

Insects Innovation in Gastronomy

MODULE 5



Module 5:

Food science and technology in the use of insect-based ingredients

Disclaimer:

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Unit 1: The Essential Role of Nutrition: Supporting Health, Metabolism, and Disease Prevention

- **Objective:** Illustrate the fundamental role of nutrition in supporting biological functions, preventing diseases, and maintaining overall well-being. Provide an overview of key macronutrients and micronutrients, highlighting their impact on health and metabolic processes.
- **Content:**
 - The role of proteins, carbohydrates, and healthy fats in energy production, tissue repair, and brain function.
 - The importance of vitamins, minerals, and dietary fibers in regulating metabolism, immune response, and gut health.
 - How a balanced diet contributes to disease prevention and overall physiological functionality.
- **Materials:** Short educational video (6 minutes) explaining the relationship between nutrition and disease prevention.

Unit 2: Edible Insects: A Sustainable and Nutritious Solution for Global Food Challenges

- **Objective:** Examine the nutritional benefits and environmental sustainability of edible insects. Provide an overview of their role in modern diets and their potential as an innovative food source for global nutrition challenges.
- **Content:**
 - The nutritional value of edible insects, including high-quality protein, healthy fats, essential vitamins (B12, E), minerals (iron, calcium), and dietary fiber from chitin.
 - The environmental advantages of insect farming, such as lower water and land use, reduced greenhouse gas emissions, and greater efficiency compared to traditional livestock.

- The growing adoption of insect-based products in Western diets, with examples of their applications in protein bars, snacks, and functional foods.
- **Materials:**
 - Short educational video (6 minutes) on the benefits of incorporating insects into modern diets.

Unit 3: How Insect Ingredients Are Made and Their Safety

- **Objective** Examine the production, nutritional value, and sustainability of insect-based ingredients. Provide an overview of their regulatory framework, challenges, and opportunities in the global food industry.
- **Content:**
 - The production process of insect-based ingredients, including farming, processing methods, and safety measures to ensure high-quality products.
 - The nutritional and environmental benefits of insect-derived products, highlighting their protein content, healthy fats, and lower resource consumption compared to traditional proteins.
 - The challenges and opportunities in consumer acceptance, regulatory compliance, and market expansion, including applications in functional foods, nutraceuticals, and alternative protein sources.
- **Materials:**
 - Short educational video (6 minutes) on the production, safety, and market potential of insect-based ingredients.

Unit 4: Ingredients derived from insects

- **Objective:** Analyze the production, functional properties, and applications of insect-based flours. Provide an overview of their technological advantages, market potential, and role in sustainable food solutions.
- **Content:**
 - The production process of insect flours, including scalding, dehydration, milling, and potential fermentation for enhanced functionality.
 - The functional properties of insect flours, such as emulsification, water retention, gelation, foaming ability, and thermal stability, and their impact on food formulations.

- The different types of insect-based products available, including pure insect flours, protein isolates, extruded granules, oils, and chitosan, with applications in food, cosmetics, and environmental sustainability.
- **Materials:**
 - Short educational video (6 minutes) on the production, functionality, and applications of insect-based flours.

Unit 5: applications on the market

- **Objective:** Explore the traditional and modern applications of insect-based ingredients in the food industry. Highlight their role in sustainable food innovation, from historical uses to emerging technologies like 3D food printing.
- **Content:**
 - Traditional applications of insect-derived ingredients, such as shellac and cochineal dye, in the food industry.
 - The evolution of insect-based food products, from high-protein snacks and baked goods to innovative solutions like 3D-printed foods.
 - The challenges and opportunities in scaling up production and standardizing insect-based ingredients for widespread market adoption.
- **Materials:**
 - Short educational video (6 minutes) on the historical and modern applications of insect-based ingredients.



