Virtual Working Group Meeting

on the Proposed draft revision on the Guidelines on the Application of General Principles of Food Hygiene to the Control of Pathogenic *Vibrio* Species in Seafood

26 February, 2024
15.00-18.00 CET / 9.00-12.00 EST / 23.00 - 27.00 JST / 17.00-20.00 EAT

Agenda

1. Brief History of the Codex work on *Vibrio*
2. Objectives and expectations of this meeting
3. Overall comments received
4. Main points of discussion

1. Brief History of the Codex work on *Vibrio*

	MRA Series	
2005	Risk assessment of *Vibrio vulnificus* in raw oysters	MRA 8
2005	Risk assessment of choleragenic *Vibrio cholerae* O1 and O139 on warm water shrimp for international trade	MRA 9

- 2007-2009 CCFH39-41
  "Guidelines on the application of general principles of food hygiene to the control of pathogenic *Vibrio* species in seafood" (CXG 73-2010)

2011	Risk assessment of *Vibrio parahaemolyticus* in seafood	MRA 16
2020	Risk assessment tools for *Vibrio parahaemolyticus and Vibrio vulnificus* associated with seafood	MRA 20
2021	Advances in science and risk assessment tools for *Vibrio parahaemolyticus* and *V. vulnificus* associated with seafood	MRA 35

- 2022 CCFH53 agreed to revise CXG 73-2010 as new work
- 2023 1st Round of comments (12 June to 10 August 2023)
- 2024 The proposed draft prepared by EWG for Comments at Step 3 (January)

2. Objectives and expectations of this meeting

- Discuss and reach consensus on the following areas:
  1. Issues where substantive comments were made
  2. Paragraphs where Chairs thought more discussion will be helpful for further revision of the proposed draft
- Outcome of this virtual meeting will be reported to CCFH54 for further discussion

3. Overall Comments Received (January-February 2024)

- Editorial suggestions, including typos, *Vibrio* in italics, translation issues *etc.*
- Some questions for clarification

  → to be taken care of as much as possible by Chairs before CCFH54

Responses to the Questions from the Chairs

- Most comments supported Chairs' proposals, no opposing comment
- Some sections will need to await the other work:
  - alignment work with the latest General Principles of Food Hygiene (CXC1-1969),
  - development of Annex II on Fishery Products of Guidelines for the Safe Use and Reuse of Water in Food Production and Processing (CXG100-2023).

4. Main points of discussion

- Structure of the document
- Additional *Vibrio* species to be listed? (para. 2*)*
- Definitions
  - Seafood
  - Partially treated / Thoroughly treated / Treated
  - Clean water
- Specific paragraphs and comments (paras. 34, 63 and 100)
- Section XI Laboratory Analysis Criteria for Detection and Enumeration of Pathogenic *Vibrio* spp.

Provisional Timetable

Time				Agenda
CET	EST	JST	EAT	
15:00	9:00	23:00	17:00	Opening of the meeting
				• Structure of the Document • *Vibrio* species • Definitions
16:30-16:40	10:30-10:40	00:30-00:40	18:30-18:40	10-minute Break
				• Specific paragraphs • Section XI
18:00	12:00	02:00	20:00	Closing of the meeting

Structure of the document

- Basically, the whole structure of the document has not been changed from the original guidelines.

- under SECTION V – CONTROL OF OPERATIONS
  - 5.2.2.3 Food processing practices, para. 72, new texts on interventions to minimize/reduce the level of *Vibrio* spp. were added.
  - 5.5 Water – we may have to wait for the work on the water guidelines (Annex II)

- SECTION XI – LABORATORY ANALYSIS CRITERIA FOR DETECTION AND ENUMERATION OF PATHOGENIC VIBRIO SPP. was newly added.

→ **Any outstanding comments or suggestions?**

Para. 2 - *Vibrio* species that are pathogenic or associated with food-borne illness

1. INTRODUCTION

2. The genus *Vibrio* contains at least ~~**eleven**~~**twelve** species pathogenic to humans, ~~**nine**~~**ten** of which can cause food-borne illness. The majority of food-borne illness is caused by *V. parahaemolyticus*, choleragenic *Vibrio cholerae* (O1, O139), or *Vibrio vulnificus*. *V. parahaemolyticus* and *V. cholerae* are mainly isolated from gastroenteritis cases that are attributable to the consumption of contaminated food (both species) or from the intake of contaminated water (*V. cholerae*). In contrast, *V. vulnificus* is primarily reported from extraintestinal infections (e.g. septicaemia, wounds, etc.) and primary septicaemia due to *V. vulnificus* infection is often associated with consumption of seafood. ***V. alginolyticus*, non-choleragenic *V. cholerae*, *V. fluvialis*, *V. furnissii*, *V. hollisae* (re-classified as *Grimontia hollisae*), *V. metschnikovii* and *V. mimicus* can also cause food-borne illness.**

Comments:

- Data from one eWG member suggests that there are other species (*V.* rare) that also cause foodborne disease which may also be of note to include in this list - *V. metocus*, *V. ponticus* and *V. harveyii*.
- "non O1/non O139 strains possessing the *ctx* gene for cholera toxin" should be added to non-choleragenic *V. cholera*, since any relevant information regarding these species be explicitly included at this stage.
- We are not sure if *V. albensis* is included in the *V. cholerae* non O1 group or does it need to be listed separately, as we have a few reported cases of *V. albensis* in Canada.

Para. 2 - *Vibrio* species that are pathogenic or associated with food-borne illness (continued)

Chair's Recommendation: *Vibrio* species associated with food-borne illness other than 3 major pathogenic species will be referred to in footnote, without mentioning the number of those species. Two more *Vibrio* species (*V. paracholerae* and *V. tarriae*) can also be included.

Possible text

2. **Most species of genus *Vibrio* that are pathogenic to humans can cause food-borne illness.** The majority of food-borne illnesses are caused by *V. parahaemolyticus*, choleragenic *V. cholerae* (O1, O139), or *V. vulnificus*.[1] *V. parahaemolyticus* and *V. cholerae* are mainly isolated from gastroenteritis cases that are attributable to the consumption of contaminated food (both species) or from the intake of contaminated water (*V. cholerae*). In contrast, *V. vulnificus* is primarily reported from extraintestinal infections (e.g., septicaemia, infected wounds, etc.) and primary septicaemia due to *V. vulnificus* infection is often associated with consumption of seafood.

[1] **Other *Vibrio* species that have been reported to cause food-borne illness include but not be limited to *V. alginoliticus*, non-choleragenic *V. cholerae* (non O1/non O139 strains possessing the *ctx* gene for cholera toxin), *V. fluvialis*, *V. furnissii*, *V. harveyii*, *V. hollisae* (re-classified as *Grimontia hollisae*), *V. metocus*, *V. metschnikovii*, *V. mimicus*, *V. paracholerae*, *V. ponticus* and *V. tarriae*.**

Definitions - “Seafood”

27. For the purpose of these Guidelines, the following definitions apply:

- **Seafood**: Fish, shellfish and other aquatic invertebrates from marine and fresh water sources and their products which are intended for human consumption.

Comments:

- Should algae and aquatic plants be included?
- Should reference to fresh water sources be eliminated?

Chair’s Recommendation: Just to add seaweed.

- **Seafood**: Fish, shellfish, other aquatic invertebrates and seaweed from marine and fresh water sources and their products which are intended for human consumption.

Definitions - "Seafood" (continued)

Reference information

- Foodborne vibriosis due to consumption of seaweed (*e.g.*, sea grapes) has been reported (See para. 12). Therefore, it should be considered as a subject of control.

  - There are some reports about contamination of *V. parahemolyticus* in seaweeds from Japan, US, etc. (*e.g.*, sea grapes (*Caulerpa lentillifera*), sea lettuce (*Ulva*), Kombu kelp (*Laminaria*), Amanori (*Porphyra*), *etc.*)

  - The prevalence rate is high, but the amount of contaminating bacteria varies depending on the report.

- At 41st CCFH , a delegation questioned **the definition for seafood**, noting that seafood normally did not include fish, shellfish and other aquatic vertebrates from **fresh water sources**. It was clarified that this definition had been extensively discussed and that it best reflected what was covered by the Guidelines (para. 90, ALIMORM 10/33/13).

- No general definition of "seafood" or "fish and fishery products" in Code of Practice for Fish and Fishery Products (CXC 52-2003)

Definition - “Partially treated”/“Thoroughly treated”

27. For the purpose of these Guidelines, the following definitions apply:

- **Partially treated**: Any treatment intended to significantly reduce or limit but not completely eliminate *Vibrio* spp. in seafood. ~~As a result of partial treatment, the sensory characteristics of the raw product are lost.~~
- **Thoroughly treated**: Any treatment intended to eliminate *Vibrio* spp. in seafood.

Comments:

- No difference between the definitions “treated” and “thoroughly treated.” Keep only “treated.”
- Include some examples of “partially treated” and “treated”, specifying, for example, which type of heat treatments would be included in each of them.

Chair’s Recommendation: To remove the definition of “Thoroughly treated” and add “Treated” utilising footnote 5.

- **Partially treated**: Any treatment intended to significantly reduce or limit but not completely eliminate *Vibrio* spp. in seafood. ~~As a result of partial treatment, the sensory characteristics of the raw product are lost.~~
- ~~**Thoroughly treated**: Any treatment intended to eliminate *Vibrio* spp. in seafood.~~
- **[Treated**: Any treatment intended to eliminate *Vibrio* spp. in seafood (e.g., heat treatment, high pressure)]

Definition – "Partially treated"/"Thoroughly treated" (continued)

Reference information

- The meaning of "**treated**" is explained in footnote 5 in the current proposed draft with examples:

  [5] "**treated**" means any vibriocidal treatment (e.g., heat treatment, high pressure.). Refer to Section 2.3 (definition for "partially treated")

- At 40th CCFH, the definition of **"partially treated"** was added to clarify that this treatment was intended to reduce but not eliminate *Vibrio* spp. (para. 119, ALIMORM 09/32/13).

Definition - “Clean water”

27. For the purpose of these Guidelines, the following definitions apply:

- **Clean water**: ~~means w~~Water that does not meet the criteria for potable water but from any source where harmful microbiological contamination, substances and/or toxic plankton are not present in such quantities that may affect the safety of fish, shellfish and their products intended for human consumption.

Comments:

- Delete “that does not meet the criteria for potable water but” to align with the Fish Code and to include potable water in the definition
- Align with CXG 100-2023 (newly adopted Guidelines for the Safe Use and Reuse of Water in Food Production and Processing)
- Definition of potable water, the difference between clean /potable water should be clear, not clear on use of clean seawater for some post-harvest operations

Chair’s Recommendation: To maintain as it is presented now.

- The definition of “Clean water” was revised to be aligned with the definition in CXG 100-2023.
- “Clean water” and “Potable water" are clearly differentiated in the *Vibrio* Guidelines, and the term “Potable water” is used in specific situations (*e.g.*, washing fish for raw consumption, cooling after cooking).
- Clean seawater is already covered by “Clean water”.

Definition - "Clean water" (continued)

Reference information

- The definitions in the Guidelines for the Safe Use and Reuse of Water in Food Production and Processing (CXG 100-2023):

  Clean water: Water that does not meet the criteria for potable water but does not compromise the safety of the food in the context of its use.

  Potable water: Water fit for human consumption

- The definitions in the Code of Practice for Fish and Fishery Products (CXC 52-2003):

  Clean water: Water from any source where harmful microbiological contamination, substances and/or toxic plankton are not present in such quantities that may affect the safety of fish, shellfish and their products intended for human consumption.

  Potable water: Freshwater fit for human consumption. Standards of potability should not be lower than those contained in the latest edition of the International Standards for Drinking-water issued by the World Health Organization.

- At 40th CCFH, the term "potable" was added *(to paras. 69 and 71 in the current proposed draft of Vibrio)* to clarify that pathogen free water should be used to wash fish prepared for raw consumption or to cool food after being cooked, in order to prevent any cross-contamination of pathogens noting that for such foods there was no additional measure on pathogen control afterward (para. 126, ALIMORM 09/32/13).
- Also, at 40th CCFH, it was noted that clean water used for washing of seafood or for the storage of live seafood products was not necessarily limited to clean potable water but also covered clean seawater (para. 121, ALIMORM 09/32/13).

Para. 34 – Handling storage and transport

SECTION III - PRIMARY PRODUCTION

3.2 Handling, storage and transport

34. For the storage and handling of seafood aboard fishing vessels, potable or clean water should be used for seafood intended to be eaten raw or partially treated, and for preparing ice ~~for such use~~. The use of sea water taken from [near the seashore or] [~~near the seashore~~ coastal sources or][the seashore ~~or~~ where there is a risk of contamination] from a drainage outlet or river contaminated with sewage should be avoided [unless appropriate monitoring and control measures are in place]. Seafood should be held at temperatures that minimize and/or prevent the growth of pathogenic *Vibrio* spp. after harvest, for example, in an ice-water slurry, ice or refrigeration on fishing vessels and at harvest sites. The delay between harvest and refrigeration should be as short as ~~possible~~ practicable.

Comments:

- Should “potable water” be included every time “clean water” is mentioned throughout the text?
- Several suggestions to modify 2nd sentence.
- There are issues with using ice slurries for bivalve molluscan shellfish.
- As short as “possible” or “practicable”?

Chair’s Recommendation:

- To use the term “potable water” in the document only when necessary *(i.e.*, at the point after which no additional pathogen control measures will be taken)
- There seems to be some confusions in the 2nd sentence. Chairs will revise the text based on what we heard.
- Is there any proposal with regard to ice-water slurries?
- As short as “possible” or “practicable” – Any help from Codex Secretariat or native speakers?

Para. 63 –Temperature of Facilities

4.4. Facilities

4.4.5 Temperature

63. The Code of Practice for Fish and Fishery Products indicates maintaining the product at temperature as close to 0ºC as possible. For pathogenic *Vibrio* spp., a temperature of ~~**10**~~ **5** ºC or lower is adequate to limit growth. In this Code, ~~**10**~~ **5** ºC is used as the target temperature to **prevent/minimize growth** of *Vibrio* spp. However, pathogenic bacteria species such as *Listeria monocytogenes*, *Clostridium botulinum* and histamine formers may also be hazards in addition to *Vibrio* spp. If this is the case, more strict temperature control, as close to 0ºC as possible, should be implemented. In the case of bivalve molluscs, a different temperature control specified in the Annex would be required. The facility should be capable of controlling ambient temperature to ensure that product temperature during processing of raw seafood is maintained at a temperature of ~~**10**~~ **5** ºC or lower.

Comments:

- We note new insertion of text 'to limit growth'. We could accept reverting to 10°C or lower as this does limit the growth of *V. parahaemolyticus* – but does not prevent its growth. If the intent was to prevent growth, 5°C or lower would be appropriate.
- Agree with this change of temperature, however we consider it would be very useful to have a scientific reference to establish this temperature.
- Agree but consider that it is necessary to harmonize the information so that the appropriate temperature for the control of *Vibrio* spp. is clear.
- This should be science based and proportionate to risk. Also what effect does this have on live shellfish?

Chair's Recommendation: Replace "to limit growth" with "to prevent/minimize growth" and keep the temperature specifications as proposed now (5°C).

Para. 100 – Wound infection

9.4 Consumer education

9.4.1 Special attention to susceptible subpopulations

100. Liver disease is a prominent risk factor for human infection with pathogenic *Vibrio* spp., especially *V. vulnificus*. Additional risk factors include diabetes, haemochromatosis and HIV/AIDSs Subpopulations with increased susceptibility should follow the advice below:

- Avoid the consumption of raw or partially treated seafood.
- Cook seafood thoroughly before consumption.
- Handle shellfish safely to avoid *[V. vulnificus infection through routes other than food ingestion e.g.,]* injury from knives and shell.

Comments:

- Should wound infection (not foodborne disease) be mentioned?
- If so, should this bullet point stay here (under 9.4.1), or should it be a warning for consumers in general, not just for susceptible subpopulations ?

Chair's Recommendation: To maintain this bullet point in para. 100 with modifications for clarification.

Para. 100 – Wound infection (continued)

Reference information

- *"Vibrio vulnificus* naturally inhabits warm estuarine environments and can infect humans via wound exposure or seafood consumption. These infections are rare and generally limited to individuals with pre-existing chronic illnesses or the immunocompromised." (MRA No.8)

Section XI Laboratory Analysis Criteria for Detection and Enumeration of Pathogenic *Vibrio* spp.

Comments:

- Section XI - on laboratory analysis is a highly variable and complex area. We consider redrafting is necessary to improve this guidance. The title could be amended to, "**Selection and application of methods for detection and enumeration of pathogenic *Vibrio* spp.**" to better explain what the section addresses. We further suggest the section could be divided into three sub-sections composed of Purpose of analytical testing; Choice of analytical method; and Types of analytical methods.

Chair's Recommendation: Discussions will be based on the alternative texts proposed by members.

SECTION XI – SELECTION AND APPLICATION OF METHODS FOR DETECTION AND ENUMERATION OF PATHOGENIC *VIBRIO* SPP.

10.1 Purpose of analytical testing

106. The purpose of analytical testing for bacterial foodborne pathogens, including pathogenic *Vibrio* spp., can be divided into the following categories:

- harvest area monitoring (to assist with establishing harvest area *Vibrio* spp. management plans, where *Vibrio* abundance can be linked to specific harvest area water temperatures, salinity or other parameters, as determined by the assessment of the area)
- post-harvest process verification including end product monitoring (as part of a quality assurance program)
- public health investigation following an incident.

Sampling plans and design must consider the purpose for which it will be used.

SECTION XI – SELECTION AND APPLICATION OF METHODS FOR DETECTION AND ENUMERATION OF PATHOGENIC *VIBRIO* SPP. *(continued)*

10.2 Choice of analytical method

107. The choice of analytical method should reflect:
- the type of sample to be tested;
- the purpose for which the data collected will be used (as per para.106);
- the desired level of sensitivity and test frequency
- whether a presence/absence or quantitative test is more appropriate
- whether detections of sub-populations (e.g. virulence markers) is necessary
- whether typing (e.g. serotype) of pathogenic strains is required

10.3 Types of analytical methods

108. Suitable analytical methods include direct plating, selective enrichment, most probable number (MPN) assay, probe-hybridization on plate assay, conventional PCR, quantitative PCR, Loop mediated isothermal amplification assay, etc. 13.

109. Additional guidance on selecting analytical methods is available in FAO and WHO, 2016, Selection and application of methods for the detection and enumeration of human pathogenic halophilic Vibrio spp. in seafood (Microbiological Risk Assessment series No. 2213)

110. Research on virulence factors and virulence related genes of *V. parahaemolyticus*, *V. vulnificus*, and *V. cholerae* is ongoing, and these genes can be used as PCR targets to assess the pathogenicity of the bacterial strains.