



**Food and Agriculture Organization
of the United Nations**

Expert consultation

Scientific advice on cell-based food products and food safety considerations

Organized by FAO in collaboration with WHO

Singapore, 1-4 November 2022

Experts and resource people participating in the meeting

Published on 13 September 2022

Background information

In order for the Food and Agriculture Organization of the United Nations (FAO) to assist its Members by providing sound scientific advice for informed decision-making, a 3.5-day expert consultation will be held in Singapore from 1 to 4 November 2022. The meeting will be organized by FAO in collaboration with the World Health Organization (WHO). For this expert consultation, FAO has issued an open and global [call for experts](#) from 1 April to 15 June 2022 in order to form a group of experts with multidisciplinary fields of expertise and experience to provide scientific advice to conduct the first step of food safety hazard identification of cell-based food. The independent selection panel, consisting of two FAO food safety officers, two FAO food safety specialists and an external evaluator, has reviewed all the applications.

The primary objective of the expert consultation is to develop a technical document with up-to-date technical knowledge on the multidisciplinary topic of cell-based food production, with a focus on the food safety aspects, through the process of expert elicitation. Specific objectives include 1) to concisely summarize the relevant technical matters for the national food safety competent authorities, particularly those in Low and Middle Income Countries (LMIC), to consider their potentially required actions; 2) to exchange the information on technical knowledge and good practices among competent authorities in various regulatory frameworks to learn from each other; and 3) to identify the needs for global actions and make expert recommendations for possible follow-up actions for relevant international organizations.

List of the Technical Panel (experts and resource people)

The following experts and resource people are proposed to consist the Technical Panel for this meeting. Should there be any comments, please contact FAO secretariat members at Masami.Takeuchi@fao.org and Leticia.Bartolomedelpino@fao.org by no later than 27 September 2022.

A. Technical Panel (experts)

Anil Kumar Anal

Dr Anal serves as Professor of the Food Engineering and Bioprocess Technology and Food Innovation, Nutrition, and Health program at the Department of Food Agriculture and Bioresources in the Asian Institute of Technology in Thailand. He completed a Master and Doctoral degrees in Food and Bioprocess Technology at the Asian Institute of Technology, Thailand. His work focuses on the field of food safety, food processing innovation, bio preservation, antimicrobial resistance, and microbial risk analysis in food systems. Dr Anal has conducted various research, working in product developments (patented), and in sustainable and safe food production systems including strategy development for food safety

standardization as well as policy implications related to food safety. Dr Anal has published many scientific publications and books as well as peer-reviewed papers on food safety regulatory frameworks for Southeast Asian and South Asian Countries. He has been serving as advisory member, associate editor, and editorial board member of various national and international peer-reviewed journals. He has been invited as a speaker and as an expert in various conferences and workshops organized by national, regional, and international agencies.

William Chen

Dr Chen holds the positions of Endowed Professor and Director of Food Science and Technology at Nanyang Technological University in Singapore. He serves also as Scientific Director of Singapore Future Ready Food Safety Hub, as well as Director of Singapore Agri-food Innovation Lab. He holds both BSc and PhD from the Université Catholique de Louvain, Belgium. His work focuses on developing technology innovations to upcycle food processing side-streams and integrate the recovered nutrients into the alternative food production. Of relevance to food safety assessment framework, he has worked in biomass fermentation for nutrient recovery, precision fermentation for sustainable food ingredients, microbiology and gut microbiome, cell/tissue culture for in vitro toxicology testing, and metabolomics analysis for biomarker identification. He serves as a member of the Novel Food Safety Expert Working group in the Singapore Food Agency. He acts as an advisor to some institutes and international organizations on tech-driven urban farming systems and consultant on food safety of plant-based proteins.

Deepak Choudhury

Dr Choudhury works as Senior Scientist and Group Leader of Biomanufacturing Technology at the Bioprocessing Technology Institute, Agency for Science, Technology and Research in Singapore. He holds a PhD in Bioengineering from the National University of Singapore. His primary research interests include biomaterials and bio fabrication processes for cellular agriculture applications and biomanufacturing for regenerative medicine. His research on cell-based food have been conducted and developed at the Singaporean national centres. He has published many insights on cell-based food (production, nomenclature, 3D printing and edible scaffolds).

Sghaier Chriki

Dr Chriki is employed as Professor in Animal Science in the Agroecology and Environment Unit at Institut Supérieur de l'Agriculture Rhône-Alpes, Lyon, France. He holds a PhD in Nutrition and Food Sciences from the University of Blaise Pascal and the French National Research Institute for Agriculture, Food and Environment (INRAE). His work focuses on meat quality and consumer expectations related to beef quality. He deals, since few years with meat alternatives properties (safety, sensory and nutritional quality), consumer attitudes and potential acceptance toward cultured meat. Dr Chriki has published more than ten peer-reviewed articles on cell-based meat. He has taken part in the preparation of two special issues on cell-based products and a scientific handbook on sustainable food. He collaborates as an editorial team member of a high impact factor journal. He also conducts various research about African consumers' perceptions toward cell-based foods.

Marie-Pierre Ellies-Oury

Dr Ellies-Oury serves as Professor in Animal Science at Bordeaux Sciences Agro, France and researcher at INRAE in the Herbivore Research Unit at Clermont-Ferrand, France. She holds a PhD in Animal science and Animal Products Qualities from the University of Burgundy, Dijon, France. Her work focuses on the optimization of nutritional, sanitary, and sensory qualities of

meat and animal products participating in international research projects on the matter. She has taken part in the coordination of books focused on these subjects too. She has also worked on cultured meat, and she has published fifteen scientific articles and several book chapters on this topic participating in various national and international conferences.

Jeremiah Fasano

Dr Fasano holds the position of Senior Policy Advisor in the Office of Food Additive Safety at the United States (US) Food and Drug Administration (FDA) Center for Food Safety and Applied Nutrition in the United States of America (USA). He holds a doctorate in plant cell physiology and molecular biology from Pennsylvania State University, USA. His work focuses on premarket safety evaluation of new food ingredients and development of risk assessment frameworks for new food technologies and functionalities. He acts as the FDA's current primary point of contact for cultured animal cell foods, as well as the designated point of contact for the interagency agreement between FDA and US Department of Agriculture (USDA) that describes the agencies' roles in shared oversight of foods produced by animal cell culture technology.

Mukunda Goswami

Dr Goswami is employed as Principal Scientist in Fish Genetics Biotechnology at the Central Institute of Fisheries Education, Indian Council of Agricultural Research, in Mumbai, India. He holds a PhD in Fish and Fisheries Science from the same institution in India. His work focuses on cultivated seafood research using fish muscle cell lines in India. Presently, he takes part in an international collaborative project with Virginia Polytechnic Institute and State University, USA, focusing on whole cut cell-based/cultivated seafood. He has developed and characterized fish cell lines including a National Repository of Fish Cell Lines in India. He has been involved in DNA barcoding of fish in India which has been used for authentication of fish species, cell lines and seafood products. He has also delivered several lectures on fish cell line development and culture techniques.

William Hallman

Dr Hallman holds the positions of Professor and Chair of the Department of Human Ecology at Rutgers University, New Brunswick, New Jersey, USA. He holds a PhD in Experimental Psychology from the University of South Carolina, USA. His work focuses on public understanding and perceptions of risk, risk communication, new food and agricultural technologies, food labelling, and consumer behaviours related to food safety. Dr Hallman has served as chair of committees on risk communication and advancing science. He is also co-author of a handbook on risk communication applied to food safety published by international organizations. Dr Hallman has also published several studies using experimental methods to determine the best nomenclature to label cell-based meat, poultry, and seafood products.

Geoffrey Muriira Karau

Dr Karau serves as Director in the Directorate of Quality Assurance and Inspection at Kenya Bureau of Standards in Nairobi, Kenya. He holds a PhD in Medical Biochemistry from Kenyatta University, Kenya. His work focuses on conformity assessment, including standardization, metrology, testing, inspection and quality assurance, and compliance of consumer products to the relevant standards and other technical regulations. He works in the development of testing methods, standards and procedures for quality assurance and inspection of various products as well as developing standards and regulations for various products. His main research is focused on food authentication and studies of contaminants such as mycotoxins in cereals, eggs, meat, and milk products. Dr Karau has acted as a board member for international associations and national quality institutions.

Lisa Kelly

Dr Kelly is employed as acting Director of Biotechnology, Toxicology and Nutrition Science in the Science and Risk Assessment branch of Food Standards Australia New Zealand in Canberra, Australia. She holds a PhD in Molecular Plant Virology from the Australian National University, Australia. Her work focuses primarily on the food safety and risk assessment of biotechnology products, with attention to the application of multidisciplinary risk assessment approaches to new technologies and innovative food products, such as the products of precision fermentation. Dr Kelly has worked for over twenty-five years in food regulation, taking part in international initiatives on risk assessment on genetically modified foods and developing international consensus and harmonized approaches.

Martín Alfredo Lema

Mr Lema is employed as Adjunct Professor in the Biotechnology School of the National University of Quilmes, Argentina. He holds a BSc in Biotechnology and undertook MSc studies in Science and Technology in the same institution. His work focuses on agrifood biotechnology, regulation of novel foods, and policymaking both at national and multilateral levels. He accumulated sixteen years of experience as a policymaker in agricultural biotechnology, having served as former Director of Biotechnology in the Argentine Government and Chair of its National Biosafety Commission. He has published many articles and book chapters in biotechnology research, education, policymaking, and safety. Mr Lema has acted as Argentine delegate to numerous biotechnology-related summit organized by international organizations. In particular, he contributed to the work of the Codex Task Force on Foods Derived from Modern Biotechnology.

Reza Ovissipour

Dr Ovissipour works as Assistant Professor in Food Safety and Cellular Agriculture at Virginia Tech. in Blacksburg, Virginia, USA. He holds a PhD degree in Bioprocess Engineering from Tarbiat Modares University in Iran, and a PhD degree in Biological Systems Engineering from Washington State University, USA. His work and research focus on bioprocess engineering, food safety, including plan developing, emerging technologies for food safety, alternative proteins, fermentation, and cellular agriculture. He has also been working with researchers from Chile, Mexico, and Oman to develop novel alternative proteins. He is serving as an ad hoc reviewer for funding agencies in Chile, Israel, and Canada and he has also worked with researchers from LMIC to develop educational materials, and presentations to increase awareness about food safety.

Christopher Simuntala

Mr Simuntala holds the position of Senior Biosafety Officer or in Standards & Technical Department at National Biosafety Authority in Lusaka, Zambia. He holds a Master of Science Degree in Biotechnology from Swinburne University of Technology, Australia. His work focuses on food safety, regulation of activities related to genetically modified foods, monitoring inspections, development, and adoption of standards to conform to international best practices and risk assessments. He served also as Deputy Head of Bacteriology laboratory and later Head of Biotechnology laboratory at the Central Veterinary Research Institute. He was involved in the research and publication of scientific papers under the food health sector. He has acted as focal point for international organizations where he has also contributed to publications and to the development of a biosafety tool kit.

Mehdi Triki

Dr Triki is employed as Food Safety Analyst in the Food Safety and Environmental Health Department at The Ministry of Public Health in Doha, Qatar. He holds a PhD degree in Food Science and Technology from Complutense University, Madrid, Spain. His work focuses on safety and control of imported/exported food products. He acts as a member of the scientific research commission in the department of food safety and as a member of the core technical group for the provision of scientific advice for countries to assure safety of cultured animal cells formed by international organizations. In the research field, Dr Triki has published many scientific research papers in peer-reviewed journals and several book chapters, in the field of meat science and especially in meat products microbiology and toxicology. Dr Triki has filled leadership positions in Tunisia and Qatar, both in the meat industry sector as Quality, Health, Safety and Environment manager and in the public sector in several scientific commissions. He works closely with various national, regional, and international institutions and organizations on food safety issues related to food importation/exportation.

Yongning Wu

Dr Wu holds the positions of Toxicology Professor and Chief Scientist in the Research Unit of Food Safety, Chinese Academy of Medical Sciences; and Key Lab of Food Safety Risk Assessment, National Health Commission at China National Center for Food Safety Risk Assessment in Beijing, China. He holds PhD in Nutrition and Food Hygiene from the Chinese Academy of Preventive Medicine, China. His work focuses on safety evaluation and substantial equivalence on novel food ingredients, especially genetic toxicology, and food allergy assessment. He serves as a member of several expert committees at national and international level, and he is also representative for international organizations. Dr Wu has worked in capacity building in LMIC, and in regulatory aspects.

B. Technical Panel (resource people)

Breanna Duffy

Dr Duffy is employed as Director of responsible research and innovation at New Harvest, USA. She holds a PhD in biomedical engineering from Tufts University, USA. Her work focuses on maximizing the positive impacts of cell-based foods to ensure future products will be safe, sustainable, and equitable. Dr Duffy works with the organization's network of researchers and diverse stakeholders to promote pre-commercial research and foster collaborations across the field. She was involved in initiatives to provide the first peer-reviewed publication on the manufacturing process and potential safety hazards of these products, informed by a diverse group of cell-cultured meat and seafood companies. During her previous research in muscle tissue engineering she focused on cell culture, materials development, and tissue perfusion.

Neta Lavon

Dr Lavon works as Chief Technology Officer and vice president of research and development at Aleph Farms, Israel. She holds a PhD in genetics from the Hebrew University of Jerusalem, Israel. Her work focuses on developing food products and planning the production path which includes safety considerations from the initial cell source selection. She has several publications in the field related to cultured meat and safety of cell lines. Dr Lavon has worked for over twenty years in stem cell applications in biotechnology, specializing in the commercialization of emerging technologies for industrial utilization. She was employed as Chief Operating Officer of a biotech company, developing cell therapy products for neurodegenerative diseases. She also served as researcher at Cedars-Sinai in Los Angeles where she took part in the establishment of repository of novel pluripotent stem cell lines and their registration for the cell lines repository at the National Institute of Health.

Amanda Leitolis

Dr Leitolis holds the position of Cultivated Meat Scientist in the Science and Technology department at The Good Food Institute in Brazil. She holds a PhD in Cellular and Molecular Biology from the Federal University of Paraná, Brazil. Her work focuses on accelerating Brazil's cultivated meat sector's development. She has worked in the promotion of original research on food safety of cultivated meat, conducted by a Brazilian team of researchers from different organizations. She has taken part in the coordination of the development of regulatory and business information documents regarding cultivated meat. Dr Leitolis has also worked on the development of the first white paper on cultivated meat in Brazil and the first regulatory study for Brazilian regulators.

Kimberly Ong

Dr Ong serves as Senior Scientist and Toxicologist at Vireo Advisors, LLC., based in Douro-Dummer, Ontario, Canada. She holds a PhD in Physiology, Cell, and Developmental Biology from University of Alberta, Canada. Her work focuses on the safety of cultured meat and innovative ingredients and novel products intended for the market. She develops strategies to ensure the safety of novel products to meet regulatory and stakeholder requirements. She works as advisor for companies manufacturing meat and seafood as well as supply chain companies, including media and scaffold developers. Dr Ong takes part in an initiative that aims to bring together industry and regulatory stakeholders to identify and address research priorities for safety assessment of cultured meat. She has co-authored one of the first peer-reviewed published papers addressing the safety of cultured meat and seafood products. She has been an invited speaker at multiple conferences to speak about potential hazards related to cultured meat production.

Mark Johannes Post

Dr Post is employed as Professor of Sustainable Industrial Tissue Engineering at Maastricht University, the Netherlands. He holds a MD/PhD in Medicine from Utrecht University, The Netherlands. His main research focuses on engineering tissues for medical applications and consumer products, which has led to the development of cultured beef from bovine skeletal muscle and fat stem cells and cultured leather from bovine skin cells. He also works as Chief Security Officer of a food technology company focusing on culture meat product development, and he is also involved in regulatory aspects of cultured meat. Dr Post has collaborated in the organization of international scientific conferences on cultured meat and meat alternatives. He has presented close to 500 lectures worldwide on the topic of food innovation, including meetings organized by non-governmental organizations concerned with food security in LMIC. He is involved in a food and agriculture innovation society in South Africa.

Aletta Schnitzler

Dr Schnitzler holds the position of Chief Scientific Officer at TurtleTree, USA. She holds a PhD in neuroscience and immunology from the Boston University School of Medicine, USA. Her work focuses on the research and development of nutritious cell-based dairy and milk bio actives. Earlier experiences were focused on cell-cultures and cell-line requirements, media optimization and single-use bioreactor systems for use in a complex regulatory environment. She collaborates as an editorial board member of Stem Cells Translational Medicine. She currently serves on the advisory board for UC Davis' Cellular Agriculture Program, funded by the US National Science Foundation.

Jo Anne Shatkin

Dr Shatkin serves as Environmental Health Scientist and President of Vireo Advisors LLC in Boston, Massachusetts, USA. She holds a PhD from Clark University, USA. Her work focuses on safety assessments for novel foods (including both hazard identification and assessment of exposure) as well as emerging ingredients and substances. She has taken part in a work to establish safety demonstration methods for cultured meat. She has also participated in the development of a process diagram and potential safety considerations for cultured meat and seafood. She collaborates with companies to prepare for regulatory acceptance internationally.

Elliot Swartz

Dr Swartz is employed as Lead Scientist specializing in cultivated meat at the Good Food Institute. Dr Swartz holds a PhD in neuroscience from the University of California, Los Angeles, USA, where he worked with induced pluripotent stem cells to model neuromuscular disease. His work focuses on analyzing the technical and economic bottlenecks facing the cultivated meat industry, identifying opportunities to accelerate the industry, and educating scientists, the public, and other industry stakeholders. Dr Swartz has worked on collaborative projects ranging from food safety and environmental impact to in-depth analysis of the cultivated meat value chain.

Keri Szejda

Dr Szejda works as Research Scientist at North Mountain Consulting Group in Phoenix, Arizona, USA, and as a visiting scholar with Arizona State University, USA. She holds a PhD in health communication from the same university, where she also completed a postdoctoral fellowship in science communication. Her work focuses on science communication and consumer research related to sustainable food systems, developing evidence-based communication strategies. She has also conducted qualitative and quantitative research on consumer perspectives of cultivated meat including desired information about food safety. She has taken part in science communication initiatives to engage and inform publics and has conducted consumer research in China, Egypt, India, Kenya, Nigeria, Singapore, South Africa, the United Kingdom, and USA.

Mercedes Vila Juarez

Dr Vila holds the position of Chief Technology Officer at BioTech Foods SL in San Sebastián, Spain. She holds a PhD in Materials Physics from Universidad Autónoma de Madrid/Consejo Superior de Investigaciones Científicas, Spain. Her work focuses on cultivated meat research and development for commercial production, defining safety assessments tests strategies, working with Good Laboratory Practice testing companies and considering nutritional composition, toxicity and allergenicity of cultivated meat. Dr Vila has received several awards and recognitions from various institutions. She has published many scientific articles in collaboration with international colleagues. She has worked in various projects which includes one with the Argentinian national program.

Peter Yu

Mr Yu is employed as Program Manager for the Asia Pacific Society for Cellular Agriculture with headquarters in Singapore. He holds an MBA from National University of Singapore, and a MSc. Molecular Biosciences and Bioengineering from University of Hawai'i at Manoa. His works focuses on risk mitigation including public awareness, consumer insight studies, industry wide collaboration, and also on regulatory harmonization, facilitating the development of regulatory frameworks. Mr Yu has worked with industry and governmental stakeholders in several countries including Singapore, Japan, South Korea, and China.

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