Model Curriculum

QP Name: Dairy Processing Equipment Operator

QP Code: FIC/Q2002

QP Version: 1.0

NSQF Level: 4

Model Curriculum Version: 1.0

Table of Contents

Training Parameters

Sector	Food Processing
Sub-Sector	Dairy Products
Occupation	Processing
Country	India
NSQF Level	4
Aligned to NCO/ISCO/ISIC Code	NCO-2004/7413.10
Minimum Educational Qualification and Experience	18 years of age 1. Class 12th passed in science stream 2. Class 10th passed and 2 years course in relevant field 3. Class 10th passed and 2 years of experience in dairy Industry 4. Class 10th Pass and 2 years of ITI
Pre-Requisite License or Training	NA
Minimum Job Entry Age	18 years
Last Reviewed On	31-05-2021
Next Review Date	31-05-2024
NSQC Approval Date	
QP Version	1.0
Model Curriculum Creation Date	04-09-2018
Model Curriculum Valid Up to Date	31-05-2024
Model Curriculum Version	1.0
Minimum Duration of the Course	400 Hours
Maximum Duration of the Course	400 Hours

Program Overview

This section summarizes the end objectives of the program along with its duration.

Training Outcomes

At the end of the program, the participants will be able to:

- Demonstrate preparation of work area for producing dairy products
- Prepare and use dairy equipment and machinery while maintaining their process parameters
- Apply production sequence as per production order
- Perform documentation and record keeping related to production of dairy products
- Apply necessary food safety and hygiene practices at the workplace

Compulsory Modules

The table lists the modules and their duration corresponding to the Compulsory NOS of the QP.

NOS and Module Details	Theory Duration	Practical Duration	On-the-Job Training Duration (Mandatory)	On-the-Job Training Duration (Recommended)	Total Duration
Introduction to the sector and job	**35:00 Hours**	**22:00 Hours**	**00:00 Hours**	**00:00 Hours**	**57:00 Hours**
Module 1: Introduction to the training program and overview of food processing industry	03:00 Hours	00:00 Hours	00:00 Hours	00:00 Hours	03:00 Hours
Module 2: Professional and Core Skills	04:00 Hours	10:00 Hours	00:00 Hours	00:00 Hours	14:00 Hours
Module 10: Employability and Entrepreneurship skills	28:00 Hours	12:00 Hours	00:00 Hours	00:00 Hours	40:00 Hours
FIC/N2005: Prepare and maintain work area and process machineries for operating dairy processing equipment NOS Version No.: 1.0 NSQF Level: 4	**15:00 Hours**	**30:00 Hours**	**00:00 Hours**	**00:00 Hours**	**45:00 Hours**

Module 3: Prepare and Maintain Work Area and Process Machineries for Operating Dairy Processing Equipment	15:00 Hours	30:00 Hours	00:00 Hours	00:00 Hours	45:00 Hours
FIC/N2006: Prepare for operating dairy process machineries and production of various dairy products NOS Version No.: 1.0 NSQF Level: 4	**15:00 Hours**	**25:00 Hours**	**00:00 Hours**	**00:00 Hours**	**40:00 Hours**
Module 4: Prepare for Operating Dairy Process Machineries and Production of Various Dairy Products	15:00 Hours	25:00 Hours	00:00 Hours	00:00 Hours	40:00 Hours
FIC/N2007: Operate dairy processing machineries NOS Version No.: 1.0 NSQF Level: 4	**35:00 Hours**	**80:00 Hours**	**00:00 Hours**	**00:00 Hours**	**115:00 Hours**
Module 5: Operate Dairy Processing Machines	25:00 Hours	60:00 Hours	00:00 Hours	00:00 Hours	85:00 Hours
Module 6: Organizational Standards and Norms	10:00 Hours	20:00 Hours	00:00 Hours	00:00 Hours	30:00 Hours
FIC/N2008: Complete documentation and record keeping related to operation of dairy processing equipment NOS Version No.: 1.0 NSQF Level: 4	**19:00 Hours**	**44:00 Hours**	**00:00 Hours**	**00:00 Hours**	**63:00 Hours**
Module 7: Complete documentation and record keeping related to operation of dairy processing equipment	06:00 Hours	14:00 Hours	00:00 Hours	00:00 Hours	20:00 Hours
Module 8: IT Orientation	13:00	30:00	00:00 Hours	00:00 Hours	43:00
FIC/N9001: Food	**30:00**	**50:00**	**00:00 Hours**	**00:00 Hours**	**80:00**

safety, hygiene and sanitation for processing food products **NOS Version No.: 1.0** **NSQF Level: 3**	**Hours**	**Hours**			**Hours**
Module 9: Food safety, hygiene and sanitation for processing food products	30:00 Hours	50:00 Hours	00:00 Hours	00:00 Hours	80:00 Hours
Total Duration	**149:00 Hours**	**251:00 Hours**	**00:00 Hours**	**00:00 Hours**	**400 Hours**

Module Details

Module 1: Introduction to the training program and overview of food processing Industry
Bridge Module

Terminal Outcomes:

- Discuss the opportunities available for dairy processing equipment operators in food processing industry
- List the GMP and HACCP practices and FSSAI guidelines applicable in dairy processing industry

Duration: 03:00	Duration: 00:00
Theory – Key Learning Outcomes	**Practical – Key Learning Outcomes**
- Discuss the future trends and career growth opportunities available to dairy processing equipment operators in the food processing industry. - Discuss the key roles and responsibilities of a 'Dairy Processing Equipment Operator'. - List the various terminologies used by dairy processing equipment operators in the food processing industry. - Discuss the role of organisational policies and procedures in the job. - List the sequence of tasks performed for dairy processing. - Discuss the impact of not following Good Manufacturing Practices (GMP), Hazard Critical Analysis and Control Points (HACCP) and Food Safety and Standards Authority of India (FSSAI) guidelines in the job.	
Classroom Aids:	
Computer, Projection Equipment, PowerPoint Presentation and software, Facilitator's Guide, Participant's Handbook.	
Tools, Equipment and Other Requirements	
Nil	

Module 2: Professional and Core Skills
Bridge Module

Terminal Outcomes:

- Discuss the attributes of desirable professional behaviour
- Demonstrate the standard measures undertaken for working effectively

Duration: *04:00*	Duration: *10:00*
Theory – Key Learning Outcomes	**Practical – Key Learning Outcomes**
- Identify personal strengths and weaknesses. - Discuss the importance of work order in the process. - State the importance of decision making in the job. - State the importance of communicating effectively.	- Apply standard practice to undertake a self-assessment test for identifying strengths and weaknesses. - Plan and prioritise tasks effectively to ensure timely completion. - Demonstrate the ways to analyse situations for identifying problems and making sound decision promptly.
Classroom Aids:	
Computer, Projection Equipment, PowerPoint Presentation and software, Facilitator's Guide, Participant's Handbook	
Tools, Equipment and Other Requirements	
Gloves, hair net, shoe cover, soap dispenser, hand sanitizer, ear plugs, masks, aprons/lab coats eye protection, hard hats, gloves, rubber boots, etc.	

Module 3: Prepare and Maintain Work Area and Process Machineries for Operating Dairy Processing Equipment
Mapped to FIC/N2005, v 1.0

Terminal Outcomes:

- Discuss the tasks to be performed to maintain the work area for operating dairy processing equipment
- State the importance of maintaining tools and equipment effectively

Duration: *15:00*	Duration: *30:00*
Theory – Key Learning Outcomes	**Practical – Key Learning Outcomes**
- List the materials and equipment used in the cleaning and maintenance of the work area. - State the common detergents and sanitizers used in cleaning work area and machineries. - Describe the properties of the cleaning agents used in the job. - Discuss the methods used for cleaning and sanitization. - Describe the different types of maintenance procedures. - Explain the method of managing and disposing waste materials. - Describe the functions to be carried out before starting production. - Explain the maintenance procedure to be followed before starting production. - Discuss the different types of maintenance procedures followed in the dairy industry.	- Demonstrate the process of preparing the work area for scheduled production. - Demonstrate how to use tools safely. - Demonstrate the process of lubricating machineries. - Perform minor repairs and faults in process machineries. - Prepare the machines and tools required for production. - Demonstrate the appropriate method of cleaning and maintain the work area. - Exhibit that the work area is safe and hygienic for food processing. - Perform cleaning of machineries using appropriate sanitizers.
Classroom Aids:	
Computer, Projection Equipment, PowerPoint Presentation and software, Facilitator's Guide, Participant's Handbook	
Tools, Equipment and Other Requirements	
pH Meter, Weighing Balance, Beaker, Bunsen Burner, Filter, Homogenizer, Pasteurizer, Separator, Clarifier, Packaging Machines, Protective Gloves, Head Caps, Aprons, Safety Goggles, Safety Boots, Mouth Masks, Sanitizer, Food Safety Manual.	

Module 4: Prepare for Operating Dairy Process Machineries and Production of Various Dairy Products
Mapped to FIC/N2006, v 1.0

Terminal Outcomes:

- List the inspections done on the machinery to confirm proper functioning
- Demonstrate the standard practices followed for production

Duration: *15:00*	Duration: *25:00*
Theory – Key Learning Outcomes	**Practical – Key Learning Outcomes**
- List the tasks to be performed for carrying out machine inspections. - Explain the techniques to be followed to check the working of all types of machinery.	- Demonstrate how to plan the production process. - Explain how to plan batch size considering full capacity utilisation of equipment. - Show how to organize the equipment. - Check to ensure that the machines are clean and functioning properly. - Demonstrate the procedure for assembling the machine components. - Perform various tasks to check the machines. - Calculate the process time for effective utilization of machines and manpower and the raw material for getting optimum quality. - Analyze the quality of raw material by assessing its physical parameters.
Classroom Aids:	
Computer, Projection Equipment, PowerPoint Presentation and software, Facilitator's Guide, Participant's Handbook	
Tools, Equipment and Other Requirements	
pH Meter, Weighing Balance, Beaker, Bunsen Burner, Filter, Homogenizer, Pasteurizer, Separator, Clarifier, Packaging Machines, Protective Gloves, Head Caps, Aprons, Safety Goggles, Safety Boots, Mouth Masks, Sanitizer, Food Safety Manual.	

Module 5: Operate Dairy Processing Machines
Mapped to FIC/N2007, v 1.0

Terminal Outcomes:

- Discuss the steps to be performed for operating dairy processing machine effectively
- Demonstrate the use of the various equipment for operating dairy processing machines

Duration: _25:00_	Duration: _60:00_
Theory – Key Learning Outcomes	**Practical – Key Learning Outcomes**
- List the sequence of operations carried out in the work process. - Discuss the steps to be followed for operating the dairy processing machines and other devices effectively.	- Set the control parameters of the machines used in a dairy processing plant. - Demonstrate use of holding tank. - Demonstrate the use of metering device for measuring the volume of milk required. - Demonstrate the use of filter to remove sediments from milk. - Demonstrate use of separator for separating cream from the milk. - Demonstrate use of homogenizer for obtaining desired fat content. - Demonstrate the use of pasteurizer in the job. - Demonstrate the procedure to carry out chilling of milk in the chilling tank. - Check the quality of product produced. - Demonstrate the steps to be performed for packaging the dairy products produced. - Perform clean-in procedures (CIP) after the production is complete. - Clean the work area using approved sanitizers and detergents.
Classroom Aids:	
Computer, Projection Equipment, PowerPoint Presentation and software, Facilitator's Guide, Participant's Handbook	
Tools, Equipment and Other Requirements	
pH Meter, Weighing Balance, Beaker, Bunsen Burner, Filter, Homogenizer, Pasteurizer, Separator, Clarifier, Packaging Machines, Protective Gloves, Head Caps, Aprons, Safety Goggles, Safety Boots, Mouth Masks, Sanitizer, Food Safety Manual.	

Module 6: Organisational standards and norms
Mapped to NOS/N2007 v 1.0

Terminal Outcomes:

- Discuss the roles and responsibilities of the individual in the job

Duration: *10:00*	**Duration**: *20:00*
Theory – Key Learning Outcomes	**Practical – Key Learning Outcomes**
- List the roles and responsibilities of the individual in the job - Explain the food safety hygiene standards to follow in a work environment	- Demonstrate how to conduct yourself at the workplace - State the personal hygiene and sanitation guidelines
Classroom Aids	
Computer, Projection Equipment, PowerPoint Presentation and software, Facilitator's Guide, Participant's Handbook	
Tools, Equipment and Other Requirements	
Protective Gloves, Head Caps, Lab Coat, Safety Goggles, Safety Boots, Mouth Masks, Sanitizer, Food Safety Manual	

Module 7: Complete Documentation and Record Keeping Related to Operation of Dairy Processing Equipment
Mapped to FIC/N2008, v 1.0

Terminal Outcomes:

- Demonstrate the process of documenting records effectively.
- Discuss the method of documenting and recording the details.

Duration: *06:00*	Duration: *14:00*
Theory – Key Learning Outcomes	**Practical – Key Learning Outcomes**
- State the need for documenting and maintaining records of raw materials, processes and finished products - State the method of documenting and recording the details of raw material to final finished product	- Demonstrate the process of documenting records of production plan, process parameters, and finished products - Demonstrate the process of maintain documents for raw materials, production plan, process parameters and finished products.
Classroom Aids:	
Computer, Projection Equipment, PowerPoint Presentation and software, Facilitator's Guide, Participant's Handbook	
Tools, Equipment and Other Requirements	
Food Safety Manual, Log Books.	

Module 8: IT orientation
Mapped to FIC/N2008 v1.0

Terminal Outcomes:

- List the parts of a computer
- Demonstrate the effective use of data recording applications at the workplace

Duration: *13:00*	Duration: *30:00*
Theory – Key Learning Outcomes	**Practical – Key Learning Outcomes**
- List the various parts of a computer. - Describe the functions of different computer devices. - List the various applications used in recording information.	- Demonstrate the standard techniques used to operate a computer. - Show how to use an ERP software for recording information. - Demonstrate the effective use of applications such as word processor and spreadsheets.
Classroom Aids:	
Computer, Projection Equipment, PowerPoint Presentation and software, Facilitator's Guide, Participant's Handbook	
Tools, Equipment and Other Requirements	
Computer/laptop.	

Module 9: Food Safety, Hygiene and Sanitation for Processing Food Product
Mapped to FIC/N9001, v 1.0

Terminal Outcomes:

- Perform safety and sanitation related functions for processing food products
- Apply food safety practices for processing food products

Duration: *30:00*	Duration: *50:00*
Theory – Key Learning Outcomes	**Practical – Key Learning Outcomes**
- Define hazards and risks. - State the importance of safety, hygiene and sanitation in the food industry. - Discuss the importance of sanitising self and the work area safely and appropriately. - Recall the ways to store the sanitising materials appropriately.	- Apply the industry standards to maintain a safe and hygiene workplace. - Demonstrate the process of maintaining personal hygiene and sanitation. - Perform identification of agents which are a potential food hazard and can cause adverse health effects. - Demonstrate and apply food safety practices at workplace. - Apply HACCP principles to eliminate food safety hazards in the process and products. - Apply safety practices in the work area.
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 Covers, Sanitizer, Food Safety Manual, Log Books etc.	

Module 10 : Employability and Entrepreneurship skills

Terminal Outcomes:

- Describe the traits of individual at workplace
- Demonstrate apply employability and entrepreneurship skills at workplace

Duration: 28:00	Duration: 12:00
Theory – Key Learning Outcomes	**Practical – Key Learning Outcomes**
- Discuss own strengths and weaknesses and analyse the gaps to ensure continuous improvement. - Discuss the measures to be undertaken to utilise time effectively thereby achieving maximum productivity. - List the characteristics of innovative individuals - List the levels of Maslow Hierarchy of needs - List the traits of effective team - Discuss tips for stress management - Discuss the importance of good work ethics - Discuss how to manage an enterprise - Describe how to plan effective strategies for solving problems and improving work culture within the team. - List the various types of digital marketing techniques. - Discuss the types and importance of e-commerce in promoting businesses. - List the various types of online banking services being used widely. - Discuss the procedure to apply for bank finances - List the elements of a proposal to attract future business opportunities and prospective clients.	- Show how to analyse a situation to identify gaps for improving the work process. - Demonstrate the procedure to plan the time taken to perform various tasks effectively. - Describe how market research is carried out - Role play the characteristics of an effective entrepreneur and leader - Demonstrate on how to identify new business opportunities - Prepare a sample plan to solve problems and improve productivity at the workplace. - Demonstrate the procedure to operate a computer for digital marketing, e-commerce, branding, etc. - Show how to use services such as NEFT, IMPS, UPI, RTGS for online banking.

• Explain how to conduct entrepreneurial programs to identify business opportunities, generate employment and increase clientele. • Understand the make in India campaign • Discuss the importance of Swachh Bharat Abhiyan • Understand the importance of entrepreneurship • Describe the traits of successful entrepreneur • List the types of enterprises • Understand the importance of effective speaking and listening • Discuss the importance of problem solving • Discuss how to deal with failures • Describe the core keys of marketing • Discuss ways to manage risks at workplace	

Classroom Aids:

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

Tools, Equipment and Other Requirements

NIL

Annexure

Trainer Requirements

<table>
<tr><th colspan="6">Trainer Prerequisites</th></tr>
<tr><th rowspan="2">Minimum Educational Qualification
<i><Select the minimum educational requirements, such as 12th Pass, Graduate or NSQF certified.></i></th><th rowspan="2">Specialization
<i><Specify the areas of specialization that are desirable.></i></th><th colspan="2">Relevant Industry Experience</th><th colspan="2">Training Experience</th><th rowspan="2">Remarks</th></tr>
<tr><th><i>Years</i></th><th><i>Specialization</i></th><th><i>Years</i></th><th><i>Specialization</i></th></tr>
<tr><td>Diploma</td><td>Dairy Technology or Food Engineering</td><td>4</td><td>Hands on experience in a Dairy industry</td><td>1</td><td>Training Dairy processing equipment operator</td><td></td></tr>
<tr><td>B.Sc/B.Tech/BE</td><td>Dairy Technology or Food Engineering</td><td>3</td><td>Hands on experience in a Dairy industry</td><td>1</td><td>Training Dairy processing equipment operator</td><td></td></tr>
<tr><td>M.Sc/M.Tech/ME</td><td>Dairy Technology or Food Engineering</td><td>2</td><td>Hands on experience in a Dairy industry</td><td>1</td><td>Training Dairy processing equipment operator</td><td></td></tr>
</table>

<table>
<tr><th colspan="2">Trainer Certification</th></tr>
<tr><th>Domain Certification</th><th>Platform Certification</th></tr>
<tr><td>Certified for Job Role: "Dairy Processing Equipment Operator" mapped to QP: "FIC/Q2002, v1.0". Minimum accepted score is 80%.</td><td>Recommended that the Trainer is certified for the Job Role: "Trainer", mapped to the Qualification Pack: "MEP/Q2601". Minimum accepted score is 80 % as per FICSI guidelines.</td></tr>
</table>

Assessor Requirements

Assessor Prerequisites						
Minimum Educational Qualification *<Select the minimum educational requirements, such as 12th Pass, Graduate or NSQF certified.>*	**Specialization** *<Specify the areas of specialization that are desirable.>*	**Relevant Industry Experience**		**Training/Assessment Experience**		**Remarks**
		Years	*Specialization*	*Years*	*Specialization*	
Diploma	Dairy Technology	5	hand on experience in a Dairy industry	1	Assessing Dairy processing equipment operator	
B.Sc/B.Tech/BE	Dairy Technology or Food Engineering	4	hand on experience in a Dairy industry	1	Assessing Dairy processing equipment operator	
M.Sc/M.Tech/ME	Dairy Technology or Food Engineering	3	hand on experience in a Dairy industry	1	Assessing Dairy processing equipment operator	

Assessor Certification	
Domain Certification	**Platform Certification**
Certified for Job Role: "Dairy Processing Equipment Operator" mapped to QP: "FIC/Q2002, v1.0". Minimum accepted score is 80%.	Recommended that the Trainer is certified for the Job Role: "Trainer", mapped to the Qualification Pack: "MEP/Q2701". Minimum accepted score is 80 % as per FICSI guidelines.

Assessment Strategy

This section includes the processes involved in identifying, gathering and interpreting information to evaluate the learner on the required competencies of the program.

Assessment will be based on the concept of Independent Assessors empanelled with Assessment Agencies, identified, selected, trained and certified on Assessment techniques. These assessors would be aligned to assess as per the laid down criteria.

Assessment Agency would conduct assessment only at the training centres of Training Partner or designated testing centers authorized by FICSI.

Ideally, the assessment will be a continuous process comprising of three distinct steps:

A. Mid- term assessment

B. Term / Final Assessment

Each National Occupational Standard (NOS) in the respective QPs will be assigned weightage. Therein each Performance Criteria in the NOS will be assigned marks for theory and / or practical based on relative importance and criticality of function.

This will facilitate preparation of question bank / paper sets for each of the QPs. Each of these papers sets / question bank so created by the Assessment Agency will be validated by the industry subject matter experts through FICSI, especially with regard to the practical test and the defined tolerances, finish, accuracy etc.

The following tools are proposed to be used for final assessment:

i. Written Test: This will comprise of (i) True / False Statements (ii) Multiple Choice Questions (iii) Matching Type Questions. Online system for this will be preferred.

ii. Practical Test: This will comprise a test job to be prepared as per project briefing following appropriate working steps, using necessary tools, equipment and instruments. Through observation it will be possible to ascertain candidate's aptitude, attention to details, quality consciousness etc. The end product will be measured against the pre-decided MCQ filled by the Assessor to gauge the level of his skill achievements.

iii. Structured Interview: This tool will be used to assess the conceptual understanding and the behavioural aspects as regards the job role and the specific task at hand.

Glossary

Term	Description
Declarative Knowledge	Declarative knowledge refers to facts, concepts and principles that need to be known and/or understood in order to accomplish a task or to solve a problem.
Key Learning Outcome	Key learning outcome is the statement of what a learner needs to know, understand and be able to do in order to achieve the terminal outcomes. A set of key learning outcomes will make up the training outcomes. Training outcome is specified in terms of knowledge, understanding (theory) and skills (practical application).
OJT (M)	On-the-job training (Mandatory); trainees are mandated to complete specified hours of training on site
OJT (R)	On-the-job training (Recommended); trainees are recommended the specified hours of training on site
Procedural Knowledge	Procedural knowledge addresses how to do something, or how to perform a task. It is the ability to work, or produce a tangible work output by applying cognitive, affective or psychomotor skills.
Training Outcome	Training outcome is a statement of what a learner will know, understand and be able to do **upon the completion of the training**.
Terminal Outcome	Terminal outcome is a statement of what a learner will know, understand and be able to do **upon the completion of a module.** A set of terminal outcomes help to achieve the training outcome.

Acronyms and Abbreviations

Term	Description
QP	Qualification Pack
NSQF	National Skills Qualification Framework
NSQC	National Skills Qualification Committee
NOS	National Occupational Standards
FIFO	First In First Out
FEFO	First Expire First Out
GMP	Good Manufacturing Practices
GHP	Good Hygiene Practices
CPR	Cardiopulmonary Resuscitation