Food Technologist - Plant based proteins

QP Code: FIC/Q9303

Version: 1.0

NSQF Level: 5

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FIC/Q9303: Food Technologist - Plant based proteins

Brief Job Description

A Food Technologist- Plant based proteins is responsible for executing the product development of plant-based products from bench to product launch. The individual will be required to work on existing and newly discovered ingredients to invent new recipes and concepts, while keeping up with the ever-changing regulations governing food development and production by ensuring that food is safe and meets the prescribed standards.

Personal Attributes

The job requires the individual to have the ability to plan, organize and prioritize tasks through effective reading, writing and communication. The individual should also be able to meet customer needs through regular interactions with them.

Applicable National Occupational Standards (NOS)

Compulsory NOS:

1. FIC/N9305: Select raw material and associated vendors
2. FIC/N9306: Carry out texturization of plant-based protein
3. FIC/N9307: Optimization of plant-based protein
4. FIC/N9308: Prepare and pack plant based protein
5. FIC/N9904: Ensure food safety at the workplace
6. FIC/N9903: Ensure workplace health and safety
7. FIC/N9902: Work effectively in an organisation

Qualification Pack (QP) Parameters

Sector	Food Processing
Sub-Sector	Packaged Foods
Occupation	Research and Development
Country	India
NSQF Level	5

Credits	NA
Aligned to NCO/ISCO/ISIC Code	NCO-2015/NIL
Minimum Educational Qualification & Experience	Graduate (Microbiology/Food technology/Biotechnology or allied disciplines) OR Diploma (3 years in relevant field after 12th class) OR Graduate (in any field) with 1 Year of experience in relevant field OR Diploma (3 years in any field after 12th class) with 1 Year of experience relevant experience OR Diploma (2 years in relevant field after 12th class) with 1 Year of experience relevant experience OR 10th Class + I.T.I (after 10th pass in relevant field) with 2 Years of experience relevant experience OR Diploma (3 years in relevant field after 10th class) with 2 Years of experience relevant experience OR Diploma (1 year in relevant field after 12th class) with 2 Years of experience OR 12th Class with 4 Years of experience relevant experience OR Certificate-NSQF (Level 4) with 2 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	22 Years
Last Reviewed On	NA
Next Review Date	NA
NSQC Approval Date	
Version	1.0

FIC/N9305: Select raw material and associated vendors

Description

This NOS unit is about selecting raw material and proteins for preparing different types of plant-based protein.

Scope

The scope covers the following :

- Identify different plant sources and ingredients
- Select vendors to obtain different material
- Plan for pilot trial
- Maintain work area and tools

Elements and Performance Criteria

Identify different plant sources and ingredients

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

PC1. • identify different types of raw material used to make final product based on the demand
• Raw material: Legumes and pulses, grains, seeds, etc.

PC2. • identify different ingredients used to make final product
• Ingredients: Proteins, binders, colorants, preservatives, fats, flavorings, etc.

PC3. • identify the combination of types of protein as mentioned in the standard operating procedure
• Protein types: concentrates, isolates, hydrolysates

PC4. identify the most suitable method of protein extraction

PC5. • identify basic equipment required for making plant-based protein
• Equipment: vacuum system, twin screw extruder, liquid feeder, cooling die, cutting unit, etc.

PC6. identify the type of flavorings and colorants to be used depending on the final product

Select vendors to obtain different material

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

PC7. identify and select vendors for sourcing raw materials, packaging materials, and equipment for production

PC8. • check and verify the quality of materials received from the vendors as per standards
• Material: protein isolates, protein concentrates, hydrolysates, etc.

PC9. maintain records of materials obtained and other documents such as equipment manuals, manufacturers' instructions, etc. for future reference

Plan for pilot trial

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

PC10. obtain consumer and market research data for preparing different products

PC11. • work on conceptualized ideas and experiment with various combinations of old and new ingredients and recipes using different food processing methods
• Food processing methods: cooking, baking, roasting, drying, freezing, etc.

PC12. develop the prototype of the desired product in different formulations using new or existing ingredients, recipes, or production process

PC13. plan and prioritize tasks as per the obtained schedule

PC14. ensure required quantity of raw materials, packaging materials, equipment are available

PC15. organize tools and equipment required for preparing plant-based protein

PC16. • organize production materials appropriately
• Production materials: raw materials, packaging materials, other ingredients, etc.

Maintain work area and tools

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

PC17. clean and maintain the work area as per organizational procedures

PC18. clean and maintain the machines and tools and sanitize them as per the organization's specifications and standards

PC19. dispose of the waste material at designated place safely

Knowledge and Understanding (KU)

The individual on the job needs to know and understand:

KU1. planning process

KU2. analysis and interpretation of prototype model

KU3. resource management process

KU4. procedure to estimate quantity of raw material and other materials

KU5. equipment type and its use

KU6. capacity utilization calculation

KU7. organizational policies and SOP on cleanliness

KU8. basic concept of food safety and hygiene

KU9. operating procedure and general maintenance of food production machineries

KU10. waste management procedures

KU11. methods to inspect tools, equipment and machinery

KU12. procedure to allot work or responsibility to the team

Generic Skills (GS)

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

GS1. write common words/signs and set phrases used in the work

GS2. prepare checklists, reports, and fill out forms in local language or Hindi/English

GS3. perform arithmetic calculations of addition, subtraction, multiplication, and division processes

GS4. read and interpret information (symbols, dimensions, terminology, dates etc.) given in local language or Hindi

GS5. state information, doubts, and concerns about work related matters in local language or Hindi/English

GS6. participate in workplace conversations and meetings and communicate by telephone in local language or Hindi/English

GS7. plan daily tasks to achieve maximum productivity

GS8. establish priorities and deadlines in consultation with others and record them

GS9. be punctual and work as per agreed priorities

GS10. manage distractions and maintain workplace discipline

GS11. breakdown relevant work process into its constituent activities for ease of analysis

GS12. importance of taking responsibility for own work outcomes

GS13. importance of following laid down rules, procedures, instructions, and policies

GS14. importance of time management for achieving better results

GS15. think through the problem, evaluate the possible solution(s), and suggest an optimum /best possible solution(s)

GS16. identify immediate or temporary solutions to resolve delays

Assessment Criteria

Assessment Criteria for Outcomes	Theory Marks	Practical Marks	Project Marks	Viva Marks
Identify different plant sources and ingredients	**10**	**11**	**-**	**6**
PC1. • identify different types of raw material used to make final product based on the demand • Raw material: Legumes and pulses, grains, seeds, etc.	-	-	-	-
PC2. • identify different ingredients used to make final product • Ingredients: Proteins, binders, colorants, preservatives, fats, flavorings, etc.	-	-	-	-
PC3. • identify the combination of types of protein as mentioned in the standard operating procedure • Protein types: concentrates, isolates, hydrolysates	-	-	-	-
PC4. identify the most suitable method of protein extraction	-	-	-	-
PC5. • identify basic equipment required for making plant-based protein • Equipment: vacuum system, twin screw extruder, liquid feeder, cooling die, cutting unit, etc.	-	-	-	-
PC6. identify the type of flavorings and colorants to be used depending on the final product	-	-	-	-
Select vendors to obtain different material	**5**	**10**	**-**	**3**
PC7. identify and select vendors for sourcing raw materials, packaging materials, and equipment for production	-	-	-	-
PC8. • check and verify the quality of materials received from the vendors as per standards • Material: protein isolates, protein concentrates, hydrolysates, etc.	-	-	-	-
PC9. maintain records of materials obtained and other documents such as equipment manuals, manufacturers' instructions, etc. for future reference	-	-	-	-

Assessment Criteria for Outcomes	Theory Marks	Practical Marks	Project Marks	Viva Marks
Plan for pilot trial	**10**	**21**	**-**	**9**
PC10. obtain consumer and market research data for preparing different products	-	-	-	-
PC11. • work on conceptualized ideas and experiment with various combinations of old and new ingredients and recipes using different food processing methods • Food processing methods: cooking, baking, roasting, drying, freezing, etc.	-	-	-	-
PC12. develop the prototype of the desired product in different formulations using new or existing ingredients, recipes, or production process	-	-	-	-
PC13. plan and prioritize tasks as per the obtained schedule	-	-	-	-
PC14. ensure required quantity of raw materials, packaging materials, equipment are available	-	-	-	-
PC15. organize tools and equipment required for preparing plant-based protein	-	-	-	-
PC16. • organize production materials appropriately • Production materials: raw materials, packaging materials, other ingredients, etc.	-	-	-	-
Maintain work area and tools	**5**	**8**	**-**	**2**
PC17. clean and maintain the work area as per organizational procedures	-	-	-	-
PC18. clean and maintain the machines and tools and sanitize them as per the organization's specifications and standards	-	-	-	-
PC19. dispose of the waste material at designated place safely	-	-	-	-
NOS Total	**30**	**50**	**-**	**20**

National Occupational Standards (NOS) Parameters

NOS Code	FIC/N9305
NOS Name	Select raw material and associated vendors
Sector	Food Processing
Sub-Sector	Packaged Foods
Occupation	Research and Development
NSQF Level	5
Credits	TBD
Version	1.0
Next Review Date	NA

FIC/N9306: Carry out texturization of plant-based protein

Description

This NOS unit is about performing texturization on plant-based protein to give it a similar texture to that of animal meat.

Scope

The scope covers the following :

- Perform texturization to prepare texturized vegetable or wheat protein
- Perform processing of whole muscle plant protein
- Perform processing of restructured plant protein

Elements and Performance Criteria

Perform texturization to prepare texturized vegetable or wheat protein

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

PC1. • ensure all the sections of the extruder are intact and operational
• Sections: Water injection system, steam extractors, driers, coolers, jacket, barrel, die, screw, etc.

PC2. assemble and attach blade to shear off extruded dough or products coming out of the extruder

PC3. attach cutter motor to the head section

PC4. • select the type of protein required for texturization
• Protein: soy protein isolate, hydrolysates, concentrates, etc.

PC5. • set processing and operating parameters in the control panel following recipe chart for the product(s) produced
• Parameters: temperature, pressure, rpm, flow rate of raw materials etc.

PC6. put the dry ingredients, water/oil in the proportion decided during the formulation time into the hopper of twin screw extrud

PC7. ensure fat is added as an ingredient to produce wet texturized vegetable protein (TVP) or texturized wheat protein (TWP)

PC8. • start main and cutter motor of extruder to produce TVP/TWP of required shape and type
• Type: High moisture extrudate, low moisture extrudate

PC9. monitor dials and gauges for temperature, pressure, etc. as the product begins to pass out of the extruder and ensure it is within the specifications

PC10. monitor operation of the equipment and adjust settings as required

PC11. check the quality of product(s) coming out through the extruder die and adjust setting to achieve product of required

PC12. sample extruded product and transfer to quality lab for analysis to ensure its conformance to quality standards

PC13. transfer the TVP/TWP into a dryer to produce dry TVP/TWP

PC14. pack the dry TVP/TWP and store it for further processing

PC15. transfer the semi solid output from the extruder into the cooking station in case of wet TVP/TWP

PC16. ensure the final moisture content of dry and wet TVP/TWP are less than 35% and more than 50% respectively

PC17. switch off feeder and conditioner

PC18. turn off steam and water

PC19. flush out barrel by keeping the extruder motor and cutter motor on

PC20. ensure all material has exited the die, push buttons to stop extruder motor and cutter motor

PC21. disengage the cutter motor and remove the head section

PC22. turn on main motor to force out any material left in the barrel

PC23. remove the die and adapter assembly carefully

PC24. inspect and clean the parts using recommended sanitizers and cleaning agents

Perform processing of whole muscle plant protein

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

PC25. procure dry as well wet TVP/TWP from the store for processing it further

PC26. hydrate the procured dry TVP/TWP with heated water and broth

PC27. • prepare marinade to coat the dry TVP/TWP as per the recipe formulation
• Marinade: fats, flavors, functional additives, etc.

PC28. pass the wet TVP/TWP through marination step to incorporate additional flavoring

PC29. apply the marinade onto the dry and wet TV/TWP to incorporate additional flavor and texture

PC30. • coat both the TVP/TWP with an adhesive component and the desired exterior coating
• Adhesive component: emulsifiers, fat, etc.
• Exterior coating: Spices, flour, breadcrumbs, etc.

PC31. • cook the coated TVP/TWP using various thermal processes depending on the final product type
• Thermal process: frying, baking, boiling, steaming, etc.
• Final product: cereals, puffed snacks, etc.

PC32. ensure the temperature and moisture of the product is maintained throughout the process

PC33. • perform extended shelf life processes (ESLP) to prolong the shelf life of the whole muscle plant protein
• ESLP: heat-pasteurization, high-pressure processing, UV, addition of antimicrobials

PC34. • cool the whole muscle plant protein using different techniques based on the final delivery
• Techniques: refrigeration, freezing, etc.

PC35. store the developed whole muscle plant protein for accelerated shelf life study in a designated area

Perform processing of restructured plant protein

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

PC36. obtain dry and wet TVP/TWP for processing it further to make restructured plant protein

PC37. blend the hydrated TVP/TWP with different ingredients, keeping macro and micro nutrient ratio in check

PC38. • ensure proper mixing of all the ingredients to form dough for different products
• Products: patties, sausages, nuggets, etc.

PC39. • ensure proper coating of fresh as well as cooked products with different material based on the final product
• Material: seasonings, breading, sausage casing, etc.

PC40. • cook the coated product or the dough formation using different thermal processes
• Thermal process: frying, baking, boiling, steaming, etc.

PC41. • perform extended shelf life processes (ESLP) on restructured plant protein to increase its shelf life
• ESLP: heat-pasteurization, high-pressure processing, UV, addition of antimicrobials

PC42. perform cooling process to further inhibit the growth of micro-organisms

PC43. store the developed restructured plant protein for accelerated shelf life study in a designated area

Knowledge and Understanding (KU)

The individual on the job needs to know and understand:

KU1. standards, policies, and procedures followed in the company relevant to food product development

KU2. SOP to use extruder for product development

KU3. types of protein used in product development

KU4. significance of texturized vegetable protein (TVP) or texturized wheat protein (TWP)

KU5. process of preparing texturized vegetable or wheat protein

KU6. different operating parameters and their effect on the extrusion process

KU7. procedure to estimate quantity of raw material and other materials

KU8. need of adding fat to product TVP and TWP

KU9. need of maintaining appropriate moisture content in wet and dry TVP and TWP

KU10. how to check the quality of extruded product

KU11. process of making whole muscle plant protein

KU12. procedure of preparing and coating marinade on the TVP/ TWP

KU13. various thermal processes to cook TVP/TWP

KU14. process of extended shelf life processes (ESLP)

KU15. various techniques to cool the food product

KU16. process of making restructured plant protein

KU17. ways to store the developed food

Generic Skills (GS)

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

GS1. write common words/signs and set phrases used in the work

GS2. prepare checklists, reports, and fill out forms in local language or Hindi/English

GS3. perform arithmetic calculations of addition, subtraction, multiplication, and division processes

GS4. read and interpret information (symbols, dimensions, terminology, dates etc.) given in local language or Hindi

GS5. state information, doubts, and concerns about work related matters in local language or Hindi/English

GS6. participate in workplace conversations and meetings and communicate by telephone in local language or Hindi/English

GS7. plan ones daily tasks to achieve maximum productivity
GS8. establish priorities and deadlines in consultation with others and record them
GS9. be punctual and work as per agreed priorities
GS10. manage distractions and maintain workplace discipline
GS11. breakdown relevant work process into its constituent activities for ease of analysis
GS12. importance of taking responsibility for own work outcomes
GS13. importance of following laid down rules, procedures, instructions, and policies
GS14. importance of time management for achieving better results
GS15. think through the problem, evaluate the possible solutions, and suggest an optimum /best possible solutions
GS16. identify immediate or temporary solutions to resolve delays

Assessment Criteria

Assessment Criteria for Outcomes	Theory Marks	Practical Marks	Project Marks	Viva Marks
Perform texturization to prepare texturized vegetable or wheat protein	**23**	**38**	**-**	**16**
PC1. • ensure all the sections of the extruder are intact and operational • Sections: Water injection system, steam extractors, driers, coolers, jacket, barrel, die, screw, etc.	-	-	-	-
PC2. assemble and attach blade to shear off extruded dough or products coming out of the extruder	-	-	-	-
PC3. attach cutter motor to the head section	-	-	-	-
PC4. • select the type of protein required for texturization • Protein: soy protein isolate, hydrolysates, concentrates, etc.	-	-	-	-
PC5. • set processing and operating parameters in the control panel following recipe chart for the product(s) produced • Parameters: temperature, pressure, rpm, flow rate of raw materials etc.	-	-	-	-
PC6. put the dry ingredients, water/oil in the proportion decided during the formulation time into the hopper of twin screw extrud	-	-	-	-
PC7. ensure fat is added as an ingredient to produce wet texturized vegetable protein (TVP) or texturized wheat protein (TWP)	-	-	-	-
PC8. • start main and cutter motor of extruder to produce TVP/TWP of required shape and type • Type: High moisture extrudate, low moisture extrudate	-	-	-	-
PC9. monitor dials and gauges for temperature, pressure, etc. as the product begins to pass out of the extruder and ensure it is within the specifications	-	-	-	-
PC10. monitor operation of the equipment and adjust settings as required	-	-	-	-

Assessment Criteria for Outcomes	Theory Marks	Practical Marks	Project Marks	Viva Marks
PC11. check the quality of product(s) coming out through the extruder die and adjust setting to achieve product of required	-	-	-	-
PC12. sample extruded product and transfer to quality lab for analysis to ensure its conformance to quality standards	-	-	-	-
PC13. transfer the TVP/TWP into a dryer to produce dry TVP/TWP	-	-	-	-
PC14. pack the dry TVP/TWP and store it for further processing	-	-	-	-
PC15. transfer the semi solid output from the extruder into the cooking station in case of wet TVP/TWP	-	-	-	-
PC16. ensure the final moisture content of dry and wet TVP/TWP are less than 35% and more than 50% respectively	-	-	-	-
PC17. switch off feeder and conditioner	-	-	-	-
PC18. turn off steam and water	-	-	-	-
PC19. flush out barrel by keeping the extruder motor and cutter motor on	-	-	-	-
PC20. ensure all material has exited the die, push buttons to stop extruder motor and cutter motor	-	-	-	-
PC21. disengage the cutter motor and remove the head section	-	-	-	-
PC22. turn on main motor to force out any material left in the barrel	-	-	-	-
PC23. remove the die and adapter assembly carefully	-	-	-	-
PC24. inspect and clean the parts using recommended sanitizers and cleaning agents	-	-	-	-
Perform processing of whole muscle plant protein	**15**	**22**	**-**	**9**
PC25. procure dry as well wet TVP/TWP from the store for processing it further	-	-	-	-

Assessment Criteria for Outcomes	Theory Marks	Practical Marks	Project Marks	Viva Marks
PC26. hydrate the procured dry TVP/TWP with heated water and broth	-	-	-	-
PC27. • prepare marinade to coat the dry TVP/TWP as per the recipe formulation • Marinade: fats, flavors, functional additives, etc.	-	-	-	-
PC28. pass the wet TVP/TWP through marination step to incorporate additional flavoring	-	-	-	-
PC29. apply the marinade onto the dry and wet TV/TWP to incorporate additional flavor and texture	-	-	-	-
PC30. • coat both the TVP/TWP with an adhesive component and the desired exterior coating • Adhesive component: emulsifiers, fat, etc. • Exterior coating: Spices, flour, breadcrumbs, etc.	-	-	-	-
PC31. • cook the coated TVP/TWP using various thermal processes depending on the final product type • Thermal process: frying, baking, boiling, steaming, etc. • Final product: cereals, puffed snacks, etc.	-	-	-	-
PC32. ensure the temperature and moisture of the product is maintained throughout the process	-	-	-	-
PC33. • perform extended shelf life processes (ESLP) to prolong the shelf life of the whole muscle plant protein • ESLP: heat-pasteurization, high-pressure processing, UV, addition of antimicrobials	-	-	-	-
PC34. • cool the whole muscle plant protein using different techniques based on the final delivery • Techniques: refrigeration, freezing, etc.	-	-	-	-
PC35. store the developed whole muscle plant protein for accelerated shelf life study in a designated area	-	-	-	-
Perform processing of restructured plant protein	**7**	**15**	**-**	**5**
PC36. obtain dry and wet TVP/TWP for processing it further to make restructured plant protein	-	-	-	-

Assessment Criteria for Outcomes	Theory Marks	Practical Marks	Project Marks	Viva Marks
PC37. blend the hydrated TVP/TWP with different ingredients, keeping macro and micro nutrient ratio in check	-	-	-	-
PC38. • ensure proper mixing of all the ingredients to form dough for different products • Products: patties, sausages, nuggets, etc.	-	-	-	-
PC39. • ensure proper coating of fresh as well as cooked products with different material based on the final product • Material: seasonings, breading, sausage casing, etc.	-	-	-	-
PC40. • cook the coated product or the dough formation using different thermal processes • Thermal process: frying, baking, boiling, steaming, etc.	-	-	-	-
PC41. • perform extended shelf life processes (ESLP) on restructured plant protein to increase its shelf life • ESLP: heat-pasteurization, high-pressure processing, UV, addition of antimicrobials	-	-	-	-
PC42. perform cooling process to further inhibit the growth of micro-organisms	-	-	-	-
PC43. store the developed restructured plant protein for accelerated shelf life study in a designated area	-	-	-	-
NOS Total	**45**	**75**	**-**	**30**

National Occupational Standards (NOS) Parameters

NOS Code	FIC/N9306
NOS Name	Carry out texturization of plant-based protein
Sector	Food Processing
Sub-Sector	Packaged Foods
Occupation	Research and Development
NSQF Level	5
Credits	TBD
Version	1.0
Next Review Date	NA

FIC/N9307: Optimization of plant-based protein

Description

This NOS unit is about optimizing the texture and the nutrient content as well as conducting shelf life study of the plant based protein as per the consumers preference.

Scope

The scope covers the following :

- Perform organoleptic testing
- Optimize various characteristics of plant based protein
- Perform accelerated shelf life study

Elements and Performance Criteria

Perform organoleptic testing

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

PC1. • prepare a list covering different parameters in which the product will be evaluated
• Parameters: describe attribute, degree of an attribute, degree of preference, etc.

PC2. • assemble the materials required to perform organoleptic testing
• Material: Final product, table, good lighting, etc.

PC3. identify the parameters most important to the product

PC4. • present the plant based protein product in its final cooked form to the panelists for sensory evaluation
• Form: fried, baked, steamed, etc.

PC5. • perform different sensory evaluation tests based on the requirement
• Sensory evaluation tests: product oriented, consumer oriented

PC6. • measure and analyse the reaction of the panelists based on their preference
• Preference: sense of sight, smell, taste, touch, etc.

PC7. • record the different observations and categorize them into groups
• Groups: appearance, texture, flavor, etc.

PC8. carry out changes in the formulation as per consumer feedback

Optimize various characteristics of plant based protein

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

PC9. • ensure the target texture is identified properly and changes are made accordingly
• Target texture: type, part, product format

PC10. • check the different parameters of texture of the final product using a texture analyzer
• Parameters: compression, puncture, cutting, extrusion, etc.

PC11. change the probes and blade of the texture analyser depending on the test

PC12. optimize the color and/or flavor of the plant based protein product based on the consumer results

PC13. determine the protein quality by different methods to optimize the protein level of plant based protein

PC14. • fortify the plant based protein with different vitamins and minerals to optimize its micronutrients
• Vitamins and minerals: thiamin, riboflavin, iron, zinc, etc.

Perform accelerated shelf life study

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

PC15. prepare the room for shelf life study

PC16. perform accelerated shelf life study to determine shelf life of different plant based protein samples

PC17. • perform chemical tests on the product
• Chemical tests: moisture, pH, acidity, etc.

PC18. perform nutritional analysis of the product

PC19. take minimum 100gm of sample from the final product for amino acid profiling test

PC20. pack and label the sample to send it for analysis

PC21. • fill test request form with the details of Amino acids that an individual want to check
• Amino acid: Lysine, Histidine, Tryptophan, Methionine, etc.

PC22. keep the sample in a box containing ice packs and speed post the sample for testing to the NABL certified lab for analysis

Knowledge and Understanding (KU)

The individual on the job needs to know and understand:

KU1. standards, policies, and procedures followed in the company relevant to food product testing

KU2. health, safety and hygiene standards to be followed in the entire process

KU3. process of organoleptic testing

KU4. SOP to use testing tools, equipment and material required for organoleptic testing

KU5. various testing parameters for testing of food product

KU6. various sensory evaluation tests and their testing procedure

KU7. ways to record the observations of tests

KU8. various parameters of texture of the final product

KU9. importance of meat analogue

KU10. use of texture analyzer for checking texture of the final product

KU11. methods to optimize the protein level of plant based protein

KU12. process of fortifying the plant based protein with different vitamins and minerals

KU13. procedure of various chemical tests, nutritional analysis test etc.

KU14. methods of doing accelerated shelf life study

KU15. significance of NABL certified lab for testing

KU16. methods of safe disposal of waste and other contaminants

KU17. cleaning and storing procedures

Generic Skills (GS)

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

GS1. write common words/signs and set phrases used in the work

GS2. prepare checklists, reports, and fill out forms in local language or Hindi/English

GS3. perform arithmetic calculations of addition, subtraction, multiplication, and division processes

GS4. read and interpret information (symbols, dimensions, terminology, dates etc.) given in local language or Hindi

GS5. state information, doubts, and concerns about work related matters in local language or Hindi/English

GS6. participate in workplace conversations and meetings and communicate by telephone in local language or Hindi/English

GS7. plan daily tasks to achieve maximum productivity

GS8. establish priorities and deadlines in consultation with others and record them

GS9. be punctual and work as per agreed priorities

GS10. manage distractions and maintain workplace discipline

GS11. breakdown relevant work process into its constituent activities for ease of analysis

GS12. importance of taking responsibility for own work outcomes

GS13. importance of following laid down rules, procedures, instructions, and policies

GS14. importance of time management for achieving better results

GS15. think through the problem, evaluate the possible solution(s), and suggest an optimum /best possible solutions

GS16. identify immediate or temporary solutions to resolve delays

Assessment Criteria

Assessment Criteria for Outcomes	Theory Marks	Practical Marks	Project Marks	Viva Marks
Perform organoleptic testing	**10**	**17**	**-**	**7**
PC1. • prepare a list covering different parameters in which the product will be evaluated • Parameters: describe attribute, degree of an attribute, degree of preference, etc.	-	-	-	-
PC2. • assemble the materials required to perform organoleptic testing • Material: Final product, table, good lighting, etc.	-	-	-	-
PC3. identify the parameters most important to the product	-	-	-	-
PC4. • present the plant based protein product in its final cooked form to the panelists for sensory evaluation • Form: fried, baked, steamed, etc.	-	-	-	-
PC5. • perform different sensory evaluation tests based on the requirement • Sensory evaluation tests: product oriented, consumer oriented	-	-	-	-
PC6. • measure and analyse the reaction of the panelists based on their preference • Preference: sense of sight, smell, taste, touch, etc.	-	-	-	-
PC7. • record the different observations and categorize them into groups • Groups: appearance, texture, flavor, etc.	-	-	-	-
PC8. carry out changes in the formulation as per consumer feedback	-	-	-	-
Optimize various characteristics of plant based protein	**7**	**11**	**-**	**5**
PC9. • ensure the target texture is identified properly and changes are made accordingly • Target texture: type, part, product format	-	-	-	-

Assessment Criteria for Outcomes	Theory Marks	Practical Marks	Project Marks	Viva Marks
PC10. • check the different parameters of texture of the final product using a texture analyzer • Parameters: compression, puncture, cutting, extrusion, etc.	-	-	-	-
PC11. change the probes and blade of the texture analyser depending on the test	-	-	-	-
PC12. optimize the color and/or flavor of the plant based protein product based on the consumer results	-	-	-	-
PC13. determine the protein quality by different methods to optimize the protein level of plant based protein	-	-	-	-
PC14. • fortify the plant based protein with different vitamins and minerals to optimize its micronutrients • Vitamins and minerals: thiamin, riboflavin, iron, zinc, etc.	-	-	-	-
Perform accelerated shelf life study	**13**	**22**	**-**	**8**
PC15. prepare the room for shelf life study	-	-	-	-
PC16. perform accelerated shelf life study to determine shelf life of different plant based protein samples	-	-	-	-
PC17. • perform chemical tests on the product • Chemical tests: moisture, pH, acidity, etc.	-	-	-	-
PC18. perform nutritional analysis of the product	-	-	-	-
PC19. take minimum 100gm of sample from the final product for amino acid profiling test	-	-	-	-
PC20. pack and label the sample to send it for analysis	-	-	-	-
PC21. • fill test request form with the details of Amino acids that an individual want to check • Amino acid: Lysine, Histidine, Tryptophan, Methionine, etc.	-	-	-	-

Assessment Criteria for Outcomes	Theory Marks	Practical Marks	Project Marks	Viva Marks
PC22. keep the sample in a box containing ice packs and speed post the sample for testing to the NABL certified lab for analysis	-	-	-	-
NOS Total	**30**	**50**	**-**	**20**

National Occupational Standards (NOS) Parameters

NOS Code	FIC/N9307
NOS Name	Optimization of plant-based protein
Sector	Food Processing
Sub-Sector	Packaged Foods
Occupation	Research and Development
NSQF Level	5
Credits	TBD
Version	1.0
Next Review Date	NA

FIC/N9308: Prepare and pack plant based protein

Description

This NOS unit is about presenting, serving and packaging of different plant based protein product by following good hygiene practices.

Scope

The scope covers the following :

- Pack and store plant-based protein products
- Present plant based protein products
- Manage post trial activities

Elements and Performance Criteria

Pack and store plant-based protein products

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

PC1. • ensure the parameters of the packaging material are met as per the specifications
• Parameters: moisture retention, barrier for oxygen, color and flavor retention, etc.

PC2. properly place the plant based protein products inside the packaging material for manual packaging while ensuring product safety of products

PC3. place canned plant based protein products in the can for retort packaging

PC4. place lid on filled cans and load in retort machine

PC5. • set the parameters of retort machine to sterilize the canned products
• Parameters: pressure, time, temperature, etc.

PC6. monitor the process to ascertain suitable packaging for plant based protein production

PC7. • ensure the label gives full disclosure about the origin of plant based protein product
• Information: name of the product (include qualifiers indicating the source), time of packing, date of manufacture, date of expiry, other label details, primary and secondary packaging materials for all finished products, storage conditions, etc. according to the FSSAI standards of packaging and labelling

PC8. store plant based protein products in appropriate environmental conditions

PC9. dispose waste and unwanted materials as per SOP

Present plant based protein products

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

PC10. identify different plant based protein products and their characteristics

PC11. • cook different products as per the cooking instructions using correct tools and equipment
• Products: ready to eat, frozen, etc.

PC12. bring the plant based protein product at room temperature before serving

PC13. present plant based protein products for customer tasting with specified theme, characteristics, provenance and processing techniques of each

PC14. make recommendations for post-purchase storage

Manage post trial activities

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

PC15. inspect the quality of finished products thoroughly before releasing the final recipe

PC16. identify optimal storage conditions of texturized vegetable protein or texturized wheat protein and communicate these to production team

PC17. coordinate with vendors for distribution and supply of TVP and TWP to individuals and organizations

PC18. • ensure the stocked material is of good quality
• Stocked material: raw material, processed material, finished products, etc.

PC19. ensure a clean and tidy workplace and take relevant measures against pest infestations and presence of dust, water, etc.

PC20. clean the work area, machineries, equipment and tools used during pilot trials using appropriate cleaning agents and sanitizers

PC21. manage and control packaging wastage

PC22. dispose the waste as per standard operating procedures

Knowledge and Understanding (KU)

The individual on the job needs to know and understand:

KU1. standards, policies, and procedures followed in the company relevant to food product preparation and packaging

KU2. health, safety and hygiene standards to be followed in the entire process

KU3. characteristics of different packaging material

KU4. suitability of packaging material with different food products

KU5. defects in packaging material

KU6. functioning of packaging equipment

KU7. importance of labelling and information to be mentioned on the product labels

KU8. packaging and labelling guidelines set up by FSSAI

KU9. ways to cook and present food product as per recipe

KU10. various post trial activities

KU11. ways for distribution and supply of TVP and TWP to individuals and organizations

KU12. methods of safe disposal of waste and other contaminants

KU13. cleaning and storing procedures

Generic Skills (GS)

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

GS1. write common words/signs and set phrases used in the work

GS2. prepare checklists, reports, and fill out forms in local language or Hindi/English

GS3. perform arithmetic calculations of addition, subtraction, multiplication, and division processes

GS4. read and interpret information (symbols, dimensions, terminology, dates etc.) given in local language or Hindi

GS5. state information, doubts, and concerns about work related matters in local language or Hindi/English

GS6. participate in workplace conversations and meetings and communicate by telephone in local language or Hindi/English

GS7. plan daily tasks to achieve maximum productivity

GS8. establish priorities and deadlines in consultation with others and record them

GS9. be punctual and work as per agreed priorities

GS10. manage distractions and maintain workplace discipline

GS11. breakdown relevant work process into its constituent activities for ease of analysis

GS12. importance of taking responsibility for own work outcomes

GS13. importance of following laid down rules, procedures, instructions, and policies

GS14. importance of time management for achieving better results

GS15. think through the problem, evaluate the possible solutions, and suggest an optimum /best possible solutions

GS16. identify immediate or temporary solutions to resolve delays

Assessment Criteria

Assessment Criteria for Outcomes	Theory Marks	Practical Marks	Project Marks	Viva Marks
Pack and store plant-based protein products	**12**	**20**	**-**	**8**
PC1. • ensure the parameters of the packaging material are met as per the specifications • Parameters: moisture retention, barrier for oxygen, color and flavor retention, etc.	-	-	-	-
PC2. properly place the plant based protein products inside the packaging material for manual packaging while ensuring product safety of products	-	-	-	-
PC3. place canned plant based protein products in the can for retort packaging	-	-	-	-
PC4. place lid on filled cans and load in retort machine	-	-	-	-
PC5. • set the parameters of retort machine to sterilize the canned products • Parameters: pressure, time, temperature, etc.	-	-	-	-
PC6. monitor the process to ascertain suitable packaging for plant based protein production	-	-	-	-
PC7. • ensure the label gives full disclosure about the origin of plant based protein product • Information: name of the product (include qualifiers indicating the source), time of packing, date of manufacture, date of expiry, other label details, primary and secondary packaging materials for all finished products, storage conditions, etc. according to the FSSAI standards of packaging and labelling	-	-	-	-
PC8. store plant based protein products in appropriate environmental conditions	-	-	-	-
PC9. dispose waste and unwanted materials as per SOP	-	-	-	-
Present plant based protein products	**6**	**11**	**-**	**5**
PC10. identify different plant based protein products and their characteristics	-	-	-	-

Assessment Criteria for Outcomes	Theory Marks	Practical Marks	Project Marks	Viva Marks
PC11. • cook different products as per the cooking instructions using correct tools and equipment • Products: ready to eat, frozen, etc.	-	-	-	-
PC12. bring the plant based protein product at room temperature before serving	-	-	-	-
PC13. present plant based protein products for customer tasting with specified theme, characteristics, provenance and processing techniques of each	-	-	-	-
PC14. make recommendations for post-purchase storage	-	-	-	-
Manage post trial activities	**12**	**19**	**-**	**7**
PC15. inspect the quality of finished products thoroughly before releasing the final recipe	-	-	-	-
PC16. identify optimal storage conditions of texturized vegetable protein or texturized wheat protein and communicate these to production team	-	-	-	-
PC17. coordinate with vendors for distribution and supply of TVP and TWP to individuals and organizations	-	-	-	-
PC18. • ensure the stocked material is of good quality • Stocked material: raw material, processed material, finished products, etc.	-	-	-	-
PC19. ensure a clean and tidy workplace and take relevant measures against pest infestations and presence of dust, water, etc.	-	-	-	-
PC20. clean the work area, machineries, equipment and tools used during pilot trials using appropriate cleaning agents and sanitizers	-	-	-	-
PC21. manage and control packaging wastage	-	-	-	-
PC22. dispose the waste as per standard operating procedures	-	-	-	-
NOS Total	**30**	**50**	**-**	**20**

National Occupational Standards (NOS) Parameters

NOS Code	FIC/N9308
NOS Name	Prepare and pack plant based protein
Sector	Food Processing
Sub-Sector	Packaged Foods
Occupation	Research and Development
NSQF Level	5
Credits	TBD
Version	1.0
Next Review Date	NA

FIC/N9904: Ensure food safety at the workplace

Description

This unit is about performing various tasks for ensuring food safety at the workplace.

Scope

The scope covers the following :

- Ensure food safety at the workplace

Elements and Performance Criteria

Ensure food safety at the workplace

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

PC1. identify the biological, chemical, and physical hazards at various stages of food processing. Stages: procurement of raw material; production, manufacturing, distribution, delivery of finished product, etc.

PC2. implement food safety procedures and regulatory policies at the food processing workplace. Policies: Visitor's Policy, Health declaration policy, Jewellery policy, Quality, and safety policy

PC3. ensure that the materials are adequately isolated to prevent them from contamination. Materials: raw materials, processed materials, finished goods, etc. Contamination: Physical, Chemical, Biological & shop floor environment

PC4. establish and follow Good Manufacturing Practices (GMPs) laid down in applicable Food Safety and Standards Authority of India (FSSAI) guidelines. Good Manufacturing Practices (GMPs): 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 etc.

PC5. establish and follow allergen management system for handling and storage of raw materials

PC6. establish and follow monitoring systems like Hazard Analysis Critical Control Point (HACCP), product information and consumer awareness, product recall and withdrawal, and traceability HACCP: Hazard identification, identification of critical control points, establish critical limits, corrective and preventive action. Product information and consumer awareness: Product labelling and consumer education. Traceability: forward and backward traceability

PC7. take appropriate action in instances such as VACCP (Vulnerability Assessment Critical Control Points) and TACCP (Threat Assessment Critical Control Points)

PC8. plan, conduct, manage, consolidate outcomes, and close corrective actions of workplace audit on food safety as per FSSAI guidelines, address the non-conformance with root cause analysis (RCA), corrective action preventive action(CAPA)

PC9. address issues pertaining to food safety and quality reported by the team members

PC10. record information such as food safety regulations followed, inspections done, faults observed, etc. as per standard procedure

PC11. organize trainings and workshops on food safety aspects such as Good Manufacturing Practices (GMP), HACCP, VACCP, TACCP, etc.

Knowledge and Understanding (KU)

The individual on the job needs to know and understand:

KU1. various processes that take place in a food industry
KU2. biological, chemical, and physical hazards in a food industry
KU3. types of food contaminations, their causes, and ways to prevent it
KU4. organisational policy and procedures for ensuring food safety(such as Visitor's Policy, Health declaration policy, Jewelry policy, Quality, and safety policy)
KU5. applicable regulations for ensuring food safety as listed in 'The Food Safety and Standards Act, 2006'
KU6. role of HACCP in food industry, its constituents and procedure to implement it in an organisation
KU7. VACCP and TACCP and how to implement it effectively
KU8. how to conduct workplace food safety audits
KU9. types of allergen and allergen management at workplace
KU10. key observations and corrective actions to be applied for ensuring food safety
KU11. various issues that can arise during production and other processes as faced by team
KU12. information to be recorded in the work process
KU13. how to do root cause analysis and perform corrective action and preventive actions
KU14. how to conduct training of workforce on various food safety procedures such as GMP, HACCP, information to be shared, ways to report accidents, escalation of issues beyond own scope, etc.

Generic Skills (GS)

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 and symbols
GS3. read and comprehend basic English to read product manuals for safe operation
GS4. question coworkers appropriately in order to clarify instructions and other issues
GS5. make appropriate decisions pertaining to the concerned area of work regarding the work objective, span of authority, responsibility, laid down procedure and guidelines
GS6. plan and organize the work schedule, work area, tools, equipment, and materials for improved productivity
GS7. identify probable solutions to the problems in hand
GS8. evaluate proposed solution with respect to key priorities and considerations
GS9. seek official and authorised sources of help and guidance to resolve problems that cannot be solved at one's level of authority
GS10. identify cause and effect relations in their area of work to anticipate potential problems and their solution
GS11. analyse the problem, suggest corrective actions and implement workable solutions

Assessment Criteria

Assessment Criteria for Outcomes	Theory Marks	Practical Marks	Project Marks	Viva Marks
Ensure food safety at the workplace	**30**	**70**	**-**	**-**
PC1. identify the biological, chemical, and physical hazards at various stages of food processing. Stages: procurement of raw material; production, manufacturing, distribution, delivery of finished product, etc.	-	-	-	-
PC2. implement food safety procedures and regulatory policies at the food processing workplace. Policies: Visitor's Policy, Health declaration policy, Jewellery policy, Quality, and safety policy	-	-	-	-
PC3. ensure that the materials are adequately isolated to prevent them from contamination. Materials: raw materials, processed materials, finished goods, etc. Contamination: Physical, Chemical, Biological & shop floor environment	-	-	-	-
PC4. establish and follow Good Manufacturing Practices (GMPs) laid down in applicable Food Safety and Standards Authority of India (FSSAI) guidelines. Good Manufacturing Practices (GMPs): 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 etc.	-	-	-	-
PC5. establish and follow allergen management system for handling and storage of raw materials	-	-	-	-
PC6. establish and follow monitoring systems like Hazard Analysis Critical Control Point (HACCP), product information and consumer awareness, product recall and withdrawal, and traceability HACCP: Hazard identification, identification of critical control points, establish critical limits, corrective and preventive action. Product information and consumer awareness: Product labelling and consumer education. Traceability: forward and backward traceability	-	-	-	-
PC7. take appropriate action in instances such as VACCP (Vulnerability Assessment Critical Control Points) and TACCP (Threat Assessment Critical Control Points)	-	-	-	-

Assessment Criteria for Outcomes	Theory Marks	Practical Marks	Project Marks	Viva Marks
PC8. plan, conduct, manage, consolidate outcomes, and close corrective actions of workplace audit on food safety as per FSSAI guidelines, address the non-conformance with root cause analysis (RCA), corrective action preventive action(CAPA)	-	-	-	-
PC9. address issues pertaining to food safety and quality reported by the team members	-	-	-	-
PC10. record information such as food safety regulations followed, inspections done, faults observed, etc. as per standard procedure	-	-	-	-
PC11. organize trainings and workshops on food safety aspects such as Good Manufacturing Practices (GMP), HACCP, VACCP, TACCP, etc.	-	-	-	-
NOS Total	**30**	**70**	**-**	**-**

National Occupational Standards (NOS) Parameters

NOS Code	FIC/N9904
NOS Name	Ensure food safety at the workplace
Sector	Food Processing
Sub-Sector	Generic
Occupation	Generic
NSQF Level	5
Credits	TBD
Version	1.0
Last Reviewed Date	24/02/2022
Next Review Date	24/02/2025
NSQC Clearance Date	24/02/2022

FIC/N9903: Ensure workplace health and safety

Description

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

Scope

The scope covers the following :

- Follow preventive measures to avoid accidents
- Deal with emergencies
- Manage infection control

Elements and Performance Criteria

Follow preventive measures to avoid accidents

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

PC1. wear appropriate personal protective equipment (PPE) as per task requirements. PPE: gloves, hairnets, masks, ear plugs, goggles, shoes etc.

PC2. identify job-site hazardous work and possible causes of risk or accident at the workplace

PC3. deal with hazards safely and appropriately to ensure safety of self and others

PC4. ensure that the equipment used (such as for lifting and carrying materials, power tools, etc.) are maintained effectively

PC5. implement organisational safety protocols to prevent accidents and hazards

PC6. ensure that general health and safety equipment are readily available at all times

PC7. ensure that common hazard signs are displayed properly wherever required

PC8. use various types of fire extinguishers effectively

PC9. train the workforce on accident prevention techniques required at the workplace. Accident prevention techniques: role of appropriate PPE; use of fire extinguishers, dealing with hazards; identification of risks that could lead to accidents; safety protocols followed to avoid accidents; role of different types of hazard signs, safe lifting and carrying practices, etc.

Deal with emergencies

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

PC10. follow workplace emergency and evacuation procedures

PC11. use safe methods to free a person from electrocution

PC12. administer appropriate first aid to victims in case of cuts, bleeding, burns, choking, electric shock, poisoning, etc.

PC13. provide artificial respiration and cardio-pulmonary resuscitation (CPR) in various instances (e.g., cardiac arrest)

PC14. report any identified breaches in health, safety and security policies and procedures to the concerned authority

PC15. train the workforce on emergency procedures to be followed at the workplace. Emergency procedures: safe evacuation; treating a person from electrocution; immediate first aid to be given at times of cuts, bleeding, burns, choking, electric shock, poisoning, etc.; administering artificial respiration and cardio-pulmonary resuscitation (CPR); escalating issues beyond own scope, etc.

Manage infection control

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

PC16. follow and enforce Good Hygiene Practices (GHP) among the team. GHP: washing hands regularly, reporting personal health issues to the concerned, undertaking preventive health check-ups at regular intervals, getting vaccinated as per standard procedures whenever required, etc.

PC17. identify the type of infection spread in discussion with designated personnel and relevant sources. Type of infection spread: severity; precautions to be taken; safety protocols to be followed during spread; sanitisers to be used, etc.

PC18. ensure the work area, equipment and related facilities are being sanitised effectively as per organisational schedule and work requirements

PC19. ensure that materials used for sanitisation are stored appropriately and readily available at times of need

PC20. take appropriate action at times of illness to self and others in the team

PC21. train the workforce on infection control practices followed at the workplace. Infection control practices: precautions to be taken; types of sanitisers to be used; ensuring appropriate sanitization of self and work area; reporting illness to self and others promptly, etc.

PC22. review standard operating procedures (SOPs) as per organisational schedule to ensure compliance with regulatory requirements

PC23. ensure periodic health check-up of all workers in compliance with FSSAI guidelines

PC24. provide regulatory support and process improvements which have an impact on regulatory affairs related to quality and safety assurance in respective departments

Knowledge and Understanding (KU)

The individual on the job needs to know and understand:

KU1. meaning of 'hazards' and 'risks'

KU2. various types of risks, hazards and accidents at the workplace and their possible causes

KU3. standard practices to be followed to control and prevent risks, hazards, and accidents

KU4. where to find all the general health and safety equipment in the workplace

KU5. parameters to be assessed during review of SOPs and compliances

KU6. how to improve regulations and processes in an organisation as per required quality and safety standards

KU7. procedure to conduct audits pertaining to workplace health and safety

KU8. parameters to be assessed during health and safety audits and acceptability levels of appropriateness

KU9. how to address team issues relating to workplace health and safety

KU10. documents and records to be maintained in the work process

KU11. types of personal protective equipment used such as eye protection, hard hats, gloves apron, rubber boots, etc. and its importance while conducting the tasks

KU12. how to deal with various types of hazards safely and appropriately
KU13. how to ensure that the equipment used is maintained effectively
KU14. preventative measures and remedial actions to be taken to avoid accidents
KU15. various types of safety signs and their relevance at the workplace
KU16. various causes of fire, ways to prevent them and rescue techniques to be followed at times of fire
KU17. use of different types of fire extinguishers
KU18. how to train the workforce on various accident prevention techniques
KU19. workplace emergency and evacuation procedures
KU20. how to administer immediate first aid to victims in case of cuts, bleeding, burns, choking, electric shock, poisoning, etc.
KU21. procedure followed for providing artificial respiration and cardio-pulmonary resuscitation (CPR) to the affected
KU22. impact of breach in health, safety and security policies and procedures on self, team, and work process
KU23. how to train the workforce on emergency procedures to be followed at the workplace
KU24. information sources and the factors to be considered for determining the type of infection
KU25. procedure to carry out sanitization of work area, equipment, and related facilities
KU26. how to act at times of illness to self and others at the workplace
KU27. train the workforce on infection control practices followed at the workplace
KU28. storing sanitization materials appropriately

Generic Skills (GS)

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 and symbols
GS3. read and comprehend basic English to read product manuals for safe operation
GS4. question coworkers appropriately in order to clarify instructions and other issues
GS5. make appropriate decisions pertaining to the concerned area of work regarding the work objective, span of authority, responsibility, laid down procedure and guidelines
GS6. plan and organize the work schedule, work area, tools, equipment, and materials for improved productivity
GS7. identify probable solutions to the problems in hand
GS8. evaluate proposed solution with respect to key priorities and considerations
GS9. seek official and authorised sources of help and guidance to resolve problems that cannot be solved at one's level of authority
GS10. identify cause and effect relations in their area of work to anticipate potential problems and their solution

Assessment Criteria

Assessment Criteria for Outcomes	Theory Marks	Practical Marks	Project Marks	Viva Marks
Follow preventive measures to avoid accidents	**13**	**31**	**-**	**-**
PC1. wear appropriate personal protective equipment (PPE) as per task requirements. PPE: gloves, hairnets, masks, ear plugs, goggles, shoes etc.	-	-	-	-
PC2. identify job-site hazardous work and possible causes of risk or accident at the workplace	-	-	-	-
PC3. deal with hazards safely and appropriately to ensure safety of self and others	-	-	-	-
PC4. ensure that the equipment used (such as for lifting and carrying materials, power tools, etc.) are maintained effectively	-	-	-	-
PC5. implement organisational safety protocols to prevent accidents and hazards	-	-	-	-
PC6. ensure that general health and safety equipment are readily available at all times	-	-	-	-
PC7. ensure that common hazard signs are displayed properly wherever required	-	-	-	-
PC8. use various types of fire extinguishers effectively	-	-	-	-
PC9. train the workforce on accident prevention techniques required at the workplace. Accident prevention techniques: role of appropriate PPE; use of fire extinguishers, dealing with hazards; identification of risks that could lead to accidents; safety protocols followed to avoid accidents; role of different types of hazard signs, safe lifting and carrying practices, etc.	-	-	-	-
Deal with emergencies	**8**	**18**	**-**	**-**
PC10. follow workplace emergency and evacuation procedures	-	-	-	-
PC11. use safe methods to free a person from electrocution	-	-	-	-

Assessment Criteria for Outcomes	Theory Marks	Practical Marks	Project Marks	Viva Marks
PC12. administer appropriate first aid to victims in case of cuts, bleeding, burns, choking, electric shock, poisoning, etc.	-	-	-	-
PC13. provide artificial respiration and cardio-pulmonary resuscitation (CPR) in various instances (e.g., cardiac arrest)	-	-	-	-
PC14. report any identified breaches in health, safety and security policies and procedures to the concerned authority	-	-	-	-
PC15. train the workforce on emergency procedures to be followed at the workplace. Emergency procedures: safe evacuation; treating a person from electrocution; immediate first aid to be given at times of cuts, bleeding, burns, choking, electric shock, poisoning, etc.; administering artificial respiration and cardio-pulmonary resuscitation (CPR); escalating issues beyond own scope, etc.	-	-	-	-
Manage infection control	**9**	**21**	**-**	**-**
PC16. follow and enforce Good Hygiene Practices (GHP) among the team. GHP: washing hands regularly, reporting personal health issues to the concerned, undertaking preventive health check-ups at regular intervals, getting vaccinated as per standard procedures whenever required, etc.	-	-	-	-
PC17. identify the type of infection spread in discussion with designated personnel and relevant sources. Type of infection spread: severity; precautions to be taken; safety protocols to be followed during spread; sanitisers to be used, etc.	-	-	-	-
PC18. ensure the work area, equipment and related facilities are being sanitised effectively as per organisational schedule and work requirements	-	-	-	-
PC19. ensure that materials used for sanitisation are stored appropriately and readily available at times of need	-	-	-	-
PC20. take appropriate action at times of illness to self and others in the team	-	-	-	-

Assessment Criteria for Outcomes	Theory Marks	Practical Marks	Project Marks	Viva Marks
PC21. train the workforce on infection control practices followed at the workplace. Infection control practices: precautions to be taken; types of sanitisers to be used; ensuring appropriate sanitization of self and work area; reporting illness to self and others promptly, etc.	-	-	-	-
PC22. review standard operating procedures (SOPs) as per organisational schedule to ensure compliance with regulatory requirements	-	-	-	-
PC23. ensure periodic health check-up of all workers in compliance with FSSAI guidelines	-	-	-	-
PC24. provide regulatory support and process improvements which have an impact on regulatory affairs related to quality and safety assurance in respective departments	-	-	-	-
NOS Total	**30**	**70**	**-**	**-**

National Occupational Standards (NOS) Parameters

NOS Code	FIC/N9903
NOS Name	Ensure workplace health and safety
Sector	Food Processing
Sub-Sector	Generic
Occupation	Generic
NSQF Level	5
Credits	TBD
Version	1.0
Last Reviewed Date	24/02/2022
Next Review Date	24/02/2025
NSQC Clearance Date	24/02/2022

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

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

Assessment Criteria

Assessment Criteria for Outcomes	Theory Marks	Practical Marks	Project Marks	Viva Marks
Communicate effectively	**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	-	-
Work in a team effectively	**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	-	-
Respect diversity	**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**	**-**	**-**

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	17/11/2025
NSQC Clearance Date	17/11/2022

Assessment Guidelines and Assessment Weightage

Assessment Guidelines

1. Criteria for assessment for each Qualification Pack will be created by the Sector Skill Council. Each 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, 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 this criterion.

6. To pass the Qualification Pack, every trainee should score a minimum of 70% of aggregate marks to successfully clear the assessment.

7. In case of unsuccessful completion, the trainee may seek reassessment on the Qualification Pack.

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/N9305.Select raw material and associated vendors	30	50	-	20	100	25
FIC/N9306.Carry out texturization of plant-based protein	45	75	-	30	150	25
FIC/N9307.Optimization of plant-based protein	30	50	-	20	100	20
FIC/N9308.Prepare and pack plant based protein	30	50	-	20	100	15
FIC/N9904.Ensure food safety at the workplace	30	70	-	-	100	5
FIC/N9903.Ensure workplace health and safety	30	70	-	-	100	5
FIC/N9902.Work effectively in an organisation	22	39	-	-	61	5
Total	**217**	**404**	**-**	**90**	**711**	**100**

Acronyms

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

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.
Knowledge and Understanding (KU)	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.

Organisational Context	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.
Technical Knowledge	Technical knowledge is the specific knowledge needed to accomplish specific designated responsibilities.
Core Skills/ Generic Skills (GS)	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.
Electives	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.
Options	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.