



Food and Agriculture Organization  
of the United Nations

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

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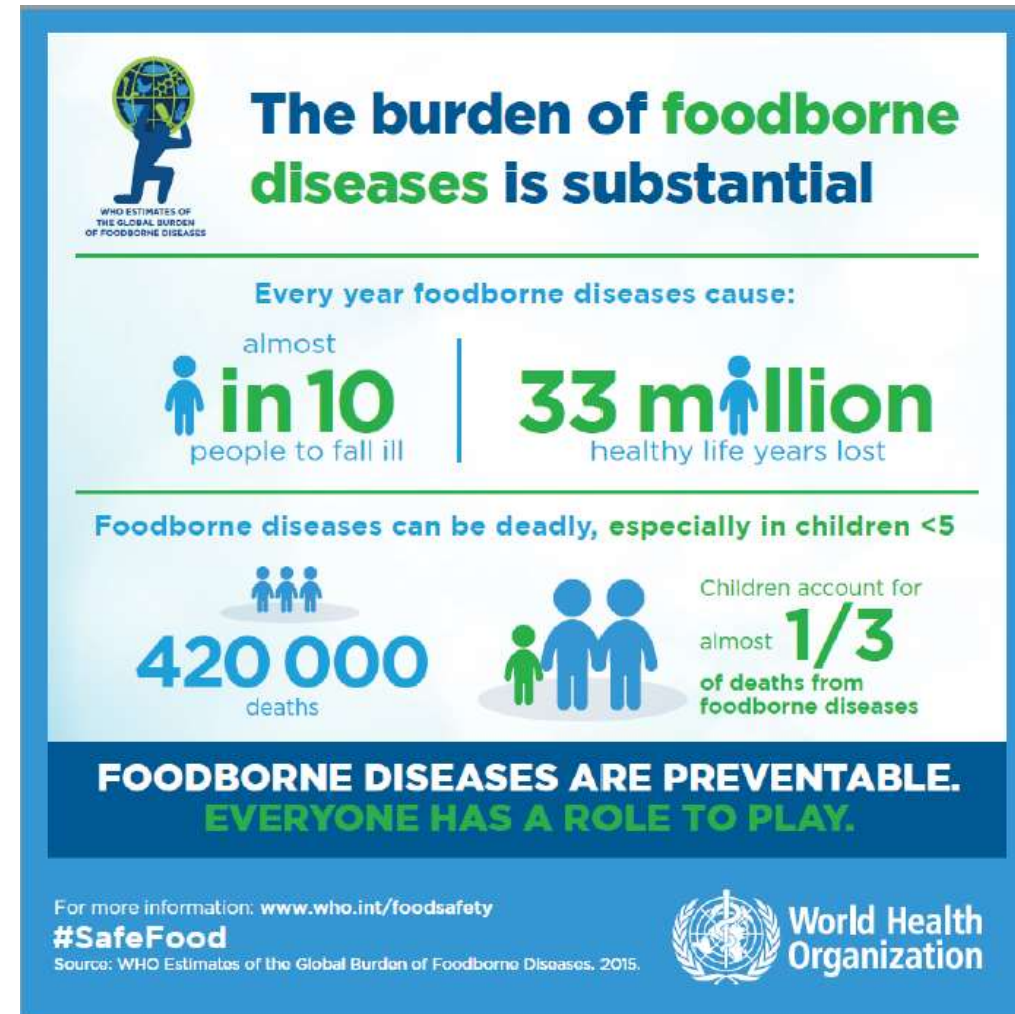
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## FAO's work increases trust in food safety

- 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**



1 NO POVERTY



2 ZERO HUNGER



3 GOOD HEALTH AND WELL-BEING

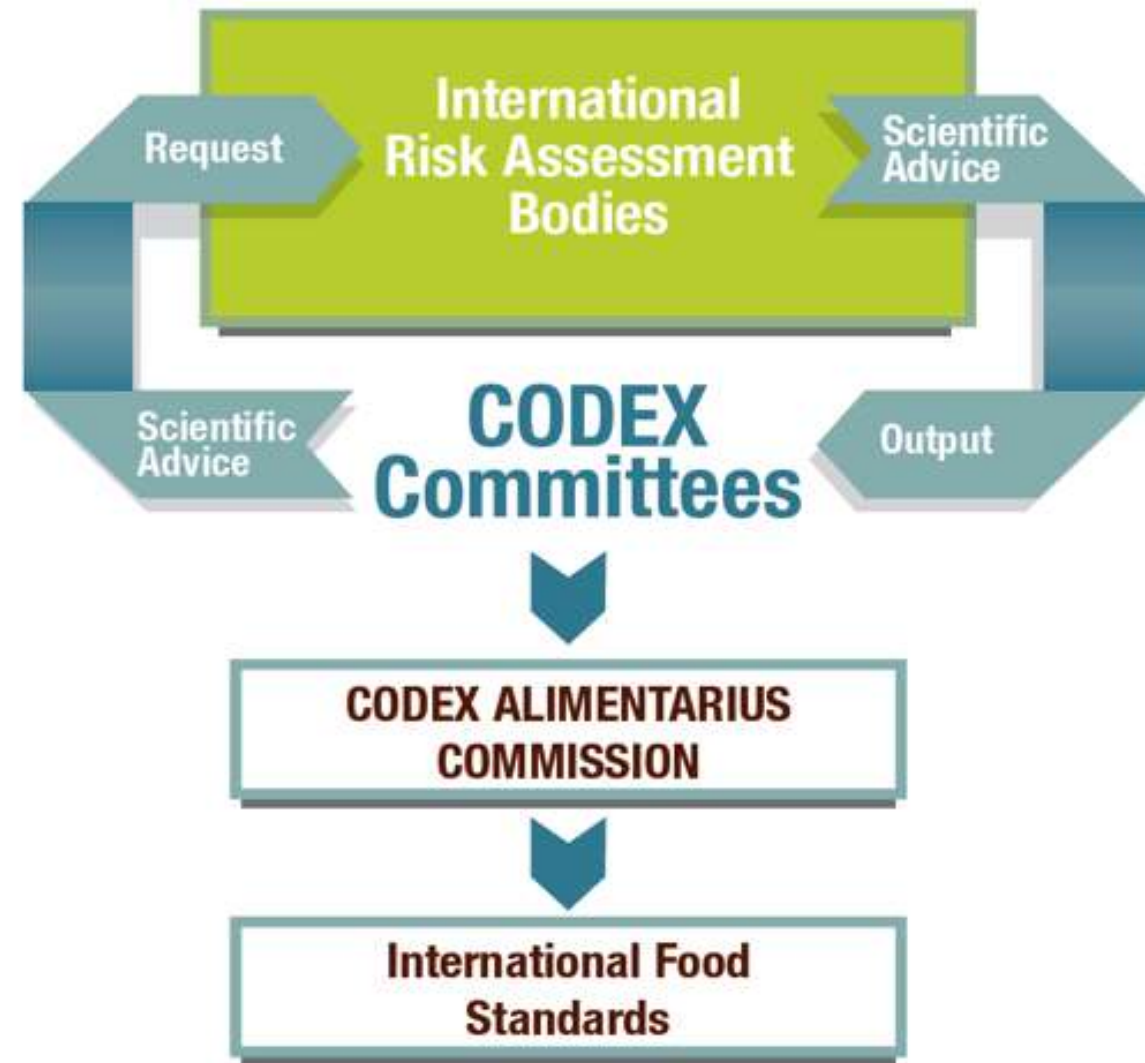


8 DECENT WORK AND ECONOMIC GROWTH



## 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).





# Water use in food production and processing

## WATER FOR FOOD HOW MUCH

Water is part of any production process. We need it to grow apples, as well as produce a packet of crisps. The amount of water needed in this process depends where we are because climate and agricultural practices will be the most important players.



For more information on Water for Food visit: [www.fao.org/NR/water](http://www.fao.org/NR/water)

## WATER IS NEEDED



or the official World Water Day 2012 Website: [www.unwater.org/worldwaterday](http://www.unwater.org/worldwaterday)

## TO PRODUCE...?





## Background on safety and quality use of water in food at the FAO

- 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

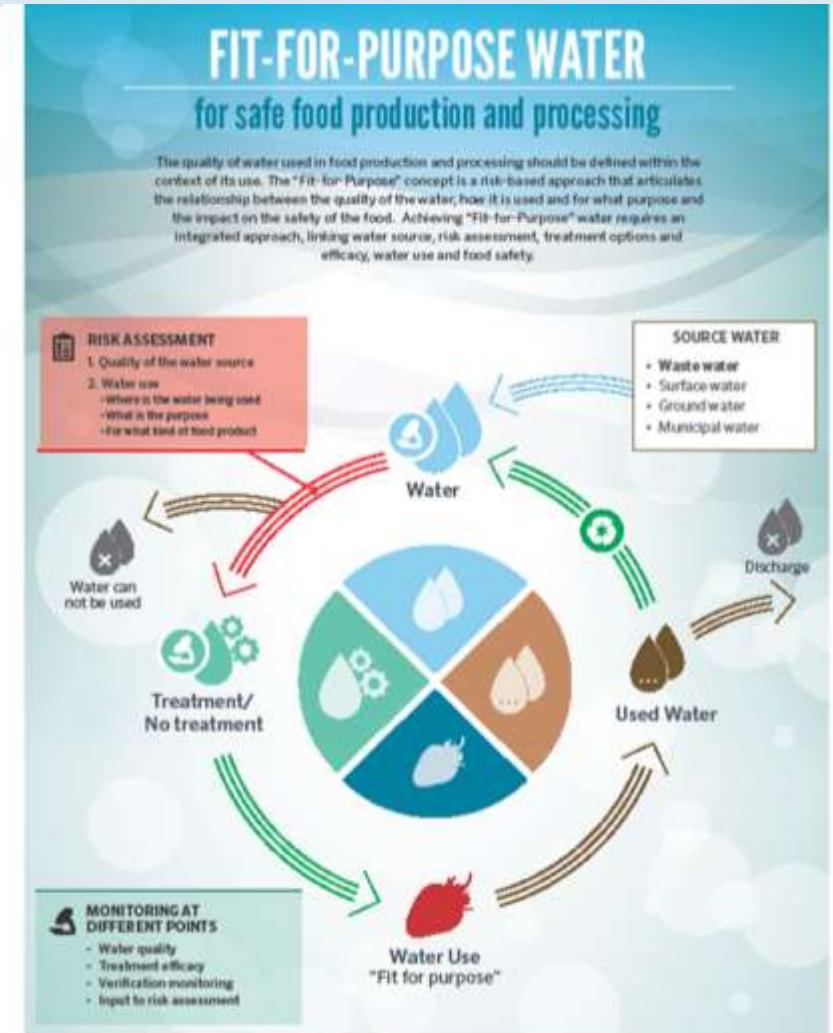
- Codex Committee on Food Hygiene (CCFH) noted the importance of water quality in food production and processing (48th session in November 2016), requested JEMRA to provide guidance processing water, in particular, “clean water” for irrigation water, clean seawater, and on the safe reuse of water

## 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



**RISK  
ASSESSMENT**



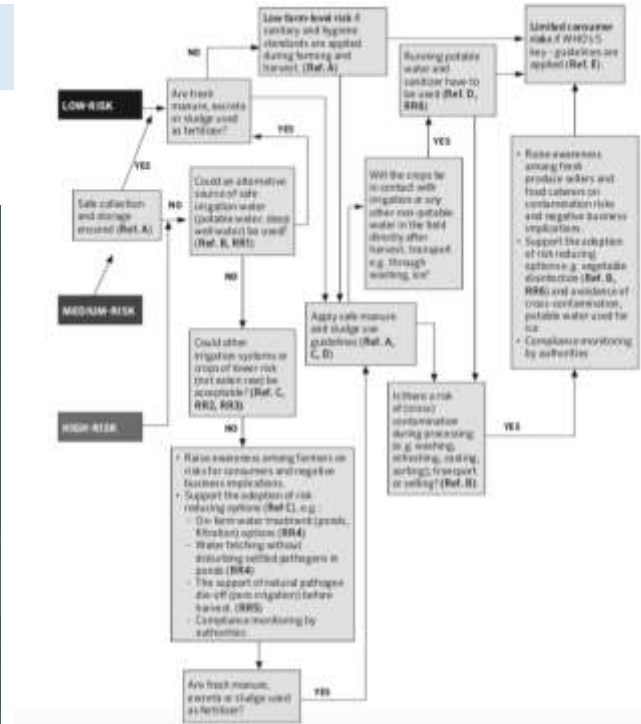
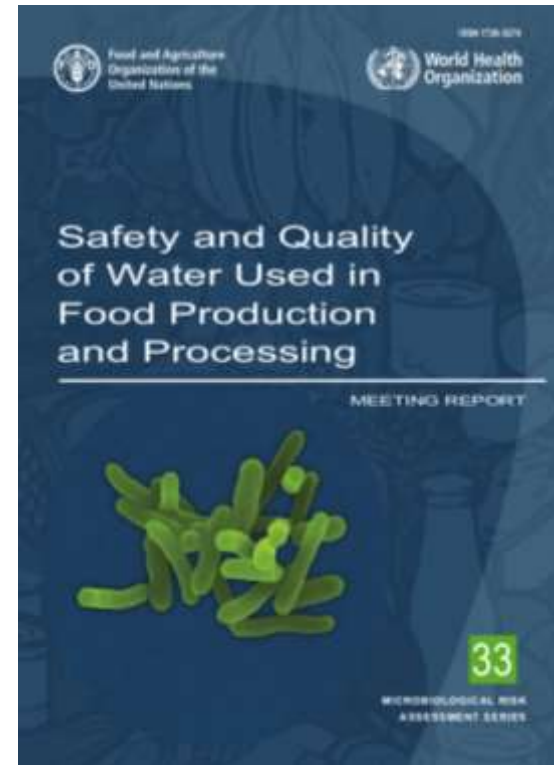
# Report of JEMRA work on water (2018)

## 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



Intended use of produce	Contact with edible plant portions	Water source				
		Wastewater	Surface and groundwater of unknown quality	Groundwater collected from protected wells	Collected rainwater	Potable water / Deep groundwater
READY-TO-EAT	contact with the edible portion	High Risk (Red)	High Risk (Red)	Medium Risk (Yellow)	Low Risk (Green)	Low Risk (Green)
	no contact with the edible portion	High Risk (Red)	Medium Risk (Yellow)	Low Risk (Green)	Low Risk (Green)	Low Risk (Green)
COOKED	contact with the edible portion	Low Risk (Green)	Low Risk (Green)	Low Risk (Green)	Low Risk (Green)	Low Risk (Green)
	no contact with the edible portion	Low Risk (Green)	Low Risk (Green)	Low Risk (Green)	Low Risk (Green)	Low Risk (Green)





## Fresh fruit and vegetables (FFV) (2019)

- 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



## Coming meeting in June 2021

- 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.



## Acknowledgment

### Experts and resource people



**2018**

- Dr Ana Allende Prieto
- Dr Philip Amoah
- Dr Martijn Bouwknecht
- Dr Anders Dalsgaard
- Dr Rob de Jonge
- Dr Ana Maria de Roda Husman
- Dr Patricia Desmarchelier
- Dr Pay Drechsel
- Dr Leon Gorris
- Dr Susanne Knøchel
- Dr Elisabetta Lambertini
- Dr Susan Petterson
- Dr Patrick Smeets
- Dr Mark Sobsey
- Dr Thor Axel Stenstrom



**2019**

- Dr Priyanie Amerasinghe
- Dr Philip Amoah
- Dr Rafael Bastos
- Dr Ana Maria de Roda Husman
- Dr Dima Faour-Klingbeil
- Dr Shay Fout
- Dr Karina Gin
- Dr Maha Halalshah
- Dr Lisa Korsten
- Dr Elisabetta Lambertini
- Dr Duncan Mara
- Dr Richard Muirhead
- Dr Mohamed Nasr Fathi Shaheen
- Dr Ana Allende Prieto
- Dr Rob de Jonge
- Dr Patricia Desmarchelier