

# Model Curriculum

## Fruit Ripening Technician

**SECTOR: FOOD PROCESSING**  
**SUB-SECTOR: FRUITS AND VEGETABLES**  
**OCCUPATION: PROCESSING**  
**REF ID: FIC/Q0104, V1.0**  
**NSQF LEVEL: 4**



## Certificate

### CURRICULUM COMPLIANCE TO QUALIFICATION PACK – NATIONAL OCCUPATIONAL STANDARDS

is hereby issued by the

FOOD INDUSTRY CAPACITY AND SKILL INITIATIVE (FICSI)

for the

**MODEL CURRICULUM**

Complying to National Occupational Standards of  
Job Role/ Qualification Pack: 'Fruit Ripening Technician' QP No. 'FIC/Q0104, NSQF Level 4'

Date of Issuance: 04 September, 2018

Valid up to: 30 June, 2019

\* Valid up to the next review date of the Qualification Pack



Authorized Signatory  
(Food Industry Capacity and Skill Initiative)

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# Fruit Ripening Technician

## CURRICULUM / SYLLABUS

This program is aimed at training candidates for the job of a “Fruit Ripening Technician”, in the “Food Processing” Sector/Industry and aims at building the following key competencies amongst the learner

<b>Program Name</b>	<b>Fruit Ripening Technician</b>		
<b>Qualification Pack Name &amp; Reference ID.</b>	FIC/Q0104, v1.0		
<b>Version No.</b>	1.0	<b>Version Update Date</b>	04/09/2018
<b>Pre-requisites to Training</b>	Preferably Class 8/ certification in refrigeration system and 1 year experience in a fruit ripening unit		
<b>Training Outcomes</b>	<b>After completing this programme, participants will be able to:</b> <ul style="list-style-type: none"> <li>• Prepare and maintain fruit ripening chamber</li> <li>• Ripen fruits &amp; vegetable in a ripening chamber</li> <li>• Document and maintain records related to fruit &amp; vegetable ripening</li> <li>• Follow and maintain food safety and hygiene in the work environment</li> </ul>		

This course encompasses 4 out of 4 National Occupational Standards (NOS) of “Fruit Ripening Technician” Qualification Pack issued by “Food Industry Capacity and Skill Initiative”.

Sr. No.	Module	Key Learning Outcomes	Equipment Required
1.	<b>Introduction to the Training Program and Overview of Food Processing Industry</b>  <b>Theory Duration</b> (hh:mm) 02:00  <b>Practical Duration</b> (hh:mm) 00:00  <b>Corresponding NOS Code</b> Bridge Module	<ul style="list-style-type: none"> <li>• Introduce each other and build rapport with fellow participants and the trainer.</li> <li>• Define food processing</li> <li>• List the various subsectors of food processing industry</li> <li>• Define fruits and vegetables processing</li> <li>• State the need for fruits and vegetables processing</li> <li>• State the common methods of fruits and vegetables processing</li> <li>• Define ripening of fruits</li> <li>• State the roles and responsibilities of fruit ripening technician</li> <li>• Discuss the nature and availability of job opportunities</li> </ul>	
2.	<b>Organizational Standards and Norms</b>  <b>Theory Duration</b> (hh:mm) 10:00  <b>Practical Duration</b> (hh:mm) 15:00  <b>Corresponding NOS Code</b> FIC/N0114	<ul style="list-style-type: none"> <li>• State the roles and responsibilities of a fruit ripening technician</li> <li>• State how to conduct yourself at the workplace</li> <li>• State the personal hygiene and sanitation guidelines</li> <li>• State the food safety and hygiene standards to be followed in an organization</li> </ul>	Protective Gloves, Head Caps, Aprons, Safety Goggles, Safety Boots, Mouth Masks, Sanitizer, Safety Manual
3.	<b>Prepare and maintain the fruit ripening chamber</b> <b>Theory Duration</b> (hh:mm) 21:00  <b>Practical Duration</b> (hh:mm) 20:00  <b>Corresponding NOS Code</b> FIC/N0113	<ul style="list-style-type: none"> <li>• Clean the fruit ripening chamber using approved sanitizers</li> <li>• Check if the ripening chamber is safe and hygienic</li> <li>• Dispose of the waste material as per company standards</li> <li>• Check working and performance of all equipment</li> <li>• Clean equipment with approved sanitizers</li> <li>• Attend to minor repair and faults</li> <li>• Ensure safety procedures are followed for handling hazardous gas</li> </ul>	Refrigeration System, Ethylene Gas Sensor, Thermostat, Pressure Regulators, Humidity Meter, Protective Gloves, Head Caps, Aprons, Safety Goggles, Safety Boots, Mouth Masks, Sanitizer, Safety Manual

Sr. No.	Module	Key Learning Outcomes	Equipment Required
4.	<p><b>Ripen fruits in the fruit ripening chamber using ethylene gas</b></p> <p><b>Theory Duration</b> (hh:mm) 26:00</p> <p><b>Practical Duration</b> (hh:mm) 45:00</p> <p><b>Corresponding NOS Code</b> FIC/N0114</p>	<ul style="list-style-type: none"> <li>• Read and understand the work order from the supervisor</li> <li>• Check the working and performance of all the machineries</li> <li>• Perform calibration of equipment</li> <li>• Check the temperature and air tightness of the chamber</li> <li>• Report any malfunctions to the supervisor</li> <li>• Weigh the different fruits and vegetables</li> <li>• Inspect the fruits by checking their maturity index</li> <li>• Carry out ripening using ethylene gas</li> <li>• Monitor the working of machineries</li> <li>• Check the quality of ripening fruits</li> </ul>	Refrigeration System, Ethylene Gas Sensor, Thermostat, Pressure Regulators, Humidity Meter, Protective Gloves, Head Caps, Aprons, Safety Goggles, Safety Boots, Mouth Masks, Sanitizer, Safety Manual
5.	<p><b>Complete documentation and record keeping related to fruit ripening</b></p> <p><b>Theory Duration</b> (hh:mm) 06:00</p> <p><b>Practical Duration</b> (hh:mm) 04:00</p> <p><b>Corresponding NOS Code</b> FIC/N0115</p>	<ul style="list-style-type: none"> <li>• State the need for documenting and maintaining records of raw materials, processes and finished products</li> <li>• State the method of documenting and recording the details of raw material to final finished product</li> </ul>	Food Safety Manual, Log Books
6.	<p><b>Food Safety, Hygiene and Sanitation</b></p> <p><b>Theory Duration</b> (hh:mm) 12:00</p> <p><b>Practical Duration</b> (hh:mm) 45:00</p> <p><b>Corresponding NOS Code</b> FIC/N9001</p>	<ul style="list-style-type: none"> <li>• State the importance of safety, hygiene and sanitation in the baking industry</li> <li>• Apply the industry standards to maintain a safe and hygiene workplace</li> <li>• Apply HACCP principles to eliminate food safety hazards in the process and products</li> <li>• Apply safety practices in the work area</li> </ul>	Protective Gloves, Head Caps, Aprons, Safety Goggles, Safety Boots, Mouth Covers, Sanitizer, Safety Manual, Log Books etc.

Sr. No.	Module	Key Learning Outcomes	Equipment Required
7.	<b>Professional and Core Skills</b>  <b>Theory Duration</b> (hh:mm) 04:00  <b>Practical Duration</b> (hh:mm) 12:00  <b>Corresponding NOS Code</b> Bridge Module	<ul style="list-style-type: none"> <li>Undertake a self-assessment test to identify personal strengths and weaknesses</li> <li>Plan and schedule the work order and manage time effectively to complete the tasks assigned</li> <li>Plan to prevent potential problems from occurring</li> <li>Analyze issues and problems using acquired knowledge and realize the importance of decision making</li> <li>Identify potential problems and make sound and timely decision</li> <li>Develop your reading skills</li> <li>State the importance of listening</li> </ul>	Laptop, White/Black Board, Marker, Chart Papers, Projector, Trainer's Guide, Student Manual
8.	<b>IT Orientation</b>  <b>Theory Duration</b> (hh:mm) 06:00  <b>Practical Duration</b> (hh:mm) 12:00  <b>Corresponding NOS Code</b> FIC/N0115	<ul style="list-style-type: none"> <li>Identify parts of the computer</li> <li>Use the computer keyboard effectively to type</li> <li>Use ERP effectively to record day-to-day activities</li> <li>Use the word processor effectively</li> <li>Use the spreadsheet application effectively</li> <li>Use the computer to document day-to-day activities</li> </ul>	Computer/Laptop
	<b>Total Duration</b> <b>240:00</b>  <b>Theory Duration</b> <b>87:00</b>  <b>Practical Duration</b> <b>153:00</b>	<b>Unique Equipment Required:</b> Refrigeration System, Ethylene Gas Sensor, Thermostat, Pressure Regulators, Humidity Meter, Protective Gloves, Head Caps, Aprons, Safety Goggles, Safety Boots, Mouth Masks, Sanitizer, Safety Manual, Log Book, Computer/Laptop, Samples of Fresh and Spoiled Food	

Grand Total Course Duration: **240Hours, 0 Minutes**

(This syllabus/ curriculum has been approved by SSC: Food Industry Capacity and Skill Initiative)

## Trainer Prerequisites for Job role: “Fruit Ripening Technician” mapped to Qualification Pack: “FIC/Q0104, v1.0”

Sr. No.	Area	Details
1	<b>Description</b>	To deliver accredited training service, mapping to the curriculum detailed above, in accordance with the Qualification Pack “FIC/Q0104”, Version 1.0
2	<b>Personal Attributes</b>	An aptitude for conducting training, and pre/ post work to ensure competent, employable candidates at the end of the training, and pre/post work to ensure competent, employable candidates at the end of the training. Strong communication skills, ability to work as part of a team; a passion for quality and for developing others; well-organized and focused, eager to learn and keep oneself updated with the latest in the mentioned fields.
3	<b>Minimum Educational Qualifications</b>	<ul style="list-style-type: none"> <li>B.Sc/B.Tech/BE in Food Technology or Agriculture with 2 years of hands on experience in a Fruits/Vegetables Processing Unit</li> <li>Diploma in Food Technology or Agriculture with 3-4 years of hands on experience in a Fruits/Vegetables Processing Unit</li> </ul>
4a	<b>Domain Certification</b>	Certified for Job Role: “ <u>Fruit Ripening Technician</u> ” mapped to QP: “FIC/Q0104, v1.0”. Minimum accepted score is 80%
4b	<b>Platform Certification</b>	Recommended that the Trainer is certified for the Job Role: “Trainer”, mapped to the Qualification Pack: “MEP/Q0102”. Minimum accepted score is 80 % as per FICSI guidelines.
5	<b>Experience</b>	<ul style="list-style-type: none"> <li>B.Sc/B.Tech/BE in Food Technology or Agriculture with 2 years of hands on experience in a Fruits/Vegetables Processing Unit</li> <li>Diploma in Food Technology or Agriculture with 3-4 years of hands on experience in a Fruits/Vegetables Processing Unit</li> </ul>



## Annexure: Assessment Criteria

<b>Assessment Criteria</b>	
<b>Job Role</b>	<b>Fruit Ripening Technician</b>
<b>Qualification Pack</b>	<b>FIC/Q0104, v1.0</b>
<b>Sector Skill Council</b>	<b>Food Processing</b>

### **Guidelines for Assessment:**

1. Criteria for assessment for each Qualification Pack will be created by the Sector Skill Council. Each Performance Criteria (PC) will be assigned marks proportional to its importance in NOS. SSC will also lay down proportion of marks for Theory and Skills Practical for each PC
2. The assessment for the theory part will be based on knowledge bank of questions created by the SSC.
3. Assessment will be conducted for all compulsory NOS, as well as the selected elective NOS/set of NOS.  
OR
4. Assessment will be conducted for all compulsory NOS, as well as the selected optional NOS/set of NOS.
5. Individual assessment agencies will create unique question papers for theory part for each candidate at each examination/training centre (as per assessment criteria below)
6. Individual assessment agencies will create unique evaluations for skill practical for every student at each examination/training centre based on this criteria
7. To pass the Qualification Pack, every trainee should score a minimum of 70% of aggregate marks to successfully clear the Assessment.
8. In case of unsuccessful completion, the trainee may seek reassessment on the Qualification Pack

		Total Mark	Out Of	Marks Allocation	
				Theory	Skills Practical
<b>1. FIC/Q0113: Prepare and fruit ripening chamber</b>	PC.1 Prepare, clean and maintain the cleanliness of the fruit ripening chamber using approved sanitizers and keep it free from dust, waste, flies and pests	<b>100</b>	25	10	15
	PC2. Ensure that the ripening chamber is safe and hygienic for food		10	3	7
	PC3. Dispose waste materials as per defined SOPs and industry requirements		15	5	10
	PC4. Check the working and performance of all machineries and tools used.		15	5	10
	PC5. Clean the machineries and tools used with approved sanitizers following SOP		5	2	3
	PC6. Calibrate the required equipments		10	4	6
	PC7. Attend the minor repairs/ faults of all machines, if required		15	5	10
	PC8. Check the quantity of gas in the gas cylinder		5	1	4
	PC9. Ensure safety procedures are followed for handling hazardous gas such as storage condition of gas cylinders, calibration and working of pressure regulators, etc. as per organisation standards		5	1	4
			<b>100</b>	<b>35</b>	<b>65</b>
<b>2. FIC/Q0114: Ripen fruits in fruit ripening chamber</b>	PC1. Read and understand the production order from supervisor	<b>100</b>	2	1.5	0.5
	PC2. Ensure the working and performance of all equipment required for fruit ripening		3	1	2
	PC3. Check the calibration of the equipments used for fruit ripening		3	1.5	1.5
	PC4. Check the working of the cooling equipment and ensure readiness		3	1	2
	PC5. Check the temperature and air tightness of the ripening chamber		3	1	2
	PC6. Check the control parameters (temperature, relative humidity, air circulation, etc.)		4	1	3
	PC7. Report any malfunction to the supervisor		1	0.5	0.5
	PC8. Understand suggested solutions and implement immediately		1	0.5	0.5
	PC9. Receive the fruits, check the weight and check quality of fruit based on its colour, pulp temperature, texture, maturity, etc.		6	2.5	3.5
	PC10.Sort the fruit for ripening based on the stage of maturity		3	1	2

	PC11.Organize packaging material (cartons/crates) or construct packaging material (wooden pallets		3	1	2
	PC12.Pack the fruits in the packaging material following SOP		3	1	2
	PC13.Label the packed fruits with details (name of the fruit, variety, etc.) As per organisation standards		2	1	1
	PC14. Determine the ripening requirement (ethylene concentration, temperature, air circulation, ethylene exposure time, relative humidity, etc.) For the fruit from the ripening parameter chart followed by the organisation		3	1.5	1.5
	PC15. Load the packed fruit in the ripening chamber following the stacking guidelines followed by the organisation and close the chamber		5	2	3
	PC16. Adjust the controls to set the required temperature, time, relative humidity to pre-cool the fruit		5	2	3
	PC17.Monitor the temperature to ensure the fruit is cooled to required temperature		5	2	3
	PC18.Open and control the regulator of the ethylene generator or use plc to introduce ethylene into the chamber to initiate ripening of fruit		5	2	3
	PC19. Monitor the air circulation system for uniform ethylene flow for the required period of time		5	2	3
	PC20. Adjust the controlling system to maintain required temperature for the fruit for specified period of time		5	1	4
	PC21. Adjust the ventilation system at periodic intervals by controlling the speed of exhaust fan to remove carbon-di-oxide		5	1	4
	PC22. Monitor the sensors and adjust controlling system to maintain temperature, relative humidity, carbondi-oxide concentration, in case of manual operation		5	1	4
	PC23. Control the PLC (ripening room management system) for temperature, fan speed, energy usage, ventilation intervals, relative humidity, etc. In the PLC controlled ripening room		5	2	3
	PC24. Open the room after specified period, leave it open and start the fan for ventilation ( to ventilate ethylene gas)		5	2	3
	PC25. Stop the fan after ventilation and remove the ripened fruit from the ripening chamber		5	1	4

	PC26. Check the quality of ripened fruit, weight it and store it as per organisation standards until dispatch to the market/farmer		5	1	4
			<b>100</b>	<b>35</b>	<b>65</b>
<b>3. FIC/N0115: Complete documentation and record keeping related to fruit ripening</b>	PC1. Document and maintain records of details of raw materials and packaging materials as per organizational standards	<b>100</b>	10	6	4
	PC2. Document and maintain record on observations (if any) related to raw materials and packaging materials		5	3	2
	PC3. Load the raw material details in ERP for future reference		5	3	2
	PC4. Verify the documents and track from finished products to raw materials, in case of quality concerns and during quality management system audits		5	3	2
	PC5. Document and maintain records of production plan with details		10	6	4
	PC6. Document and maintain records of process details for entire production in process chart or production log for all products produced		15	9	6
	PC7. Document and maintain records of batch size, production yield, wastage of raw materials, energy utilization and final product produced		10	6	4
	PC8. Document and maintain record of observations or deviations		5	3	2
	PC9. Load the production plan and process details in ERP for future reference		5	3	2
	PC10. Verify documents and track from finished product to ingredients, in case of quality concerns and for quality management system audit		5	3	2
	PC11. Document and maintain records of finished products		3	2	1
	PC12. Document and maintain records of the finished product details as per organizational standards		7	4	3
	PC13. Document and maintain record on observations or deviations related to finished products		5	3	2
	PC14. Load the finished product details in ERP for future reference		5	3	2
	PC15. Verify the documents and track from finished product to ingredients, in case of quality concerns and for quality management system audits		5	3	2
			<b>100</b>	<b>60</b>	<b>40</b>

<b>4. FIC/N9001: Food Safety, hygiene and sanitation for processing food products</b>	PC1. Comply with food safety and hygiene procedures followed in the organization	<b>100</b>	5	2	3
	PC2. Ensure personal hygiene by use of gloves, masks ,hair net, ear plugs, boots etc.		6	1	5
	PC3. Ensure hygienic production of food by inspecting raw materials, ingredients, finished products etc for compliance to physical, chemical and microbiological procedures		5	2	3
	PC4. Pack products in appropriate packaging material, label and store them in designated area free from pests, flies etc.		10	4	6
	PC5. Clean, maintain and monitor food processing equipments periodically, using it only for the specified purpose		5	2	3
	PC6. Use safety equipment such as fire extinguisher, eye wash unit, first aid kit when required		10	4	6
	PC7. Follow housekeeping practices by having designated area for machines/tools		5	2	3
	PC8. Follow industry standards like GMP, HACCP and product recall		10	4	6
	PC9. Attend training on hazard management to understand type of physical, chemical and microbiological hazards		5	1	4
	PC10. Identify, document and report problems such as rodents and pests to management		5	1	4
	PC11. Conduct workplace checklist audit before and after work to ensure safety and hygiene		5	1	4
	PC12. Document and maintain raw material, process, packaging material to maintain the effectiveness of quality system		4	1	3
	PC13. Determine the quality of food using criteria such as odor, color, taste and best before date and take immediate measures to prevent spoilage		5	2	3
	PC14. Store raw materials, finished products and allergens separately to prevent cross contamination		5	2	3
	PC15. Label raw materials and finished products and store them in different storage areas according to safe food practices		5	2	3

	PC16.Follow stock rotation based on FEFO/FIFO		10	4	6
			<b>100</b>	<b>35</b>	<b>65</b>