



# Makhana Grower cum Processor

Options: Processing/ Products Preparation

QP Code: AGR/Q0306

Version: 1.0

NSQF Level: 4

Agriculture Skill Council of India || 6th Floor, GNG Tower, Plot No. 10, Sector -44, Gurgaon  
Haryana-122004 || email:shrinkhala@asci-india.com

## Qualification Pack

### Contents

AGR/Q0306: Makhana Grower cum Processor .....	3
<i>Brief Job Description</i> .....	3
Applicable National Occupational Standards (NOS) .....	3
<i>Compulsory NOS</i> .....	3
<i>Option 1: Processing</i> .....	3
<i>Option 2: Products Preparation</i> .....	3
<i>Qualification Pack (QP) Parameters</i> .....	3
AGR/N0327: Procure seed and manage nursery for makhana cultivation .....	5
AGR/N0328: Carry out cultivation of makhana using Good Agricultural Practices (GAP) .....	11
AGR/N0329: Harvest and post-harvest management of makhana .....	20
AGR/N9903: Maintain health and safety at the workplace .....	26
AGR/N9908: Undertake basic entrepreneurial activities for small enterprise .....	32
AGR/N0330: Carry out processing of makhana in the makhana processing unit .....	36
AGR/N0331: Carry out processing of makhana in the makhana processing unit .....	42
Assessment Guidelines and Weightage .....	45
<i>Assessment Guidelines</i> .....	45
<i>Assessment Weightage</i> .....	46
Acronyms .....	48
Glossary .....	49

## Qualification Pack

### AGR/Q0306: Makhana Grower cum Processor

#### Brief Job Description

A Makhana Grower cum processor primarily carries out cultivation of makhana as per the recommended package of practices, its processing using traditional method (manually) and selling the produce as per the market demand.

#### Personal Attributes

The individual should be able to work independently, bear risks and must take decisions pertaining to his/her area of work. The individual should be result oriented and responsible for his/her own learning and working. The person should possess alert and physically active body and be capable of working for long hours in open fields or cultivation area and possess an eye for details

#### Applicable National Occupational Standards (NOS)

##### Compulsory NOS:

1. [AGR/N0327: Procure seed and manage nursery for makhana cultivation](#)
2. [AGR/N0328: Carry out cultivation of makhana using Good Agricultural Practices \(GAP\)](#)
3. [AGR/N0329: Harvest and post-harvest management of makhana](#)
4. [AGR/N9903: Maintain health and safety at the workplace](#)
5. [AGR/N9908: Undertake basic entrepreneurial activities for small enterprise](#)

##### Options(Not mandatory):

###### Option 1: Processing

The job holder is responsible for processing of makhana in the makhana processing unit.

1. [AGR/N0330: Carry out processing of makhana in the makhana processing unit](#)

###### Option 2: Products Preparation

The job holder is responsible for preparation of different value added products of makhana- makhana flakes, instant makhana kheer mix and flavoured makhana using processing machines.

1. [AGR/N0331: Carry out processing of makhana in the makhana processing unit](#)

## Qualification Pack

### Qualification Pack (QP) Parameters

<b>Sector</b>	Agriculture
<b>Sub-Sector</b>	Agriculture Crop Production
<b>Occupation</b>	Fruit Crops Cultivation
<b>Country</b>	India
<b>NSQF Level</b>	4
<b>Aligned to NCO/ISCO/ISIC Code</b>	NCO-2015/NIL
<b>Minimum Educational Qualification &amp; Experience</b>	Ability to read and write
<b>Minimum Level of Education for Training in School</b>	
<b>Pre-Requisite License or Training</b>	NA
<b>Minimum Job Entry Age</b>	18 Years
<b>Last Reviewed On</b>	04/07/2018
<b>Next Review Date</b>	04/07/2022
<b>NSQC Approval Date</b>	03/08/2018
<b>Version</b>	1.0
<b>Reference code on NQR</b>	2018/AGR/ASCI/02541
<b>NQR Version</b>	1.0

## Qualification Pack

### AGR/N0327: Procure seed and manage nursery for makhana cultivation

#### Description

This unit deals with the selection and procurement of seed, seed treatment and management of nursery for makhana cultivation.

#### Scope

This unit/task covers the following:

#### Elements and Performance Criteria

##### *Selection of seed and seed treatment*

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

- PC1.** select varieties based on area / ecosystem / season, yield and resistance to pests and diseases and maximum pop recovery
- PC2.** identify various vendors / suppliers (including government nurseries / department) for the certified seeds
- PC3.** ascertain the quality of seed material from each source in terms of free from pests and diseases germination percentage etc.
- PC4.** collect the prevailing market rates for the seed material from different sources
- PC5.** procure the seed material
- PC6.** store the seed at an appropriate place as per the recommended procedure

##### *Nursery management under the field system*

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

- PC7.** treat the seed as per the recommended dosage
- PC8.** assess the nursery site based on the requirement
- PC9.** prepare suitable design and layout for nursery construction
- PC10.** plough and puddle the nursery field
- PC11.** maintain depth of water as per depth of the main field
- PC12.** ensure proper facilities for timely irrigation
- PC13.** broadcast the sprouted seed as per the recommended seed rate
- PC14.** apply manure in the recommended doses
- PC15.** control weeds as per the recommended practices
- PC16.** control pests and diseases as per the recommended practices
- PC17.** uproot the seedlings for transplantation at the recommended stage

#### Knowledge and Understanding (KU)

The individual on the job needs to know and understand:

- KU1.** relevant legislation, standards, policies, and procedures in work

## Qualification Pack

- KU2.** relevant health and safety requirements
- KU3.** own job role and responsibilities and sources for information pertaining to work
- KU4.** who to approach for support in order to obtain work related information, clarifications and support
- KU5.** importance of following health, hygiene, safety and quality standards and the impact of not following the standards on consumers and the business
- KU6.** various climatic parameters such as maximum and minimum temperatures, intensity and distribution of precipitation (rainfall), relative humidity etc.
- KU7.** pest and diseases specific to a given agro climatic region, the life cycles of these pests and diseases and the sources of infection
- KU8.** duration of various varieties of makhana
- KU9.** yields of the varieties
- KU10.** resistance and susceptibility of the variety to various pests and diseases
- KU11.** maximum pop recovery percentage (thickness of seed coat)
- KU12.** appropriate personal protective equipment used during nursery preparation
- KU13.** hazards and risks associated with nursery raising in agricultural land and how to control injury to self
- KU14.** factors determining nursery site selection
- KU15.** various types of tools, equipment, materials and machinery used in nursery preparation
- KU16.** role of good drainage system in a nursery
- KU17.** different types of nursery
- KU18.** importance of preparing design and layout
- KU19.** techniques used to check soil quality
- KU20.** safe handling and transportation practices of nursery plants
- KU21.** practices of nursery preparation and management
- KU22.** different activities involved in nursery such as sowing, planting, watering, weeding, transplanting etc.
- KU23.** pest and disease management in nursery

## Generic Skills (GS)

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

- GS1.** read basic instructions and information in local language related to work
- GS2.** read and interpret safety warnings, symbols, signs, etc. mentioned on tools, equipment and materials
- GS3.** get information and update on the latest variety of seeds by reading newspapers and magazines
- GS4.** maintain effective working relationships
- GS5.** communicate clearly and effectively with others like farmers, concerned officer/stakeholders
- GS6.** comprehend information shared by senior people and experts
- GS7.** make decisions pertaining to procurement of seed and selection of nursery site

## Qualification Pack

- GS8.** seek clarification from responsible authority when faced with difficult decisions
- GS9.** plan and organize work such that all activities are completed in time and as per standard quality procedures
- GS10.** seek advice from makhana experts/traders for growing quality produce
- GS11.** use customer demand as a key factor for production targets
- GS12.** determine difficulties or non-conducive conditions for nursery preparation and resolve potential threats by adopting approaches based on previous experiences
- GS13.** identify potential problems and seek guidance from subject matter experts on how to rectify problems
- GS14.** apply logical reasoning to solve problems or any potential problems related to work by analyzing previous experiences

**Qualification Pack**
**Assessment Criteria**

Assessment Criteria for Outcomes	Theory Marks	Practical Marks	Project Marks	Viva Marks
<i>Selection of seed and seed treatment</i>	<b>6</b>	<b>10</b>	-	-
<b>PC1.</b> select varieties based on area / ecosystem / season, yield and resistance to pests and diseases and maximum pop recovery	1	2	-	-
<b>PC2.</b> identify various vendors / suppliers (including government nurseries / department) for the certified seeds	1	2	-	-
<b>PC3.</b> ascertain the quality of seed material from each source in terms of free from pests and diseases germination percentage etc.	1	2	-	-
<b>PC4.</b> collect the prevailing market rates for the seed material from different sources	1	2	-	-
<b>PC5.</b> procure the seed material	1	1	-	-
<b>PC6.</b> store the seed at an appropriate place as per the recommended procedure	1	1	-	-
<i>Nursery management under the field system</i>	<b>14</b>	<b>20</b>	-	-
<b>PC7.</b> treat the seed as per the recommended dosage	1	2	-	-
<b>PC8.</b> assess the nursery site based on the requirement	1	2	-	-
<b>PC9.</b> prepare suitable design and layout for nursery construction	2	2	-	-
<b>PC10.</b> plough and puddle the nursery field	1	2	-	-
<b>PC11.</b> maintain depth of water as per depth of the main field	1	1	-	-
<b>PC12.</b> ensure proper facilities for timely irrigation	1	2	-	-
<b>PC13.</b> broadcast the sprouted seed as per the recommended seed rate	1	1	-	-
<b>PC14.</b> apply manure in the recommended doses	2	1	-	-

### Qualification Pack

Assessment Criteria for Outcomes	Theory Marks	Practical Marks	Project Marks	Viva Marks
<b>PC15.</b> control weeds as per the recommended practices	1	2	-	-
<b>PC16.</b> control pests and diseases as per the recommended practices	2	3	-	-
<b>PC17.</b> uproot the seedlings for transplantation at the recommended stage	1	2	-	-
<b>NOS Total</b>	<b>20</b>	<b>30</b>	-	-

## Qualification Pack

### National Occupational Standards (NOS) Parameters

<b>NOS Code</b>	AGR/N0327
<b>NOS Name</b>	Procure seed and manage nursery for makhana cultivation
<b>Sector</b>	Agriculture
<b>Sub-Sector</b>	Agriculture Crop Production
<b>Occupation</b>	Fruit Crops Cultivation
<b>NSQF Level</b>	4
<b>Credits</b>	TBD
<b>Version</b>	1.0
<b>Last Reviewed Date</b>	04/07/2018
<b>Next Review Date</b>	04/07/2022

## Qualification Pack

# AGR/N0328: Carry out cultivation of makhana using Good Agricultural Practices (GAP)

## Description

This unit deals with the cultivation of makhana using Good Agricultural Practices.

## Scope

This unit/task covers the following:

## Elements and Performance Criteria

### *Land/ Pond preparation, ploughing and puddling*

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

- PC1.** select suitable methods of cultivation-field system, pond system, makhana-fish integration based on the available resources
- PC2.** renovate pond/wetland area
- PC3.** clean the field/pond
- PC4.** plough, submerge and puddle the main field incase of field cultivation and plough and dry the pond incase of pond cultivation
- PC5.** carry out leveling of the field/pond
- PC6.** carry out manuring, fertilizing and liming of pond incase of pond cultivation
- PC7.** irrigate the field/pond
- PC8.** prepare and raise the bunds to suitable height
- PC9.** compact the bunds
- PC10.** employ advanced practices (central/peripheral vacate system) that would support integrated makhana-fish cultivation
- PC11.** carry out sowing of seeds in the pond system

### *Transplantation*

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

- PC12.** carry out root dipping of makhana seedlings for plant protection as per the recommended procedures
- PC13.** maintain inter-row distance between the seedlings
- PC14.** transplant seedlings as per the recommended procedures
- PC15.** carry out gap-filling as and when required

### *Application of organic and inorganic fertilizers*

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

- PC16.** carry out soil sampling for soil testing
- PC17.** procure the recommended doses of fertilizers/nutrients/farm yard manure (FYM) as mentioned in the soil health card
- PC18.** select appropriately decomposed farm yard manure for soil application

## Qualification Pack

- PC19.** apply the FYM to the soil as per recommended dosage and procedure before planting and during crop cultivation (if required)
- PC20.** employ various cultural practices that enhances the soil nutrient status for the benefit of crop stand
- PC21.** apply organic and inorganic fertilizers for macro and micro nutrients as per the recommended dosage, timing and method of application
- PC22.** apply lime before transplanting

### *Weed management*

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

- PC23.** identify different weeds afflicting the makhana crop
- PC24.** Carry out manual weeding at appropriate stages of crop growth
- PC25.** Clean the field bunds regularly to avoid proliferation of weed seeds

### *Integrated pest and disease management*

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

- PC26.** identify different types of pests and diseases in makhana crop
- PC27.** identify crop stage and pest/disease incidence and prepare pest/disease calendar
- PC28.** diagnose signs and symptoms of different pest and disease infestation
- PC29.** identify the pest life cycle duration and their behavior
- PC30.** identify natural enemies of the pests
- PC31.** identify mode of transmission of different diseases (implements, vectors, water, rain, wind)
- PC32.** identify and select suitable preventive and curative measures to control pests and diseases- chemical, biological, mechanical, cultural
- PC33.** carry out preventive and curative measures to control pests and diseases- chemical, biological, mechanical, cultural
- PC34.** prepare and apply biopesticides like neem seed kernel extract (nske), leaf extract, panchagavya spray, sour butter milk extract etc depending on the pest type
- PC35.** prepare and apply agrochemical sprays as per the recommended doses using suitable method

### *Irrigation Management*

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

- PC36.** ensure standing water is maintained at the recommended depth in the pond/main field
- PC37.** carry out water treatment based on the water test report
- PC38.** ensure measures to avoid water loss through seepage and leaching

### *Adoption of suitable cropping pattern*

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

- PC39.** select suitable cropping system based on the type of land
- PC40.** demonstrate integration of fish in makhana pond
- PC41.** rear, harvest and market the fish
- PC42.** transplant suitable crop after the harvest of makhana, viz. paddy, water chestnut etc
- PC43.** harvest, grade and market the agricultural produce

## Knowledge and Understanding (KU)

## Qualification Pack

The individual on the job needs to know and understand:

- KU1.** relevant legislation, standards, policies, and procedures in work area
- KU2.** relevant health and safety requirements
- KU3.** own job role and responsibilities and sources for information pertaining to work
- KU4.** who to approach for support in order to obtain work related information, clarifications and support
- KU5.** importance of following health, hygiene, safety and quality standards and the impact of not following the standards on consumers and the business
- KU6.** relevant people and their responsibilities within the work area
- KU7.** escalation matrix and procedures for reporting regulatory issues
- KU8.** documentation and related procedures applicable in the context of work
- KU9.** importance of using personal protective equipment
- KU10.** hazards and risks associated with makhana cultivation and relevant safety measures to be undertaken
- KU11.** various kinds of tools, machinery and materials used for makhana cultivation and their functions
- KU12.** methods for preparing pond/field
- KU13.** importance of land leveling as per different methods of irrigation
- KU14.** various methods of land preparation and their influence on the soil tilth
- KU15.** advantages and disadvantages of transplanting and direct sowing methods
- KU16.** advantages and challenges of line transplanting and space between rows
- KU17.** density of transplanting and the influence on the crop yield
- KU18.** interaction effects of the soil type, level of the land and water availability on the crop growth and its yield
- KU19.** good agricultural practices used in makhana cultivation
- KU20.** water management practices
- KU21.** water requirement and irrigation schedule
- KU22.** transplantation techniques and environmental conditions
- KU23.** seed placement distance e.g. row to row and plant to plant distance
- KU24.** principles of raising and managing seedlings
- KU25.** different pests and diseases infecting makhana plants and their behavior
- KU26.** operations that have an impact on pest incidence and precautions to be taken up while land preparation and sowing (stubble clearing, resistant varieties, seed and seedling treatment etc)
- KU27.** different preventive and curative methods used for the control of pests and diseases
- KU28.** advantages and methods of soil application of neem cake, bio agents like neem seed kernel extract (NSKE), cow dung and urine spray, panchagavya spray, 5 leaf extract, 10 leaves extract, sour butter milk extract etc based on pest type etc.
- KU29.** advantages of various resource plants (neem, pongamia, vitex, etc)
- KU30.** methods and procedures of preparing various biopesticides (neem seed kernel extract, cow dung urine solution)

## Qualification Pack

- KU31.** integrated pest and disease management techniques
- KU32.** national and international standards on pesticide residues
- KU33.** importance of safe production and safe produce
- KU34.** soil sampling technique
- KU35.** components of soil analysis report and reading the soil health card
- KU36.** different types of manures/composts/ fertilizers to be used
- KU37.** appropriate methods of application of various fertilizers, micro nutrients and other agrochemicals
- KU38.** various weeds and their influence on crop yield
- KU39.** types of weeds and their means of propagation
- KU40.** different control methods of weeds
- KU41.** critical stages of weed control
- KU42.** methods used in weeding
- KU43.** suitable cropping pattern that can be adopted with makhana cultivation
- KU44.** rearing practices of fish in makhana pond

## Generic Skills (GS)

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

- GS1.** note down the activity schedules in logs, registers, etc. in english or local language
- GS2.** fill details of expenditure incurred in english or local language
- GS3.** read basic instructions and information in local language related to work
- GS4.** read and interpret safety warnings, symbols, signs, etc. mentioned on tools, equipment and materials
- GS5.** communicate effectively with co-workers, subordinates, etc. to ensure work flow is carried out responsibly
- GS6.** seek clarification and understanding where instructions are not clear in any language understood locally
- GS7.** follow the instructions of responsible authority completely in order to avoid miscommunication or conflicts at work
- GS8.** make decisions pertaining to the irrigation time and methods, weeding activities, disease and pest identification and its management, type of fertilizers and its application, tools, etc.
- GS9.** plan and organize work such that all activities are completed in time and as per standard quality procedures
- GS10.** use customer demand as a key factor for production targets
- GS11.** identify potential problems and seek guidance from subject matter experts on how to rectify problems
- GS12.** apply logical reasoning to solve problems or any potential problems related to work by analyzing previous experiences
- GS13.** determine the impact of inappropriate use of inputs and adopt sustainable practices

**Qualification Pack**
**Assessment Criteria**

Assessment Criteria for Outcomes	Theory Marks	Practical Marks	Project Marks	Viva Marks
<i>Land/ Pond preparation, ploughing and puddling</i>	<b>11</b>	<b>20</b>	-	-
<b>PC1.</b> select suitable methods of cultivation-field system, pond system, makhana-fish integration based on the available resources	1	2	-	-
<b>PC2.</b> renovate pond/wetland area	1	2	-	-
<b>PC3.</b> clean the field/pond	1	1	-	-
<b>PC4.</b> plough, submerge and puddle the main field incase of field cultivation and plough and dry the pond incase of pond cultivation	1	2	-	-
<b>PC5.</b> carry out leveling of the field/pond	1	2	-	-
<b>PC6.</b> carry out manuring, fertilizing and liming of pond incase of pond cultivation	1	2	-	-
<b>PC7.</b> irrigate the field/pond	1	2	-	-
<b>PC8.</b> prepare and raise the bunds to suitable height	1	2	-	-
<b>PC9.</b> compact the bunds	1	2	-	-
<b>PC10.</b> employ advanced practices (central/peripheral vacate system) that would support integrated makhana-fish cultivation	1	2	-	-
<b>PC11.</b> carry out sowing of seeds in the pond system	1	1	-	-
<i>Transplantation</i>	<b>4</b>	<b>6</b>	-	-
<b>PC12.</b> carry out root dipping of makhana seedlings for plant protection as per the recommended procedures	1	2	-	-
<b>PC13.</b> maintain inter-row distance between the seedlings	1	1	-	-
<b>PC14.</b> transplant seedlings as per the recommended procedures	1	2	-	-
<b>PC15.</b> carry out gap-filling as and when required	1	1	-	-

**Qualification Pack**

Assessment Criteria for Outcomes	Theory Marks	Practical Marks	Project Marks	Viva Marks
<i>Application of organic and inorganic fertilizers</i>	<b>7</b>	<b>13</b>	-	-
<b>PC16.</b> carry out soil sampling for soil testing	1	2	-	-
<b>PC17.</b> procure the recommended doses of fertilizers/nutrients/farm yard manure (FYM) as mentioned in the soil health card	1	2	-	-
<b>PC18.</b> select appropriately decomposed farm yard manure for soil application	1	1	-	-
<b>PC19.</b> apply the FYM to the soil as per recommended dosage and procedure before planting and during crop cultivation (if required)	1	2	-	-
<b>PC20.</b> employ various cultural practices that enhances the soil nutrient status for the benefit of crop stand	1	2	-	-
<b>PC21.</b> apply organic and inorganic fertilizers for macro and micro nutrients as per the recommended dosage, timing and method of application	1	2	-	-
<b>PC22.</b> apply lime before transplanting	1	2	-	-
<i>Weed management</i>	<b>3</b>	<b>4</b>	-	-
<b>PC23.</b> identify different weeds afflicting the makhana crop	1	2	-	-
<b>PC24.</b> Carry out manual weeding at appropriate stages of crop growth	1	1	-	-
<b>PC25.</b> Clean the field bunds regularly to avoid proliferation of weed seeds	1	1	-	-
<i>Integrated pest and disease management</i>	<b>12</b>	<b>25</b>	-	-
<b>PC26.</b> identify different types of pests and diseases in makhana crop	1	2	-	-
<b>PC27.</b> identify crop stage and pest/disease incidence and prepare pest/disease calendar	1	2	-	-
<b>PC28.</b> diagnose signs and symptoms of different pest and disease infestation	1	2	-	-

**Qualification Pack**

Assessment Criteria for Outcomes	Theory Marks	Practical Marks	Project Marks	Viva Marks
<b>PC29.</b> identify the pest life cycle duration and their behavior	1	2	-	-
<b>PC30.</b> identify natural enemies of the pests	1	2	-	-
<b>PC31.</b> identify mode of transmission of different diseases (implements, vectors, water, rain, wind)	1	2	-	-
<b>PC32.</b> identify and select suitable preventive and curative measures to control pests and diseases- chemical, biological, mechanical, cultural	1	2	-	-
<b>PC33.</b> carry out preventive and curative measures to control pests and diseases- chemical, biological, mechanical, cultural	3	5	-	-
<b>PC34.</b> prepare and apply biopesticides like neem seed kernel extract (nske), leaf extract, panchagavya spray, sour butter milk extract etc depending on the pest type	1	4	-	-
<b>PC35.</b> prepare and apply agrochemical sprays as per the recommended doses using suitable method	1	2	-	-
<i>Irrigation Management</i>	<b>2</b>	<b>5</b>	-	-
<b>PC36.</b> ensure standing water is maintained at the recommended depth in the pond/main field	-	1	-	-
<b>PC37.</b> carry out water treatment based on the water test report	1	2	-	-
<b>PC38.</b> ensure measures to avoid water loss through seepage and leaching	1	2	-	-
<i>Adoption of suitable cropping pattern</i>	<b>6</b>	<b>12</b>	-	-
<b>PC39.</b> select suitable cropping system based on the type of land	1	2	-	-
<b>PC40.</b> demonstrate integration of fish in makhana pond	2	3	-	-
<b>PC41.</b> rear, harvest and market the fish	1	3	-	-
<b>PC42.</b> transplant suitable crop after the harvest of makhana, viz. paddy, water chestnut etc	1	2	-	-

### Qualification Pack

Assessment Criteria for Outcomes	Theory Marks	Practical Marks	Project Marks	Viva Marks
<b>PC43.</b> harvest, grade and market the agricultural produce	1	2	-	-
<b>NOS Total</b>	<b>45</b>	<b>85</b>	-	-

## Qualification Pack

### National Occupational Standards (NOS) Parameters

<b>NOS Code</b>	AGR/N0328
<b>NOS Name</b>	Carry out cultivation of makhana using Good Agricultural Practices (GAP)
<b>Sector</b>	Agriculture
<b>Sub-Sector</b>	Agriculture Crop Production
<b>Occupation</b>	Fruit Crops Cultivation
<b>NSQF Level</b>	4
<b>Credits</b>	TBD
<b>Version</b>	1.0
<b>Last Reviewed Date</b>	04/07/2018
<b>Next Review Date</b>	04/07/2022

## Qualification Pack

### AGR/N0329: Harvest and post-harvest management of makhana

#### Description

This OS unit covers the range of learning outcomes expected from a person to competently carry out harvesting and post-harvesting procedures of makhana using the traditional method

#### Scope

This unit/task covers the following:

- Harvesting of makhana
- Storage of makhana seeds
- Post-harvest management of makhana using the traditional method

#### Elements and Performance Criteria

##### *Harvesting of makhana*

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

- PC1.** harvest the crop at the appropriate stage and time
- PC2.** fill the field with water up to the desired level (1.5 ft.)
- PC3.** wash the harvested produce to remove thin layer of decomposed aril

##### *Storage of makhana seeds*

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

- PC4.** carry out bagging of seeds
- PC5.** dip the seeds in water for maintaining their viability

##### *Post-harvest management of makhana using the traditional method*

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

- PC6.** carry out drying and grading of seeds
- PC7.** carry out pre-heating/ roasting of seeds
- PC8.** carry out popping of seeds
- PC9.** carry out polishing/finishing of popped makhana
- PC10.** carry out grading of popped makhana
- PC11.** carry out packaging of popped makhana
- PC12.** label the packed item correctly with all the required information
- PC13.** carry out storage of popped makhana
- PC14.** record information such as quality, quantity, expenditure incurred in operation, etc. in appropriate registers, record book and logs
- PC15.** carry out safe transportation of the produce

#### Knowledge and Understanding (KU)

The individual on the job needs to know and understand:

## Qualification Pack

- KU1.** relevant legislation, standards, policies, and procedures related to work
- KU2.** relevant health and safety requirements
- KU3.** own job role and responsibilities and sources for information pertaining to work
- KU4.** who to approach for support in order to obtain work related information, clarifications and support
- KU5.** importance of following health, hygiene, safety and quality standards and the impact of not following the standards on consumers and the business
- KU6.** relevant people and their responsibilities within the work area
- KU7.** documentation and related procedures applicable in the context of work
- KU8.** importance of appropriate personal protective equipment
- KU9.** hazards and risks in the work environment and how to control injury to self and others
- KU10.** tools and equipments used in the harvest and post-harvest procedures of makhana
- KU11.** ideal stage of harvesting
- KU12.** harvesting method of makhana
- KU13.** methods to avoid grain loss during harvest
- KU14.** different post-harvesting procedures followed for makhana processing
- KU15.** cleaning, drying, roasting, popping, grading, packaging methods
- KU16.** storage, safe handling and transporting procedures
- KU17.** various methods of storage and their influence on the grain quality
- KU18.** various methods of storage and their cost dynamics
- KU19.** chemicals and other cultural methods that may be used to prevent losses from storage pests

## Generic Skills (GS)

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

- GS1.** note down the activity schedules in logs, registers, etc. in english or local language
- GS2.** fill details of expenditure incurred in english or local language
- GS3.** read basic instructions and information in local language related to work
- GS4.** read and interpret safety warnings, symbols, signs, etc. mentioned on tools, equipment and materials
- GS5.** communicate effectively with co-workers, subordinates, etc. to ensure work flow is carried out responsibly
- GS6.** seek clarification and understanding where instructions are not clear in any language understood locally
- GS7.** follow instructions from responsible authority completely in order to avoid miscommunication or conflicts at work
- GS8.** make decisions pertaining to the harvesting, post-harvesting methods and tools for makhana processing
- GS9.** plan and organize harvest and post-harvest activities such that all activities are completed in time and as per standard quality procedures
- GS10.** assess customers demand of makhana

## Qualification Pack

- GS11.** provide customer good quality produce and maintain good relationship
- GS12.** identify potential problems and seek guidance from subject matter experts on how to rectify problems
- GS13.** apply logical reasoning to solve problems or any potential problems related to work by analyzing previous experiences
- GS14.** optimize the use of resources and achieve maximum profit

**Qualification Pack**
**Assessment Criteria**

Assessment Criteria for Outcomes	Theory Marks	Practical Marks	Project Marks	Viva Marks
<i>Harvesting of makhana</i>	<b>3</b>	<b>5</b>	-	-
<b>PC1.</b> harvest the crop at the appropriate stage and time	2	3	-	-
<b>PC2.</b> fill the field with water up to the desired level (1.5 ft.)	-	1	-	-
<b>PC3.</b> wash the harvested produce to remove thin layer of decomposed aril	1	1	-	-
<i>Storage of makhana seeds</i>	<b>1</b>	<b>4</b>	-	-
<b>PC4.</b> carry out bagging of seeds	1	3	-	-
<b>PC5.</b> dip the seeds in water for maintaining their viability	-	1	-	-
<i>Post-harvest management of makhana using the traditional method</i>	<b>21</b>	<b>41</b>	-	-
<b>PC6.</b> carry out drying and grading of seeds	2	6	-	-
<b>PC7.</b> carry out pre-heating/ roasting of seeds	2	6	-	-
<b>PC8.</b> carry out popping of seeds	2	6	-	-
<b>PC9.</b> carry out polishing/finishing of popped makhana	2	6	-	-
<b>PC10.</b> carry out grading of popped makhana	2	6	-	-
<b>PC11.</b> carry out packaging of popped makhana	3	5	-	-
<b>PC12.</b> label the packed item correctly with all the required information	3	2	-	-
<b>PC13.</b> carry out storage of popped makhana	1	1	-	-
<b>PC14.</b> record information such as quality, quantity, expenditure incurred in operation, etc. in appropriate registers, record book and logs	3	2	-	-
<b>PC15.</b> carry out safe transportation of the produce	1	1	-	-

### Qualification Pack

Assessment Criteria for Outcomes	Theory Marks	Practical Marks	Project Marks	Viva Marks
<b>NOS Total</b>	<b>25</b>	<b>50</b>	<b>-</b>	<b>-</b>

## Qualification Pack

### National Occupational Standards (NOS) Parameters

<b>NOS Code</b>	AGR/N0329
<b>NOS Name</b>	Harvest and post-harvest management of makhana
<b>Sector</b>	Agriculture
<b>Sub-Sector</b>	Agriculture Crop Production
<b>Occupation</b>	Fruit Crops Cultivation
<b>NSQF Level</b>	4
<b>Credits</b>	TBD
<b>Version</b>	1.0
<b>Last Reviewed Date</b>	04/07/2018
<b>Next Review Date</b>	04/07/2022

## Qualification Pack

### AGR/N9903: Maintain health and safety at the workplace

#### Description

This OS is for the cultivator who is responsible for maintaining health and safety of self and others co workers at workplace

#### Scope

This unit/task covers the following:

- Maintain clean and efficient workplace
- Render appropriate emergency procedures

#### Elements and Performance Criteria

##### *Maintain clean and efficient workplace*

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

- PC1.** undertake basic safety checks before operation of all machinery and vehicles and ensure hazards are reported to the appropriate supervisor
- PC2.** work for which protective clothing or equipment is required is identified and the appropriate protective clothing or equipment is used in performing these duties in accordance with workplace policy
- PC3.** read and understand the hazards of use and contamination mentioned on the labels of pesticides/fumigants etc
- PC4.** assess risks prior to performing manual handling jobs, and work according to currently recommended safe practice
- PC5.** use equipment and materials safely and correctly and return the same to designated storage when not in use
- PC6.** dispose off waste safely and correctly in a designated area
- PC7.** recognise risks to bystanders and take action to reduce risk associated with jobs in the workplace
- PC8.** perform work in a manner which minimizes environmental damage by following all procedures and work instructions for controlling risk
- PC9.** report any accidents, incidents or problems without delay to an appropriate person and take necessary immediate action to reduce further danger

##### *Render appropriate emergency procedures*

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

- PC10.** follow procedures for dealing with accidents, fires and emergencies, including communicating location and directions to emergency
- PC11.** follow emergency procedures to company standard/workplace requirements
- PC12.** use emergency equipment in accordance with manufacturers' specifications and workplace requirements
- PC13.** provide treatment appropriate to the patient's injuries in accordance with recognized first aid techniques

## Qualification Pack

- PC14.** recover (if practical), clean, inspect/test, refurbish, replace and store the first aid equipment as appropriate
- PC15.** report details of first aid administered in accordance with workplace procedures

### Knowledge and Understanding (KU)

The individual on the job needs to know and understand:

- KU1.** relevant legislation, standards, policies, and procedures in work
- KU2.** relevant health and safety requirements applicable in the work environment
- KU3.** own job role and responsibilities and sources for information pertaining to work
- KU4.** who to approach for support in order to obtain work related information, clarifications and support
- KU5.** importance of following health, hygiene, safety and quality standards and the impact of not following the standards on consumers and the business
- KU6.** documentation and related procedures applicable in the context of work
- KU7.** your general duties under the relevant health and safety legislation
- KU8.** what personal protective equipment and clothing should be worn and how it is cared for
- KU9.** the correct and safe way to use materials and equipment required for your work
- KU10.** the importance of good housekeeping in the workplace
- KU11.** safe disposal methods for waste
- KU12.** methods for minimizing environmental damage during work
- KU13.** the risks to health and safety and the measures to be taken to control those risks in your area of work
- KU14.** workplace procedures and requirements for the treatment of workplace injuries/illnesses.
- KU15.** basic emergency first aid procedure
- KU16.** local emergency services
- KU17.** why accidents, incidents and problems should be reported and the appropriate action to take

### Generic Skills (GS)

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

- GS1.** mention the data which are required for record keeping purpose
- GS2.** report problems to the appropriate personnel in a timely manner
- GS3.** write descriptions and details about incidents in reports
- GS4.** read instruction manual for hand tool and equipments
- GS5.** communicate clearly and effectively with others like farmers, concerned officer/stakeholders
- GS6.** comprehends information shared by senior people and experts
- GS7.** make decisions pertaining to types of tools to be used
- GS8.** identify need of first aid and render it accordingly
- GS9.** schedule daily activities and drawing up priorities; allocate start times, estimation of completion times and materials, equipment and assistance required for completion

## Qualification Pack

- GS10.** manage relationships with co-workers and managers who may be stressed, frustrated, confused or angry
- GS11.** troubleshooting: determine what is causing an operating error and deciding what to do about it
- GS12.** monitor and maintain the condition of tools and equipment
- GS13.** assess situation and identify appropriate control measures
- GS14.** he is responsible for his own working and learning
- GS15.** assess the health and conditions of trees, shrubs, plants and other planting materials

**Qualification Pack**
**Assessment Criteria**

Assessment Criteria for Outcomes	Theory Marks	Practical Marks	Project Marks	Viva Marks
<i>Maintain clean and efficient workplace</i>	<b>15</b>	<b>15</b>	-	-
<b>PC1.</b> undertake basic safety checks before operation of all machinery and vehicles and ensure hazards are reported to the appropriate supervisor	1	1	-	-
<b>PC2.</b> work for which protective clothing or equipment is required is identified and the appropriate protective clothing or equipment is used in performing these duties in accordance with workplace policy	1	1	-	-
<b>PC3.</b> read and understand the hazards of use and contamination mentioned on the labels of pesticides/fumigants etc	2	3	-	-
<b>PC4.</b> assess risks prior to performing manual handling jobs, and work according to currently recommended safe practice	3	2	-	-
<b>PC5.</b> use equipment and materials safely and correctly and return the same to designated storage when not in use	2	3	-	-
<b>PC6.</b> dispose off waste safely and correctly in a designated area	1	1	-	-
<b>PC7.</b> recognise risks to bystanders and take action to reduce risk associated with jobs in the workplace	3	2	-	-
<b>PC8.</b> perform work in a manner which minimizes environmental damage by following all procedures and work instructions for controlling risk	1	1	-	-
<b>PC9.</b> report any accidents, incidents or problems without delay to an appropriate person and take necessary immediate action to reduce further danger	1	1	-	-
<i>Render appropriate emergency procedures</i>	<b>15</b>	<b>15</b>	-	-
<b>PC10.</b> follow procedures for dealing with accidents, fires and emergencies, including communicating location and directions to emergency	2	3	-	-

### Qualification Pack

Assessment Criteria for Outcomes	Theory Marks	Practical Marks	Project Marks	Viva Marks
<b>PC11.</b> follow emergency procedures to company standard/workplace requirements	2	3	-	-
<b>PC12.</b> use emergency equipment in accordance with manufacturers' specifications and workplace requirements	3	2	-	-
<b>PC13.</b> provide treatment appropriate to the patient's injuries in accordance with recognized first aid techniques	3	2	-	-
<b>PC14.</b> recover (if practical), clean, inspect/test, refurbish, replace and store the first aid equipment as appropriate	3	3	-	-
<b>PC15.</b> report details of first aid administered in accordance with workplace procedures	2	2	-	-
<b>NOS Total</b>	<b>30</b>	<b>30</b>	-	-

## Qualification Pack

### National Occupational Standards (NOS) Parameters

<b>NOS Code</b>	AGR/N9903
<b>NOS Name</b>	Maintain health and safety at the workplace
<b>Sector</b>	Agriculture
<b>Sub-Sector</b>	Generic
<b>Occupation</b>	Generic
<b>NSQF Level</b>	4
<b>Credits</b>	TBD
<b>Version</b>	1.0
<b>Last Reviewed Date</b>	30/11/2018
<b>Next Review Date</b>	31/03/2022
<b>NSQF Clearance Date</b>	19/12/2018

## Qualification Pack

# AGR/N9908: Undertake basic entrepreneurial activities for small enterprise

## Description

This OS unit is about trading skills and knowledge recommended for small entrepreneur to market and sell produce

## Elements and Performance Criteria

### *Undertake basic small entrepreneurial activities*

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

- PC1.** seek information regarding demand and supply of produce in the market
- PC2.** identify target customers and assess their needs such as amount required, purpose, quality, expectations, etc.
- PC3.** perform basic accounting such as calculating expenditure incurred, costing and pricing of produce
- PC4.** ensure that the cost of production, transportation and marketing are included in costing and pricing
- PC5.** collect information related to various subsidies/funds offered by the Government, authorized state units and other financial institutions involved with the promotion of the produce
- PC6.** comply with relevant regulations in marketing of the produce
- PC7.** track information related to wholesale and retail price of the produce
- PC8.** record daily sale and purchase of items in designated log books, register, etc.
- PC9.** record quantity, quality, date of manufacture and batch number of every produce accurately
- PC10.** identify appropriate marketing channels related to the produce considering requirements and constraints

## Knowledge and Understanding (KU)

The individual on the job needs to know and understand:

- KU1.** relevant legislation, standards, policies, and procedures related to the produce
- KU2.** relevant health and safety requirements applicable in the enterprise
- KU3.** own job role and responsibilities and sources for information pertaining to marketing of produce
- KU4.** who to approach for support in order to obtain market related information and clarifications
- KU5.** importance of following health, hygiene, safety and quality standards and the impact of not following the standards on consumers and the business
- KU6.** relevant people and their responsibilities within the market
- KU7.** escalation matrix and procedures for reporting regulatory issues
- KU8.** documentation and related procedures applicable in the context of work
- KU9.** basic accounting such as calculating expenditure incurred, total cost of production

## Qualification Pack

- KU10.** how to determine market value of the produce
- KU11.** relevant regulations related to marketing and sale of the produce
- KU12.** various trading channels of produce and their margin of profit
- KU13.** various subsidies/funds offered by the Government, authorized state units and other financial institutions involved with the promotion and sale of produce
- KU14.** strategies for choosing and exploiting marketing channels related to the produce such as retailers, farmers, vendors, whole-sellers (mandi), related companies, marketing associations, cold storage owners, exporters, etc.

## Generic Skills (GS)

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

- GS1.** record marketing activities, schedules, etc. in logs, registers, etc. in English or local language
- GS2.** fill details of expenditure incurred, stock status of material, monthly sales and distribution, etc. in English or local language
- GS3.** read basic instructions and information in English or local language related to entrepreneurial activities
- GS4.** communicate effectively with co-workers, subordinates, customers, exporters, etc.
- GS5.** seek clarification and understanding where instructions are not clear in any language understood locally
- GS6.** follow instructions from responsible authority completely in order to avoid miscommunication or conflicts at work
- GS7.** seek clarification from responsible authority when faced with difficult decisions
- GS8.** all activities necessary for the marketing and selling of the produces are completed in time and as per standard quality procedures
- GS9.** use customer demand as a key factor for production targets
- GS10.** assess and meet customer satisfaction objectives to guide quality considerations at work
- GS11.** present oneself and deal with customers in a professional and courteous manner
- GS12.** ensure customer receives a fair deal in business transactions with the organisation
- GS13.** prepare plan to get right price of product without compromising the quality of product and by-products
- GS14.** identify the cost effective marketing channels related to produce considering requirements and constraints
- GS15.** evaluate the demand and supply gaps related to product

## Qualification Pack

### Assessment Criteria

Assessment Criteria for Outcomes	Theory Marks	Practical Marks	Project Marks	Viva Marks
<i>Undertake basic small entrepreneurial activities</i>	<b>50</b>	<b>50</b>	-	-
<b>PC1.</b> seek information regarding demand and supply of produce in the market	5	5	-	-
<b>PC2.</b> identify target customers and assess their needs such as amount required, purpose, quality, expectations, etc.	5	5	-	-
<b>PC3.</b> perform basic accounting such as calculating expenditure incurred, costing and pricing of produce	5	5	-	-
<b>PC4.</b> ensure that the cost of production, transportation and marketing are included in costing and pricing	5	5	-	-
<b>PC5.</b> collect information related to various subsidies/funds offered by the Government, authorized state units and other financial institutions involved with the promotion of the produce	5	5	-	-
<b>PC6.</b> comply with relevant regulations in marketing of the produce	5	5	-	-
<b>PC7.</b> track information related to wholesale and retail price of the produce	5	5	-	-
<b>PC8.</b> record daily sale and purchase of items in designated log books, register, etc.	5	5	-	-
<b>PC9.</b> record quantity, quality, date of manufacture and batch number of every produce accurately	5	5	-	-
<b>PC10.</b> identify appropriate marketing channels related to the produce considering requirements and constraints	5	5	-	-
<b>NOS Total</b>	<b>50</b>	<b>50</b>	-	-

## Qualification Pack

### National Occupational Standards (NOS) Parameters

<b>NOS Code</b>	AGR/N9908
<b>NOS Name</b>	Undertake basic entrepreneurial activities for small enterprise
<b>Sector</b>	Agriculture
<b>Sub-Sector</b>	Generic
<b>Occupation</b>	Generic
<b>NSQF Level</b>	4
<b>Credits</b>	TBD
<b>Version</b>	1.0
<b>Last Reviewed Date</b>	24/02/2022
<b>Next Review Date</b>	24/02/2025
<b>NSQC Clearance Date</b>	24/02/2022

## Qualification Pack

### AGR/N0330: Carry out processing of makhana in the makhana processing unit

#### Description

The OS unit deals with the processing of makhana in the makhana processing unit .

#### Scope

This unit/task covers the following:

- Carry out processing of makhana using makhana processing machineries
- Post-processing activities

#### Elements and Performance Criteria

##### *Carry out processing of makhana using makhana processing machineries*

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

- PC1.** illustrate the layout of the makhana processing unit
- PC2.** comply with relevant health and safety regulations pertaining to makhana processing unit
- PC3.** follow the standard operating procedures (SOP) for handling different machineries
- PC4.** illustrate the components and functioning of different machineries
- PC5.** check the working and performance of all machineries
- PC6.** assess possible risks and hazards in the work environment and comply with safety measures to minimize injury to self and others
- PC7.** operate and handle different machineries used for makhana processing
- PC8.** wash and clean the raw seeds by raw makhana seed washer
- PC9.** grade the seeds on the basis of seed sizes by makhana seed grader
- PC10.** dry the graded raw makhana seed by makhana seed dryer
- PC11.** carry out pre heating / initial roasting of raw makhana seed by seed roasting machine
- PC12.** carry out popping of seed by makhana popping machine
- PC13.** separate husk, unpopped whole seeds, unpopped decorticated kernels, partially popped makhana and popped makhana by makhana pop grader
- PC14.** grade unpopped makhana kernels and produce the makhana flour by makhana grinder
- PC15.** carry out packaging of the processed makhana by makhana packaging machine
- PC16.** carry out storage of the processed makhana
- PC17.** carry out transportation of the processed makhana

##### *Post-processing activities*

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

- PC18.** ensure that the work area is in a safe and clean condition before leaving the premises
- PC19.** keep the tools and materials back in appropriate storage area
- PC20.** carry out periodic maintenance of the makhana processing machineries following the SOP.
- PC21.** attend to minor repairs/ faults of the machineries, if required

## Qualification Pack

**PC22.** dispose wastes materials in accordance with environmental health and safety guidelines

**PC23.** report any work related problems or issues to responsible authority and seek guidance on how to rectify problems

### Knowledge and Understanding (KU)

The individual on the job needs to know and understand:

- KU1.** relevant legislation, standards, policies, and procedures related to the produce
- KU2.** relevant health and safety requirements applicable to the enterprise
- KU3.** own job role and responsibilities and sources for information pertaining to marketing of produce
- KU4.** who to approach for support in order to obtain market related information and clarifications
- KU5.** importance of following health, hygiene, safety and quality standards and the impact of not following the standards on consumers and the business
- KU6.** relevant people and their responsibilities within the market
- KU7.** escalation matrix and procedures for reporting regulatory issues
- KU8.** documentation and related procedures applicable in the context of work
- KU9.** importance of appropriate personal protective equipment
- KU10.** hazards and risks in the work environment and how to control injury to self and others
- KU11.** different post-harvest steps followed for makhana processing
- KU12.** different machineries and equipments used in processing of makhana
- KU13.** components and functioning of different machineries
- KU14.** supplier/manufacturers instructions related to machineries
- KU15.** defects and adjustments of various components of different type of machines
- KU16.** common tools and equipments to be used for service and maintenance
- KU17.** common faults, repairs and replacement of of different type of machine equipment
- KU18.** importance of safety and precautions while carrying out maintenance and repair
- KU19.** importance of carrying out regular maintenance
- KU20.** methods of maintaining safety check list for all machineries
- KU21.** different aspects of the dangerous machines (regulation) act, 1983
- KU22.** cleaning, drying, roasting, popping, grading, packaging methods
- KU23.** different grades of makhana
- KU24.** different packaging materials
- KU25.** storage, safe handling and transporting procedures for makhana
- KU26.** food Safety Standards and Regulations (as per FSSAI)
- KU27.** good Manufacturing Practices (GMP) and Sanitation Standard Operating Procedures (SSOP) norms and Hazard Analysis Critical Control Point (HACCP) concept

### Generic Skills (GS)

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

## Qualification Pack

- GS1.** note down the activity schedules in logs, registers, etc. in english or local language
- GS2.** fill details of expenditure incurred in english or local language
- GS3.** read sop and basic instructions in english or local language related to use of different processing machineries
- GS4.** communicate effectively with co-workers, subordinates, customers, exporters, etc.
- GS5.** seek clarification and understanding where instructions are not clear in any language understood locally
- GS6.** follow instructions from responsible authority completely in order to avoid miscommunication or conflicts at work
- GS7.** make decisions pertaining to the processing methods and machineries used for makhana processing
- GS8.** plan and organize processing activities such that all activities are completed in time and as per standard quality procedures
- GS9.** assess customers demand of makhana
- GS10.** provide customer good quality produce and maintain good relationship
- GS11.** identify potential problems and seek guidance from subject matter experts on how to rectify problems
- GS12.** identify potential problems and seek guidance from subject matter experts on how to rectify problems
- GS13.** apply logical reasoning to solve problems or any potential problems related to work by analyzing previous experiences
- GS14.** optimize the use of resources and achieve maximum profit

**Qualification Pack**
**Assessment Criteria**

Assessment Criteria for Outcomes	Theory Marks	Practical Marks	Project Marks	Viva Marks
<i>Carry out processing of makhana using makhana processing machineries</i>	<b>27</b>	<b>51</b>	-	-
<b>PC1.</b> illustrate the layout of the makhana processing unit	2	1	-	-
<b>PC2.</b> comply with relevant health and safety regulations pertaining to makhana processing unit	2	1	-	-
<b>PC3.</b> follow the standard operating procedures (SOP) for handling different machineries	2	1	-	-
<b>PC4.</b> illustrate the components and functioning of different machineries	2	2	-	-
<b>PC5.</b> check the working and performance of all machineries	2	3	-	-
<b>PC6.</b> assess possible risks and hazards in the work environment and comply with safety measures to minimize injury to self and others	2	2	-	-
<b>PC7.</b> operate and handle different machineries used for makhana processing	4	6	-	-
<b>PC8.</b> wash and clean the raw seeds by raw makhana seed washer	1	4	-	-
<b>PC9.</b> grade the seeds on the basis of seed sizes by makhana seed grader	1	4	-	-
<b>PC10.</b> dry the graded raw makhana seed by makhana seed dryer	1	4	-	-
<b>PC11.</b> carry out pre heating / initial roasting of raw makhana seed by seed roasting machine	1	4	-	-
<b>PC12.</b> carry out popping of seed by makhana popping machine	1	4	-	-
<b>PC13.</b> separate husk, unpopped whole seeds, unpopped decorticated kernels, partially popped makhana and popped makhana by makhana pop grader	1	4	-	-

**Qualification Pack**

Assessment Criteria for Outcomes	Theory Marks	Practical Marks	Project Marks	Viva Marks
<b>PC14.</b> grade unpopped makhana kernels and produce the makhana flour by makhana grinder	1	4	-	-
<b>PC15.</b> carry out packaging of the processed makhana by makhana packaging machine	2	3	-	-
<b>PC16.</b> carry out storage of the processed makhana	1	2	-	-
<b>PC17.</b> carry out transportation of the processed makhana	1	2	-	-
<i>Post-processing activities</i>	<b>8</b>	<b>14</b>	-	-
<b>PC18.</b> ensure that the work area is in a safe and clean condition before leaving the premises	1	2	-	-
<b>PC19.</b> keep the tools and materials back in appropriate storage area	1	1	-	-
<b>PC20.</b> carry out periodic maintenance of the makhana processing machineries following the SOP.	2	3	-	-
<b>PC21.</b> attend to minor repairs/ faults of the machineries, if required	2	3	-	-
<b>PC22.</b> dispose wastes materials in accordance with environmental health and safety guidelines	1	4	-	-
<b>PC23.</b> report any work related problems or issues to responsible authority and seek guidance on how to rectify problems	1	1	-	-
<b>NOS Total</b>	<b>35</b>	<b>65</b>	-	-

## Qualification Pack

### National Occupational Standards (NOS) Parameters

<b>NOS Code</b>	AGR/N0330
<b>NOS Name</b>	Carry out processing of makhana in the makhana processing unit
<b>Sector</b>	Agriculture
<b>Sub-Sector</b>	Agriculture Crop Production
<b>Occupation</b>	Fruit Crops Cultivation
<b>NSQF Level</b>	4
<b>Credits</b>	TBD
<b>Version</b>	1.0
<b>Last Reviewed Date</b>	04/07/2018
<b>Next Review Date</b>	04/07/2022

## Qualification Pack

# AGR/N0331: Carry out processing of makhana in the makhana processing unit

## Description

The OS unit deals with the preparation of different value added products of makhana makhana flakes, instant makhana kheer mix and flavoured makhana using processing machines.

## Scope

This unit/task covers the following:

## Elements and Performance Criteria

### *Carry out preparation of makhana products*

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

- PC1.** ensure that the work area is safe and hygienic for preparation of makhana products
- PC2.** ensure the working of all the tools and equipments used for preparation of makhana products
- PC3.** ensure the availability of the raw materials required
- PC4.** select ingredients and their quantity for preparing the desired product
- PC5.** prepare makhana flakes
- PC6.** prepare instant makhana kheer mix
- PC7.** prepare flavoured makhana using roasting and flavouring machine
- PC8.** pack the processed products using appropriate packaging materials
- PC9.** keep the tools and materials back in appropriate storage area
- PC10.** dispose wastes materials in accordance with environmental health and safety guidelines
- PC11.** adhere to hazard analysis critical control point (HACCP) and food safety and standards authority of india (FSSAI) regulations

## Knowledge and Understanding (KU)

The individual on the job needs to know and understand:

- KU1.** relevant legislation, standards, policies, and procedures related to the produce
- KU2.** relevant health and safety requirements applicable in the enterprise
- KU3.** own job role and responsibilities and sources for information pertaining to marketing of produce
- KU4.** who to approach for support in order to obtain market related information and clarifications
- KU5.** importance of following health, hygiene, safety and quality standards and the impact of not following the standards on consumers and the business
- KU6.** relevant people and their responsibilities within the market
- KU7.** escalation matrix and procedures for reporting regulatory issues

## Qualification Pack

- KU8.** documentation and related procedures applicable in the context of work
- KU9.** different value added products of makhana
- KU10.** types of raw materials required for preparation of different products
- KU11.** tools and equipments required for the preparation of different makhana products
- KU12.** method of preparation of different value added products
- KU13.** importance of adherence to hygienic handling
- KU14.** different packaging materials
- KU15.** food safety standards and regulations (as per fssai)

## Generic Skills (GS)

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

- GS1.** note down the recipe of different makhana preparations/dishes
- GS2.** fill details of expenditure incurred in english or local language
- GS3.** read basic instructions and information in english or local language related to preparation of makhana products
- GS4.** communicate effectively with co-workers, subordinates, customers, etc.
- GS5.** seek clarification and understanding where instructions are not clear in any language understood locally
- GS6.** follow instructions from responsible authority completely in order to avoid miscommunication or conflicts at work
- GS7.** decide on the quality and quantity of ingredients for preparation of the desired makhana products
- GS8.** organize resources for preparation of the desired makhana products
- GS9.** assess and meet customer satisfaction objectives to guide quality considerations at work
- GS10.** present oneself and deal with customers in a professional and courteous manner
- GS11.** identify potential problems and seek guidance from subject matter experts on how to rectify problems
- GS12.** apply logical reasoning to solve problems or any potential problems related to work by analyzing previous experiences
- GS13.** assess the effect of using different ingredients on the flavor and taste of product
- GS14.** improve the product quality on a continuous basis

## Qualification Pack

### Assessment Criteria

Assessment Criteria for Outcomes	Theory Marks	Practical Marks	Project Marks	Viva Marks
<i>Carry out preparation of makhana products</i>	<b>40</b>	<b>60</b>	-	-
<b>PC1.</b> ensure that the work area is safe and hygienic for preparation of makhana products	2	3	-	-
<b>PC2.</b> ensure the working of all the tools and equipments used for preparation of makhana products	1	4	-	-
<b>PC3.</b> ensure the availability of the raw materials required	2	3	-	-
<b>PC4.</b> select ingredients and their quantity for preparing the desired product	2	3	-	-
<b>PC5.</b> reprepare makhana flakes	2	8	-	-
<b>PC6.</b> prepare instant makhana kheer mix	2	8	-	-
<b>PC7.</b> prepare flavoured makhana using roasting and flavouring machine	10	10	-	-
<b>PC8.</b> pack the processed products using appropriate packaging materials	10	10	-	-
<b>PC9.</b> keep the tools and materials back in appropriate storage area	2	3	-	-
<b>PC10.</b> dispose wastes materials in accordance with environmental health and safety guidelines	2	3	-	-
<b>PC11.</b> adhere to hazard analysis critical control point (HACCP) and food safety and standards authority of india (FSSAI) regulations	5	5	-	-
<b>NOS Total</b>	<b>40</b>	<b>60</b>	-	-

## Qualification Pack

### National Occupational Standards (NOS) Parameters

<b>NOS Code</b>	AGR/N0331
<b>NOS Name</b>	Carry out processing of makhana in the makhana processing unit
<b>Sector</b>	Agriculture
<b>Sub-Sector</b>	Agriculture Crop Production
<b>Occupation</b>	Fruit Crops Cultivation
<b>NSQF Level</b>	4
<b>Credits</b>	TBD
<b>Version</b>	1.0
<b>Last Reviewed Date</b>	04/07/2018
<b>Next Review Date</b>	04/07/2022

## 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) (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. Individual assessment agencies will create unique question papers for theory part for each candidate at each examination/training center (as per assessment criteria below).
4. Individual assessment agencies will create unique evaluations for skill practical for every student at each examination/ training center based on these criteria.
5. In case of successfully passing only certain number of NOSs, the trainee is eligible to take subsequent assessment on the balance NOS's to pass the Qualification Pack.
6. 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.)

## Qualification Pack

### Assessment Weightage

#### Compulsory NOS

National Occupational Standards	Theory Marks	Practical Marks	Project Marks	Viva Marks	Total Marks	Weightage
AGR/N0327.Procure seed and manage nursery for makhana cultivation	20	30	-	-	50	15
AGR/N0328.Carry out cultivation of makhana using Good Agricultural Practices (GAP)	45	85	-	-	130	30
AGR/N0329.Harvest and post-harvest management of makhana	25	50	-	-	75	40
AGR/N9903.Maintain health and safety at the workplace	30	30	-	-	60	10
AGR/N9908.Undertake basic entrepreneurial activities for small enterprise	50	50	-	-	100	5
<b>Total</b>	<b>170</b>	<b>245</b>	<b>-</b>	<b>-</b>	<b>415</b>	<b>100</b>

#### Optional: 1 Processing

National Occupational Standards	Theory Marks	Practical Marks	Project Marks	Viva Marks	Total Marks	Weightage
AGR/N0330.Carry out processing of makhana in the makhana processing unit	35	65	-	-	100	35
<b>Total</b>	<b>35</b>	<b>65</b>	<b>-</b>	<b>-</b>	<b>100</b>	<b>35</b>

#### Optional: 2 Products Preparation

### Qualification Pack

National Occupational Standards	Theory Marks	Practical Marks	Project Marks	Viva Marks	Total Marks	Weightage
AGR/N0331.Carry out processing of makhana in the makhana processing unit	40	60	-	-	100	10
<b>Total</b>	<b>40</b>	<b>60</b>	<b>-</b>	<b>-</b>	<b>100</b>	<b>10</b>

## Qualification Pack

### Acronyms

<b>NOS</b>	National Occupational Standard(s)
<b>NSQF</b>	National Skills Qualifications Framework
<b>QP</b>	Qualifications Pack
<b>TVET</b>	Technical and Vocational Education and Training
<b>GAP</b>	Good Agricultural Practices
<b>PPE</b>	Personal Protective Equipment
<b>FYM</b>	Farm Yard Manure
<b>IPM</b>	Integrated Pest Management
<b>INM</b>	Integrated Nutrient Management
<b>GMP</b>	Good Manufacturing Practices
<b>HACCP</b>	Hazard Analysis Critical Control Point
<b>FSSAI</b>	Food Safety and Standards Authority of India

## Qualification Pack

### Glossary

<b>Sector</b>	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.
<b>Sub-sector</b>	Sub-sector is derived from a further breakdown based on the characteristics and interests of its components.
<b>Occupation</b>	Occupation is a set of job roles, which perform similar/ related set of functions in an industry.
<b>Job role</b>	Job role defines a unique set of functions that together form a unique employment opportunity in an organisation.
<b>Occupational Standards (OS)</b>	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.
<b>Performance Criteria (PC)</b>	Performance Criteria (PC) are statements that together specify the standard of performance required when carrying out a task.
<b>National Occupational Standards (NOS)</b>	NOS are occupational standards which apply uniquely in the Indian context.
<b>Qualifications Pack (QP)</b>	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.
<b>Unit Code</b>	Unit code is a unique identifier for an Occupational Standard, which is denoted by an 'N'
<b>Unit Title</b>	Unit title gives a clear overall statement about what the incumbent should be able to do.
<b>Description</b>	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.
<b>Scope</b>	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.

## Qualification Pack

<b>Knowledge and Understanding (KU)</b>	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.
<b>Organisational Context</b>	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.
<b>Technical Knowledge</b>	Technical knowledge is the specific knowledge needed to accomplish specific designated responsibilities.
<b>Core Skills/ Generic Skills (GS)</b>	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.
<b>Electives</b>	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.
<b>Options</b>	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.