Microbiological hazards and safety and quality of water used in food production

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Safe food is critical to all human development

Improving local value chains: health and trade

Strengthening national institutional capacities: public health

Normative work for SPS and TBT support: access to trade

Foresight: prepare to become resilient

If it is not safe, it is not food
Joint FAO/WHO Scientific Advice Programme

- **JEMRA**: Joint FAO/WHO Expert Meeting on Microbiological Risk Assessment
  - Established in 2000
  - Scientific advice on microbiological risk assessment
  - Expert meetings based on requests from Codex (CCFH)
- **JECFA, JMPR, JEMNU, ad hoc**
- **Food safety**: Assurance that food will not cause adverse health effects to the consumer when it is prepared and/or eaten according to its intended use (Codex).

*Codex: develops international food safety standards and guidelines and Codex documents are a reference in WTO disputes. 188+1
Water use in food production and processing

HOW MUCH

- 1 cup of tea: 35 litres
- 1 cup of coffee: 140 litres
- 1 glass of wine: 120 litres
- 1 glass of beer: 75 litres
- 1 glass of orange juice: 170 litres
- 1 glass of milk: 200 litres
- 1 orange: 50 litres
- 1 potato: 25 litres

WATER IS NEEDED

- 1 tomato: 13 litres
- 1 apple: 70 litres
- 1 egg: 135 litres
- 1 slice of bread: 40 litres
- 1 hamburger: 2400 litres
- 1 bag of potato chips: 185 litres
- 1 Beef Steak: 7000 litres

For more information on Water for Food visit: www.fao.org/NR/water

or the official World Water Day 2012 Website: www.unwater.org/worldwaterday

WWD 2012 is coordinated by the Food and Agriculture Organization of the United Nations
Many Codex documents make reference to the use of portable or ‘clean’ water. It recognizes that not all situations may require potable water. At the same time, we do not want to compromise food safety.

**Challenge**

How to turn the Codex current definition clean water “*water which does not compromise the safety of food in the context of its use*” into operational guidance/target for *water use and re-use* by food producers and processors.

- Codex Committee on Food Hygiene (CCFH) noted the importance of water quality in food production and processing (48th session in November 2016), requested JEMRA to provide guidance processing water, in particular, “clean water” for irrigation water, clean seawater, and on the safe reuse of water.
Pathway Forward

- JEMRA meetings in
  - 2017 (Netherlands)
  - 2018 (Rome)
  - 2019 (Geneva)
  - 2021 (virtual)

- Place a greater emphasis on a **risk-based approach to safe water use**.

- Instead of 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.

- Does not compromise the safety of the final product for the consumer
Conclusions

- Similarity of water and food
- Risk assessment is essential
- Complexities
- Portable water is not always available
- Decision tree support management

Gaps

- Lack of guidance on microbiological criteria
- Lack of understanding regarding the behaviour of microbiological hazards introduced via water

Report of JEMRA work on water (2018)

The microbiological criteria of water quality required for the safe production of FFV should be determined using a risk-based approach, taking into account:

- the availability and suitability of the water for its intended purpose, the method of application, and the production stage at which it will be used;
- the types of FFVs and any specific characteristics (e.g. leafy vegetables, netted rind melons), the FFV production system (e.g. contact with soil, grown on trees, hydroponic), whether they are usually eaten raw or cooked, peeled or unpeeled;
- the water retention and contact time with the edible part of the FFV;
- the potential for decline or proliferation of pathogens or introduction of contamination of FFV after each point of water contact.

No one water quality microbial indicator is appropriate/useful for all water types, and for some water types there may not even be a single useful indicator.

Case studies
Fishery and dairy
- Identifying the availability and suitability of the water used and at what point in the food chain it is introduced.
- Describing the measures used for assessing “fitness” of water for its intended purpose and the benefits and pitfalls of these different measures.
- Providing scientific evidence and criteria recommendations for the safety and quality of various types of water used for different production, processing, transportation, retail sale and consumption applications.
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