# Advanced Grains and Pulses 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

Advanced Grains and Pulses Processing Training Course provides comprehensive technical insights into modern methods, technologies, and innovations in the processing of grains and pulses. This course focuses on improving nutritional quality, product functionality, safety, and efficiency throughout the value chain from raw material handling to finished product development. Participants will explore advanced techniques such as milling, extrusion, dehulling, soaking, fermentation, and protein extraction to enhance the commercial and nutritional value of grains and pulses.

The course integrates scientific, engineering, and industrial perspectives to equip professionals with the skills required to optimize processes, reduce losses, and develop high-quality grain and pulse-based products. Through a mix of theoretical sessions, hands-on case studies, and real-world examples, learners will develop expertise in sustainable processing practices, quality control, and value addition in global grain and legume industries.

## Programme Curriculum

**Advanced Grains and Pulses Processing Training Course**

**Introduction**

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**Course Objectives**

1. Understand the composition and characteristics of grains and pulses.
2. Analyze advanced processing technologies and equipment.
3. Evaluate the impact of processing on nutritional and functional properties.
4. Explore cleaning, sorting, and dehulling techniques.
5. Study wet and dry milling systems for various grains.
6. Examine extrusion, puffing, and roasting applications.
7. Learn about protein extraction and isolation methods.
8. Understand fermentation and bio-conversion of pulses.
9. Apply process optimization and automation in production lines.
10. Develop value-added grain and pulse-based products.
11. Implement food safety and quality management systems.
12. Integrate sustainability and waste reduction in processing plants.
13. Analyze case studies of successful grain and pulse processing enterprises.

**Organizational Benefits**

1. Improved processing efficiency and product yield.
2. Enhanced compliance with food safety and quality standards.
3. Increased production of high-value and fortified food products.
4. Strengthened innovation in plant-based and protein-rich foods.
5. Reduced operational costs through process optimization.
6. Adoption of sustainable and energy-efficient technologies.
7. Empowered workforce with modern technical expertise.
8. Strengthened R&D and product diversification capacity.
9. Expanded access to export and functional food markets.
10. Enhanced brand reputation for quality and innovation.

**Target Audiences**

1. Food technologists and processing engineers
2. Grain and pulse mill operators
3. Research and development scientists
4. Quality assurance and production managers
5. Nutritionists and product formulators
6. Entrepreneurs in plant-based food industries
7. Agricultural extension officers and cooperatives
8. Exporters and business development professionals

**Course Duration:** 10 days

**Course Modules**

**Module 1: Overview of Grains and Pulses**

- Classification and global importance of grains and pulses
- Structural composition and functional properties
- Nutritional significance and health implications
- Post-harvest handling and storage considerations
- Emerging markets for plant-based protein foods
- Case Study: Global Trends in Pulse Utilization

**Module 2: Raw Material Preparation and Cleaning**

- Pre-processing and conditioning of grains and pulses
- Cleaning and grading equipment technologies
- Removal of impurities and defective grains
- Moisture adjustment for processing stability
- Quality control in raw material selection
- Case Study: Cleaning Systems in Lentil Processing Plants

**Module 3: Dehulling, Splitting, and Polishing**

- Principles of mechanical and abrasive dehulling
- Equipment selection and operation parameters
- Effect of dehulling on nutritional quality
- Polishing techniques for visual appeal
- Loss reduction during dehulling operations
- Case Study: Optimization of Chickpea Dehulling Efficiency

**Module 4: Milling Technologies for Grains and Pulses**

- Dry and wet milling processes
- Roller milling versus stone milling techniques
- Pulse flour production and particle size distribution
- Process control for quality and yield improvement
- Modern automation in milling operations
- Case Study: Advanced Milling Systems in Wheat Flour Processing

**Module 5: Extrusion Processing and Value Addition**

- Principles of extrusion cooking and texturization
- Application in snack, pasta, and meat analog production
- Process parameters affecting expansion and texture
- Nutrient retention during high-temperature processing
- Extruder configuration and throughput efficiency
- Case Study: High-Protein Extruded Pulse Snacks Development

**Module 6: Roasting, Toasting, and Puffing**

- Heat treatment methods and their effects on grains
- Control of Maillard reaction and color development
- Optimization of roasting temperature and time
- Nutrient and flavor enhancement in puffed products
- Equipment and energy considerations
- Case Study: Roasted Bean Snacks Market Innovation

**Module 7: Fermentation and Bioconversion Processes**

- Traditional and modern fermentation methods
- Microbial strains and starter culture applications
- Biochemical changes during fermentation
- Improvement of digestibility and flavor
- Fermented grain and pulse products for global markets
- Case Study: Fermented Soybean Products in East Asia

**Module 8: Protein Extraction and Isolation**

- Wet fractionation and dry separation techniques
- Recovery of plant-based proteins from pulses
- Functional properties of isolated proteins
- Application in alternative proteins and dairy analogs
- Challenges in purity and solubility control
- Case Study: Pea Protein Extraction for Plant-Based Beverages

**Module 9: Starch and Fiber Recovery**

- Starch isolation methods from grains and legumes
- Fiber enrichment and utilization techniques
- Functional modifications and value-added applications
- Integration into bakery and snack formulations
- Sustainability in by-product valorization
- Case Study: Starch Extraction from Mung Beans

**Module 10: Nutritional Enhancement and Fortification**

- Fortification with vitamins and minerals
- Processing impact on amino acid profiles
- Bioavailability and anti-nutritional factor reduction
- Incorporation of prebiotics and functional compounds
- Nutritional labeling and health claims
- Case Study: Fortified Lentil Flour for School Feeding Programs

**Module 11: Quality Assurance and Food Safety Systems**

- Implementation of HACCP and GMP in processing plants
- Microbiological and chemical safety assessment
- Control of allergens and contaminants
- Validation of critical control points
- Traceability and documentation systems
- Case Study: HACCP in Industrial Pulse Milling Facilities

**Module 12: Packaging and Storage Technologies**

- Packaging materials for moisture and oxygen control
- Modified atmosphere packaging for extended shelf life
- Storage management and pest prevention
- Maintaining nutritional and sensory stability
- Logistics for grain and pulse supply chains

- Case Study: Sustainable Packaging in Grain Export Chains

**Module 13: Process Optimization and Automation**

- Process modeling and control strategies
- Data-driven decision-making in milling and extrusion
- Automation of quality monitoring systems
- Integration of sensors and digital traceability tools
- Productivity and energy optimization
- Case Study: Automated Lentil Processing Plant Efficiency

**Module 14: Sustainability and Environmental Management**

- Waste minimization and by-product utilization
- Water and energy conservation practices
- Circular economy in grain and pulse processing
- Renewable energy integration
- Environmental compliance and certifications
- Case Study: Sustainable Pulse Milling Operations in Canada

**Module 15: Product Development and Market Innovation**

- Emerging trends in grain and pulse-based foods
- Consumer behavior and functional food trends
- Innovation in gluten-free and high-protein products
- Branding and export opportunities
- Commercialization and scaling of innovations
- Case Study: Development of Gluten-Free Pulse Pasta

**Training Methodology**

1. Expert-led theoretical sessions and technical demonstrations
2. Interactive group discussions and knowledge-sharing
3. Hands-on laboratory and pilot-scale experiments
4. Case study analysis of successful processing enterprises
5. Assessments through project-based innovation tasks

**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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