codex alimentarius commission

FOOD AND AGRICULTURE ORGANIZATION OF THE UNITED NATIONS

WORLD HEALTH ORGANIZATION

JOINT OFFICE: Viale delle Terme di Caracalla 00100 ROME Tel: 39 06 57051 www.codexalimentarius.net Email: codex@fao.org Facsimile: 39 06 5705 4593

Agenda Item 4 **CX/FFP 00/4-Add. 1**

JOINT FAO/WHO FOOD STANDARDS PROGRAMME

CODEX COMMITTEE ON FISH AND FISHERY PRODUCTS
Twenty-fourth Session
Ålesund, Norway, 5-9 June 2000

PROPOSED DRAFT CODE OF PRACTICE FOR FISH AND FISHERY PRODUCTS
GOVERNMENT COMMENTS AT STEP 3

BRAZIL

General Comments

Despite what is stated in Section 3 *Pre-requisite Programme* – 2nd. paragraph, the document shows a repetitive approach concerning the control of hazards that should have being dealt primarily by the Pre-requisite Programme. Example: identification of pathogenic microorganisms as a hazard in fish handling /processing operations concerned with washing, rinsing, glazing.

The revised document is now much more uniform concerning the collation of a number of texts written by different groups of persons. However, there is still space for improvement, aiming at reaching a coherent final text as, for example, in the Sections 7, 9 and 16.

Item 2.1 General Definitions - It is better to define "Biotoxins" instead of "Marine Biotoxins" once there is reference on biotoxin from freshwater puffer fish.
Add to this definition phrase: "These poisonous substances may be also accumulated due to microbial activity (i.e. tetrodotoxin)".

Item 2.10 Frozen Surimi
"Gel Forming Ability or Gel Strength Capability" – means the ability of surimi to form an elastic gel when comminuted fish flesh is added and then formed and heated. This elasticity is a function possessed by myosin as the primary component of myofibrillar protein.

"Suwari" (setting) – is the process of three-dimensional network formation of actomyosin in the meat sol.

Add the word lipids after the word blood in the definition of "Washing" – "means a process of washing away blood, lipids and water soluble..... ."

Section 3 Pre-requisite Programme

Item 3.4.5.1 Water - Correct call for footnote number (1) as well as the footnote number itself.

Item 3.4.5.2 Ice - As in item 3.4.5.1

Item 3.5.2 Personnel Hygiene - Fourth bullet: Separate in new bullet details related to the phrase "hand-washing should be carried out for all personnel:"

Section 4 General Considerations for the handling of fresh fish and shellfish

Item 4.1.1 Parasites - Aiming at correct and improve the document, it is proposed to introduce the following changes in the text:

First paragraph
Stop the paragraph in its 4th line, i.e. in the phrase ending by "…causing food borne disease. The proposed change would eliminate duplication of statements connected with control measures that would be better dealt with at each sub-item related to specific parasite groups.

Sub-item on *Nematodes*
In second phrase add *Angiontrogylus* spp. and re-organize the phrase as such: "Among the nematodes of most concern are *Anisakis* spp., *Pseudoterranova* spp., *Angiostrongylus* spp., *Capillaria* spp., and *Gnasthostoma* spp., and which can be found in the liver, belly cavity and flesh of marine fish."
In last phrase change add word "inactivated" before … "by freezing".

Sub-item on *Trematodes*
New text for last phrase: "Some studies indicate that normal temperatures for food cooking and freezing with the objective of inactivate fish parasites, such as nematodes of the family Anisakidae, would not be enough to kill trematodes (metacercariae) in the fish flesh."

Supporting references (available if required): Fan, 1998; Thamsten Coelho et al., 1997; Saraiva, 1991; Hamed & Elias, 1970.

Item 4.1.1.2 Bacteria - Second paragraph, second phrase: add the species "*Clostridium botulinum*" aiming at better matching the content of Table 5.2

Item 4.1.1.3 Scombrotoxin – Second phrase: add the word "mainly" before "attributed". This indication will better reflect actual scientific knowledge on the production of this toxin by other bacterial species than members of Enterobacteriaceae will.

An important point to ensure document's coherence concerns the need to define if *Scombrotoxin* is a biological or a chemical hazard. In item 4.1.1.3 it is considered as a biological hazard whereas in Table 5.2 and 5.3 it appears as a chemical hazard.

Item 4.1.2 Chemical hazards – A special emphasis is given to *biotoxins* that deserve the only existing sub-item. This approach does not reflect the reality of chemical hazards presently being controlled in fish and fishery products, particularly by industrialized countries. The suggestion is to include other sub-items as necessary to cover other chemical hazards as indicated in this paragraph (agro-chemicals, heavy metals, antibiotic residues, and diesel oil).

Item 4.1.2.1 Biotoxins – The following changes are suggested aiming at correcting/improving the text:

First paragraph, last phrase: the following new next is suggested: " The poison is usually limited to some organs or, in some species, the toxins are spread all over the tissues (flesh, viscera, skin), or is restricted to some periods of the year."

Second paragraph – Delete the whole paragraph.

Add a new sub-item under the title of Tetrodotoxin before the existing sub-items covering Ciguatoxin and Phycotoxins. The numeration should also be changed accordingly:

New sub-item Tetrodotoxin – Suggested text:
"Fish mainly belonging to the family Tetraodontidae ('puffer fishes") may accumulate this toxin which is responsible for several poisonings, often lethal. The toxin is generally found in the fish liver, roe and guts, and less frequent in the flesh. Differently from most other fish biotoxins that accumulate in live fish or shellfish, algae do not produce this toxin. The mechanism of toxin production is still not clear, however, apparently there are often indications of the involvement of symbiotic bacteria."

Section 5 HACCP and DAP Analysis

Table 5.2 Possible Pre-harvest and Harvest Hazards in incoming Fish & Shellfish

First column – Include "Clostridium botulinum" among the pathogenic bacteria. Include "Hepatitis A" among the viruses.

Table 5.6 An example of the significant hazard... – Correct in the title the word "botulinum". The abbreviation of the word "Clostridium" should also be consistent throughout the text, i.e. (C.) or (Cl.)?

Section 6 Processing of Fresh, Frozen and Minced Fish

Item 6.4.4 Wrapping and Packing (Processing Steps 17 & 25) - Delete the word "decomposition" since it is unlikely that this defect would be significant at that processing step.

Section 8 Processing of Lobsters and Crabs

In accordance with the original draft of this section sent to the Coordination of the Drafting Group, it is necessary to make the following corrections in the present text:

Section 2 Definitions
Section 2.4 Lobsters and Crabs
Lack of the following definitions:

Intestine/Vein	is used in this code to mean the posterior portion of the lobster alimentary tract;
Leg tips	are the third leg Segments counting from the crab shell;
Lobster	means species from the genus *Homarus* of the family Nephropidae; and rock lobster, spiny lobster, and slipper lobster from the families Palinuridae and Scyllaridae;
Loose neck	has the same meaning in some areas as "Droptail";
Pasteurisation	means subjecting crustacean meat to heat at times and temperatures which destroy a high proportion of micro-organisms without noticeable changes in appearance, texture and flavour of the product;
Picking	refers to the process of removing meat from the crabs shell by machine or by hand;
Pounding	refers to the holding of live crabs or lobsters in water tanks or floating crates for extended periods of time;
Sections	are the cleaned, eviscerated and degilled crab parts usually consisting of one half of the crab body and the attached walking legs and claw;
Shaking	refers to the industrial practice of manual meat extraction used for king, snow and Dungeness crabs. The cooked sections are processed by hitting or shaking the meat out of the shell;
Shell	the hard outer covering of lobsters and crabs;
Shucking	is the process of removing the meat from the shell and appendages of the lobsters;
Tail	in crustacean is the abdomen or posterior part of the body;
Tailing	is the process of separating the tail from the cephalothorax;
Trimming	is the process of removing any signs of blood, membrane or remnants of the gut, which may be attached to the shell, or meat of lobsters.
Viscera	refers to the contents of the gut of crabs;
Waste	means those crab or lobster parts, which remain after the meat removal operation is completed.

Section 8.3 Processing Operations – Lobsters and Crabs

The figure 8.1 should be placed just behind of the Section 8.3.1 title.

The figure 8.2 should be placed just behind of the Section 8.3.2 title.

Section 8.3.2.1 Drowning or Insensibilizing

There are no bullets to specify the Technical Guidance described in this Section.

The figure 8.3 should be placed just behind of the Section 8.3.3 title.

Section 8.3.3.9 Pasteurization

The 5th. bullet, as indicated in the document, is, in fact, the continuation of the 4th. bullet.

It was not indicated the title of the Section 8.3.3.11 – Chilled Storage (Processing Step 13) – page 74 of the Draft Code.

Section 9 Processing of shrimps and prawns

The text does not take into consideration the content of other sections and it is rather confusing. Its format and terminology do not follow the document style and needs considerable technical improvement. For instance, the flow diagram does not match what is written in the text, as well as, does not reflect what happens in the international production/trade shrimp industry worldwide.

Nevertheless, despite the above negatives, an effort was made to make some suggestions on this section due to its high importance to international fish trade.

The first suggestion concerns the need to an introductory text to this section. This introduction could be based on the text proposed for the previous section (Processing of lobster and crabs) with due reference to the particularities of shrimp and prawn commercial species.

Item 9.1 Frozen shrimps and prawns – general

Delete the whole content of the item inclusive its title.
The new following new text and title is proposed for this item:

9.1 General Considerations for the handling of shrimps and prawns

Refer to Section 4 – General Considerations for the Handling of Fresh Fish and Shellfish.

9.1.1 Potential Hazards and Defects Associated with Shrimps and Prawns

Refer also to Section 4.1 Potential Hazards Associated with Fresh Fish and Shellfish and Section 5.3.3 Identification of Hazards and Defects."

9.1.2 Minimise the Deterioration of Shrimps and Prawns – Handling

Refer also to Section 4.3 – Minimise the Deterioration of Fish – Handling
Using the original text proposed in item 9.1 (page 74), introduce the following changes:
Delete second bullet

9.2 Processing operations

The flow diagram indicated, i.e. Figure 9.1, is absent from the received documentation package. From the text it is understood that this flow diagram refers to the following operation phases on board a shrimp freezing trawler and in a shrimp processing plant on-shore (original terminology was kept):

Reception (in behead area)
Washing
Behead/Washing
Freezing
Reception (in the processing plant)
Controlled thawing
Inspection/Pre-selection
Packaging/Labelling
Freezing
Glaze and Master Case

A second flow diagram is presented in the text concerning the production of Individually Quick Frozen Peeled, Peeled and Deveined, Cooked or Breaded Shrimp.

At this stage of the elaboration of this Revised Code of Practice it would be wise to not include shrimp handling operations on board fishing vessels. Therefore, it is strongly recommended to start the text from the point where the raw material arrives in the shrimp processing plant on shore and to proceed until the Shipment and Distribution of the final product.

Within this framework, it is suggested to start this item from the point of raw material reception at shrimp processing plant.

Section 10 Processing of Cephalopods

The flow diagram proposed should be revised, in order to incorporate, for instance, the possibility to receive frozen raw material and to indicate the frozen storage step operation.

Add Technical Guidance in the Section 10.2.6 – Grading/Packing

Section 11 Processing of Salted Fish

The text concerning this item does not follow the adopted style. An effort should be made to harmonize the whole document in connection with the initial descriptive items of each processing type.

Figure 11.1
The flow chart does not cover the whole process what makes the figure and the following text difficult to follow and understand. Salted Fish processing plants are quite often of medium and small size and of artisanal level: therefore, the document should be as user-friendliness as possible.

Item 11.2.1 Splitting, Washing and Rinsing

First bullet, second phrase: The statement “The waste should be continuously removed from the line” is a most appropriate one and should be included in Section 3 “ Pre-requisites Programme”.

Item 11.3.2 Salt requirements

Last bullet, last line: this statement is rather restrictive – when marine salt is used it would be extremely difficult and expensive to comply with this requirement. Other control methods should be used instead, i.e. keeping product under 5-10°C

Item 11.4.1 Brining

Potential hazards:
Add the words “biological and chemical” before the word “contamination”, to follow what is stated in Item 11.3.2;
Delete the word “decomposition” since this is a defect;
Delete brackets and its contents – instead add the words “histamine development”

Potential defects:
Add the words “biological, chemical and physical” before the word “contamination”;
Delete brackets and its contents.

Item 11.4.2 Wet salting
Same corrections as suggested for Item 11.4.1.

Item 11.4.3 Dry salting
Same corrections as suggested for Item 11.4.1.

Item 11.4.4 Pickling
Same corrections as suggested for Item 11.4.1.

Item 11.4.5 Maturing

Potential hazards:
Delete “decomposition”.
Delete brackets and its contents and instead add the words “Histamine development”.

Technical Guidance:
Brazil acknowledges the correctness of the recommendations, however, recognizes the extreme difficulties to put them in practice in tropical/temperate countries.

11.5.2 Packaging/Wrapping

Potential defects:
Delete the word “contamination” since the hazards involved in that step should be controlled by the Pre-requisite Programme.
Delete the word “decomposition” since it is unlikely to occur at that step.

11.6 Chill storage

Potential hazards:
Add the words “biological and chemical” before the word “contamination”, to follow what is stated in Item 11.3.2;
Delete the word “decomposition” since this is a defect;
Delete brackets and its contents – instead add the words “histamine development”.

Potential defects:
Add the words “biological, chemical and physical” before the word “contamination”;
Delete brackets and its contents – instead add the words “Histamine development”.

Section 12 Processing of Smoked Fish

There is no reference concerning the example(s) of the product chosen in this chapter as well as its flow diagram.
The text could be revised since there are some repetitions where technical guidance is referred.

Section 13 Processing of Canned Fish and Shellfish

Item13.3.1 Raw Materials reception
The raw material reception would not be the best step to control the defect “species substitution”. In many industries, introducing fish sorting operation prior to the filling prevents this defect.

Item13.4.6 Pre-cooking
It should be revised whether the microbiological or biochemical (scombrotoxin) growth is likely to occur since the pre-requisite program could cover them.

Section 14 Processing of Frozen Surimi

Aiming at avoids duplication and improves the text it is suggested to merge 2nd and 3rd paragraphs. The suggested revised text for the new second paragraph would be the following:

“The main emphasis of this section of the code is to give guidance to the manufacture of frozen surimi mainly processed from marine groundfish such as Alaska Pollock and Pacific Whiting by mechanized operations. These operations are common in Japan, the United States and some other countries. This section of the Code will necessitate period revision due to continuous technological advances and the change of main raw fish species (such as Hake, and Threadfin Bream) for frozen surimi production.”

14.2.1 Raw Fresh and Frozen Fish Reception

4th bullet, 1st temperature requirement (round) – end of phrase: aiming at reach uniformity it should state “…when stored at or bellow 4^{o}C.” , as stated below (dressed).

Second bullet – As in other parts of the document the term "protease activity" is used. However, in last bullet, the term "proteolytic enzyme activity" is used instead. Since both terms have the same meaning, it is recommended to uniformise the text.

14.9 Freezing operation
New bullet: "It is recommended to use a contact (plate) freezer equipment."

Item 14.13 Frozen Storage
First bullet: Why the indication of minus 20°C? Minus 18°C should be maintained in order to maintain the text uniformity.

Section 16 Aquaculture Production

Item 16.1
General Comments

Brazil recognises that the technical content reflects what it is required to develop industrialised and commercial aquaculture operations. However, its format does not follow the document style and needs considerable improvement.

First paragraph, first phrase
Delete, as unnecessary, the last statement: "…and that are intended for direct human consumption".

Second paragraph, first phrase

It would be advisable to emphasize the particular characteristics of a fish-farming establishment. Direct comparisons with land-based traditional food fish processing plants should be avoided. This does not imply any intention of applying a different criteria of food hygiene – however, a careful common sense approach should be used, taking into account the particular characteristics of fish farms.

Item 16.9.1 Registration and Distribution of Veterinary Drugs

There are two consecutive items with the same number (16.9.1). This has affected the whole text concerned with aquaculture products and should be corrected.

Item 16.9.2 Withdrawal Period – Control related to the Protection of Public Health

Second paragraph, second line – Add solubility of drug.

Item 16.13 Records
Item 16.14 Documentation

The content of these items are technically sound, well written and complement Item 5.3.10 Establishing Record Keeping Procedures which refers to the HACCP/DAP system in general. Therefore, it is suggested the redrafting of the Code in connection with these items, i.e. a merging exercise (5.3.10 + 16.13 + 16.14) aiming at improving the whole Code.

Item 16.15 Review and verification

As in the previous items, it is suggested to redraft the document by merging the content of this item with that of Item 5.3.9 Establish Verification Procedures which refers to the HACCP/DAP systems.

Appendix X

Moisture
The formula is lacking the indication of multiplied by 100 (x 100)

2.2.2.2 Expressible Moisture
Both formulas are lacking the multiplication by 100 (x100)

CANADA

"Canada generally supports this document and recognizes that it will provide a sound basis for discussion at the 24th Session of the Codex Committee on Fish and Fishery Products.

Canada would like to have an opportunity to revisit the discussion of the Codex Committee on Fish and Fishery Products at its last session which is outlined in paragraph 36 of the final report (Alinorm 99/18). In this report, the Committee noted a suggestion made by some delegations who expressed the view that there might be a need for two codes, one for pre-harvest operations and one for processing, and that this approach may be considered in the future.

Canada suggests that the sections dealing with Molluscan Shellfish and Aquaculture Production be removed from the "Proposed Draft Code of Practice for Fish and Fishery Products" (CX/FFP 00/4) and dealt with separately at this time, and at a future session determine whether these sections, or parts of these sections, should be amalgamated with the main code.

The aquaculture section deals primarily with "pre-harvest factors" such as site selection, veterinary drugs and water quality. The molluscan shellfish section deals mainly with the handling of live molluscan shellfish prior to receipt at a processing facility.

By dealing with the hazards, defects and technical guidance associated with aquaculture and molluscan shellfish separately from the processing sections, this may facilitate discussions, lead to improved organization of the documentation, and promote the advancement of all sections of the Code of Practice.

In the eventual determination as to whether or not the Aquaculture and Molluscan Shellfish sections should be amalgamated with the main code, user-friendliness is a factor which should also be considered."

ISRAEL

Section 2: Definitions

2.2 We propose to include in the definition of frozen fish after " … to a level low enough to preserve the inherent quality of the fish"…: and don't permit development of biological contaminants… .

We suggest to introduce in the paragraphs 2.4, 2.5, 2.6 or 2.9 the definition of pasteurisation.

In our vision pasteurisation means the heat treatment to inactivate pathogens in order to avoid a health hazards. The pasteurisation is different according to the product and is quantified in terms of time and temperature.

Section 4 – General consideration for the handling of fresh fish and shellfish.

4.1 Potential hazards associated with fresh fish and shellfish.

4.1.1.2 We proposed to introduce a sentence about health ricks from *Vibrio sp*.
Health risk can be reduced by preventing the directly, contact between the consumer and life or refrigerated fish. (This is necessary to prevent the abscessed infection).

Section 16: Aquaculture Production

16.8.2 Water based establishments.
We propose a discussion about the necesity of a chemical and bacteriological standard of the water.

Table 2 – We suggest to introduce in the hazards also biological contaminants.

NEW ZEALAND

SECTION 2 DEFINITIONS
The following definitions do not correspond with those in other Codex documents. It is suggested that uniformity will be reached by comparing those definitions provided in previous codex documents. In doing

so the most accepted definitions can then be standardised.

2.1 GENERAL DEFINITIONS

Chilling Differs from that in the report from the Twenty-third Session, ALINORM 99/18 which reads:
"is the process of cooling and is only completed when fish is at a temperature approaching that of melting ice;"

Contaminant Insert "or" between "safety suitability".

Contamination The definition differs from that in the *Codex Alimentarius Basic Food Hygiene Texts* which reads as follows:

"Contamination - the introduction or occurrence of a contaminant in food or food environment."

Disinfection The definition differs from the twenty-third session, ALINORM 99/18, which reads as follows:
"Disinfection - the reduction, by means of chemical agents and/or physical methods, of the number of micro-organisms in the environment, to a level that does not compromise food safety or suitability."

Fish Differs from the definition in the draft report from the Twenty-third Session, ALINORM 99/18 which reads:
"means any of the cold-blooded aquatic vertebrates commonly known as such. This includes Pisces, Elasmobranchs and Cyclostomes. Aquatic mammals and amphibians are not included;"

Hazard Analysis New Zealand would like to see the definition

"***Hazard analysis:*** The process of collecting and evaluating information on hazards and conditions leading to their presence to decide which are significant for food safety and therefore should be addressed in the HACCP plan."

Validation New Zealand would like to see the definition from the *Codex Alimentarius Basic Food Hygiene Texts* included as follows:

"Validation: Obtaining evidence that the elements of the HACCP plan are effective."

2.11 AQUACULTURE

Fish Differs from the definition in 2.1.

Good Aquaculture Definition differs from the the definition in the draft report from the Twenty-third Session, ALINORM 99/18 which reads:

"are defined as those practices of the aquaculture sector that are necessary to produce quality food products conforming to food laws."

SECTION 3
Section 3 Prerequisite Programmes
Final paragraph - where safety is mentioned insert "food" to read "rather than **food** safety and are not always essential to a pre-requisite programme for a **food** safety oriented HACCP system."
- This paragraph should also make reference to the fact that HACCP principles can be applied to defect action points.

Section 3.4
Paragraph 1 - Remove the word "farmed" to read "handling of products,"

Section 3.4.5.1
It is suggested that seawater is included in bullet two to read;

- Potable water and/or seawater should be used wherever necessary to avoid contamination to the fish and shellfish.

Section 3.5.2
It is suggested that under the fourth bullet point, dash five be transferred to a new bullet point with subsequent dashes to read;

- Hand washing should be carried out by all personnel working in a processing facility
  - at the start of fish handling activities and upon re-entering a processing area;
  - immediately after using the toilet

Section 3.8 Training
Proposed alternative wording for , Section 3.8 Training, from the Codex Alimentarius Basic Texts Food Hygiene.

3.8 TRAINING

Those engaged in food operations who come directly or indirectly into contact with food should be trained, and/or instructed in food hygiene to a level appropriate to the operations they perform.

Training is fundamentally important to any food hygiene system. Inadequate hygiene training, and/or instruction and supervision of *all* people involved in food related activities pose a potential threat to the safety of food and its suitability for consumption.

3.8.1 Awareness and Responsibilities

Food hygiene training is fundamentally important. All personnel should be aware of their role and responsibility in protecting food from contamination or deterioration. Food handlers should have the necessary knowledge and skills to enable them to handle food hygienically. Those who handle strong cleaning chemicals or other potentially hazardous chemicals should be instructed in safe handling techniques.

3.8.2 Training Programmes

Factors to take into account in assessing the level of training required include:

- the nature of the food, in particular its ability to sustain growth of pathogenic or spoilage micro-organisms;
- the manner in which the food is handled and packed, including the probability of contamination;
- the extent and nature of processing or further preparation before final consumption;
- the conditions under which the food will be stored; and the expected length of time before consumption.

3.8.3 Instruction And Supervision

Periodic assessments of the effectiveness of training and instruction programmes should be made, as well as routine supervision and checks to ensure that procedures are being carried out effectively.

Managers and supervisors of food processes should have the necessary knowledge of food hygiene principles and practices to be able to judge potential risks and take the necessary action to remedy deficiencies.

3.8.4 Refresher Training

Training programmes should be routinely reviewed and updated where necessary. Systems should be in place to ensure that food handlers remain aware of all procedures necessary to maintain the safety and suitability of food.

SECTION 4 GENERAL CONSIDERATIONS FOR THE HANDLING OF FRESH FISH AND SHELLFISH

Paragraph 1 - At the end of the first sentence add, " known to be harmful to human health".
- Second sentence should give an option for the product to be reworked in order to make it safe for consumption.

4.1.1.4 Viral Contamination
It is suggested that the second paragraph should begin with the following "Generally fish viruses are species specific…."

Section 4.1.2.1 Biotoxins
Biotoxins have a biological origin that is distinct from other chemical hazards such as production chemicals or environmental chemicals and as such should be under biological hazards.
It is suggested that a change in title from Biotoxins to Marine Toxins may be appropriate.
Follow Intergovernmental Oceanic Commission guidelines for definitions of Ciguatoxin and Phychotoxins.

Section 4.1.2.3 Phychotoxins
Insert after"…..*Dinophysis*, Amnesic Shellfish Poisoning (ASP) in which Nitzchi spp produce domoic acid, or Neurotoxic Shellfish Poisoning (NSP) produced by Gymnodium spp,"

SECTION 5 HAZARD ANALYSIS CRITICAL CONTROL POINT (HACCP) AND DEFECT ACTION POINT (DAP) ANALYSIS

Figure 5.1 HACCP Plan and Defect Analysis System
The principles, including footnotes, should be presented in full as provided in the CCFH basic text[1].

Step 13 - Review HACCP Plan
Step 13 should be removed, as it is a component of Step 11 - Establish Verification Procedures.

Step 12 would then become "Establish Documentation and Record Keeping Procedures", as documentation precedes record keeping procedures.

Section 5.3 Application
It is suggested that an additional sentence be added to the beginning of paragraph three to read;
"The scope of the HACCP plan should be identified and should describe which segment of the food chain is involved and the general classes of hazards to be addressed."

Section 5.3.3 Identification of Hazards and Defects
In paragraph 1 it is suggested that the following be inserted;
"It cannot be stressed enough that **where practical and feasible** each individual facility should gather sound scientific and technical data **relevant to the business**."

Table 5.2 /Table 5.3
Biological hazards should be similar to those depicted in section 4.1.1. This is a mix and match and doesn't appear to be accurate with respect to pathogenic bacteria for preharvest and harvest, then post harvest and further processing.

It is suggested that the word "critical" be removed from Physical hazard list to read "Foreign Matter". The criticality of a hazard is determined during hazard analysis and CCP determination.

Table 5.2
It is suggested that "Miscellaneous" be changed to "Pollutants".
Is the pathogenic bacteria *E coli* 0157 an appropriate example for fish and shellfish?

Table 5.3
Chemical - Take out "Agro" from Chemical list. Only relevant for preharvest/harvest.
Alternatively the words "Production Chemicals" could be used.

[1] *International Recommended Code of Practice - General Principles of Food Hygiene* (CAC/RCP 1-1969, Rev.3 - 1997), Annex: HACCP System and Guidelines for its Application.

Footnote - Take out “the” in third line and suggest add “to human health” after “risk”.

Section 5.3.3.1 Hazards
In first sentence include "**food**" to read "food safety hazards."

Section 5.3.4 Significance of Hazards and Defects.
In paragraph one it is suggested that sentence two should be replaced with the following:
"The judgement of significance should consider the source of introduction or manifestation of hazard or defect (and the objectives of the HACCP plan). The risk is a function of the probability of an adverse health effect and the severity of the effect, consequential to a hazard in food. Where significant hazard(s) and/or defects have been identified, control measures to reduce or eliminate their potential occurrence must be considered. Acceptable and unacceptable levels need to be defined within the overall objectives in identifying the CCPs of a HACCP plan."

Section 5.3.8 Establish Corrective Action
It is suggested that sentence three is amended as follows;
"The goal of this plan is to ensure that comprehensive and specific controls are in place and can be implemented to; restore control, detain product, cease production and prevent the affected lot(s) from reaching the consumer."

Table 5.6
It is suggested that the potential hazard is Cl. botulinum (spores).
The justification for significance is that the expected outcome for this canned product is commercial sterility. This cannot be achieved while there is any presence of C. botulinum (spores). Therefore this hazard of Cl. botulinum is significant until destroyed; i.e. significant at all process steps from introduction up to and including the process step that eliminates them (i.e. heat process step).
Control measures are the parameters for the scheduled process as they apply to the cooking step, these should relate to the on-line controls available at this step. It is suggested that controls relating to prerequisites and verification should be removed. It is recommended that the following be deleted: training and qualification, working procedures and instructions maintenance procedures, calibration, verification cleaning and disinfection,

Table 5.7
It is suggested that the justification should be that it does not meet quality or customer requirements.

Table 5.8
It is suggested that the following footnote from the General Principle of Food Hygiene[3] decision tree be added to assist with understanding of acceptability and unacceptability. This reads; "Acceptable and unacceptable levels need to be determined within the overall objectives in identifying the CCPs of the HACCP plans."
It is suggested that the answer for Q2 is replaced with; "Yes this step was specifically designed to eliminate spores i.e. 12D reduction."
It is recommended that the following control measures be deleted because pre-requisite programmes cover them:
- Training and qualification of personnel
- Maintenance procedures and instructions of retorts, control and recording of equipment; calibration, verification and standardisation of measurement equipment.
- Cleaning and disinfecting procedures and instructions (sprinkling openings, water circuit…).
It is suggested that the control measure detailing parameters should be reworded to read the following:
- "Working procedures and instruction establishing all **scheduled** parameters (product initial t°, t° levels, back-pressure,….)."

Table 5.9
It is recommended that the following control measures be deleted because pre-requisite programmes cover them:
- Maintenance procedure of the refrigeration system
- Personnel training and qualification

[3] *International Recommended Code of Practice - General Principles of Food Hygiene* (CAC/RCP 1-1969, Rev.3 - 1997), Annex: HACCP System and Guidelines for its Application.

Section 5.3.5
Define “acceptable level” for hazard.
Correct text "5.4 & 5.5..." To "5.8 & 5.9….."

Section 5.3.6
Second sentence – Add to this sentence as follows - “….to ensure its effectiveness in controlling the hazard or defect **to the determined level**”

Section 5.3.7
Last sentence – For CCPs, records of monitoring should be acknowledged and dated by a responsible person.

Section 5.3.8
Product disposition needs to be clearly portrayed.

Section 5.3.9 Establish Verification Procedures
It is recommended that the first sentence read; "A processing facility should establish a verification procedure, carried out by qualified individuals, to periodically assess if the HACCP and DAP plans are complete, implemented and working properly

It is suggested that the third sentence should read: "Examples of verification activities include validation of all components of the HACCP plan including: a paper review of HACCP system, its procedure and records; review of corrective actions and product disposition actions when critical limits are not met and validation of established critical limits."

It is suggested that the sixth sentence should read: "In addition to the verification activities carried out by the operator or third party experts, verification may be carried out by officials of regulatory agencies.

Section 5.3.10
It is suggested that the heading be changed to; “Establish documentation and record keeping procedures". This is due to the fact that documentation is described prior to records.

It is recommended that elements that should be documented are included. Examples may include - hazard analysis, CCP determination, CL determination and verification procedures.

Table 5.10
Suggest the following changes:
Critical limit column – those specific parameters associated with heat processing;
Monitoring – remove stability tests, add all parameters,
Corrective Action – Who – Qualified personnel
Records – Monitoring records, corrective action records, product evaluation records, calibration records, validation records, audit records, HACCP plan review record
Verification – Validation, finished product evaluation, internal audit, review of records, Calibration of machinery (this may be a prerequisite), review of HACCP plan, external audit.

Conclusion
It is suggested that sentence four be changed as follows: “Furthermore, because of the nature of the significance of hazards and defects it is not possible to categorically determine which steps in a process will be CCPs and/or DAPs without actually assessing the process, the objectives of the process, its environment and expected outcomes."

It is recommended that the final sentence of the first paragraph be changed to read: "The example of canned tuna fish processing line is intended to illustrate how to apply the principles, given an outcome of a commercially sterile product, and why a HACCP and DAP plan will be unique to each operation."

SECTION 6 PROCESSING OF FRESH, FROZEN AND MINCED FISH

Section 6.1.1
Refer to Codex Sensory Evaluation code/guideline
Potential hazards – metal rather than physical contamination

Section 6.1.3
Add following pathogens – microbiological pathogens, toxins, viable parasites (because of control function here)

Section 6.1.5
Under potential hazards remove biochemical toxins as they are not introduced or controlled.

Section 6.2.2
MAP. Is metal inclusion an appropriate hazard here? What from?

Section 6.3.1
Include freezer burn under potential defects
Bullet 4 - product should be removed to store once it has reached the required core temperature.
Remove bullet point 7, should have occurred before reaching this step.

Section 6.3.2
Remove bullet point 6 as this should have occurred before reaching this step.

Section 6.4.3
Potential hazards – add chemical hazards in non-approved additives and/or ingredients
- include microbiological hazards from additives.

Section 6.5.1 & 6.5.2
Microbiological pathogens and biochemical toxins unlikely and should be addressed by prerequisite programmes as GMP.

In the following sections (Sections 7-17) New Zealand has supplied the following comments to be considered by the drafters of these sections.

In the following sections it is essential to develop a consistent approach to that applied in section six with regards to the identification of Potential Hazards and Potential Defects.

SECTION 7 PROCESSING OF MOLLUSCAN SHELLFISH

Section 7.1 Identification of Hazards
It is suggested that the first two sentences of paragraph one be amended as follows:
"**Some** molluscan shellfish species **eg.** oysters, mussels, manilla and hard shell clams can survive for extended periods out of water and can be traded for human consumption as live animals. Other species **eg.** cockles can be traded live if carefully handled, but are normally processed.

It is suggested that the first two sentences of paragraph two be amended as follows:
"The main hazards known from the production of molluscan shellfish are from sewage contamination of growing waters. Since molluscs are filter feeders they can concentrate pollution **to** a much higher concentration than the surrounding seawater."

Section 7.2 Growing Area Requirements
It is suggested that paragraph six be amended as follows:
"Deep water stocks of wild scallops of the type trawled commercially are not considered prone to sewage contamination but can be subject to **biotoxins** and chemical/toxic substance contamination.

Section 7.2.2 Marine biotoxin control
Change wording of title to "Marine biotoxin management".
In paragraph one it is suggested that the second sentence be amended as follows:
"The risk of blooms of toxic **phytoplankton** may show seasonal variability and areas may also be affected by toxic **phytoplankton** earlier unknown in the surrounding sea or coastal waters."

Section 7.5
Re-circulated water should be treated to remove microbial, physical and chemical contamination. The following performance criteria should be included salinity, dissolved oxygen, pH, temperature, turbidity, flow rate and microbiological levels.

Section 7.6.2
First paragraph - It is suggested that it should be made clear that conditioning does not remove contaminants ie. purpose is not to purify.

Section 7.6.4
Needs to be made clear that this refers to live product not processed shellfish. It is suggested that a title be included which reads "Packing Live Shellfish".
It is suggested that bullet three - "The packaging material should avoid contamination and should be drained", as this information is covered in bullet point two.

Section 7.7.1
In paragraph two - the symbol (Fχ15) should be explained in greater detail to aid understanding.

It is suggested that the bullet points should include separation of raw and cooked product

Section 7.8
Bullet 3 -Include the following additional wording - "must identify the amount of shellfish within the lot that is being processed."

Section 7.9
Bullet 3 - should include cessation of processing, disposition of product etc. It is suggested that the following wording be included; "In instances where the process parameters are not achieved processing should cease and the disposition of non-complying product be determined."

SECTION 8 PROCESSING OF LOBSTERS AND CRABS

Section 8.2.1.1
Under the subtitle *Bacteria*, at end of first paragraph the writer refers to molluscan shellfish. It is recommended that this be deleted.

Section 8.2.1.2
It is recommended that all references to molluscan shellfish be removed.

Potential hazards - Generally these state that the risk of hazards is unlikely but there is no consideration of microbiological contamination.

Section 8.3.1.6
Suggest defect - decomposition, be included.

Section 8.3.1.11
Suggest defect - dehydration, be included.

Section 8.3.1.13
Suggest defect - dehydration, be included.
Technical guidance should include suitable stock rotation.

Section 8.3.1.14 Additives, Packaging and Label Reception
Remove words "absence of labelling of allergenic additives"
Allergenic = chemical hazard
Labelling = defect

8.3.2.2 Cooking (Processing Step 4)
Potential hazards - Change to Pathogenic micro-organisms (remove "survival of….due to insufficient cook").

8.3.2.3 Cooling (Processing Step 5)
It is suggested that the potential hazard - Microbial contamination is not appropriate and should be removed.

8.3.3.4 Cooking (Processing Step 4)
Under potential hazards it is suggested that this be renamed to read; "Pathogenic micro-organisms."

8.3.3.6 Sectioning/Meat Extraction
Under potential hazards it is suggested that this be renamed to read "Recontamination with pathogenic microorganisms."

8.3.3.7 Shell Fragments Removing
It is suggested that the first bullet point should refer to accept/reject criteria established for shell fragments.

8.3.3.9 Pasteurisation
Under Potential Hazards it is recommended that information be renamed to read "Survival of pathogens."
It is suggested that bullet point four should be linked with bullet five to complete the statement.

SECTION 9 PROCESSING OF SHRIMPS AND PRAWNS

Section 9.2.1 Reception (in behead area)
It is suggested that under potential hazards include chemicals, pesticide and veterinary drug residues, as this is mentioned in technical guidance.

Section 9.2.6
Under Potential Defects include - texture deterioration

Section 9.2.7
Under Potential Defects include - black spot and decomposition

Section 9.2.9
Under Potential Defects include - dehydration
Under Technical guidance - the addition of "freezers should be monitored" is suggested.

Section 9.2.10
Under Potential Hazards: It is suggested that physical hazards be removed, as these are more identified in the Technical Guidance Section.

Section 9.2.11
Under Potential Hazards: It is suggested the microbial contamination is very unlikely at this stage therefore it should be removed.
Under Potential Defects include - dehydration

Section 9.3 I.Q.F. Peel, Peel & Devein, Cooked or Breaded Shrimps or Prawns.

Sections 9.3.1, 9.3.3 - 9.3.9
No hazards or defects have been listed. It is suggested that these are identified or listed as unlikely.

Section 9.3.11
Under Potential Defects include - dehydration

SECTION 10 PROCESSING OF CEPHALOPODS

Section 10.2.4
Under Potential hazards include - microbiological and chemical contamination.

SECTION 12 PROCESSING OF SMOKED FISH
Liquid smoke - flavouring process

SECTION 13 PROCESSING OF CANNED FISH AND SHELLFISH
No mention of likely chemical hazards

Section 13.2.1
Container hazards identified but don’t appear elsewhere
Section 13.3.1.1
Potential hazards: are heavy metals appropriate here?
It is suggested that biotoxins should be included.

Section 13.3.2.2
Section 13.2.1 (c) lists hazards associated with the container, but this section does not address them. It is suggested that microbiological and chemical hazards associated here be included.

Section 13.4.6
Mentions chemical hazards as does Section 13.3.1.1 but these are not included in the list of hazards in Section 13.2.1 it is suggested that these be included.

SECTION 14 PROCESSING OF FROZEN SURIMI
Section 14.2.1
It is suggested that Potential hazards should include parasites, microbiological, chemical etc. Histamine is mentioned in the technical guidance.

Section 14.2.1
Potential hazards - Parasites and chemicals (eg., histamines) should be included.
Fourth bullet point - Should read 14 hours not 14 days.

Section 14.4
The Potential hazard is pathogenic microbial growth however according to Sections 14.2.1 - 14.3 there are no microbiological hazards. It is suggested that this be listed for consistency if it is not intended that they may be added at this step.

Section 14.9
Under Potential Defects include - dehydration

SECTION 15 PROCESSING OF COATED QF FISHERY PRODUCTS
Section 15.3.3
Under Bullet 2 it is suggested that plastic embedded in product be included.

SECTION 16 AQUACULTURE PRODUCTION

Title should clearly reflect that this is aquaculture of finfish & crustaceans not molluscan shellfish.

SECTION 17 TRANSPORTATION

Potential hazards: should include microbial pathogens for chilled products, chemical from fuel, other products being transported with fish.

SECTION 18: RETAIL

Potential hazards: Hazards exist for unpackaged product in retail including microbiological contamination.

Section 18.1
Bullets should include adequate drainage of displayed product (melt water, fish juices) and a cleaning regime for cabinets and utensils.

UNITED STATES

General comments

The U.S. is generally pleased with the incorporation of HACCP principles and the overall revisions to the Proposed Draft Code of Practice for Fish and Fishery Products.

Suggested Change: Change “histamine” throughout the draft to “scombrotoxin.”
Reason: The term scombrotoxin is a more technically correct term than histamine.

Section 2

2.1 General Definitions

Control Measure: The definition of "control measure" should be modified by adding "prevent or" before the word "eliminate."
Reason: Consistency with Codex HACCP document.

2.2 Fresh, Frozen and Minced Fish Definitions, Freezer.

Suggested Change: Add the following definition "**Storage Freezer:** equipment designed for maintaining fish and other foods in a frozen state, preferably below -18° C."

Reason: Freezers used for food processing are of at least two distinct types with two different purposes. The definition of freezer should address storage freezer versus preservation freezer. The draft definition can be used for the latter.

2.4 Lobsters and Crabs

Claw**: The definition of "claw" should read: "means the pincer appendage at the end of the crab or lobster arm."**

Reason: Proper designation of crustacean anatomy.

Suggested Changes: Add the following to the definition—

The definition of "carpus" needs to be inserted. The "carpus" "is the second leg segment from the shoulder of the crab."

The definition for "dactyl tip" should be inserted and read, "is the lowest segment on a crab leg."

The definition for "merus" should be inserted and read, "is the first leg segment from the shoulder of the crab."

The definition for "propodus" should be inserted and read, "is the third leg segment from the shoulder of the crab."
The definition for "shoulder" should be inserted and read, "is the section containing meat in the body of the crab."

Add the definition for "Lobster" and read, "**Lobster** means commercially important species in the order Decapoda, and families Nephropridae Scyllaridae or Palinuridae or other economically important taxonomic families."

Reason: lobsters are as economically important as crab.

2.8 Smoked Fish Definitions,Wood

Comments: The following statement should be removed from the definition and moved to Section 12 which addresses smoked fish: "• Painted, impregnated or otherwise treated wood or woody plants must not be used for the generation of smoke."

Reason: does not contribute to the understanding of wood as a commodity.

3.2.2 To Minimize Contamination

Suggested Change: Add an additional bullet point stating "Potable and non-potable water lines should be fitted with back flow devices".

Reason: Good hygienic practice.

3.5.2 Personnel Hygiene, 1st bullet

Comment: add "transmitted through food" after the word " disease".

Reason: The definition unnecessarily bars persons with communicable diseases not transmissible through food from the processing area.

SECTION 4 GENERAL CONSIDERATIONS FOR THE HANDLING OF FRESH FISH AND SHELLFISH

Paragraph 1, first sentence, after "processing" add "or intended use."

Reason: the wording would eliminate the acceptance of raw products containing pathogens that could be eliminated by cooking.

4.1.1.2 Bacteria

Change the first sentence, second paragraph to add "or incidentally" after the word "normal".

Reason: *Listeria monocytogenes* does not seem to fit either indigenous or non-indigenous categories because it is not naturally present in the aquatic environment and is not present due to the introduction of industrial wastes. It is incidentally present in aquatic environment when it is washed in from the shore.

TABLE 5.1

Suggested Change: Add "intended use" after the word "description" in the title of Table 5.1

Reason: Clarity since this table covers product description and intended use, but only references product description.

5.3.1 Describe Product

Since the Table 5.1 includes intended use it should be referenced here.
Reason: Clarity.

5.3.4 Significance of Hazards and Defects

Suggested Change: Change the heading of this section to read—"Hazard or Defect Analysis: identification and determination of significance. "

Reason: Clarity and it is not determining the significance of hazards, hazard or defect analysis. The section should reflect this.

5.4.3 Table 5.6 Control Measures

Suggested Change: Add the following bullets that are control measures more specific to the safe processing of canned fish.

- Visual examination of unfilled cans for safety related defects.
- Visual examination of seamed cans.
- Physical examination of seamed cans (teardown seam measurements).
- The establishment of adequate venting procedures and process time and temperature parameters that ensure safe product.
- Monitoring of retort venting procedures.
- Monitoring of retort time and temperature parameters to ensure that they are in accordance with established safety criteria.
- Monitoring retort cooling procedures that will ensure safe product.

- Monitoring of proper can handling after retort processing.

Reason: The control measures as listed are vague and should be more specific to the hazard being controlled. Control measures should not be generic.

Suggested Change: Change "sprinkling holes" to "spray apertures."

Reason: Appropriate technical terms should be used in a technical document. Apparently the above term refers to spray nozzle orifices in a water spray retort. Therefore, An

Table 5.7 under justification.

Inadequate protection of frozen tuna could be added as a justification (e.g., open packages, lack of glaze).

Reason: Inadequate protection will promote freezer burn and/or rancidity in frozen tuna. Freezer burn cannot be eliminated as a defect.

5.3.9 Establish Verification Procedures.

Suggested Change: Place the following sentence after the sixth sentence in the paragraph that ends in "applicable: "Additionally, instrument calibration should be verified periodically to ensure proper measurements are obtained."

Reason: Instrument calibration should be included here. It does not appear to be included elsewhere.

TABLE 5.10

Comment: Stability tests should be a verification measure not a normal monitoring procedure.

Reason: Stability tests verifies the adequacy of the thermal processing but
the process is too lengthy for proper control during processing.

6.1.1 RAW, FRESH OR FROZEN FISH RECEPTION (PROCESSING STEPS 1)

Suggested Change: Under "Technical Guidance", following the first bullet point regarding specifications, add a sentence "- provide time/temperature records for Scombrotoxin producing species".

Reason: Good technical guidance.

6.3.1 Freezing Process.

Comment: Viable parasites should be removed as a potential hazard.

Reason: Parasites are not likely to survive the freezing process.

6.5.1 Raw Material Reception, 6.5.2 Raw Material Storage

Comment: Remove biochemical toxin as a hazard.

Reason: It is highly unlikely for packaging materials to be contaminated with the biochemical toxins associated with seafood.

7.1 Identification of Hazards

Suggested Change: Soft-shell clams should be listed as suitable for depuration.

7.2 Growing Area Requirements.

Suggested Change: Add the following sentence—"• Since bio-toxins in scallops are usually concentrated in the viscera or the gonads, processing that removes these organs may be an effective preventive measure."

Reason: For scallops, some mention should be made that bio-toxins generally affect the viscera and gonads and to a much lesser degree the adductor muscle. Processing of scallops may be an effective preventive measure for bio-toxins if the viscera and/or gonads are removed.

7.6.2 Conditioning and storage of molluscan shellfish in sea water tanks, basins etc.

Suggested Change: change the 6th bullet to read as follows—"• the oxygen content and other factors that affect shellfish health in the sea water should be monitored and maintained at an adequate level at all times;"

Reason: The 6th bullet could include other factors that affect fish health. In addition to oxygen content factors such as salinity, nitrates, nitrites and the presence of other chemicals are also important to maintaining shell health..

Section 8 Processing of Lobsters and Crabs.

Suggested Change: include appropriate information about crawfish processing.

Reason: this is the obvious section of the document to include crawfish.

8.1.2 Hygiene Control Programme

Suggested Change: remove the 2nd bullet.

Comment: The second bullet is unnecessary since hygiene is covered thoroughly in a previous section.

8.2.1.1 Biological Hazards.

Suggested Change: Remove first paragraph on parasites and third paragraph on bacteria; add the following after the second paragraph—"Northern crab often have infestations of marine leeches that are ecto-parasites and black shell which is a fungal infection. Both are common defects." Additionally the heading should be changed to "biological hazards and defects."

Reason: Parasites and bacteria cited should be specific to crustaceans. The parasites referenced do not all relate to crustaceans so should be removed. Additionally, marine leeches that are prevalent ecto-parasites on many northern species of crab should be added as a potential defect. Leech and black shell infestations are common defects of crab from North America. Black shell, which is a fungal infection, should be added for the same reason. The paragraph on bacteria is redundant to earlier sections of the draft.

8.3.1.13 Frozen Storage.

Suggested Change: add the following bullet—"• product should be properly protected from dehydration by proper packaging material or glaze."

Reason: Dehydration is likely to occur unless lobster is properly packaged and/or glazed.

9.1 Shrimp and Prawns - General

Suggested Change: Add appropriate information about shrimp and prawn processing.

Reason: There is no preamble information for shrimp and prawns.

9.3.1 Peel or Peel and De-vein, 9.3.3 to 9.3.9

Comment: The draft does not follow the agreed upon format. There are no potential hazards/defects/technical guidance sections listed.

Reason: Provide guidance in accordance to the format.

9.3.1 Peel or Peel and De-vein

SUGGESTED CHANGE: ADD REFERENCE TO MECHANICAL DE-VEINING MACHINERY.

Reason:. De-veining is not always a manual operation Johnson and Laithram equipment are designed to mechanically slice and remove the vein.

9.2 Shrimp and Prawns Processing Operations

Suggested Change: Two bullets should be added:

9.2.1—"• sulfite levels in raw shrimp should be monitored at receipt."
9.2.8—"• if sulfites are present in the product it should be declared on the label."

Reason: Sulfites are commonly used in shrimp to control blackspot and can be a dangerous allergen. This section needs to address the use of sulfites in shrimp and its proper control as a potential food safety hazard.

Figure 10.1 Cephalopod Flow Chart (between 10.2.3 and 10.2.4)

Comment: Is this the intended location for Figure 10.1?

Reason: text continuity.

Suggested Change: Relocate to an appropriate place.

10.2.1 Reception of Cephalopods

Suggested Change: the following bullet should be added, "• for squid a pinkish coloration may be a sign of early decomposition."

Reason: The draft could include a bullet concerning pinkish coloration in squid (loligo species) that is a sign of early decomposition.

Figure 10.1 Cephalopod Flow Chart (between 10.2.3 and 10.2.4)

Suggested Change: Relocate to an appropriate place.

Reason: Text continuity.

11.2.1 Splitting, Washing and Rinsing (Salted Fish)

Suggested Change: Remove parasites as a hazard

Reason: Parasites should not be considered a hazard in this section. If the fish is properly salted to prevent spoilage and in almost all cases cooked thereafter parasite would not likely survive and be a hazard.

11.3.2 Salt Requirements

Suggested Change: Delete "incorrect composition" and add "C*lostridium botulinum*, microbiological growth."

Reason: "incorrect composition" is not the hazard, it is *Clostridium botulinum*. *C. botulinum* is the hazard to be controlled.

11.4.1 Brining

Suggested Change: Cnsider removing "contamination" as a hazard.

Reason: Comment: The reference to "contamination" should be more specific. What contamination is likely and would it be a hazard or just a defect? Contamination may not always be a hazard.

11.4.1 Brining, 11.4.2 Wet Salting, 11.4.3 Dry Salting, 11.4.4 Pickling

"*Potential Hazards*"

Suggested Change: Delete "fatty fish."

Reason: Decomposition of fatty fish is not a hazard. The decomposition of fatty fish is not reasonably likely to cause a human health problem?

"*Potential Defects*"

Suggested Change: Remove "histamine" as a defect.

Reason: Scombrotoxin is a hazard because it may cause human health problems.

11.4.3 Dry Salting
Last bullet, delete "or to high temperatures" and add the following bullet "• salted fish should be stored or maintained at 9° C. to prevent possible scombrotoxin formation.

Reason: There is a need to provide specific guideline on storage temperatures.

Suggested Change: add the following bullet—" • walls that contact dry salted fish in storage should be clean and made of an impermeable surface suitable for product contact."

Reason: Dry salted fish is often stacked against walls. There should be some reference to walls that salted fish may interface.

SECTION 12 PROCESSING OF SMOKED FISH PREAMBLE

Suggested Change: Define the term or use some words that are universally understood. We recommend that this paragraph be re-written.

Reason: This paragraph is confusing.

12.1 Pre-Salting

Comment: The United States believes that 3.5% water phase salt is the proper level to prevent *Clostridium botulinum* growth.

Reason: The scientific literature so indicates.

12.1 Pre-Salting

Suggested Change: Remove chemical and physical contamination as hazards.

Reason: HACCP controls and pre-requisite programmes should properly control those possible hazards.

12.2 The Smoking

Suggested Change: remove the narrative and keep the bullets but ensure that all technical guidance from the narrative is captured.

Reason: The narrative and the bullets for this section are redundant. Additionally, the insertion of a narrative and bulleted technical guidance is inconsistent with the agreed upon format.

12.3 Slicing of Cold Smoked Products (Processing Steps 5 & 6)

Suggested Change: add, "poor or incomplete slicing" as a defect. Add the following bullet—"• the slicer should be sharp and well maintained to avoid damaging product."

Reason: The slicing operation would result in defective product if it were not carried out properly.

12.5 Packing of Hot Smoked Products

Suggested Change: *Clostridium botulinum* should be added as a potential hazard and the following bullet should be included "• MAP packaging of smoked fish should include appropriate barriers to prevent botulism outgrowth."

Reason: *Clostridium botulinum* outgrowth is reasonably likely to occur in Modified Atmosphere Packaging.

12.7 Storage, Distribution and Retail

Suggested Change: *Clostridium botulinum* should be added as a potential hazard and the following bullet should be included "• smoked fish products in MAP should be held and handled at temperatures below 38° F (3° C.) To prevent possible botulism toxin outgrowth.

Reason: *Clostridium botulinum* outgrowth is reasonably likely to occur in Modified Atmosphere Packaging.

SECTION 13 GENERAL

Suggested Change: Remove reference to low acid canned foods safety requirements.

Reason: To avoid redundancy and conflict with the established Code of Hygienic Practice for Low-Acid Canned Foods. The technical requirements of low-acid canned foods need not reiterated in the Fish Code of Practice. It would be simpler to refer to the Recommended International Code of Hygienic Practice for Low-Acid and Acidified Canned Food (CAC/PRC 23-1979).

13.1 General – Addition to re-requisite Programme

Suggested Change: Combine bullets or remove one.

Reason: They appear to be redundant.

13.2.1 Hazards B – Microbiological Toxins

Suggested Change: Add the following at the end of the first sentence—"but may be brought about by inadequate container integrity."

Reason:. *Clostridium botulinum* could be a hazard on adequately heat-processed products where container integrity is inadequate. A poorly sealed container could aspirate bacteria from the cooling water or surrounding environment.

13.3.2.2 Containers and Packaging

Suggested Change: add the following bullet "• cans should be subjected to a spray washing prior to filling."
Reason: Manufactured cans often have dirt and debris in them.

13.4 Pre-Cooking and Other Treatments

Suggested Change: Add the following bullet under 13.3.5.1 Fish preparation or 13.4.6.1 General Considerations—"• care should be taken to prevent temperature abuse of scombrotoxic fish prior to pre-cooking."

Reason: Scombrotoxin does not form during or after cook but may result from poor handling or abuse prior to pre-cook. This hazard is not inherently associated with cooking.

13.4.6 Pre-cooking

Comment: "chemical contamination" should be removed as a hazard and it should be added as a potential defect.

Reason: oxidized oil does not pose a human health risk.

13.4.9 Thermal Processing

Suggested Change: Remove reference to low acid canned foods safety requirements.
It would be simpler to refer to the Recommended International Code of Hygienic Practice for Low-Acid and Acidified Canned Food (CAC/PRC 23-1979).

Reason: To avoid redundancy and conflict with the established Code of Hygienic Practice for Low-Acid Canned Foods.

13.4.9.2 Heat Processing Operation

Suggested Change: Bullets 3 and 4 should be combined.

Reason: bullets 3 and 4 are redundant.

3.4.11 Monitoring After Heat Processing and Cooling

Comment: Stability tests should be a verification measure not a normal monitoring procedure.

Reason: Stability tests verifies the adequacy of the thermal processing but
the process is too lengthy for proper control during processing.

13.4.12 Labeling, Casing and Storage of Finished Products, 13.4.13 Transportation of Finished Products

Suggested Change: The words " of *Clostridium botulinum"* after "recontamination" under Potential Hazards.

Reason: *Clostridium botulinum* is the hazard to be concerned with in canned products.

15.3. 3 Unwrapping, Unpacking

Suggested Change: To the Technical Guidance, add a fourth bullet point "protect wrapped, unwrapped and unpacked fish blocks when cleaning and sanitizing processing lines during breaks and between shifts."

Reason: This is a good hygienic practice. Unwrapped product can be contaminated during processing.

17.2 To Minimize Damage and the Rate of Decomposition of Fish and Fishery Products During Transportation

Suggested Change: add the following sentence to the last bullet "The use of a recording thermometer is recommended."

Reason: The use of recording thermometers should be encouraged. Use of recording thermometers provides more complete control of product quality and safety.

SECTION 18 RETAIL

Comment: Retail handling and display may adversely affect fish quality and safety. Since there is a planned revision of this section, the following draft is offered:

Figure 18.1 Chilled Seafood at Retail

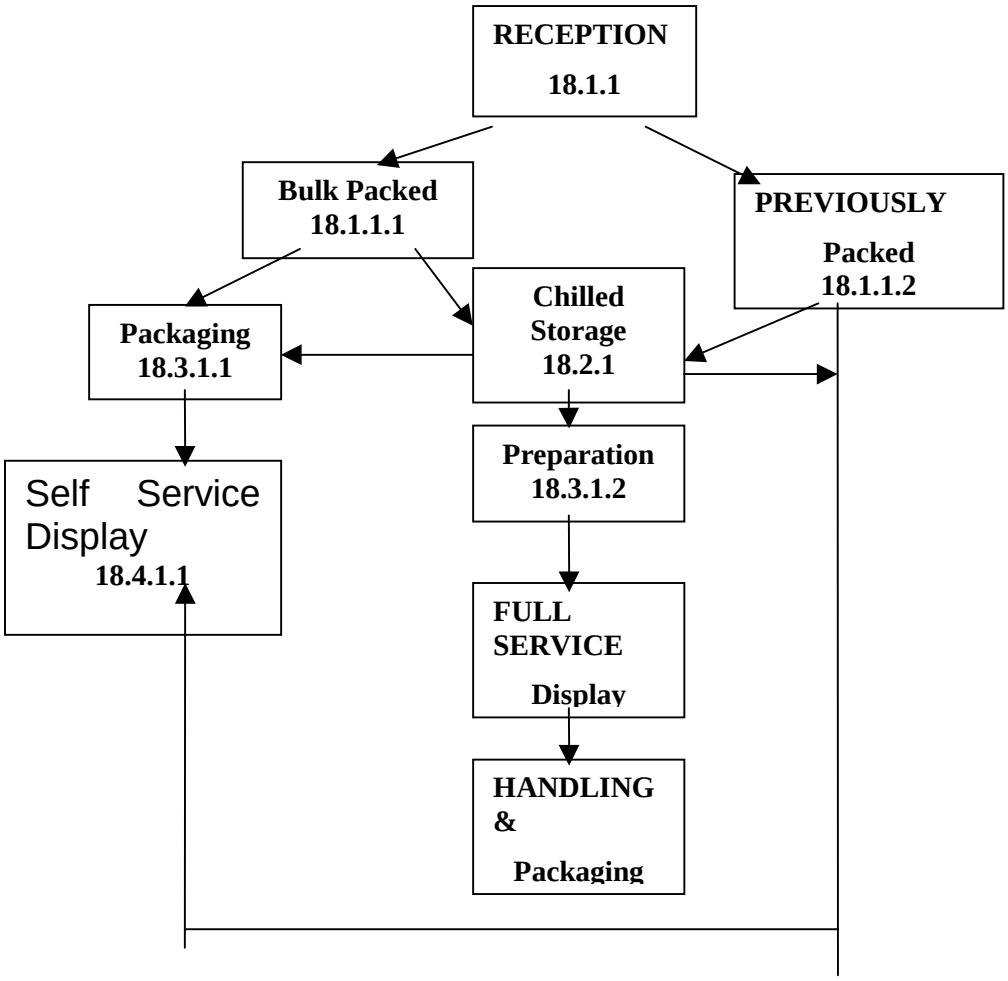
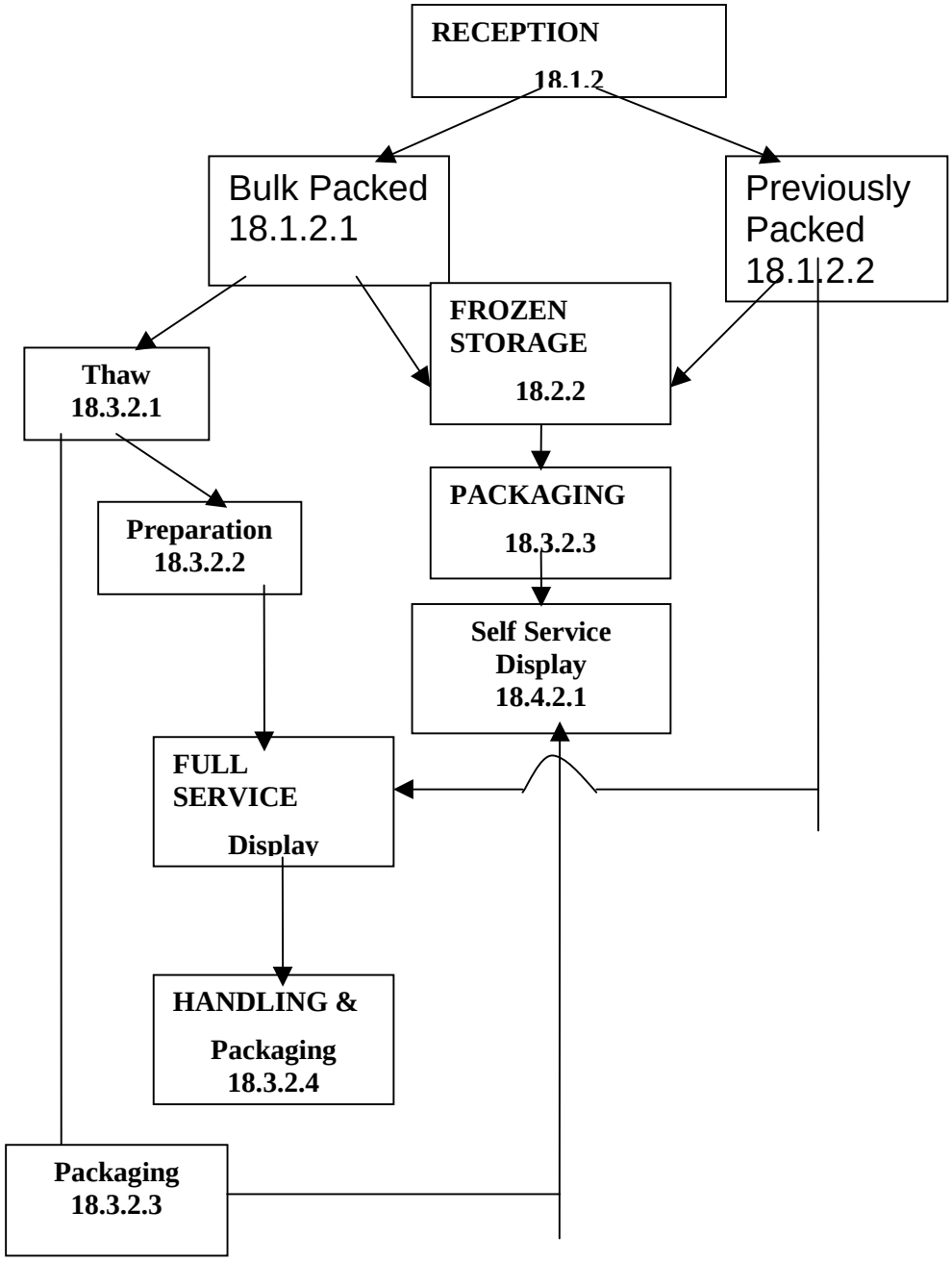


FIGURE 18.2 FROZEN SEAFOOD AT RETAIL



Section 18: Retail

Fish and shellfish at retail should be received, handled, stored and displayed to consumers in a manner that minimizes potential food safety hazards and defects and maintains essential quality.

Consistent with the HACCP approach to food safety and quality , products should be purchased from known or approved sources under the control of competent health authorities that can verify HACCP controls. Retail operators should develop and use written purchase specifications designed to ensure food safety and desired quality levels.

Proper temperature storage after receipt is critical to maintaining fish and fishery product safety and essential quality. Chilled products should be stored in a hygienic manner at temperatures at or less than 4 ° C. while frozen products should be stored at temperatures at or less than -18 ° C.

Preparation and packaging should be carried out in a manner consistent with the principals and recommendations found in Section 3, Prerequisite Programmes. At all times, displayed seafood items should be held at temperatures and conditions that preclude the development of potential bacterial growth and other hazards in addition to loss of essential quality.

Consumer information at the point of purchase, for example placards, brochures, or kiosks, that informs consumers about proper preparation procedures and potential risks of seafood products if mishandled or improperly prepared, helps to ensure that product safety and quality is maintained.

A system of tracking the origin and codes of fish and shellfish should be established to facilitate product recall or public health investigations in the event of the failure of preventive health protection processes and measures. These systems exist for shellfish in some countries in the form of shellfish tagging requirements.

18.1 Reception of Fish and Fishery Products at Retail – General Considerations

Potential Hazards: see Reception 6.1, 7.1

Potential Defects: see Reception 6.1, 7.1

Technical Guidance:

- The transport vehicle should be examined for overall hygienic condition. Fish and fishery products subjected to filth, taint or contamination should be rejected.

- Seafood should be regularly examined for adherence to purchasing specifications.

- All fish and fishery products should be examined for decomposition and spoilage at receipt. Products exhibiting signs of decomposition should be refused.

18.1.1 Reception of Chilled Fish and Fishery Products at Retail

Potential Hazards: Pathogen Growth, Cross Contamination, Scombrotoxin Formation

Potential Defects: Spoilage (decomposition), Contaminants, Filth

Technical Guidance:

- Internal temperatures of incoming chilled seafood should be taken and recorded from several locations in the shipment. Chilled fish should be maintained at or below 4° C. (40° F.)

18.1.2 Reception of Frozen Fish and Fishery Products at Retail

Potential Hazards: None likely

Potential Defects: Thawing, Contaminants, Filth

Technical Guidance:

- Incoming frozen seafood should be examined for signs of thawing and evidence of filth or contamination. Suspect shipments should be refused.

- Internal temperatures of incoming chilled seafood should be taken and recorded from several locations in the shipment. Frozen fish should be maintained at or below -18° C. (0° F.) and should be rejected if the internal temperature exceeds 0° C. (32° F.).

18.2.1 Chilled Storage of Fish and Fishery Products at Retail

Potential Hazards: Scombrotoxin, Microbiological growth, Cross Contamination

Potential Defects: Decomposition, Contaminants, Filth

Technical Guidance:

- Fish and fishery products in chilled storage should be kept at 4° C. (40° F.) or below.
- Seafood should be properly protected from filth and other contaminants through proper packaging.
- A continuous temperature recording chart for seafood storage coolers is recommended.
- The cooler room should have proper drainage to prevent product contamination.
- Ready-to-eat items and molluscan shellfish should be kept separate from other raw food products in chilled storage.
- A product rotation system to ensure first in, first out usage should be established.

18.2.2 Frozen Storage of Fish and Fishery Products at Retail

Potential Hazards: None Likely
Potential Defects: Chemical decomposition (rancidity), Dehydration

Technical Guidance:

- Product should be maintained at -18° C. or less. Regular temperature monitoring should be carried out. A recording thermometer is recommended.
- Seafood products should not be stored directly on the floor or stacked in such close proximity that proper air circulation and thawing would be inhibited.

18.3.1 Preparation and Packaging Chilled Seafood at Retail

Potential Hazards: Scombrotoxin, Microbiological Growth, Cross Contamination

Potential Defects: Decomposition, Improper Labeling

Technical Guidance:

- Care should be taken to ensure that handling and packaging product is conducted in accordance to guidelines in Section 3 Pre-requisite Programmes.
- Care should be taken to ensure that product is not subjected to temperature abuse during packaging and handling.

18.3.2 Preparation and Packaging of Frozen Seafood at Retail

Potential Hazards: Cross Contamination

Potential Defects: Thawing, Improper Labeling

Technical Guidance:

- Frozen seafood products should not be subjected to ambient room temperatures for a prolonged period of time.

18.4.1 Retail Display of Chilled Seafood

Potential Hazards: Scombrotoxin, Microbiological Growth, Cross Contamination

Potential Defects: Decomposition, Dehydration

Technical Guidance:

- Fish and fishery products in chilled display should be kept at 4° C. (40° F.) or below. Temperatures of product should be taken at regular intervals.

- Ready-to-eat items and molluscan shellfish should be kept separate from other raw food products in chilled full service display. A diagram of display is recommended to ensure that cross contamination does not occur.

- If ice is used, proper drainage of melt water should be in place. Retail displays should be self-draining.

- Each commodity in a full service display should have its own container and serving implement to avoid cross contamination.

- Care should be taken to avoid arranging product in too large a mass so that proper chilling cannot be maintained.

- Product should not be added above the "load line" where a chilled state cannot be maintained in self-service display cases.

- Care should be taken to avoid drying of unprotected products in full service displays. Use of an aerosol spray, under hygienic conditions is recommended.

18.4.2 Retail Display of Frozen Seafood

Potential Hazards: None Likely

Potential Defects: Thawing, Dehydration (Freezer Burn)

Technical Guidance:

- Product should be maintained at -18° C. or less. Regular temperature monitoring should be carried out. A recording thermometer is recommended.

- Product should not be added above the "load line" where a frozen state cannot be maintained in self-service display cases.

- A product rotation system to ensure first in, first out usage of frozen seafood should be established.

- Frozen seafood in retail displays should be examined periodically to assess the level of dehydration or freezer burn.

Appendix I

Suggested Change: In the first sentence of the fourth pragraph, add " processed ready-to-eat products in" after "Seal integrity of."

Reason: for most products this situation would not be a food safety problem. Although MAP packaged seafood will probably have a longer shelf life than products in normal atmosphere, it is difficult to see why seal integrity is a CCP. It it is breached, the shelf life will be shortened but products that are ultimately cooked will probably spoil before a pathogen would grow. In that event the product would likely not be consumed. However, it may be true for a processed ready-to-eat product.