Bioconversion of Food Waste into Functional Ingredients Training Course

Professional Development Training Course Outline

Category	Food processing and Technology	**Duration**	5 Days
Base Fee	$1,500 USD	**Delivery Mode**	Online / On-site Hybrid

Course Introduction

Food waste is one of the most pressing environmental and economic challenges of the 21st century. With global populations rising and consumption patterns intensifying, the volume of discarded food continues to surge, contributing to resource depletion, greenhouse gas emissions, and lost economic value. Bioconversion of food waste into functional ingredients presents a sustainable solution, transforming discarded biomass into high-value products such as bioactive compounds, enzymes, dietary fibers, and probiotics. This approach not only addresses waste management challenges but also promotes circular economy principles, enhances food security, and fosters innovation in the nutraceutical, pharmaceutical, and food industries.

Bioconversion of Food Waste into Functional Ingredients Training Course equips participants with comprehensive knowledge and practical skills to implement advanced bioconversion technologies. Through a blend of theoretical insights, hands-on case studies, and real-world applications, attendees will explore strategies for valorizing food waste into functional ingredients that improve human health, support sustainable practices, and enhance organizational efficiency. Participants will gain a deep understanding of microbial fermentation, enzymatic processes, bioactive compound extraction, and regulatory frameworks for functional ingredients, making this course essential for professionals aiming to lead sustainability initiatives and innovation in the food and biotech sectors.

Programme Curriculum

Bioconversion of Food Waste into Functional Ingredients Training Course

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Course Objectives

1. Understand the principles of food waste management and sustainable bioconversion.
2. Explore microbial fermentation techniques for functional ingredient production.
3. Identify high-value bioactive compounds from diverse food waste streams.
4. Learn enzymatic hydrolysis methods for nutrient recovery.
5. Develop skills in extracting and purifying functional ingredients.
6. Implement quality control and standardization procedures for functional ingredients.
7. Evaluate the economic feasibility and scalability of bioconversion processes.
8. Analyze regulatory frameworks governing functional ingredients.
9. Apply circular economy principles in food waste valorization.
10. Explore biotechnological innovations in bioactive compound production.
11. Assess environmental impacts of bioconversion processes.
12. Design pilot-scale bioconversion projects for organizational implementation.
13. Integrate sustainable practices to enhance corporate social responsibility.

Organizational Benefits

- Reduction of food waste disposal costs.
- Generation of additional revenue streams from functional ingredients.
- Enhancement of brand image as a sustainability-focused organization.
- Compliance with environmental regulations and sustainability standards.
- Improved employee knowledge and technical capabilities.
- Access to innovative technologies and industry best practices.
- Increased operational efficiency through resource optimization.
- Expansion into nutraceutical and functional food markets.
- Strengthened partnerships with research and development institutions.
- Promotion of circular economy and sustainable business practices.

Target Audiences

- Food industry professionals.
- Biotechnologists and microbiologists.

- Environmental engineers and sustainability officers.
- Nutritionists and dietitians.
- Quality assurance and regulatory personnel.
- Entrepreneurs in functional foods and nutraceuticals.
- Research scholars and students in food technology.
- Policy makers in waste management and food safety.

Course Duration: 5 days

Course Modules

Module 1: Introduction to Food Waste and Sustainability

- Global trends in food waste generation and management.
- Environmental, economic, and social impacts of food waste.
- Circular economy principles in food industry.
- Strategies for food waste reduction and valorization.
- Emerging technologies for sustainable food management.
- Case Study: Successful food waste management models in urban areas.

Module 2: Microbial Fermentation for Functional Ingredients

- Overview of microbial species used in bioconversion.
- Fermentation techniques for bioactive compound production.
- Optimization of fermentation parameters.
- Challenges in large-scale fermentation.
- Applications of fermented food waste in functional ingredients.
- Case Study: Lactic acid bacteria fermentation of fruit peel waste.

Module 3: Enzymatic Hydrolysis and Nutrient Recovery

- Principles of enzymatic hydrolysis.
- Selection of enzymes for different food wastes.
- Process optimization and kinetics.
- Recovery of proteins, fibers, and antioxidants.
- Industrial applications of enzymatically hydrolyzed products.
- Case Study: Enzymatic hydrolysis of potato peel waste for functional fibers.

Module 4: Extraction and Purification Techniques

- Solvent-based and green extraction methods.
- Membrane separation and chromatography.
- Concentration and drying processes.
- Quality control of extracted functional ingredients.
- Scaling up laboratory extraction to industrial production.
- Case Study: Extraction of polyphenols from grape pomace.

Module 5: Quality Control and Regulatory Compliance

- Analytical methods for functional ingredient assessment.
- Regulatory frameworks for nutraceuticals and food additives.
- Food safety considerations in bioconversion.

- Standardization and labeling requirements.
- Documentation and traceability in production.
- Case Study: Regulatory approval process for a functional ingredient.

Module 6: Valorization of Bioactive Compounds

- Identification of antioxidants, prebiotics, and probiotics.
- Functional properties and health benefits.
- Market potential of bioactive compounds.
- Formulation of functional foods and nutraceuticals.
- Stability and shelf-life considerations.
- Case Study: Conversion of citrus peel waste into bioactive powders.

Module 7: Economic and Environmental Impact Assessment

- Cost-benefit analysis of bioconversion processes.
- Life cycle assessment of functional ingredient production.
- Sustainability metrics and reporting.
- Strategies to improve economic feasibility.
- Integration of green technologies.
- Case Study: Comparative assessment of different food waste valorization strategies.

Module 8: Project Design and Implementation

- Designing pilot-scale bioconversion projects.
- Technology selection and process flow design.
- Monitoring and performance evaluation.
- Risk assessment and mitigation strategies.
- Scaling up from pilot to commercial production.
- Case Study: Implementation of a fruit peel bioconversion project in a food processing unit.

Training Methodology

- Interactive lectures with real-world examples.
- Hands-on laboratory exercises and demonstrations.
- Group discussions and problem-solving sessions.
- Case studies analyzing industrial applications.
- Practical exercises for process optimization.
- Q&A sessions and feedback for continuous improvement.

Register as a group from 3 participants for a Discount

Send us an email: info@fineskilltrainingcenter.org or call *+254769199797*

Certification

Upon successful completion of this training, participants will be issued with a globally- recognized certificate.

Tailor-Made Course

We also offer tailor-made courses based on your needs.

Key Notes

a. The participant must be conversant with English.

b. Upon completion of training the participant will be issued with an Authorized Training Certificate

c. Course duration is flexible and the contents can be modified to fit any number of days.

d. The course fee includes facilitation training materials, 2 coffee breaks, buffet lunch and A Certificate upon successful completion of Training.

e. One-year post-training support Consultation and Coaching provided after the course.

f. Payment should be done at least a week before commence of the training, to Fineskill Training Center account, as indicated in the invoice so as to enable us prepare better for you.

Upcoming Scheduled Sessions

Start Date	End Date	Location	Price
23 Nov 2026	27 Nov 2026	Online	$1,000
23 Nov 2026	27 Nov 2026	Physical	$1,500
23 Nov 2026	27 Nov 2026	Physical	$3,000
23 Nov 2026	27 Nov 2026	Physical	$3,000
23 Nov 2026	27 Nov 2026	Physical	$6,000
23 Nov 2026	27 Nov 2026	Physical	$4,500
23 Nov 2026	27 Nov 2026	Physical	$6,000
23 Nov 2026	27 Nov 2026	Physical	$6,000

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