

Syllabus For Milk Fat (Butter and Ghee) Producer

Course Name	Milk Fat (Butter and Ghee) Producer
Sector	Food Processing
Course Code	FPT/2024/MFBG/432
Level	3
Occupation	Milk Fat (Butter and Ghee) Producer
Job Description	A Milk Fat (Butter and Ghee) Producer is responsible for receiving raw milk, performing quality checks, and separating cream for fat processing. They operate machinery to churn butter and produce ghee, carefully controlling temperature and process timing. The operator ensures product quality through sensory evaluations and tests, maintaining standards for texture, flavor and fat content.
Course Duration	Total Duration 390 Hrs (T-90, P-180, OJT-60 and ES-60)
Trainees' Entry Qualification	Grade 10 OR 8th grade pass with 2 yrs relevant experience OR Previous relevant Qualification of NSQF Level 2.5 with 1.5 years experience
Trainers Qualification	Diploma in Food Processing Technology/ Dairy Technology with 3 years experience in relevant field OR B.Sc./B.Tech/B.E. in Food Processing Technology/ Dairy Technology with 2 years experience in relevant field

Structure of Course:

Module No.	Module name	Outcome	Compulsory/ Optional	Theory (Hrs)	Practical (Hrs)	OJT (Hrs.)	Total (Hrs) [Multiple of 30]
1.	Introduction to Milk	Assess the quality and safety of dairy products, including milk and its derivatives	Compulsory	20	40		60
2	Separation and collection of milk fat and production of sterilized cream, sour cream	Separate and collect the milk fat and produce sterilized cream and sour cream	Compulsory	20	40		60
3.	Butter Production Process	Demonstrate the production processes of	Compulsory	20	40		60

Module No.	Module name	Outcome	Compulsory/ Optional	Theory (Hrs)	Practical (Hrs)	OJT (Hrs.)	Total (Hrs) [Multiple of 30]
		butter, butter oil, and butter milk					
4.	Ghee Production Process	Exhibit the production processes of ghee and grading and packaging of ghee products	Compulsory	20	40		60
5.	Food Safety, Hygiene and Sanitation for milk fat processing	Implement Food safety hygiene and sanitation practices at milk fat processing workplace	Compulsory	10	20		30
6.	OJT	Work in real job situation with special emphasis on basic safety and hazards in this domain (OJT).	Compulsory	--	--	60	60
7.	Employability Skill	As per guided curriculum	Compulsory	60	--	--	60
TOTAL				150	180	60	390

SYLLABUS:**Module 1 : Introduction to Milk**

Learning Outcome: Assess the quality and safety of dairy products, including milk and its derivatives

Duration: 20:00		Duration: 40:00	
Theory – Key Learning Outcomes		Practical – Key Learning Outcomes	
1.1	Elucidate the PFA and FSSAI definitions of milk, detail the composition and nutritive value of milk, and explain the energy value of milk.	1.1	Display the process of receiving milk and assessing its quality.
1.2	Outline the composition of milk across various species, portray the composition of Milk Fat, elucidate the fatty acid profile of milk fat, and analyze factors influencing milk composition.	1.2	Evaluate milk and milk product quality through various analytical techniques, encompassing Milk Fat, Moisture, Solids Not Fat, Milk Protein, Lactose, Added Sucrose, Titrable Acidity, Total Ash, Acid Insoluble Ash, Alkaline Phosphatase, Creaming Index, and Butyro Refractometer
1.3	Characterize the Physical Properties of Milk,		

<p>encompassing density, boiling and freezing points, refractive index, acidity and pH, viscosity, and surface tension.</p> <p>1.4 Explain the Chemical properties of milk, delve into the chemical properties of milk lipids, investigate fat destabilization, examine functional properties of milk lipids and proteins, classify milk protein types, analyze casein micellar structure and aggregation, explore milk enzymes and coagulation, evaluate lactose, and detail vitamins and minerals present in milk.</p> <p>1.5 Assess the quality of raw material by evaluating its physical parameters.</p> <p>1.6 Examine the processes of procurement, handling, transportation, and reception of freshly produced milk.</p> <p>1.7 Identify common detergents and sanitizers employed for cleaning work areas and machinery.</p> <p>1.8 Articulate the methods employed for cleaning and sanitization.</p> <p>1.9 Enumerate the necessary tasks to be completed before commencing production.</p> <p>1.10 Enumerate the materials and equipment utilized in the cleaning and maintenance of a dairy plant.</p>	<p>reading.</p> <p>1.3 Analyze the microbiological quality of milk by conducting MBRT tests, identifying microorganisms in milk and milk products, and recognizing inhibitors present in milk.</p> <p>1.4 Detect the presence of E. coli in milk samples.</p> <p>1.5 Execute the cleaning and sanitization of processing equipment.</p> <p>1.6 Conduct a thorough inspection to ensure all machinery is clean and in optimal working condition.</p>
Classroom Aids:	
Computer, Projection Equipment, PowerPoint Presentation and software, Facilitator's Guide, Participant's Handbook	
Tools, Equipment and Other Requirements	
Protective Gloves, Head Caps, Aprons, Safety Goggles, Safety Boots, Mouth Masks, Sanitizer, Food Safety Manual., gerber centrifuge, Lactometer, Butyrometer, Milk Analyser, Hot air oven, Muffle Furnes, Butyro refractometer, Milk protein analyser, milk adulteration kit.	

Module 2: Separation and collection of milk fat and production of sterilized cream, sour cream

Outcome: Separate and collect the milk fat and produce sterilized cream and sour cream

Duration: 20:00	Duration: 40:00
Theory – Key Learning Outcomes	Practical – Key Learning Outcomes
<p>2.1 Explain the processes of filtration/clarification, sterilization, and pasteurization of cream, sour cream</p> <p>2.2 Outline the working principles and functions of liquid milk processing machinery, including Filters and Clarifiers,</p> <p>2.3 Elaborate on the working principles and functions of cream separation, Purpose of cream separation,</p>	<p>2.1 Perform a check if all the machineries are clean and in good working conditions</p> <p>2.2 Demonstrate the receiving of milk and checking its quality</p> <p>2.3 Demonstrate the process of clarification of milk</p> <p>2.4 Demonstrate use of separator for separation of</p>

<p>Cream separation by gravity method (Shallow Pan Method, Deep Pan Method, Water Dilution Method, Scalding Method, Jersey Creamery Method) , Cream separation by centrifugal method, Characteristics difference of gravity and centrifugal methods, Factors Influencing the Fat Percentage of Cream, standardization of cream, methods of Standardization.</p> <p>2.4 Discuss the methods of pasteurization of cream, Methods of Cooling Pasteurized Cream, Flow diagram for production of sterilized cream, Flow diagram for production of sour cream.</p> <p>2.5 Classify cream (Table Cream, Light Cream, Coffee Cream, Heavy Cream, Plastic Cream, Whipped Cream, Sour Cream, Clotted cream, Reconstituted Cream, Recombined cream, Fermented cream, Acidified cream, Whey Cream, Synthetic Cream).</p> <p>2.6 Examine the composition of milk cream, Food Safety and Standards Regulations (FSSR) of cream, Physico-Chemical Properties (Viscosity, Whipping quality, Titratable acidity, Specific gravity).</p> <p>2.7 Ensure Quality of cream, factors effecting the production of good quality cream, microbiological quality of cream, Defects in Cream, their Causes and Prevention.</p>	<p>cream from milk</p> <p>2.5 Display use of cream separator for getting desire fat content</p> <p>2.6 Demonstrate the process of Cooling Pasteurized Cream.</p> <p>2.7 Identify composition of milk cream and maintain Food Safety and Standards Regulations (FSSR) of cream.</p> <p>2.8 Determine Physico-Chemical Properties (Viscosity, Whipping quality, Titratable acidity, Specific gravity).</p> <p>2.9 Inspect quality of cream, factors effecting the production of good quality cream, microbiological quality of cream</p> <p>2.10 Identify defects in Cream, their Causes and Prevention.</p>
---	--

Classroom Aids:

Computer, Projection Equipment, PowerPoint Presentation and software, Facilitator's Guide, Participant's Handbook

Tools, Equipment and Other Requirements

Protective Gloves, Head Caps, Aprons, Safety Goggles, Safety Boots, Mouth Masks, Sanitizer, Food Safety Manual., Filters, Clarifiers, cream separator, cream Pasteurizer equipment, cream Chillers.

Module 3: Butter Production Process

Outcome: Demonstrate the production processes of butter, butter oil, and butter milk

Duration: 30:00	Duration: 30:00
Theory – Key Learning Outcomes	Practical – Key Learning Outcomes
<p>3.1 Explain FSSAI standards for butter, permitted food additives in butter as per FSSAI.</p> <p>3.2 Outline composition of Butter, Fatty acid composition of butter.</p> <p>3.3 Classify Butter based on acidity of cream used for butter making, based on salt content, based on the production practice (as followed by FSSAI).</p>	<p>3.1 Skilfully generate sterilized cream and sour cream for butter preparation</p> <p>3.2 Present the steps involved in butter production</p> <p>3.3 Demonstrate cream churning process and extrusion process during butter production</p> <p>3.4 Highlight the salting technique for butter production.</p> <p>3.5 Depict the process of creating butter oil.</p> <p>3.6 Demonstrate the production method flavoured</p>

<p>3.4 Illustrate process outlines of butter making, flow diagram of cream preparation for butter production, flow diagram of butter production</p> <p>3.5 Examine the impact of cream ripening on butter, particularly regarding flavor and aroma.</p> <p>3.6 Discuss factors influencing Diacetyl and Acetoin content in butter.</p> <p>3.7 Explore the influence of cream ripening on butter's keeping quality, focusing on cooling, aging, and milk fat crystallization.</p> <p>3.8 Explain the cream churning process, including churning theories (Phase Reversal, Foam, King's).</p> <p>3.9 State the factors affecting cream churnability (Butter fat composition, Cream richness, Viscosity, Fat globule size, Temperature, Cream volume, Agitation nature).</p> <p>3.10 Describe desirable butter color properties and types of butter colors (Vegetable, Mineral).</p> <p>3.11 Elaborate on butter salting, along with its purpose.</p> <p>3.12 Discuss the effects of salt on butter's keeping quality, moisture distribution, and texture.</p> <p>3.13 Explain salt addition methods, moisture content adjustment, butter working processes (Initial, Final, Vacuum), and butter removal from churn.</p> <p>3.14 Highlight the impact of working on moisture distribution in butter and the removal of worked butter.</p> <p>3.15 Outline butter overrun and its calculation.</p> <p>3.16 Cover desired butter attributes (Salt, Color, Texture, Flavor), butter grading, microbial sources, and defects.</p> <p>3.17. Highlight grading of butter, desirable attributes of butter (Salt, Colour & appearance, Body & texture, Flavour)</p> <p>3.18 Outline sources of microorganisms in butter, microbial deterioration/spoilage of butter, microbial Defects in butter - Bacterial/mold discoloration, enzymatic deterioration and their control measures, Color defects (Discoloration), Bacterial Discoloration, Mold discoloration, Flavor defects, Putrefactive taint, Cheese taints.</p> <p>3.19 Describe Butter oils prepared from salted and unsalted butter by heating</p> <p>3.20 Explore flavoured butter milk production, packaging, and storage processes.</p>	<p>butter milk</p> <p>3.7 Display adept packaging strategies of butter, butter oil and butter milk</p> <p>3.8 Exhibit the correct cleansing of machinery using recommended sanitizers through the CIP procedure.</p> <p>3.9 Illustrate the cleaning of equipment and tools using authorized cleaning agents and sanitizers.</p> <p>3.10 Conduct grading of butter, desirable attributes of butter (Salt, Colour & appearance, Body & texture, Flavour)</p> <p>3.11 Identify sources of microorganisms in butter, microbial deterioration/spoilage of butter, microbial Defects in butter - Bacterial/mold discoloration</p> <p>3.12 Examine enzymatic deterioration and their control measures, Color defects (Discoloration), Bacterial Discoloration, Mold discoloration, Flavor defects, Putrefactive taint, Cheese taints.</p>
---	--

Classroom Aids:
Computer, Projection Equipment, PowerPoint Presentation and software, Facilitator's Guide, Participant's Handbook
Tools, Equipment and Other Requirements
Protective Gloves, Head Caps, Aprons, Safety Goggles, Safety Boots, Mouth Masks, Sanitizer, Food Safety Manual., Filters, Pasteurizer for cream, Homogenizer for cream, butter churner, butter extruder, packaging machine

Module 4: Ghee Production Process

Outcome: Exhibit the production processes of ghee and grading and packaging of ghee products

Duration: 10:00	Duration: 20:00
Theory – Key Learning Outcomes	Practical – Key Learning Outcomes
4.1 Explain FSSAI standards for Ghee, permitted food additives in ghee as per FSSAI. 4.2 Outline composition of ghee, Fatty acid composition of butter. 4.3 Classify ghee based on the production practice (Desi or Indigenous Method, Direct Cream Method, Creamery Butter Method). 4.4 Illustrate process outlines of Ghee production processes (Desi/Indigenous, Direct Cream, Creamery Butter) 4.5 Describe operation of Ghee Vat. 4.6 Explain the granulation and cooling phenomena in Ghee, including granulation causes. 4.7 Elaborate factors affecting ghee yield, quality, grading, flavor formation (Carbonyls, Lactones), flavor components, and texture. 4.8 Discuss defects in Ghee and preventive measures (Flavor, Texture, Appearance). 4.9 Illustrate Physico-chemical and Functional Properties of Ghee-Residue and Chemical composition 4.10 Highlight yield of ghee-residue (Lipids in ghee-residue, Proteins in ghee-residue, Milk sugars in ghee-residue, Flavouring properties, Antioxidant properties) and applications of Ghee-Residue.	4.1 Skilfully generate sterilized cream and sour cream for ghee preparation 4.2 Present the steps involved in Desi or Indigenous ghee production. 4.3 Highlight the technique for ghee production by Direct Cream Method 4.4 Depict the process of creating ghee by Creamery Butter Method. 4.5 Demonstrate the operation of ghee vat 4.6 Exhibit the method the granulation and cooling of ghee 4.7 Identify factors affecting ghee yield, quality, grading, flavor formation and texture. 4.8 Identify defects in Ghee and their Prevention (Flavor Defects, Texture Defects, Appearance Defects), 4.9 Display adept packaging strategies for dairy products. 4.10 Exhibit the correct cleansing of machinery using recommended sanitizers through the CIP procedure. 4.11 Illustrate the cleaning of equipment and tools using authorized cleaning agents and sanitizers. 4.12 Demonstrate separation, collection and storage of ghee residue
Classroom Aids:	
Computer, Projection Equipment, PowerPoint Presentation and software, Facilitator's Guide, Participant's Handbook	
Tools, Equipment and Other Requirements	
Protective Gloves, Head Caps, Aprons, Safety Goggles, Safety Boots, Mouth Masks, Sanitizer, Food Safety Manual., Pasteurizer for cream, Homogenizer for cream, ghee vat, ghee filter, packaging machine	

Module 5: Food Safety, Hygiene and Sanitation for milk fat processing

Outcome Implement Food safety hygiene and sanitation practices at milk fat processing workplace

Duration: 30:00	Duration: 30:00
Theory – Key Learning Outcomes	Practical – Key Learning Outcomes
<p>5.1 Define hazards and risks.</p> <p>5.2 Identify the various types of health and safety equipment available in an organization and the methods for obtaining them.</p> <p>5.3 Elaborate the industry standards to maintain a safe and hygiene workplace.</p> <p>5.4 Explain HACCP principles to eliminate food safety hazards in the process of milk fat.</p> <p>5.5 Highlight safety practices in the work area.</p> <p>5.6 Outline FSSAI standard for milk fat products</p> <p>5.7 Comply with food safety and hygiene procedures followed in the organization.</p> <p>5.8 Ensure hygienic production of food by inspecting raw materials, ingredients, finished products, etc. for compliance to physical, chemical and microbiological parameters.</p> <p>5.9 Pack products in appropriate packaging materials, label and store them in designated area, free from pests, flies and infestations.</p> <p>5.10 Follow industry standards like GMP and HACCP and product recall process.</p> <p>5.11 Highlight the organizational health and safety policies and procedures.</p> <p>5.12 State the importance of safety, hygiene and sanitation in the milk fat processing industry.</p> <p>5.13 Highlight the importance of sanitizing self and the work area safely and appropriately.</p> <p>5.14 Follow housekeeping practices by having designated area for materials/tools.</p> <p>5.15 Document and maintain raw material, packaging material, process and finished products for the credibility and effectiveness of the food safety control system.</p>	<p>5.1 Ensure personal hygiene by using of gloves, hairnets, masks, ear plugs, shoes, etc.</p> <p>5.2 Conduct hygienic production of food by inspecting raw materials, ingredients, finished products, etc. for compliance to physical, chemical and microbiological parameters.</p> <p>5.3 Clean maintain and monitor food processing equipment periodically, using it only for specified purpose.</p> <p>5.4 Apply housekeeping practices by having designated area for materials/tools.</p> <p>5.5 Apply the industry standards to maintain a safe and hygiene workplace.</p> <p>5.6 Apply GMP and HACCP principles to eliminate food safety hazards in the process and products.</p> <p>5.7 Apply safety practices in the work area.</p> <p>5.8 Maintain raw material, packaging material, process and finished products for the credibility and effectiveness of the food safety control system.</p>
Classroom Aids:	
Computer, Projection Equipment, PowerPoint Presentation and software, Facilitator’s Guide, Participant’s Handbook	

Tools, Equipment and Other Requirements

Protective Gloves, Head Caps, Aprons, Safety Goggles, Safety Boots, Mouth Masks, Sanitizer, Food Safety Manual, Fruit and Vegetable Pulp and juice standard manual.

Module 6 : OJT

Outcome: Work in real job situation with special emphasis on basic safety and hazards in this domain

Practical Content:

Assessor will check report prepared for this component of Practical training of the course and assess whether competency has been developed to work in the real job situation with special emphasis on basic safety and hazards in this domain. (The trainee is expected to undertake work in actual workplace under any supervisor / contractor for **60 Hours**.)

Module 7 : Employability Skills (60 Hrs)**Key Learning Outcomes****Introduction to Employability Skills**

Duration: 1.5 Hours

After completing this programme, participants will be able to:

1. Discuss the Employability Skills required for jobs in various industries
2. List different learning and employability related GOI and private portals and their usage

Constitutional values - Citizenship

Duration: 1.5 Hours

3. Explain the constitutional values, including civic rights and duties, citizenship, responsibility towards society and personal values and ethics such as honesty, integrity, caring and respecting others that are required to become a responsible citizen
4. Show how to practice different environmentally sustainable practices.

Becoming a Professional in the 21st Century

Duration: 2.5 Hours

5. Discuss importance of relevant 21st century skills.
6. Exhibit 21st century skills like Self-Awareness, Behavior Skills, time management, critical and adaptive thinking, problem-solving, creative thinking, social and cultural awareness, emotional awareness, learning to learn etc. in personal or professional life.
7. Describe the benefits of continuous learning.

Basic English Skills

Duration: 10 Hours

8. Show how to use basic English sentences for everyday conversation in different contexts, in person and over the telephone
9. Read and interpret text written in basic English
10. Write a short note/paragraph / letter/e -mail using basic English

Career Development & Goal Setting

Duration: 2 Hours

11. Create a career development plan with well-defined short- and long-term goals

Communication Skills

Duration: 5 Hours

12. Demonstrate how to communicate effectively using verbal and nonverbal communication etiquette.
13. Explain the importance of active listening for effective communication
14. Discuss the significance of working collaboratively with others in a team

Diversity & Inclusion

Duration: 2.5 Hours

15. Demonstrate how to behave, communicate, and conduct oneself appropriately with all genders and PwD
16. Discuss the significance of escalating sexual harassment issues as per POSH act.

Financial and Legal Literacy

Duration: 5 Hours

17. Outline the importance of selecting the right financial institution, product, and service
18. Demonstrate how to carry out offline and online financial transactions, safely and securely
19. List the common components of salary and compute income, expenditure, taxes, investments etc.
20. Discuss the legal rights, laws, and aids

Essential Digital Skills

Duration: 10 Hours

21. Describe the role of digital technology in today's life
22. Demonstrate how to operate digital devices and use the associated applications and features, safely and securely
23. Discuss the significance of displaying responsible online behavior while browsing, using various social media platforms, e-mails, etc., safely and securely
24. Create sample word documents, excel sheets and presentations using basic features
25. utilize virtual collaboration tools to work effectively

Entrepreneurship

Duration: 7 Hours

26. Explain the types of entrepreneurship and enterprises
27. Discuss how to identify opportunities for potential business, sources of funding and associated financial and legal risks with its mitigation plan
28. Describe the 4Ps of Marketing-Product, Price, Place and Promotion and apply them as per requirement
29. Create a sample business plan, for the selected business opportunity

Customer Service

Duration: 5 Hours

30. Describe the significance of analyzing different types and needs of customers
31. Explain the significance of identifying customer needs and responding to them in a professional manner.
32. Discuss the significance of maintaining hygiene and dressing appropriately

Getting Ready for apprenticeship & Jobs

Duration: 8 Hours

33. Create a professional Curriculum Vitae (CV)
34. Use various offline and online job search sources such as employment exchanges,

- recruitment agencies, and job portals respectively
35. Discuss the significance of maintaining hygiene and confidence during an interview
 36. Perform a mock interview
 37. List the steps for searching and registering for apprenticeship opportunities

Learning Outcome – Assessment Criteria

Module No.	Outcome	Assessment Criteria
1	Assess the quality and safety of dairy products, including milk and its derivatives, through hands-on application of analytical techniques, microbiological evaluation, and equipment sanitation procedures.	<p>After completion of this module students will be able to:</p> <ol style="list-style-type: none"> 1.1 Display the process of receiving milk and assessing its quality. 1.2 Evaluate milk and milk product quality through various analytical techniques, encompassing Milk Fat, Moisture, Solids Not Fat, Milk Protein, Lactose, Added Sucrose, Titrable Acidity, Total Ash, Acid Insoluble Ash, Alkaline Phosphatase, Creaming Index, and Butyro Refractometer reading. 1.3 Analyze the microbiological quality of milk by conducting MBRT tests, identifying microorganisms in milk and milk products, and recognizing inhibitors present in milk. 1.4 Detect the presence of E. coli in milk samples. 1.5 Execute the cleaning and sanitization of processing equipment. 1.6 Conduct a thorough inspection to ensure all machinery is clean and in optimal working condition.
2	Assist in milk quality assessment, filtration, clarification, cream separation and production of sterilized cream, sour cream.	<p>After completion of this module students will be able to:</p> <ol style="list-style-type: none"> 2.1 Perform a check if all the machineries are clean and in good working conditions 2.2 Demonstrate the receiving of milk and checking its quality 2.3 Show how to Use the filter to remove sediments from milk 2.4 Demonstrate the process of clarification of milk 2.5 Demonstrate use of separator for separation of cream from milk 2.6 Display use of cream separator for getting desire fat content 2.7 Demonstrate the methods of Standardization of cream. 2.8 Demonstrate use of cream pasteurizer 2.9 Demonstrate methods of Cooling Pasteurized Cream. 2.10 Demonstrate the production of sterilized cream and sour cream.

Module No.	Outcome	Assessment Criteria
		2.11 Demonstrate how to carry out processing of pasteurized cream 2.12 Demonstrate the process of Cooling Pasteurized Cream.
3	Demonstrate the production processes of butter, butter oil and butter milk	After completion of this module students will be able to: 3.1 Generate sterilized cream and sour cream for butter preparation 3.2 Present the steps involved in butter production 3.3 Demonstrate cream churning process and extrusion process during butter production 3.4 Highlight the salting technique for butter production. 3.5 Depict the process of creating butter oil. 3.6 Demonstrate the production method flavored butter milk 3.7 Display adept packaging strategies of butter, butter oil and butter milk 3.8 Exhibit the correct cleansing of machinery using recommended sanitizers through the CIP procedure. 3.9 Illustrate the cleaning of equipment and tools using authorized cleaning agents and sanitizers. 3.10 Conduct grading of butter, desirable attributes of butter (Salt, Colour & appearance, Body & texture, Flavor)
4	Exhibit the production processes of ghee and grading and packaging of ghee products	After completion of this module students will be able to: 4.1 Generate sterilized cream and sour cream for ghee preparation 4.2 Present the steps involved in Desi or Indigenous ghee production. 4.3 Highlight the technique for ghee production by Direct Cream Method 4.4 Depict the process of creating ghee by Creamery Butter Method. 4.5 Demonstrate the operation of ghee vat 4.6 Exhibit the method the granulation and cooling of ghee 4.7 Identify factors affecting ghee yield, quality, grading, flavor formation and texture. 4.8 Identify defects in Ghee and their Prevention (Flavor Defects, Texture Defects, Appearance Defects), 4.9 Display adept packaging strategies for dairy

Module No.	Outcome	Assessment Criteria
		products. 4.10 Exhibit the correct cleansing of machinery using recommended sanitizers through the CIP procedure.
5	Implement Food safety hygiene and sanitation practices at milk fat processing workplace	After completion of this module students will be able to: 5.1 Ensure personal hygiene by using of gloves, hairnets, masks, ear plugs, shoes, etc. 5.2 Conduct hygienic production of food by inspecting raw materials, ingredients, finished products, etc. for compliance to physical, chemical and microbiological parameters. 5.3 Clean maintain and monitor food processing equipment periodically, using it only for specified purpose. 5.4 Apply housekeeping practices by having designated area for materials/tools. 5.5 Apply the industry standards to maintain a safe and hygiene workplace. 5.6 Apply GMP and HACCP principles to eliminate food safety hazards in the process and products. 5.7 Apply safety practices in the work area. 5.8 Maintain raw material, packaging material, process and finished products for the credibility and effectiveness of the food safety control system.
6	OJT	Work in real job situation with special emphasis on basic safety and hazards in this domain (OJT).
7	Employability Skill	As per guided curriculum

List of Tools, Equipment & materials needed for 30 Trainees (Practical)

Sl No	Items Name	Specification	Qty
1	Gerber Centrifuge Machine	Description : Electric Gerber Machine for 24 Test with Mechanical Brake, 0-30 Minutes Timer, Stainless Steel Disc. & Protective cover. Supply with accessories Milk Testing Kit Type : For FAT/SNF Testing Unit : Set Description :2.0000 Each Kit Consisting of: Std. Pack a. Milk Butyrometer 0 - 10 % 20 "BENNY" - Tested b. Lock Stopper - Brass Cap 60 c. Lock Stopper Key - Aluminium 06 d. Milk Pipette 10.75 ml 06 "BENNY" e. Plastic Tilt Measure - 1ml 06 with bottle f. Plastic Tilt Measure - 10 ml 06 With bottle g. Sample Bottle 85 ml 50 h. Plastic Sample Bottle Stand 03 12 holes i. Plastic Butyrometer Shaking 03 Stand - 12 holes	01

SI No	Items Name	Specification	Qty
		j. Plastic Butyrometer Holding 03 Stand - 12 holes k. Plastic Pipette Stand 02 l. Nylon Butyrometer Cleaning 01 gross Brush m. Nylon Pipette Cleaning Brush 01 gross n. Nylon Sample Bottle Cleaning Brush 01 gross o. Stainless Steel Sample Dipper 02 100 ml p. Plastic Dropping Bottle 06 250 ml q. Thermometer 0 - 110°C Alcohol 10 Research r. Lactometer 0 - 40° at T 84°F 12 Tested s. Plastic Lactometer Jar - small 06 t. Stainless Steel Can Plunger 01 u. Anyl Alcohol - Grade A 02 Ltr. v. Con sulphuric acid 02 Ltr.	
2	Batch Pasteurizer 25 litre with Stirrer	Electric Batch / Vat Pasteuriser: Capacity – 25 liters Completely made of SS 316 AISI (inner and outer) Motor – ½ HP Compton with gear box for stirring. Triple walled with glass wool insulated. Electric immersion heater 6KW for heating of water. Digital temp indicator for product (multispan/SELEC) and Digital temp. controller cum indicator for water medium (multispan /SELEC) in with separate panel, Water level indicator, glycerin Pressure Gauge , safety valve and necessary fitting. Operated on 440 volts 3 ph AC.	01
3	Cream Seperator	Cream separator machine: Capacity – 10 liters minimum maximum. Motor – ½ HP Compton , 2800 rpm. Contact parts are of SS 304. Operated on 230 volts AC.	01
4	Butter Churner	Butter churner: Capacity – 3-5 KG max. Tank volume – 10 liters Made of SS 304 grade. Motor – ½ HP Compton with gear box Operated on 230 volts AC. Supply with one butter cake former extruder of capacity 10-15 kg per hour. Motor 2HP with gear box.	01
5	Cream Homogenizer 50lit	Two stage Homogeniser completely made of SS 304 AISI (inner and outer). Capacity – 25-40 liters/hour Motor – 1HP Compton Pressure regulator – double stage, 140 Bar (max. pressure at 200 bar) with Electric Motor along with standard accessories. and Homogenising Valve and Valve Seats are made of Stellite. Plungers and valve made of SS 316. The Homogeniser is supplied with standard accessories like glycerin Pressure Gauge and tool kit etc. Operated on 440 volts AC.	01
6	Butter Extruder	As a butter extruder for sticks or blocks of butter from 125g to 2kg, depending on the models. The extrusion dies are interchangeable to create various shapes such as sheets of shortening	01

SI No	Items Name	Specification	Qty
		butter for commercial pastry preparation or blocks of butter	
7	Ghee Vat	<p>Functional requirement Ghee boiler (Steam heated kettle) will be used for the production of ghee from butter or cream.</p> <p>This is three jacket, fabricated from SS 304 material. The inner jacket is closed, by hemispherical dish from the bottom and top is covered. The plate thickness is selected to suit pressure. The volume of the vessel is 20 ltr. The outer jacket is steam jacket. This is fabricated from SS material. This jacket has, steam inlet, condensate outlet, and safety valve connection. The steam is distributed in the jacket with the help of pipe. The kettle is then insulated by glass wool insulation and finally cladded with SS sheet.</p>	01
8	Butter oil vat	<p>This is three jacket, fabricated from SS 304 material. The inner jacket is closed, by hemispherical dish from the bottom and top is covered. The plate thickness is selected to suit pressure. The volume of the vessel is 20 ltr. The outer jacket is steam jacket. This is fabricated from SS material. This jacket has, steam inlet, condensate outlet, and safety valve connection.</p>	01
9	Milk testing analysis	<p>Ultrasonic Milk Analyzer and ultrasonic stirrer for testing of milk sample.</p> <p>a) <i>Milk Analyzer Specification</i></p> <p>Usage/Application Laboratory Use Relative Humidity 30% to 80% Interface RS 232 Display 2 Line, 16 Character, Big LCD Display, 10mm Character Height Operating Facilities Cleaning, Single Curve Calibration, Error List, Suitable for Cow/Buffalo/Mixed Milk Operating Voltage: 230 V + 15-20%, AC, 50 Hz, 12V DC +/- 8% Ambient Air Temperature:- 15 Degree Celsius to 50 Degree Celsius Milk Temperature: 5 Degree Celsius to 35 Degree Celsius</p> <p>b) <i>Ultrasonic stirrer Specification</i></p> <p>Stirring removes air from fresh milk samples by vibrations created in the milk before testing Available in Powder Coated/Stainless Steel housing Vibrator – SS Ball type/Aluminium Ball Type.</p>	01
10	B.O.D cooling incubator	<p>B.O.D COOLING INCUBATOR</p> <p>Cooling BOD incubator, combined low & high temperature, provided with precise electronic temperature control with digital readout</p> <p>a) Construction: Double-walled with adequate polystyrene and glass wool insulation.</p> <p>b) Inner Chamber: Stainless Steel, (304SS of 20gauge) duly polished with different shelf positions.</p> <p>c) Outer Walls: CRC Steel Sheet, scraped and treated with anti-corrosive primer and finished with powder coating.</p> <p>d) Outer Door: The outer door will be double walled duly insulated and provided with magnetic strip gasket with proper sealing and locking device with anti-corrosive primer and finished with powder coating.</p>	01

SI No	Items Name	Specification	Qty
		<p>e) Inner Door: An Acrylic door is provided.</p> <p>f) Inner chamber made of 304 grade quality Stainless Steel. Wall side 20 gauge thickness sheets & Tray side 18 gauge thickness perforated sheets.</p> <p>g) Temp. Digital controller - Multispan brand. Temperature Range : 5°C to 60°C Temperatures Accuracy of Control : ± 0.50 Working Chamber Made of : Stainless Steel Sheet. Volume=285 Lt/ 10cft No. of Tray : 3 Numbers Perforated 304SS Trays of 18 gauge. Operable on : 220/230 Volts, Single Phase</p> <p>Proper white light illumination is necessary in inner chamber.</p>	
11	Thermometer, 0deg C to 250 deg C	Thermometer, 0degC to 250 deg C glass	03
12	Digital Thermometer	Temperature scale: deg C User-Selective Resolution: 1 °C Measurement Range: 0°C to 250°C Display: LCD	03
13	Disposable gloves	Disposable gloves	100
14	Hairnets or caps	Hairnets or caps	100
15	Lab coats or aprons	Lab coats or aprons	30
16	Safety goggles or glasses	Safety goggles or glasses	30
17	Face masks	Face masks	100
18	Food-grade cleaning agents (e.g., detergents, sanitizers)	Food-grade cleaning agents (e.g., detergents, sanitizers)	10L
19	Sanitizing wipes or disinfectant sprays	Sanitizing wipes or disinfectant sprays	6
20	Brushes, sponges, and scrubbers	Brushes, sponges, and scrubbers	50
21	Mops, buckets, and floor squeegees	Mops, buckets, and floor squeegees	12
22	Cleaning cloths or towels	Cleaning cloths or towels	30
23	Hand soap and hand sanitizer	Hand soap and hand sanitizer	30
24	pH meters or pH test strips	pH meters or pH test strips	01
25	Temperature probes or thermometers (digital or analog)	Temperature probes or thermometers (digital or analog)	03
26	Microbiological sampling kits (swabs, agar plates, incubators)	Microbiological sampling kits (swabs, agar plates, incubators)	02
27	Microscopes (for	Microscopes (for microbial analysis)	01

SI No	Items Name	Specification	Qty
	microbial analysis)		
28	Petri dishes and agar media	Petri dishes and agar media	50
29	Pipettes and pipette tips	Pipettes and pipette tips	50
30	Weighing scales or balances	Weighing scales or balances	02
31	Sample containers and labeling materials	Sample containers and labeling materials	50
32	Sterile swabs or sampling devices	Sterile swabs or sampling devices	01
33	Magnifying glass or magnifier lamp (for visual inspection)	Magnifying glass or magnifier lamp (for visual inspection)	12
34	Colorimeters or spectrophotometers (for color analysis)	Colorimeters or spectrophotometers (for color analysis)	01
35	Flavor testing kits or sensory evaluation materials	Flavor testing kits or sensory evaluation materials	02
36	Packaging integrity testing equipment (e.g., vacuum seal testers)	Packaging integrity testing equipment (e.g., vacuum seal testers)	01
37	Logbooks or record sheets for cleaning and sanitizing activities	Logbooks or record sheets for cleaning and sanitizing activities	40
38	Checklists for quality control inspections	Checklists for quality control inspections	40
39	Regulatory documents and reference materials (food safety regulations, industry standards)	Regulatory documents and reference materials (food safety regulations, industry standards)	01
40	Training manuals or handbooks on food safety, hygiene, and quality control	Training manuals or handbooks on food safety, hygiene, and quality control	06
41	Educational materials (posters, charts, diagrams) for staff training	Educational materials (posters, charts, diagrams) for staff training	20
42	Online resources (websites, databases, forums) for staying updated on industry trends and best practices	Online resources (websites, databases, forums) for staying updated on industry trends and best practices	01
43	First aid kit	First aid kit	03

SI No	Items Name	Specification	Qty
44	Spill kits for hazardous materials	Spill kits for hazardous materials	04
45	Fire extinguisher(s) and fire blanket(s)	Fire extinguisher(s) and fire blanket(s)	04
46	Milk adulteration kit	Milk adulteration kit	02
47	Gas oven	<p>Design: Gas oven Colour: Silver Material: Stainless Steel Special Feature: Manual Ignition Heating Elements 2 burner Material: Top-quality stainless-steel material with a glossy finish that ensures the durability and longevity of the product. Burners: Equipped with two high-efficiency brass burners (1 Big and 1 Small) that ensure uniform distribution of heat on the utensils. Heavy-duty Pan Supports - The pan supports are designed to accommodate all major sizes of pans as it is reliable and rigid in construction. Knobs: Ergonomic and safe-handling knobs not only offers beauty & safety but also grants easy and quick access to lit the stove.</p>	01

Marks Distribution

Outcome	Outcome Code	Total Th Marks	Total Pr. Marks	Total OJT. Marks
Assess the quality and safety of dairy products, including milk and its derivatives	FPT/1119/OC1	30	140	0
Separate and collect the milk fat and produce sterilized cream and sour cream	FPT/1119/OC2	30	130	0
Demonstrate the production processes of butter, butter oil, and butter milk	FPT/1119/OC3	30	130	0
Exhibit the production processes of ghee and grading and packaging of ghee products	FPT/1119/OC4	30	130	0
Implement Food safety hygiene and sanitation practices at milk fat processing workplace	FPT/1119/OC5	30	120	0
Work in real job situation with special emphasis on basic safety and hazards in this domain (OJT).	FPT/1119/OC6	0	0	150
Employability Skills – 60 Hrs	DGT/VSQ/N0102	50	0	0