



Food and Agriculture
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Joint FAO/WHO Expert Meeting on microbiological risk assessment of *Listeria monocytogenes* in foods. Part 2: Risk Assessment Models

WHO HQ, Geneva, Switzerland, 29 May – 2 June 2023

Experts participating in the meeting

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Background information

In response to the request from Codex for scientific advice, FAO and WHO has undertaken the risk assessment on *L. monocytogenes* in several foods since 1999. The 2004 FAO/WHO risk assessment on *L. monocytogenes* (MRA4 and MRA5)^{1,2} provided scientific insight into the risk characterization of *L. monocytogenes* contamination in food and the seriousness of listeriosis for susceptible populations. These risk assessment documents covered a cross-section of RTE foods (pasteurized milk, ice cream, cold-smoked fish and fermented meats) linked to invasive listeriosis. Since the publication of these documents, outbreaks of listeriosis continue to occur across the globe associated with previously reported foods, but also with many previously unreported food vehicles, including fresh and minimally processed fruits and vegetables. In 2020, a virtual meeting of the Joint FAO/WHO Expert Meeting on Microbiological Risk Assessment (JEMRA) of *L. monocytogenes* in RTE Food: Attribution, Characterization and Monitoring was held to review recent data on *L. monocytogenes* and determine the need to modify, update, or develop new risk assessment models and tools for this pathogen.³ The expert group recommended to extend future risk assessments to diverse commodity sub-groups and to consider a farm-to-fork risk assessment. The expert group also recommended that future risk assessments should review groupings of susceptible populations based on physiological risks and other socio-economic factors. In conclusion, the expert group identified several critical gaps in the current FAO/WHO risk assessment model and collectively agreed that updating the model would be valuable for informing risk analysis strategies, including in low- and middle-income countries (LMICs).

¹ MRA4: <https://www.who.int/publications/i/item/9241562617>

² MRA5: <https://www.who.int/publications/i/item/9241562625>

³ Summary report: [https://www.who.int/news-room/events/detail/2020/10/20/default-calendar/joint-fao-who-expert-meeting-on-microbiological-risk-assessment-of-listeria-monocytogenes-in-ready-to-eat-\(rte\)](https://www.who.int/news-room/events/detail/2020/10/20/default-calendar/joint-fao-who-expert-meeting-on-microbiological-risk-assessment-of-listeria-monocytogenes-in-ready-to-eat-(rte))

The summary of the 2020 expert meeting was reported to the 52nd session of the Codex Committee on Food Hygiene (CCFH52) in March 2022, and the proposal that JEMRA undertake a full farm to table risk assessment on *L. monocytogenes* in foods was supported by the members of CCFH52.^{4, 5} Based on the request of CCFH52, FAO and WHO hosted a meeting in October 2022 and elaborated formal models for the risk assessment of *Listeria monocytogenes* for leafy greens, cantaloupe, frozen vegetables and ready-to-eat fish.

Scope and Objectives of the Meeting

The purpose of this meeting is to test and revise the full farm to table risk assessment for *Listeria monocytogenes* in foods.

The assessment include the following types of food:

- Leafy greens
- Cantaloupe melon
- Frozen vegetables (for example peas, corn)
- RTE seafood that allows for the growth of *L. monocytogenes*, for example gravad (sugar-salt marinated) and smoked salmon.

Based on the risk assessment outputs, this expert meeting will inform a possible future revision of the *Guidelines on the Application of General Principles of Food Hygiene to the Control of Listeria monocytogenes in Foods* (CXG 61-2007).⁶

List of experts

The following list of experts is proposed for this meeting. Please find below their bio-sketches. If you have any comments, please contact us at jemra@fao.org and jemra@who.int no later than **12 May 2023**.

⁴ Matters Arising from the Work of FAO and WHO (including JEMRA): https://www.fao.org/fao-who-codexalimentarius/sh-proxy/en/?lnk=1&url=https%253A%252F%252Fworkspace.fao.org%252Fsites%252Fcodex%252FMeetings%252FCX-712-52%252Ffh52_03e.pdf

⁵ The report of CCFH52: https://www.fao.org/fao-who-codexalimentarius/sh-proxy/en/?lnk=1&url=https%253A%252F%252Fworkspace.fao.org%252Fsites%252Fcodex%252FMeetings%252FCX-712-52%252FReport%252FREP22_FHe.pdf

⁶ CXG 61-2007: https://www.fao.org/fao-who-codexalimentarius/sh-proxy/en/?lnk=1&url=https%253A%252F%252Fworkspace.fao.org%252Fsites%252Fcodex%252FStandards%252FCXG%2B61-2007%252FCXG_061e.pdf

Ana Allende

Ana Allende from CEBAS-CSIC (Spanish National Research Council) in Spain is a Senior Researcher with focus on safety of fresh produce. She obtained her PhD in Food Science and Technology at the University of Cartagena in Spain. She holds several positions in (inter)-national institutions including vice-chair of the BIOHAZ panel at the European Food Safety Authority (EFSA), vice-director of the CEBAS-CSIC, Member of the Joint FAO/WHO Expert Meetings on Microbiological Risk Assessment (JEMRA) Roster of Experts. She has published more than 225 research articles in peer-reviewed international journals focused on the safety of fresh produce with more than 8000 cites. Her current H-index is 50. She has built up more than twenty years of scientific research but also management experience by executing, initiating and guiding more than 30 international and national research projects in the area of microbial safety of fresh produce. Promotor of 7 PhD students (past and present). Over the last years, her research activity has been focused on safety aspects of fruits and vegetables, specifically, on leafy greens and fresh-cut products from pre-harvest to post-harvest operations. Her research topics deal with the study of preventive and intervention strategies implemented through good agricultural practices, and the optimization of processing operations including water disinfection in the agro-food industry that impacts product quality and safety.

Li Bai

Li Bai is the Director of Division I of Risk Assessment of the National Centre for Food Safety Risk Assessment (CFSA) in China. She has over 14 years of experience in the food safety sector with a focus on molecular epidemiological microbiology, foodborne disease surveillance and microbiological risk assessment. She published more than 50 high-quality peer-reviewed research papers. She is a member of the National Committee for Food Safety Standards and the National Committee for Food Safety risk assessment, an expert of the Joint FAO/WHO Expert Meeting on Microbiological Risk Assessment (JEMRA) and a member of the WHO advisory group Foodborne Disease Burden Epidemiology Reference Group (FERG).

Elena Carrasco Jiménez

Elena Carrasco Jiménez is a Professor of the Department of Food Science and Technology of the University of Córdoba, with more than 20 years of teaching experience in the field of Food Hygiene, Quality and Safety at the University of Cordoba. Research specialization in predictive microbiology and Quantitative Microbial Risk Assessment (QMRA), participating in a range of national and international projects, contracts and collaborations. More than 50 publications in scientific journals, books and chapters, and an extensive record of dissemination activities such as collaboration with scientific opinions for the Spanish Food Safety and Nutrition Agency. She participated in EFSA tenders during 2014-2017 dealing with QMRA of *Listeria monocytogenes* in ready-to-eat foods at the European level. She is a member of the EFSA Microbiological Risk Assessment network representing Spain since 2007 and member of the Management Committee of the COST action 18105 "Risk-based meat inspection and integrated meat safety assurance" (RIBMINS), with activities focused on the quantitative prioritization of risks in foods of animal origin. Current research interests covers the improvement of risk assessment models through the incorporation of molecular information; risk management; and evaluation of the safety and quality of foods packaged with environmentally-friendly packaging material.

ir Heidy den Besten

ir Heidy den Besten obtained a BSc in Food Technology and a BSc in Mathematics and completed her MSc Food Technology cum laude specialising in Food Safety at Wageningen University. Before starting as Assistant Professor at the Laboratory of Food Microbiology of Wageningen University she completed her PhD project entitled "Quantification of *Bacillus cereus* stress responses". Since 2016 she is Associate professor and her research activities focus on pathogen ecology interlinking functional genomics and prediction of microbial behaviour. She acts as editorial board member of Journal of Food Microbiology and Journal of Food Protection. She is an expert group member of the ILSI task force Microbiological Food Safety and an international member of the PhD board of the University of Turin. Also, she is teaching within the MSc and BSc Food Microbiology programmes of Wageningen University and coordinates a BSc Food Microbiology course in Wageningen and in Singapore.

Qingli Dong

Qingli Dong is a professor and doctoral supervisor of the University of Shanghai for Science and Technology (USST), China, and he received his M.E. and PhD on food science and engineering at 2004 and 2007, respectively. Afterwards he worked as a post-doctoral fellow in USST during 2007-2009. Qingli Dong worked as a visiting scholar at the Institute of Food Research, the United Kingdom, during 2013-2014. His research focus on predictive food microbiology and microbiological risk assessment, mainly supported by the Natural Science Foundation of China (NSFC) and China National Center for Food Safety Risk Assessment (CFSA). Qingli Dong is a member of the 2nd National Food Safety Risk Assessment Commission by the National Health Commission (NHC) of China since 2019, and he joined in FAO/WHO JEMRA Expert Meeting on *Listeria monocytogenes* in Ready-to-Eat Food: Attribution, Characterization and Monitoring in October 2020 and Microbiological Risk Assessment of *Listeria monocytogenes* in Foods in October 2022, respectively. Qingli Dong has published more than 200 academic papers in some international or Chinese journals of food science, and reviewed more than 1200 manuscripts for some journals as a peer reviewer.

Aamir Fazil

Aamir Fazil has been working on microbial risk assessment and public health issues for more than 20 years. He is currently Chief of the Risk Integration Synthesis and Knowledge (RISK) Section of the Public Health Risk Sciences Division, NML at the Public Health Agency of Canada (PHAC).

Aamir Fazil is recognized internationally as an expert in microbial risk assessment and has been invited to participate in numerous international expert consultations organized by the World Health Organization (WHO), the Food and Agriculture Organization (FAO) and other international organizations. He was a member of the WHO Foodborne Epidemiology Reference Group estimating the Global Burden of Foodborne Illness and a member of the WHO/FAO Joint Expert Meetings in Microbial Risk Assessment (JEMRA). He played a principal role on the first international microbial risk assessment project conducted by WHO and FAO including developing the first dose-response model based on outbreak data. He has also been involved as an expert in the preparation of international guidance documents for approaches to conducting microbial risk assessments and was part of the Codex Intergovernmental task force charged with developing anti-microbial resistance risk assessment guidance. The modelling group he is part of was recently awarded the annual PHAC award for contributions to the agencies pandemic response.

Andreas Kiermeier

Andreas Kiermeier is a professional statistician and food safety risk assessor with over 20 years of experience. He gained his PhD in statistics from The University of Adelaide in 2004, shortly after joining the South Australian Research and Development Institute's Food Safety research program. In 2007, Andreas Kiermeier became Program Leader of the Food Safety research program and led multi-disciplinary food safety research projects on eggs, sprouts, pork, red meat, and other food commodities. From 2011 he headed up the SARDI Food Safety and Innovation research program, which had grown to a research program with 25 staff under his leadership. He continued to apply his statistics and risk assessment skills to a range of projects designed to deliver quantitative research outcomes on pathogenic bacteria, viruses, biotoxins, chemical contaminants, and quality characteristics of food. In October 2013, Andreas Kiermeier set up his own statistical consulting and training company. He has participated in several JEMRA expert consultations and has extensive international experience having delivered risk assessment and management training initiatives in east and west Africa and projects in Viet Nam, Egypt, Bangladesh and Georgia. Andreas continues to work closely with Australian agri-food industries in Australia.

Jovana Kovacevic

Jovana Kovacevic is an Associate Professor and Food Safety Extension Specialist at the Oregon State University's Food Innovation Center (FIC) in Portland. She has over 15 years of research and work experience in the food safety and food microbiology, coming from academia, government, and food industry. In her current role, Jovana Kovacevic directs the food safety program at the FIC and the USDA-funded Western Regional Center to Enhance Food Safety. Her research uses molecular methods and whole genome sequencing to trace, better understand and prevent contamination events in the food chain, with particular focus on *Listeria monocytogenes*. Her research interests also include sanitizer and antimicrobial resistance in the food chain, pathogen stress survival and biofilms, and understanding and prevention of food contamination. Through her work with the Western Regional Center, Jovana Kovacevic supports the Western U.S. region in Food Safety Modernization Act-related food safety training, education and outreach activities. Prior to joining OSU, Jovana Kovacevic worked as a lecturer at the University of British Columbia, a food safety consultant with the British Columbia Ministry of Health, and a Food Safety Scientist at the British Columbia Centre for Disease Control, in Canada.

Roland Lindqvist

Roland Lindqvist has been employed by the Swedish Food Agency since 1994. His responsibilities has ranged from leading and co-ordinating activities in the microbial food safety area, to advisory tasks and research. In his capacity at the agency he serves as a member of the Swedish Board of Zoonoses. Most recently, he was the head of the microbiological risk assessment team. He was involved in the first FAO/WHO JEMRA expert meetings (2000-2004) which resulted in FAO/WHO monographies about *Listeria monocytogenes* and Salmonella. Lindqvist has published research in food safety, the epidemiology of foodborne illnesses, predictive microbiology and risk assessment. His work at the agency has also involved close interaction and communication with food safety risk managers. He was adjunct professor in food safety, especially risk assessment of foods, at the Agricultural University in Uppsala (SLU), between 2010 and 2012. Lindqvist is a member of the EFSA panel on Biological Hazards since July, 2012, and has been involved in several working groups, e.g., on *Listeria* and frozen vegetables (member) and on trends and risk assessment of *Listeria* in RTE foods (chair).

Bing Wang

Bing Wang is a human health risk analyst specialized in addressing microbial food safety issues. Bing Wang's research aims to improve public health decision making through data analysis and decision tools, particularly the use of epidemiology, systematic review, meta-analysis, predictive microbiology, and quantitative microbial risk assessment to optimize the food production and processing conditions and enhance the effectiveness of food safety and quality resources. Bing Wang is currently an associate professor at the University of Nebraska-Lincoln. In addition, she serves as an expert advisor to the Joint FAO/WHO Expert Meetings on Microbial Risk Assessment (JEMRA) and food safety consultant for FAO, and is appointed as the member on the National Advisory Committee on Microbiological Criteria for Foods of the United States (NACMCF).

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