

'Controls' are measures that prevent, eliminate or reduce to an acceptable level a food safety hazard. Examples are included in Table 2.

Most of the requirements in the standard are controls at steps in the primary production and processing operations to control hazards, for example:

- during storage, the business must control temperature to ensure that growth of pathogenic bacteria is prevented, or prevented from reaching unsafe levels
- during packaging, businesses must only use packaging material that is fit for use to prevent contamination of seafood.

Most businesses have already implemented controls for hazards although they may not be expressing what they are doing in these terms. For example, if a business is cooking prawns (whether on the vessel or on shore) it will ensure that they are adequately cooked and, in terms of the definition of control, this will eliminate or reduce pathogenic bacteria to a safe level.

Businesses will find guidance on control measures in industry and government codes of practice. Businesses should ensure that the code or guideline covers the seafood operations they carry out and is current, and that controls are in place for any operations not covered.

Note that hazards from air, soil and water are also controlled under clause 4, which addresses contamination and regulates both safety and suitability. Bait and feedstuffs, fertilisers, pesticides and veterinary drugs are inputs and are specifically controlled under clause 5.

Food safety risk

'Food safety risk' is not defined in the standard or in Chapter 3. In the context of food safety, 'risk' means a function of the probability of an adverse health effect and the severity of that effect, consequential to a hazard or hazards in food.⁶

If a hazard is likely to occur in a product and is life-threatening, or likely to cause serious injury or illness, then the hazard is a greater risk to consumers than a hazard that is unlikely to occur or that causes minor illness.

The business is likely to have assessed the food safety risk of a particular hazard although may not have considered the action in these terms. Industry guidelines are available to help businesses establish the risk associated with hazards.

Table 2: Examples of controls commensurate with food safety risk

Example of hazard	Control commensurate with risk	Comments
Pathogenic bacteria in cooked prawns	<p>These controls are essential to ensure that cooked prawns are not contaminated after cooking:</p> <ul style="list-style-type: none"> • use clean seawater or drinking water to cool prawns • use separate equipment for raw and cooked prawns • keep cooked prawns separate from raw prawns • ensure that cooked prawns are not handled by staff who are also handling raw prawns. 	Pathogenic bacteria are killed in the cooking process. The hazard occurs if there is contamination after cooking. Skills and knowledge of staff in minimising contamination during processing and handling prawns are essential.
Pathogenic bacteria on raw fish intended to be eaten raw	<p>These controls are essential to maximise the safety of fish that may be eaten raw:</p> <ul style="list-style-type: none"> • keep fish under effective temperature control to prevent growth of any bacteria • protect the fish from contamination. 	With any fish eaten raw, for example sashimi, sushi, carpaccio ⁷ , guidelines for catching, handling and preparing fish must be followed to prevent contamination. Skills and knowledge of staff in understanding the potential for and preventing contamination of raw fish, for example preparation methods ⁸ , are essential.

Continued

6 Definitions for the purposes of the Codex Alimentarius Codex Procedural Manual www.fao.org/docrep/005/Y2200E/y2200e07.htm, 7 July 2004.

7 Terms for dishes of raw fish include sashimi, sushi, carpaccio (Latin style), tartare (French style, as in salmon tartare), poisson cru, escabeche, ceviche and tataki.

8 It is important to highlight that where raw seafood products are prepared with lemon or lime juice or marinades (or other ingredients) and this is intended to ensure safety, the business ensures that the preparation method and ingredients will achieve this. Manufacturers and retailers, not within the scope of clause 3, should control these hazards under Standard 3.2.2.

Table 2 (continued): Examples of controls commensurate with food safety risk

Example of hazard	Control commensurate with risk	Comments
Parasites in raw fish intended to be eaten raw	<p>These controls are essential to maximise the safety of fish that may be eaten raw:</p> <ul style="list-style-type: none"> • freeze to -18°C or colder to control some parasites • visually inspect at the point of cutting. 	Parasitic infection of fish does occur and must be managed by those businesses involved in selling raw fish that may be eaten raw.
Pathogenic bacteria and parasites in/on raw fish intended to be eaten cooked	<p>This control is important to reduce the likelihood of contamination to a minimum:</p> <ul style="list-style-type: none"> • ensure the fish are chilled or frozen promptly after catching. 	Pathogenic bacteria and parasites are killed when the fish is cooked. Therefore, controls are less important than for ready-to-eat food such as the raw fish eaten raw (above). Bacteria may spoil fish before it is cooked, resulting in a product that may be unsuitable for its intended use.

Seafood Services Australia provides information on risks in seafood in its guide and CD-ROM *SeaQual's guide to food safety risks in seafood*. There is information on hazards and their control in the seafood industry, assessment of product–pathogen pairings (both only available on CD-ROM), risk assessment (available on CD-ROM and hard copy), The Risk Ranger (a risk calculation tool which businesses can use to estimate the level of risk associated with their products, available on CD-ROM only), HACCP and quality assurance (available on CD-ROM and hard copy). The guides do not attempt to cover all hazards in all processes and products but focus on those most prevalent.

Documentation

Although Clause 3 does not require businesses to document their food safety management systems, businesses may be required to do so under state or territory legislation. Benefits include:

- streamlining processes, as recording tasks often highlights duplication or unnecessary work
- having a record of staff responsibilities in the business, who is responsible for tasks, the tasks they have to carry out and when
- providing evidence in case of a complaint, or inspection of their operation, to support their commitment to safety.

4 Contamination and handling

The seafood business takes steps to ensure that seafood is not, or does not become, contaminated by biological agents, chemicals or substances foreign to seafood and takes reasonable measures to ensure that seafood handlers handle seafood in a safe way.

4(1) A seafood business must take all necessary steps to prevent the likelihood of seafood being or becoming contaminated.

This subclause applies to all seafood handled by the seafood business in all primary production and processing activities. The intent is to control potential food safety and food suitability problems that are caused by contamination at all stages of production.

‘Contamination’ is defined in Standard 3.1.1 and means the introduction or occurrence of a contaminant in food. ‘Contaminant’ is also defined and means any biological or chemical agent, foreign matter or other substances that may compromise food safety or suitability.

‘Safe’ and ‘suitable’ food are defined in Standard 3.1.1, and an explanation of these terms has been provided earlier in this guide.

In assessing compliance with this clause, there only has to be the likelihood of contamination; contamination does not have to have actually occurred.

Causes of contamination

Seafood may be contaminated by micro-organisms, chemicals or foreign material that:

- is present in the water, for example naturally occurring algae toxins, or introduced by faecal, industrial or agricultural pollution of water
- occurs post-harvest, for example during handling, storage, processing such as cooking or transport, whilst at sea and on land
- is due to poor personal hygiene or ill health of seafood handlers.

Specific requirements to prevent contamination are in subclause 5; for example, under subclause 5(1) there are controls on inputs, and under subclause 5(2) businesses must harvest from uncontaminated areas. Clause 13 addresses health and personal hygiene of seafood handlers.

Contamination from the aquatic environment

Bacteria, viruses, parasites or other micro-organisms may cause contamination. Examples include contamination by naturally occurring *Vibrio* species, viral contamination from faecally polluted water, and parasites, for example roundworms, which cause anisakiasis. Standard 1.6.1 of the Code lists the maximum permissible levels of food-borne micro-organisms that pose a risk to human health in nominated foods or classes of foods, for example *Salmonella* in raw crustaceans and *E. coli* in some types of bivalve molluscs. In addition, there are guideline criteria⁹ for *E. coli* and *Vibrio cholerae* in raw crustaceans.

⁹ User guide to Standard 1.6.1 *Microbiological Limits for Food with Additional Guideline Criteria*.

Industrial, agricultural and sewage pollution may introduce various hazardous chemicals into the sea, estuaries and waterways. Some seafood, particularly oysters, can extract chemical contaminants, which may accumulate to hazardous levels in their flesh. Concentration of heavy metals, for example cadmium, mercury and arsenic, whether naturally present in the water or due to pollution, are also of concern.

Aerosols and chemical drift from agricultural spraying operations may be a source of chemical contamination that should be considered in aquaculture operations.

Fish may become contaminated with toxins from certain algae and cause illness in persons eating the fish. For example, ciguatera poisoning is caused by eating the flesh of toxic fish caught in tropical reef waters. The toxin (a neurotoxin) is believed to originate in microscopic algae that grow on the reef. Smaller reef-browsing herbivorous fish first eat the toxic algae and then are themselves eaten by larger predatory carnivorous fish. Since the larger predatory fish can consume many of the smaller fish, the ciguatoxins become more concentrated as they move up the food chain. It is for this reason that large carnivorous tropical reef fish are considered to have the highest risk of toxicity. Fish species that may be affected include Coral Trout, Red Bass, Red Emperor, Spanish Mackerel and various species of cod.

Shellfish may also become toxic from feeding on toxic algae, which may result in illness in consumers, for example paralytic and amnesic shellfish poisoning.

Standard 1.4.1 contains maximum levels of specified metal and non-metal contaminants in nominated foods. Maximum levels are included for arsenic and mercury in crustaceans, fish and molluscs, and lead in fish and molluscs. There are also levels for amnesic, neurotoxic and paralytic shellfish poisons in bivalve molluscs. As a general principle, regardless of whether a maximum level exists, the levels of contaminants should be kept as low as reasonably achievable.

Examples of steps businesses can take to prevent contamination include:

- skippers of vessels avoiding waters known to be polluted by domestic, agricultural or industrial runoff
- skippers of vessels avoiding known ciguatera areas and placing size restrictions on certain species
- purchasing from reputable suppliers who avoid known ciguatera areas and respect size restrictions
- establishing suitable sites for aquaculture by checking previous and current land use in the vicinity and avoiding areas where industrial or agricultural practices could contaminate aquaculture ponds, or where there is a possibility of seepage or leaching, for example, from septic tanks and industrial sites
- if catching by hook and line, ensuring that fish hooks are removed
- freezing fish to control parasitic infections, for example nematodes.

Post-harvest (during handling, processing and storage) contamination

Contamination after harvesting may be microbiological, for example bacteria and viruses from:

- fishermen handling the catch

- cross-contamination from raw product to cooked product
- materials in contact with the seafood, such as ice made from contaminated seawater in contact with seafood during storage
- dirty vessels, premises and equipment.

The microbiological limits in Standard 1.6.1 and the guideline criteria referred to above also apply in relation to post-harvest contamination, for example, coagulase-positive *Staphylococci* in raw crustaceans are more likely to be due to post-harvest contamination.

Using clean water to wash and chill seafood, make ice and clean equipment is essential if contamination is to be prevented. Potable water may be available on shore but at sea clean seawater is more likely to be used. Clean water is discussed under clause 14.

Sources of chemical contamination may include abusive use of food additives and preservatives such as excessive sodium sulphite in prawns, cleaning chemicals, spilt fuel and pesticides.

Examples of foreign objects that contaminate seafood include hair and faeces from rodents, dead insects, glass, dirt, flaking paint, drink cans and cigarette butts.

Businesses can prevent contamination by ensuring that:

- holding tanks for live fish or for wet storage of shellstock are clean and covered if necessary, to protect against contamination from birds, animals or pests
- bags, tubs and other containers used to store shellstock are clean and made from materials that will not contaminate the stored seafood
- plastic liners and other materials in contact with raw seafood are clean and made from food-grade material
- ice in contact with stored seafood is made from potable water, is obtained from an approved supplier or, if made on board, is made from clean seawater once the vessel is clear of the harbour and sailing in clean water
- decks, storage areas, coolrooms, freezers and any other areas where fish are handled are maintained clean and in good condition to minimise the opportunity for dirt, fish scraps, shell fragments, flaking paint or other material to contaminate seafood
- bait and waste are stored in containers that are not used for seafood and are marked for bait or waste
- fuel, oil and other chemicals are stored and handled so as to avoid any likelihood of chemical contamination of seafood or surfaces likely to be in contact with seafood
- clean water and equipment are used for cooling cooked crustaceans
- pets such as cats and dogs, or other animals, are not kept, or allowed, on board vessels.

Contamination during transport

Contamination of seafood during transport can be caused by:

- using dirty food transport vehicles and packaging
- using packaging materials that are not intended for use with seafood, are not food-grade materials or are damaged by poor stowing on the vehicle or through poor handling
- stacking containers of seafood so that ready-to-eat product is contaminated by raw seafood

- inappropriate handling by food handlers
- transporting seafood with other products, for example chemicals that could contaminate seafood during transport.

Table 3: Examples of controls to prevent contamination

Transport	Controls to prevent contamination
Seafood on board vessels	<p>Stow seafood in clean hold (below decks) or cover to prevent contamination.</p> <p>Maintain the vessel in good condition to prevent contamination by material such as flaking paint and wood splinters. This is required under clause 14.</p> <p>Transport seafood in clean tubs, tanks, cages, mesh panels and other containers. This is required under clause 14.</p>
Beach-caught seafood	<p>Fish may be carried in trays of vehicles provided that:</p> <ul style="list-style-type: none"> • trays have been thoroughly cleaned before use • carriage of other items that could contaminate the fish is avoided • fish are protected from contamination by clean coverings.
Seafood in transport off ship/boat	<p>Pack in containers or other packaging to protect it from contamination from the vehicle, equipment and other products on the vehicle. This includes protecting ready-to-eat product from contamination by raw product, and from handlers.</p> <p>Cover unpackaged seafood to prevent contamination from seagulls or other birds.</p> <p>Stack ready-to-eat product above containers of raw product. Ensure bases of containers are clean.</p> <p>Ensure clean packaging in contact with seafood.</p> <p>Stow the load so as to prevent damage to packaging or contamination of packaging that could result in contaminated seafood.</p>

4(2) A seafood business must take all reasonable measures to ensure that seafood handlers handle seafood or surfaces likely to come into contact with seafood in a way that is not likely to compromise the safety or suitability of seafood.

The intent of this subclause is to place responsibility on the seafood business to ensure that seafood handlers carry out their work in a way that does not result in food becoming unsafe or unsuitable.

Seafood handlers are persons who engage in, or supervise, the primary production of seafood for a seafood business. In this subclause it covers those seafood handlers who 'handle seafood or surfaces likely to come into contact with seafood'. This narrows the application to only those that have an impact on seafood safety or suitability, for example it would exclude staff who carry out administrative work or repair machinery that is not used in contact with seafood because contamination of seafood is very unlikely.

Businesses are required to take only measures that are reasonable. The term 'reasonable' has been included because it is unlikely that businesses are able to take every measure that is possible to ensure that seafood handlers always prevent seafood becoming unsafe or unsuitable. The seafood business will need to decide what measures are reasonable in the circumstances, having regard to the nature of the product being handled. Some examples of reasonable measures are described below.

Ways in which businesses can ensure that food handlers ensure the safety and suitability of seafood

Seafood handlers will not be able to ensure safety and suitability unless they have skills and knowledge on how safety and suitability can be compromised. Seafood businesses should ensure that they comply with the skills and knowledge requirement in clause 12. On-the-job training or training through formal training programs such as the Seafood Industry Training Package¹⁰ are two ways in which businesses can provide staff with skills and knowledge. Also, businesses may choose to employ people who can demonstrate that they already have skills and knowledge in these matters.

Businesses should ensure that seafood handlers receive clear instructions on the measures they are expected to take. Instructions and work procedures should be presented in a form that the individual handler should understand and be able to follow, for example, in languages other than English if necessary.

Businesses should ensure that staff are supervised. On vessels, businesses could assign a crewmember to ensure handlers follow procedures during the trip. This could include responsibility for ensuring the vessel is properly cleaned, fish is correctly iced and any documentation is accurately completed.

Businesses must provide facilities that enable the seafood handlers to comply with health and hygiene practices and procedures. For example, all handlers should wash their hands before handling cooked prawns. The business cannot ensure that they do this unless they provide hand washing facilities, for example, a handbasin with running water, soap and paper towels where practicable or a gel hand sanitiser that is suitable for use by food handlers.

The person in charge of a particular operation should observe the handlers carrying out their work to check whether anything is being missed or has been forgotten, and identify any need for further instruction or training.

Although the above requirement applies to seafood businesses, seafood handlers must comply with health and hygiene requirements in subclause 13(1).

Example

A seafood handler's task is to descale and fillet fish, wash the fillets in clean, cool water in rinse tanks and return the washed fillets to the coolroom immediately each tub of fish has been filleted. This ensures that the filleted fish is washed in clean, cold water and is outside the coolroom for a short time. The proprietor explains the reason for ensuring fish is kept chilled and not contaminated by dirty water or ice, and checks during the day that the handler follows this procedure.

¹⁰ Information is available on the website of Seafood Training Australia, www.seafoodtraining.com.au.

5 Inputs and harvesting areas

The seafood business ensures that feed, chemicals and other substances used in producing seafood do not adversely affect the safety or suitability of the seafood, and the business is only harvesting seafood from areas where the seafood is safe and suitable.

This clause controls hazards that could be introduced with inputs such as feed and veterinary chemicals used in aquaculture or that arise from the waters, natural and in tanks or ponds, where seafood is harvested.

5(1) A seafood business must take all reasonable measures to ensure inputs do not adversely affect the safety or suitability of the seafood

Seafood businesses must take reasonable measures to ensure that substances they deliberately use during seafood production do not adversely affect the safety or suitability of seafood.

'Inputs' are defined to include any feed, chemicals, including veterinary chemicals, or other substances used in, or in connection with, the primary production of seafood. The definition of 'primary production of seafood' means that inputs used in growing, cultivating, harvesting (capture, or taking seafood from the sea or from aquaculture enclosures or ponds), collection, packing, treating, sorting, grading or storage of seafood are included. Inputs used in processing, for example in boiling crustaceans, are also included.

The term 'reasonable measures' has been included to indicate that the business may be limited to the extent that it can control inputs. For example, it is reasonable for a business to:

- use veterinary chemicals that are licensed, registered or otherwise approved for the intended use and supplied by reputable manufacturers
- follow directions on use, storage and withholding times of veterinary chemicals to ensure that use of products does not result in non-complying residues
- check the local press for recalls or other information to suggest that the product should not be used.

However, it may not be reasonable to expect the business to do any specific research or otherwise check the validity of the information supplied by the chemical manufacturer.

Inputs at sea

After harvest, ice, in some cases mixed with salt, or clean seawater is used to chill fish. Ice slurries should be made with clean water. If seawater ice is used, the temperature should be monitored because salt water has a lower freezing point than fresh water and could damage fish, making them unsuitable.

One of the main inputs used in some sea fishing is bait. For example, in Western Australia part of the pilchard catch is used commercially for bait in lobster pots. All seafood businesses using bait must ensure that the bait will not adversely affect the safety and suitability of the target seafood.

Chemicals used to clean and sanitise the boat and equipment should be appropriate for use in food premises and should be used in a manner that does not impart undesirable odours or taste to seafood, for example, phenols and chlorine may taint seafood such as prawns. Chemicals should be used in accordance with directions for use.

Inputs in aquaculture

The main inputs into aquaculture are feed, veterinary chemicals and drugs, chemical water treatments and other chemicals used, for example, to control marine fouling of sea cages. It is important to note that veterinary chemicals and drugs permitted in other countries may not be permitted in Australia, therefore residues in imported seafood may render the seafood unsuitable. Business that import seafood should be advised to ensure that products intended for import for sale in Australia should not have been treated with veterinary chemicals or drugs that are not permitted.

Feed

Feed for aquaculture should be free from pathogens that may contaminate the seafood. It should not contain substances such as antibiotics unless these are specifically required, known to be in the feed and permitted. Any additives, such as colouring agents and antioxidants, should be used according to directions and at the recommended levels.

Seafood businesses should have specifications for feed, and purchase feed from suppliers who meet these specifications. Suppliers' invoices and labels should be checked to ensure that the correct feed has been received. Any supplies that do not meet specifications should be rejected and returned to the supplier.

Feed should be labelled, stored in accordance with the manufacturer's directions and protected from contamination and access by vermin.

Veterinary chemicals and drugs

Veterinary chemicals and drugs are used in aquaculture to treat and prevent disease, control parasites, control reproduction and growth, and tranquillise fish, for example during transportation.

Australian law requires that the Australian Pesticides and Veterinary Medicines Authority (APVMA) register all veterinary chemical products sold in Australia. The APVMA is an Australian government authority responsible for evaluating the safety and performance of pesticides and veterinary medicines and their regulation up to and including the point of sale. For further information see the APVMA's website www.apvma.gov.au.

Veterinary chemicals must be used according to the manufacturer's label or veterinarian's advice and for the purpose for which they are registered.

Where veterinary drugs and chemicals are used, treatment regimes must be adhered to and withholding periods observed to ensure that residue levels are within legally permissible limits and that edible tissue is safe when the seafood is available for sale. Residue limits are prescribed in the Code.¹¹

Off-label use of specific chemicals may be permitted by some jurisdictions and with conditions attached. Enforcement agencies should check any off-label use.

¹¹ Standard 1.4.1 *Maximum Residue Limits*.

Water treatments

Chlorine and other active halogen compounds are used to treat water. Ozone can be an effective oxidising agent for use in water treatment and reduction of pathogen loads in recirculating aquaculture systems. However, high residual ozone concentrations may cause tissue damage and stock mortalities, and affect the suitability of seafood.

Cleaning and pest control chemicals

Cleaning and sanitising chemicals, for example alkaline detergents used to remove fish fat and protein from equipment and chlorine compounds used to sanitise, should not be permitted to contaminate seafood directly through spillages or indirectly through residues left on cleaned equipment. These may cause harm if consumed. All cleaning and sanitising agents should be classified by the manufacturer as suitable for use in food premises.

Some pesticides are highly toxic to fish or may accumulate in fish. Aquaculture seafood businesses must ensure that chemicals to control pests and weeds in areas adjacent to ponds are appropriate for use in aquaculture and are used only at the recommended dosage rates.

All chemicals used by a seafood business should be stored in their original containers where possible. Labelling of all containers should include, at a minimum, the contents and directions for use and storage. They should be stored away from areas where aquaculture feeds are stored in case of accidental misuse or cross-contamination. It is advisable to keep a copy of instructions for use as labels may become obscured over time.

Under clause 12, seafood handlers whose work involves using chemicals must have skills and knowledge in the handling and use of chemicals so that the safety and suitability of seafood is ensured.

Inputs post-harvest

Additives

Additives are not permitted in uncooked crustaceans, for example sulphur dioxide and sodium and potassium sulphites, in unprocessed fish and in fish fillets except in accordance with the Code.¹²

Water for purging

Some aquaculture and wild-caught species such as pipis require purging before being packed for market. 'Purging' is the process of placing live seafood in a holding tank and allowing the natural evacuation of food and faecal matter from the digestive tract. Purging also helps in removing off flavours and taints from some species of fish and rids the skin of parasites, mud and algae.

Large volumes of water are usually used for purging and businesses typically reuse this water. The business must ensure that the water does not introduce pathogens or other substances that could affect the safety or suitability of the seafood. The business should therefore ensure that the water has been treated to destroy or remove micro-organisms and unwanted chemicals.

¹² Standard 1.3.1 *Food Additives and Schedule 1*.

Water for oyster depuration and wet storage

Criteria for water used in depuration plants are included in state shellfish programs, for example the New South Wales program requires compliance with the *Code of Practice for Depuration of NSW Oysters*.¹³ State shellfish programs also include criteria for water quality for wet storage.

Water and ice for cooling and chilling cooked crustaceans

It is usual practice for prawn fishers operating in estuaries to use estuarine water to cool the cooked prawns and then use ice or an ice slurry to chill the prawns. The water used for cooling and chilling must not be contaminated with pathogenic bacteria or viruses from sewage or contaminated run-off, or contain high levels of toxic algae.

Guidance on judging whether estuarine water is polluted is provided in *Safe and hygienic practices for cooking prawns on trawlers*. If there is doubt about the safety of the water, businesses should move to another location before cooking and chilling, or chill and hold green prawns for cooking at another location or on shore.

Ice must be made from potable water or clean seawater. There is information on water under clause 14.

Records

Businesses may find it useful to keep records of inputs that may later help in resolving any problems, and that could demonstrate compliance with clause 3 and that good hygienic practices have been implemented. Records could include specifications for feed, invoices and a list of suppliers of feed, veterinary chemicals and drugs used, including treatment records. These records would form part of the food safety management system of the business and assist in demonstrating due diligence.

5(2) A seafood business must not harvest seafood in an area if it is known, or ought reasonably be known at the time, that the seafood, if harvested in the area, may not be safe or suitable when sold for human consumption.

This subclause places a general requirement on all seafood businesses to ensure that they do not harvest seafood from areas where the business knows, or could reasonably be expected to know, that the seafood may not be safe or suitable for consumption. There is a specific requirement in Division 3 to include harvesting controls for bivalve molluscs in the food safety management system.

The seafood business should ensure that the business is aware of waters that are closed to commercial harvest due to environmental chemical contaminants or pesticides, or are subject to other government notification as having a water quality problem likely to result in unsafe or unsuitable seafood.

The business is expected to know about closed areas only to the extent that information is reasonably available. For example, government agencies publish information of areas closed for fishing.

13 Code of Practice for Depuration of NSW Oysters, Appendix VII of the *NSW Shellfish Program operations manual*, 1st edition, 2001.

Example

In trawling for prawns in estuaries, waste material such as discarded paint tins or old oil filters may be trawled up with prawns. The presence of this waste on the estuary floor indicates that the prawns may be contaminated and these areas should be avoided. Any catch visibly contaminated should be discarded.

Businesses should be familiar with local areas where fish may be toxic, for example due to ciguatoxin, and not fish in those areas.

In aquaculture, businesses should be aware of agricultural practices in the immediate area, which could affect water safety or quality, and of any other local information that could affect safe seafood production.

Application to importers

Seafood importing businesses are not (generally) harvesting and, therefore, are not directly responsible for ensuring that seafood has been harvested from safe waters. However, they must ensure that imported seafood will comply with requirements for contaminants and residues in the Code.

6 Seafood storage

The seafood business stores seafood at a temperature that minimises the growth of pathogenic bacteria and production of toxins, and has a means of monitoring the temperature of the seafood.

Live seafood is stored in conditions that ensure that safety and suitability are not adversely affected.

This clause controls hazards that could be introduced during storage of seafood.

Seafood is stored if it is not being handled in any way; for example, it is stored if it is not being harvested, cooked, filleted, sorted, graded, shucked, glazed, chilled, received, packaged or transported.

'Storage' includes wet storage of shellfish after depuration or relaying. 'Storage' also includes holding fish live in tanks.

Seafood does not have to be in a 'storage area' such as the fishing vessel hold, coolroom or freezer to be 'stored'. Seafood that is held between one process or preparation step and another is being 'stored' for the purposes of this clause. For example, fish that have been harvested and are lying on the deck are 'stored' for the purposes of this clause.

The clause does not apply to storage that is part of manufacturing or retail activities or to seafood intended for disposal under clause 9. The clause does not control hazards caused by contamination of seafood, other than live seafood, during storage, for example in dirty storage conditions. Contamination during storage is controlled under clause 4. Cleanliness of storage facilities is controlled under clause 14.

6(1) A seafood business must, when storing seafood, other than live seafood, store the seafood under temperature control

'Temperature control' is defined in clause 2 of the standard to mean **maintaining** seafood at a temperature of:

- (a) 5° C, or below if this is necessary to minimise the growth of infectious or toxigenic micro-organisms in the food so that the microbiological safety of the food will not be adversely affected for the time the food is at that temperature,
or
- (b) another temperature, if the seafood business demonstrates that maintenance of the food at this temperature for the period of time for which it will be so maintained will not adversely affect the microbiological safety of the seafood.

The definition of 'temperature control' includes a reference to time because it is not possible to store potentially hazardous foods for long periods at a temperature that prevents all growth of pathogenic bacteria unless the seafood is frozen. For example, *Listeria monocytogenes* may survive processing and is capable of growth at refrigeration temperatures in some seafood.

Chilled seafood

To ensure microbiological safety, the standard requires seafood, other than live seafood, to be stored at 5° C or colder unless the seafood business can demonstrate that maintaining the seafood at a different temperature for the time it is being stored will not adversely affect its safety.

Industry guidelines recommend that fresh or wet seafood is stored at between -1° C and 4° C and that storage in ice is the preferable method. Ice should be placed under, between and on top of fish to ensure that all fish in the box is chilled. Snow, flaked or shaved ice is preferable to cubed, tubed or crushed ice to avoid bruising the fish. Cubed, tubed or crushed ice can be used on top of seafood if care is taken not to damage the seafood.

Shelf life at this temperature will depend on several factors, including:

- limiting stress during harvest
- chilling as soon after catching as possible, particularly freshly caught fish that are not chilled on the boat
- careful handling to prevent damage during handling, storage and transport.

Guidance on shelf life is available in industry guidelines, for example the *Australian seafood users manual*. Shelf-life estimates are aimed at maintaining quality, as raw seafood is likely to spoil and become unsuitable for consumption rather than be unsafe once cooked.

Raw ready-to-eat products, for example sushi and sashimi, demand fish of high quality, and temperature control is a key factor in maintaining this quality. Criteria for assessing quality of sashimi-grade fish are included, for example, in the *Sydney Fish Market seafood handling guidelines*. The main control for safety is preventing contamination of the fish during capture and subsequent handling and storage.

Ready-to-eat processed products that are potentially hazardous will remain safe provided the product is stored only for a limited time. The United States Food Code specifies that

ready-to-eat potentially hazardous food should not be stored for longer than 7 days at 5° C or lower, with the day of preparation being Day 1.

Some types of seafood must be kept chilled to prevent the formation of toxins in the seafood for the time that the seafood is stored. Scombroid species of fish such as Tuna and Mackerel, which have high levels of histidine, are more likely to accumulate high concentrations of histamine under conditions of time or temperature abuse. Non-scombroid species, for example Australian Salmon and Mahi Mahi, may also have high levels of histamine if subjected to temperature abuse. The histamine is produced as a result of action by enzymes produced by bacteria growing on the fish. Enzymic action can continue during freezing and drying processes and businesses must ensure that time/temperature controls minimise these hazards. Further processing, including cooking, does not destroy the histamine.

Standard 2.2.3 provides that the level of histamine in fish and fish products must not exceed 200 mg/kg.

Storage above 5° C

Storage of seafood above 5° C is not advisable because the products are generally very perishable. Therefore, freshly caught seafood should be placed in chilled storage as soon as possible.

The following guidance may assist in determining how long seafood may be stored above 5° C. However, its application in Standard 4.2.1 is limited to potentially hazardous seafood **that has been cooked or otherwise processed to make it safe and has not been contaminated** after processing. It does not apply to raw fish that is to be cooked before consumption.

Guidance in Appendix 1 in *Safe food Australia* states that food **that has been cooked or otherwise processed to make it safe and has not been contaminated** after processing will remain safe if it has been at temperatures between 5° C and 60° C:

- for a total of less than 2 hours and it is then refrigerated (chilled) or used immediately, or
- for a total of longer than 2 hours but less than 4 hours, if it is then used immediately.

Seafood that has been between 5° C and 60° C for a total of 4 hours or longer must be thrown out or not used for human consumption.

Note that the above times are cumulative, that is, they include all the time that the food has been between 5° C and 60° C since processed to assure safety.

Frozen seafood

Seafood should be frozen for extended storage.

Long storage times and fluctuations in storage temperature affect the suitability of seafood, causing changes in flavour, odour, texture and colour to the extent that it becomes unsuitable.

Protection against dehydration may be necessary to prevent damage. Seafood should be protected by glazing (sprayed or dipped in water and then frozen to coat with an unbroken

icy glaze) or packaging in plastic liners, containers with lids or some other means of protection against dehydrating airflow.

Maintaining temperature

The definition of temperature control requires the business to maintain the temperature of the seafood, that is, not allow it to fluctuate. Temperature fluctuations of frozen seafood may allow some surface thawing and refreezing, which may damage the seafood or release enzymes that may cause damage. If the damage is extensive it may affect the suitability of the product.

There may also be suitability issues if food is not maintained at a low enough frozen temperature. Chemical changes may occur that result in toughening and drying of the flesh and development of undesirable flavours, for example oxidation of fats. The rate at which this proceeds depends largely on temperature, with a slower rate of change occurring at lower temperatures. Extensive changes may make the product unsuitable, and therefore businesses must ensure that frozen seafood is maintained at an appropriate temperature during storage.

6(1) continued – and have a means of monitoring the temperature of the seafood.

‘Monitoring’ is defined in Standard 3.2.1 to include checking, observing or supervising in order to maintain control. The intent in relation to temperature is that the business must have a means of checking the temperature of seafood to ensure that the seafood temperature is being controlled.

Businesses must be able to check that the temperature of the seafood is 5° C or below, or another temperature if time is used as a control during storage. The ‘means’ they use may depend on the type of storage. For example, fish stored in ice will be at a temperature of 5° C or less if melting ice surrounds the fish; monitoring to ensure that there is always melting ice would satisfy this requirement.

The requirement is for a means of monitoring the temperature of seafood, not the temperature of the storage area. Temperature gauges installed on coolrooms measure the internal temperature of the storage area and are useful in helping to monitor seafood temperature. This equipment would form part of monitoring, in conjunction with measuring the temperature of the seafood using a sanitised, accurate probe thermometer. When the business establishes the coolroom temperature necessary to achieve a seafood temperature of 5° C or below, then measuring the coolroom temperature would satisfy the ‘means of control’.

Infrared thermometers are a rapid means of monitoring seafood surface temperature and avoid the need for piercing seafood. When the business establishes surface temperatures that give an indication of seafood temperature, this would satisfy a ‘means of monitoring’. A business should have a probe thermometer available to check infrared readings and, if the business is required to comply with Chapter 3, it must have a probe thermometer readily available on the premises.

It is recommended that businesses record temperatures taken, as this will demonstrate that monitoring is occurring and may help in identifying the cause of any later temperature-related safety or quality problems.

If the business is using alternative temperatures and time as a control, it will need to monitor and record the temperatures in order to demonstrate that the limits the business has determined are safe are not exceeded.

Clause 14 requires equipment used by the seafood business to be kept clean and designed, constructed, maintained and operated such that the safety or suitability of the seafood will not be adversely affected. This means that monitoring equipment must be clean, accurate and operated correctly. Clause 12 requires seafood handlers to have skills and knowledge in food safety and hygiene matters, and this includes the skills and knowledge necessary to monitor temperatures and maintain and operate monitoring equipment.

6(2) A seafood business must, when storing live seafood, store the seafood in such a way that the conditions under which it is stored will not adversely affect the safety or suitability of the seafood.

The subclause is intended to control potential hazards to live seafood from temperature abuse and inappropriate environmental conditions, for example water and ice quality, pH, salinity, humidity, overcrowding and packaging conditions.

Seafood that is stored live includes fish such as Barramundi, Silver Perch and reef fish; crustaceans such as rocklobsters and crabs, particularly Mud Crabs; and molluscs such as abalone, mussels and oysters.

As a general principle, seafood should be kept as cool as is tolerant to the species to reduce the need for oxygen, lessen appetite, prevent cannibalism where the seafood is in crowded conditions and minimise the risk of the live seafood dying. Water that is too warm may cause death and consequent rapid spoilage. Keeping live seafood too cold may also result in death. The safety or suitability of any dead seafood that has died in these circumstances cannot be assured and such seafood should be discarded.

Temperature ranges that can be tolerated by finfish depend on the species, for example, reef fish can be held for several days at 23° C to 25° C (at appropriate salinity) whereas Silver Perch prefer the lower range of 15° C to 18° C. Suitable temperatures for seafood that survive out of water, such as Mud Crabs, will depend on whether they are stored in or out of water.

Live seafood need to be in conditions that will minimise stress, for example, tank water should be changed frequently to prevent the accumulation of metabolites and a drop in oxygen levels. Bright lights may also stress fish. Salinity is important for some species, for example, rapid changes in salinity should be avoided for Barramundi and Silver Perch to avoid stress. Conditions should not result in tissue damage, such as bruising, to such an extent that the fish is unsuitable. For example, overcrowding of finfish in tanks should be avoided.

Signs of unsatisfactory conditions in holding tanks for live fish include cloudy water, foam on the top of water, and slime and algal growth on the tank surfaces.

Pathogens such as *Vibrio vulnificus*, *Vibrio parahaemolyticus*, *Vibrio cholerae* and *Listeria monocytogenes* that may be present in low numbers at the time that molluscs and shellfish are harvested may increase to more hazardous levels if they are exposed to time or temperature abuse.

Shellstock should be stored so that crushing or other damage to shells is minimised to prevent damage or contamination of the contents. Similarly, finfish containers should not be overfilled.

Note that storage of live seafood may be subject to state and territory animal welfare legislation.

Example

Storing oysters out of water

Shellstock should be kept moist and placed under ambient refrigeration at 10°C or less within 24 hours of harvest for up to 6–7 days. Any oysters with gaping shells should be discarded.¹⁴

7 Seafood transportation

The seafood business transports seafood at a temperature that minimises the opportunity for pathogenic bacteria to grow or toxins to be produced, and has a means of monitoring the temperature of the seafood.

Live seafood is transported under conditions that ensure that safety and suitability are not adversely affected.

This clause is intended to control hazards that could arise during transport and delivery of seafood. It mirrors the requirements in clause 6 **Seafood storage** to provide a continuum in the safety and suitability requirements for seafood.

The clause covers transport and delivery at all stages of primary production, including processing, but not associated with manufacturing or retailing activities.

It applies to road, sea and air transport and whether the seafood is on a powered vehicle or other form of transport, for example a forklift, or on non-powered transport, for example a trolley.

Protection from contamination of seafood during transport is controlled under clause 4.

7(1) A seafood business must, when transporting seafood, other than live seafood, transport the seafood under temperature control

During transport seafood must be maintained at 5°C or colder unless the seafood business transporting the food can demonstrate that keeping the food at another temperature for the transport time will not adversely affect the microbiological safety of the seafood.

Seafood should be transported chilled or frozen. It should be kept cold by packing it in ice and/or using coolant, insulating it and preferably transporting it in a refrigerated vehicle that is chilled before being loaded, if this is feasible.

The NSW Code of Practice for the Transport of Primary Produce and Seafood states that

¹⁴ AQIS, 2004, *Australian Shellfish Quality Assurance Program Export Standards*.

refrigerated vehicles should be used to transport potentially hazardous seafood, particularly if the journey is likely to take longer than two hours.

If a business transports seafood above 5° C, the time that the seafood will remain safe and suitable will be limited due to the perishable nature of seafood. The maximum time that the business may transport seafood above 5° C will depend on:

- the previous temperature history of the food—the time above 5° C is cumulative and includes any storage at temperatures above 5° C
- the actual temperature of the seafood during transport—the higher the temperature the shorter the time the seafood should be at that temperature
- specifications from the food business receiving the seafood.

If the seafood is likely to rise above 5° C then the time that the seafood is above 5° C must be monitored to ensure that the time does not exceed safe limits.

Businesses can help to maintain seafood at cold temperatures by arranging for loading and unloading to occur during the coolest parts of the day. If the seafood is to be transported to air or sea freighters then the air/sea craft's estimated time of departure should be checked before loading, and the load out scheduled to match craft departure times.

7(1) continued – and have a means of monitoring the temperature of the seafood.

'Monitoring' is defined in Standard 3.2.1 to include checking, observing or supervising in order to maintain control. Businesses must be able to check the temperature of the seafood during transport.

The business is not specifically required to use a temperature measuring device to check temperature and may use other means, for example, observing the time at ambient temperature or transport conditions such as the quantity and state of ice around the seafood, to ensure that the temperature of the seafood is under control.

For example, freshly caught fish stowed in ice in the hold of a fishing vessel will be transported at 5° C or less if the fish is surrounded by melting ice. The means of control is supervision and observation of the ice conditions. Alternatively, the temperature should be checked using a sanitised accurate probe thermometer inserted so as not to damage the seafood. Infrared thermometers may be used but, as these indicate fish surface temperatures, businesses must ensure that the readings are indicative of the true temperature of the seafood. Businesses may prefer to use continual monitoring using data loggers.

The requirement is to monitor the temperature of seafood, not the temperature of the transport vehicle. Therefore, temperature gauges indicating the internal temperature of the vehicle do not, on their own, meet the requirements of the subclause. The business could measure the temperature of seafood when it is loaded, again when it is unloaded, and the temperature of the vehicle. This would satisfy the requirement.

It is recommended that businesses record temperatures taken, as this will demonstrate that monitoring is occurring and may help in identifying the cause of any later temperature-related safety or quality problems.

If the business is using alternative temperatures and time as a control, it should monitor and record the temperatures in order to demonstrate that safe limits are not exceeded.

Clause 14 requires equipment used by the seafood business to be kept clean, and designed, constructed, maintained and operated such that the safety or suitability of the seafood will not be adversely affected. This means that monitoring equipment must be clean, accurate and operated correctly. Clause 12 requires seafood handlers to have skills and knowledge in food safety and hygiene matters, and this includes the skills and knowledge necessary to monitor temperatures and maintain and operate monitoring equipment.

7(2) A seafood business must when transporting live seafood, transport the seafood under conditions that will not adversely affect the safety or suitability of the seafood.

The subclause controls potential hazards to live seafood from temperature abuse and inappropriate environmental conditions during transport, for example water and ice quality, pH, salinity, humidity, overcrowding and packaging conditions. The intention is to protect live seafood from becoming stressed and dying. Stressed fish and/or crustaceans may damage themselves or others, which could affect the suitability of the seafood for sale, and they may be more susceptible to microbiological or chemical changes that could also affect safety or suitability. The main seafood markets prohibit the sale of crustaceans that are dead on arrival.

Several species of fish and crustaceans are transported live, including Carp, Rockcod, Yabby, Marron, Redclaw, rocklobsters, Mud Crab, Spanner Crab and prawns.

The temperature of live seafood should be maintained at a level that will ensure that the seafood remains alive during transport and is not in a stressed state.

The business can assist in keeping live seafood chilled by packing them in insulated foam containers, or waxed or cardboard containers, preferably containing damp seaweed or damp, clean paper. Pre-chilling foam containers will help to keep seafood cool.

Transporting fish in water cooler than their natural water reduces stress on the fish and slows down their respiratory and metabolic rates, with consequent slower degradation of the water quality and greater likelihood of survival. For example, Wrasse caught by line in Victoria are becoming common as eating fish and on the boat are placed in holding tanks filled with cooled seawater.

Water quality is important in preventing stress and keeping fish alive. Transport of live fish in closed tanks, generally used for airfreight and for road transport from regional to metropolitan areas, results in losses of water quality. Excretory products, mucus and regurgitated food degrade the water quality and stress the fish. Respiration causes decreased levels of oxygen and increased levels of carbon dioxide. High carbon dioxide levels will eventually kill the fish. The water:fish ratio is very important but it is also important to control oxygen and carbon dioxide levels, in combination with other environmental conditions such as transporting in dark or low-light conditions, reducing water temperature and using pH buffers.

Humidity is also important when transporting live crustaceans without water as decreased humidity causes a fall in the survival rate.

It is important to prevent crushing and other damage to live seafood caused by overcrowding. Damage such as bruising, loss of scales or skin tears may reduce the likelihood of survival. To reduce the risk of damage, containers should not be overfilled and should be loaded so that they do not move around during transport.

Examples

Molluscs such as oysters are transported live for live sale. It is recommended that fluctuations in temperature be avoided to avoid stress. Therefore, shellstock that have been stored under refrigeration should be transported in refrigerated vehicles capable of maintaining air temperature at 10°C or less. Refrigerated vehicles should also be used when ambient air temperatures and time of travel could cause unacceptable bacterial growth or deterioration. Depending on where they are caught, Mud Crabs should be transported at 16°C–20°C (at 100% humidity) for maximum survival rate. Live lobsters should be between 4°C–20°C to minimise stress and, if transport to market will take more than 8 hours, lobsters should be conditioned by starving them prior to travel, reducing the temperature to slow their metabolism (depending on where caught) and reducing exposure to sunlight or bright light (as this increases their metabolism).

Ensuring that containers are not bounced or jolted around during transport will also increase their chances of survival.

8 Seafood packaging

The seafood business uses packaging materials that are suitable for use with seafood. The seafood packaging and the packing processes do not contaminate seafood.

The intent of this clause is to control hazards that could arise when seafood is packed. It does not apply to packing that is part of manufacturing or retail activities.

The definition of 'processing of seafood' includes 'packing' seafood. Therefore, the clause applies to businesses that package seafood whether or not they carry out other primary production or processing operations. Examples include:

- onboard packaging of fish, for example, boxing in ice and packing cooked prawns
- onsite packaging of aquaculture products
- packaging of seafood for transport
- packaging of live fish and live crustaceans.

8 A seafood business must, when packaging seafood –

(a) only use packaging material that is fit for its intended use; and

A seafood business must use packaging material in contact with seafood that is appropriate for the intended use. The supplier or manufacturer of the packaging can supply information on whether the material is appropriate for contact with the type of seafood to be packaged and for the storage conditions. For example, the specifications for cartons for frozen seafood may require the cartons to have high stacking strength and be leak-proof.

If the packaging is important in keeping seafood cool, then the packaging must be insulated and/or able to be used with ice or coolant.

(b) only use packaging material that is not likely to cause contamination of the seafood; and

The seafood business must ensure that packaging material will not adversely affect the safety or suitability of seafood that may come into contact with it.

Packaging material should be clean. During storage, packaging material should be protected from contamination from, for example, dust, dirt and pests and should not be used if there is any likelihood that it has been contaminated.

Chemicals in the packaging may be a source of contamination of seafood. Standard 1.4.1 *Contaminants and Natural Toxicants* in the Code sets out maximum levels of specified metal and non-metal contaminants in nominated foods, including acrylonitrile and vinyl chloride used in the manufacture of some packaging materials. These levels must not be exceeded. Where no maximum level is prescribed, the levels of contaminants should be kept as low as reasonably achievable. The manufacturer of the packaging material is responsible for ensuring that packaging material intended for contact with seafood is safe for that purpose.

Australian Standard 2070–1999 *Plastic materials for food contact use* is a guidance document that specifies materials and the procedures for use during the various stages of production of plastic materials, coating and printing of plastic items for food contact, and subsequent use. This includes such items as packages, domestic containers, wrapping materials, utensils or any other plastic items intended for food contact applications.

A source of information on seafood packaging is the *Australian seafood users manual*.

(c) take all reasonable measures to ensure that the seafood does not become contaminated.

During packaging the seafood may be exposed to contamination from:

- dirt, dust, insects, birds such as seagulls, and foreign material such as metal, plastic or flaking paint in the packaging area
- the packaging equipment, for example pieces of metal, dirt, grease or oil
- unsuitable types of ice, or ice made from dirty water, and coolants used in packaging
- other parts of the seafood
- handlers contacting the food directly or items from the body or clothing of handlers.

The packaging area and equipment used for packaging must be clean to ensure compliance with clause 14, which also requires that these areas are designed, constructed, maintained and operated in a way that will not adversely affect the safety and suitability of the seafood.

Seafood businesses and handlers must ensure that seafood is not contaminated commensurate with the food safety risks (posed by the product) for compliance with clause 13.

The business has to take 'all reasonable measures' to ensure that seafood does not become contaminated. It would be reasonable to expect businesses to be aware of any specific conditions of packing particular types of seafood.

Preventing damage during packing would be a reasonable measure as damage may result in contamination and compromise seafood suitability. For example, the business should use soft flakes of ice to pack finfish to avoid damage that could be extensive and make the fish

unsuitable. Similarly, to avoid extensive damage from crushing, containers should be stacked so that the container takes the weight, not the fish. Damage may also allow contamination of the flesh by spoilage organisms, which may affect suitability.

Packaging should be carried out without delays, to minimise opportunities for contamination.

Industry guidelines are a useful source of information. For example, *Seafood handling guidelines*, published by the Sydney Fish Market, has useful guidance, including illustrations, on the correct packing of various types of seafood.

9 Seafood for disposal

The seafood business ensures that unsafe or unsuitable seafood is not sold and does not contaminate safe and suitable seafood.

This clause is intended to control hazards that could arise from unsafe or unsuitable seafood contaminating safe and suitable seafood, and to ensure that seafood businesses dispose of unsafe and unsuitable seafood so that it cannot be used for human consumption.

The business must keep recalled food, returned food, unsafe or unsuitable seafood, or seafood that is suspected of being unsafe or unsuitable, separate from safe and suitable seafood and identified as recalled, returned or unsafe or unsuitable food, as the case may be. This seafood is termed 'seafood for disposal'. Seafood for disposal has the same meaning as 'food for disposal' in clause 11, Standard 3.2.2 and an editorial note notes this. It is seafood that is:

- subject to a recall
 - returned to the business
 - not safe or suitable
- or
- reasonably suspected of not being safe or suitable.

'Recalled' seafood may be part of stock that has been recalled by the seafood business. Alternatively, it may be seafood in the business's possession that has been recalled by another business.

Seafood 'returned to the business' means seafood that is returned to the business for any reason, for example, is rejected by another business (for any reason) and is delivered back to the seafood premises of the supplier.

Seafood that is 'not safe or suitable' means seafood known by the business to be unsafe or unsuitable. It would include seafood that has been contaminated by foreign material or pathogenic micro-organisms, or contains levels of contaminants or natural toxicants that are illegal or unsafe. It also includes food that has deteriorated, is so damaged that it is unsuitable for sale, or in some other way is unsafe or unsuitable.

Seafood that is 'reasonably suspected of not being safe or suitable' is seafood that the business may not know, but may reasonably suspect, is unsafe or unsuitable, for example, live fish or crustaceans that have died during transport would be reasonably expected to be

unsuitable. In less obvious cases, the extent to which a business is expected to 'reasonably suspect' would be determined on the basis of each case. If a problem with the safety of particular seafood has been widely reported in the media, or industry associations have disseminated information on the problem, it would be reasonable to expect the business to be aware that this type of seafood could be affected. However, it may not be 'reasonable' if the issue is new and/or there is limited industry awareness.

These foods must be disposed of by the business in accordance with one of the options described below. Note that one of the options is that the business determines that the seafood is safe and suitable for sale.

9(1) A seafood business must ensure that seafood for disposal is held and kept separate until it is –

The subclause applies to food that is held. If the business makes an immediate decision about particular seafood and disposes of it in accordance with the requirements, there is no opportunity to 'hold it' and 'keep it separate'.

If the food is held, it must be kept separate from food that is not for disposal. A completely separate storage area is not necessary, but separation must be adequate to prevent unsafe or unsuitable seafood contaminating safe and suitable seafood. For example, deteriorated shark and ray meat gives off ammonia that could contaminate other fish to such an extent that the fish is unsuitable. If quantities are small the food may be held in a container. Large quantities should be in part of a freezer or coolroom separated by space from other food.

The business must hold and keep separate the seafood until it takes one of the following actions.

(a) destroyed or otherwise used or disposed of so that it cannot be used for human consumption; or

The business may choose to destroy the food or dispose of it for a purpose other than human consumption, for example, for animal feed or bait (if safe for this purpose). This may be the only option available to the business if the other options do not apply.

Small amounts of seafood may be disposed of with the normal waste from the business. Arrangements should be made with the authority (which may in this case be the local government council) before disposing of large amounts, for example through landfill, due to the perishable nature of seafood and its attraction to seagulls and other pests. In addition, the business should consider whether environmental protection legislation affects the method of disposal.

(b) returned to its supplier; or

This option will apply in circumstances where a seafood business has seafood obtained from another business and must return it, for example, a seafood business that distributes seafood may find that seafood now in its ownership is subject to recall and must be returned to the producer.

(c) processed in a way that ensures its safety and suitability; or

The seafood business may be able to process seafood or arrange for the seafood to be processed to ensure its safety and suitability.

(d) **ascertained to be safe and suitable for sale.**

There are circumstances where a seafood business may be holding seafood because there is doubt about whether it is safe or suitable, for example, if it is likely to be recalled or while awaiting results of further investigations. The business can sell the seafood when it is satisfied that the seafood is safe and suitable for sale.

9(2) A seafood business must clearly identify any seafood that is held and kept separate in accordance with subclause (1) as returned seafood, recalled seafood, or seafood that is or may not be safe and suitable.

The seafood business must identify any food that is being held as to whether it is returned seafood, recalled seafood or seafood that is, or may be, unsafe or unsuitable. If the seafood is packaged, the packaging should be marked or a label attached. If the seafood is in containers then the containers should be marked or labelled.

10 Seafood receipt

The seafood business only accepts seafood into its seafood premises that is protected from contamination, is under temperature control and, if live seafood, has been transported in a way that has not affected its safety or suitability.

The intent of this clause is to control hazards that can be identified when seafood is received at premises so that the business receiving the seafood has an opportunity to reject (not accept) seafood that is:

- not protected from contamination
 - not under temperature control
- or
- if live seafood, has been transported under conditions that may make the seafood unsafe or unsuitable.

The clause is particularly relevant to importers, distributors, wholesalers, transporters and processors that may not be the primary producers of the seafood. They may be receiving seafood that has been caught or harvested etc. by another seafood business.

10(1) A seafood business must take all reasonable measures to ensure it only accepts seafood that is protected from the likelihood of contamination.

Seafood businesses must ensure that seafood delivered to their premises ('seafood premises' includes vehicles) is protected from the likelihood of contamination before they accept delivery of that seafood. The phrase 'all reasonable measures' has been included to clarify that businesses may not be able to inspect every item of every consignment that arrives at the premises.

The type of measures that would be considered reasonable for businesses to take include:

- specifying to suppliers that seafood must be packaged, in covered containers or otherwise covered

- ensuring that, whenever possible, seafood is delivered when staff are available to check deliveries
- checking deliveries and selecting random packages of seafood for closer inspection.

If food is not protected, or the business receiving the food suspects it is contaminated or is likely to be contaminated, the business must reject the seafood.

If it is not possible to check seafood before accepting it into the premises then arrangements may be made with suppliers that seafood is not 'accepted' until it has been inspected.

10(2) A seafood business must, when receiving seafood, other than live seafood, take all reasonable measures to ensure it only accepts seafood that is under temperature control.

The intent of this subclause is to ensure that the business only accepts seafood (other than live seafood) that has not been subject to temperature abuse. The extent to which a business can ensure this is limited, as the business is unlikely to have control over the seafood before it arrives at the premises. Therefore, the requirement is qualified by the business having to take 'all reasonable measures' to ensure compliance.

Requirements for live seafood are in subclause (3).

'Temperature control' is defined and has been discussed previously. The business receiving the seafood must ensure that the seafood on arrival is either 5° C or colder or, if at another temperature, the food businesses delivering the food can demonstrate that the time that the seafood has been above 5° C has not adversely affected the microbiological safety of the seafood.

For businesses receiving chilled seafood, including transport companies, a straightforward approach is to check seafood temperature and that there is no evidence to suggest that the seafood has been at higher temperatures during transport (or any other step before then). The business can check the temperature of the seafood itself or, if it is iced, the state of the ice. Evidence that would suggest temperature abuse includes spoilage or deterioration. Seafood should only be accepted if it is suitable for its intended use.

Some businesses receive freshly caught seafood, which is not chilled to 5° C or colder. The requirement is not intended to prevent the practice, as experienced businesses will know from the condition of the seafood whether it is in fact freshly caught. In other cases, businesses that receive seafood at temperatures above 5° C should ensure that the supplier is able to demonstrate the previous temperature/time history of the seafood. It is recommended that such demonstration be recorded rather than accepting verbal assurances. If there is doubt about its safety or suitability, the seafood should be rejected.

If a business rejects any seafood it should advise the supplier of the reason. Most businesses would normally do this.

Businesses should use reputable suppliers, ensure that their suppliers are aware of the specifications for temperature and include specifications as part of a supplier assurance program. In some states and territories, seafood businesses must be registered/licensed and businesses should avoid suppliers that cannot demonstrate current registration or licensing.

Example

A seafood business's major activity is catching Whiting. It also buys and transports Whiting caught by another business. The business specifies that all Whiting delivered to the premises or transported must be in covered containers and the fish packed in ice. Containers are checked on arrival and the temperature of containers where there is little or no ice is checked. Whiting that are not delivered in covered containers or which are at a temperature greater than 5°C are rejected and returned to the supplier.

10(3) A seafood business must, when receiving live seafood, take all reasonable measures to ensure that it receives seafood that has been transported in such a way that has not or will not adversely affect the safety or suitability of the seafood.

The intent of this subclause is to ensure that the business only accepts live seafood that has been transported under conditions that will not adversely affect the safety and suitability of the seafood. The extent to which a business can do this is limited, as the business may have had no control over the seafood before it arrives at the premises. Therefore, the requirement is qualified by the business having to take 'all reasonable measures' to ensure compliance.

Conditions that affect live seafood during transport have been discussed under subclause 7(2). Businesses that know or suspect that the live seafood has been subject to conditions that may affect the safety or suitability of the seafood should reject it. Indications that finfish may be unsafe or unsuitable are:

- extensive skin damage or ulcerated areas
- fish swimming on their sides
- dead or belly-up fish in the tanks.

Indications that crustaceans and molluscs have been transported under adverse conditions are:

- damage to shells or legs
- presence of dead individuals.

As in subclause (2), businesses should use reputable suppliers and specify the conditions under which live seafood should be transported.

Record keeping

Businesses usually keep records of food received. It is good practice to note on these records (or elsewhere) if foods are rejected and the reason for rejection. This practice enables the business to demonstrate compliance with the above requirements. It also demonstrates compliance with clause 3 in that the business has controlled potential hazards at the receipt step.

11 Seafood tracing

The seafood business keeps records that identify where the seafood came from and where it was sent.

The intent of the clause is to ensure that seafood businesses can trace the movement of seafood one step backward and one step forward.

11 A seafood business must maintain sufficient written records to identify the immediate supplier and immediate recipient of seafood for the purposes of ensuring the safety of the seafood.

The 'immediate supplier' is the business that has provided the seafood to the seafood business. For example, if a business fillets fish caught by another business, the 'immediate supplier' is the business that caught the fish.

The 'immediate recipient' is the business that purchases the seafood from the seafood business, that is, the 'immediate customer'.

The clause applies only to seafood. The business is not required to maintain records of packaging or of inputs.

Advantages of keeping traceability records

The records will enable businesses to identify and locate seafood if the seafood is recalled because of a safety problem. Targeted and accurate withdrawals or recalls from the marketplace avoid the potential for unnecessary or wider disruption of the seafood market in the event of a food safety problem. It also enables businesses to identify seafood still in its possession that may have a safety or suitability problem, for example seafood that has been caught in an area subsequently identified as unsafe for fishing.

Type of records

Businesses must maintain records that are relevant to ensuring the safety of seafood.

Examples are:

- name and address of suppliers and a description of seafood/products, such as the name of the species
- name and address of customers and a description of seafood/products
- date of transaction or delivery
- volume or quantity of seafood received and supplied
- batch or lot numbers and other markings that will assist with identification
- a detailed description of the product, such as whether prepacked or bulk, whether raw or processed.

Correct identification of all seafood

Seafood should be identified with the species of seafood or fish name as appears in the

*Australian fish names list*¹⁵, which sets out names of specific fish species in Australia. Inaccurate labelling may result in seafood remaining in the market when the business intended that it be recalled because of a food safety problem.

State and territory legislation may contain requirements for identification of seafood, for example, specific requirements for shellfish in the NSW Shellfish Program.

Example

The NSW Shellfish Program requires bags or containers to be labelled, at the time of filling, in waterproof distinctive ink with the product record number, the words 'deputation plant' and the plant number, common species name, source (estuary), packer's name and address, country of origin and the date the oysters completed deputation (or the date of harvest as appropriate), quantity of oysters and the lease number.

Identification of mixed seafood

Businesses that mix batches of seafood should ensure that the batches making up the mix are known: the one-step-back approach. This will avoid the business having to recall greater quantities of potentially unsafe product because specific affected product cannot be identified. This 'internal traceability' system will enable the business to contribute to more targeted and accurate withdrawals or recalls.

Clause 17 specifically requires the business not to co-mingle batches of bivalve molluscs.

Harvest and packing records of catches

For wild catch, records should indicate the name of the vessel, date of capture, type of fish and the fishing area. Vessel logbooks and catch returns may be suitable for this purpose. If the vessel is several days at sea, the business should include a way of differentiating catches from different days of fishing. This allows specific catches of seafood to be identified.

In aquaculture, businesses should be able to identify the type of fish, pond, cage or rack of each 'batch', the date and time of harvest, particularly if more than one 'batch' is harvested in a day, and to whom and when the product was sold.

For shellfish, the business should maintain information on the grower/supplier, particularly if the shellfish are from another business, the unique lease number, name of the harvesting area, date of harvest, and type and quality of shellstock.

Information should also include pack details if seafood is available in various types of weights, styles and packs.

Despatch records

Records should identify when product is despatched, details of the despatched product, the transporting company and the recipients so that the business knows which batch of product was sent to which recipient. Examples are shipping manifests and delivery dockets.

¹⁵ *Australian fish names list*, published by the Fish Names Committee, Seafood Services Australia. Posters illustrating commercially important fishes of Australia are available from Seafood Services Australia.

Other records

Rapid and effective tracing will be facilitated if the business maintains records of:

- a list of government agencies that should be notified so that they are aware of unsafe seafood possibly being in the marketplace. This is particularly important if distribution is interstate or international, so that tracing efforts can be rapidly coordinated across different jurisdictions
- advice for customers to ensure food is returned, for example, who to contact and what action to take in regard to recalled seafood
- arrangements for assessing how much seafood is still in the food chain and how much has been returned, in order to know that all the seafood has been traced.

Maintaining records

Documents include electronic documents and should be in English.

Records kept for other purposes may meet the requirements of this clause, for example, many businesses keep lists of suppliers and customers, invoices and other records.

State and territory legislation gives powers to enforcement officers to obtain and examine documents relevant to food safety issues. Businesses should maintain records in an accessible place or, if records are electronic, be able to download them quickly as it may be essential to trace seafood promptly to prevent it being distributed or consumed.

Businesses will need to decide how long to keep their records. As a general guide, records should be kept for the period of the shelf life plus six months after the date of harvest or delivery.

Seafood businesses may find the advice in the FSANZ guide *Food industry recall protocol—a guide to writing a food recall plan and conducting a recall* useful in deciding the records they need to keep to trace seafood.

12 Skills and knowledge

The seafood business ensures that persons handling or supervising the production of seafood have appropriate skills and knowledge in food safety and food hygiene.

The intent of this clause is to ensure that the skills and knowledge of seafood handlers are assessed by their employers to ensure the handlers are informed and trained in seafood safety and hygiene.

12 A seafood business must ensure that seafood handlers have –

- (a) skills in food safety and food hygiene; and**
- (b) knowledge of food safety and food hygiene matters;**

commensurate with their work and the food safety risks.

To effectively control hazards in seafood, people who work in seafood businesses must have skills and knowledge for their work that ensure that the seafood they handle remains safe and suitable. It is the business's responsibility to ensure that food handlers have these necessary skills and knowledge.

'Seafood handlers' are defined in the standard to mean persons who engage in, or supervise, the primary production of seafood for a seafood business. This means that persons who directly handle seafood and persons who supervise the handling of seafood must have skills and knowledge in food safety and food hygiene commensurate with the work carried out by the handlers and commensurate with the food safety risk.

A 'skill' is the ability to carry out a task and in this case means that the food handler has the ability to perform tasks, or supervise tasks, that are necessary to ensure the safety of seafood being produced by the business.

'Knowledge' is an acquaintance with facts, truths or principles. For seafood producers, food handlers must know the facts associated with seafood safety and hygiene.

The skills and knowledge must be commensurate with the work carried out by the handlers. Skills and knowledge of individual food handlers only has to extend to the responsibilities and tasks that they carry out as part of the business. A seafood handler carrying out a variety of tasks will need to have more skills and knowledge in seafood safety and seafood hygiene than a food handler whose tasks are limited. The seafood handler's skills and knowledge do not have to extend to other people's work unless they supervise that person.

The extent of the skills and knowledge is also commensurate with the food safety risk of the seafood produced by the business. For example, a fisherman catching fish in pristine waters, known to be free from pollution, would not be expected to have detailed knowledge about sources or types of pollution because the likelihood of catching seafood affected by pollution would be very low. However, the fisherman should know to look for unusual water conditions that might indicate a problem. Operators of oyster leases in areas that have been subject to pollution would be expected to have knowledge of sources and types of pollution in their area and the skills to obtain information as to whether areas are open or closed.

Seafood businesses should note that there are specific obligations in clause 13 on seafood handlers in regard to their personal health and hygiene. Also, the business must ensure, under clause 13, that seafood handlers follow these practices. Some seafood handlers may not be aware of these obligations or not have the skills to comply with the practices, for example they may not have knowledge of the symptoms of food-borne disease. Therefore, businesses should ensure that seafood handlers have skills and knowledge in this area as part of the business's obligations under clause 12.

The standard does not specify how the business must ensure that food handlers have the appropriate skills and knowledge and, therefore, businesses may choose the best option for their circumstances.

These options include:

On-the-job training

This is likely to be common practice in the seafood industry and allows the business to

tailor the training to the tasks in hand, individual learning skills and prior skills and knowledge of the food handler. Many people learn best through observation and by repeating the task or behaviour themselves. This way they demonstrate that they have the skills. In addition to observing tasks, it is helpful to explain the reasons for doing the task or observing certain behaviours because people are more likely to consistently use skills if they know why they are necessary. Businesses may also find that staff benefit from work procedures or work instructions that explain their responsibilities.

Some businesses have induction training for new staff, for example, training on prawn trawlers could include cooking times for prawns, the importance of using clean cooling water, cleaning procedures and personal hygiene practices.

Using formal training schemes

Some businesses may prefer to train staff through formal seafood training schemes such as those that meet the nationally endorsed Seafood Industry Training Package developed by Seafood Training Australia, the training arm of the Australian Seafood Industry Training Advisory Body. This training is competency-based, that is, successful participants have demonstrated their ability to apply their skills and knowledge. Information on training courses is available from Seafood Training Australia (www.seafoodtraining.com.au) and from state fishing organisations.

Assistance with training

To supplement on-the-job training and formal training, businesses could use material available from industry associations and government agencies. Some of these resources are included in the Bibliography.

Training records

It is advisable for businesses to record training received by food handlers, particularly if there are a lot of employees and employment is seasonal. This way, the business can be confident that employees are aware of their food safety and hygiene responsibilities.

Example

An aquaculture business requires all new staff to undergo initial food safety and food hygiene training, which covers the use of protective clothing, personal hygiene, what to do in the event of sickness, and methods of cleaning. The business ensures that staff carrying out particular tasks have skills and knowledge about those tasks, for example, the person who orders feed knows to check that feed is delivered to specification from suppliers approved by the business.

A record is made of all new staff and the date they completed the induction training. Specific training and the dates are noted. Copies of certificates of formal training are kept with these records.

13 Health and hygiene requirements

Seafood handlers ensure that personal hygiene and health practices are adequate to prevent contamination of seafood.

Seafood handlers who may have food-borne illness ensure that they do not contaminate seafood.

Seafood businesses ensure that seafood handlers follow personal hygiene and health practices.

The intent of this clause is to ensure that personal hygiene and health practices do not adversely affect the safety and suitability of seafood, and that seafood handlers who may be suffering from a food-borne illness, or know they are suffering from or are a carrier of a food-borne disease, do not engage in seafood handling if there is a reasonable likelihood of seafood contamination.

13(1) A seafood handler must exercise personal hygiene and health practices that are commensurate with the food safety risks and that do not adversely affect the safety or suitability of the seafood.

Seafood handlers are responsible for complying with the requirements. However, food businesses have the overall responsibility for ensuring that only safe and suitable food is sold.

'Seafood handler' is defined in clause 2 to mean a person who engages in or supervises the primary production of seafood, for a seafood business.

Personal hygiene practices

Personal hygiene practices are measures that food handlers take to avoid contaminating seafood, or surfaces likely to be in contact with seafood, on the premises. Contamination could occur from foreign objects, micro-organisms, chemicals transferred to seafood from the food handler directly or as a result of the food handler contaminating surfaces that could come into contact with seafood, or ingredients added to seafood.

Generally, these personal hygiene practices cover the following types of behaviour:

- ensuring that items from the body such as hair or items from clothing such as dirt, dust, buttons, items in pockets etc. do not contaminate food
- avoiding any unnecessary contact with seafood that is ready to eat
- ensuring that clothing is of a level of cleanliness that is appropriate for the job
- ensuring that cuts and other skin lesions are covered with dressing that prevents seepage from the wound that could contaminate seafood
- avoiding eating over unprotected food and not sneezing, blowing, coughing, spitting or smoking over unprotected food
- only urinating or defecating in a toilet, where available
- washing and drying hands whenever hands could be a source of contamination of seafood or surfaces likely to be in contact with seafood.

Health practices

Health practices are practices that the food handler follows to ensure that any illness or condition from which the food handler is suffering, or may be suffering, does not affect the safety or suitability of seafood. Examples include:

- staying away from work until well
- if at work and/or at sea:
 - reporting symptoms to the person in charge
 - wherever possible, carrying out tasks that do not involve handling seafood or fishing equipment
 - avoiding contact with other people's eating and drinking utensils, food contact surfaces and, in particular, ready-to-eat seafood
 - using medications that dry up discharges from ear, nose or eye.

Application of practices based on risk

Personal hygiene and health practices must be commensurate with the risk to food safety. This means that seafood handlers must follow practices that will prevent the contamination of seafood if there is a likelihood that contamination would occur, and would be severe enough to cause a safety issue for consumers. For example, the risk associated with handling cooked prawns on a fishing vessel is greater than handling raw prawns because bacterial pathogens contaminating raw prawns will be destroyed during cooking.

Example

A seafood handler cuts her hand and the cut becomes infected. She leaves the cut uncovered. The handler continues to handle seafood and fails to tell her supervisor of the infection. A number of people subsequently become ill after consuming seafood from the business and are diagnosed as suffering from Staphylococcus toxin food poisoning.

13(2) A seafood handler who –

- (a) **has a symptom that indicates the handler may be suffering from a food-borne disease; or**

'Food-borne disease' is defined in Standard 3.2.2 to mean a disease that is likely to be transmitted through consumption of contaminated food.

'Symptom' is defined in Standard 3.2.2 to mean diarrhoea, vomiting, sore throat with fever, fever or jaundice. These symptoms indicate that the seafood handler may be suffering from a disease that the handler could transmit by contaminating the seafood that he or she is handling. For example, common symptoms of hepatitis A are jaundice and fever with shedding of virus particles that could contaminate seafood.

These symptoms may also be symptoms of illness or conditions that are not associated with food-borne disease, for example, fever from an infection not associated with food-borne illness or vomiting during pregnancy. There is no restriction on food handlers who are suffering from these symptoms if they know they are not related to food-borne illness.

Table 4: Diseases that are likely to be transmitted by infected seafood handlers

Disease	Pathogen causing the disease
Cholera	<i>Vibrio cholerae</i> (O1 and O139)
<i>Campylobacter</i> enteritis	<i>Campylobacter jejuni</i>
Gastroenteritis	Noroviruses, <i>Vibrio parahaemolyticus</i>
Hepatitis A	Hepatitis A virus (HAV)
Listerial gastroenteritis	<i>Listeria monocytogenes</i>
Salmonellosis	Non-typhoidal <i>Salmonella</i>
Staphylococcal food poisoning	<i>Staphylococcus aureus</i>
Typhoid	<i>Salmonella typhi</i>

(b) knows he or she is suffering from a food-borne disease; or

A seafood handler may know that he or she has a food-borne disease because they have been diagnosed and tested by their medical practitioner.

(c) is a carrier of a food-borne disease;

A seafood handler may know they are a carrier because they have been diagnosed and tested by their medical practitioner. A person who is a carrier of a disease does not have symptoms but still may shed pathogenic organisms and is capable of contaminating food.

The definition of 'carrier' in Standard 3.2.2 clarifies that a carrier of a food-borne disease does not include a person who is a carrier of *Staphylococcus aureus*. A percentage of the population carry these bacteria on their skin and in their nasal passages. Staphylococcal food poisoning occurs when a cooked food has been contaminated with these bacteria and has been temperature-abused. Control is by preventing contamination and controlling temperature.

13(2) continued – must not engage in any handling of seafood where there is a reasonable likelihood of seafood contamination as a result of the disease.

If a seafood handler has one or more symptoms of food-borne illness, he or she must not engage in any handling of seafood where there is a reasonable likelihood of seafood contamination as a result of the disease. The seafood handler should tell their supervisor that they are unwell and then the supervisor can assess whether they should handle seafood.

Persons who have symptoms should seek medical attention and follow medical advice as to whether they should be at work. Generally, it would not be acceptable for a person to work when they have vomiting or diarrhoea.

Persons who know they are suffering from, or may be a carrier of, food-borne disease are restricted from handling seafood if there is a reasonable likelihood that the handling will result in contamination of the seafood. States and territories have policies in place that include restrictions on work activities to prevent transmission of diseases.

There may be tasks that seafood handlers could perform that will not result in seafood contamination, for example, transporting pre-packed seafood or administrative tasks. Each case should be assessed on its merits. If there are no activities that the person can take without a risk of food contamination it is advised that these handlers stay away from work until they are well. A person who has been excluded from work by his or her medical practitioner should follow the medical advice as to when they may return. Persons who return to work should be particular with their personal hygiene practices as they may be still excreting pathogenic micro-organisms.

13(3) A seafood business must take all reasonable measures to ensure that seafood handlers exercise personal hygiene and health practices that are commensurate with the food safety risks and that do not adversely affect the safety or suitability of the seafood.

The seafood business is responsible for ensuring that seafood handlers exercise the personal hygiene and health practices that are necessary to produce safe and suitable seafood.

The business should take measures such as:

- maintaining a personal hygiene and health policy which is explained to food handlers and which food handlers should agree to follow. It could include:
 - what to do about staff working if they report that they are unwell
 - which illnesses or conditions make a person unable to work
 - when medical clearance is required before returning to work
 - personal hygiene practices that staff are expected to follow
- documenting the policy
- keeping a diary of any staff illness.

Business should be aware that seafood handlers cannot be expected to follow practices if they receive no, or incorrect, information to justify these practices. For example, businesses should ensure that seafood handlers are aware of food-borne illness symptoms and the consequences of not reporting them.

Businesses can inform staff of their health and hygiene responsibilities in a variety of ways including:

- verbally explaining practices to staff as part of training
- maintaining a manual of practices to be read by new staff
- displaying signs and illustrations.

This should be included as part of the training discussed under clause 12.

Food handlers should take active steps to ensure that they are provided with information on acceptable personal health and hygiene practices.

The requirement is qualified by the business only having to take what are considered to be reasonable measures. What is reasonable will depend on the nature of the business and the food safety risk presented by seafood produced by the business. It is expected that a business that harvests seafood that is ready to eat would have to implement more stringent staff practices than a business producing a raw product.

Example

The following advice is provided in the SQMI Code of Practice for Handling Pilbara Trawl Fish:

Hygiene and health of crew

All crew must maintain a high standard of personal hygiene whilst handling seafood or containers used in holding seafood. This is achieved by:

- ensuring that crew are fully trained in the hygienic handling of food product
- crew thoroughly washing their hands with soap and rinsing and drying hands before handling seafood or entering the holding rooms especially after using the toilet
- prohibiting smoking, drinking and eating in the packing area, holding rooms or wherever fish are handled
- having crew with hepatitis or gastroenteritis, infectious skin conditions or other illnesses that may be transmitted to the product excluded from processing areas
- ensuring that bandages (on minor injuries) are clean and waterproof and of an easily detectable type or colour.

14 Seafood premises and equipment

The seafood business uses premises and equipment that are clean and are designed, constructed, maintained and operated so as to produce safe and suitable seafood.

The clause controls hazards from premises (including vehicles) and equipment due to:

- contamination from dirty premises and equipment
- design and construction that is inappropriate for the intended use
- inadequate or inappropriate maintenance
- faulty or inappropriate operation of premises.

Seafood businesses must ensure that seafood premises, vehicles and equipment are kept clean and are designed, constructed, maintained and operated such that the safety and suitability of the seafood will not be adversely affected.

14(1) A seafood business must ensure that seafood premises, including live seafood premises, and equipment used in the primary production of seafood are –

‘Seafood premises’ is defined in clause 2 to mean any premises including land, vehicles, parts of structures, tents, stalls and other temporary structures, vessels, pontoons, and any other place declared by the relevant authority to be premises under the Food Act, that are kept or used for the primary production or processing of seafood (exclusively or otherwise), regardless of whether the premises are owned by the proprietor, including premises used principally as a private dwelling.

The definition is very broad and is intended to include:

- fishing vessels of all types

- temporary and permanent buildings
- tents or other temporary type of structures
- land such as the land that surrounds buildings or land that contains no buildings or structures
- parts of private dwellings used for the purposes of a seafood business
- vehicles used by the business whether used as mobile seafood premises or for transporting seafood.

‘Live seafood premises’ are premises used for primary production of live seafood. This includes sea cages.

The clause also applies to equipment used by the seafood business. ‘Equipment’ is defined in Standard 3.1.1 to mean a machine, instrument, apparatus, utensil or appliance, other than a single-use item, used or intended to be used in or in connection with food handling, and includes any equipment used or intended to be used to clean food premises and equipment.

‘Food handling’ is also defined in Standard 3.1.1. The definition is inclusive and covers activities that would be carried out by a seafood business such as producing, collecting, storing and transporting.

‘Equipment’ may be at the premises, on a vehicle, on a fishing vessel or at some other place that is not the premises of the business. Examples include nets and other fishing gear, pots, tubs and other containers, live fish tanks and aquaculture ponds. The term also includes equipment used by the business to clean the premises, vehicle or fishing vessel, or equipment.

(a) so far as is reasonably necessary, kept clean; and

The business must keep premises and equipment clean. ‘Clean’ is defined in Standard 3.1.1 to mean clean to touch and free of extraneous visible matter and objectionable odour.

The business must ensure that there is no matter on the premises or equipment that could contaminate seafood or encourage pests on the premises such as food waste, garbage and recyclable material except in containers for those purposes; dirt; grease or oil; or any other visible matter. The premises and equipment must feel clean, that is, not feel greasy or oily, and must not have any objectionable smell.

In order to comply with paragraph 14(1)(a) above, a business must comply with Division 5 – **Cleaning, sanitising and maintenance** of Standard 3.2.2 *Food Safety Practices and General Requirements* or a set of requirements recognised by the authority.

The business has to keep premises and equipment clean only as far as reasonably necessary to ensure the safety and suitability of seafood. Grounds for requiring a business to clean premises or equipment should be supported by evidence that food safety or suitability are being compromised by the state of the premises or equipment. For example, an editorial note refers to fishing nets and oyster racks, which by nature are not kept as ‘clean’ as containers used to store fish.

Cleaning programs

Clause 3 requires the business to implement controls for food safety hazards. A documented cleaning program would help to show that the business is controlling hazards from dirty premises and equipment.

A cleaning program is a system that the business has in place to ensure that premises and equipment are cleaned at the appropriate times and using the appropriate chemicals and cleaning equipment.

Cleaning programs should include:

- frequency of cleaning premises and equipment
- cleaning equipment, chemicals and methods to be used
- personnel responsible for the various cleaning tasks
- records to indicate that cleaning was carried out
- who to report any problems to.

It is preferable to write out the cleaning program so that it is available for all staff. This ensures no jobs are missed and all the staff can share the tasks. For businesses with a small amount of equipment or small number of staff, a checklist of all jobs to be done, and when, should be adequate.

Table 5: Example cleaning program (based on ISO Best practice manual: harvest, processing and transport of farmed prawns, 1997)

Equipment	Equipment, chemicals and method	Who is responsible	Frequency
Grading machine for farmed prawns	At the end of processing the machine is cleaned and sanitised as follows: <ul style="list-style-type: none"> • Dry clean to remove all scraps and prawns. • Place plastic bag over the electrics of grader. • Hose with cold water to remove as much soil as possible and to thoroughly wet all surfaces. • Foam detergent slurry over the equipment using a chlorinated alkali detergent. • Hose off with cold water and allow to drain. 	Joe Smith	At end of processing

Businesses can obtain advice on cleaning from industry guidelines. For example:

Table 6: Examples of advice in industry guidelines

Type of premises/vessel	Advice	Source
Finfish vessels— before fishing	Make sure that surfaces that come into contact with fish, such as benches and equipment, are cleaned and sanitised properly. Do this on the way to the fishing grounds with potable water or clean seawater sourced once you have left the harbour. This will enable you to remove anything that may have contaminated equipment while at the wharf.	<i>The Western Australian quality finfish guide</i> , WA Seafood Quality Management Initiative.

Continued

Table 6 (continued): Examples of advice in industry guidelines

Type of premises/vessel	Advice	Source
Finfish vessels— on completion of fishing	<p>Hose all surfaces with clean seawater, ensuring that all local laws regarding pollution are abided by.</p> <p>Use a detergent and sanitiser to scrub and clean all surfaces, such as deck to control rust.</p> <p>Where possible, rinse with clean seawater/freshwater and allow to dry in the sun.</p> <p>Do not use the same pump for draining the bilge when hosing down and washing the fish rooms.</p> <p>Ensure the remainder of the vessel, including toilets, shower and wash basins, is clean.</p>	<p><i>Eastern Tuna and Billfish Fishery: Industry Code of Practice for Responsible Fishing,</i> Jusseit & Robinson, East Coast Tuna Boat Owners Association Inc.</p>
Seafood transport vehicles	<p>Areas used to carry foods in food vehicles should be cleaned after each use (for example daily) and any spills should be cleaned as soon as practicable.</p>	<p><i>Seaqual's food safety guidelines for aquaculture,</i> Seafood Services Australia.</p>

(b) designed, constructed, maintained and operated;

such that the safety or suitability of the seafood will not be adversely affected.

Design and construction

The business must ensure that seafood premises, including live seafood premises, and equipment are designed and constructed in a way that will not adversely affect the safety and suitability of the seafood.

The intent of this requirement is to ensure that premises and equipment are:

- appropriate for the primary seafood production operations which take place on the premises
- constructed of materials that are fit for the purpose, will not contaminate seafood, and are as easy as possible to clean and keep clean.

To comply with this requirement, businesses are required by subclause 14(2) to comply with Standard 3.2.3 *Food Premises and Equipment* or a set of requirements recognised by the authority.

In enforcing the requirement, the design and construction requirements must be such that the safety and suitability of the seafood will not be adversely affected. Therefore, the grounds for requiring a business to provide a particular piece of equipment or alter premises, or for other design and construction requirements, must be supported by food safety and suitability reasons based on the products handled by the business, the food-handling operations that take place on the premises and potential hazards to consumers.

Businesses that use the same premises for export and domestic production will need to comply with requirements for premises, vessels and equipment in the Export Control Orders. Compliance with those orders would indicate compliance with this standard.

Appropriate for primary production operations

The business must provide, to the extent that is reasonable and practicable for the type of seafood operation:

- sufficient space for seafood handling separated from any living quarters
- appropriate equipment and facilities, including facilities for cleaning and personal hygiene, seafood storage and seafood processing equipment
- an adequate supply of water
- effective waste disposal
- sufficient lighting and ventilation.

Safety of water, particularly water in contact with seafood or used to make ice and ice slurries, is a particular concern. Hazards include the presence of pathogens; bacteria including *Vibrio* spp. and viruses, and chemical contaminants. The term 'an adequate supply of water' is defined in Standard 3.2.2 to mean potable water that is available at a volume, pressure and temperature that is adequate for the purposes for which the water is used.

Seafood businesses at sea or in remote areas may be limited in the amount of potable water that is available and therefore may use clean seawater for a range of uses including chilling cooked product such as prawns. Because businesses are required to comply with Standard 3.2.3 *Food Premises and Equipment*, please refer to text on potable water under paragraph 14(2)(a).

The Codex Draft Code of Practice for Fish and Fishery Products allows 'clean water' to be used instead of potable water and defines 'clean water' as water that is from any source where harmful microbiological contamination, substances and/or toxic plankton are not present in such quantities as may affect the health quality of fish, shellfish and their products.

Advice on practices to ensure that seawater is clean is available in government and industry guidelines, for example *Safe and hygienic practices for cooking prawns on trawlers*. These practices include:

- drawing water out at sea, thereby avoiding water from close to shore which may be contaminated by land runoff, sewage or waste water
- drawing from waterways with good tidal flow
- using indicators of pollution such as checking salinity—drops from normal levels for the area may indicate pollution
- checking that the waters are not closed for reasons associated with the health and safety of seafood
- ensuring that pumps are only used for that purpose and are not contaminated by other uses
- ensuring that water storage tanks are kept clean and covered to prevent entry of vermin or dirt.

The business must also ensure that design and construction:

- excludes dirt, dust, fumes, smoke and other contaminants
- does not provide harbourage for pests and prevents access by other animals such as dogs.

Parts of the vessel where seafood is handled or stored should be separated from areas containing propulsion machinery and fuel to avoid contamination.

Constructed of suitable materials

The business must ensure that premises and equipment are made of materials that do not transmit toxic substances to seafood.

Where possible, materials for the premises, including vessels, should be non-absorbent, smooth and able to withstand frequent vigorous cleaning. This will enable the premises and equipment to be cleaned and kept clean, and reduce opportunities for seafood contamination.

As this is not always practicable on vessels, particular attention must be given to seafood handling and storage areas.

If possible, the design of these areas should be simple and avoid inaccessible places and cracks or crevices where debris can lodge or vermin find harbourage. They should be well-drained to ensure that water does not pond and pose a contamination risk.

Smooth-surfaced, non-absorbent, rot- and corrosion-resistant construction material such as GRP (glass-reinforced plastic—fibreglass) or marine-grade aluminium are recommended but, where impractical or unavailable, timber or steel construction is adequate if treated with materials non-toxic to food, and in good condition.

Although not within the scope of this standard, decks etc. should be non-slip where possible.

Example

To comply with this requirement, small fishing boats that spend only a few hours fishing and where there is minimal gutting or filleting on board should meet minimal requirements, for example, the boat should be made of materials that can be cleaned, and be designed and constructed as far as practicable so that it can be kept free of accumulations of dirt and waste.

There should be clean washable containers on board to store ice and fish.

Maintenance and operation

The seafood business must ensure that seafood premises, including fishing vessels and live seafood premises, and equipment used in the primary production of seafood are maintained and operated in a way that will not adversely affect the safety and suitability of the seafood. The business must comply with Division 5 of Standard 3.2.2 *Food Safety Practices and General Requirements*, which requires food premises, fixtures, fittings and equipment, and those parts of vehicles used to transport food, to be maintained in a good state of repair and working order having regard to their use. Alternatively, they may comply with a set of requirements recognised by the authority.

The intention is that the business implements a maintenance program in a similar way to that described for a cleaning program. This would satisfy the requirement in clause 3 to control hazards that arise from contamination of food from poorly maintained premises,

including vehicles, and equipment. The maintenance program should include routine maintenance and what to do in the event of a breakdown of equipment that is critical to maintaining seafood safety or suitability, for example, action to take when the freezer or coolroom breaks down.

The business should also ensure that staff know and understand operating requirements for the premises and equipment that affect the safety and suitability of seafood. Note that businesses are required under clause 12 to ensure that all food handlers and supervisors have appropriate skills and knowledge.

Codes of practice and guidelines

Codes of practice and guidelines produced by government contain advice on design, construction, maintenance and operation of premises, fishing vessels and vehicles to achieve the above outcomes. For example, the NSWFA *Code of Practice for Seafood Handling Premises* contains advice on design and construction for specified seafood handling premises; the NSWFA *Code of Practice for the Transport of Primary Produce and Seafood* advises on transport vehicles and the *Australian Shellfish Quality Assurance Program operations manual* contains requirements for vessels and equipment on vessels handling shellfish. Industry association guidelines may also assist, for example, Seaqual's food safety guidelines list key features of premises for ease of cleaning and to minimise contamination.

14(2) For the purposes of subclause (1), a seafood business must comply with –

(a) Division 5 of Standard 3.2.2 and Standard 3.2.3 of this Code; or

Seafood businesses must comply with the requirements of Division 5 – **Cleaning, sanitising and maintenance** of Standard 3.2.2 *Food Safety Practices and General Requirements* and with the requirements of Standard 3.2.3 *Food Premises and Equipment*. Alternatively, the business can comply with a set of requirements recognised by the authority under paragraph 2(b) of Standard 4.2.1. These requirements are discussed below.

The requirements of Standard 3.2.2 and Standard 3.2.3 and a comprehensive guide to their interpretation are available in *Safe food Australia*.

Division 5 – Cleaning, sanitising and maintenance of Standard 3.2.2

The Division requires:

- premises, equipment and those parts of vehicles that are used to transport food to be maintained in an acceptable standard of cleanliness
- specific equipment to be clean and sanitised to prevent transmission of infectious disease
- premises, equipment and vehicles to be maintained in a good state of repair and working order, having regard to their use.

The requirements in Division 5 are stated as outcomes, and businesses and authorities should find that they accommodate degrees of compliance appropriate to different activities on land and on fishing vessels.

Standard 3.2.3

Standard 3.2.3 sets out requirements for premises, equipment and transport vehicles. The objective of the standard is to ensure that:

- the layout of the premises minimises opportunities for food contamination
- food premises, equipment and transport vehicles are designed and constructed to be cleaned and, where necessary, sanitised
- the premises are provided with services of water, waste disposal, light, ventilation, cleaning and personal hygiene facilities, storage space and access to toilets.

Most of the requirements are stated as outcomes, for example, clause 11 requires walls and ceilings to be provided where they are necessary to protect food from contamination and, where provided, they must be designed and constructed in a way that is appropriate for the activities conducted on the premises.

The drafting of Standard 3.2.3 enables a practical approach to be taken in applying the standard to a wide range of types of premises used by seafood businesses, for example existing premises, temporary premises and 'mobile' premises such as fishing vessels where space, weight and self-sufficiency in terms of water and waste disposal are important. Further flexibility is provided to authorities under paragraph 2(b).

Clause 4 of Standard 3.2.3 requires a seafood business to use potable water for all activities that are conducted on the premises and permits the business to use non-potable water only if it can demonstrate that the use of non-potable water for a purpose will not adversely affect the safety of food. 'Potable water' is defined as water that is acceptable for human consumption (Standard 3.2.3). Therefore businesses are obliged to provide evidence that the use of non-potable water will not affect safety. Providing evidence may be problematic in sectors where seawater has a traditional use and enforcement agencies may need to address this under paragraph 2(b). Enforcement agencies are encouraged to promote the use of potable water and to ensure that businesses use clean seawater where there is no potable alternative.

Where requirements of Standard 3.2.3 are prescriptive, for example, the provision of hand washing facilities, which may be impractical in certain circumstances, an exemption may be available in the clause (for temporary premises or private dwellings) or the authority can recognise requirements under paragraph 2(b).

(b) a set of requirements recognised by the Authority.

Under this paragraph the authority has the mechanism to agree to alternative requirements to Division 5 of Standard 3.2.2 and Standard 3.2.3 for complying with subclause 14(1). These alternative requirements must achieve the outcomes of subclause (1).

Note that in this subclause, 'authority' is defined in Standard 1.1.1 as the authority with responsibility for enforcing the Code.

Division 3 – Specific requirements for bivalve molluscs

Division 3 applies only to seafood businesses that are primary producers, including processors, or manufacturers of bivalve molluscs.

'Manufacturing of seafood' is defined in clause 2 to mean the canning, smoking or crumbing of seafood or the addition of other food to seafood, and other like activities.

The intent of the Division is to provide controls in addition to those in Divisions 1 and 2 on primary production, processing and manufacturing of bivalve molluscs. Also, state and territory programs to manage shellfish include restrictions on seafood businesses such as requiring licences to harvest and permits to relay. Information on these, and other obligations on seafood businesses that relay or carry out depuration, should be obtained from the contacts given in the Contacts section.

15 Interpretation

Terms are defined. In the absence of a definition, the definition in *The Macquarie dictionary* (latest edition) should be used.

This clause includes definitions applicable to this Division only and is intended to ensure accurate interpretation of the requirements in the Division. Definitions that apply to all Divisions are in clause 2. Note that, unless the contrary intention appears, the definitions in Chapter 3 apply for the purposes of this Division.

15 In this Division –

Term	Definition	Reference in Division 3
approved	means approved by the Authority.	The term is used in the Schedule in relation to approval by the authority of areas that are undergoing classification for harvesting bivalve molluscs. 'Authority' is defined overleaf.
area	means an area where bivalve molluscs are grown or harvested.	These areas are usually a marine or enclosed body of water such as a bay, harbour, gulf, cove, lagoon, inlet, estuary or river where commercial species of bivalve molluscs grow naturally or are grown by aquaculture. The term is used in the Schedule and in the definition of 'growing on', 'relaying' and 'wet storage'.

Term	Definition	Reference in Division 3
ASQAP Manual	means the Australian Shellfish Quality Assurance Program Operations Manual – Version 3 of 2002.	<p>The <i>Australian Shellfish Quality Assurance Program operations manual</i> is developed by the Australian Shellfish Quality Assurance Advisory Committee as a reference document for Australian government and state and territory government agencies involved in implementing the Australian Shellfish Quality Assurance Program for bivalve molluscs commercially harvested for human consumption from Australian waters.</p> <p>The manual contains procedures and guidelines to use when applying Australian and state and territory legislation, which controls shellfish growing areas and harvesting, processing and distribution of shellfish.</p> <p>Revision of the manual is made from time to time to reflect changes, including in scientific knowledge, shellfish culture techniques and processing technology. It is available on the Internet at www.pir.sa.gov.au/ASQAP_MANUAL.</p>
Authority	means the State, Territory or Commonwealth government agency or agencies having the legal authority to implement and enforce this Division.	<p>The agency (or agencies) responsible for the enforcement of the requirements of this Division may differ in each jurisdiction. Information on enforcement in a particular state or territory is available from the contacts listed in the Contacts section.</p>
batch	means a quantity of bivalve molluscs which is harvested, depurated or handled from the same lease number and with the same harvest date.	<p>The term is defined for the purposes of clause 17 to indicate which bivalve molluscs must be separated from other bivalve molluscs. A note in regard to wild-caught molluscs is included under clause 17.</p>

Term	Definition	Reference in Division 3
bivalve molluscs	include cockles, clams, mussels, oysters, pipis and scallops intended for human consumption, but excludes scallops and pearl oysters, where the only part of the product consumed is the adductor muscle, and spat.	<p>This definition has been included to define the types of bivalve molluscs that are included in the scope of Division 3.</p> <p>The intent is to include only the bivalve molluscs that are higher risk because they are filter feeders and are eaten with viscera and other organs intact. To avoid doubt as to the types of bivalves that are included in the Division, oysters, clams, scallops, pipis and mussels are specifically mentioned.</p> <p>Not all bivalve molluscs are higher risk and three types have been specifically excluded: spat and those scallops and Pearl Oysters where the only part eaten is the adductor muscle.</p> <p>‘Spat’ is defined and means juvenile bivalve molluscs taken for the sole purpose of growing on. ‘Growing on’ is also defined and is discussed below. Spat are excluded from the requirements of the Division unless they are intended for human consumption.</p> <p>Scallops and Pearl Oysters, where the only part eaten is the adductor muscle, are excluded because the risk of food-borne illness from molluscs where viscera and other organs are not eaten is significantly reduced. Scallops with roe on, intended for human consumption, are included in the scope of this Division.</p> <p>Division 3 does not apply to other types of molluscs such as abalone, a gastropod mollusc, or octopus and squid, which are examples of cephalopod molluscs. These types of molluscs are not considered high risk compared with bivalve molluscs.</p>
growing on	means the process where juvenile bivalve molluscs are translocated to a classified area for a sufficient period to enable their development prior to sale.	For example, oyster production depends on growing commercial-sized oysters from spat naturally available or produced by hatcheries. Spat are transferred from the hatcheries to aquaculture sites where they are grown to a marketable size. This practice is termed ‘growing on’. The term is only used in the definition of ‘spat’.

Term	Definition	Reference in Division 3
relaying	means the transfer of bivalve molluscs from one area to another for the reduction of contaminants in the bivalve molluscs.	<p>Bivalve molluscs that are harvested from areas where pollution is an actual or potential risk have the potential to be contaminated. The likelihood of contamination may be minimised by moving the bivalve molluscs to uncontaminated water so that a process of natural purification can take place. This purification is specifically intended to reduce the number of pathogenic organisms that may be present in the shellfish harvested from moderately polluted waters to levels that make the shellfish safe for consumption without further processing.</p> <p>Purification can take place in either a natural, clean environment or in a controlled environment, for example, a land-based plant designed and constructed specifically for that purpose. The term 'depuration' refers to purification in a land-based plant and 'relaying' to purification in the natural environment.</p> <p>'Relaying' is referred to in the Schedule.</p>
spat	means juvenile bivalve molluscs taken for the sole purpose of growing on.	An editorial note clarifies that if spat are harvested for human consumption the product falls within the definition of bivalve molluscs and the requirements of this Division apply.
wet storage	means the temporary storage of bivalve molluscs from an area in containers or tanks containing natural or artificial seawater for purposes other than depuration.	'Wet storage' refers to the holding of bivalve molluscs after harvest or after depuration until preparation for distribution, to remove sand from the shellfish or to add salt. It is referred to in the Schedule.

16 Food safety management systems for bivalve molluscs

The seafood business manages food safety hazards in bivalve molluscs by implementing a food safety management system that includes controls to ensure that waters used for harvesting and wet storage are safe.

The intent of the clause is to manage the higher risk presented by bivalve molluscs by requiring businesses to:

- control the safety of bivalves at all stages of production up to the back door of retail by implementing a food safety management system that effectively controls hazards that potentially could adversely affect the safety of the bivalve molluscs handled by the business
- document the food safety management system.

The drafting acknowledges that there are alternative food safety management systems that are effective in controlling hazards.

16(1) A seafood business that engages in the primary production or processing of, or manufacturing activities concerning, bivalve molluscs must implement a documented food safety management system that effectively controls the hazards.

Seafood businesses that are primary producers, including processors and manufacturers, of bivalve molluscs must implement a system to control the safety of bivalve molluscs harvested and handled by the business.

‘Manufacturing of seafood’ is defined in clause 2 to mean the canning, smoking or crumbing of seafood, or the addition of other food to seafood and other like activities.

The requirement does not apply to activities such as shucking oysters that are part of retail activities (including food service at restaurants, cafes and similar) or to producers of spat.

An editorial note states that ‘hazard’ is defined in Standard 3.1.1 as a biological, chemical or physical agent in, or condition of, food that has the potential to cause an adverse health effect in humans. The food safety management system may also be used to manage suitability issues. The editorial note also mentions that subclause 1(2) exempts retail sale activities from the standard.

Food safety management systems

‘Food safety management system’ is not defined. However, the system must be capable of controlling hazards and consequently should include the identification of hazards and where they are to be controlled. The ‘taken to comply’ requirements in subclause (2) provide guidance on the scope of the system. Based on subclause (2), the system should include, as a minimum, the following elements as relevant to the specific handling activities of the business:

- identification of all potential hazards that may reasonably be expected to occur in the harvest, subsequent handling and manufacturing steps. (The business may establish that there are no potential food safety hazards associated with a particular step.)

- identification of where in the harvest, handling and manufacturing steps each of these hazards is controlled
- program controls to prevent, eliminate or reduce the potential hazards to acceptable levels (how the business controls the hazard)
- a program for monitoring controls to ensure they are in place and working
- corrective actions to take if monitoring indicates that the hazard is not under control, that is, is not within limits set by the business to separate acceptable product from unacceptable product
- a program for the review of the food safety management system to ensure that it is effective in controlling the hazards, it is being implemented by the business and changes are made to ensure the system continues to maintain the safety of seafood handled by the business
- a record-keeping system, including sample record sheets and records completed since the previous audit, so that the business is confident that its system is working correctly and can demonstrate this to an auditor or to the authority.

Subject to clause 16(3), the controls must include the conditions in the Schedule for water used for harvesting bivalve molluscs and for their temporary wet storage.

Compliance with clause 16 is compliance with clause 3 as clause 3 requires all seafood businesses to identify and control potential food safety hazards.

Documenting the system

The system must be documented, that is, it must be described in a written document, either hard copy or electronically.

This poses an additional requirement on producers of bivalve molluscs compared with the obligation under clause 3 of this standard. This is warranted by the higher risk posed by this type of seafood.

In addition to documenting the actions in the above dot points, the business should document the following to help demonstrate that all hazards have been identified and controlled and there is a system in place to manage food safety:

- the organisational structure of the business, indicating which staff members have responsibility for food safety matters including traceability

This will help ensure that staff are aware of their responsibilities, assist in identifying who should have food safety skills and knowledge, and assist internal and external audits (or reviews).

- a description of the products handled by or produced by the business and their intended use

This identifies the products that are within the scope of the food safety management system. Only bivalve mollusc products must be included. Products that are intended for specific groups of consumers may present different hazards.

- a list of suppliers and companies that are supplied with the product
Records of immediate suppliers and immediate recipients are required under clause 11 and should form part of the food safety management system. It will assist with recalls and tracing the source of any food safety problems.
- a floor plan of the premises
This assists in identifying any hazards that arise from product, staff and airflow through the premises. It may also identify cross-contamination hazards from equipment. It assists the auditor and may reduce audit costs.
- a flowchart of processes
An accurate flowchart of all food-handling operations and inputs is important because it enables the business to systematically identify hazards at each step of production.
- support programs
Support programs, such as personal hygiene programs, cleaning programs and pest control programs, control hazards at several food handling/processing steps. Where they control a specified hazard they should be listed as the control measure, for example in the hazard audit table. As it would be repetitive to include the details of the program each time the program is mentioned, these details should be included separately in the food safety management system document.

Documents can be maintained in electronic format under the *Commonwealth Electronic Transaction Act 1999* and state and territory mirror legislation.

16(2) A seafood business is taken to comply with subclause (1) if it implements –

Seafood businesses that have one of the following in place are taken to meet the requirements of subclause (1).

(a) a food safety program set out in Standard 3.2.1; or

Standard 3.2.1 *Food Safety Programs* defines a food safety program to mean one that satisfies clause 5 of Standard 3.2.1. Clause 5 states that a food safety program must:

- (a) systematically identify the potential hazards that may be reasonably expected to occur in all food-handling operations of the food business
- (b) identify where, in a food-handling operation, each hazard identified under paragraph (a) can be controlled, and the means of control
- (c) provide for the systematic monitoring of those controls
- (d) provide for appropriate corrective action when that hazard, or each of those hazards, is found not to be under control
- (e) provide for the regular review of the program by the food business to ensure its adequacy
- (f) provide for appropriate records to be made and kept by the food business demonstrating action taken in relation to, or in compliance with, the food safety program.

A guide to Standard 3.2.1 is planned for publication on the FSANZ website in 2006.

(b) a food safety management system set out in the Commonwealth Export Control (Processed Food) Orders; or

Under Australian government requirements for the export of bivalve molluscs, export businesses must have in place approved arrangements to control the safety of product intended for export. These arrangements are approved and audited by the Australian Quarantine and Inspection Service (AQIS) of the Australian Government Department of Agriculture, Fisheries and Forestry. Information on the Orders is available on the Quarantine and Export Services page of the Department of Agriculture, Fisheries and Forestry's website at www.daff.gov.au.

Seafood businesses that have these food safety management systems in place for export of bivalve molluscs are deemed to comply with subclause (1).

(c) the Codex Alimentarius Hazard Analysis and Critical Control Point System (HACCP) for food safety management set out in Annex C to CAC/RCP 1-1969, revision 4 (2003); or

The first section of Annex C sets out the principles of the Hazard Analysis and Critical Control Point system adopted by the Codex Alimentarius Commission. The second section provides general guidance for its application while recognising that details of application may vary depending on the circumstances of the food operation. The guidelines are available on the website of Codex Alimentarius at www.codexalimentarius.net.

(d) any other Hazard Analysis and Critical Control Point (HACCP) based food safety management system recognised by the Authority.

The subclause allows a business to use a HACCP food safety management system that is 'recognised' by the authority. Producers of bivalve molluscs in some states including New South Wales and Victoria must already have food safety management systems in place under state regulations.

Systems 'recognised' under this subclause are meeting the outcomes of subclause (1), that is, they are effectively controlling the hazards.

Example

In New South Wales, the Food Production (Seafood Safety Scheme) Regulation 2001 requires seafood businesses to have in place food safety programs certified by the NSW Food Authority. To grant certification, the program must comply with Standard 3.2.1 Food Safety Programs in the Food Standards Code. Businesses with certification are deemed to meet the requirements for a food safety management system.

16(3) For the purposes of subclause (1), a seafood business must comply with –

(a) the conditions of the ASQAP Manual specified in the Schedule to this Standard; or

Where a business carries out the activities listed in the schedule it must include compliance with the conditions in the Schedule in its food safety management system. These activities are:

- harvesting for sale without depuration or relaying

- harvesting for depuration or relaying
- temporarily placing bivalves in wet storage after harvest.

Appendix 1 contains the Schedule and a summary of the requirements. Standard 4.2.1 would require amendment if there were changes to the ASQAP Manual that need to be reflected in the standard.

(b) conditions recognised by the Authority.

As an alternative to meeting subclause (1), that is, complying with the conditions in the Schedule, a business may comply with conditions recognised by the authority. The intention is to allow flexibility, provided that the outcome of subclause (1) is met, that is, the food safety management system is effectively controlling the hazards.

State and territory agencies that enforce the requirements of the ASQAP develop their own procedural manuals based on the ASQAP Manual or may have alternative conditions prescribed in legislation or guidelines, for example, the *NSW Shellfish operations manual*. Advice on recognised conditions is available from the relevant enforcement agencies.

An editorial note clarifies that the ASQAP Manual is the national guideline for managing risks in the harvesting, relaying, depuration and wet storage of shellfish and it is maintained by the Australian Shellfish Quality Assurance Advisory Committee. The note clarifies that the classification of areas is the responsibility of state shellfish control agencies. Also, it states that 'HACCP' has a technical meaning commonly understood by the food production and manufacturing industry.

17 Co-mingling of bivalve molluscs

The seafood business separates different batches of bivalve molluscs to aid traceability.

17 A seafood business must ensure that each batch of bivalve molluscs harvested must be separated in a manner that prevents co-mingling of batches.

Businesses sometimes mix batches, for example, for washing or to ensure correct weights or numbers in a container. In the event of a food safety problem this makes it difficult to identify the origin of the shellfish. This clause prohibits these practices.

The intent is to enable the business to trace each batch of bivalve molluscs. The business is required by clause 11 to maintain sufficient written records to enable trace-forward and trace-back of seafood. The increased food safety risk from bivalve molluscs warrants a specific requirement in this clause that enables the seafood business to be able to trace each batch.

'Batch' is defined to mean a quantity of bivalve molluscs which is harvested, depurated or handled from the same lease number and with the same harvest date. The reference to the lease number is to indicate that bivalves may have been harvested from different locations. Lease numbers are unique to the lease and are assigned by state departments of fisheries or their equivalents.

For bivalves harvested from different areas which have no lease numbers (wild catch), the intent is that these bivalves are kept separate from one another in the same way as if a lease number was attached to the location.

Appendixes

Appendix 1

Harvesting and wet storage requirements for bivalve molluscs

Bivalves pose a higher relative risk to public health when harvested from growing environments likely to be exposed to faecal contamination and/or not under a shellfish safety management scheme. Therefore, seafood businesses that are harvesting and/or temporarily placing bivalve molluscs in wet storage after harvest must comply with measures to prevent the growing and harvesting of bivalves from waters made unsuitable by the presence of biological or chemical hazards at levels likely to present a public health risk.

Clause 16(3)(a) achieves this by requiring seafood businesses that are producers, processors or manufacturers of bivalve molluscs to comply with conditions of the Australian Shellfish Quality Assurance Program specified in the Schedule.

Appendix 1 includes the Schedule and explanation of its requirements. Amendments to the Schedule, if required as a result of changes to the ASQAP Manual, would be made following processes in the *Food Standards Australia New Zealand Act 1991*.

Schedule – ASQAP Manual conditions

Column 1 Activities	Column 2 Conditions
<p>Activity 1 Harvesting</p>	<p>The area –</p> <ul style="list-style-type: none"> (a) has been classified by the Authority as – <ul style="list-style-type: none"> (i) approved: or (ii) conditionally approved; or (iii) approved as remote; or (iv) offshore; and (b) is subject to a Marine Bio-toxin Management Plan; and (c) has an open status; or (d) is undergoing classification and is approved by the Authority subject to conditions, if any, specified by the Authority.
<p>Activity 2 Harvesting for depuration or relaying</p>	<p>The area –</p> <ul style="list-style-type: none"> (a) has been classified by the Authority as – <ul style="list-style-type: none"> (i) approved: or (ii) conditionally approved; or (iii) approved as remote; or (iv) restricted; or (v) conditionally restricted; and (b) is subject to a Marine Bio-toxin Management Plan; and (c) has an open status for the purposes of depuration or relaying; or (d) is undergoing classification and is approved by the Authority subject to conditions, if any, specified by the Authority.
<p>Activity 3 Post-harvest temporary wet storage</p>	<p>The water used must be –</p> <ul style="list-style-type: none"> (a) sourced from an area that satisfies the conditions for Activity 1 (other than Condition (d)); or (b) of a quality that will not adversely affect the safety and suitability of the bivalve molluscs; and (c) effectively disinfected or maintained during the course of the wet storage in such a way that it continues to satisfy the conditions for Activity 1 (other than Condition (d)).

Activity 1 – Harvesting bivalve molluscs

The intent is to ensure that bivalve molluscs that are intended for sale without undergoing depuration or relaying are harvested from only harvest or growing areas that have been assessed as suitable for growing or harvesting. These areas are:

- approved
- conditionally approved
- approved as remote
- offshore.

The purpose of classifying the areas is to assign harvesting controls that ensure the safety of shellfish from that area.

Classification is the responsibility of the state, territory or Australian government authorities that have the legal authority to implement and enforce the requirements for bivalve molluscs in the standard. In some jurisdictions there may be more than one agency involved.

Some authorities maintain a current list of all harvesting areas in their state. Contact the government departments listed in the Contacts section of this guide for information.

‘Approved’ areas are areas that the authority has determined through a sanitary survey are not subject to contamination from human or animal faecal matter at levels that present an actual or potential public health hazard. The authority has also determined that these areas are not otherwise subject to contamination from pathogenic organisms, poisonous or deleterious substances and/or biotoxins exceeding relevant standards specified in the manual. These specific criteria for approved classification are in clauses 15.2–15.4 of the ASQAP Manual.

‘Conditionally approved’ areas are harvesting areas that would otherwise meet the criteria for ‘approved’ classification but may be subject to intermittent pollution caused by events such as failure of a waste water treatment plant, flooding of a major river, rainfall that causes a runoff of pollutants, seasonal increases in the population, or increases in use of waterways or harbours. If the events that may result in intermittent potential sources of pollution can be predicted then the area may be classified as conditionally approved. The authority must develop a written management plan for the area, which meets criteria specified in the manual.

Areas ‘approved as remote’ satisfy three criteria:

- a sanitary survey determines that there are no human inhabitants in the area and the area is not affected or likely to be affected by pollution
- the area meets the approved classification criteria
- the area continues to comply with all sanitary survey requirements as prescribed in the manual.

The principles behind classifying a harvest area as ‘offshore’ is that the area is sufficiently distant from land that the shellfish are not exposed to pollutants. Maritime legislation prescribes 3 nautical miles (5.55 km) as the boundary for ‘coastal waters’. On this basis and as a ‘rule of thumb’, the manual states that a sufficient distance from nearest land is 3 nautical miles. However, the area must not be adversely affected by sources of significant

pollution such as offshore sewage or industrial waste outfalls, by pollutants carried by tides or currents, or by any other meteorological or other conditions.

For harvesting, the area must, in addition to being classified as above, have a marine biotoxin management plan in place. Sources of information on each state bio-toxin management plan are listed in the Contacts section.

The status of a harvesting area is separate and distinct from its classification and an area may be either open or closed for the harvesting of shellstock.

The authority may close any harvesting area for a limited or temporary period because shellstock may be unsafe. Areas may be closed because of a pollution emergency, levels of biotoxin that are a risk to public health, phytoplankton counts exceed trigger levels, or other information on the adverse public health risk from consuming shellfish from that area indicates that the area should be closed.

Some areas may be undergoing classification. Where the classification of the area has not been completed, harvest of shellfish for human consumption may be conducted under specified circumstances as directed by the authority. The authority may have established an interim management plan to apply until the classification is completed.

The authority ensures that boundaries of harvesting areas are charted, described by geographic information system coordinates and marked by fixed objects or landmarks sufficient to allow successful prosecution of any illegal commercial harvesting activity. In addition, growers/harvesters must be notified of the boundaries by dissemination of information with licences, through publications or by direct notification.

Activity 2 – Harvesting for depuration or relaying

The intent is to ensure that bivalve molluscs are only harvested from areas where the levels of any pollution are so low that depuration or relaying will effectively reduce contaminants to safe levels.

Depuration and relaying are not effective in removing contaminants introduced from heavily polluted areas or to reduce levels of toxic substances that have accumulated over the lifetime of the shellfish. However, depuration is reasonably efficient at reducing the load of enteric bacteria in oysters, but is significantly less effective in reducing the levels of viruses. Depuration is also not particularly effective at reducing levels of chemicals and algal biotoxins. Therefore, water at harvesting sites must be of adequate quality to enable depuration to be effective.

Guidelines on effective operation of depuration plants is available in codes of practice, for example Code of Practice for Depuration of NSW Oysters, Appendix VII, *NSW Shellfish Program operations manual*, NSWFA, 2001.

Harvesting for depuration or relaying may take place in areas that have been classified by the authority as:

- approved
- conditionally approved
- approved as remote
- restricted
- conditionally restricted.

The first three classifications are the same as those approved for harvesting of bivalve molluscs for direct sale (that is, without depuration or relaying).

'Restricted' areas are subject to a limited degree of pollution and bivalve molluscs can be made safe if subjected to depuration or relaying.

'Conditionally restricted' areas meet the 'restricted' criteria for a predictable period only, not for the whole season. The period depends on meeting acceptable performance standards specified in the management plan for the area.

As with Activity 1, the area must have an open status for the purposes of depuration or relaying; or is undergoing classification and is approved by the authority, subject to conditions, if any, specified by the relevant authority.

The seafood business may only harvest from areas that have open status for relaying and depuration or from areas undergoing classification that are approved by the authority.

Activity 3 – Post-harvest temporary wet storage

This provision in the Schedule ensures that water used for wet storage of bivalve molluscs after harvest, relaying or depuration does not contaminate the molluscs.

The purpose of wet storage is to store, condition, remove sand or add salt to shellfish before they are prepared for distribution.

'Wet storage' is defined for the purposes of the clause to mean temporary storage in containers or tanks containing natural or artificial seawater, and specifically excludes such storage for the purposes of depuration.

The term 'temporary storage' is to clarify that the requirement is not referring to water used for growing on or relaying.

The seafood business must source water for wet storage from an area classified by the authority as:

- approved
- conditionally approved
- approved as remote
- or
- offshore.

The area must be subject to a marine bio-toxin management plan and have open status. Water is not permitted from areas that are undergoing classification.

Alternatively, the business may use water of a quality that will not adversely affect the safety and suitability of the bivalve molluscs. The ASQAP Manual provides information on water quality for wet storage.

Businesses will need to include in their food safety management systems how they monitor the quality of the water used for wet storage. Information on sampling, other monitoring activities and record keeping is available in the ASQAP Manual.

To ensure that the water is maintained safe for wet storage, water must be effectively disinfected or maintained during the course of the wet storage in such a way that it continues to satisfy the conditions for Activity 1 (other than condition (d)).

As an indication of 'effectively', the NSW Code of Practice for Wet Storage (Appendix VI, *NSW Shellfish Program operations manual*, NSWFA, 2001) requires disinfected water entering the wet storage tanks to have no detectable levels of the faecal coliform group per 100 ml of water. This is consistent with the ASQAP Manual, Section 37.6.

The food safety management system must include a system for monitoring the effectiveness of disinfection or other means of maintaining water quality.

Example

A seafood business that uses a recirculating water system ensures that water is effectively disinfected by following the requirements in the NSW Code of Practice for Wet Storage. For example, the business:

- carries out a sampling and testing study as described in the Code of Practice to demonstrate that the disinfection system will consistently produce water that is negative for the faecal coliform group under normal operating conditions
- samples and tests the water for faecal coliforms and keeps records for at least two years to demonstrate the quality of the water is being controlled
- cleans and services the disinfection units regularly.

Appendix 2

Tools to help businesses with food safety management systems

Seafood businesses within the scope of the standard that shuck oysters are required to have food safety management systems. The Australian Government and state and territory governments have prepared a food safety program tool to help these businesses develop and implement their own food safety programs. The tool is a two-part step-by-step guide based on the principles of the HACCP approach and is consistent with Standard 3.2.1 of the *Food Standards Code*.

The first part is to assist oyster processors to adopt practices that are an essential foundation for implementing a food safety program. These practices are consistent with the requirements in the *Food Standards Code*.

The second part explains why oyster processors should implement food safety programs; lists and explains steps to building a food safety program; and describes how to put the program into action.

A generic food safety program, checklists, forms and operating procedures are provided for businesses to customise to their own operations.

The Australian Government and state and territory governments have prepared a similar food safety program tool to help seafood businesses that cook prawns on trawlers. A third tool, for businesses that cold-smoke fish, is also available.

The tools:

- tool for the implementation of safe and hygienic practices and for food safety programs for shucking oysters
- tool for the implementation of safe and hygienic practices and for food safety programs for cooking prawns on board trawlers
- tool for the implementation of safe and hygienic practices and for food safety programs for cold-smoking fish

are available through state and territory government departments listed in the Contacts section.

Appendix 3

Australia New Zealand Food Standards Code requirements for seafood

Standard 4.2.1 *Primary Production and Processing Standard for Seafood* is one of a collection of individual food standards in the *Australia New Zealand Food Standards Code*. Standards on related matters are grouped together into Parts, which in turn are collected together into four Chapters.

Chapter 1 contains standards which apply to all foods for sale in Australia and New Zealand, except for maximum residue limits and processing requirements. These apply in Australia only and New Zealand has its own regulations.

Chapter 2 contains labelling and compositional requirements for particular classes of foods including fish and fish products.

Chapter 3 contains standards for food safety and hygiene, notification of food businesses and skills and knowledge of food handlers. These requirements apply in Australia. New Zealand has its own food hygiene arrangements. These standards are referred to in Standard 4.2.1 *Primary Production and Processing Standard for Seafood*.

Chapter 4 contains standards for primary production and processing of food in Australia. New Zealand has its own arrangements for primary production of food.

Food standards are developed or varied by FSANZ and are reviewed by a council of government ministers known as the Australia and New Zealand Food Regulation Ministerial Council.

Standards approved by the authority are published in the *Commonwealth of Australia Gazette* and the *New Zealand Gazette*. A date for the standard commencing as part of the Code is also specified. The latest version of the Code is available on the FSANZ website at www.foodstandards.gov.au

Food standards have the force of law in Australia because they are given legal effect by state and territory laws. Therefore, it is important to read the Code in conjunction with the relevant state or territory food legislation.

The specific standards that could apply to seafood are summarised in the table opposite.

Please refer to the *Australia New Zealand Food Standards Code* at www.foodstandards.gov.au/foodstandardscode/ for further detail and any information in relation to each of the items identified.

Standard	Name Area of application
Chapter 1 General Food Standards	
PART 1.1	Preliminary
1.1.1	<i>Preliminary Provisions</i> General application and interpretation provisions, including many definitions that are applied through the Code.
PART 1.1A	Transitional Standards
1.1A.2	<i>Health Claims</i> Specifies that health claims are not permitted, except where prescribed (none are prescribed for seafood).
1.1A.3	<i>Country of Origin Labelling Requirements</i> Clauses 1, 2 and 3 detail the country of origin labelling requirements for packaged and unpackaged seafood.
PART 1.2	Labelling and Other Information Requirements
1.2.1	<i>Application of Labelling and Other Information Requirements</i> Sets out labelling requirements for food, including seafood, for retail sale and not for retail sale.
1.2.2	<i>Food Identification Requirements</i> Requires name of food, lot identification, and name and address of supplier to be included on a food label.
1.2.3	<i>Mandatory Warning and Advisory Statements and Declarations</i> Sets out mandatory advisory statements and declarations that must be made in relation to certain substances. Clause 4 requires fish and fish products to be declared on food labels when present in the food.
1.2.4	<i>Labelling of Ingredients</i> Specifies requirements for naming of ingredients, compound ingredients and additives on food labels.
1.2.5	<i>Date Marking of Packaged Food</i> Prescribes a date-marking system for packaged food and the form in which these foods must be date marked. Applies to packaged seafood.
1.2.6	<i>Directions for Use and Storage</i> Requires either direction for use and/or directions for storage of food, to be included on the label, where, for reasons of health and safety, the consumer should be informed of specific use or storage requirements.

Standard	Name Area of application
1.2.8	<i>Nutrition Information Requirements</i> Sets out nutrition information labelling, and prescribes when nutritional information must be provided and the manner in which such information is provided. Where food is fish that comprises a single ingredient or category of ingredient, it is not required to carry a nutrition information panel.
1.2.9	<i>Legibility Requirements</i> Sets out general and specific legibility requirements for labelling of packaged foods.
1.2.10	<i>Characterising Ingredients and Components of Food</i> Specifies requirements for the declaration of the percentage of characterising ingredients and components of certain food products, which must be declared. Includes methods for determining the proportion of characterising ingredient/s. Applies to packaged seafood.
PART 1.3	Substances Added to Food
1.3.1	<i>Food Additives</i> Defines food additives and regulates their use in production and processing of food. Food additives not specified in this standard must not be added to foods.
1.3.2	<i>Vitamins and Minerals</i> Regulates the addition of vitamins and minerals to foods and restricts claims in relation to vitamin and mineral content.
1.3.3	<i>Processing Aids</i> Regulates the use of processing aids in food manufacture, prohibiting their use in food unless there is a specific permission within this standard.
1.3.4	<i>Identity and Purity</i> Ensures that substances added to food in accordance with this Code meet appropriate specifications for identity and purity of food additives, processing aids, vitamins and minerals, and other added nutrients.
PART 1.4	Contaminants and Residues
1.4.1	<i>Contaminants and Natural Toxicants</i> Sets out the maximum levels (MLs) of specified metal and non-metal contaminants and natural toxicants in nominated foods. Those relevant to seafood include arsenic (inorganic), cadmium, lead, mercury, tin, acrylonitrile, amnesic shellfish poisons, diarrhoeic shellfish poisons, neurotoxic shellfish poisons, paralytic shellfish poisons, PCBs and vinyl chloride.
1.4.2	<i>Maximum Residue Limits (Australia only)</i> Maximum permissible limits for agricultural and chemical residues in food are specified in Schedules to the standard.

Standard	Name Area of application
1.4.3	<i>Articles and Materials in Contact with Food</i> Provides permission for articles and materials to be in contact with food in accordance with the conditions set out in this standard. Standard 1.4.1 sets out the MLs for a number of metal and non-metal contaminants and natural toxicants that may be present in food as a result of contact with the articles and materials regulated in this standard.
PART 1.5 Food Requiring Pre-Market Clearance	
1.5.1	<i>Novel Foods</i> Regulates the sale of novel foods and novel food ingredients, for example docosahexaenoic acid (DHA), a marine microalgae.
1.5.2	<i>Food Produced Using Gene Technology</i> Regulates sale of food produced using gene technology, other than additives and processing aids. These foods may only be used or sold if specifically permitted.
1.5.3	<i>Irradiation of Food</i> Prohibits the irradiation of food unless specifically permitted.
PART 1.6 Microbiological and Processing Requirements	
1.6.1	<i>Microbiological Limits for Food</i> Lists the maximum permissible levels of food-borne micro-organisms that pose a risk to human health in nominated foods, or classes of foods. Includes mandatory sampling plans. Micro-organisms relevant to seafood include <i>Listeria monocytogenes</i> , coagulase-positive <i>Staphylococci</i> , <i>Salmonella</i> , <i>Escherichia coli</i> .
Chapter 2 Food Product Standards	
PART 2.2 Meat, Eggs and Fish	
2.2.3	<i>Fish and Fish Products</i> Defines the term 'fish', provides a compositional standard specific to histamine in fish and fish products, and requires cooking instructions on packaged raw fish that has been joined using a binding system without the application of heat.
Chapter 3 Food Safety Standards (Australia only)	
PART 3.1 Preliminary	
3.1.1	<i>Interpretation and Application</i> Sets out the interpretation and application provisions for Chapter 3 of the Code.

Standard	Name Area of application
PART 3.2	Food Safety Requirements
3.2.1	<p><i>Food Safety Programs</i></p> <p>Defines a food safety program. It requires food businesses to develop, implement and review their food safety program and have the program audited. A food safety program as set out in the standard is taken to comply with clause 16 of Standard 4.2.1.</p>
3.2.2	<p><i>Food Safety Practices and General Requirements</i></p> <p>Sets out specific requirements for food businesses and food handlers (other than primary production) that will ensure food does not become unsafe or unsuitable. Division 5 of Standard 3.2.2 is referred to in clause 14 of Standard 4.2.1</p>
3.2.3	<p><i>Food Premises and Equipment</i></p> <p>Sets out requirements for food premises and equipment that will facilitate compliance by food businesses with the food safety requirements of Standard 3.2.2. Standard 3.2.3 is referred to in clause 14 of Standard 4.2.1.</p>
Chapter 4 Primary Production Standards (Australia only)	
PART 4.2	
4.2.1	<p><i>Primary Production and Processing Standard for Seafood</i></p> <p>Sets out food safety and suitability requirements for seafood from pre-harvesting production of seafood up to but not including manufacturing and retail (seafood manufacturing and retail are covered by Chapter 3). Additionally, the standard requires primary producers and manufacturers of specified bivalve molluscs to implement a documented food safety management system.</p>

Food Standards Code requirements for seafood

Glossary of definitions

This glossary is an alphabetical listing of all the definitions relevant to Standard 4.2.1 that are included in Standards 3.1.1, 3.2.1, 3.2.2, 3.2.3 and 4.2.1. The applicable standard is referenced at the end of each definition.

adequate supply of water

potable water that is available at a volume, pressure and temperature that is adequate for the purposes for which the water is used. (Standard 3.2.3)

approved

approved by the [relevant] Authority. (Standard 4.2.1)

area

an area where bivalve molluscs are grown or harvested. (Standard 4.2.1)

Authority

the State, Territory or Commonwealth government agency or agencies having the legal authority to implement and enforce this Division [Division 3]. (Standard 4.2.1)

batch

a quantity of bivalve molluscs which is harvested, depurated or handled from the same lease number and with the same harvest date. (Standard 4.2.1)

bivalve molluscs

include cockles, clams, mussels, oysters, pipis and scallops intended for human consumption, but excludes scallops and pearl oysters, where the only part of the product consumed is the adductor muscle, and spat. (Standard 4.2.1)

carrier of a food-borne disease

does not include a person who is a carrier of *Staphylococcus aureus*. (Standard 3.2.2)

clean

clean to touch and free of extraneous visible matter and objectionable odour (Standard 3.1.1)

contaminant

any biological or chemical agent, foreign matter, or other substances that may compromise food safety and suitability. (Standard 3.1.1)

contamination

the introduction or occurrence of a contaminant in food. (Standard 3.1.1)

control

a measure that prevents, eliminates or reduces to an acceptable level, a food safety hazard. (Standard 4.2.1)

depuration

a process using a controlled environment to reduce the level of certain pathogenic organisms that may be present in live shellfish and crustaceans. (Standard 4.2.1)

equipment

a machine, instrument, apparatus, utensil or appliance, other than a single-use item, used or intended to be used in or in connection with food handling and includes any equipment used or intended to be used to clean food premises or equipment.

(Standard 3.1.1)

food-borne disease

a disease that is likely to be transmitted through consumption of contaminated food.

(Standard 3.2.2)

food safety program

a food safety program that satisfies the requirements of clause 5 (Standard 3.2.1).

Clause 5 states that:

A food safety program must –

- (a) systematically identify the potential hazards that may be reasonably expected to occur in all food handling operations of the food business;
- (b) identify where, in a food handling operation, each hazard identified under paragraph (a) can be controlled and the means of control;
- (c) provide for the systematic monitoring of those controls;
- (d) provide for appropriate corrective action when that hazard, or each of those hazards, is found not to be under control;
- (e) provide for the regular review of the program by the food business to ensure its adequacy; and
- (f) provide for appropriate records to be made and kept by the food business demonstrating action taken in relation to, or in compliance with, the food safety program. (Standard 3.2.1)

growing on

the process where juvenile bivalve molluscs are translocated to a classified area for a sufficient period to enable their development prior to sale. (Standard 4.2.1)

handling of food

includes the making, manufacturing, producing, collecting, extracting, processing, storing, transporting, delivering, preparing, treating, preserving, packing, cooking, thawing, serving or displaying of food. (Standard 3.1.1)

harvesting

the capture or taking of seafood and includes the capture or taking of seafood from an enclosure or pond used in aquaculture. (Standard 4.2.1)

hazard

a biological, chemical or physical agent in, or condition of, food that has the potential to cause an adverse health effect in humans. (Standard 3.1.1)

inputs

includes any feed, chemicals or other substances used in, or in connection with, the primary production of seafood. (Standard 4.2.1)

live seafood premises

a premises used for the primary production of live seafood, and includes sea cages. (Standard 4.2.1)

manufacturing of seafood

the canning, smoking or crumbing of seafood or the addition of other food to seafood and other like activities. (Standard 4.2.1)

monitoring

includes checking, observing or supervising in order to maintain control. (Standard 3.2.1)

potable water

water that is acceptable for human consumption. (Standard 3.2.3)

primary production of seafood

means the –

- (a) growing, cultivation, picking, harvesting, collection or catching of seafood; or
- (b) growing on of seafood; or
- (c) transportation or delivery of seafood; or
- (d) holding of live seafood;

and includes processing of seafood.

processing of seafood

includes –

- (a) the killing, dismembering, filleting or cutting into portions, gill or gutting, or skinning of seafood; and
- (b) the depuration of shellfish and crustaceans; and
- (c) the shucking or peeling of seafood; and
- (d) the cooking, including steaming or boiling, of crustaceans; and
- (e) the brining of seafood; and
- (f) the packing, treating, washing, freezing, refrigeration or storing of seafood; and
- (g) other similar activities. (Standard 4.2.1)

relaying

the transfer of bivalve molluscs from one area to another for the reduction of contaminants in the bivalve molluscs. (Standard 4.2.1)

seafood

all aquatic vertebrates and aquatic invertebrates intended for human consumption, but excludes amphibians, mammals, reptiles, and aquatic plants. (Standard 4.2.1)

seafood business

a business, enterprise or activity that involves the primary production of seafood intended for sale. (Standard 4.2.1)

seafood handler

a person who engages in or supervises the primary production or processing of seafood, for a seafood business. (Standard 4.2.1)

seafood for disposal

food that:

- (a) is subject to recall;
- (b) has been returned;
- (c) is not safe or suitable; or
- (d) is reasonably suspected of not being safe or suitable. (Standard 3.2.2)

seafood premises

any premises including land, vehicles, parts of structures, tents, stalls and other temporary structures, vessels, pontoons, and any other place declared by the relevant authority to be a premises under the Food Act, kept or used for the primary production of seafood (exclusively or otherwise), regardless of whether the premises are owned by the proprietor, including premises used principally as a private dwelling. (Standard 4.2.1)

sewage

includes the discharge from toilets, urinals, basins, showers, sinks and dishwashers, whether discharged through sewers or by other means. (Standard 3.2.3)

spat

juvenile bivalve molluscs taken for the sole purpose of growing on. (Standard 4.2.1)

symptom

diarrhoea, vomiting, sore throat with fever, fever or jaundice (Standard 3.2.2)

temperature control

maintaining seafood at a temperature of –

- (a) 5° C, or below if this is necessary to minimise the growth of infectious or toxigenic micro-organisms in the food so that the microbiological safety of the food will not be adversely affected for the time the food is at that temperature; or
- (b) another temperature – if the food business demonstrates that maintenance of the food at this temperature for the period of time for which it will be so maintained, will not adversely affect the microbiological safety of the food. (Standard 4.2.1)

wet storage

temporary storage of bivalve molluscs from an area in containers or tanks containing natural or artificial seawater for purposes other than depuration. (Standard 4.2.1)

Contacts for advice and information

Australian Capital Territory

Health Protection Service
Locked Bag 5
Weston Creek ACT 2611
Phone 02 6205 1700
Fax 02 6205 1705
Email hps@act.gov.au

New South Wales

New South Wales Food Authority
Consumer and Industry Contact Centre
PO Box 6682
Silverwater NSW 1811
Phone 1300 552 406
Email contact@foodauthority.nsw.gov.au

Northern Territory

Department of Health & Community Services
Environmental Health Branch
PO Box 40596
Casuarina NT 0811
Phone 08 8922 7152
Email envirohealth@nt.gov.au

Queensland

Safe Food Queensland
PO Box 440
Spring Hill QLD 4004
Phone 1800 300 815
Email info@safefood.qld.gov.au

Queensland Health
Environmental Health Unit
GPO Box 48
Brisbane QLD 4001
Phone 07 3234 0938
Email ehu@health.qld.gov.au

South Australia

Primary Industries and Resources
South Australia
PO Box 1671
Adelaide SA 5001
Phone 08 8226 0222

South Australian Department of Health
Environmental Health Service
Food Safety Section
PO Box 6 Rundle Mall
Adelaide SA 5000
Phone 08 8226 7107
Email food@health.sa.gov.au

Tasmania

Department of Health and Human Services
Public and Environmental Health Service
GPO Box 125B
Hobart TAS 7001
Phone 03 6222 7724
or 1800 671 738

Department of Primary Industries, Water
and Environment
GPO Box 44
Hobart TAS 7000
Phone 03 6336 6439
or 1300 368 550
Email pi.enquiries@dpiwe.tas.gov.au

Victoria

PrimeSafe
PO Box 2057
South Melbourne VIC 3205
Phone 03 9685 7333
Email enquiries@primesafe.vic.gov.au

Department of Human Services Victoria
Food Safety Unit
GPO Box 1670N
Melbourne VIC 3001
Phone 03 9637 4085
or 1300 366 356
Email foodsafety@dhs.vic.gov.au

Western Australia

Department of Health
Environmental Health Branch
PO Box 8172
Stirling Street
Perth WA 6849
Phone 08 9388 4999

Department of Fisheries
Locked Bag 39
Cloisters Square Post Office
Perth WA 6850
Phone 08 9482 7333
Email info@fish.wa.gov.au

Australian Government

Australian Pesticides and
Veterinary Medicines Authority
PO Box E240
Kingston ACT 2604
Phone 02 6272 5852

Australian Quarantine and Inspection Service
GPO Box 858
Canberra ACT 2601
Phone 02 6272 3933
or 1800 020 504 (free call)

Department of Agriculture, Fisheries
and Forestry
GPO Box 858
Canberra ACT 2601
Phone 02 6272 3933

Department of Health and Ageing
GPO Box 9848
Canberra ACT 2601
Phone 02 6281 1555
or 1800 020 103 (free call)

Therapeutic Goods Administration
PO Box 100
Woden ACT 2606
Phone 02 6232 8444
or 1800 020 653 (free call)

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Please advise FSANZ of any omissions, which we can include in an update.

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Useful websites

Australian Aquaculture Portal—links to aquaculture associations: www.australian-aquacultureportal.com.

Australian Consumers Association: www.choice.com.au

Australian Fish Names List: www.fishnames.com.au

Australian Food and Grocery Council: www.afgc.org.au

Australian Government Department of Agriculture, Fisheries and Forestry: www.daff.gov.au

Australian Government Department of Health and Ageing: www.health.gov.au

Australian Quarantine and Inspection Service: www.aqis.gov.au

Australian Seafood Industry Council: www.asic.org.au

Codex Alimentarius: www.codexalimentarius.net

Commonwealth Scientific Industrial Research Organisation (CSIRO): www.csiro.au

Fisheries Research and Development Corporation: www.frdc.com.au

'GROWfish' Gippsland Aquaculture Industry Network: www.growfish.com.au

Master Fish Merchants Association of Australia: www.mfma.com.au

Northern Territory Seafood Council: www.ntsc.com.au

Queensland Seafood Industry Association: www.seafoodsite.com.au

Rural Industries Research and Development (RIRDC): www.rirdc.gov.au

Seafood Council (SA) Ltd: www.seafoodsa.com

Seafood Industry Victoria: www.siv.com.au

Seafood Training Australia: www.seafoodtraining.com.au

South Australian Research and Development Institute (SARDI): www.sardi.sa.gov.au

Sydney Fish Market: www.sfmlive.com

Tasmanian Fishing Industry Council: www.tfic.com.au

WA Seafood Quality Management Initiative: www.fish.wa.gov.au/sqmi

Western Australian Fishing Industry Council: www.wafic.com.au

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