



Model Curriculum

QP Name: Multi Skill Technician-Fruits and Vegetables

QP Code: FIC/Q0205

QP Version: 1.0

NSQF Level: 3

Model Curriculum Version: 1.0

Food Industry Capacity and Skill Initiative (FICSI)
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Training Parameters

Sector	Food Processing
Sub-Sector	Fruits and Vegetables
Occupation	Processing-Fruits and Vegetables
Country	India
NSQF Level	3
Aligned to NCO/ISCO/ISIC Code	NCO-2015/8160.2300,2400,3200,7514.1000, 0700
Minimum Educational Qualification and Experience	1. Grade 10 Pass OR 2. Grade 9 pass and pursuing continuous schooling in regular school OR 3. 9th Grade Pass with 1-year of relevant experience OR 4. Grade 8 pass and pursuing continuous schooling in regular school OR 5. 8th Grade Pass with 2-year of relevant experience OR 6. 5th Grade Pass with 5-year of relevant experience OR 7. Previous relevant qualification of NSQF Level 2.5 with 1.5years of relevant experience OR 8. Previous relevant qualification of NSQF Level 2 with 3 years of relevant experience
Pre-Requisite License or Training	Not Applicable
Minimum Job Entry Age	18 years
Last Reviewed On	18/03/2023
Next Review Date	17/03/2026

NSQC Approval Date	23/06/2023
QP Version	1.0
Model Curriculum Creation Date	15/02/2023
Model Curriculum Valid Up to Date	15/02/2026
Model Curriculum Version	1.0
Minimum Duration of the Course	600 Hours
Maximum Duration of the Course	600 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:

- Sort and grade fruits, vegetables, nuts based on colour, size, appearance, feel and smell
- Process fruits and vegetables to produce jam, jelly and ketchup manually or mechanically
- Operate various mechanical or automated machineries for canning
- Prepare and process various fruits and vegetables manually or in machine-operated units for pickle-making
- Process fruits and vegetables to produce squash and juice manually or mechanically
- Plan, organize, prioritize, inspect, and calculate production requirements and maintain process parameters to achieve the desired quality and quantity
- Maintain process parameters to attain the desired quality and quantity
- Follow and maintain food safety and hygiene in the work environment
- Knowledge of working in a team

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
FIC/N0111 Produce jam, jelly and ketchup NOS Version No.: 2.0 NSQF Level: 3	24:00 Hours	36:00 Hours	00:00 Hours	00:00 Hours	60:00 Hours
Module 1: Introduction to Food Processing Sector and the job role	04:00	00:00	00:00	00:00	04:00
Module 2: Produce Jam, Jelly and Ketchup	20:00 Hours	36:00 Hours	00:00 Hours	00:00 Hours	56:00 Hours
FIC/N0122 Produce Fruit Pulp from Various Fruits NOS Version No. 2.0 NSQF Level 3	60:00 Hours	90:00 Hours	00:00 Hours	00:00 Hours	150:00 Hours
Module 3: Wash and Sort the Fruits for Processing	12:00 Hours	18:00 Hours	00:00 Hours	00:00 Hours	30:00 Hours
Module 4: Peel, De-seed and Destone the Fruits	12:00 Hours	15:00 Hours	00:00 Hours	00:00 Hours	27:00 Hours
Module 5: Fruit Pulp Extraction and Pre-cooking of the Pulp	20:00 Hours	30:00 Hours	00:00 Hours	00:00 Hours	50:00 Hours
Module 6: Aseptic Sterilization and Packing of Fruit Pulp	08:00 Hours	12:00 Hours	00:00 Hours	00:00 Hours	20:00 Hours
Module 7: Can the Fruit Pulp	08:00 Hours	15:00 Hours	00:00 Hours	00:00 Hours	23:00 Hours
FIC/N0203: Carry out preservation of fruits and vegetables Version No.: 1.0 NSQF Level: 4	20:00 Hours	40:00 Hours	00:00 Hours	00:00 Hours	60:00 Hours
Module 8: Carry out preservation of Fruit and Vegetable	20:00 Hours	40:00 Hours	00:00 Hours	00:00 Hours	60:00 Hours

FIC/N0204 Carry out production of various types of pickles and pastes NOS Version No.: 1.0 NSQF Level: 3	20:00 Hours	40:00 Hours	00:00 Hours	00:00 Hours	60:00 Hours
Module 9: Carry out production of various types of pickles and pastes	20:00 Hours	40:00 Hours	00:00 Hours	00:00 Hours	60:00 Hours
FIC/N0129 - Sort and grade produce NOS Version No. 2.0 NSQF Level: 3	44:00 Hours	46:00 Hours	00:00 Hours	00:00 Hours	90:00 Hours

Module 10: Carry out sorting and grading of fruits and vegetables	44:00 Hours	46:00 Hours	00:00 Hours	00:00 Hours	90:00 Hours
FIC/N0103 Produce squash and juice NOS Version No.: 1.0 NSQF Level: 4	32:00 Hours	58:00 Hours	00:00 Hours	00:00 Hours	90:00 Hours
Module 11: Produce squash and juice	32:00 Hours	58:00 Hours	00:00 Hours	00:00 Hours	90:00 Hours
FIC/N9901 –Implement Health and Safety practices at the workplace NOS Version No. 1.0 NSQF Level 3	10:00	20:00	00:00	00:00	30:00
Module 12: Ensuring food safety and personal hygiene	05:00	10:00	00:00	00:00	15:00
Module 13: Managing accidents and emergencies	05:00	10:00	00:00	00:00	15:00
DGT/VSQ/N0102 Employability Skills NOS Version No.: 1.0 NSQF Level: 4	24:00 Hours	36:00 Hours	00:00 Hours	00:00 Hours	60:00 Hours
Module 14: Employability Skills	24:00 Hours	36:00 Hours	00:00Hours	00:00Hours	60:00 Hours
Total Duration	234:00 Hours	366:00 Hours	00:00 Hours	00:00 Hours	600:00 Hours

Module Details

Module 1: Introduction to Food Processing sector and the job role

Mapped to FIC/N0111 v1.0

Terminal Outcomes:

- Describe the food processing industry and its sub-sectors in brief.
- Discuss the roles and responsibilities of a job role holder.

Duration: 04:00	Duration: 00:00
Theory – Key Learning Outcomes	Practical – Key Learning Outcomes
<ul style="list-style-type: none"> • Define food processing and fruits and vegetables processing • Discuss the food processing industry and its various subsectors • Explain the terminologies used in the process of food processing • Discuss the standard business etiquette and code of conduct in the food processing industry • Discuss the career opportunities available in food processing industry 	
Classroom Aids:	
Whiteboard, Marker, Duster, Projector, Laptop, PowerPoint Presentation	
Tools, Equipment, and Other Requirements	
Nil	

Module 2: Produce Jam, Jelly and Ketchup

Mapped to FIC/N0111 v1.0

Terminal Outcomes:

- List the steps followed to prepare Jam, Jelly and ketchup.
- Demonstrate the various processes used to prepare Jam, Jelly and ketchup.

Duration: 20:00	Duration: 36:00
Theory – Key Learning Outcomes	Practical – Key Learning Outcomes
<ul style="list-style-type: none"> • Explain the Selection of Raw material (ripening stage, spices of fruits etc.) for different products. • Explain the processing of Jam. • Define the processing of Jelly. • Explain the processing of Ketchup. • State the procedures used to extract the fruit and vegetable juice/pulp. • Describe enzyme activity in fruit processing • Describe pectin's role. • Describe pasteurization process for fruit processing industry. • Describe sterilization process for fruit processing industry. • State the methods of sterilizing fruit juice. • Define the methods of sterilizing fruit juice. • State the quality control of a product. • List the quality parameters of fruit pulp, jam, jelly and ketchup. • Explain aseptic packaging in fruit processing industry. • State the methods for storing raw materials for later use. • Explain the process of storing packaged fruit pulp. • State the process of maintaining storage conditions as per organizational standards. • Define kinds of waste produced and its 	<ul style="list-style-type: none"> • Demonstrate the pre-pulping processes of fruit and vegetables. • Demonstrate the process of fruit and vegetable pulping. • Demonstrate the process to extract juice. • Demonstrate the process to prepare jam. • Demonstrate the process to prepare jelly. • Demonstrate the process to prepare Ketchup. • Demonstrate the process of Ketchup preparation. • Demonstrate the process of packaging jam and jelly. • Demonstrate the process of packaging ketchup. • Demonstrate the process of cleaning the work area and machines after production.

disposal.	
Classroom Aids:	
Computer, Projection Equipment, PowerPoint Presentation and software, Facilitator's Guide, Participant's Handbook.	
Tools, Equipment and Other Requirements	
SOP; pH meter(Digital); Thermometer (Digital); Beakers; Measuring Cylinder; Measuring flask; Brinometer; Salinometer, Hydrometer; Weighing Balance (Digital); Brix Meter/ Refractometer; Deep fridge; refrigerator; Gas burner with cylinder; Fruit tray; Stainless steel mug; Pilfer proof capping machine; Cutting knives; mixer/electric mixer; water tank; fruit slicing machine; sealing machine; Vacuum gauge; pressure gauge; seam checking gauge or screw gauge; pressure cooker; coring Knives; Pitting knives; Juice extractor, crown corking machine; pulper; fruit mill; vacuum pan; mechanical peeler/ batch type of fruit and vegetable peeling; steam jacket kettle; baby boiler/ exhausting box; shredder for slicing of fruit and vegetable; liquid filling machine; Autoclaves S.S vessels with lids; micrometer seam checking gauge; bottle brush washer; protective gloves, head caps, aprons, safety goggles, safety boots, mouth masks, sanitizer, safety manual.	

Module 3: Wash and Sort the Fruits for Processing

Mapped to FIC/N0122 v2.0

Terminal Outcomes:

- Discuss the procedure to wash the fruits for fruit pulp processing
- Perform the tasks to inspect the washed fruits manually and sort them for fruit pulp processing

Duration: 12:00	Duration: 18:00
Theory – Key Learning Outcomes	Practical – Key Learning Outcomes
<ul style="list-style-type: none"> • Discuss the significance and procedure of receiving and checking fruits from supplier or vendor for quality and quantity • List the physical quality parameters of the fruits such as appearance, colour, texture, maturity, etc. • Discuss the methods to monitor temperature of fruits to be cooled to the required temperature • Elaborate on the standard operating procedure of a ladder conveyor • Explain the Standard Operating Procedure (SOP) to wash fruits to start the process • Discuss the visual inspection procedure for manually washed fruits 	<ul style="list-style-type: none"> • Dramatize a situation on how to receive fruits from the supplier or vendor for quality and quantity • Demonstrate how to check fruits received from supplier or vendor for quality and quantity • Apply appropriate practices to remove dirt, soil, dust, and unwanted sticky material, etc. by dumping fruits into the washing tank • Show how to use transfer fruits from the washing tank to the washing line conveyor using the ladder conveyor • Demonstrate how to rinse fruits with a high-pressure spraying system • Apply appropriate methods to visually inspect the washed fruits and removing damaged, blemished, and rotten ones manually
Classroom Aids:	
Training kit (Trainer guide, Presentations), White board, Marker, Projector, Laptop, Presentation, Participant Handbook and Related Standard Operating Procedures	
Tools, Equipment and Other Requirements	
Washing tank, Washing line conveyor, High-pressure spray, etc.	

Module 4: Peel, De-seed and Destone the Fruits

Mapped to FIC/N0122 v 2.0

Terminal Outcomes:

- Perform the process to peel, de-seed, and cut the sorted fruits
- Describe the ways to dispose of the peeling material or core of the fruits

Duration: 12:00	Duration: 15:00
Theory – Key Learning Outcomes	Practical – Key Learning Outcomes
<ul style="list-style-type: none"> • Elaborate on the standard operating procedure of chopper/cutter/slicer machine • Explain the process of peeling or core removal of the fruits • State the significance ensuring the removal of peel or core appropriately by monitoring the fruits emerging from the peeling or coring process • Discuss the SOP to cut fruits manually and dispose of the waste 	<ul style="list-style-type: none"> • Demonstrate the steps to remove the peel or core of the sorted fruits using the peeler or corer (depending on the type of fruits) • Show how to wash peeled fruits using pump water or open spraying system • Apply appropriate practices to either dispose of or process the peeled material or core further separately as per standards • Demonstrate how to cut fruits manually in required size or loading them in the chopper, cutter or slicer machine • Show how to cut the fruit tip or peel the fruit manually
Classroom Aids:	
Training kit (Trainer guide, Presentations), White board, Marker, Projector, Laptop, Presentation, Participant Handbook and Related Standard Operating Procedures	
Tools, Equipment and Other Requirements	
Peeler, Corer, Open spray system, Chopper, Slicer machine, Cutter, etc.	

Module 5: Fruit Pulp Extraction and Pre-cooking of the Pulp

Mapped to FIC/N0122 v 2.0

Terminal Outcomes:

- Discuss the tasks to be performed to extract the fruit pulp
- Perform the activities to pre-cook the extracted fruit pulp

Duration: 20:00	Duration: 30:00
Theory – Key Learning Outcomes	Practical – Key Learning Outcomes
<ul style="list-style-type: none"> • Discuss the fruit pulp extraction process • State the importance of ensuring that collected pulp is free from seeds and fiber • Discuss the methods to examine pre-cooked fruits pulp • Explain the control parameters (Pressure, temperature, cooking time, stirrer speed, etc.) of cooking tank as per standards • Discuss the standard procedure to replace damaged or clogged filter screen of pulper cum finisher/pulper refiner machine • Describe the procedure to transfer the sample of the pulp to the quality lab as per standards 	<ul style="list-style-type: none"> • Apply appropriate procedure to extract the fruit pulp using various machinery • Employ appropriate practices to collect the refined pulp in the collection tank • Demonstrate how to replace damaged or clogged filter screen of pulper cum finisher or pulper refiner machine • Demonstrate how to pre-cook the pulp by transferring pulp to steam jacketed kettle or pre-cooking tank, checking pumped quantity and setting the control parameters like pressure, temperature, cooking time, stirrer speed, etc. • Demonstrate how to examine pre-cooked fruits pulp through feel or texture • Show how to operate refractometer to measure the brix • Apply appropriate practices to collect the pre-cooked pulp in the collection or holding tank • Employ appropriate practices to collect and transfer the samples of pulp to the quality lab for analysis (such as brix, pH, titratable acidity, etc.) • Demonstrate the procedure to de-aerate and concentrate the fruit pulp
Classroom Aids:	
Training kit (Trainer guide, Presentations), White board, Marker, Projector, Laptop, Presentation, Participant Handbook and Related Standard Operating Procedures	
Tools, Equipment and Other Requirements	
Collection tank, Steam jacketed kettle or Pre-cooking tank, De-aeration tank, Evaporator, etc.	

Module 6: Aseptic Sterilization and Packing of Fruit Pulp

Mapped to FIC/N0122 v 2.0

Terminal Outcomes:

- Discuss the procedure of aseptic sterilization of the fruit pulp
- Perform the activities to pack and send the fruit pulp to the storage area

Duration: 08:00	Duration: 12:00
Theory – Key Learning Outcomes	Practical – Key Learning Outcomes
<ul style="list-style-type: none"> • Discuss the control parameters (such as Temperature, pressure, time, etc.) of the sterilizer to be maintained for sterilizing the fruit pulp • Discuss the operating procedure of aseptic packaging machineries, aseptic packaging process and relevant parameters • Describe the procedure to monitor and maintain steam pressure • State the significance of maintaining the temperature of the product surge tank until the marked filling level • Explain the SOP for sending the filled aseptic bags to the storage area, and storing raw materials, and packaging material 	<ul style="list-style-type: none"> • Demonstrate the procedure to sterilize the pre-cooked, de-aerated and concentrated pulp by transferring the pulp into sterilization tank and adjusting the controls of the tank like temperature, pressure, time etc. • Apply appropriate procedure to monitor and maintain steam pressure by adjusting gauges to sterilize fruit pulp as per standards • Show how to place plastic liners in the container such as drums, cartons, etc. = • Demonstrate how to check the labelling details (like, Date of manufacture, date of expiry, batch code etc.) on the packaging material and place it inside the liner for filling pulp • Demonstrate how to fix spout of aseptic bag to the filling nozzle of the machine • Show how to fill hot sterile product into the aseptic bag and seal or close it with sterile closures while setting controls like pressure, temperature, filling volume etc. • Apply appropriate practices to check for the required weight of the container and label the container along with the details, such as, batch number, date of manufacture, date of expiry, volume/weight, etc. • Employ appropriate practices to transfer filled aseptic bags into the storage area and store them by maintaining storage conditions as per standards

Classroom Aids:

Training kit (Trainer guide, Presentations), White board, Marker, Projector, Laptop, Presentation, Participant Handbook and Related Standard Operating Procedures

Tools, Equipment and Other Requirements

Sterilization tank, Product surge tank, Plastic liners, Drums, Cartons, Aseptic bag, etc.

Module 7: Can the Fruit Pulp

Mapped to FIC/N0122 v 2.0

Terminal Outcomes:

- Discuss the procedure to can the fruit pulp
- Perform the tasks to report the discrepancy, if any

Duration: 08:00	Duration: 15:00
Theory – Key Learning Outcomes	Practical – Key Learning Outcomes
<ul style="list-style-type: none"> • Discuss the operating procedure of canning machinery • Discuss the canning process of the fruit pulp and the parameters to be considered for the process • Describe the procedure to fill pulp into the cans • Discuss the SOP on storing finished goods • Outline the scope of various standards as well as FSSAI laws and regulations on product, packaging, and labelling • Discuss the procedure to place a lid over the filled cans with a sealing machine or manually • State the importance of taking the canned fruit pulp samples for quality lab for analysis • Discuss various types of packaging materials, and packaging machinery for fruit pulp • Discuss standard quality parameters, basic food microbiology and quality assessment of the fruit pulp based on physical parameters 	<ul style="list-style-type: none"> • Demonstrate operating procedure of can reformer, flanger, seamer, can body beader, and embossing machines to form cans • Apply appropriate practices raise stacked cans and transferring them to mechanical conveyor using machine-lift • Employ appropriate observation method to remove defective/damaged cans from the conveyor and discard them as per the standards • Show how to feed the empty cans to conveyors for washing, filling, and sealing machines • Demonstrate the procedure to sterilize, collect, and transfer the cans to the filling machine and also to place them on the conveyor • Show how to transfer pre-cooked/pre-heated pulp into the filling tank and set control parameter, such as temperature, volume, agitator etc. • Show how to transfer the filled can to the can sealing machine and load the canned product manually in metal baskets • Demonstrate how to sterilize process of the can at a specified temperature for specified time and cool the cans in cold water tank by operating the valves to circulate cold water in tanks and manually dry the cans or by adjusting the controls of dryer
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	<ul style="list-style-type: none"> • Apply appropriate practices to transfer the filled and cooled cans to the packaging machine • Apply appropriate practices to take samples of canned products and sending them to the quality lab for analysis • Show how to pack the labeled cans into cartons and transfer to the storage area and store them as per standard storage conditions • Dramatize a situation on how to inform the supervisor on discrepancies or concerns for immediate action
Classroom Aids:	
Training kit (Trainer guide, Presentations), White board, Marker, Projector, Laptop, Presentation, Participant Handbook and Related Standard Operating Procedures	
Tools, Equipment and Other Requirements	
Reformer, Flanger, Seamer, Can body beader, and Embossing machines, Machine-lift, Mechanical conveyor, Packaging machine, etc.	

Module 8: Carry out preservation of Fruits and Vegetables

Mapped to FIC/N0203, v 1.0

Terminal Outcomes:

- Discuss the process to Dry/dehydrate and freeze fruits and vegetables
- Demonstrate the standard practices followed for drying, dehydrating and freezing of fruits and vegetables

Duration: 20:00	Duration: 40:00
Theory – Key Learning Outcomes	Practical – Key Learning Outcomes
<ul style="list-style-type: none"> • List the raw materials to be procured. • Discuss the production plan. • State how to dry/dehydrate fruits and vegetables. • List types of peeling. • Explain the process of reheating the lye solution. • Discuss the use of different solar dryers. • Discuss how to check the physical parameters of the dried product passing out of the dryer. • Explain how to transfer dried product into scraping line or to vibrating mesh conveyor to remove any undesirable particles left on the produce. 	<ul style="list-style-type: none"> • Demonstrate how to check the weight, appearance, and other physical parameters. • Show how to transfer produce into the washing tank. • Show how to operate agitator. • operate sorting/inspecting line conveyor to transfer produce to inspection station. • inspect visually and remove damaged, blemished and rotten fruits and discard them. • Show how to prepare solution for various peeling method. • operate conveyor or elevator and transfer sorted produce into peeler or corer machine. • Show how to set controls of a blancher. • Perform the inspection of blanched produce . • Demonstrate how to transfer dried produce to different dryers for removal of moisture. • Show how to set parameters of dryer. • Carry out cooling of the dried produce • Carry out forming and filling of cans • Show how to add brine and the steps before sealing the cans. • Demonstrate the post sealing process. • Show different steps of freezing the fruits and vegetables.

Classroom Aids
Computer, Projection Equipment, PowerPoint Presentation and software, Facilitator's Guide, Participant's Handbook
Tools, Equipment and Other Requirements
Fruit Washer, Peeler, Fruit Pulper, Juice Extractor, Clarifier, Filter, Pasteurizer, Steam Jacketed Kettles, Packaging Machines, Protective Gloves, Head Caps, Lab Coat, Safety Goggles, Safety Boots, Mouth Masks, Sanitizer, Food Safety Manual

Module 9: Carry out production of various types of pickles and pastes

Mapped to FIC/N0204 v 1.0

Terminal Outcomes:

- Discuss the process for preparing different types of pickles, pastes and murabba from fruits and vegetables
- Demonstrate the standard work practices followed to produce various types of pickles and pastes

Duration: 20:00	Duration: 40:00
Theory – Key Learning Outcomes	Practical – Key Learning Outcomes
<ul style="list-style-type: none"> • Recall the procedure of sampling to test the water quality and verifying the water level • Discuss the significance of drying line conveyor and sorting line conveyor • Describe the operation of a peeling machine • Explain the mechanism of peeling and slicing fruits and vegetables • Explain how to inspect the vegetables and fruits to identify spoilage • Elucidate the need of brine solution and fermentation process • State the importance and use of vinegar, brine and oil solution for pickle making • Describe the method of preparing pickle, paste and murabba using essential machines • Explain the packaging and postproduction activities • Describe the standard practices to replace defective material and to follow the process of disposing them safely • Discuss the impact of various kinds of hazardous material on the production process 	<ul style="list-style-type: none"> • Show how to check the quality and level of water before washing the fruits and vegetables • Demonstrate the standard procedure for rinsing and drying the fruits and vegetables • Show how to use a peeling machine • Illustrate the process of peeling and slicing using appropriate machines • Exemplify the steps to prepare the brine solution and fermentation process • Demonstrate the process of preparing pickle, murabba and paste using necessary machines • Demonstrate how to analyse the quality of the finished product as per the standards of the organization • Demonstrate the various steps that are performed for packaging of the processed food • Illustrate the techniques for cleaning the machineries using recommended sanitizers following industry procedures such as cleaning clean-in-place, cleaning out of place • Apply standard practices to replace defective material and to follow the process of disposing them safely • Show how to dispose unwanted (such as

	broken, chipped or cracked equipment, spoiled material, etc.) and hazardous materials safely as per standard work practices
Classroom Aids:	
Computer, Projection Equipment, PowerPoint Presentation and software, Facilitator's Guide, Participant's Handbook	
Tools, Equipment and Other Requirements	
Water tank, spraying system, drying line conveyor, sorting line conveyor, peeling machine, steam jacketed kettle, salinometer, crusher/mill, pulper, grinding machine, pickle making machine, container, filling machine, batch mixing cooker, raw ingredients, refractometer, storage tank, packaging machines, sterilized packing material, cartons, protective gloves, head caps, aprons, safety goggles, safety boots, mouth masks, various types of sanitisers and disinfectants, trash bins for waste material disposal, equipment for cleaning, procedural manual for reference	

Module 10: Carry out sorting and grading of fruits and vegetables

Mapped to FIC/N0129, v 2.0

Terminal Outcomes:

- Discuss the sequence of operations to be performed for sorting and grading the produce
- List the various types of tools, equipment and related machinery utilised in the process
- Demonstrate the procedure to be followed for sorting, grading, packaging and dispatching the produce

Duration: 44:00	Duration: 46:00
Theory – Key Learning Outcomes	Practical – Key Learning Outcomes
<ul style="list-style-type: none"> • List the quality parameters (physical, chemical, microbiological, sensory) required to be evaluated while sorting the agricultural produce. • Describe the importance of determining physical and sensory characteristics of the produce. • Describe the various types of tests performed to check the quality of agricultural produce. • Discuss the procedure of sampling of produce and testing the water for desired levels of suitability. • State the significance of washing the agricultural produce. • State the importance of grading fruits and vegetables. • Discuss the steps to be performed for receiving agricultural produce from the supplier/vendor. • Explain the technique used for washing fruits and vegetables as per industrial practices. • List the tools and equipment required for washing, drying, sorting and grading of fruits and vegetables. • Identify the rejects and take appropriate action as per standard work practices. 	<ul style="list-style-type: none"> • Show how to receive the agricultural produce. • Demonstrate the procedure to be followed for washing and cleaning the agricultural produce. • Demonstrate the process of drying the washed produce. • Show how to inspect the washed produce to ensure its adequately dried. • Show how to apply waxing on agricultural produce. • Demonstrate the use of various equipment by setting controls for washing, drying, sorting and grading the produce. • Use relevant tools and equipment to test the quality of produce at various stages and take appropriate action in case of variances. • Apply standard practices to move the materials from place to another. • Show how to calibrate the equipment as required at various stages. • Show how to measure the specified quantity of chlorine and dosage in water. • Demonstrate the steps followed to prepare the chlorinated water. • Perform relevant steps for sorting and grading the agricultural produce.
24 <i>Multi Skill Technician - Fruits and Vegetables</i> <ul style="list-style-type: none"> • Describe the storage procedure to store the incoming produce, packaging materials and packed produce safely. 	<ul style="list-style-type: none"> • Employ appropriate practices to move products in the packaging machine.

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| <ul style="list-style-type: none"> • Describe the techniques used for determining the quality of the product. • Explain the standards to be followed for handling various grades of agricultural produce. • Explain the ways to implement food safety management system and critical control points for washing, sorting and grading of agricultural produce. • List the various types of packaging material used in the job. • Discuss the types of defects and procedure to handle rejected materials appropriately. • Explain the methods used to store and organize pallets appropriately. • State the importance of labelling on package. • List the information to be verified on the label. • State the importance of following defined maintenance procedures in the job. • Explain the importance of following standard operating procedures for production, cleaning and use of machine or equipment. • State the importance of evaluating the quality of produce for further processing. • Explain the importance of performing chemical and microbiological tests on the produce and techniques used. • Elucidate the cleaning practices to be followed in the job. • Describe the role of GMP and GHP at the workplace. | <ul style="list-style-type: none"> • Show how to check the product labels to confirm appropriate packing and display of required information. • Show how to pack the product and eliminate the packaging defects. • Carry out secondary packaging as per standard practices. • Operate packaging machine, printing machine and labelling machine effectively. • Apply standard methods to store the produce appropriately. • Demonstrate the procedure to be followed for cleaning the work area and machinery. • Dramatize on how to coordinate with relevant personnel to dispatch the produce for further processing. • Roleplay a situation on how to escalate issues beyond own scope, address issues at work, etc. • Show how to attend to minor repairs and equipment faults. • Show how to clean the tools and equipment after task completion thoroughly. • Prepare sample documents as required in the job. |
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Classroom Aids

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

Tools, Equipment and Other Requirements

Pump, Water, Spray System, Sorting Line Conveyor, Grading Line Conveyor, Electronic Sorting Machine, Packaging Machine, Protective Gloves, Head Caps, Aprons, Safety Goggles, Safety Boots, Mouth Masks, Sanitizer, Food Safety Manual

Module 11: Produce squash and juice

Mapped to FIC/N0103, v1.0

Terminal Outcomes:

- Demonstrate the processing of squash and juice.
- Demonstrate the method of clarifying fruit juice and packaging.

Duration: 32:00	Duration: 58:00
Theory– Key Learning Outcomes	Practical– Key Learning Outcomes
<ul style="list-style-type: none"> • Explain the processing of Squash and Juice. • State the procedures used to extract the fruit and vegetable juice/pulp. • Describe pasteurization process for fruit juice. • List the quality parameters of squash and juice. • Explain aseptic packaging in fruit processing industry. • State the methods for storing raw materials for later use. • Explain the process of storing packaged fruit pulp. • Explain the FSSAI regulations for Squash and Juice. • Explain different quality parameters to be checked for juice and squash 	<ul style="list-style-type: none"> • Demonstrate the pre-extraction processes of fruits. • Demonstrate the method of production and clarifying fruit juice. • Demonstrate the process of packaging squash and juice. • Demonstrate quality checks to be performed • Demonstrate the process of cleaning the work area and machines after production.
Classroom Aids:	
NIL	
Tools, Equipment and Other Requirements	
Thermometer (Digital), Beakers, Measuring Cylinder, Measuring Flask, Weighing Balance (Digital), Brix Meter/Refractometer, Fruit Tray, Cutting Knives, Mixer/Electric Mixer, Fruit Slicing Machine, Pulper, Peeler, Steam Jacketed Kettle, Slicer, Pasteurizer, Sterilizer, Clarifier, Protective Gloves, Head Caps, Aprons, Safety Goggles, Safety Boots, Mouth Masks, Sanitizer, Safety Manual.	

Module 12: Ensuring food safety and personal hygiene

Mapped to FIC/N9901 v 1.0

Terminal Outcomes:

- Explain the ways to ensure food safety and personal hygiene at the workplace
- Demonstrate the steps to be followed for implementing good hygiene and manufacturing practices

Duration: 05:00	Duration: 10:00
Theory – Key Learning Outcomes	Practical – Key Learning Outcomes
<ul style="list-style-type: none"> • Define hazards and risks. • Recall the various types of health and safety equipment available in an organisation and the methods for obtaining them. • Discuss the relevant health and safety standards to be followed in the job as listed in 'The Food Safety and Standards Act, 2006'. • Elucidate the ways to prevent product contamination and cross contamination at the workplace. • Discuss the ways to handle items that can lead to allergic reactions in a retail environment. • State the importance of preventive health check-ups for ensuring personal hygiene. • State the importance of storing food at specified temperature. • Discuss the importance of sanitising self and the work area safely and appropriately. • Recall the ways to store the sanitising materials appropriately. 	<ul style="list-style-type: none"> • Employ appropriate techniques to prevent product contamination and cross contamination. • Demonstrate the steps to be performed for implementing good manufacturing practices (GMP) in a retail environment. • Show how to treat injuries such as cuts, boils, skin infections and grazes appropriately. • Apply suitable methods for disinfecting the work area and equipment thoroughly. • Demonstrate how to wash hands and use alcohol-based sanitisers appropriately. • Show how to wear personal protective equipment such as gloves, hairnets, masks, ear plugs, goggles, shoes etc. properly ensuring adequate protection. • Prepare a sample report consisting of information such as illness to self and others as per organisational practice. • Roleplay a situation on how to communicate with the supervisor for reporting illness of self and others.
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 13: Managing accidents and emergencies

Mapped to FIC/N9901, v 1.0

Terminal Outcomes:

- List the various types of accidents and emergencies that can arise at the workplace and the ways to address them
- Demonstrate the steps to be followed to implement emergency and evacuation procedures effectively

Duration: 05:00	Duration: 10:00
Theory – Key Learning Outcomes	Practical – Key Learning Outcomes
<ul style="list-style-type: none"> • List the various types of health and safety hazards present in the environment. • Discuss the possible causes of risk, hazard or accident at the workplace. • Elucidate the standard practices and precautions used to control and prevent risks, hazards and accidents at the workplace. • Discuss the dangers associated with the use of electrical and other equipment. • State the importance of using protective equipment and clothing for specific tasks and work conditions. • Discuss the role of organisational protocols in preventing accidents and hazards. • Recall the preventive and remedial actions to be taken in the case of exposure to toxic materials at the workplace. • Discuss the various causes of fire and ways to prevent them. • Elaborate the steps to use different types of fire extinguishers. • Explain the procedure to provide artificial respiration and cardio-pulmonary resuscitation (CPR) to the affected. • Summarise the rescue techniques to be followed at times of fire hazard. 	<ul style="list-style-type: none"> • Apply appropriate techniques to deal with hazards safely and appropriately. • Demonstrate the use of various types of fire extinguishers effectively. • Demonstrate appropriate ways to respond to an accident situation or medical emergency promptly and appropriately. • Demonstrate the steps to be followed for providing artificial respiration and cardio-pulmonary resuscitation (CPR) in various instances (e.g. cardiac arrest). • Perform the steps to be followed during emergency and evacuation procedure. • Demonstrate the procedure of freeing a person from electrocution. • Show how to administer appropriate first aid to victims in case of cuts, bleeding, burns, choking, electric shock, poisoning etc.

- Discuss the significance of various types of hazard and safety signs.
- Discuss the workplace emergency and evacuation procedures.
- Elaborate the type of first-aid treatment to be offered at times of shock, electrical shock, bleeding, breaks to bones, minor burns, resuscitation, poisoning, eye injuries, etc.
- Discuss about the potential injuries and ill health conditions that are caused due to incorrect manual handling practices.
- List the precautions to be taken while lifting and carrying materials in a food retail environment.

Classroom Aids:

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

Tools, Equipment and Other Requirements

Helmet, gloves, rubber mat, ladder, neon tester, leather or asbestos gloves, flame proof aprons, flame proof overalls buttoned to neck, cuff less (without folds) trousers, reinforced footwear, helmets/hard hats, cap and shoulder covers, ear defenders/plugs, safety boots, knee pads, particle masks, glasses/goggles/visors, hand and face shields, machine guards, residual current Devices, shields, dust sheets, respirator.

Module 14: Employability skills

Mapped to DGT/VSQ/N0102, v 1.0

Terminal Outcomes:

- Discuss Employability skills, Constitutional values, digital, financial, and legal literacy
- Explain about diversity and Inclusion, communication skills, and customer service
- State the relevance of entrepreneurship skills and how to be ready for jobs and apprenticeship

Duration: 24:00	Duration: 36:00
Theory – Key Learning Outcomes	Practical – Key Learning Outcomes
<ul style="list-style-type: none"> • Discuss the importance of Employability Skills in meeting the job requirements • Explain constitutional values, civic rights, duties, citizenship, responsibility towards society etc. that are required to be followed to become a responsible citizen • Show how to practice different environmentally sustainable practices • Discuss 21st century skills. • Display positive attitude, self - motivation, problem solving, time management skills and continuous learning mindset in different situations • Use appropriate basic English sentences/phrases while speaking • Discuss the significance of reporting sexual harassment issues in time • Discuss the significance of using financial products and services safely and securely • Explain the importance of managing expenses, income, and savings • Explain the significance of approaching the concerned authorities in time for any exploitation as per legal rights and laws • Discuss the significance of using internet for browsing, accessing social media platforms, safely and securely 	<ul style="list-style-type: none"> • Demonstrate how to communicate in a well -mannered way with others • Demonstrate working with others in a team • Show how to conduct oneself appropriately with all genders and PwD • Show how to operate digital devices and use the associated applications and features, safely and securely • Create a biodata

- Discuss the need for identifying opportunities for potential business, sources for arranging money and potential legal and financial challenges
- Differentiate between types of customers
- Explain the significance of identifying customer needs and addressing them
- Discuss the significance of maintaining hygiene and dressing appropriately
- Use various sources to search and apply for jobs
- Discuss the significance of dressing up neatly and maintaining hygiene for an interview
- Discuss how to search and register for apprenticeship opportunities

Classroom Aids:

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

Tools, Equipment and Other Requirements

Computer (PC) with latest configurations – and Internet connection with standard operating system and standard word processor and worksheet software (Licensed) (all software should either be latest version or one/two version below) , UPS, Scanner cum Printer, Computer Tables, Computer Chairs, LCD Projector, White Board 1200mm x 900mm

Annexure

Trainer Requirements

Trainer Prerequisites						
Minimum Educational Qualification	Specialization	Relevant Industry Experience		Training Experience		Remarks
		Years	Specialization	Years	Specialization	
M.Sc/M.Tech/ME	Food Technology or Food Engineering	2	Fruit and vegetable industry	1		
B.Sc or graduate/B.Tech/BE	Food Technology or Food Engineering	3	Fruit and vegetable industry	1		
Diploma	Food Technology or Food Engineering	4	Fruit and vegetable industry	2		
B.Sc	Food Science and Quality Control	4	Fruit and vegetable industry	2		
Diploma / Hotel Management/ Certificate course	Fruits and Vegetables Processing	5	Fruit and vegetable industry	2		

Trainer Certification	
Domain Certification	Platform Certification
Certified for Job Role: “Multi Skill Technician - Fruits and Vegetables mapped to QP: “FIC/Q0205, v1.0”. Minimum accepted score is 80%.	Recommended that the Trainer is certified for the Job Role: “Trainer” (VET & SKILLS), mapped to the Qualification Pack: “MEP/Q2601”, V.2. Minimum accepted SCORE IS 80 % as per SSC guidelines.

Assessor Requirements

Assessor Prerequisites						
Minimum Educational Qualification	Specialization	Relevant Industry Experience		Training/Assessment Experience		Remarks
		Years	Specialization	Years	Specialization	
B. Sc/Diploma	Hotel management/Food Technology/Home Science/Agriculture/Post Harvest Processing	5	Fruit and vegetable industry	3		
B.Tech/B.E./	Food Technology / Food Engineering/Agriculture Engineering	3	Fruit and vegetable industry	2		
M.Sc./M.E./M.Tech	Food Technology or Food Engineering/Agriculture engineering	2	Fruit and vegetable industry	1		
MBA	Agri Business Management/FTM	2	Fruit and vegetable industry	1		

Assessor Certification	
Domain Certification	Platform Certification
Certified for Job Role: “Multi Skill Technician- Fruits and Vegetables” mapped to QP: “FIC/Q0205, v1.0”. Minimum accepted score is 80%.	Recommended that the Assessor is certified for the Job Role: “Assessor” (VET & SKILLS), mapped to the Qualification Pack: “MEP/Q2701”, V-2. Minimum accepted SCORE IS 80 % as per SSC 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 behavioral 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
HACCP	Hazard Analysis and Critical Control Points
GMP	Good Manufacturing Practices
GHP	Good Hygiene Practices