CODEX ALIMENTARIUS COMMISSION

Food and Agriculture Organization of the United Nations

World Health Organization

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Agenda Item 2 **CRD04**

JOINT FAO/WHO FOOD STANDARDS PROGRAMME

CODEX ALIMENTARIUS COMMISSION

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Food safety aspects of cell-based food

(Prepared by FAO and WHO)

Background

Cell-based food production[1], also known as cellular agriculture, is the process involves culturing cells isolated from animals, followed by cell growth, harvesting and processing techniques that result in food products comparable to their corresponding animal versions, such as meat including poultry and seafood.

The increasing recognition of the challenges related to feeding a growing global population, while at the same time producing food more sustainably, is spurring food system innovations which are shaping our future agri-food landscape. Considering the growing global demand for protein-rich foods, some say cell-based food may have the potential to find some solutions.

Various cell-based food products are under advanced stages of development across the world, making it timely critical to objectively assess any potential food safety risks associated with them in a timely manner. Food safety is one of the most important questions consumers may raise about any food and in particular any new food production process.

Expert Consultation on food safety aspects of cell-based food

Given this context, the Food and Agriculture Organization of the United Nations (FAO), in collaboration with the World Health Organization (WHO) organized the first global Expert Consultation on food safety aspects of cell-based food[2] in Singapore, from 1 to 4 November 2022. A group of 23 experts from 15 countries conducted the food safety hazards identification for cell-based foods.

Terminology matters

The Technical Panel members - who have gained knowledge of cell-based food in the public and private sectors, academia, research and non-government organizations – agreed to use the term "cell-based food" as a working terminology[3] for the purpose of the expert consultation. While noting there is no perfect terminology, the term was found to be less confusing, conveniently over-arching and generally well-accepted by consumers.

Hazard identification

The Technical Panel considered all potential hazards to develop an exhaustive list based on the four stages of the cell-based food production, namely: 1) cell-sourcing; 2) cell growth and production; 3) cell harvesting; and 4) processing. The experts found that with cell-based food, many hazards are already well-known and they exist in the conventionally produced food. For example, microbiological contamination can occurs at any

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[1] FAO Food Safety and Quality website. 2022. Scientific advice – cell-based food. https://www.fao.org/food-safety/scientific-advice/crosscutting-and-emerging-issues/cell-based-food/

[2] FAO Food Safety and Quality website. 2022. News - First global consultation looks at the safety of cell-based foods. https://www.fao.org/food-safety/news/news-details/en/c/1615562/

[3] FAO Food Safety and Quality website. 2022. News - Mince no words: establishing "working" terminology for cell-based food. https://www.fao.org/food-safety/news/news-details/en/c/1609618/

stages of any food production processes, including the one of cell-based food. The experts concluded, however, that most cases of microbial contamination during the cell growth and production stages inhibit cell growth. If the cells have grown and reached product expectations for harvest, then such contamination would not occur during the production process but could occur post-harvest, as is the case with many other food products. Various existing control measures and good manufacturing and hygiene practices, and Hazard Identification and Critical Control Points (HACCP), are applicable to ensure food safety for cell-based food.

Food safety plans would also need to focus on the materials, inputs, ingredients, and equipment that can be specific to cell food production, referring to the use of new substance applications to nourish the cells; and the possibility of allergic reactions to them. However, while such inputs and materials can be new, existing preventative measures and safety assurance tools are applicable to control such hazards.

Preparedness for effective communication

While specialist clearly differentiate the concept of "hazard" and "risk," the importance of this distinction is not always commonly understood and appreciated by the media or consumers. Therefore, the list of hazards identified by the Technical Panel could be all perceived as risks, rather than controllable hazards with variance in probability and degree of threat. To prevent any possible confusion of such, regulators may wish to already initiate the development process of tailored communication strategies to contextualize potential hazards and the probability or degree of threat each risk might represent.

It is a pivotal moment for regulators to introduce cell-based food to consumers in a proactive and transparent manner. Continuous engagement of the stakeholders, meaning that both regulators and consumers are involved in communication, is essential to strengthen the trust that consumers need to have in regulators.

Next step – data generation and collection for risk assessment

Hazard identification is only the first step of the formal risk assessment process. In order to conduct a proper risk assessment for cell-based food, it is essential to collect a sufficient amount of scientific data/information that is required for exposure assessment and risk characterization. To this aim, Food safety competent authorities may wish to collaborate with other food safety competent authorities in the region or trade partner countries to share the experience so that the data and insights required for safety assessment of cell-based food can be complemented. Also, active engagement of stakeholders is useful to maintain the transparency in their own food safety assessment data and results.

Knowledge transfer and dialogue facilitation

While the full results of the Expert Consultation will be compiled and published in the first half of 2023, basic technical background papers on the topic of terminology[4], generic production process[5] and regulatory frameworks[6] have been published online. To complement the regulatory frameworks paper, three country case studies from Israel, Qatar and Singapore with the aim to capture various good practices will also be included in the document to be published in 2023.

In order to safeguard the health of consumers and to facilitate global discussions on the topic of cell-based food, FAO and WHO will continue to developing the scientific advice for their Members. FAO and WHO remain available for further technical support and engagement in this area.

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[4] FAO. 2022. Food safety aspects of cell-based food – Background document one:Terminologies. Rome. https://doi.org/10.4060/cc2241en

[5] FAO. 2022. Food safety aspects of cell-based food – Background document two: Generic production process. Rome. https://doi.org/10.4060/cc2502en

[6] FAO. 2022. Food safety aspects of cell-based food. Background document three – Regulatory frameworks. Rome. https://doi.org/10.4060/cc2353en

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