

# codex alimentarius commission



FOOD AND AGRICULTURE  
ORGANIZATION  
OF THE UNITED NATIONS

WORLD  
HEALTH  
ORGANIZATION



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Agenda Item 8

CX/FH 08/40/8 - Add.1  
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## JOINT FAO/WHO FOOD STANDARDS PROGRAMME

### CODEX COMMITTEE ON FOOD HYGIENE

Fortieth Session

The Marriot Hotel, Guatemala City, Guatemala

### PROPOSED DRAFT CODE OF HYGIENIC PRACTICE FOR *VIBRIO* SPP. IN SEAFOOD AT STEP 3

#### Comments Submitted By:

Australia, Canada, Costa Rica, Guatemala, Iran, Mexico, Philippines, United States &  
International Commission on Microbiological Specifications for Foods (ICMSF)

#### GENERAL COMMENTS

##### AUSTRALIA

In the absence of the three FAO/WHO risk assessments for *Vibrio parahaemolyticus* in oysters, *V. parahaemolyticus* in raw and undercooked finfish and *V. parahaemolyticus* in *Anadara granosa* (bloody clams) detailed comments on specific issues relating to requests made by CCFFP cannot be made.

##### CANADA

We appreciate the efforts of the Working Group in developing a first draft of the Code of Practice. We are of the view that, in order to warrant the development of this guidance as a stand-alone document, future iterations of the document should focus on providing more specific risk management guidance for the control of pathogenic *Vibrio* spp. in seafood, as feasible and appropriate, and in order to respond to the request of the Codex Committee on Fish and Fishery Products.

We suggest replacing occurrences of “undercooked” with “partially cooked”. The use of the term “undercooked” in this context may be misleading since it is commonly associated in the food safety realm with failure to cook foods properly while in this case, it may be intended to refer to seafood that receive a partial heat treatment on purpose to achieve a specific goal, e.g., heat shocking bivalve molluscs in the shell to facilitate rapid removal of meat from the shell for the purpose of shucking;

Several of the recommendations made in different sections are considered as general hygienic practices that are addressed by the provisions in the General Principles of Food Hygiene. As they are not specific to the control of *Vibrio* spp., it is suggested reference to the General Principles of Food Hygiene would be sufficient. Examples of such recommendations are found in Section 3.4,

paragraph 42, the second sentence starting with “a carrier...”, in paragraphs 43, 55, 61, 62, 63, 101.

Furthermore, the risk management recommendations in the draft Code should be consistent with existing Codex guidance and care should be taken that the recommendations, while controlling *Vibrio* spp. in seafood, would not lead to hazardous practices with respect to other foodborne pathogens, and/or would not imply that *Vibrio* spp. are the only pathogens of concern in seafood production. For example, it is indicated in the second sentence of paragraph 67 that a temperature of 10°C is adequate for the control of *Vibrio* spp. While 10°C may be adequate to control growth of pathogenic *Vibrio* spp., it would be considered inadequate for the control of other pathogens or spoilage organisms. Also, the draft guidance should always be kept in the broader context of the recommendations of the Code of Practice for Fish and Fishery products, which specifies for example that fresh fish, shellfish and their products should be kept at a temperature as close as possible to 0°C while refrigerated processed products should be maintained at the temperature specified by the processor but should not exceed 4°C (refer to Section 17.1 of the Code of Practice for Fish and Fishery Products).

## **MEXICO**

Mexico reiterates its commitment to the Codex Alimentarius and is grateful for the opportunity to make the following remarks about the document:

We congratulate the technical group that developed the document for their work, as it was generally found to be complete. Nevertheless, we have the following observations:

- Check to see if the definition of “Primary Production” indicated in the International Code of Recommended Practices—General Principles of Food Hygiene includes “harvest” in aquaculture.

## **TITLE**

### **PHILIPPINES**

In the title above add “Pathogenic” after “Practice For”.

### **UNITED STATES**

We believe the document is promising and with a little more work will be very useful. We appreciate the opportunity to review the document and have the following overarching comments: The document would benefit from specific examples in many places and we have tried to note them in our specific comments. Also, it appears in some areas the recommendations apply to a subset of seafood rather than all seafood. It is important to qualify which sets of recommendations apply to which seafood.

## **BACKGROUND**

### ***Paragraph 4***

#### **UNITED STATES**

The workgroup may want to consider the relevance of each of the four areas identified by the CCFFP and whether those items have been adequately addressed. Including language in the report that explains the workgroup's response to each item would help to clarify the workgroup's activities for CCFFP and CCFH review. A statement providing this information should be included under the Working Group Report on page 2.

**WORKING GROUP REPORT****Paragraph 10****AUSTRALIA**

Third Sentence: in the parenthesis delete 20 and replace with 21.

**Rationale:** Paragraph 21 corrects the inaccuracy to the reference.

**Paragraph 13****AUSTRALIA**

The development of an Annex for *V. parahaemolyticus* and *V. vulnificus* in molluscan shellfish to the Proposed Draft Code is supported. The current Proposed Draft Code focuses heavily on the use of ice for cooling which is not suitable for live shellfish.

**UNITED STATES**

The U.S. agrees with the workgroup's recommendation to include specific pathogen/commodity combinations in an Annex.

First sentence: delete “to” after CCFH.

**Paragraph 14****IRAN**

Consider including some base for microbial criteria, e.g., ICMSF Criteria.

**UNITED STATES**

First sentence: replace “reply” with “response.”

**APPENDIX: PROPOSED DRAFT CODE OF HYGIENIC PRACTICE FOR PATHOGENIC *VIBRIO* SPECIES IN SEAFOOD AT STEP 3****GENERAL COMMENT****PHILIPPINES**

The Philippines recommends that a table of contents be included in the Draft Code of Hygienic Practice for *Vibrio* spp. in Seafood with the proposed sections:

**Rationale:** The outline should follow the food chain approach from pre-harvest to consumption.

**INTRODUCTION****Paragraph 4****AUSTRALIA**

This paragraph requires revision. Suggest focusing only on virulence factors e.g. *Vp* has *tdh* and *trh* genes, *Vc* has *ctx* genes, while no clear virulence factors have been identified for *Vv*. The FAO/WHO risk assessment notes for *Vv* that “virulence appears to be multifaceted and is not well understood, and therefore all strains are considered virulent.”

**Rationale:** Highlighting host factors is not relevant to this paragraph.

**Paragraph 6****AUSTRALIA**

Suggestion: After “three” add “main”

**Paragraph 7****UNITED STATES**

Last sentence; add explanation to statement about multiplication of *V. parahaemolyticus* being more rapid in cooked foods rather than raw.

***Vibrio cholerae*****Paragraph 13****AUSTRALIA**

Second sentence: After “.*V. cholerae*” delete “0” and substitute with “O”

***Vibrio vulnificus*****Paragraph 19****AUSTRALIA**

Delete First Sentence and substitute with: “ The densities of *V. vulnificus* are high in oysters at harvest when water temperatures exceed 20°C in areas where *V. vulnificus* is endemic; *V. vulnificus* multiplies rapidly in oysters if not refrigerated. The salinity optimum for *V. vulnificus* appears to vary considerably from area to area, but highest numbers are usually found at intermediate salinities of 5 to 25 ppt. Relaying oysters to high salinity waters (>32 ppt) was shown to reduce *V. vulnificus* numbers by 3–4 logs (<10 per g) within 2 weeks.”

**Rationale:** Extending the text to cover oyster growing areas where *Vv* is not endemic and/or high salinity waters. Additional text taken from the FAO/WHO risk assessment for *Vv*

***FAO/WHO Risk Assessments*****GENERAL COMMENT****AUSTRALIA**

Australia notes that risk assessments for *Vp* in raw oysters, raw and undercooked finfish and *Anadara granosa* are not available for review.

***Target Hazards and Target Food*****Paragraph 21****AUSTRALIA**

This [text] paragraph appears out of place and would be better located in paragraph 23, which outlines the Scope of the Proposed Draft Code.

**SECTION I – OBJECTIVES****1.1 THE CODEX GENERAL PRINCIPLES OF FOOD HYGIENE****PHILIPPINES**

Delete: subsection title 1.1

## SECTION II – SCOPE, USE AND DEFINITION

### 2.1 SCOPE

#### *Paragraph 23*

##### **CANADA**

It is indicated in paragraph 23 that the scope of the document includes seafood in the **cooked** state, which is not consistent with paragraph 25 where it is specified that existing Codex Codes of practice should generally be suitable to control pathogenic *Vibrio* spp. in cooked seafood. The Committee may wish to consider whether “cooked seafood” should remain in the scope of the document.

##### **PHILIPPINES**

First sentence: add After “raw” delete remainder of the sentence and replace with: “**chilled/frozen, undercooked, cooked, and ready -to-eat** state”

**Rationale:** Most seafood in the Philippines are marketed in live, chilled/frozen forms.

#### *Paragraph 24*

##### **AUSTRALIA**

First Sentence: Delete “consumption” and substitute with “retail”

**Rationale:** Extending the Code to include consumption raises issues about how regulation is to be applied (see Section 9.4 Consumer Information, paragraphs 106 – 108). It is suggested that the Code will be more focused if it is applied from primary production to **retail**.

#### *Paragraph 25*

##### **MEXICO**

Last Sentence: Delete the text after “seafood”

**Rationale:** Modifying the phrasing of the last sentence or eliminate it, to offer a better sense of the sentence as it appears to provide options to cover up bad practices in ready to eat foods contaminated with raw fishery foods.

##### **PHILIPPINES**

Second Sentence: After “...*Vibrio* spp. in” delete “raw...ready to eat...” Replace with live, raw, chilled/frozen, undercooked seafood and in cooked, and ready -to-eat.

**Rationale:** The term “ready-to-eat” is used in the document as seen in paragraphs 25, 48, 83 and 107.

### 2.3 DEFINITIONS

#### **GENERAL COMMENT**

##### **PHILIPPINES**

Please include the following additional definitions:

**Chilling:** process of cooling fish and shellfish to a temperature approaching that of melting ice (Code of Practice for Fish and Fishery Products, CAC/RCP 52-2003)

**Freezing:** process which is carried out in appropriate equipment in such a way that the range of temperature of maximum crystallization is passed quickly, The quick freezing process shall not be regarded as complete unless and until the product temperatures has reached -18°C (-0.4°F) or lower at the thermal centre after thermal stabilization. (Code of Practice for Fish and Fishery Products, CAC/RCP 52-2003)

**Ready-To-Eat:** status of the food being ready for immediate consumption at the point of sale, It could be raw or cooked, hot or chilled, and can be consumed without further heat-treatment including re-heating (Food and Environmental Hygiene Department 2001)<sup>1</sup>

#### **Refrigeration:**

##### **Paragraph 27**

#### **CANADA**

The definition of refrigeration should be revised for consistency with other Codex codes. For example, the Code of Hygienic Practice for Refrigerated Packaged Foods with Extended Shelf Life (CAC/RCP 46-1999) defines Refrigerated food as “*Food which is kept at cold storage temperatures to maintain its safety, quality and suitability, for the intended shelf life*”.

#### **UNITED STATES**

Insert “(<10 °C)” after temperature.

#### **Disinfected water:**

#### **IRAN**

Insert the word “has” at the beginning of the sentence, to read “Seawater that has received...”

#### **Clean Water:**

#### **AUSTRALIA**

Include a reference to “clean sea water” in the definition of ‘clean water’ (see Proposed Draft Code of Practice for Fish and Fishery Products, ALINORM 04/27/18 Appendix VIII)

#### **Artificial sea water:**

#### **IRAN**

Suggests changing the definition to read: “*Potable water in which a mixture of mineral salts has been dissolved, so that it simulates natural seawater.*”

#### **Seafood:**

#### **AUSTRALIA**

Relevance of footnote 7?

#### **CANADA**

Footnote 7 is redundant and should be deleted. The definition of seafood presented in the draft Code includes fresh water sources.

### **SECTION III - PRIMARY PRODUCTION**

#### **3.1 ENVIRONMENTAL HYGIENE (PRE-HARVEST CONTROL)**

#### **GENERAL COMMENTS**

#### **AUSTRALIA**

Suggest moving paragraphs 29 -34 to the proposed Annex

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<sup>1</sup> Food and Environmental Hygiene Department. (2001). Microbiological Guidelines for Ready-to-eat Food. Risk Assessment Section, Food and Environmental Hygiene Department, 43/F, Queensway Government Offices, 66 Queensway, Hong Kong. SOURCE: <http://www.fehd.gov.hk/safefood/ready-to-eat-food.pdf>.

## **COSTA RICA**

We believe that clarification should be made about molluscs farming conditions, in which the environment can be controlled, because in our situation the majority of farming cases are done directly in the bodies of water, and therefore environmental conditions cannot be controlled, and therefore, we think that it should be limited to pond farming.

## **MEXICO**

Delete: “(pre harvest control)” from the title

**Rationale:** consider that section 3.1 combines recommendations about good practices and risk assessment, which while both are important to the objectives of the document. We suggest revising the text under 3.1 as follows:

### **3.1.1 Pre-harvest control program – Risk assessment**

Mexico also suggests that paragraphs 28, 29 30 & 31 fall under 3.1.1 Pre-harvest control program – Risk Assessment as follows:

28. No change

29. No change

30. Risk assessment should consider epidemiological and pathogen exposure studies, as well as factors such as temperature and salinity of the area, which allow for permanent prediction models to be established to indicate the probable concentration of *Vibrio* spp in sea water and/or bivalves. Said models can be improved by incorporating local data and considering other factors such as hydrodynamic effects (cyclical tides, rain) and the level of sunlight.

31. Additionally, the levels of pathogenic species of *Vibrio* should be monitored during the harvest of molluscs and crustaceans, which together with prediction models will determine regional and seasonal risks of the occurrence of these microorganisms.

Mexico Suggests adding a second subsection as follows:

### **3.1.2 Pre-harvest control program – Control actions**

32. When prediction models and/or monitoring surpass the recommended levels, taking certain preventive measures should be considered, such as: closing the area to harvest or issuing a public warning that the area has problems with *Vibrio*; reducing the time between harvest and cooling the product; indicating that the product should undergo cooking treatment or other post harvest processing to reduce the level of *Vibrio*.

Eliminate paragraph 33, which is included in paragraph 30.

34. In cultivating sea food products in local coastal areas, especially in those with endemic cholera problems, the necessary measures should be taken to prevent contamination of bivalves with faecal matter that might contain toxigenic *V. cholerae* (choleric).

## **UNITED STATES**

Terms used in this section should be consistent with those used in the scope. Also, it appears that most of this section may not be applicable to all seafood—this should be clearly stated if it is the case.

### **Paragraph 29**

## **PHILIPPINES**

First Sentence: Delete “Generally” start sentence with **P**re-harvest

**UNITED STATES**

First sentence: Are the pre-harvest controls the parameters like temperature and salinity mentioned in the subsequent paragraphs? Need to clarify.

Second sentence: Need examples of areas where pre-harvest controls might be appropriate.

**Paragraph 30****PHILIPPINES**

First sentence: After “Temperature,” Add “*pH, dissolved oxygen*”

Second sentence: After “..temperature” add “*pH, dissolved oxygen (DO)*”

**Rationale:** pH and DO are likewise intrinsic factors that affect the growth dynamics of *Vibrio* spp. based on studies conducted (ASEAN Australia Development Cooperation Program on MRA on *Vibrio parahaemolyticus* 2007)<sup>2</sup> (unpublished); \_\_ (thesis c/o Dr. Silvestre-Battad) (unpublished)

**Paragraph 32****UNITED STATES**

Suggest rewording the first phrase of the first sentence to read When testing/monitoring criteria, established by a risk assessment, are exceeded, closing the harvesting area....”

**Paragraph 34****UNITED STATES**

Suggest rewording end of sentence: “...care should be taken to avoid contamination of seafood with faecal cholerae *V. cholerae*.”

**3.2 HYGIENIC PRODUCTION OF FOOD SOURCES****IRAN**

Title, after “Hygienic Production” add “SEA” or delete "OF FOOD SOURCES" to be consistent with the other subheadings

**Paragraph 35****AUSTRALIA**

Italicize “R” in *Recommended*.

**3.3 HANDLING, STORAGE AND TRANSPORT****GENERAL COMMENTS****AUSTRALIA**

Consideration of appropriate temperatures for holding of live fish and shellfish

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<sup>2</sup>ASEAN-Australia Development Cooperation Program Stream. 2007. Unpublished Report. Technical Report on Strengthening ASEAN Risk Assessment Capability to Support Food Safety Measures: Risk Assessment of *V. parahaemolyticus* in shrimps in ASEAN countries.

**PHILIPPINES**

To be consistent with the sequence of the Sub-section 3.3 heading on HANDLING, STORAGE AND TRANSPORT, we recommend change of sequence of order of paragraphs as follows:

Move the current text from paragraph 39 to paragraph 37.

Move the current text from paragraph 37 to paragraph 39.

Move the current text from paragraph 38 to paragraph 40.

Move the current text from paragraph 40 to paragraph 38.

**Paragraph 36****UNITED STATES**

Is there a temperature that could be added, perhaps <10C which is referenced elsewhere in the document.

**Paragraph 37****MEXICO**

Delete current text and replace with "*When the product is required to be washed whether onboard the boat or at port, clean water must be used.*"

**Paragraph 38****AUSTRALIA**

Second sentence: The use of ice is not appropriate for transportation of live fish and shellfish. Section 3.6 of the Code of Practice for Fish and Fishery Products (CAC/RCP 52-2003) notes that: "live fish and shellfish are to be transported at temperature tolerant to species". Suggest alternative wording: "live fish and shellfish are to be transported at temperatures tolerable for the species"

**COSTA RICA**

Paragraph 38 says that packaging for transport should be closed; however, it does not say if they should be completely sealed, I think this could be misinterpreted and it could be assumed that closed packaging could be, for example, a bag with a knot.

**IRAN**

Last sentence: insert the word "infections" after "*V. cholerae*"

**MEXICO**

The use of closed containers during transport is a good general practice, and limited to endemic *V. cholera colerico* areas. Similarly, the term closed packages should be clarified, as it limits customary practices. Based on the above, the following phrasing is suggested for the last sentence. "Covered containers shall be used for transport to prevent contamination with faecal material."

**UNITED STATES**

Last sentence; examples of the closed packaging might be helpful.

**PHIIPPINES**

Last sentence: “.enclosed packaging”, we would want to clarify whether seafood, ice or container is being referred to by the phrase “enclosed packaging “ on the line no. 5 as this would affect the heat transfer. Likewise, seafood packaging at harvest only requires the use of fish containers.

Last sentence: End the sentence after “used”

Add a new sentence that reads: “To prevent fecal contamination, good hygienic practice should be observed.”

**Paragraph 40****MEXICO**

Replace “fish” with “seafood products”

**Rationale:** Fish are not the only fishery products that are stored live.

**3.4 CLEANING, MAINTENANCE AND PERSONNEL HYGIENE AT PRIMARY PRODUCTION****PHILIPPINES**

delete: “AT PRIMARY PRODUCTION” from the title of this section.

**Rationale:** We recommend the deletion of the phrase “at primary production” in Section 3.4 as the Section heading. The SECTION III title states PRIMARY PRODUCTION.

**SECTION IV - ESTABLISHMENT: DESIGN AND FACILITIES****4.2 PREMISES AND ROOMS****4.2.1 Design and layout****Paragraph 49****PHILIPPINES**

First Sentence: After “seafood” add “product” ”

**Paragraph 50****CANADA**

Paragraph is confusing and should be further clarified.

**4.3.2 Food control and monitoring equipment****Paragraph 55****MEXICO**

In practice, not all thermometers are calibrated, understood as part of the certification of equipment before a recognized entity, which generally has a calibrated one that is used to verify the functioning of the others. This situation must be clarified in the document, given that the current phrasing limits this practice that there must be reliable thermometers.

**4.4 FACILITIES****UNITED STATES**

There are many uses of the word “adequate” in this section with no examples.

**4.4.1 Water supply****Paragraph 60****PHILIPPINES**

End sentence after “seafood” delete the remainder of the sentence

**Rationale:** An adequate supply of clean water do not reduce bacterial load of pathogenic *Vibrio* spp prior to processing

**4.4.5 Temperature control****PHILIPPINES**

We recommend inclusion of “time and” to the Section heading.

**Rationale:** citing Section 4.1 of the Code of Fish and Fishery Products (CAC/RCP 52-2003)

**ICMSF**

The proposed Code emphasises a number of very important *Vibrio* issues: keeping temperature below 10°C, using “clean water” for rinsing or cooling cooked products, etc. One should however be very careful with the temperature limit. In many ready-to-eat seafood products, bacterial species such as *Listeria monocytogenes*, *Clostridium botulinum* and histamine formers are also hazards in addition to *Vibrio* spp. – and they are not controlled by 10°C. In contrast, they do proliferate at this temperature. For example, group II botulinum toxins were produced at 8°C after 6 and 12 days in inoculated vacuum-packed Salmon and Rockfish, respectively (ICMSF 1996) and Type E *Cl. botulinum* may form toxin as low as 1-3°C.

Although the ICMSF understands that the target microbiological hazards of this Code are pathogenic *Vibrio* spp., we are concerned that the reference to 10°C is misinterpreted and understood as indication that are safe also from other hazards at this temperature. This Code should specify that 10°C applies to pathogenic *Vibrio* spp. and that a lower temperature is often required in order to keep other risks under control.

**Paragraph 67****AUSTRALIA**

First sentence: The recommendation that temperatures of less than 10 °C is adequate should be reviewed in light of the evidence that some *Vibrio* spp. are capable of growth below 10 °C. Suggest inclusion of the need to minimise the time that product is at temperatures approaching 10 °C.

The use of ice is not appropriate for transportation of live fish and shellfish. Section 3.6 of the Code of Practice for Fish and Fishery Products (CAC/RCP 52-2003) notes that: “live fish and shellfish are to be transported at temperature tolerant to species”. Suggest alternative wording: “*live fish and shellfish are to be transported at temperatures tolerable for the species*”

**IRAN**

First sentence: replace “10° C” with “4° C”, to make sure there is no growth of *other microorganisms*.

**MEXICO**

First Sentence: After “indicates” add “maintaining the product”

**ICMSF**

Add the following sentence to the end of the paragraph: ‘In products where other microbial hazards, such as *Listeria monocytogenes*, *Clostridium botulinum* and histamine-formers, are of concern, the temperature of seafood products should be maintained  $\leq 4^{\circ}\text{C}$ .’ (Reference: ICMSF 1996 *Clostridium Botulinum*. In Microorganisms in Foods 5 Characteristics of Microbial Pathogens. Blackie Academic and Professional.)

**Rationale:** The proposed Code emphasises a number of very important *Vibrio* issues: keeping temperature below  $10^{\circ}\text{C}$ , using “clean water” for rinsing or cooling cooked products, etc. One should however be very careful with the temperature limit. In many ready-to-eat seafood products, bacterial species such as *Listeria monocytogenes*, *Clostridium botulinum* and histamine formers are also hazards in addition to *Vibrio* spp. – and they are not controlled by  $10^{\circ}\text{C}$ . In contrast, they do proliferate at this temperature. For example, group II botulinum toxins were produced at  $8^{\circ}\text{C}$  after 6 and 12 days in inoculated vacuum-packed Salmon and Rockfish, respectively (ICMSF 1996) and Type E *Cl. botulinum* may form toxin as low as  $1-3^{\circ}\text{C}$ .

Although the ICMSF understands that the target microbiological hazards of this Code are pathogenic *Vibrio* spp., we are concerned that the reference to  $10^{\circ}\text{C}$  is misinterpreted and understood as indication that are safe also from other hazards at this temperature. This Code should specify that  $10^{\circ}\text{C}$  applies to pathogenic *Vibrio* spp. and that a lower temperature is often required in order to keep other risks under control.

**SECTION V - CONTROL OF OPERATION****5.1 CONTROL OF FOOD HAZARDS****Paragraph 71****IRAN**

First sentence states, “This section should be...” should it be” This section is”?

**PHILIPPINES**

First Sentence: delete “..food service/catering businesses” and replace with “retail food service”

**UNITED STATES**

Are the supportive programs and the prerequisite programs referenced in this paragraph the same?

**5.2 KEY ASPECTS OF HYGIENE CONTROL SYSTEMS****Paragraph 81****UNITED STATES**

There should be a footnote here to the Validation Guidelines.

**5.2.2.1 Washing and processing****PHILIPPINES**

Add a new sentence: In shrimp, removal of heads may be done to further reduce pathogenic *Vibrio* spp.

**Rationale:** Based on study, the removal of heads contributed to the reduction in count of pathogenic *Vibrio* spp. in the shrimp aside from cleaning and washing.

**Paragraph 75****COSTA RICA**

Paragraph indicates that it is preferable to wash the cavities of fish with running water, I think the term “preferable” leaves open the option to do it or not do it. In other words, if someone prefers they can wash the cavities with water in a container in which other fish have been washed. Changing the term could be considered to prevent possible cross contamination.

**5.2.2.2 Cooking****Paragraph 76****GUATEMALA**

Guatemala suggests to standardize for each process both time and temperature to the inactivation of pathogenic *Vibrio* spp., and not leave it to each country or industry’s decision. Otherwise, the variation would be too great and the decider will have all the burden. We suggest to define the more common species with a time and temperature curve for cooking.

**PHILIPPINES**

Add a second sentence: Cooking time may be longer for seafood with high salt concentration.

**Rationale:** *Vibrio parahaemolyticus* is heat-sensitive and dies slowly at 46°C and quickly at > 60°C. Cooking to an internal temperature of  $\geq 65^{\circ}\text{C}$  will effectively destroy *V. parahaemolyticus*. Heat sensitivity is influenced by salt concentration and the food matrix.

**5.2.2.3 Food processing practices****Paragraph 79****CANADA**

It would be useful to specify the types of products that can be frozen and whether this control measure is applicable/useful with respect to all pathogenic *Vibrio* spp./products covered in the scope of the Code or only to specific species/products.

**COSTA RICA**

Paragraph 79 talks about freezing as a means to reduce the level of *Vibrio* spp. in seafood products, it would be recommendable to mention thawing practices or refer to section 8.1.4 of the code of practices for fish and fishery products, although it only indicates a process of controlled thawing and does not specify the time in which it should reach the appropriate temperatures to prevent the propagation of pathogenic microorganisms, specifically *Vibrio* spp.

**Paragraph 80****IRAN**

First sentence; insert "high hydrostatic pressure (HHP)"

**Paragraph 81****CANADA**

Canada suggests revising this paragraph as follows,

“Any practice selected to **reduce/inactivate pathogenic *Vibrio* spp. in seafood or control/minimize their** ~~the growth of pathogenic *Vibrio* spp.~~ should be adequately validated to ensure that the process is effective.

**5.2.2.4 Storage****Paragraph 83****AUSTRALIA**

The use of ice is not appropriate for transportation of live fish and shellfish. Section 3.6 of the Code of Practice for Fish and Fishery Products (CAC/RCP 52-2003) notes that: “live fish and shellfish are to be transported at temperature tolerant to species”. Suggest alternative wording: “live fish and shellfish are to be transported at temperatures tolerable for the species”

**GUATEMALA**

Guatemala suggests to specify the ideal temperature of the ice and water mixture, as detailed in Paragraph 67 “a temperature of less than 10°C is adequate”, as this would make it clear and not leave it to individual criteria.

**UNITED STATES**

Does ‘finely divided’ mean ‘finely crushed?’

**SECTION VIII – TRANSPORTATION****Paragraph 101****GUATEMALA**

It is known that transportation is an integral step in the food chain, so here temperature should be controlled as well. Therefore it is important to include the paragraph regarding the proper temperature, again like paragraph 67: “a temperature of less than 10°C is adequate.”

**SECTION IX - PRODUCT INFORMATION AND CONSUMER AWARENESS****9.3 LABELLING****COSTA RICA**

This paragraph discusses the information that should be communicated to the consumer; however, it does not mention the importance of indicating the allergenic nature of many seafood products.

**Paragraph 105****CANADA**

First sentence: it is not clear to which food safety aspects the term “true nature” refers to in this sentence. We suggest deleting it from the sentence;

Second sentence, starting with “*In particular, any physical....*”: we are not clear as to the intent of this sentence. If the purpose of such labelling is for informed consumer choice with respect, for example, of an untreated and live product vs a treated but raw looking one (e.g., live oysters vs dead raw oysters), then this provision is covered by the mandatory labelling requirements of the General Standard for the Labelling of Prepackaged Foods (Codex STAN 1-1985). Section 4 of the GSLPF (*Mandatory Labelling or Prepackaged Foods*), subsection 4.1.2, which specifies that the condition or the type of treatment that the food has undergone must be declared on the label, as a mandatory requirement.

If the purpose of this sentence is to indicate to consumers that a raw-looking product is safe to eat because it has undergone a specific treatment to that effect, then the labelling provision should be further expanded to clarify its purpose as a risk management measure and further indicate that clear labelling messages would need to be developed to ensure that consumers can clearly distinguish between such products. Also, related provisions should be included in section 9.4, on the need to educate consumers about the difference between untreated products and products which have been treated for the purpose of ensuring their safety but which may still look raw.

#### **UNITED STATES**

First sentence: What is meant in the first sentence by the “true nature of these products?”

### **9.4 CONSUMER EDUCATION**

#### *Paragraph 106*

##### **IRAN**

At the end of the sentence, after ““established” insert “and implemented...”

#### *Paragraph 107*

##### **CANADA**

bullets 1 and 2: we recommend that an example be provided with respect to keeping seafood cold and keeping refrigerator temperatures as low as possible, e.g., “not to exceed 4°C.

##### **GUATEMALA**

Within the recommendations made to the consumer it is important to add the use of **drinking water**, as well as the use of utensils and product handling as all can be a cross contamination factor.

##### **IRAN**

Add a statement about *education of all people involved from harvest through to food services/catering business*: (1). Public education through radio, TV and other mass media, as well as, consumer associations, volunteer associations (in some countries these are important ), etc., (2). Health personnel refresher training; and (3). Food sellers and suppliers.

#### **UNITED STATES**

First bullet, second tick mark: Perhaps a specific temperature should be added in addition to “as low as practical,” e.g., “<10C or as low as is practicable.” It could be practical to get the temperature lower than is needed for the safety of the product.

### **9.4.1 Special Application to Susceptible Subpopulations**

#### *Paragraph 108*

##### **IRAN**

Second bullets, end of the sentence add “before consumption.”

#### **UNITED STATES**

Are there risk factors in addition to liver disease that could be specifically mentioned here?

**SECTION X - TRAINING****10.1 AWARENESS AND RESPONSIBILITIES***Paragraph 110***CANADA**

We suggest that this sentence should be further clarified. It would be expected that fishermen, primary producers, distributors, retailers, food service establishments, etc. should receive specific instructions and training for the control of pathogenic *Vibrio* spp. in seafood and would then convey this information, as appropriate, to employees, consumers, etc.

**10.2 TRAINING PROGRAMMES***Paragraph 111***MEXICO****First bullet**

Mexico suggests replacing "its harbourage sites" with "habitat."

**Rationale:** For clarity

**PHILIPPINES**

We recommend insertion of another bullet to be read as follows:

- managing microbiological risks of *Vibrio* spp. in the different types of seafood

**Rationale:** As several studies on risk assessment have been made on specific pathogenic *Vibrio* spp. vis a vis specific seafood, continued efforts should be made in disseminating and updating the stakeholders in addressing the public health risks.

**Editorial Comments****MEXICO**

- In the Spanish version, substitute the word "colérico" (choleric) with "toxigénico" (toxigenic), because this is the commonly used term in the literature, including Mexican health legislation.
- Remarks on the corrections to the Spanish translation will be made during the session with the other Spanish-speaking countries.