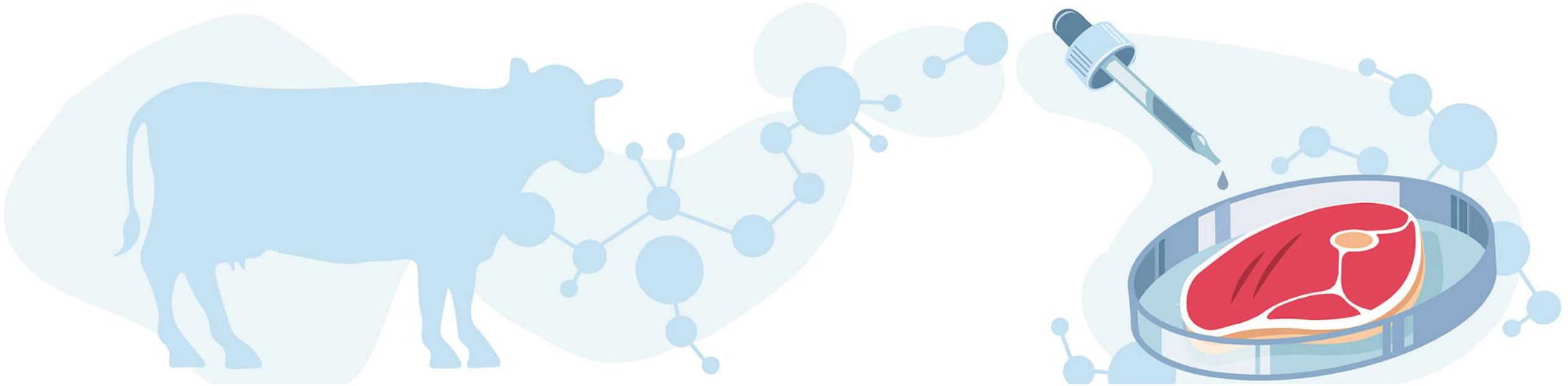
Food and Agriculture Organization of the United Nations

SUSTAINABLE DEVELOPMENT GOALS



Global perspectives on food safety aspects of cell-based food production and precision fermentation

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Food and Agriculture Organization of the United Nations (FAO)

Source: BBC, 2020. https://www.bbc.com/news/business-55155741
Photo credit: © Eat Just

Singapore approved cultured chicken in Dec 2021, now others follow

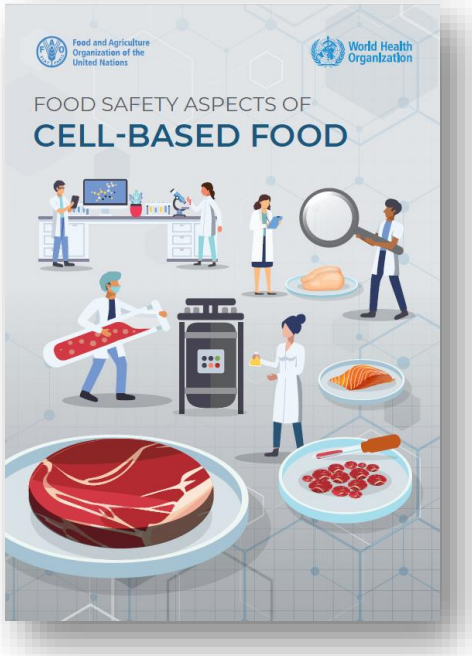
- **Singapore** has set up the approval process, approved one product in December 2021.
- **Israel** is in the process of finalizing the approval process.
- **Qatar** approved production-only facilities.
- **US FDA** has issued “no more questions” advisory on food safety aspects on 2 applications so far.

FAO Technical working group

- Informal group active since Feb 2021
- Regulatory experts from public sector
- 35+ regulatory experts / 13+ countries and jurisdictions, 16+ agencies
- TWG shares the issues they are facing, activities they are conducting
- TWG informs FAO of their wishes for international organization's actions
- Wide variety of topics covered: Cell-based food and precision fermentation included
- WHO will join this group in June 2023

Provision of Scientific Advice (ad hoc scientific advice)

Food safety aspects of cell-based food



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https://bit.ly/40PgOwG

Calls for experts / data

Identifying regulatory collaborators, partners, expert group, authors for the technical papers

Technical document development

Literature syntheses on terminologies, production processes, regulatory frameworks, and country case studies

Stakeholder roundtable

One day global meeting to discuss with cell-based food researchers and developers on the food safety assurance issues as well as relevant communication issues

WHO joined FAO here

Expert consultation

3.5-day physical meeting to focus on food safety hazard identification of cell-based food production

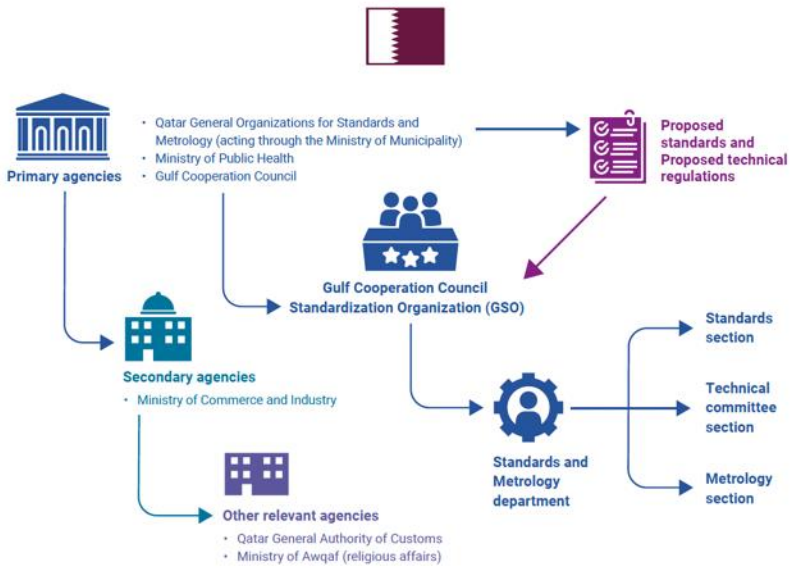
FAO/WHO Global dissemination

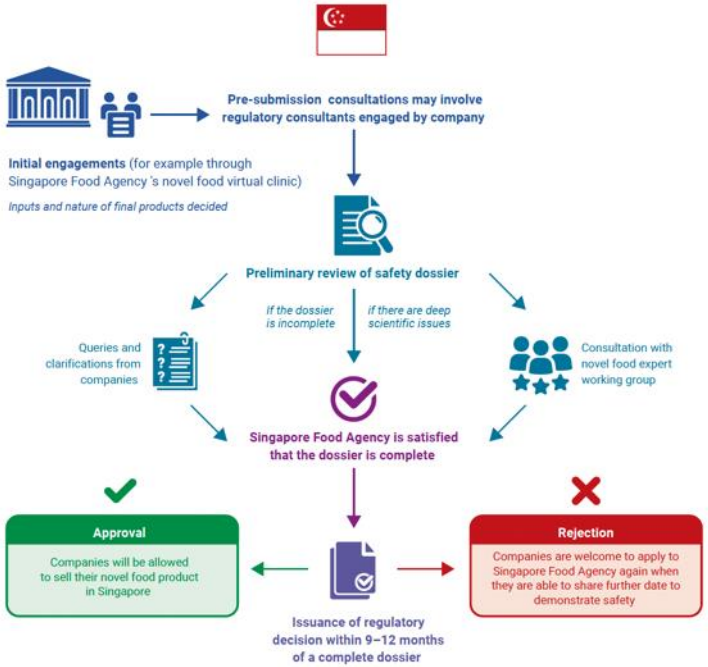
Webinar
Media interviews
Conference contributions

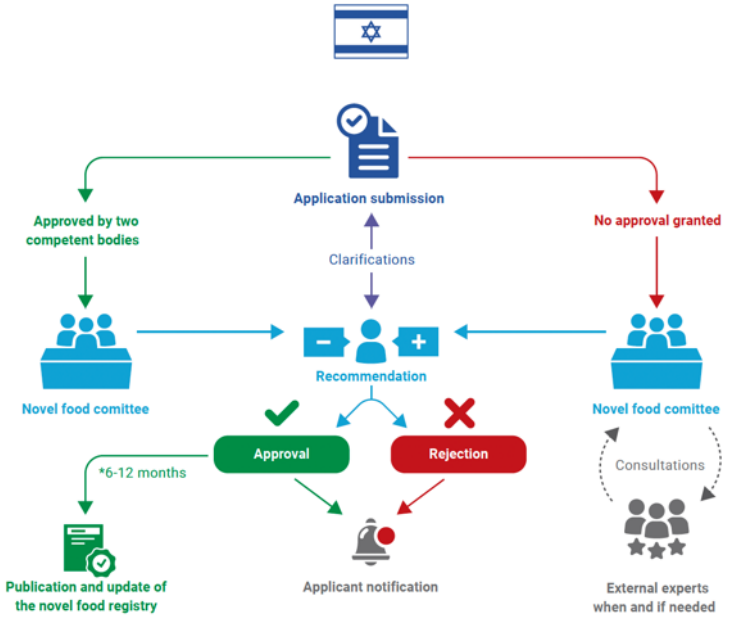
2021 2022 2023

Literature Synthesis

1) **Terminologies**
   - All the relevant terminologies collected
   - Sector-based use analyzed
   - Not to pick “popular terms” but to lay out the facts
2) **Production process**
   - Very high-level overviews
   - Production steps identified for the purpose of food safety hazard identification
3) **Regulatory frameworks**
   - State of the art as of June 2022
   - Not so many countries are “ready”







3 Country case studies

1) Israel
2) Qatar
3) Singapore

Stakeholder round table

Discussion on the latest development

Exchange knowledge on food safety assurance

Various production processes to be presented for the food safety hazard identification process

Brainstorming relevant communication strategies

Mice no words – terminology matters

One global literature synthesis and one nation-wide study on nomenclature were referred.

- No term that is 100% scientifically accurate
- Better to find a single less-confusing (differentiations, allergy issues), relatively over-arching and relatively well-accepted (by consumers) term

Working terminologies for the FAO: cell-based food products/production

While internationally harmonized terminologies are ideal, country contexts and languages need to be considered

Expert consultations

- A formal process of provision of scientific advice
- The first expert consultation meeting: 1-4 Nov 2022 in Singapore
- Organized by FAO in collaboration with WHO
- Focus is **food safety hazard identification**
- A total of 23 experts / resource people from 15 countries qualified and selected to form the Technical Panel

Hazard identification

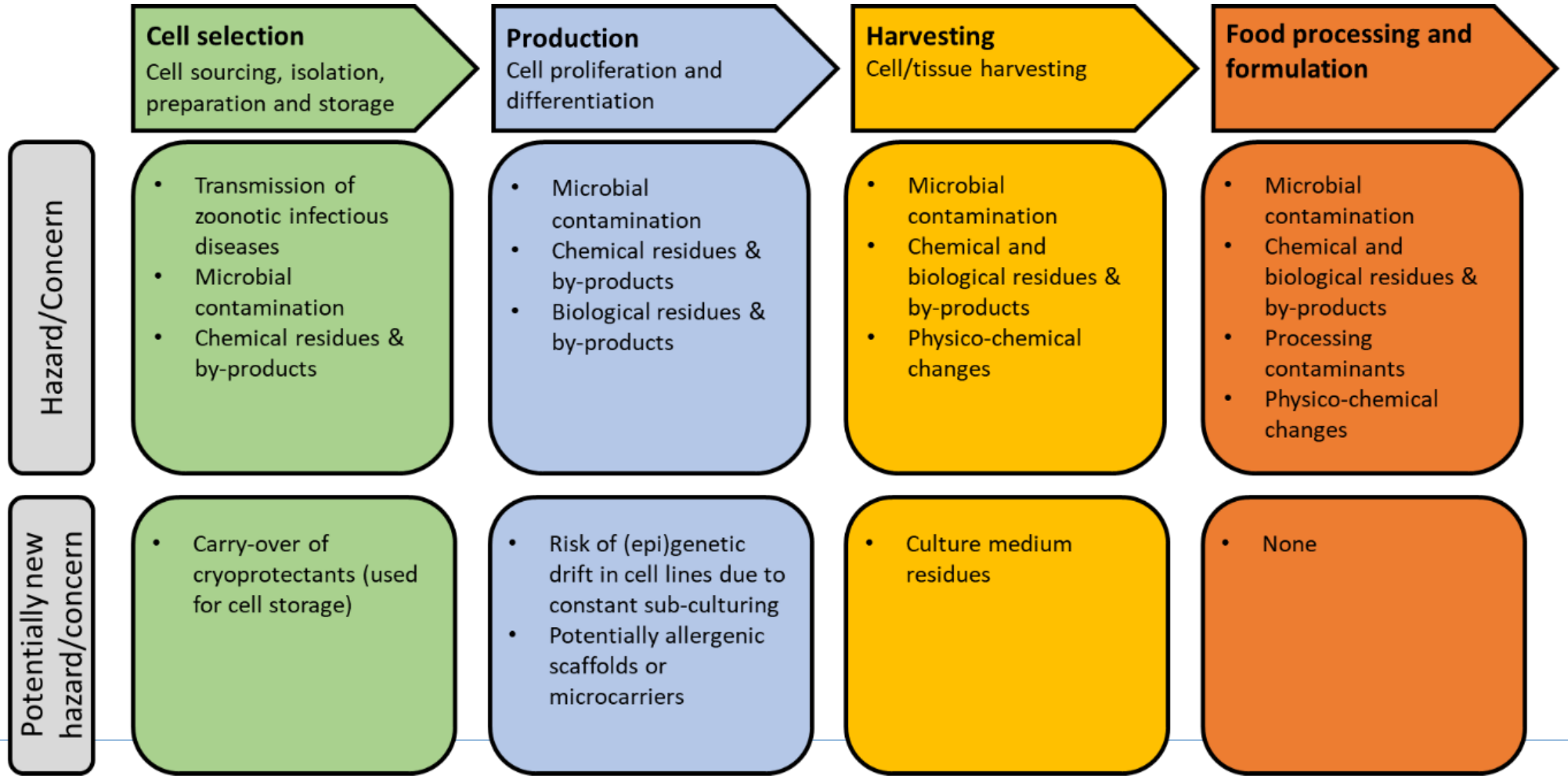
Hazards are not **Risks**

Comprehensive hazard identification is the first step of food safety risk assessment process:

1. **Hazard identification**
2. Hazard characterization
3. Exposure assessment
4. Risk characterization

Extensive list of more than 40 potential hazards have been identified in 4 different production steps

Hazard identification based on 4 production phases



Results of hazard identification

- Many hazards are already well-known and they exist in the conventionally produced food. For example, microbiological contamination can occurs at any stages of any food production processes, including the one of cell-based food
- 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.

Results of hazard identification

- 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.
- While such inputs and materials can be new, existing preventative measures and safety assurance tools are applicable to control such hazards

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.

Effective communication

- 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.
- The milestone publication includes tips and guide for competent authorities on food safety communication of cell-based food products.

Global follow-ups

- Codex Commission (CAC45) and Executive Committee (CCEXEC83) Conference Room Document (CRD) were circulated among Codex Members and Observers.
- Reaching out to the scientific communities for critical data generation for future risk assessment (peer-reviewed manuscript development by FAO and WHO)
- Milestone publication launching event held on 5 April 2023

Precision fermentation

- Back to the basics:
  - Terminology issues
  - Existing (various) definitions
  - Regulatory frameworks
- The objective/result-driven:
  - Consumer health (food safety) vs. mechanical compliance issues
  - Codex objectives – consumer protection and trade facilitation
- Literature synthesis
- Hazard identification

Food and Agriculture Organization of the United Nations

World Health Organization

Download the publication now

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FOOD SAFETY ASPECTS OF CELL-BASED FOOD

Food and Agriculture Organization of the United Nations

SUSTAINABLE DEVELOPMENT GOALS

Thank you