Supercritical Fluid Extraction (SFE) in Food 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

Supercritical Fluid Extraction (SFE) is a cutting-edge technology that has transformed modern food processing and functional ingredient development. By utilizing supercritical fluids such as carbon dioxide, this method allows the efficient extraction of bioactive compounds, essential oils, antioxidants, flavors, and nutritional components with superior purity. SFE is gaining traction in the global food industry due to its environmentally friendly nature, reduced solvent use, and ability to preserve sensitive compounds. Supercritical Fluid Extraction (SFE) in Food Training Course provides a comprehensive foundation in SFE applications, covering scientific principles, equipment operation, process optimization, sustainability strategies, and regulatory compliance.

The course is designed for professionals, researchers, and food technologists aiming to stay ahead of innovations in green extraction technologies. It integrates theory, case studies, and practical insights to provide actionable knowledge for food product development and industrial scaling. Through this program, participants will learn to optimize extraction processes, evaluate critical parameters, apply sustainable practices, and explore real-world case studies in nutraceuticals, functional foods, and clean-label product formulations.

Programme Curriculum

Supercritical Fluid Extraction (SFE) in Food Training Course

Introduction

Supercritical Fluid Extraction (SFE) is a cutting-edge technology that has transformed modern food processing and functional ingredient development. By utilizing supercritical fluids such as carbon dioxide, this method allows the efficient extraction of bioactive compounds, essential oils, antioxidants, flavors, and nutritional

components with superior purity. SFE is gaining traction in the global food industry due to its environmentally friendly nature, reduced solvent use, and ability to preserve sensitive compounds. Supercritical Fluid Extraction (SFE) in Food Training Course provides a comprehensive foundation in SFE applications, covering scientific principles, equipment operation, process optimization, sustainability strategies, and regulatory compliance.

The course is designed for professionals, researchers, and food technologists aiming to stay ahead of innovations in green extraction technologies. It integrates theory, case studies, and practical insights to provide actionable knowledge for food product development and industrial scaling. Through this program, participants will learn to optimize extraction processes, evaluate critical parameters, apply sustainable practices, and explore real-world case studies in nutraceuticals, functional foods, and clean-label product formulations.

Course Objectives

1. Understand the scientific principles of supercritical fluids and extraction mechanisms.
2. Explore the role of SFE in green and sustainable food processing.
3. Learn about equipment design, operation, and process control.
4. Analyze extraction efficiency through pressure, temperature, and solvent variables.
5. Apply SFE for natural flavors, fragrances, and bioactive compounds.
6. Evaluate cost-effectiveness and energy efficiency in SFE operations.
7. Assess regulatory standards and food safety compliance for SFE products.
8. Study applications in functional foods, nutraceuticals, and dietary supplements.
9. Integrate sustainability strategies in food product innovation.
10. Examine advanced purification and separation techniques in SFE.
11. Gain expertise in scale-up from laboratory to industrial operations.
12. Review successful industrial case studies of SFE in food and beverages.
13. Develop skills to design and optimize SFE-based product development.

Organizational Benefits

- Improved sustainability through green processing technologies.
- Reduced operational costs with efficient solvent-free methods.
- Enhanced innovation capacity in product development.
- Strong compliance with food safety and international standards.
- Competitive advantage in functional and nutraceutical markets.
- Increased product purity and bioactivity preservation.
- Alignment with global clean-label consumer demand.
- Practical knowledge application for industrial scaling.
- Strengthened employee skills in emerging technologies.
- Greater adaptability to future food processing innovations.

Target Audiences

1. Food scientists and technologists
2. Quality assurance managers
3. Research and development specialists
4. Process engineers in food industries
5. Nutraceutical and functional food developers
6. Regulatory and compliance officers
7. Academic researchers and graduate students
8. Sustainability and innovation managers

Course Duration: 5 days

Course Modules

Module 1: Fundamentals of Supercritical Fluid Extraction

- Understanding supercritical fluid behavior
- Properties of carbon dioxide and co-solvents
- Thermodynamics of SFE processes
- Role of pressure and temperature in extraction efficiency
- Limitations and challenges of traditional extraction methods
- Case study: Basic SFE applications in coffee decaffeination

Module 2: Equipment and Technology Design

- Key components of SFE equipment
- Process control and monitoring tools
- Safety considerations in equipment design
- Scale-up challenges in technology development
- Maintenance and operational troubleshooting
- Case study: Industrial-scale SFE equipment in food applications

Module 3: Process Parameters and Optimization

- Critical control points in SFE systems
- Extraction yield optimization strategies
- Role of modifiers and co-extractants
- Analytical tools for monitoring efficiency
- Process integration in food manufacturing
- Case study: Optimization of antioxidant extraction from spices

Module 4: Applications in Natural Flavors and Fragrances

- Extraction of essential oils and volatile compounds
- Role of SFE in flavor preservation
- Comparison with steam distillation methods
- Industrial applications in food and beverages
- Clean-label product development using SFE
- Case study: Natural flavor extraction for beverages

Module 5: Nutraceuticals and Functional Ingredients

- Extraction of bioactive compounds for health products
- Nutritional benefits of SFE-based extracts
- Application in dietary supplements and functional foods
- Market trends in nutraceutical applications
- Role of SFE in enhancing bioavailability
- Case study: Omega-3 extraction from marine sources

Module 6: Regulatory and Safety Compliance

- Global regulatory frameworks for SFE food products

- Compliance with food safety standards
- Environmental and occupational safety considerations
- Quality assurance in extraction processes
- Labeling requirements for clean-label extracts
- Case study: Regulatory approval of SFE-based food additives

Module 7: Sustainability and Green Processing

- Environmental benefits of SFE in food industry
- Carbon footprint reduction strategies
- Solvent recovery and waste minimization
- Integration into circular economy models
- Consumer demand for sustainable food products
- Case study: SFE in sustainable tea extract production

Module 8: Industrial Applications and Case Studies

- Real-world use cases in food and beverages
- Economic evaluation of SFE operations
- Strategies for industrial scaling and adaptation
- Market trends and future outlook
- Success stories in global food industries
- Case study: SFE applications in the chocolate and cocoa sector

Training Methodology

- Interactive lectures and expert presentations
- Hands-on demonstrations of SFE equipment and systems
- Group discussions and collaborative problem-solving
- Real-life industrial case studies and best practices
- Practical assignments and assessment exercises

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

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

Register Online Now

Email: info@fineskilltrainingcenter.com | Website: www.fineskilltrainingcenter.com