



Food and Agriculture Organization  
of the United Nations

# FAO Activities on STEC

## National Reference Laboratories for *E. coli* in the EU

16th Annual Workshop (Virtual)  
18-19 October 2021

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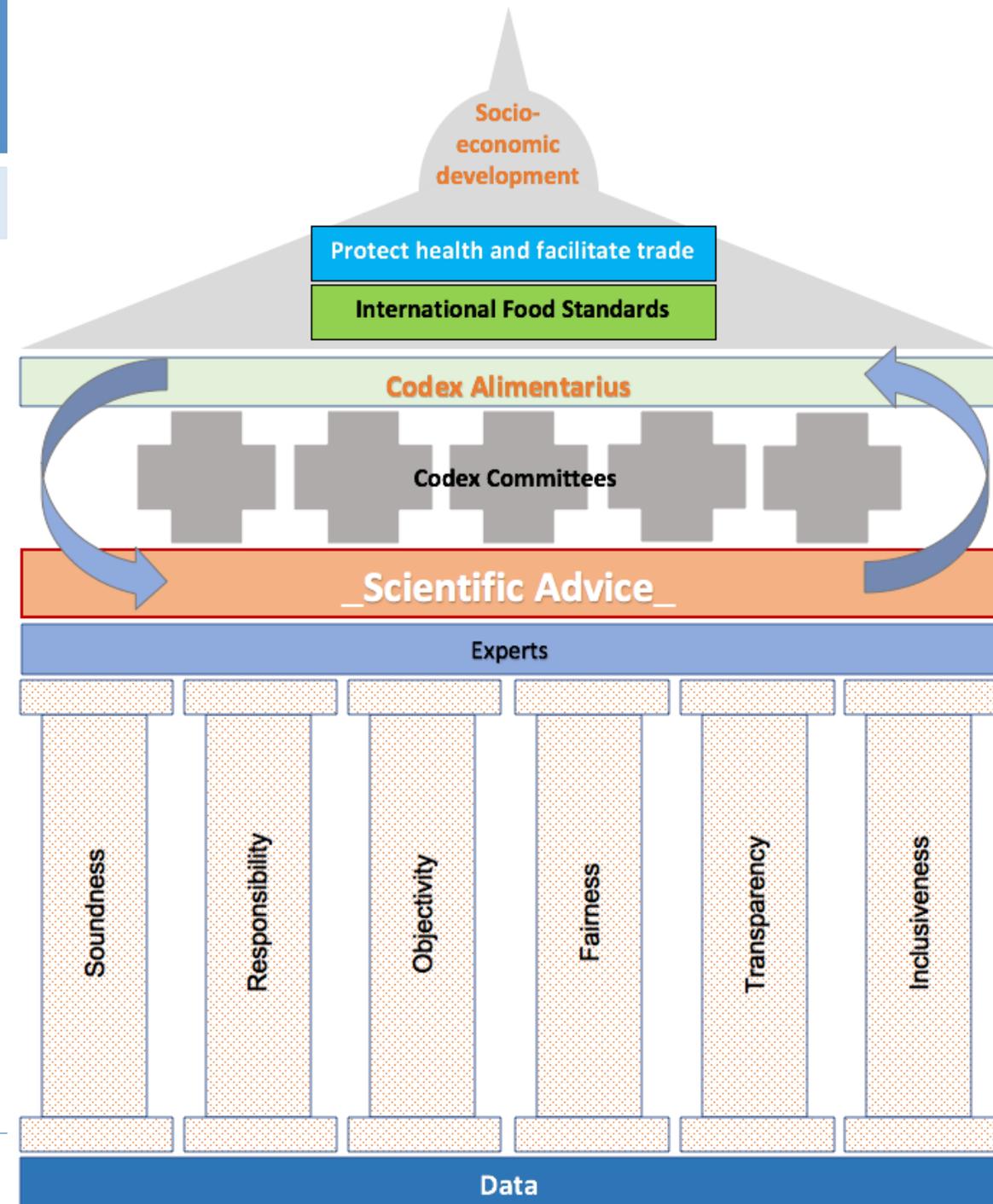
# Objectives

- The work of the JEMRA
- Background on STEC activities at the FAO
- Control of STEC in fresh fruit and vegetables
- Next Steps



## 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) and as deemed necessary
- JECFA, JMPR, JEMNU, ad hoc





## JEMRA meeting in 2020

- **Shiga toxin-producing *Escherichia coli* (STEC) associated with Meat and Dairy Products**
  - STEC caused more than 1.2 million illnesses, 128 deaths, and nearly 13,000 Disability Adjusted Life Years (DALYs) in 2010.
  - To review relevant measures for pre- and post-harvest control of STEC in animals and foods of animal origins.
- ***Listeria monocytogenes* in Ready-to-Eat (RTE) Food: Attribution, Characterization and Monitoring**
  - New outbreak with different foods with broader geographic, new data, new tools. Scientific is needed.

## JEMRA meeting in 2021

- **Microbiological safety and quality of water used in the production of fishery and dairy products**
  - To develop clear and practical guidance on the microbiological criteria that can be used to determine if water is 'fit-for-purpose' for sourcing, use and re-use in fishery and dairy.
- **Prevention and control of microbiological hazards in fresh fruits and vegetable**
  - To collect, review and discuss relevant measures for controls of microbiological hazards from primary production to consumption in: Fresh leafy vegetables; Ready-to-eat, fresh, and minimally processed fruits and vegetables; and sprouts.



Communication

# FAO/WHO Joint Expert Meeting on Microbiological Risk Assessment (JEMRA): Twenty Years of International Microbiological Risk Assessment

Jeffrey T. LeJeune <sup>1,\*</sup>, Kang Zhou <sup>1</sup>, Christine Kopko <sup>1</sup> and Haruka Igarashi <sup>2</sup>

**In brief: Assessing the risk of microbiological hazards in foods**



The Microbiological Risk Assessment Guidance for Food (MRA-20) provides a structured framework for assessing the risk of microbiological hazards in food. It was developed for the global community of scientists and risk assessors, both experienced and inexperienced in risk assessment, and for risk managers or others responsible for risk decision-making and/or communication to the public.

- Identify the key issues and features of a microbiological risk.
- Recognize the properties of a best practice risk assessment.
- Avoid some common pitfalls of risk assessment, and
- Perform risk assessments that are responsive to the needs of risk managers.

The Microbiological Risk Assessment Guidance for Food updates three previous guidance documents by the Food and Agriculture Organization of the United Nations (FAO) and the World Health Organization (WHO) and brings them into a single volume, providing an overall umbrella for microbiological risk assessment. In doing so it captures recent growth and experience in the field, which continues to evolve in line with science and risk management demands.



**Microbial safety of lipid-based ready-to-use foods for management of moderate acute malnutrition and severe acute malnutrition**

ISSN 1726-5274

Food and Agriculture Organization of the United Nations | World Health Organization

SECOND REPORT

**Advances in science and risk assessment tools for *Vibrio parahaemolyticus* and *V. vulnificus* associated with seafood**

ISSN 1726-5274

Food and Agriculture Organization of the United Nations | World Health Organization

MEETING REPORT

**Risk-based examples and approach for control of *Trichinella* spp. and *Taenia saginata* in meat**

ISSN 1726-5274

Food and Agriculture Organization of the United Nations | World Health Organization

REVISED EDITION

**Microbiological Risk Assessment Guidance for Food**

ISSN 1726-5274

Food and Agriculture Organization of the United Nations | World Health Organization

GUIDANCE

36 MICROBIOLOGICAL RISK ASSESSMENT SERIES

**Risk assessment tools for *Vibrio parahaemolyticus* and *Vibrio vulnificus* associated with seafood**

ISSN 1726-5274

Food and Agriculture Organization of the United Nations | World Health Organization

MEETING REPORT

20 MICROBIOLOGICAL RISK ASSESSMENT SERIES

**FAO GUIDE TO RANKING FOOD SAFETY RISKS AT THE NATIONAL LEVEL**



**Microbiological Risk Assessment (MRA) for Food**

MRA: a structured approach that can be tailored to answer specific questions about risk or risk reduction.

MRA is a science-based process made up of four steps:

- Hazard identification:** Microbial hazards in foods include infectious agents or toxins produced by microorganisms.
- Hazard characterization:** Hazard characterization is based on the adverse effects that can result following ingestion.
- Exposure assessment:** Exposure assessment evaluates the likely amount of hazard a population may ingest over time.
- Risk characterization:** Risk characterization is the integration of these three: an estimate of likelihood and severity of an adverse effect in a population.

Risk analysis results in better food safety outcomes, and improvements in public health and market access.



2021

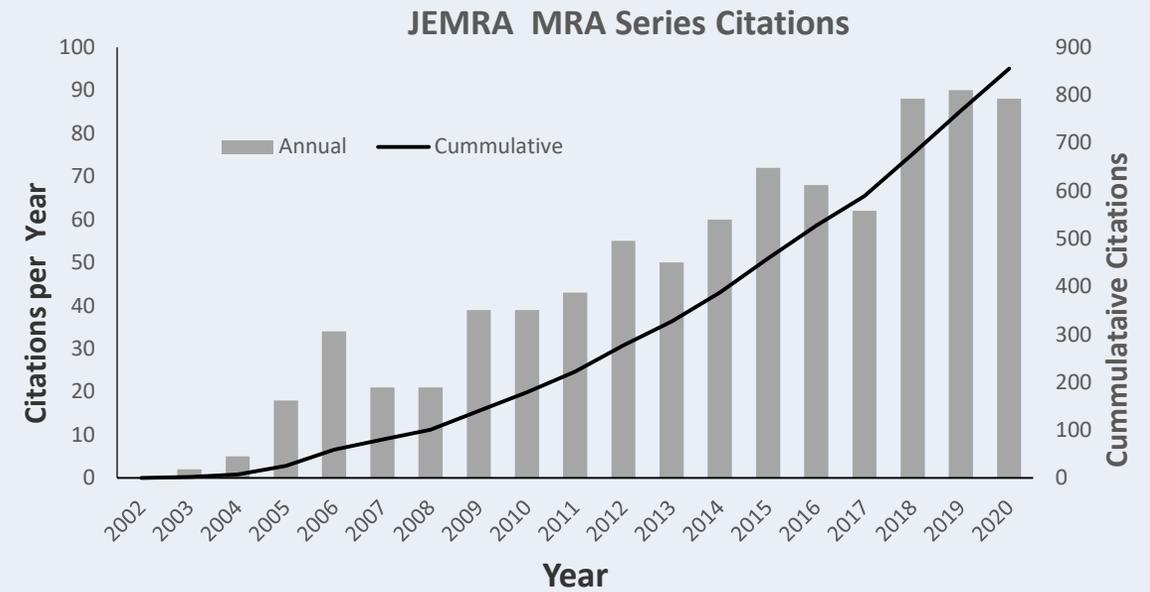
2020



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## 20 years of JEMRA

More than **40** publications, **20** Codex standards and their updates, almost **900** citations, over **370** experts, **40%** female over last 5-8 years (recent meeting is at **1:1**) nearly **60** different countries ...



	<i>Salmonella</i> spp.	<i>Listeria monocytogenes</i>	<i>Cronobacter (Enterobacter sakazakii)</i>	<i>Vibrio</i> spp.	<i>Campylobacter</i> spp.	<b><i>E.coli</i> spp.</b>	Parasites	Viruses
Eggs	1, 2, 34							
Poultry	1, 2, 19, 34				11, 12, 19, 34			
Dairy		4, 5, 34				<b>31, 32, 34</b>	23	
Infant formula and lipid-based foods for children	10, 26, 28, 29, 34	26, 28, 29, 34	6, 10, 15., 26, 28, 29, 34			<b>26, 28, 29, 34</b>		
Fish and seafood	21, 33, 34	4, 5, 34		8, 9, 16, 20, 22, 33, 34, 35			23, 33	13, 33
Fresh fruit and vegetables	14, 33, 34, 37	14, 33, 34, 37		14, 33, 34	14, 34	<b>31, 32, 33, 34, 37</b>	14, 23, 33, 37	14, 13, 33, 37
Meat	30, 34	4, 5, 34				<b>18, 31, 32, 34</b>	25	
Spices and herbs	14, 26, 27, 34, 37	14, 26, 34, 37		26, 14, 34	14, 34	<b>26, 34, 37</b>	14, 37	14, 37
Low moisture foods	26, 34	26, 34	26, 34			<b>26, 34</b>		
Water	33, 34, 37	33, 34, 37		33, 34		<b>33, 34, 37</b>	33, 37	13, 33, 37



## Background on STEC at the FAO

### 2015 - Request for advice from Codex

- The global burden of disease attribution
- Hazard identification & characterization
- Monitoring programs & lab methods used

### 2016 & 2017 - JEMRA meetings on STEC

### 2019 - Request for advice from Codex

- 2020: Control of STEC in beef, raw milk and raw milk cheese
- **2021: leafy greens and sprouts**





# JEMRA on the Prevention and Control of Microbiological Hazards in Fresh Fruits and Vegetables

**Scope:** general principles to control microbiological hazards in fresh ready-to-eat and minimally processed fruits and vegetables, including leafy greens from primary production to point of sale.

- 15 experts, 5 resource persons and secretariat
- Virtual setting
- Executive summary: soon
- Final report: TBD



## Topics of interest for scientific advice...

- Specific control measures to control of STEC
- GHP/GAP and HACCP for the control of STEC
- Appropriate distance between fields growing leafy vegetables and animal operations
- Evidence of animal intrusion in fields or on product



## Topics of interest for scientific advice...

### Sampling and testing

- Irrigation water
- Leafy greens
- Indicator organisms

Is it recommended?

At what frequency?

For what purpose?

How to interpret  
results?



## Next Steps...

November 2021

- Control of microbial hazards in sprouted seeds

2022

- Recommendations on other commodity-specific FFV



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# Thank You!