# Biotechnology and Enzyme Applications in Food Processing Training Course

Professional Development Training Course Outline

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|---|---|---|---|
| **Category** | Food processing and Technology | **Duration** | 10 Days |
| **Base Fee** | $3,000 USD | **Delivery Mode** | Online / On-site Hybrid |

## Course Introduction

Biotechnology and enzyme applications in food processing have become essential drivers of innovation, sustainability, and efficiency in the global food industry. With the increasing demand for healthier, functional, and safe food products, biotechnology and enzyme technologies are transforming traditional food production systems into modern, eco-friendly, and cost-effective processes. Biotechnology and Enzyme Applications in Food Processing Training Course focuses on enhancing professional knowledge in biotechnology tools, enzyme engineering, fermentation technology, and advanced bioprocessing solutions that are reshaping food manufacturing worldwide.

Participants will explore industrial biotechnology advancements, novel enzyme formulations, and their integration into food production processes such as baking, brewing, dairy, meat processing, and plant-based product development. Through comprehensive case studies, interactive learning, and real-world applications, this course equips professionals with practical skills to meet industry demands, improve product quality, and align with sustainability goals.

## Programme Curriculum

**Biotechnology and Enzyme Applications in Food Processing Training Course**

**Introduction**

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**Course Objectives**

1. Understand the principles of biotechnology in food systems.
2. Explore the industrial applications of enzymes in food processing.
3. Analyze enzyme engineering and biocatalysis for improved efficiency.
4. Examine fermentation biotechnology in food product development.
5. Learn genetic engineering techniques for food improvement.
6. Evaluate bioprocessing solutions for sustainable production.
7. Apply molecular biotechnology in food safety enhancement.
8. Integrate biotechnological innovations into product formulation.
9. Assess enzyme applications in dairy, baking, brewing, and beverages.
10. Understand bioreactor design and process optimization.
11. Explore bioinformatics in food biotechnology research.
12. Study regulatory frameworks and quality standards in biotechnology.
13. Implement case studies on enzyme-based food processing innovations.

**Organizational Benefits**

- Increased productivity through efficient enzyme technologies
- Reduced processing costs with biotechnology-based optimization
- Enhanced food safety and compliance with global standards
- Improved sustainability and eco-friendly processing methods
- Greater innovation capacity within food product development
- Competitive advantage in global food biotechnology markets
- High-quality product formulation and consumer satisfaction
- Reduced waste generation and energy consumption
- Stronger research and development collaboration opportunities
- Better workforce skills in biotechnology and enzyme applications

**Target Audiences**

- Food technologists
- Biotechnologists
- Quality assurance professionals
- Research and development scientists
- Food production managers
- Regulatory compliance officers
- Academicians and students in food science
- Entrepreneurs in food biotechnology

**Course Duration:** 10 days

**Course Modules**

**Module 1: Fundamentals of Biotechnology in Food Processing**

- Introduction to food biotechnology concepts
- Key biotechnology tools and techniques
- Role of biotechnology in sustainable food systems
- Microbial biotechnology in food applications
- Trends in industrial food biotechnology
- Case study: Biotechnology-driven innovations in global food industries

**Module 2: Enzyme Technology and Applications in Food Processing**

- Enzyme classifications and mechanisms
- Industrial enzyme production techniques
- Enzyme modification and engineering
- Role of enzymes in texture and flavor improvement
- Application of enzymes in various food sectors
- Case study: Enzymes in improving bakery product quality

**Module 3: Fermentation Biotechnology in Food Production**

- Principles of fermentation technology
- Microorganisms in food fermentation
- Industrial fermentation processes in food
- Traditional and modern fermented foods
- Fermentation optimization strategies
- Case study: Fermentation biotechnology in dairy industries

**Module 4: Genetic Engineering in Food Biotechnology**

- Basics of genetic engineering techniques
- Recombinant DNA technology in food applications
- Genetically modified organisms in food processing
- Advances in gene editing technologies
- Ethical and regulatory considerations
- Case study: CRISPR applications in food biotechnology

**Module 5: Biocatalysis and Enzyme Engineering**

- Biocatalysis principles in food industry
- Protein engineering for improved enzymes
- Directed evolution of enzymes
- Biocatalysis in green chemistry applications
- Commercial applications of engineered enzymes
- Case study: Enzyme engineering in brewing industry

**Module 6: Food Safety and Biotechnology**

- Biotechnology approaches to enhance food safety

- Biosensors and detection systems
- Antimicrobial peptides and biotechnology solutions
- Molecular methods in food safety monitoring
- Biotechnology in pathogen control
- Case study: Biotechnology for foodborne pathogen detection

**Module 7: Bioprocessing Solutions in Food Manufacturing**

- Bioreactor design and operation
- Scale-up of bioprocesses
- Downstream processing technologies
- Process optimization in enzyme production
- Applications in food product development
- Case study: Bioprocess optimization in enzyme-based food systems

**Module 8: Dairy Biotechnology and Enzyme Applications**

- Role of enzymes in milk processing
- Lactose hydrolysis and lactose-free products
- Cheese production using biotechnology
- Probiotic applications in dairy biotechnology
- Value-added dairy products from biotechnology
- Case study: Enzyme use in dairy fermentation

**Module 9: Enzyme Applications in Baking Industry**

- Amylases in bread production
- Proteases in dough conditioning
- Lipases in bakery fats improvement
- Enzyme cocktails for baking innovations
- Enzymes in gluten-free product development
- Case study: Enzyme solutions in large-scale baking industries

**Module 10: Brewing and Beverage Biotechnology**

- Enzymes in beer brewing
- Yeast biotechnology for brewing
- Biotechnology in wine and spirits
- Enzymes in juice clarification
- Innovations in non-alcoholic beverage production
- Case study: Enzyme use in craft brewing

**Module 11: Meat Processing Biotechnology**

- Enzymes in tenderization of meat
- Biotechnology for meat preservation
- Flavor enhancement using biotechnology
- Biotechnology in meat substitutes
- Enzymes in reducing meat waste
- Case study: Biotechnology in plant-based meat production

**Module 12: Plant-based and Functional Foods Biotechnology**

- Role of biotechnology in plant-based foods
- Enzymes in plant protein modification
- Biotechnology for functional food development
- Nutraceuticals and bioactive compounds
- Probiotics and prebiotics innovations
- Case study: Enzyme-modified proteins in plant-based products

**Module 13: Bioinformatics in Food Biotechnology**

- Bioinformatics tools and applications
- Genome analysis in food biotechnology
- Enzyme structure-function relationship studies
- Databases for enzyme research
- Computational enzyme design
- Case study: Bioinformatics for enzyme discovery in food industry

**Module 14: Regulations and Quality Standards in Food Biotechnology**

- International food biotechnology regulations
- Safety assessment protocols
- Intellectual property rights in biotechnology
- Labeling requirements and consumer rights
- Standards for enzyme applications in foods
- Case study: Global regulatory compliance in enzyme-based foods

**Module 15: Emerging Trends and Future Prospects in Food Biotechnology**

- Artificial intelligence in biotechnology research
- Synthetic biology in food production
- Nanobiotechnology in food industry
- Personalized nutrition and biotechnology
- Global biotechnology market outlook
- Case study: Future trends in enzyme applications for food security

**Training Methodology**

- Interactive lectures with expert trainers
- Group discussions and collaborative learning
- Hands-on practical demonstrations
- Real-world case study analysis
- Multimedia presentations and e-learning resources
- Assessments and feedback sessions

**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** | 04 Dec 2026 | Online | $2,000 |
| **23 Nov 2026** | 04 Dec 2026 | Physical | $3,000 |
| **23 Nov 2026** | 04 Dec 2026 | Physical | $6,000 |
| **23 Nov 2026** | 04 Dec 2026 | Physical | $6,000 |
| **23 Nov 2026** | 04 Dec 2026 | Physical | $12,000 |
| **23 Nov 2026** | 04 Dec 2026 | Physical | $9,000 |
| **23 Nov 2026** | 04 Dec 2026 | Physical | $12,000 |
| **23 Nov 2026** | 04 Dec 2026 | Physical | $12,000 |

Ready to enroll or request a customized program? Book online or contact us:

**Register Online Now**

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