

CODEX ALIMENTARIUS COMMISSION



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Organization of the
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World Health
Organization

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Agenda Item 9

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JOINT FAO/WHO FOOD STANDARDS PROGRAMME

CODEX COMMITTEE ON FOOD HYGIENE

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DISCUSSION PAPER ON PRINCIPLES FOR THE SAFE USE OF WATER IN FOOD PROCESSING (REVISED)

Prepared by Honduras with the support of Chile, Denmark, European Union and India

INTRODUCTION¹

1. At the 50th Session of the Committee on Food Hygiene (CCFH50), CCFH reviewed the forward workplan and agreed to move the work on principles for the safe use of water in food processing to the top of the table following its evaluation against the criteria for new work priorities.

2. CCFH50 noted the need for a discussion paper on principles for the safe use of water in food processing to progress this work and welcomed the offer of Honduras, with support of Chile, EU, India and Denmark to prepare a discussion paper on this subject for consideration by CCFH51.

BACKGROUND

3. Water is an important input in food, through all stages of the food value chain from primary production to consumption as it is used as: an ingredient, in direct and indirect contact (e.g. cleaning of surfaces in contact) with food and for hygiene sanitation in food businesses. The important role of water in food production has led to ensure its quality since it can be a vehicle for the transmission of many diseases or contamination.

4. Water is a dwindling resource worldwide and not all food processors have access to safe water sources; while for others, safe water access and waste discharge are incurring increasing financial and environmental costs. Consequently, minimizing water use and waste, and reusing water are highly desirable. WHO estimates that in 2025 half of the worldwide population will live in water-scarce areas (WHO 2018a). For this reason, water in food production should be managed in a way that safety of food is guaranteed, avoiding at the same time unnecessary consumption, redundant waste and associated costs to the community and the environment (FAO/WHO, 2019).

5. Having in mind that 70% of the global supply of drinking water is used in food production and that less than 3 % of the world's water is drinkable, water reuse is addressed by the Sustainable Development Goals (SDGs) established by the United Nations (UN) as follows:

- a) Goal 6, Ensure availability and sustainable management of water and sanitation for all:
 - Target 6.3: By 2030, improve water quality by reducing pollution, eliminating dumping and minimizing release of hazardous chemicals and materials, halving the proportion of untreated wastewater and substantially increasing recycling and safe reuse globally.
 - Target 6a: By 2030, expand international cooperation and capacity-building support to developing countries in water- and sanitation-related activities and programs, including water

¹ REP19/FH, paras 78 and 79

harvesting, desalination, water efficiency, wastewater treatment, recycling and reuse technologies.

b) Goal 12, Ensure sustainable consumption and production patterns:

- Target 12.5: By 2030, substantially reduce waste generation through prevention, reduction, recycling and reuse.

6. CCFH has discussed in various meetings the importance of water in food production. At the 32nd session (CCFH32) held in 1999 a Discussion Paper on Proposed Draft Guidelines for the Hygienic Reuse of Processing Water in Food Plants² was presented and it was agreed to elaborate guidelines for the hygienic reuse of processing water in food plants. However, at CCFH34, it was agreed to discontinue this work due to the heavy workload of the Committee. At CCFH48 held in 2016³ CCFH agreed to request FAO and WHO to elaborate guidelines for those situations where the use of “clean water” was indicated in Codex texts, in particular for irrigation water and clean sea water and on the safe reuse of process water. In addition, guidance was sought on where it is appropriate to use “clean water” and if this is the appropriate terminology to be used in Codex documents for harmonization. A Joint FAO/WHO Expert Meeting on the Safety and Quality of Water Used in Food Production and Processing was held in Rome from 14-18 May 2018, and a report entitled “Safety and Quality of Water Used in Food Production and Processing” is in publication (hereafter the “JEMRA review”).

7. Water used for food production is a critical key food safety element as water quality can be affected by the presence of infectious agents, toxic chemicals or radiation. This applies to water used as an ingredient, in direct or indirect contact with food and for sanitary operations and it is significant throughout the food chain. To address these hazards, drinking water quality is often seen as the safest option in order to reduce or eliminate variation in water source quality, water treatment challenges, frequency and extent of control performed by local authorities and variations in education level in food businesses. Though the safest option in food production may be the use of drinking-water or water of drinking-water quality; it is however not often a sustainable, viable, practical or responsible solution and other types of water may be suitable for certain purposes, provided that they do not compromise the safety of the final product for the consumer. Further, hazards that are associated with drinking water and those associated with water generated from other sources may differ. On the other hand, impairment of the quality of drinking water may have serious effects on food processing facilities and potentially on public health. The consequences of using water with inadequate quality will depend on the purpose of the use and the need for further treatment to make it fit for purpose. Occasional variations in quality and safety, which can occur in water, can be unacceptable for some uses in the food industry and may have consequences with significant economic impacts in food production (e.g. the withdrawal of the product from the market).

8. The food industry with its diverse segments generate a large amount of wastewater. Principles of cleaner production have many applications in food industries that are necessary to ensure quality and productivity without damaging the environment. A way to achieve efficiency in water consumption is reusing water. However, the complexity of procedures for removing undesired material and the serious consequences of inadequate treatment of the reused water may arise in reluctance or slow down the widespread implementation of water reuse.

9. The definitions of water quality and whether it is fit for purpose for a specific food application, which have already been provided by Codex, international agencies and competent authorities, are inconsistent and not readily operationalized by food businesses.

10. There are similarities with the principles of risk management approaches adopted to ensure safety of drinking water and safety of food. For example, both must be based on the risk and scientific evidence with hazard control measures implemented within the framework of management plans, with verification and the necessary monitoring to ensure that the plans/systems function as intended (FAO/WHO, 2019).

² Discussion paper on proposed draft guidelines for the hygienic reuse of processing water in food plants /available http://www.fao.org/tempref/codex/Meetings/CCFH/cfh32/FH99_13e.pdf

³ Report of the 48th Session of the CCFH Rep 17/FH available: http://www.fao.org/fao-who-codexalimentarius/sh-proxy/en/?lnk=1&url=https%253A%252F%252Fworkspace.fao.org%252Fsites%252Fcodex%252FMeetings%252FCX-712-48%252FReport%252FFinal%252FREP17_FHs.pdf

11. Water quality is regulated in some countries. However, where criteria are recommended, there are inconsistencies among competent authorities. It is therefore necessary to identify appropriate indicators and methods for follow-up, to support case-by-case assessments, and to apply risk assessment and the principles of Hazard Analysis Critical Control Point (HACCP). Some of the problems that may arise or slow down the widespread implementation of water reuse and conservation practices are related to the types of indicators available, which in most cases are not a direct index of the presence or concentration of pathogens or safety for consumers.

12. There is a great difficulty in determining which indicators are the best globally to assess the state of the water. WHO recognizes that very stringent reference values cannot be used universally since this can severely limit the availability of water. Instead, WHO has developed a range of reference values for more than 60 parameters, and also makes a general review of the reference values used by the WHO, the European Union, Canada and the United States of America.

13. The JEMRA review makes 2 main recommendations:

- a) In Codex documents there needs to be a greater emphasis on a risk-based approach to safe water sourcing, use and reuse. In Codex texts, rather than specifying use of potable water, or in some instances other water quality types, a risk-based approach and assessment of the fitness of the water for the purpose intended should be articulated.
- b) Further work should be conducted to consider appropriate microbiological criteria.

14. Furthermore, the JEMRA review focusses on three priority topics: fresh produce sector, fishery sector and water reuse in food establishments.

15. Within the dairy sector there is also a strong need for guidance and efficient strategies for the safe sourcing, use and reuse of water. Even though the dairy sector was not addressed specifically in the JEMRA review, there is already a considerable knowledge and incentive to develop such guidance; and hence, it would be useful to also obtain guidelines for the dairy sector based on this knowledge.

16. This discussion paper presents the needs for CCFH to develop [Principles/Guidelines] for safe water use and reuse in the food production. Such work in CCFH would greatly contribute to establish practical guidance to Food Business Operators (FBOs) in determining controls and strategies within the framework of their food safety management system to reduce and prevent the sourcing, use and reuse of unsafe water based on the JEMRA review that summarizes relevant information about safe use and reuse of water. The JEMRA report will be a key source in the development of these [Principles/Guidelines].

Recommendation

17. CCFH is invited to consider the new work proposal for the development of the “[Principles/Guidelines] for the safe use and reuse of water in food production” (Appendix I).

18. CCFH is also invited to consider the proposed structure for the document as follows:

- General guidance document and key definitions for the safe sourcing, use and reuse of water in food production
- Sector-specific annexes as priority/starting point, including microbiological criteria for pathogens (bacteria, viruses, parasites) and risk-based approaches and assessment of the fitness use and reuse of water for the purpose intended (e.g. with the use of decision support system (DSS) tools/ decision trees) for the following sectors:
 - Fresh produce sector
 - Fishery sector
 - Dairy sector

19. CCFH is invited to consider requesting ask JEMRA to further develop examples of microbiological criteria for water use and reuse in sector specific (e.g. fresh produce, fishery and dairy sectors).

Summary References

1. FAO/OMS 2019, Joint FAO/WHO Expert Meeting on the Safety and Quality of Water Used in Food Production and Processing.
2. WHO 2018^a. <https://www.who.int/es/news-room/fact-sheets/detail/drinking-water>
3. WHO 2019^b. Disponible <https://www.who.int/sustainable-development/housing/health-risks/waterborne-disease/en/>
4. Discussion paper on proposed graft guidelines for the hygienic reuse of processing water in food plants /available http://www.fao.org/tempref/codex/Meetings/CCFH/ccfh32/FH99_13e.pdf
5. Report of the 30th Session of the CCFH available: http://www.fao.org/fao-who-codexalimentarius/sh-proxy/en/?Ink=1&url=https%253A%252F%252Fworkspace.fao.org%252Fsites%252Fcodex%252FMeetings%252FCX-712-30%252Fal99_13e.pdf
6. Report of the 37th Session of the CCFH available: http://www.fao.org/fao-who-codexalimentarius/sh-proxy/en/?Ink=1&url=https%253A%252F%252Fworkspace.fao.org%252Fsites%252Fcodex%252FMeetings%252FCX-712-37%252Fal28_13e.pdf
7. Report of the 46th Session of the CCFH available: http://www.fao.org/fao-who-codexalimentarius/sh-proxy/en/?Ink=1&url=https%253A%252F%252Fworkspace.fao.org%252Fsites%252Fcodex%252FMeetings%252FCX-712-46%252FREP15_FHe.pdf
8. Report of the 47th Session of the CCFH available: http://www.fao.org/fao-who-codexalimentarius/sh-proxy/en/?Ink=1&url=https%253A%252F%252Fworkspace.fao.org%252Fsites%252Fcodex%252FMeetings%252FCX-712-47%252FReport%252FREP16_FHe.pdf
9. Report of the 48th Session of the CCFH Rep 17/FH: http://www.fao.org/fao-who-codexalimentarius/sh-proxy/es/?Ink=1&url=https%253A%252F%252Fworkspace.fao.org%252Fsites%252Fcodex%252FMeetings%252FCX-712-48%252FReport%252FFinal%252FREP17_FHe.pdf

PROJECT DOCUMENT**[Principles/Guidelines] for the Safe Use and Reuse of Water in Food Production****1. The purposes and scope of the Standard**

The purpose and scope of this document is to elaborate [Principles/Guidelines] for the safe sourcing, use and reuse of water in direct and indirect contact with food across the food chain (primary production and processing) by applying the principle of 'fit for purpose' using a risk-based approach.

2. Its relevance and timeliness

In a food business operation, water can be used as an ingredient, to wash food or clean food at contact surfaces, and in many other applications where there is potential for contact between the water and the food. In addition, there are many other applications where there is no intended or expected contact of the water with food (e.g. in personal water use applications and fire control). In all situations, water use should be part of an operation's prerequisite hygiene and HACCP systems.

The requirements for water quality use along the food chain must be considered in context, taking into account the purpose of the water use, hazards that may be present in the water and the need to be controlled to minimize the potential for contamination of food, when used as intended.

Water can be a vector to transmit pathogens or other contaminants from a single food product specimen to a large number of products, thus increasing the number of people exposed and its potential health impact. Therefore, the safest option in food production might be the use of water of potable or drinking water quality. However, this is often not a sustainable, feasible, practical or responsible solution and other types of water could be fit for some purposes or can be made fit for use, provided its intended use does not compromise the safety of the food for the consumer.

The Codex Committee on Food Hygiene (CCFH) has discussed the issue of water since its 30th session (REP ALINORM 99/13)⁴ where a working paper with guidelines for the hygienic recycling of processing water in food plants was circulated to members. Although a proposed draft Guidelines were elaborated for comment at Step 3, CCFH36 (ALINORM 04/27/13)⁵ agreed to discontinue this work due to the heavy workload in the agenda of the Committee at that time. The issue was again discussed at CCFH46 (REP15/FH)⁶, as an important topic on the Revision of the General Principles of Food Hygiene (CXC 1-1969) and its HACCP annex. CCFH47 then agreed that water was an important issue to be addressed (REP16/FH)⁷ and therefore requested the Food and Agriculture Organization (FAO) and the World Health Organization (WHO), to provide scientific advice to help clarify the use of clean, potable and other types of water in the General Principles of Food Hygiene and other hygiene texts.

The Joint FAO/WHO Expert Meeting on the Safety and Quality of Water Used in Food Production and Processing took place in May 2018. At CCFH 48 (REP17/FH)⁸, the representative of FAO reported the preliminary findings of the meeting, highlighting that the use of water is diverse and complex and that "fit for purpose" water should be determined by a risk-based approach.

⁴ Report of the 30th Session of the CCFH available: http://www.fao.org/fao-who-codexalimentarius/sh-proxy/en/?lnk=1&url=https%253A%252F%252Fworkspace.fao.org%252Fsites%252Fcodex%252FMeetings%252FCX-712-30%252Fa99_13e.pdf

⁵ Report of the 36th Session of the CCFH available: http://www.fao.org/fao-who-codexalimentarius/sh-proxy/en/?lnk=1&url=https%253A%252F%252Fworkspace.fao.org%252Fsites%252Fcodex%252FMeetings%252FCX-712-36%252Fa04_13e.pdf

⁶ Report of the 46th Session of the CCFH available: http://www.fao.org/fao-who-codexalimentarius/sh-proxy/en/?lnk=1&url=https%253A%252F%252Fworkspace.fao.org%252Fsites%252Fcodex%252FMeetings%252FCX-712-46%252FREP15_FHe.pdf

⁷ Report of the 47th Session of the CCFH available: http://www.fao.org/fao-who-codexalimentarius/sh-proxy/en/?lnk=1&url=https%253A%252F%252Fworkspace.fao.org%252Fsites%252Fcodex%252FMeetings%252FCX-712-47%252FReport%252FREP16_FHe.pdf

⁸ Report of the 48th Session of the CCFH available: http://www.fao.org/fao-who-codexalimentarius/sh-proxy/en/?lnk=1&url=https%253A%252F%252Fworkspace.fao.org%252Fsites%252Fcodex%252FMeetings%252FCX-712-48%252FReport%252FFinal%252FREP17_FHe.pdf

There is a need in Codex documents for a risk-based approach to safe water and reuse. Rather than focusing on the use of potable water or other quality types (e.g. clean water), a risk-based approach and assessment of the fitness of the water for the purpose intended should be articulated.

Risk management plans addressing food safety and water use or reuse have to consider many factors in their development and implementation. Water reuse is considered a priority as this is becoming an emerging issue in industry due to increasing requirements for and costs of water discharge and the acceptability of the products produced for global trade.

Although current Codex documents provide guidance on the safe use of water, there is a need to develop practical guidance and tools to help FBOs understand the risks and potential interventions that are available as well as identifying other overarching issues that are required for defining fit-for-purpose water.

3. The main aspects to be covered

The projected format will follow the *General Principles of Food Hygiene* (CXC 1-1969). The proposed structure is as follows;

- General guidance document on key elements and definitions relevant for safe water sourcing, use and reuse as part of a food safety management program in food production
- Annex 1: Risk based sector-specific potential intervention strategies for water sourcing, use and reuse in the food chain, applicable microbiological criteria (bacteria, viruses, parasites) and examples of the decision support system (DSS) tools such as Decision trees (DT) to determine the water quality needed for the specific intended purpose in fresh produce
- Annex 2: Risk based sector-specific potential intervention strategies for water sourcing, use and reuse in the food chain, applicable microbiological criteria (bacteria, viruses, parasites) and examples of the decision support system (DSS) tools such as Decision trees (DT) to determine the water quality needed for the specific intended purpose in fishery sector
- Annex 3: Risk based sector-specific potential intervention strategies for water sourcing, use and reuse in the food chain, applicable microbiological criteria (bacteria, viruses, parasites) and examples of the decision support system (DSS) tools such as Decision trees (DT) to determine the water quality needed for the specific intended purpose in dairy sector

4. An assessment against the *Criteria for establishment of work priorities*

The [Principles/Guidelines] need to be developed in order to meet the general criterion: Consumer protection from the point of view of health, food safety, ensuring fair practices in the food trade and taking into account the identified needs of developing countries.

The proposed work is directed primarily at establishing [Principles/Guidelines] for safe use and reuse of water in direct or indirect contact with food across the food chain including its sourcing, by applying the principle of 'fit for purpose' under a risk-based approach.

The proposed work directly relates to several Codex strategic goals from the Codex Strategic Plan: 2020-2025.

- Strategic Goal 1: Address current, emerging and critical issues in a timely manner
These [Principles/Guidelines] would establish a new Codex standard in response to needs identified by Members and in response to current factors that affect food safety and fair practices in the food trade. It will provide practical guidance on "fit for purpose" approach based on risk analysis for sourcing, use and reuse of water in the food chain.
- Strategic Goal 2: Develop standards based on science and Codex risk-analysis principle
The development of the [Principles/Guidelines] will be consistent with the use of scientific advice and risk analysis principles in the articulation of the control measures. Scientific advice from the FAO/WHO expert bodies, particularly JEMRA, and scientific input from all countries will be solicited.

5. Information on the relation between the proposal and other existing Codex documents

The proposed Guidelines will follow the example of the overarching Codex *General Principles of Food* (CXC 1-1969), *Hygiene Code of Hygienic Practice for Meat* (CXC 58-2005), *Code of Hygienic Practice for Fresh Fruits and Vegetables* (CXC 53-2003) and *Code of Practice for Fish and Fishery Products* (CXC 52-2003), *Code of Hygienic Practice for Milk and Milk Products* (CXC 57-2004) all of which provide current guidance on the safety requirements for use of water when handling food, particularly on the use of potable water or clean water for

agriculture, food handling and processing, water reuse and for the elaboration of ice. It is expected that reference to the proposed guidelines will also be made in the aforementioned texts.

6. Identification of any requirement for and availability of expert scientific advice

There may be a need for additional scientific advice from FAO/WHO's expert body JEMRA to establish the microbiological criteria for pathogens (bacteria, viruses, parasites) for water use and reuse on food production and to revise the examples when using the tools suggested by JEMRA.

7. Identification of any need for technical input to the standard from external bodies so that this can be planned for

None identified so far.

8. The proposed time-line for completion of the new work, including the start date, the proposed date for adoption at Step 5, and the proposed date for adoption by the Commission

A five-year timeline is proposed for the completion of the Guidelines with adoption at Step 5 by CAC43 in 2022 and final adoption in 2023 by CAC44 as regards the main document and Annexes 1 and 2, and with adoption at Step 5 by CAC44 in 2023 and final adoption in 2024 by CAC45 as regards the Annex 3.