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WEBINAR

Exploring Novel Foods: Opportunities and Challenges for Sustainable Agriculture

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Contents

What are novel foods?

- foods that have no significant history of consumption, or foods produced by a method that has not previously been used

- traditional foods coming from third world countries

European Food Safety Authority

What are novel foods?

- Examples: chia seeds, noni fruit juice, exotic fruits, herbs and nuts, some kinds of tea, leaves, insects and exotic animals

What are novel foods?

- food products (including ingredients) that have been newly created through innovative means
- items produced using advanced technologies and production methods
- traditionally consumed in regions outside of the local area

Algae as novel food

- 29 algae species are already being used as food or food ingredients while six (6) microalgae species are considered as novel food as of 2024

European Algae Biomass Association

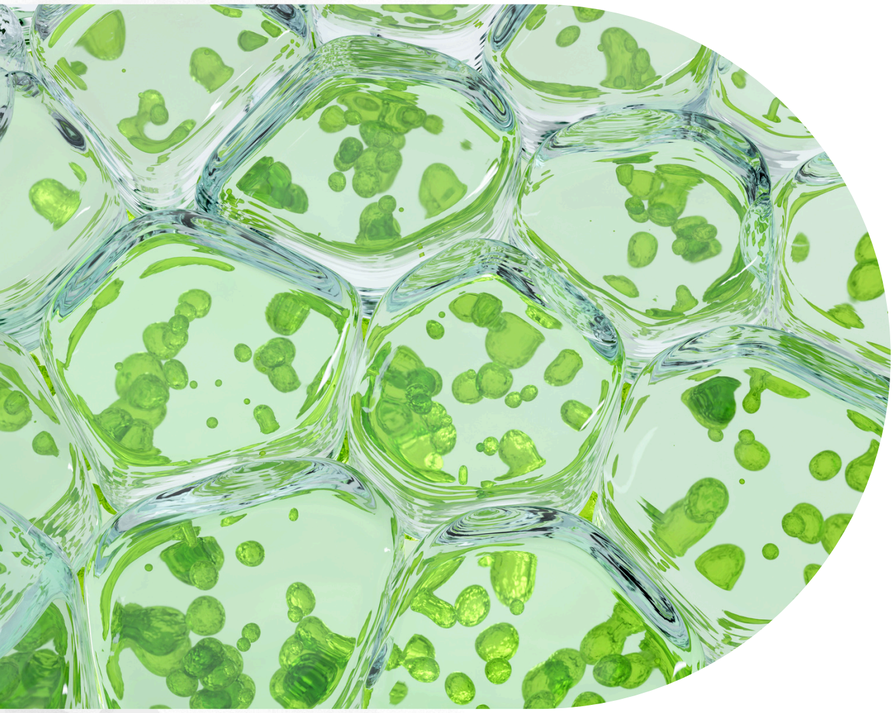
Insects as novel food

- Edible insects are being consumed as alternatives to pork and beef because of high protein content and high levels of vitamin B12, iron, zinc, fiber, essential amino acids, omega-3 and omega-6 fatty acids, and antioxidants

Molecular food production

- **Biotechnology** has been applied for the development of novel foods. **It can produce novel foods and apply relatively novel processes "to produce or improve existing foods".**

- recombinant DNA or genetic modification and microbial fermentation, among others



Molecular food production

- Molecular farming transforms ordinary plants and food into “biofactories or bioreactors that can produce beneficial proteins, pharmaceuticals, or biochemicals.”

Bright Green Partners, 2024

Molecular food production

- Plant-based milk alternatives
- Biomanufacturing of cultivated meat industry to come up with more sustainable meat production
- GM soybean plants with pig protein

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BIOTECH™

Novel foods in development and production

- Microbial enzymes
- Microbial Rennet
- MONASCUS RED® food colorant
- Probiotic guava leaf-based beverages
- Proculant™

biotech.uplb.edu.ph

Novel foods: Impact on agriculture and sustainability

Environment

Economic

Food security

Environmental benefits

- Reduced greenhouse gas emissions compared to traditional livestock farming
- Less strain on arable land and water resources.

Economic potential

- Growth of industries like molecular farming and cultivated meats.
- High investment opportunities (e.g., over $1 billion in alternative proteins in Israel).

Food security contribution

- Novel foods can address global malnutrition and food scarcity by providing affordable and nutritious alternatives.

Barriers to adoption

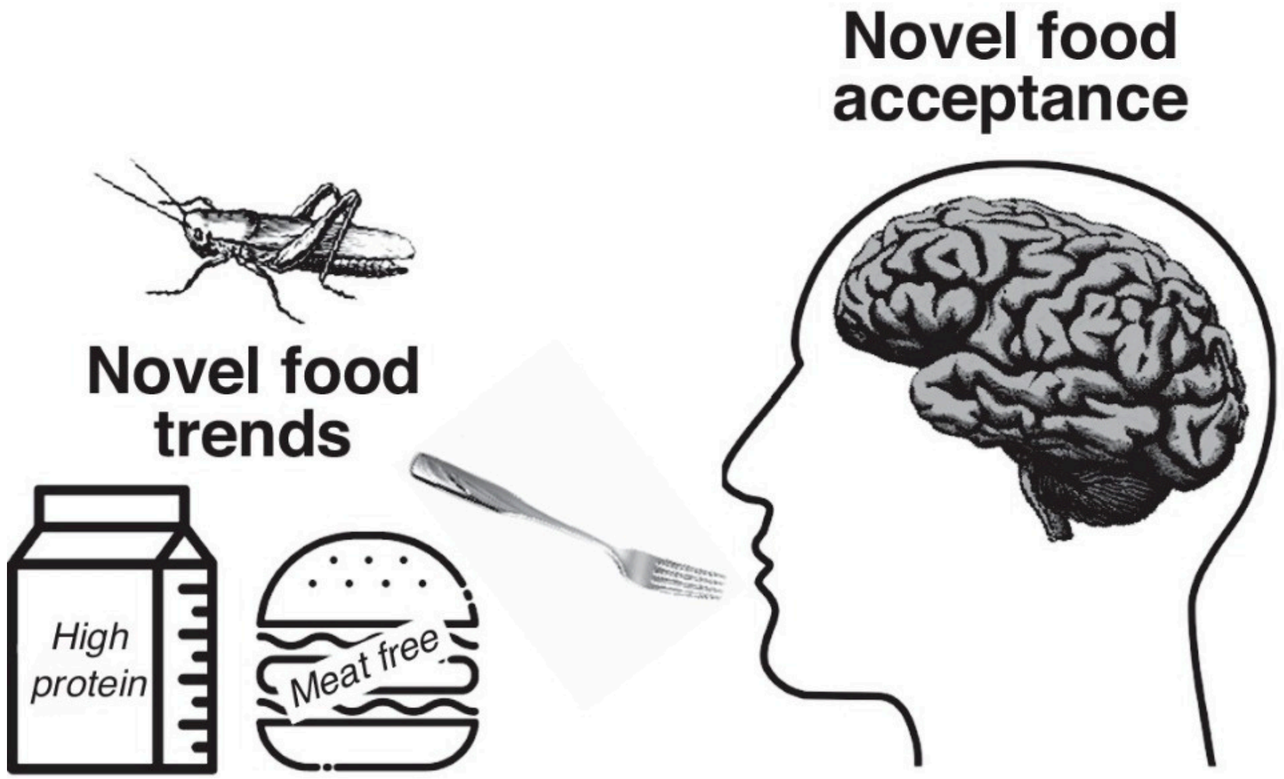

Image modified from graphical abstract of Tuorila and Hartmann (2020)

Barriers to adoption

- Regulatory challenges
  - Complex frameworks vary globally (e.g., US FDA vs. EU guidelines).
  - Biosafety and food safety remain critical concerns.

Barriers to adoption

- Consumer resistance
  - Food neophobia and lack of awareness.
  - Misconceptions about laboratory-produced or genetically modified foods.

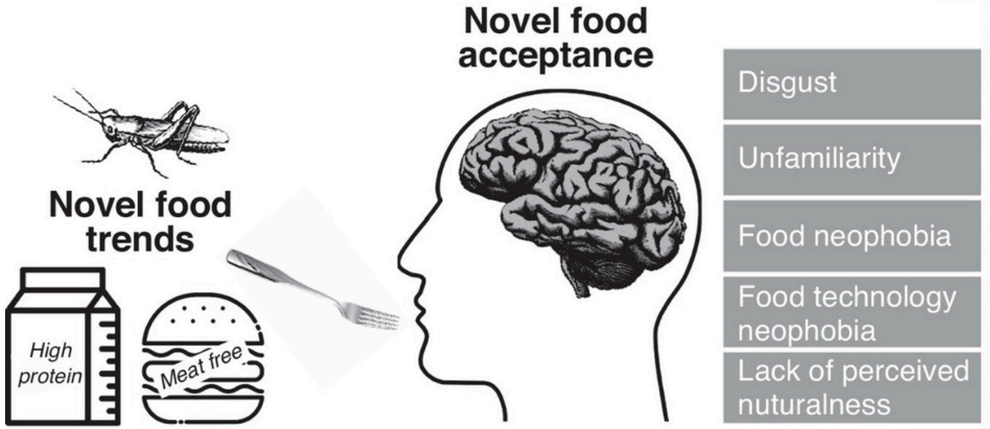

Image from: Tuorila and Hartmann (2020)

Barriers to adoption

- Economic hurdles
  - High production costs for cultivated meats and molecularly farmed products.
  - Limited presence of novel food companies in some regions.

Novel Foods for Sustainable Agriculture

01

Strong regulatory frameworks

Science-based policies for safe and effective adoption of novel foods

02

Public awareness campaigns

Educating consumers and stakeholders about the science and benefits

03

Incentivizing research and innovation

Government and private sector collaboration to support novel food industries

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  - Pexels.com
  - Tuorila H. and C. Hartmann. 2020. Consumer responses to novel and unfamiliar foods. Current Opinion on Food Science. Volume 33, June 2020, Pages 1-8
  - Canva