

Qualification Pack



Fruit Pulp Processing Technician

Electives: Squash and Juice / Jam, Jelly and Ketchup

QP Code: FIC/Q0106

Version: 3.0

NSQF Level: 3

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FIC/Q0106: Fruit Pulp Processing Technician

Brief Job Description

The individual at work is responsible for producing fruit pulp from a variety of fruits through various processes from preparing for the production till storage of the final product.

Personal Attributes

The job requires the individual to be physically fit with the ability to plan, organize, prioritize, and handle pressure.

Applicable National Occupational Standards (NOS)

Compulsory NOS:

1. [FIC/N9026: Prepare for production](#)
2. [FIC/N0122: Produce fruit pulp from various fruits](#)
3. [FIC/N9901: Implement health and safety practices at the workplace](#)
4. [FIC/N9902: Work effectively in an organisation](#)
5. [SGJ/N1702: Optimize resource utilization at workplace](#)

Electives (mandatory to select at least one):

Elective 1: Squash and Juice

This elective is about production of squash and juice.

1. [FIC/N0103: Produce squash and juice](#)

Elective 2: Jam, Jelly and Ketchup

This elective is about production of jam, jelly and ketchup

1. [FIC/N0111: Produce jam, jelly and ketchup](#)

Qualification Pack (QP) Parameters

Sector	Food Processing
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Sub-Sector	Fruits and Vegetables
Occupation	Processing-Fruits and Vegetables
Country	India
NSQF Level	3
Aligned to NCO/ISCO/ISIC Code	NCO-2015/7514.9900
Minimum Educational Qualification & Experience	10th Class OR 8th Class with 2 Years of experience relevant experience OR Certificate-NSQF (Level 3 qualification certificate of food processing sector) with 2 Years of experience relevant experience OR Ability to read and write with 5 Years of experience relevant experience
Minimum Level of Education for Training in School	Not Applicable
Pre-Requisite License or Training	NA
Minimum Job Entry Age	16 Years
Last Reviewed On	30/12/2021
Next Review Date	24/02/2024
Deactivation Date	24/02/2024
NSQC Approval Date	24/02/2022
Version	3.0
Reference code on NQR	2022/FI/FICSI/05404
NQR Version	1

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FIC/N9026: Prepare for production

Description

This NOS unit is about performing various tasks prior to production in the food processing industry.

Scope

The scope covers the following :

- Plan for production
- Clean and maintain work area, machineries, and tools for production
- Organize for production

Elements and Performance Criteria

Plan for production

To be competent, the user/individual on the job must be able to:

- PC1.** identify work requirements by obtaining instructions from the supervisor. Instructions: process chart, product flow chart, formulation, chart, etc.
- PC2.** plan and prioritize tasks as per work schedule. Tasks: inspect, clean, maintain, verify, etc.
- PC3.** estimate manpower and material requirements as per work requirement. Material: raw materials and packaging materials
- PC4.** ensure required quantity of raw materials, packaging materials, equipment, and manpower for production
- PC5.** plan capacity utilization of machinery with respect to the processing time, production order, and batch size for each product

Clean and maintain work area, machineries, and tools for production

To be competent, the user/individual on the job must be able to:

- PC6.** clean and maintain the work area as per organizational procedures
- PC7.** clean and maintain the machines and tools and sanitize them as per the organization's specifications and standards
- PC8.** dispose of the waste material at designated place safely. Waste material: hazardous waste, food waste, packaging waste, etc.
- PC9.** inspect the tools, equipment, and machinery to ascertain suitability for use
- PC10.** report information such as faulty tools and equipment to the concerned authority

Organize for production

To be competent, the user/individual on the job must be able to:

- PC11.** organize tools and equipment
- PC12.** receive and organize production materials appropriately. Production materials: raw materials, packaging materials, etc.
- PC13.** allot responsibilities/work to the assistants and helpers

Knowledge and Understanding (KU)

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The individual on the job needs to know and understand:

- KU1.** production planning process
- KU2.** analysis and interpretation of various process charts, product flow charts, etc.
- KU3.** resource management process
- KU4.** procedure to estimate manpower and raw material
- KU5.** capacity utilization calculation
- KU6.** organizational policies and SOP on cleanliness
- KU7.** operating procedure and general maintenance of food production machineries
- KU8.** waste management procedures
- KU9.** methods to inspect tools, equipment and machinery
- KU10.** procedure to allot work or responsibility to the team

Generic Skills (GS)

User/individual on the job needs to know how to:

- GS1.** read and interpret organizational policies, SOP, production charts, etc.
- GS2.** communicate effectively with subordinates as well as supervisors
- GS3.** plan and prioritize various tasks
- GS4.** be always punctual and courteous
- GS5.** organize all process/equipment manuals to access information easily
- GS6.** discuss task lists, schedules, and activities with the senior/supervisor

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Assessment Criteria

Assessment Criteria for Outcomes	Theory Marks	Practical Marks	Project Marks	Viva Marks
<i>Plan for production</i>	11	25	-	-
PC1. identify work requirements by obtaining instructions from the supervisor. Instructions: process chart, product flow chart, formulation, chart, etc.	3	6	-	-
PC2. plan and prioritize tasks as per work schedule. Tasks: inspect, clean, maintain, verify, etc.	2	5	-	-
PC3. estimate manpower and material requirements as per work requirement. Material: raw materials and packaging materials	2	4	-	-
PC4. ensure required quantity of raw materials, packaging materials, equipment, and manpower for production	2	5	-	-
PC5. plan capacity utilization of machinery with respect to the processing time, production order, and batch size for each product	2	5	-	-
<i>Clean and maintain work area, machineries, and tools for production</i>	14	32	-	-
PC6. clean and maintain the work area as per organizational procedures	3	7	-	-
PC7. clean and maintain the machines and tools and sanitize them as per the organization's specifications and standards	3	7	-	-
PC8. dispose of the waste material at designated place safely. Waste material: hazardous waste, food waste, packaging waste, etc.	3	7	-	-
PC9. inspect the tools, equipment, and machinery to ascertain suitability for use	3	6	-	-
PC10. report information such as faulty tools and equipment to the concerned authority	2	5	-	-
<i>Organize for production</i>	5	13	-	-
PC11. organize tools and equipment	2	7	-	-

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Assessment Criteria for Outcomes	Theory Marks	Practical Marks	Project Marks	Viva Marks
PC12. receive and organize production materials appropriately. Production materials: raw materials, packaging materials, etc.	2	4	-	-
PC13. allot responsibilities/work to the assistants and helpers	1	2	-	-
NOS Total	30	70	-	-

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National Occupational Standards (NOS) Parameters

NOS Code	FIC/N9026
NOS Name	Prepare for production
Sector	Food Processing
Sub-Sector	Generic
Occupation	Production
NSQF Level	3
Credits	TBD
Version	1.0
Last Reviewed Date	24/02/2022
Next Review Date	24/02/2025
NSQC Clearance Date	24/02/2022

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FIC/N0122: Produce fruit pulp from various fruits

Description

This unit is about producing fruit pulp from a variety of fruits using various machinery as per the standards and the requirements of the organization.

Scope

The scope covers the following :

- Wash and sort the fruits
- Peel/De-seed/Destone the fruits
- Perform fruit pulp extraction and pre-cooking pulp activities
- Carry out aseptic sterilization and packing of fruit pulp
- Can fruit pulp
- Perform post-production cleaning and maintenance of equipment's

Elements and Performance Criteria

Wash and sort the fruits

To be competent, the user/individual on the job must be able to:

- PC1.** dump fruits into the washing tank to remove dirt, soil, dust and unwanted sticky material, etc.
- PC2.** transfer fruits from the washing tank to the washing line conveyor using ladder conveyor
- PC3.** rinse fruits with a high-pressure spraying system
- PC4.** inspect and sort fruits visually and manually to remove damaged, blemished, and rotten fruits

Peel/De-seed/Destone the fruits

To be competent, the user/individual on the job must be able to:

- PC5.** put sorted fruits in the peeler or corer (depending on the type of fruits)
- PC6.** remove the peel or core of the fruits
- PC7.** wash peeled fruits with pump water or open spraying system
- PC8.** observe the fruits emerging from the peeling/coring process and ensure removal of peel/core
- PC9.** dispose of or further process the peeled material/core separately as per organization standards, as appropriate
- PC10.** cut fruits manually in required size or load the fruits in the chopper/cutter/slicer machine
- PC11.** cut the fruit tip or peel manually, if required

Perform fruit pulp extraction and pre-cooking pulp activities

To be competent, the user/individual on the job must be able to:

- PC12.** extract pulp of the fruits using various machinery
- PC13.** collect the refined pulp in the collection tank
- PC14.** check collected pulp to ensure if it is free from seeds and fiber
- PC15.** replace damaged or clogged filter screen of pulper cum finisher/pulper refiner machine

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- PC16.** transfer measured quantity of pulp from collection tank to steam jacketed kettle/ pre-cooking tank for cooking pulp
- PC17.** check pumped quantity through the level indicator and glass windows of the pre-cooking tank
- PC18.** set control parameters of cooking tank, as required. Set Controls: Pressure, temperature, cooking time, stirrer speed, etc.
- PC19.** examine pre-cooked fruits pulp through feel/texture
- PC20.** measure the brix with the help of refractometer
- PC21.** collect the pre-cooked pulp in the collection tank/ holding tank
- PC22.** take samples of the pulp and transfer it to the quality lab for analysis as per organizational standards. Analysis: Brix, pH, titratable acidity, etc.
- PC23.** transfer measured quantity of pre-cooked pulp into de-aeration tank to the de-aerate pulp
- PC24.** transfer measured quantity of de-aerated pulp into continuous evaporator for concentrating the pulp

Carry out aseptic sterilization and packing of fruit pulp

To be competent, the user/individual on the job must be able to:

- PC25.** transfer measured quantity of pre-cooked/de-aerated and concentrated pulp into sterilization tank to sterilize pulp before aseptic packing
- PC26.** perform sterilization of the pre-cooked/de-aerated and concentrated pulp as per organizational standards. Adjust controls of the sterilizer: Temperature, pressure, time, etc.
- PC27.** monitor and maintain steam pressure by adjusting gauges to sterilize fruit pulp as per SOP
- PC28.** maintain the temperature of the product surge tank until the marked filling level
- PC29.** place plastic liners in the container such as drums, cartons, etc.
- PC30.** check the labelling details on the packaging material and place inside the liner for filling pulp. Details: Date of manufacture, date of expiry, batch code etc.
- PC31.** fix the spout of the aseptic bag to the filling nozzle of the machine
- PC32.** fill hot sterile product into the aseptic bag. Set controls: Pressure, temperature, filling volume, etc. and automatically seal/close with sterile closures
- PC33.** check for the required weight of the container and label the container along with the details. Details: Batch number, date of manufacture, date of expiry, volume/weight, etc.
- PC34.** transfer filled aseptic bags into the storage area and store them by maintaining storage conditions as per SOP

Can fruit pulp

To be competent, the user/individual on the job must be able to:

- PC35.** operate can reformer, flanger, seamer, can body beader, and embossing machines to form cans
- PC36.** use machine-lift to raise stacked cans and transfers them to mechanical conveyor
- PC37.** observe passing cans and remove defective/damaged cans from the conveyor and discard them as per SOP
- PC38.** feed empty cans to conveyors leading to the washing, filling, and sealing machines. Set controls: Temperature, pressure, conveyor speed of empty can machine, etc.
- PC39.** perform sterilization process of the cans and collect sterilized cans and transfer them to the filling machine

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- PC40.** place sterilized cans on conveyor/manually in the filling line conveyor
 - PC41.** transfer pre-cooked/pre-heated pulp into the filling tank. Set control: Temperature, volume, agitator etc.
 - PC42.** transfer filled cans to the can sealing machine or manually place a lid over the filled cans
 - PC43.** load the canned product manually in metal baskets
 - PC44.** sterilize the can to a specified temperature for specified time
 - PC45.** 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
 - PC46.** inspect the cans for leakage and remove the leaked cans from the water tank for further re-use/discard
 - PC47.** transfer the filled and cooled cans to the packaging machine
 - PC48.** take samples of the canned product and send them to the quality lab for analysis
 - PC49.** pack the labeled cans into cartons and transfer to the storage area and store them as per standard storage conditions
 - PC50.** inform department supervisor on discrepancies/concerns for immediate action
- Perform post-production cleaning and maintenance of equipment's*
- To be competent, the user/individual on the job must be able to:
- PC51.** clean work area, machineries, equipment, and tools using recommended cleaning agents and sanitizers
 - PC52.** attend minor repairs/faults of all the machines, if any
 - PC53.** ensure periodic (daily/weekly/monthly/quarterly/half-yearly/annual) maintenance of all machines and equipment as per standard

Knowledge and Understanding (KU)

The individual on the job needs to know and understand:

- KU1.** procedure to receive and check fruits from the supplier/vendor for quality and quantity
- KU2.** physical parameters such as appearance, colour, texture, maturity, etc. to check the quality of the fruit
- KU3.** methods to monitor the temperature of the fruits to be cooled to the required temperature
- KU4.** operating procedure of the ventilation system, ladder conveyor, chopper/cutter/slicer machine, aseptic packaging machineries, and canning machineries
- KU5.** SOP to wash fruits, cut fruits manually, dispose of the waste, replace damaged or clogged filter screen of pulper cum finisher/pulper refiner machine, transfer quality lab analysis of the products, send filled aseptic bags to the storage area, storing raw materials, packaging materials and finished goods
- KU6.** visual inspection procedure for manually washed fruits
- KU7.** peel/core removal process of the fruits
- KU8.** basics and concept of fruit pulp extraction process
- KU9.** process to collect refined fruit pulp into collection tank
- KU10.** methods to examine pre-cooked fruits pulp
- KU11.** aseptic packaging process and parameters

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- KU12.** procedure to monitor and maintain steam pressure
- KU13.** canning process and parameters
- KU14.** how to fill pulp into the cans
- KU15.** types and category of packaging materials, and packaging machineries
- KU16.** post-production cleaning and maintenance procedures of the production equipment
- KU17.** quality parameters, basic food microbiology, and quality assessment based on physical parameters
- KU18.** sanitizers and disinfectants and its handling and storing procedure
- KU19.** organizational and FSSAI laws and regulations on product, packaging, and labelling

Generic Skills (GS)

User/individual on the job needs to know how to:

- GS1.** note down the information communicated by the senior/supervisor, raw materials used for production and the finished products produced, readings of the process parameters and provide necessary information to fill the process chart, and down observations (if any) related to the process
- GS2.** read and interpret equipment manuals and process documents to understand the equipment's operation and process requirement, and internal information documents sent by internal teams, etc.
- GS3.** write information documents to internal departments/ internal teams
- GS4.** plan, prioritize, and sequence work operations
- GS5.** communicate effectively with the team members, senior/supervisor, and other departments
- GS6.** discuss task lists, schedules, and activities with the senior/supervisor
- GS7.** analyse critical points in day-to-day tasks through experience and observation and identify control measures to solve the issue

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Assessment Criteria

Assessment Criteria for Outcomes	Theory Marks	Practical Marks	Project Marks	Viva Marks
<i>Wash and sort the fruits</i>	8	12	-	-
PC1. dump fruits into the washing tank to remove dirt, soil, dust and unwanted sticky material, etc.	2	3	-	-
PC2. transfer fruits from the washing tank to the washing line conveyor using ladder conveyor	2	3	-	-
PC3. rinse fruits with a high-pressure spraying system	2	3	-	-
PC4. inspect and sort fruits visually and manually to remove damaged, blemished, and rotten fruits	2	3	-	-
<i>Peel/De-seed/Destone the fruits</i>	10	10	-	-
PC5. put sorted fruits in the peeler or corer (depending on the type of fruits)	1	1	-	-
PC6. remove the peel or core of the fruits	1	1	-	-
PC7. wash peeled fruits with pump water or open spraying system	1	1	-	-
PC8. observe the fruits emerging from the peeling/coring process and ensure removal of peel/core	2	1	-	-
PC9. dispose of or further process the peeled material/core separately as per organization standards, as appropriate	1	2	-	-
PC10. cut fruits manually in required size or load the fruits in the chopper/cutter/slicer machine	2	2	-	-
PC11. cut the fruit tip or peel manually, if required	2	2	-	-
<i>Perform fruit pulp extraction and pre-cooking pulp activities</i>	26	17	-	-
PC12. extract pulp of the fruits using various machinery	2	2	-	-
PC13. collect the refined pulp in the collection tank	2	2	-	-
PC14. check collected pulp to ensure if it is free from seeds and fiber	2	1	-	-

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Assessment Criteria for Outcomes	Theory Marks	Practical Marks	Project Marks	Viva Marks
PC15. replace damaged or clogged filter screen of pulper cum finisher/pulper refiner machine	2	1	-	-
PC16. transfer measured quantity of pulp from collection tank to steam jacketed kettle/ pre-cooking tank for cooking pulp	2	1	-	-
PC17. check pumped quantity through the level indicator and glass windows of the pre-cooking tank	2	1	-	-
PC18. set control parameters of cooking tank, as required. Set Controls: Pressure, temperature, cooking time, stirrer speed, etc.	2	1	-	-
PC19. examine pre-cooked fruits pulp through feel/texture	2	1	-	-
PC20. measure the brix with the help of refractometer	2	1	-	-
PC21. collect the pre-cooked pulp in the collection tank/ holding tank	2	2	-	-
PC22. take samples of the pulp and transfer it to the quality lab for analysis as per organizational standards. Analysis: Brix, pH, titratable acidity, etc.	2	2	-	-
PC23. transfer measured quantity of pre-cooked pulp into de-aeration tank to the de-aerate pulp	2	1	-	-
PC24. transfer measured quantity of de-aerated pulp into continuous evaporator for concentrating the pulp	2	1	-	-
<i>Carry out aseptic sterilization and packing of fruit pulp</i>	14	20	-	-
PC25. transfer measured quantity of pre-cooked/de-aerated and concentrated pulp into sterilization tank to sterilize pulp before aseptic packing	1	2	-	-
PC26. perform sterilization of the pre-cooked/de-aerated and concentrated pulp as per organizational standards. Adjust controls of the sterilizer: Temperature, pressure, time, etc.	2	2	-	-
PC27. monitor and maintain steam pressure by adjusting gauges to sterilize fruit pulp as per SOP	2	2	-	-
PC28. maintain the temperature of the product surge tank until the marked filling level	2	2	-	-

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Assessment Criteria for Outcomes	Theory Marks	Practical Marks	Project Marks	Viva Marks
PC29. place plastic liners in the container such as drums, cartons, etc.	2	2	-	-
PC30. check the labelling details on the packaging material and place inside the liner for filling pulp. Details: Date of manufacture, date of expiry, batch code etc.	1	2	-	-
PC31. fix the spout of the aseptic bag to the filling nozzle of the machine	1	2	-	-
PC32. fill hot sterile product into the aseptic bag. Set controls: Pressure, temperature, filling volume, etc. and automatically seal/close with sterile closures	1	2	-	-
PC33. check for the required weight of the container and label the container along with the details. Details: Batch number, date of manufacture, date of expiry, volume/weight, etc.	1	2	-	-
PC34. transfer filled aseptic bags into the storage area and store them by maintaining storage conditions as per SOP	1	2	-	-
<i>Can fruit pulp</i>	28	32	-	-
PC35. operate can reformer, flanger, seamer, can body beader, and embossing machines to form cans	1	2	-	-
PC36. use machine-lift to raise stacked cans and transfers them to mechanical conveyor	2	2	-	-
PC37. observe passing cans and remove defective/damaged cans from the conveyor and discard them as per SOP	2	2	-	-
PC38. feed empty cans to conveyors leading to the washing, filling, and sealing machines. Set controls: Temperature, pressure, conveyor speed of empty can machine, etc.	2	2	-	-
PC39. perform sterilization process of the cans and collect sterilized cans and transfer them to the filling machine	2	2	-	-
PC40. place sterilized cans on conveyor/manually in the filling line conveyor	2	2	-	-

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Assessment Criteria for Outcomes	Theory Marks	Practical Marks	Project Marks	Viva Marks
PC41. transfer pre-cooked/pre-heated pulp into the filling tank. Set control: Temperature, volume, agitator etc.	1	2	-	-
PC42. transfer filled cans to the can sealing machine or manually place a lid over the filled cans	2	2	-	-
PC43. load the canned product manually in metal baskets	2	2	-	-
PC44. sterilize the can to a specified temperature for specified time	2	2	-	-
PC45. 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	1	2	-	-
PC46. inspect the cans for leakage and remove the leaked cans from the water tank for further re-use/discard	2	2	-	-
PC47. transfer the filled and cooled cans to the packaging machine	2	2	-	-
PC48. take samples of the canned product and send them to the quality lab for analysis	2	2	-	-
PC49. pack the labeled cans into cartons and transfer to the storage area and store them as per standard storage conditions	2	2	-	-
PC50. inform department supervisor on discrepancies/concerns for immediate action	1	2	-	-
<i>Perform post-production cleaning and maintenance of equipment's</i>	4	4	-	-
PC51. clean work area, machineries, equipment, and tools using recommended cleaning agents and sanitizers	2	1	-	-
PC52. attend minor repairs/faults of all the machines, if any	1	2	-	-
PC53. ensure periodic (daily/weekly/monthly/quarterly/half-yearly/annual) maintenance of all machines and equipment as per standard	1	1	-	-



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Assessment Criteria for Outcomes	Theory Marks	Practical Marks	Project Marks	Viva Marks
NOS Total	90	95	-	-

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National Occupational Standards (NOS) Parameters

NOS Code	FIC/N0122
NOS Name	Produce fruit pulp from various fruits
Sector	Food Processing
Sub-Sector	Fruits and Vegetables
Occupation	Processing-Fruits and Vegetables
NSQF Level	3
Credits	TBD
Version	2.0
Last Reviewed Date	30/12/2021
Next Review Date	24/02/2024
NSQC Clearance Date	24/02/2022

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FIC/N9901: Implement health and safety practices at the workplace

Description

This unit is about following health and safety procedures at the workplace.

Scope

The scope covers the following :

- Ensure food safety and personal hygiene
- Follow safety measures to avoid accidents
- Follow emergency procedures
- Manage infection control

Elements and Performance Criteria

Ensure food safety and personal hygiene

To be competent, the user/individual on the job must be able to:

- PC1.** follow relevant practices to avoid cross contamination at all stages of food processing operations
- PC2.** follow organisational procedures for handling items that may cause allergic reactions
- PC3.** follow Good Manufacturing Practices (GMP) at the workplace. Good Manufacturing Practices: location and layout (ergonomics), cleaning and sanitation, equipment and containers, pest control, facilities (lighting, water supply, drainage and waste disposal, air quality and ventilation), food storage, transportation, and distribution (Source: Schedule IV, FSSAI Licensing and Registration, 2011)
- PC4.** follow Good Hygiene Practices (GHP) at the workplace appropriately. Good Hygiene Practices: use of gloves, hairnets, masks, ear plugs, goggles, shoes etc; washing hands regularly; treating injuries such as cuts, boils, skin infections and grazes; preventive health check-ups ; getting vaccinated whenever required. (Source: Schedule IV, FSSAI Licensing and Registration, 2011)

Follow safety measures to avoid accidents

To be competent, the user/individual on the job must be able to:

- PC5.** use protective clothing/equipment for specific tasks and work conditions
- PC6.** identify job-site hazardous work and possible causes of risk or accident at the workplace
- PC7.** deal with hazards safely and appropriately to ensure safety of self and others as per organisational protocol
- PC8.** use various types of fire extinguishers effectively
- PC9.** respond promptly and appropriately to an accident situation or medical emergency
- PC10.** provide cardio-pulmonary resuscitation (CPR) as per the requirement (e.g. cardiac arrest)

Follow emergency procedures

To be competent, the user/individual on the job must be able to:

- PC11.** follow workplace emergency and evacuation procedures
- PC12.** use safe methods to free a person from electrocution

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PC13. administer appropriate first aid to victims in case of cuts, bleeding, burns, choking, electric shock, poisoning etc.

Manage infection control

To be competent, the user/individual on the job must be able to:

PC14. use appropriate disinfectants to disinfect the work area and equipment as per organisational protocol

PC15. ensure personal hygiene by washing hands regularly using alcohol based sanitisers and wearing personal protective equipment (PPE)

PC16. report illness of self and others to the supervisor or concerned authority

Knowledge and Understanding (KU)

The individual on the job needs to know and understand:

KU1. meaning of hazards and risks

KU2. possible causes of risk, hazard or accident in the workplace

KU3. where to find all the general health and safety equipment in the workplace

KU4. health and safety policy and procedures of the organization

KU5. health and safety hazards commonly present in the work environment

KU6. work practices and precautions used to control and prevent risks, hazards and accidents

KU7. applicable standards and regulations as listed in The Food Safety and Standards Act, 2006

KU8. importance of each personal protective equipment used such as eye protection, hard hats, gloves apron, rubber boots, etc.

KU9. importance of ensuring personal hygiene at the workplace

KU10. ways to prevent cross contamination at the workplace

KU11. importance of storing food at specified temperatures

KU12. various dangers associated with the use of electrical and other equipment

KU13. preventive and remedial actions to be taken in the case of exposure to toxic materials

KU14. various causes of fire and the ways to prevent them

KU15. techniques of using the different fire extinguishers

KU16. procedure followed for providing cardio-pulmonary resuscitation (CPR) to the affected

KU17. rescue techniques applied during a fire hazard

KU18. various types of safety signs and what they mean

KU19. workplace emergency and evacuation procedures

KU20. appropriate basic first aid treatment relevant to the condition e.g. shock, electrical shock, bleeding, breaks to bones, minor burns, resuscitation, poisoning, eye injuries

KU21. potential injuries and ill health conditions associated with incorrect manual handling

KU22. safe lifting and carrying practices

KU23. safe practices to be followed for ensuring sanitisation of self and work area

KU24. procedure for storing the sanitising materials appropriately

Generic Skills (GS)

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User/individual on the job needs to know how to:

- GS1.** write an accident/incident report in local language or English
- GS2.** read and comprehend basic content to read labels, charts, signages, symbols and product manuals
- GS3.** communicate with coworkers appropriately in order to clarify instructions and other issues
- GS4.** make appropriate decisions pertaining to the concerned area of work regarding the work objective, span of authority, responsibility, laid down procedure and guidelines
- GS5.** plan and organize the work schedule, work area, tools, equipment and materials for improved productivity
- GS6.** identify probable solutions to the problems in hand and evaluate them
- GS7.** seek official and authorised sources of help and guidance to resolve problems that cannot be solved at one's level of authority

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Assessment Criteria

Assessment Criteria for Outcomes	Theory Marks	Practical Marks	Project Marks	Viva Marks
<i>Ensure food safety and personal hygiene</i>	7	19	-	-
PC1. follow relevant practices to avoid cross contamination at all stages of food processing operations	1	4	-	-
PC2. follow organisational procedures for handling items that may cause allergic reactions	1	4	-	-
PC3. follow Good Manufacturing Practices (GMP) at the workplace. Good Manufacturing Practices: location and layout (ergonomics), cleaning and sanitation, equipment and containers, pest control, facilities (lighting, water supply, drainage and waste disposal, air quality and ventilation), food storage, transportation, and distribution (Source: Schedule IV, FSSAI Licensing and Registration, 2011)	3	7	-	-
PC4. follow Good Hygiene Practices (GHP) at the workplace appropriately. Good Hygiene Practices: use of gloves, hairnets, masks, ear plugs, goggles, shoes etc; washing hands regularly; treating injuries such as cuts, boils, skin infections and grazes; preventive health check-ups ; getting vaccinated whenever required. (Source: Schedule IV, FSSAI Licensing and Registration, 2011)	2	4	-	-
<i>Follow safety measures to avoid accidents</i>	11	24	-	-
PC5. use protective clothing/equipment for specific tasks and work conditions	2	4	-	-
PC6. identify job-site hazardous work and possible causes of risk or accident at the workplace	2	4	-	-
PC7. deal with hazards safely and appropriately to ensure safety of self and others as per organisational protocol	2	4	-	-
PC8. use various types of fire extinguishers effectively	2	4	-	-
PC9. respond promptly and appropriately to an accident situation or medical emergency	1	4	-	-

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Assessment Criteria for Outcomes	Theory Marks	Practical Marks	Project Marks	Viva Marks
PC10. provide cardio-pulmonary resuscitation (CPR) as per the requirement (e.g. cardiac arrest)	2	4	-	-
<i>Follow emergency procedures</i>	6	12	-	-
PC11. follow workplace emergency and evacuation procedures	2	4	-	-
PC12. use safe methods to free a person from electrocution	2	4	-	-
PC13. administer appropriate first aid to victims in case of cuts, bleeding, burns, choking, electric shock, poisoning etc.	2	4	-	-
<i>Manage infection control</i>	6	15	-	-
PC14. use appropriate disinfectants to disinfect the work area and equipment as per organisational protocol	3	7	-	-
PC15. ensure personal hygiene by washing hands regularly using alcohol based sanitisers and wearing personal protective equipment (PPE)	1	4	-	-
PC16. report illness of self and others to the supervisor or concerned authority	2	4	-	-
NOS Total	30	70	-	-

Qualification Pack

National Occupational Standards (NOS) Parameters

NOS Code	FIC/N9901
NOS Name	Implement health and safety practices at the workplace
Sector	Food Processing
Sub-Sector	Generic
Occupation	Generic
NSQF Level	3
Credits	TBD
Version	1.0
Last Reviewed Date	24/02/2022
Next Review Date	24/02/2025
NSQC Clearance Date	24/02/2022

Qualification Pack

FIC/N9902: Work effectively in an organisation

Description

This unit is about working effectively with others.

Scope

The scope covers the following :

- Communicate effectively
- Work in a team effectively
- Respect diversity

Elements and Performance Criteria

Communicate effectively

To be competent, the user/individual on the job must be able to:

- PC1.** obtain complete information and instructions from designated personnel
- PC2.** reciprocate understanding and seek clarifications whenever required
- PC3.** provide information accurately and clearly
- PC4.** use inclusive language (verbal, non-verbal and written) that is gender, disability and culturally sensitive

Work in a team effectively

To be competent, the user/individual on the job must be able to:

- PC5.** plan tasks to be performed as per priority and need
- PC6.** consult with and assist others to maximize effectiveness and efficiency at work
- PC7.** escalate problems and grievances beyond own scope to the concerned authority
- PC8.** take appropriate action to resolve conflicts at the workplace

Respect diversity

To be competent, the user/individual on the job must be able to:

- PC9.** maintain a gender-neutral behaviour with everyone at the workplace
- PC10.** empathise with People with Disabilities (PwD) and offer help, if required
- PC11.** recognise and report incidents of harassment and discrimination to appropriate authority

Knowledge and Understanding (KU)

The individual on the job needs to know and understand:

- KU1.** organizational quality procedures and processes associated with work
- KU2.** standards, policies, and procedures followed in the organization relevant to employment, harassment, discrimination and performance conditions
- KU3.** reporting structure, inter-dependent functions, lines, and procedures applicable at the workplace

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- KU4.** different types of harassment and discrimination based on gender, disability, caste, religion, and culture
- KU5.** components of effective communication and its importance
- KU6.** importance of teamwork in organizational and individual success
- KU7.** importance of ethics and discipline for professional success
- KU8.** how to express and address grievances appropriately and effectively
- KU9.** importance and ways of managing interpersonal conflict effectively
- KU10.** different types of disabilities and the challenges faced by persons with disability (PwD)
- KU11.** laws, acts and provisions defined for PwD
- KU12.** importance of gender sensitivity and equality
- KU13.** legislations, grievance redressal mechanisms, and penalties against harassment in the workplace

Generic Skills (GS)

User/individual on the job needs to know how to:

- GS1.** communicate information, doubts and concerns about work related matters in local language or Hindi/English
- GS2.** read and interpret information given in local language or Hindi/English
- GS3.** establish priorities and deadlines in consultation with other and record them
- GS4.** be punctual
- GS5.** listen to others concerns and doubts carefully and address them
- GS6.** be courteous

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Assessment Criteria

Assessment Criteria for Outcomes	Theory Marks	Practical Marks	Project Marks	Viva Marks
<i>Communicate effectively</i>	8	13	-	-
PC1. obtain complete information and instructions from designated personnel	2	3	-	-
PC2. reciprocate understanding and seek clarifications whenever required	2	3	-	-
PC3. provide information accurately and clearly	2	3	-	-
PC4. use inclusive language (verbal, non-verbal and written) that is gender, disability and culturally sensitive	2	4	-	-
<i>Work in a team effectively</i>	8	14	-	-
PC5. plan tasks to be performed as per priority and need	2	4	-	-
PC6. consult with and assist others to maximize effectiveness and efficiency at work	2	3	-	-
PC7. escalate problems and grievances beyond own scope to the concerned authority	2	3	-	-
PC8. take appropriate action to resolve conflicts at the workplace	2	4	-	-
<i>Respect diversity</i>	6	12	-	-
PC9. maintain a gender-neutral behaviour with everyone at the workplace	2	4	-	-
PC10. empathise with People with Disabilities (PwD) and offer help, if required	2	4	-	-
PC11. recognise and report incidents of harassment and discrimination to appropriate authority	2	4	-	-
NOS Total	22	39	-	-

Qualification Pack

National Occupational Standards (NOS) Parameters

NOS Code	FIC/N9902
NOS Name	Work effectively in an organisation
Sector	Food Processing
Sub-Sector	Generic
Occupation	Generic
NSQF Level	3
Credits	TBD
Version	1.0
Last Reviewed Date	24/02/2022
Next Review Date	24/02/2025
NSQC Clearance Date	24/02/2022

Qualification Pack

SGJ/N1702: Optimize resource utilization at workplace

Description

This unit is about adopting sustainable practices and optimizing use of resources, especially material, energy and waste, in day-to-day operations at work

Scope

The scope covers the following :

- Material conservation practices
- Energy/electricity conservation practices
- Effective waste management/recycling practices

Elements and Performance Criteria

Material conservation practices

To be competent, the user/individual on the job must be able to:

- PC1.** identify ways to optimize usage of material including water in various tasks/activities/processes
- PC2.** check for spills/leakages in various tasks/activities/processes
- PC3.** plug spills/leakages and escalate to appropriate authority if unable to rectify
- PC4.** carry out routine cleaning of tools, machines and equipment

Energy/electricity conservation practices

To be competent, the user/individual on the job must be able to:

- PC5.** identify ways to optimize usage of electricity/energy in various tasks/activities/processes
- PC6.** check if the equipment/machine is functioning normally before commencing work and rectify wherever required
- PC7.** report malfunctioning (fumes/sparks/emission/vibration/noise) and lapse in maintenance of equipment
- PC8.** ensure electrical equipment and appliances are properly connected and turned off when not in use

Effective waste management/recycling practices

To be competent, the user/individual on the job must be able to:

- PC9.** identify recyclable and non-recyclable, and hazardous waste generated
- PC10.** segregate waste into different categories
- PC11.** dispose non-recyclable waste appropriately
- PC12.** deposit recyclable and reusable material at identified location
- PC13.** follow processes specified for disposal of hazardous waste

Knowledge and Understanding (KU)

The individual on the job needs to know and understand:

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- KU1.** potential hazards, risks and threats based on the nature of work
- KU2.** layout of the workstation and electrical and thermal equipment used
- KU3.** organizations procedures for minimizing waste
- KU4.** efficient and inefficient utilization of material and water
- KU5.** ways of efficiently managing material and water in the process
- KU6.** basics of electricity and prevalent energy efficient devices
- KU7.** ways to recognize common electrical problems
- KU8.** common practices of conserving electricity
- KU9.** usage of different colours of dustbins
- KU10.** categorization of waste into dry, wet, recyclable, non-recyclable and items of single-use plastics
- KU11.** waste management and methods of waste disposal
- KU12.** common sources of pollution and ways to minimize it

Generic Skills (GS)

User/individual on the job needs to know how to:

- GS1.** record data on waste disposal at workplace
- GS2.** complete statutory documents relevant to safety and hygiene
- GS3.** read Standard Operating Practices (SOP) documents
- GS4.** communicate with colleagues on the significance of greening of jobs
- GS5.** make timely decisions for efficient utilization of resources
- GS6.** complete tasks efficiently and accurately within stipulated time
- GS7.** work with supervisors/team members to carry out work related tasks
- GS8.** identify cause and effect of greening of jobs

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Assessment Criteria

Assessment Criteria for Outcomes	Theory Marks	Practical Marks	Project Marks	Viva Marks
<i>Material conservation practices</i>	4	8	-	-
PC1. identify ways to optimize usage of material including water in various tasks/activities/processes	1	2	-	-
PC2. check for spills/leakages in various tasks/activities/processes	1	2	-	-
PC3. plug spills/leakages and escalate to appropriate authority if unable to rectify	1	2	-	-
PC4. carry out routine cleaning of tools, machines and equipment	1	2	-	-
<i>Energy/electricity conservation practices</i>	4	8	-	-
PC5. identify ways to optimize usage of electricity/energy in various tasks/activities/processes	1	2	-	-
PC6. check if the equipment/machine is functioning normally before commencing work and rectify wherever required	1	2	-	-
PC7. report malfunctioning (fumes/sparks/emission/vibration/noise) and lapse in maintenance of equipment	1	2	-	-
PC8. ensure electrical equipment and appliances are properly connected and turned off when not in use	1	2	-	-
<i>Effective waste management/recycling practices</i>	5	10	-	-
PC9. identify recyclable and non-recyclable, and hazardous waste generated	1	2	-	-
PC10. segregate waste into different categories	1	2	-	-
PC11. dispose non-recyclable waste appropriately	1	2	-	-
PC12. deposit recyclable and reusable material at identified location	1	2	-	-
PC13. follow processes specified for disposal of hazardous waste	1	2	-	-



Qualification Pack

Assessment Criteria for Outcomes	Theory Marks	Practical Marks	Project Marks	Viva Marks
NOS Total	13	26	-	-

Qualification Pack

National Occupational Standards (NOS) Parameters

NOS Code	SGJ/N1702
NOS Name	Optimize resource utilization at workplace
Sector	Green Jobs
Sub-Sector	Other Green Jobs
Occupation	Resource Optimization
NSQF Level	3
Credits	TBD
Version	1.0
Last Reviewed Date	10/08/2022
Next Review Date	27/01/2026
NSQC Clearance Date	27/01/2022

Qualification Pack

FIC/N0103: Produce squash and juice

Description

This unit is about producing squash and juice using various machineries as per specifications and standards of the organization

Scope

The scope covers the following :

- Perform fruit juice extraction process
- Pasteurize the extracted juice
- Clarify the juice
- Prepare squash
- Fill, pack and store juice and squash
- Carry out post-production cleaning and regular maintenance of equipments

Elements and Performance Criteria

Perform fruit juice extraction process

To be competent, the user/individual on the job must be able to:

- PC1.** grind the fruits like apple and pear into fine gratings
- PC2.** collect sliced/grated fruits from the discharge chute
- PC3.** extract juice from the fruit extractor
- PC4.** collect juice flowing through the discharge outlet in collection tank, and remove peel and seeds simultaneously
- PC5.** measure enzymes required for each batch as per the formulation chart
- PC6.** perform enzyme activity of the cut/grated fruits as per SOP
- PC7.** press the enzyme treated fruits such as apple, pear etc. using the pressing machine
- PC8.**
 - transfer fruit juice to filter and collect it in collection tank check the quality of extracted juice through physical parameters
 - Physical parameters: Appearance, colour, consistency, flavour, taste, etc.
- PC9.** take samples of the extracted juice and send them to quality lab for analysis
- PC10.** concentrate fruit juice and recover aroma (aroma stripping)

Pasteurize the extracted juice

To be competent, the user/individual on the job must be able to:

- PC11.**
 - monitor the process parameters of the pasteurizer
 - Process parameters: Pressure, temperature, flow rate, time, etc.
- PC12.** ensure cloudy juice are pasteurized immediately after pressing
- PC13.** heat up raw incoming juice by allowing the pasteurized juice to pass through heat exchangers
- PC14.** circulate water through heat exchangers to cool pasteurized juice

Clarify the juice

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To be competent, the user/individual on the job must be able to:

- PC15.** measure enzymes required for the clarification of juice as per the formulation chart
- PC16.** add the required enzymes to the pasteurized juice in the collection tank (for obtaining clear juice)
- PC17.** ensure uniform mixing of enzymes
- PC18.** allow enzyme treated juice to pass through ultra-filtration unit to remove smallest particles and obtain clear juice
- PC19.**
 - check quality of juice through physical parameters
 - Physical parameters: Colour, appearance, flavour, taste, etc.
- PC20.** take and send the samples from the production line to the lab for quality analysis such as pH, acidity, etc. and ensure conformance to the standards
- PC21.** fill up processed juice into the holding/reservoir tanks and store them as per standard storage practices for further processing or packaging

Prepare squash

To be competent, the user/individual on the job must be able to:

- PC22.** prepare sugar syrup by measuring the sugar and water as defined in the formulation (add acids if specified in the formulation)
- PC23.** add sugar syrup into the kettle/tank and turn on mixer/agitator with a controlled speed to mix the ingredients
- PC24.**
 - admit steam into kettle/tank by opening the valves and set controls of the tank to heat the solution as per SOP
 - Controls: Pressure, temperature and time
- PC25.** check sugar syrup brix using refractometer instrument to conform its specifications to standards
- PC26.** remove undesirable particles and sediments from the sugar syrup through the process of filtration
- PC27.** collect filtered sugar syrup in storage/ holding tanks
- PC28.** carry out blending process of the juice concentrate or clarified juice
- PC29.** add measured quantity of acids, preservatives, color, flavor, etc. into the blending tank as per the SOP
- PC30.**
 - start the mixer after setting the controls of stirrer/agitator
 - Controls of stirrer/agitator: Mixing speed, mixing time, etc.
- PC31.** observe mixing process and collect sample and check physical parameters to ensure uniform mixing
- PC32.** adjust controls to set temperature, pressure, etc. of pasteurizer/heat exchanger
- PC33.** transfer blended product into pasteurizer/heat exchanger
- PC34.** control process parameters and open valves to allow water to pass thorough heat exchanger to cool product
- PC35.** collect finished product in storage tank
- PC36.**
 - check the quality of finished product through physical parameters
 - Physical parameters: Appearance, colour, consistency, flavour, taste, etc
- PC37.** take samples and send to the quality lab for analysis to ensure conformance to standards

Fill, pack and store juice and squash

To be competent, the user/individual on the job must be able to:

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- PC38.** transfer finished product into the filling tank of packaging machine
- PC39.** • load packing materials (tetra packs, glass bottles, plastic containers, etc.) in packaging machine, sealing materials (caps, lids, crowns, etc.) in sealing machine, and labels in labelling machine.
• Packing material: Tetra packs, glass bottles, plastic containers, caps, lids, crowns, labels, etc.
• Set Controls of the packaging machine: Filling volume, batch code details, date of manufacture, best before date, etc.)
- PC40.** fill bottle/plastic containers to measured quantity of finished products
- PC41.** close/seal and label and check the weight of packed product periodically to ensure conformance to standards
- PC42.** place packed and labelled products in cartons and transfer to storage area as per SOP
- PC43.** report discrepancies/concerns to department supervisor for immediate action
- Carry out post-production cleaning and regular maintenance of equipments*
- To be competent, the user/individual on the job must be able to:
- PC44.** clean the work area, machineries, equipment and tools using approved cleaning agents and sanitizers
- PC45.** attend minor repairs/faults of all machines, if any
- PC46.** ensure periodic (daily/weekly/monthly/quarterly/half yearly/annual) maintenance of all machines and equipment as per the SOP or supplier's instructions/manuals

Knowledge and Understanding (KU)

The individual on the job needs to know and understand:

- KU1.** procedure to interpret process chart, product flow chart, and formulation chart analysis for various products
- KU2.** procedure to perform fruit juice extraction process
- KU3.** physical parameters such appearance, colour, consistency, flavour, taste, etc. to check the quality of extracted juice
- KU4.** procedure to inspect fruits visually and remove the damaged ones
- KU5.** SOP to dispose of the waste
- KU6.** standard procedure to take samples and send them to quality lab for analysis
- KU7.** procedure to carry out pasteurize process of the extracted juice
- KU8.** significance of pasteurizing and clarifying the juice
- KU9.** basic food microbiology and quality assessment based on physical parameters
- KU10.** food safety and hygiene standards as per organizational policies
- KU11.** procedure to prepare to clarify fruit juice squash
- KU12.** procedure to transfer finished product to the filling tank
- KU13.** SOP to wash bottle/plastic containers to fill measured quantity of finished products

Generic Skills (GS)

User/individual on the job needs to know how to:

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- GS1.** note down the information communicated by the senior/supervisor, raw materials used for production and the finished products produced, readings of the process parameters and provide necessary information to fill the process chart, down observations (if any) related to the process
- GS2.** read and interpret equipment manuals and process documents to understand the equipments operation and process requirement, and internal information documents sent by internal teams, etc.
- GS3.** write information documents to internal departments/ internal teams
- GS4.** plan, prioritize, and sequence work operations
- GS5.** communicate effectively with the team members, senior/supervisor, and other departments
- GS6.** organize all process/equipment manuals to access information easily
- GS7.** discuss task lists, schedules, and activities with the senior/supervisor

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Assessment Criteria

Assessment Criteria for Outcomes	Theory Marks	Practical Marks	Project Marks	Viva Marks
<i>Perform fruit juice extraction process</i>	10	10	-	-
PC1. grind the fruits like apple and pear into fine gratings	-	-	-	-
PC2. collect sliced/grated fruits from the discharge chute	-	-	-	-
PC3. extract juice from the fruit extractor	-	-	-	-
PC4. collect juice flowing though the discharge outlet in collection tank, and remove peel and seeds simultaneously	-	-	-	-
PC5. measure enzymes required for each batch as per the formulation chart	-	-	-	-
PC6. perform enzyme activity of the cut/grated fruits as per SOP	-	-	-	-
PC7. press the enzyme treated fruits such as apple, pear etc. using the pressing machine	-	-	-	-
PC8. <ul style="list-style-type: none"> transfer fruit juice to filter and collect it in collection tank check the quality of extracted juice through physical parameters Physical parameters: Appearance, colour, consistency, flavour, taste, etc. 	-	-	-	-
PC9. take samples of the extracted juice and send them to quality lab for analysis	-	-	-	-
PC10. concentrate fruit juice and recover aroma (aroma stripping)	-	-	-	-
<i>Pasteurize the extracted juice</i>	10	10	-	-
PC11. <ul style="list-style-type: none"> monitor the process parameters of the pasteurizer Process parameters: Pressure, temperature, flow rate, time, etc. 	-	-	-	-
PC12. ensure cloudy juice are pasteurized immediately after pressing	-	-	-	-

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Assessment Criteria for Outcomes	Theory Marks	Practical Marks	Project Marks	Viva Marks
PC13. heat up raw incoming juice by allowing the pasteurized juice to pass through heat exchangers	-	-	-	-
PC14. circulate water through heat exchangers to cool pasteurized juice	-	-	-	-
<i>Clarify the juice</i>	10	10	-	-
PC15. measure enzymes required for the clarification of juice as per the formulation chart	-	-	-	-
PC16. add the required enzymes to the pasteurized juice in the collection tank (for obtaining clear juice)	-	-	-	-
PC17. ensure uniform mixing of enzymes	-	-	-	-
PC18. allow enzyme treated juice to pass through ultra-filtration unit to remove smallest particles and obtain clear juice	-	-	-	-
PC19. <ul style="list-style-type: none"> check quality of juice through physical parameters Physical parameters: Colour, appearance, flavour, taste, etc. 	-	-	-	-
PC20. take and send the samples from the production line to the lab for quality analysis such as pH, acidity, etc. and ensure conformance to the standards	-	-	-	-
PC21. fill up processed juice into the holding/reservoir tanks and store them as per standard storage practices for further processing or packaging	-	-	-	-
<i>Prepare squash</i>	11	12	-	-
PC22. prepare sugar syrup by measuring the sugar and water as defined in the formulation (add acids if specified in the formulation)	-	-	-	-
PC23. add sugar syrup into the kettle/tank and turn on mixer/agitator with a controlled speed to mix the ingredients	-	-	-	-
PC24. <ul style="list-style-type: none"> admit steam into kettle/tank by opening the valves and set controls of the tank to heat the solution as per SOP Controls: Pressure, temperature and time 	-	-	-	-

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Assessment Criteria for Outcomes	Theory Marks	Practical Marks	Project Marks	Viva Marks
PC25. check sugar syrup brix using refractometer instrument to conform its specifications to standards	-	-	-	-
PC26. remove undesirable particles and sediments from the sugar syrup through the process of filtration	-	-	-	-
PC27. collect filtered sugar syrup in storage/ holding tanks	-	-	-	-
PC28. carry out blending process of the juice concentrate or clarified juice	-	-	-	-
PC29. add measured quantity of acids, preservatives, color, flavor, etc. into the blending tank as per the SOP	-	-	-	-
PC30. <ul style="list-style-type: none"> start the mixer after setting the controls of stirrer/agitator Controls of stirrer/agitator: Mixing speed, mixing time, etc. 	-	-	-	-
PC31. observe mixing process and collect sample and check physical parameters to ensure uniform mixing	-	-	-	-
PC32. adjust controls to set temperature, pressure, etc. of pasteurizer/heat exchanger	-	-	-	-
PC33. transfer blended product into pasteurizer/heat exchanger	-	-	-	-
PC34. control process parameters and open valves to allow water to pass thorough heat exchanger to cool product	-	-	-	-
PC35. collect finished product in storage tank	-	-	-	-
PC36. <ul style="list-style-type: none"> check the quality of finished product through physical parameters Physical parameters: Appearance, colour, consistency, flavour, taste, etc 	-	-	-	-
PC37. take samples and send to the quality lab for analysis to ensure conformance to standards	-	-	-	-
<i>Fill, pack and store juice and squash</i>	6	5	-	-

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Assessment Criteria for Outcomes	Theory Marks	Practical Marks	Project Marks	Viva Marks
PC38. transfer finished product into the filling tank of packaging machine	-	-	-	-
PC39. <ul style="list-style-type: none"> load packing materials (tetra packs, glass bottles, plastic containers, etc.) in packaging machine, sealing materials (caps, lids, crowns, etc.) in sealing machine, and labels in labelling machine. Packing material: Tetra packs, glass bottles, plastic containers, caps, lids, crowns, labels, etc. Set Controls of the packaging machine: Filling volume, batch code details, date of manufacture, best before date, etc.) 	-	-	-	-
PC40. fill bottle/plastic containers to measured quantity of finished products	-	-	-	-
PC41. close/seal and label and check the weight of packed product periodically to ensure conformance to standards	-	-	-	-
PC42. place packed and labelled products in cartons and transfer to storage area as per SOP	-	-	-	-
PC43. report discrepancies/concerns to department supervisor for immediate action	-	-	-	-
<i>Carry out post-production cleaning and regular maintenance of equipments</i>	3	3	-	-
PC44. clean the work area, machineries, equipment and tools using approved cleaning agents and sanitizers	-	-	-	-
PC45. attend minor repairs/faults of all machines, if any	-	-	-	-
PC46. ensure periodic (daily/weekly/monthly/quarterly/half yearly/annual) maintenance of all machines and equipment as per the SOP or supplier's instructions/manuals	-	-	-	-
NOS Total	50	50	-	-

Qualification Pack

National Occupational Standards (NOS) Parameters

NOS Code	FIC/N0103
NOS Name	Produce squash and juice
Sector	Food Processing
Sub-Sector	Fruits and Vegetables
Occupation	Processing-Fruits and Vegetables
NSQF Level	3
Credits	TBD
Version	2.0
Last Reviewed Date	30/12/2021
Next Review Date	24/02/2024
NSQC Clearance Date	24/02/2022

Qualification Pack

FIC/N0111: Produce jam, jelly and ketchup

Description

This unit is about production of jam, jelly and ketchup using various machineries as per the specifications and standards of the organization

Scope

The scope covers the following :

- Prepare jam and jelly
- Prepare ketchup
- Fill and pack jam, jelly and ketchup
- Carry out post-production cleaning and regular maintenance of equipment

Elements and Performance Criteria

Prepare jam and jelly

To be competent, the user/individual on the job must be able to:

- PC1.** transfer measured quantity of fruit pulp/juice from the holding tank/container into cooking kettle/tank for preparing jam/jelly (pulp of various fruit as per formulation for preparing mixed fruit jam)
- PC2.** heat fruit pulp/fruit juice to the required temperature and concentration
- PC3.** stir the pulp continuously to avoid sticking/scorching
- PC4.** monitor pressure and temperature gauge and adjust controls to achieve specified pressure and temperature to cook fruit pulp / fruit juice
- PC5.** transfer measured quantity of water into pre-mixing tank
- PC6.** measure specified quantity of pectin/gelatin and water as per formulation and add to the pre-mixing tank with uniform stirring to prepare pectin/gelatin solution
- PC7.** measure and add the ingredients into pulp/juice in the kettle/tank for the batch preparation as per the formulation chart
- PC8.**
 - operate the cooker and set the controls of cooker.
 - Controls: Temperature, pressure, etc.
- PC9.** transfer the solution at a specific brix and temperature into the cooker for cooking at higher temperature and pressure
- PC10.** observe the cooking process and check the product in refractometer to ensure completeness of cooking process
- PC11.** check the quality of cooked product through physical parameters such as colour, appearance, texture, taste, etc.
- PC12.** take sample and send to the quality lab for analysis
- PC13.** transfer the heated product manually/automatically into hopper of the bottled Jam/jelly packaging
- PC14.** transfer heated product manually/automatically into the hopper of filling/moulding machine of jelly making

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- PC15.** monitor the moulding process and inspect the jellies for shapes, sizes and weights as per organizational standards and adjust the controls, as required
- PC16.** adjust the speed of cooling conveyor & fans and cool the moulded jellies to an appropriate temperature for packaging
- PC17.** inspect the defective jellies and re-use them as a rework in specified quantity and heat with the pulp (discard the foreign matter contaminated jellies with organizational procedure)
- PC18.** transfer the good jellies to the packaging machine either automatically through packing conveyors or manually by crates/containers

Prepare ketchup

To be competent, the user/individual on the job must be able to:

- PC19.** transfer measured quantity of tomato pulp/puree from holding tank/ container to cooking kettle
- PC20.** heat tomatoes paste to required temperature and thickness by opening the valves to admit steam through the kettle or light burner with continuous stirring to avoid sticking/scorching or stir manually
- PC21.** measure ingredients such as sugar, salt, spice powder, vinegar, etc. required for batch as per the formulation chart
- PC22.** add the measured ingredients as per the sequence into the tomato pulp/puree in kettle following SOP and continue pre-cooking
- PC23.** observe pre-cooking process and check the quality of pre-cooked product through feel, consistency, refractometer, colour, etc.
- PC24.** transfer pre-cooked material at a specific brix and temperature into the cooker for cooking at higher temperature and pressure
- PC25.** observe the cooking process and check the product in refractometer to ensure completeness of cooking process
- PC26.** check the quality of cooked product through physical parameters such as colour, appearance, texture, taste, etc.
- PC27.** take the sample and send it to the quality lab for analysis and conformance to standards
- PC28.** transfer product into filling tank/hopper of the packaging machine or manually filling hot product in packaging containers

Fill and pack jam, jelly and ketchup

To be competent, the user/individual on the job must be able to:

- PC29.** transfer the heated jam/jelly/moulded jelly/heated ketchup into the packaging machine to pack jam/jelly/ketchup by operating valves and pump
- PC30.** load packing materials such as glass bottle, plastic bottle, pouches, laminates, Jars, etc. and sealing materials such as lid, closures, etc. on packaging machines
- PC31.** set packaging machine for filling volume, speed, size etc.
- PC32.** start automatic packaging machine for forming, washing bottles, filling, sealing container (or) fill measured quantity of hot product in packaging containers, place lid and close manually or mechanically
- PC33.** start machine to fill hot products/jellies in the container/jars/laminates/bottles and check weight of packed products periodically to ensure its conformance to standards
- PC34.** spray water on containers to cool and set product (setting in case of jam and jelly) or arrange filled jam/jelly containers in rack and allow to stand for specified time following SOP to cool

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- PC35.** • dry the cooled bottles by allowing the cooled bottles to pass through the drying tunnel by setting controls of air dryer before labelling
• Set controls: Air temperature, air flow rate, etc.
- PC36.** load labels in labelling machine, set date, batch coding, date of manufacture, best before date, etc.
- PC37.** place the packed and labelled products in cartons and transfer to storage area maintaining storage conditions as per the SOP
- PC38.** report discrepancies/concerns to department supervisor for immediate action
- Carry out post-production cleaning and regular maintenance of equipment*
- To be competent, the user/individual on the job must be able to:
- PC39.** clean the work area, machineries, equipment and tools using approved cleaning agents and sanitizers
- PC40.** attend minor repairs/faults of all machines (if any)
- PC41.** ensure periodic (daily/weekly/monthly/quarterly/half yearly/annual) maintenance of all machines and equipment as per the SOP or supplier's instructions/manuals

Knowledge and Understanding (KU)

The individual on the job needs to know and understand:

- KU1.** ingredients used in preparing ketchup such as sugar, salt, spice powder, vinegar, etc.
- KU2.** operating procedure for cooking kettle
- KU3.** method to test the viscosity of the ketchup using viscometer
- KU4.** procedure to operate packaging machine
- KU5.** SOP to load labels in labelling machine
- KU6.** procedure to set date coding machine for batch number, date of manufacture, date of expiry, etc.
- KU7.** food safety and hygiene as per organisational policies
- KU8.** SOP to clarify fruit juice
- KU9.** procedure to prepare clarify fruit juice squash
- KU10.** transfer process of finished product to the filling tank
- KU11.** SOP to wash bottle/plastic containers to fill measured quantity of finished products
- KU12.** post-production cleaning and regular maintenance procedures of the equipment

Generic Skills (GS)

User/individual on the job needs to know how to:

- GS1.** note down the information communicated by the senior/supervisor, raw materials used for production and the finished products produced, readings of the process parameters and provide necessary information to fill the process chart, down observations (if any) related to the process

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- GS2.** read and interpret equipment manuals and process documents to understand the equipments operation and process requirement, and internal information documents sent by internal teams, etc.
- GS3.** write information documents to internal departments/internal teams
- GS4.** plan, prioritize, and sequence work operations
- GS5.** communicate effectively with the team members, senior/supervisor, and other departments
- GS6.** discuss task lists, schedules, and activities with the senior/supervisor

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Assessment Criteria

Assessment Criteria for Outcomes	Theory Marks	Practical Marks	Project Marks	Viva Marks
<i>Prepare jam and jelly</i>	19	24	-	-
PC1. transfer measured quantity of fruit pulp/juice from the holding tank/container into cooking kettle/tank for preparing jam/jelly (pulp of various fruit as per formulation for preparing mixed fruit jam)	-	-	-	-
PC2. heat fruit pulp/fruit juice to the required temperature and concentration	-	-	-	-
PC3. stir the pulp continuously to avoid sticking/scorching	-	-	-	-
PC4. monitor pressure and temperature gauge and adjust controls to achieve specified pressure and temperature to cook fruit pulp / fruit juice	-	-	-	-
PC5. transfer measured quantity of water into pre-mixing tank	-	-	-	-
PC6. measure specified quantity of pectin/gelatin and water as per formulation and add to the pre-mixing tank with uniform stirring to prepare pectin/gelatin solution	-	-	-	-
PC7. measure and add the ingredients into pulp/juice in the kettle/tank for the batch preparation as per the formulation chart	-	-	-	-
PC8. <ul style="list-style-type: none"> operate the cooker and set the controls of cooker. Controls: Temperature, pressure, etc. 	-	-	-	-
PC9. transfer the solution at a specific brix and temperature into the cooker for cooking at higher temperature and pressure	-	-	-	-
PC10. observe the cooking process and check the product in refractometer to ensure completeness of cooking process	-	-	-	-
PC11. check the quality of cooked product through physical parameters such as colour, appearance, texture, taste, etc.	-	-	-	-

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Assessment Criteria for Outcomes	Theory Marks	Practical Marks	Project Marks	Viva Marks
PC12. take sample and send to the quality lab for analysis	-	-	-	-
PC13. transfer the heated product manually/automatically into hopper of the bottled Jam/jelly packaging	-	-	-	-
PC14. transfer heated product manually/automatically into the hopper of filling/moulding machine of jelly making	-	-	-	-
PC15. monitor the moulding process and inspect the jellies for shapes, sizes and weights as per organizational standards and adjust the controls, as required	-	-	-	-
PC16. adjust the speed of cooling conveyor & fans and cool the moulded jellies to an appropriate temperature for packaging	-	-	-	-
PC17. inspect the defective jellies and re-use them as a rework in specified quantity and heat with the pulp (discard the foreign matter contaminated jellies with organizational procedure)	-	-	-	-
PC18. transfer the good jellies to the packaging machine either automatically through packing conveyors or manually by crates/containers	-	-	-	-
<i>Prepare ketchup</i>	10	13	-	-
PC19. transfer measured quantity of tomato pulp/puree from holding tank/ container to cooking kettle	-	-	-	-
PC20. heat tomatoes paste to required temperature and thickness by opening the valves to admit steam through the kettle or light burner with continuous stirring to avoid sticking/scorching or stir manually	-	-	-	-
PC21. measure ingredients such as sugar, salt, spice powder, vinegar, etc. required for batch as per the formulation chart	-	-	-	-
PC22. add the measured ingredients as per the sequence into the tomato pulp/puree in kettle following SOP and continue pre-cooking	-	-	-	-

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Assessment Criteria for Outcomes	Theory Marks	Practical Marks	Project Marks	Viva Marks
PC23. observe pre-cooking process and check the quality of pre-cooked product through feel, consistency, refractometer, colour, etc.	-	-	-	-
PC24. transfer pre-cooked material at a specific brix and temperature into the cooker for cooking at higher temperature and pressure	-	-	-	-
PC25. observe the cooking process and check the product in refractometer to ensure completeness of cooking process	-	-	-	-
PC26. check the quality of cooked product through physical parameters such as colour, appearance, texture, taste, etc.	-	-	-	-
PC27. take the sample and send it to the quality lab for analysis and conformance to standards	-	-	-	-
PC28. transfer product into filling tank/hopper of the packaging machine or manually filling hot product in packaging containers	-	-	-	-
<i>Fill and pack jam, jelly and ketchup</i>	18	10	-	-
PC29. transfer the heated jam/jelly/moulded jelly/heated ketchup into the packaging machine to pack jam/jelly/ketchup by operating valves and pump	-	-	-	-
PC30. load packing materials such as glass bottle, plastic bottle, pouches, laminates, Jars, etc. and sealing materials such as lid, closures, etc. on packaging machines	-	-	-	-
PC31. set packaging machine for filling volume, speed, size etc.	-	-	-	-
PC32. start automatic packaging machine for forming, washing bottles, filling, sealing container (or) fill measured quantity of hot product in packaging containers, place lid and close manually or mechanically	-	-	-	-
PC33. start machine to fill hot products/jellies in the container/jars/laminates/bottles and check weight of packed products periodically to ensure its conformance to standards	-	-	-	-

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Assessment Criteria for Outcomes	Theory Marks	Practical Marks	Project Marks	Viva Marks
PC34. spray water on containers to cool and set product (setting in case of jam and jelly) or arrange filled jam/jelly containers in rack and allow to stand for specified time following SOP to cool	-	-	-	-
PC35. • dry the cooled bottles by allowing the cooled bottles to pass through the drying tunnel by setting controls of air dryer before labelling • Set controls: Air temperature, air flow rate, etc.	-	-	-	-
PC36. load labels in labelling machine, set date, batch coding, date of manufacture, best before date, etc.	-	-	-	-
PC37. place the packed and labelled products in cartons and transfer to storage area maintaining storage conditions as per the SOP	-	-	-	-
PC38. report discrepancies/concerns to department supervisor for immediate action	-	-	-	-
<i>Carry out post-production cleaning and regular maintenance of equipment</i>	3	3	-	-
PC39. clean the work area, machineries, equipment and tools using approved cleaning agents and sanitizers	-	-	-	-
PC40. attend minor repairs/faults of all machines (if any)	-	-	-	-
PC41. ensure periodic (daily/weekly/monthly/quarterly/half yearly/annual) maintenance of all machines and equipment as per the SOP or supplier's instructions/manuals	-	-	-	-
NOS Total	50	50	-	-

Qualification Pack

National Occupational Standards (NOS) Parameters

NOS Code	FIC/N0111
NOS Name	Produce jam, jelly and ketchup
Sector	Food Processing
Sub-Sector	Fruits and Vegetables
Occupation	Processing-Fruits and Vegetables
NSQF Level	3
Credits	TBD
Version	2.0
Last Reviewed Date	30/12/2021
Next Review Date	24/02/2024
NSQC Clearance Date	24/02/2022

Assessment Guidelines and Assessment Weightage

Assessment Guidelines

1. Criteria for assessment for each Qualification Pack will be created by the Sector Skill Council. Each Element/ 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 Element/ 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, and where applicable, on the selected elective/option NOS/set of NOS.
4. Individual assessment agencies will create unique question papers for theory part for each candidate at each examination/training center (as per assessment criteria below).
5. Individual assessment agencies will create unique evaluations for skill practical for every student at each examination/ training center based on these criteria.
6. To pass the Qualification Pack assessment, every trainee should score the Recommended Pass % aggregate for the QP.
7. In case of unsuccessful completion, the trainee may seek reassessment on the Qualification Pack.

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Minimum Aggregate Passing % at QP Level : 70

(Please note: Every Trainee should score a minimum aggregate passing percentage as specified above, to successfully clear the Qualification Pack assessment.)

Assessment Weightage

Compulsory NOS

National Occupational Standards	Theory Marks	Practical Marks	Project Marks	Viva Marks	Total Marks	Weightage
FIC/N9026.Prepare for production	30	70	-	-	100	20
FIC/N0122.Produce fruit pulp from various fruits	90	95	-	-	185	30
FIC/N9901.Implement health and safety practices at the workplace	30	70	-	-	100	10
FIC/N9902.Work effectively in an organisation	22	39	-	-	61	10
SGJ/N1702.Optimize resource utilization at workplace	13	26	-	-	39	10
Total	185	300	-	-	485	80

Elective: 1 Squash and Juice

National Occupational Standards	Theory Marks	Practical Marks	Project Marks	Viva Marks	Total Marks	Weightage
FIC/N0103.Produce squash and juice	50	50	-	-	100	20
Total	50	50	-	-	100	20

Elective: 2 Jam, Jelly and Ketchup

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National Occupational Standards	Theory Marks	Practical Marks	Project Marks	Viva Marks	Total Marks	Weightage
FIC/N0111.Produce jam, jelly and ketchup	50	50	-	-	100	20
Total	50	50	-	-	100	20

Qualification Pack

Acronyms

NOS	National Occupational Standard(s)
NSQF	National Skills Qualifications Framework
QP	Qualifications Pack
TVET	Technical and Vocational Education and Training

Qualification Pack

Glossary

Sector	Sector is a conglomeration of different business operations having similar business and interests. It may also be defined as a distinct subset of the economy whose components share similar characteristics and interests.
Sub-sector	Sub-sector is derived from a further breakdown based on the characteristics and interests of its components.
Occupation	Occupation is a set of job roles, which perform similar/ related set of functions in an industry.
Job role	Job role defines a unique set of functions that together form a unique employment opportunity in an organisation.
Occupational Standards (OS)	OS specify the standards of performance an individual must achieve when carrying out a function in the workplace, together with the Knowledge and Understanding (KU) they need to meet that standard consistently. Occupational Standards are applicable both in the Indian and global contexts.
Performance Criteria (PC)	Performance Criteria (PC) are statements that together specify the standard of performance required when carrying out a task.
National Occupational Standards (NOS)	NOS are occupational standards which apply uniquely in the Indian context.
Qualifications Pack (QP)	QP comprises the set of OS, together with the educational, training and other criteria required to perform a job role. A QP is assigned a unique qualifications pack code.
Unit Code	Unit code is a unique identifier for an Occupational Standard, which is denoted by an 'N'
Unit Title	Unit title gives a clear overall statement about what the incumbent should be able to do.
Description	Description gives a short summary of the unit content. This would be helpful to anyone searching on a database to verify that this is the appropriate OS they are looking for.
Scope	Scope is a set of statements specifying the range of variables that an individual may have to deal with in carrying out the function which have a critical impact on quality of performance required.

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Knowledge and Understanding (KU)	<p>Knowledge and Understanding (KU) are statements which together specify the technical, generic, professional and organisational specific knowledge that an individual needs in order to perform to the required standard.</p>
Organisational Context	<p>Organisational context includes the way the organisation is structured and how it operates, including the extent of operative knowledge managers have of their relevant areas of responsibility.</p>
Technical Knowledge	<p>Technical knowledge is the specific knowledge needed to accomplish specific designated responsibilities.</p>
Core Skills/ Generic Skills (GS)	<p>Core skills or Generic Skills (GS) are a group of skills that are the key to learning and working in today's world. These skills are typically needed in any work environment in today's world. These skills are typically needed in any work environment. In the context of the OS, these include communication related skills that are applicable to most job roles.</p>
Electives	<p>Electives are NOS/set of NOS that are identified by the sector as contributive to specialization in a job role. There may be multiple electives within a QP for each specialized job role. Trainees must select at least one elective for the successful completion of a QP with Electives.</p>
Options	<p>Options are NOS/set of NOS that are identified by the sector as additional skills. There may be multiple options within a QP. It is not mandatory to select any of the options to complete a QP with Options.</p>