



RQF LEVEL 4



FOPPP403

FOOD PROCESSING

Paddy Rice Processing into Milled Rice

TRAINER'S MANUAL

October, 2024



PADDY RICE PROCESSING INTO MILLED RICE

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TABLE OF CONTENT

AUTHOR'S PAGE NOTES (COPY RIGHT) -----	ii
ACKNOWLEDGEMENTS-----	iii
TABLE OF CONTENT -----	vi
ACRONYMS-----	viii
INTRODUCTION -----	1
MODULE CODE AN TITLE: FOPPP403 PADDY RICE PROCESSING INTO MILLED RICE -----	2
Learning Outcome 1: Receive Paddy Rice -----	3
Key Competencies for Learning Outcome 1: Receive Paddy Rice-----	4
Indicative content 1.1: Preparation of Work Area -----	7
Indicative content 1.2: Checking the quality of paddy rice-----	14
Indicative content 1.3: Storing paddy rice -----	17
Learning outcome 1 end assessment -----	20
Further information to the trainer-----	24
Learning Outcome 2: Perform Milling of Paddy Rice -----	25
Key Competencies for Learning Outcome 2: Perform Milling of Paddy Rice -----	26
Indicative content 2.1: Cleaning of paddy rice -----	29
Indicative content 2.2: Checking of physical hazards in paddy rice -----	32
Indicative content 2.3: De-hulling of paddy rice -----	34
Indicative content 2.4: Whitening and polishing of brown rice -----	37
Indicative content 2.5: Checking the quality of milled rice-----	40
Learning outcome 2 end assessment -----	42
Further information to the trainer-----	46
Learning Outcome 3: Store the Milled Rice -----	47
Key Competencies for Learning Outcome 3: Store the Milled Rice -----	48
Indicative content 3.1: Grading of milled rice -----	50
Indicative content 3.2: Packaging of milled rice -----	53
Indicative content 3.3: Labelling of milled rice-----	56
Indicative content 3.4: Storage parameters of milled rice -----	58
Learning outcome 3 end assessment -----	60

ACRONYMS

%: Percentage

°C: Degree Celsius

ATP: Adenosine Triphosphate

E.g: Example

ELISA: Enzyme-Linked Immunosorbent Assay

FOP: Food Processing

GC: Gas Chromatography

HPLC: High-Performance Liquid Chromatography

KOICA: Korea International Cooperation Agency

LC-MS/MS: Liquid Chromatography-Mass Spectrometry

MC: Moisture Content

Ppb: Part per Billion

PPE: Personal Protective Equipment

RH: Relative Humidity

RQF: Rwanda Qualification Framework

RTB: Rwanda TVET Board

SOPs: Standard Operating Procedures

TLC: Thin-Layer Chromatography

TQUM: TVET Quality Management

TVET: Technical and Vocational Educational and Training

INTRODUCTION

This trainer's manual includes all the methodologies required to effectively deliver the module titled "**Paddy Rice Processing into Milled Rice**" trainees enrolled in this module will engage in practical activities designed to develop and enhance their competencies.

The development of this training manual followed the Competency-Based Training and Assessment (CBT/A) approach, offering ample practical opportunities that mirror real-life situations.

The trainer's manual is organized into Learning Outcomes, which is broken down into indicative content that includes both theoretical and practical activities. It provides detailed information on the key competencies required for each learning outcome, along with the objectives to be achieved.

As a trainer, you will begin by asking questions related to the activities to encourage critical thinking and guide trainees toward real-world applications in the labor market. The manual also outlines essential information such as learning hours, didactic materials, and suggested methodologies.

This manual outlines the procedures and methodologies for guiding trainees through various activities as detailed in their respective trainee manuals. The activities included in this training manual are designed to offer students opportunities for both individual and group work. Upon completing all activities, you will assist trainees in conducting a formative assessment known as the end learning outcome assessment. Ensure that students review the key reading and the points to remember section.

MODULE CODE AND TITLE: FOPPP403 PADDY RICE PROCESSING INTO MILLED RICE

Learning Outcome 1: Receive paddy rice

Learning Outcome 2: Perform milling of paddy rice

Learning Outcome 3: Store the milled rice

Learning Outcome 1: Receive Paddy Rice



Indicative contents

1.1 Preparation of work area

1.2 Checking the quality of paddy rice

1.3 Storing of paddy rice

Key Competencies for Learning Outcome 1: Receive Paddy Rice

Knowledge	Skills	Attitudes
• Description of tools and equipment used in paddy rice processing. • Description of cleaning agents used in paddy rice processing. • Explanation of cleaning methods for the workplace, tools and equipment • Description of work area arrangement of • Explanation of pest control measures. • Description of the quality characteristics of paddy rice • Description of storage conditions of paddy rice	• Selecting tools materials and equipment used in paddy rice processing. • Cleaning workplace • Checking cleanliness of workplace • Arranging work area • Controlling pests in paddy rice • Checking the quality of paddy rice • Storing paddy rice	• Being accurate while measuring and testing paddy rice. • Being careful while preparing cleaning products. • Being attentive while cleaning tools and equipment. • Being vigilant while arranging the work area. • Pay attention while controlling pests and storing paddy rice.



Duration: 15hrs

Learning outcome 1 objectives:



By the end of the learning outcome, the trainees will be able to:

1. Describe properly tools and equipment used in paddy rice processing according to their uses.
2. Select properly tools and equipment used in paddy rice processing according to their intended use.
3. Describe clearly cleaning agents used in paddy rice processing.
4. Select effectively equipment, tools and materials used in paddy rice processing.
5. Clean properly workplace according to paddy rice hygiene and safety requirements.
6. Check effectively the cleanliness of workplace according to sanitation standard operating procedures.
7. Arrange properly work area according to processing line and standard operating procedure.
8. Control effectively pests in paddy rice processing plant according to pests control guidelines.
9. Describe correctly the quality characteristics of paddy rice for according to paddy rice standard.
10. Check properly the quality characteristics of paddy rice according to product specification.
11. Describe clearly the storage conditions of paddy rice according to storage requirement.
12. Store correctly paddy rice according to paddy rice storage conditions.



Resources

Equipment	Tools	Materials
• Pre-cleaner machine • Elevator • Conveyor • Destoner • De-hulling machine • Whitener • Cyclone	• Metallic brush • Sampling tools • Aflatoxin test tool kit • Sweepers • Squeegees • Brushes • Hygrometers • Moisture meters	• Thread • Paddy rice • Detergents • Disinfectant • Sanitizer • Portable waters • Packaging materials • Labels

• Packaging machine • fan • Compressor • Grading machine • Filling machine • Sealing machine • PPE • Working table • Samples Grinder • Storage bins	• Insect killer • Mouse traps • Thermometers • Dust bins • Mops • Buckets • Magnets • Weighing scales • Testing tools	• Stickers
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Advance Preparation:

Before delivering this learning outcome, you are recommended to:

- Avail classroom and workshop for paddy rice processing.
- Avail tools and equipment used in paddy rice processing.
- Avail varieties of paddy rice, brown rice, white/milled rice, and parboiled rice are available.
- Make sure cleaning tools and materials are available.
- Prepare teaching aids and didactic material related to preparation of work area (videos, Audio visuals, manual/guide, task sheets, protocols)



Indicative content 1.1: Preparation of Work Area



Duration: 8hrs



Theoretical Activity 1.1.1: Description of materials, tools and equipment used in paddy rice processing



Notes to the trainer:

- Trainer may use small groups for describing tools and equipment used in paddy rice processing.
- The use pictures, videos and audio visuals as didactic material for describing tools and equipment used in paddy rice processing is required.



Key steps:

While delivering this activity, pass through the following steps:

Step 1: Introduce the activity and ask trainees to answer the following questions:

- i. How do you understand by the following terms?
 - a) Paddy rice
 - b) Milled/white rice
 - c) Brown rice
 - d) White rice
 - e) Parboiled rice
- ii. Give examples of tools and equipment that could be used in paddy rice processing.
- iii. What could be the safety precautions of using tools and equipment?
- iv. Suggest any cleaning agents used in cleaning workplace for paddy rice processing

Step 2: Ask trainees to write their findings on papers, flip chart, blackboard, or white board.

Step 3: Engage trainees to present their answers.

Step 4: Provide the expert view and clarify ideas by using didactic materials.

Step 5: Address any questions or concerns.

Step 6: Ask trainees to read the key readings 1.1.1 in trainee manual.



Points to Remember

- For effective handling and use of tools and equipment it is recommended to follow their safety precautions.
- Cleaning agent required in paddy rice processing need to be safe for food contact surfaces and effective against a wide range of microorganisms. The direction for use of cleaning agent is more crucial to prevent cross contamination and ensure their effectiveness.



Practical Activity 1.1.2: Selecting and adjusting tools and equipment used in paddy rice processing



Notes to the trainer

- The trainer may use individual based activity and he/she is supposed to demonstrate how to select and to adjust tools, materials, and equipment used in paddy rice processing.
- Avail materials, tools, and equipment to be selected
- Avail tools and equipment to be adjusted
- Develop protocol to be followed when selecting materials, tools and equipment and adjusting tools, and equipment.
- Avail tutorial videos related to selection of materials, tools and equipment and adjusting tools and equipment as didactic material.



Key steps:

While delivering this activity, pass through the following steps:

- Step 1:** Introduce the activity and ask trainees to go in paddy rice processing workshop to select tools, material, and equipment and adjust tools and equipment used in paddy rice processing.
- Step 2:** Explain the task and provide clear work instructions (PPE, Time allocated)
- Step 3:** Demonstrate how to select tools, materials and equipment and how to adjust tools and equipment and explain the selection criteria and procedures.
- Step 4:** Asks trainees to select tools, materials and equipment and adjust tools and equipment used in paddy rice processing and monitor the activities.
- Step 5:** Verify whether tools, materials and equipment are correctly selected and whether tools and equipment are adjusted and provide feedback where necessary.
- Step 6:** Ask trainees to read the key readings 1.1.2 in trainee manual.
- Step 7:** Ask trainees to perform the task provided in application of learning 1.1.



Points to Remember

- Selecting the right tools and equipment for paddy rice processing is crucial to ensure efficiency and high-quality production.
- Selecting the right cleaning agent is essential for maintaining high standards of food safety.



Theoretical Activity 1.1.3: Description of workplace arrangement



Notes to the trainer:

- Trainer may use small groups for describing workplace arrangement for paddy rice processing.
- The use of pictures, videos, audio visuals as didactic material for describing cleaning methods and techniques for workplace, pest control measures, and arrangement of workplace for paddy rice processing is required.



Key steps:

While delivering this activity, pass through the following steps:

Step 1: Introduce the activity and ask trainees to answer the following questions:

- i. What are the purposes for cleaning workplace?
- ii. Suggest cleaning methods used in paddy rice processing.
- iii. What is the importance of arranging workplace?
- iv. What do you think can be ways for checking cleanliness of paddy rice processing workplace?

Step 2: Ask trainees to write their findings on papers, flip chart, blackboard or white board.

Step 3: Engage trainees to present the answers.

Step 4: Provide the expert view and clarify ideas by using didactic materials.

Step 5: Address any questions or concerns.

Step 6: Ask trainees to read the key readings 1.1.3 in trainee manual.



Points to Remember

- While arranging work area for paddy rice processing consider processing line and Standard operating procedures. Make sure that the work area is well cleaned. Don't forget to read label before using any cleaning product.



Practical Activity 1.1.4: Cleaning workplace, tools and equipment



Notes to the trainer

- Trainer is supposed to demonstrate how to clean workplace, tools and equipment.
- For the effective delivery it is recommended to:
 - ✓ Avail uncleaned workplace,
 - ✓ Avail tools and equipment to be cleaned.
 - ✓ Avail cleaning protocol.
 - ✓ Avail cleaning material , tools and equipment to be used during cleaning



Key steps:

While delivering this activity, pass through the following steps:

- Step 1:** Introduce the activity and ask trainees to go to paddy rice processing workshop and clean workplace, tools and equipment used in paddy rice processing according to the protocol.
- Step 2:** Explain the task and provide clear work instructions (PPE, Time allocated, ...)
- Step 3:** Demonstrate how to clean, tools and equipment used in paddy rice processing.
- Step 4:** Ask trainees to clean workplace, tools and equipment used in paddy rice processing and monitor the procedures.
- Step 5:** Verify whether the workplace, tools and equipment used in paddy rice processing are well cleaned and provide feedback where necessary.
- Step 6:** Ask trainees to read key readings 1.1.4 in trainee manual.
- Step 7:** Ask trainees to perform the task provided in application of learning 1.1.



Points to Remember

- While Cleaning workplace, tools and equipment used in paddy rice processing, you are recommended to follow and respect cleaning procedure to ensure quality, safety and extend the lifespan of tools and equipment.



Practical Activity 1.1.5: Controlling pest



Notes to the trainer

- Trainer is supposed to demonstrate how to control pest.
- Avail traps such as pheromone traps, sticky traps and rodent traps.
- Avail, picture and photos of pests that are likely to be present in paddy rice



Key steps:

While delivering this activity, pass through the following steps:

- Step 1:** Introduce the activity and ask trainees to go to the paddy rice processing workshop to control pest that can attack paddy rice.
- Step 2:** Explain the task and provide clear work instructions (PPE, Time allocated, ...)
- Step 3:** Demonstrate how to control pest and explain pest control measures applied in paddy rice processing plant.
- Step 4:** Ask trainees to apply pest control measures.
- Step 5:** Verify whether the control measures are applied and provide feedback where necessary.
- Step 6:** Ask trainees to read the key readings 1.1.5 in trainee manual.
- Step 7:** Ask trainees to perform the task provided in application of learning 1.1.



Points to Remember

- For effective pest control, ensure storage areas are cleaned, dried, and free from any previous grain residues to prevent pest infestations.
- You are recommended to control pest in workplace for protecting rice quality, minimize losses and maintaining sanitation.



Practical Activity 1.1.6: Organizing/ arranging of the workplace



Notes to the trainer

- Trainer is supposed to demonstrate how to arrange workplace for paddy rice processing.
- For the effective delivery it is recommended to avail disorganized workplace
- Avail cleaned tools and equipment.
- Avail protocols to be followed when organizing workplace



Key steps:

While delivering this activity, pass through the following steps:

Step 1: Introduce the activity and ask trainees to go in paddy rice processing workshop to organize the workplace.

Step 2: Explain the task and provide clear work instructions (PPE, Time allocated, ...)

Step 3: Demonstrate how to organize/arrange the workplace.

Step 4: Ask trainees to organize the workplace and monitor the activities

Step 5: Verify whether the workplace is correctly arranged and provide feedback where necessary.

Step 6: Ask trainees to read the key readings 1.1.6 in trainee manual.



Points to Remember

- In the arrangement of workplace, you are recommended to follow production line and Standard operating procedure.



Application of learning 1.1.

Request trainees to go to paddy rice processing workshop and perform the following tasks:

1. Select material, tools and equipment for paddy rice processing,
2. Adjust tools and equipment
3. Clean workplace, tools and equipment

4. Arrange the workplace
5. Control pest in workplace

Checklist

SN	Criteria	Indicators	Score	
			Yes	No
1	Material, Tools and Equipment are properly selected	Cleaning agents' materials are selected		
		Tools are selected		
		Equipment is selected		
2	Workplace, Tools and equipment are properly cleaned	Workplace is cleaned		
		Tools are cleaned		
		Equipment is cleaned		
3	Tools and equipment are properly adjusted	Tools are adjusted		
		Equipment is adjusted		
4	Pest are correctly controlled	Insect are controlled		
		Rodent are controlled		
5	Workplace is properly arranged	Equipment is arranged		
		Tools are arranged		
		Materials are arranged		



Indicative content 1.2: Checking the quality of paddy rice



Duration : 4hrs



Theoretical Activity 1.2.1: Description of the quality characteristics of paddy rice



Notes to the trainer:

- Trainer may use small groups for describing the quality characteristics of paddy rice.
- The use of pictures, videos, and audio visuals as didactic material for describing the quality characteristics of paddy rice is required.
- Avail paddy rice



Key steps:

While delivering this activity, pass through the following steps:

- Step 1:** Introduce the activity and ask trainees to answer the following question:
- Give any three characteristics to consider when checking the quality of paddy rice?
- Step 2:** Ask trainees to write their findings on papers, flip chart, blackboard or white board.
- Step 3:** Engage trainees to present the answers.
- Step 4:** Provide the expert view and clarify ideas by using didactic materials.
- Step 5:** Address any questions or concerns.
- Step 6:** Ask trainees to read the key reading 1.2.1 in trainee manual.



Points to Remember

The quality characteristics of paddy rice are critical for determining its value, suitability for various end-uses, and consumer preference. These characteristics can vary based on the rice variety, cultivation practices, and post-harvest handling methods.



Practical Activity 1.2.2. Checking the quality characteristics of paddy rice



Notes to the trainer

- Trainer is supposed to demonstrate how to check the quality of paddy rice.
- For the effective delivery it is recommended to:
 - ✓ Avail samples of unsorted paddy rice.
 - ✓ Avail different varieties of paddy rice.
 - ✓ Avail materials and tools and equipment.



Key steps:

While delivering this activity, pass through the following steps:

Step 1: Introduce the activity and ask trainees to go in paddy rice processing workshop to check the quality of paddy rice.

Step 2: Explain the task and provide clear work instruction (PPE, Time allocated)

Step 3: Demonstrate how to check the quality of paddy rice and explain procedures

Step 4: Ask trainees to check the quality of paddy rice

Step 5: Verify whether the paddy rice quality is checked and provide feedback where necessary.

Step 6: Ask trainees to read key reading 1.2.2 in trainee manual.



Points to Remember

To check the quality characteristics of paddy rice the formula and methods for each should be used effectively.



Application of learning 1.2.

Ask trainees to visit any rice processing plant and ask them to check quality paddy rice and taking decisions based on the results found.

Checklist :

Criteria	Indicators	Score	
		Yes	No
Quality characteristics of paddy rice is well checked	Purity degree is checked		
	Varietal purity is checked		
	Cracked grains are checked		
	Immature grains are checked		
	Discoloured grains are checked		
	Damaged grains are checked		
	Total aflatoxin analysed		
	Moisture content is measured.		



Indicative content 1.3: Storing paddy rice



Duration : 3hrs



Practical Activity 1.3.1: Monitoring storage condition of paddy rice



Notes to the trainer

- Trainer is supposed to demonstrate how to monitor storage condition for paddy rice.
- For the effective delivery it is recommended to:
 - ✓ Avail paddy rice to be stored.
 - ✓ Avail all requirements for storage of paddy rice.



Key steps:

While delivering this activity, pass through the following steps:

- Step 1:** Introduce the activity and ask trainees to go in paddy rice processing workshop to monitor storage conditions of paddy rice.
- Step 2:** Explain the task and provide clear work instruction (PPE, Time allocated, ...)
- Step 3:** Demonstrate how to monitor storage conditions of paddy rice.
- Step 4:** Ask trainees to monitor the storage conditions of paddy rice.
- Step 5:** Verify whether the paddy rice storage conditions are correctly monitored and provide feedback where necessary.
- Step 6:** Ask trainees to read the key reading 1.3.1. in trainee manual
- Step 7:** Ask trainees to perform the tasks provided in application of learning 1.3.



Points to Remember

- Monitoring storage conditions of paddy rice is essential to ensure its quality and prevent spoilage. While storing paddy rice, maintain temperature and relative humidity to the required level as a key for ensuring its quality.



Theoretical Activity 1.3.2: Identification of lot



Notes to the trainer:

- Trainer may use small groups for lot identification.
- Trainer may use drawings, pictures, videos, Audio visuals as didactic material for Lot identification.



Key steps:

While delivering this activity, pass through the following steps:

Step 1: Introduce the activity and ask trainees to answer the following question:

- i. How do you understand the following terms?
 - a) Lot
 - b) Lot identification
- ii. Suggest the components of Lot Identification

Step 2: Ask trainees to write their findings on papers, flip chart, blackboard or white board.

Step 3: Engage trainees to present their findings.

Step 4: Provide the expert view and clarify ideas by using didactic materials.

Step 5: Address any questions or concerns.

Step 6: Ask trainees to read the key reading 1.3.2. in trainee manual



Points to Remember

- During lot identification don't forget to show all necessary details for ensuring that each lot of paddy rice is clearly identified and traceable throughout its handling and storage.



Application of learning 1.3.

Ask trainees to go in paddy rice processing workshop and perform following task:

- (a) identify paddy rice lot,
- (b) store paddy rice, and
- (c) monitor the storage conditions.

Checklist:

SN	Criteria	Indicators	Score	
			Yes	No
1	Storage condition is well monitored	Temperature is monitored		
		Relative humidity is monitored		
2	Lot is appropriately identified.	Lot number/code is identified		
		Variety is indicated		
		Reception is Date indicated		
		Quantity is indicated		
		Origin of rice is identified		
		Quality/Grade is specified		
		Name of supplier is identified		



Learning outcome 1 end assessment

Written assessment

- 1) Complete the following statement by using correct terms in the brackets (**paddy rice, milled rice and brown rice, Varietal Purity, Immature Grains, parboiled rice**)

a)is milled rice that has only had the husk removed.

Answers: Brown rice

b) Rice grain after the husk and bran have been removed is called.....

Answer: milled rice

c)is the rice grain after it has been harvested and threshed, but before the husk has been removed.

Answer: paddy rice

d)is the percentage of grains in the sample that belong to the desired variety.

Answer: varietal purity

e) are grains that haven't fully developed and are often smaller, chalky, and translucent.

Answer: immature grains

- 2) Read the following statement below related to description of materials, tools and equipment used in paddy rice processing and answer by **true (T)** if it is correct or **false(F)** if it is wrong.

a) Thermometer is an instrument used to measure the relative humidity of the air.

Answer: False

a) Rice Whitener is machine polishes the brown rice to remove the bran and germ.

Answer: True

b) Always read the instructions from the manufacturer before using any equipment.

Answer: True

c) Cleaning is a process of improving dirt, dust and organic matter to surfaces.

Answer: False

d) Immature Grains are grains that haven't fully developed and are often smaller, chalky, and translucent.

Answer: True

- 3) Read the following statement and answer by circling a letter corresponding to the correct answer.

a) The following are quality characteristic of paddy rice **EXCEPT**

i) Cracked grains

ii) Immature grains

- iii) Discouraged grains
- iv) Varietal impurity

Answer: iv

b) The optimal storage relative humidity for paddy rice is....

- i) 50-70%
- ii) 60-70%
- iii) 60-75%
- iv) 70-80%

Answer: ii

c) Which one among the following factors is **NOT** influencing cleaning efficiency?

- i) Contact time
- ii) Nature of contaminant
- iii) Type of cleaning product
- iv) Tempering
- v) Concentration of cleaning product

Answer: iv) tempering

d) One of the following is a pest control measure.

- i) Physic control
- ii) Biology control
- iii) Varietal control
- iv) Chemistry control

Answer: i) physical control

e) The one of the following is the components of Lot Identification for paddy rice.

- i) Lot number/Code, Reception Date, Variety of Rice, Quantity, Origin
- ii) Lot number/Code, Expiry Date, Type of Packaging, Quantity, Country of Export
- iii) Lot number/Code, Production Date, Type of Processing, Quality, Origin
- iv) Lot number/Code, Expiry Date, Variety of Rice, farming technics, Supplier Name

Answer: i) Lot number/Code, Reception Date, Variety of Rice, Quantity, Origin

4) Match the equipment used in paddy rice processing and their uses. The **column A** is the name of equipment and **column B** is their uses. And write the corresponding letter in the answer's column.

Answer	Column A	Column B
1.....	A. Rice Huller	i. This machines transport the rice from one machine to another.
2.....	B. Paddy Separator	ii. This used to separate rice into different categories according to their size, quality, and other factors.
3.....	C. Conveyors	iii. This machine removes the husk from the paddy, revealing the brown rice
4.....	D. Rice Grader	iv. This a machine separates the paddy from the other impurities
5.....	E. Rice Whitener	v. This machine polishes the brown rice to remove the bran and germ, producing white rice

Answer:

1. A iii
2. B iv
3. C i
4. D ii
5. E v

Practical assessment

B&G Ltd plant is rice processing company in Kigali. They process different varieties of rice. They must receive paddy rice harvested in previous season 2024B for processing, unfortunately they don't have a qualified technician in paddy rice reception. You are asked to Prepare workplace, receive 50 sacks of paddy rice, and check the quality of paddy rice. All required tools, materials and equipment are available at B & G Ltd plant.

Checklist

SN	Criteria	Indicators	Score	
			Yes	No
1	Work area is properly prepared	Temperature is monitored		
		Relative humidity is monitored		
		Cleaning agents are selected		
		Pests are controlled		
		Cleaning method is applied		
		Workplace is arranged		
2		Purity degree is checked		

	The quality of paddy rice is well-checked	Varietal purity is checked		
		Cracked grains are checked		
		Immature grains are checked		
		Discoloured grains are checked		
		Damaged grains are checked		
		Total aflatoxin checked		
		Moisture content measured		
3	Paddy rice is properly stored	Temperature is monitored		
		Relative humidity is monitored		
		Lot is identified		

END



Further information to the trainer

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Learning Outcome 2: Perform Milling of Paddy Rice



Indicative contents

- 2.1. Cleaning of paddy rice**
- 2.2. Checking of physical hazards in paddy rice**
- 2.3. De-hulling of paddy rice**
- 2.4. Whitening and polishing of brown rice**
- 2.5. Checking the quality of milled rice**

Key Competencies for Learning Outcome 2: Perform Milling of Paddy Rice

Knowledge	Skills	Attitudes
• Description of cleaning methods of paddy rice • Description of waste present in paddy rice • Description of De-hulling method of paddy rice • Description of whitening methods for brown rice • Description of by products in rice mill industry • Explanation of quality characteristics for milled rice	• Cleaning paddy rice • Disposing waste from paddy rice • Checking physical hazard in paddy rice • De-hulling of paddy rice • whitening brown rice • checking quality of milled rice	• Being careful while cleaning and checking physical hazard of paddy rice. • Being vigilant while disposing waste. • Being careful while whitening • Being accurate while dehulling of paddy rice



Duration: 20hrs

Learning outcome 2 objectives:



By the end of the learning outcome, the trainees will be able to:

1. Describe clearly cleaning method used in milling of paddy rice.
2. Describe properly the types of wastes from paddy rice.
3. Clean effectively paddy rice as required in milling process.
4. Dispose correctly wastes from paddy rice according to their types.
5. Check properly physical hazards from paddy rice.
6. Describe clearly the de-hulling method used in milling paddy rice.
7. De-hull correctly as required in paddy rice milling process.
8. Describe correctly whitening methods used for brown rice.
9. Whiten effectively brown rice according to the product requirement.
10. Describe clearly the by-products in rice milling process.
11. Explain properly the quality characteristics for milled rice.
12. Check appropriately the quality of milled rice according to milled rice standards.



Resources

Equipment	Tools	Materials
• Pre-cleaner • De-huller • Destoner • Whitener/Polisher • Separator • Cyclone • Aspirator • Fan • Elevator • Working table	• Magnet • Moisture meter • Hygrometer • Sampling tools • Aflatoxin test tool kit • Measuring balance • Metallic brush • Non-metallic brush	• Paddy rice • Packaging materials



Advance Preparation:

Before delivering this learning outcome, you are recommended to:

- Avail classroom and prepared workshop for paddy rice processing.
- Avail tools and equipment used in milling of paddy rice.
- Make sure paddy rice are available.

- Prepare teaching aids and didactic material (videos, Audio visuals, manual/guide, task sheets, protocols) for milling paddy rice.



Indicative content 2.1: Cleaning of paddy rice



Duration: 5hrs



Theoretical Activity 2.1.1: Description of paddy rice cleaning



Notes to the trainer:

- Trainer may use small groups for describing paddy rice cleaning.
- Trainer may use pictures, videos, Audio visuals as didactic material related to cleaning of paddy rice.



Key steps:

While delivering this activity, pass through the following steps:

Step 1: Introduce the activity and ask trainees to answer the following question:

- What is the purpose of cleaning paddy rice?
- Suggest any cleaning methods of paddy rice.
- What could be the types of waste from paddy rice?

Step 2: Ask trainees to write their findings on papers, flip chart, blackboard or white board.

Step 3: Engage trainees to present their findings.

Step 4: Provide the expert view and clarify ideas by using didactic materials.

Step 5: Address any questions or concerns.

Step 6: Ask trainees to read the key readings 2.1.1. in trainee manual



Points to Remember

- Paddy rice cleaning is a crucial step in the rice processing chain that involves removing impurities and unwanted materials from harvested paddy rice before it undergoes further processing. While cleaning paddy rice, manual and mechanical methods are used.



Practical Activity 2.1.2: Cleaning paddy rice



Notes to the trainer

- Trainer is supposed to demonstrate how to clean paddy rice
- For the effective delivery it is recommended to:
 - Avail un-cleaned paddy rice.
 - Avail tools and equipment for paddy rice cleaning.



Key steps:

While delivering this activity, pass through the following steps:

- Step 1:** Introduce the activity and ask trainees to go to the paddy rice processing workshop to clean paddy rice.
- Step 2:** Explain the task and provide clear work instruction (PPE, Time allocated)
- Step 3:** Demonstrate how to clean paddy rice.
- Step 4:** Ask trainees to clean paddy rice.
- Step 5:** Verify whether the paddy rice is cleaned and provide feedback where necessary.
- Step 6:** Ask trainees to read the key readings 2.1.2.in trainee manual.
- Step 7:** Ask trainees to perform the task provided in application of learning 2.1.



Points to Remember

- While cleaning paddy rice, you are recommended to remove all impurities. Remember to follow required procedure for selected cleaning method.
- By thoroughly cleaning the paddy rice before milling, the quality of the rice is greatly improved, and the milling machinery is protected from damage caused by foreign materials.



Practical Activity 2.1.3: Disposing waste from paddy rice



Notes to the trainer

- Trainer is supposed to demonstrate how to dispose wastes from paddy rice.
- For the effective delivery it is recommended to avail wastes from paddy rice.



Key steps:

While delivering this activity, pass through the following steps:

Step 1: Introduce the activity and ask trainees to go to dispose waste from paddy rice.

Step 2: Explain the task and provide clear work instruction (PPE, Time allocated, ...)

Step 3: Demonstrate how to dispose waste from paddy rice.

Step 4: Ask trainees to dispose waste from paddy rice.

Step 5: Verify whether the paddy rice wastes are disposed and provide feedback where necessary.

Step 6: Ask trainees to read the key readings 2.1.3 in trainee manual.

Step 7: Ask trainees to perform the task provided in application of learning 2.1.



Points to Remember

- The waste from paddy rice production can be managed in a way that minimizes environmental impact and maximizes their utilization.



Application of learning 2.1.

Request trainees to go to the food processing industry and perform the following tasks:

- Clean 20kg of paddy rice
- Dispose generated wastes effectively

Checklist:

SN	Criteria	Indicators	Score	
			Yes	No
1	Cleaning method of paddy rice are well applied.	Manual cleaning is done		
		Mechanical cleaning methods are applied		
2	Disposal of waste from paddy rice is properly conducted	Composting is done.		
		Animal feeds are produced		
		Biogas is produced		
		Building materials are produced		



Indicative content 2.2: Checking of physical hazards in paddy rice



Duration: 3hrs



Practical Activity 2.2.1: Checking physical hazard in paddy rice



Notes to the trainer

- Trainer is supposed to demonstrate how to check physical hazard in paddy rice.
- For the effective delivery it is recommended to avail cleaned paddy rice for checking.



Key steps:

While delivering this activity, pass through the following steps:

- Step 1:** Introduce the activity and ask trainees to go to the paddy rice processing workshop to check physical hazard in paddy rice.
- Step 2:** Explain the task and provide clear work instructions (PPE, Time allocated)
- Step 3:** Demonstrate how to check physical hazard in paddy rice.
- Step 4:** Ask trainees to check physical hazard in paddy rice.
- Step 5:** Verify whether the physical hazard in paddy rice is well checked and provide feedback where necessary.
- Step 6:** Ask trainees to read the key readings 2.2.1 in trainee manual



Points to Remember

- Efficiently checking and removing of physical hazards in paddy rice is vital for ensuring consumer safety, protecting equipment, maintaining product quality, and complying with food safety regulations.



Application of learning 2.2.

Ask trainees to go to the paddy rice processing workshop to check 500g of cleaned paddy rice and take decisions according to found results.

Checklist:

SN	Criteria	Indicators	Score	
			Yes	No
1	Physical hazard in paddy rice is well checked.	Visual inspection is conducted		
		Contamination level is calculated		
		Decision is taken		
		Time is respected		



Indicative content 2.3: De-hulling of paddy rice



Duration: 4hrs



Theoretical Activity 2.3.1: Description of de-hulling methods of paddy rice



Notes to the trainer:

- Trainer may use small groups for describing the methods for paddy rice de-hulling.
- The use of drawings, pictures, videos, audio visuals as didactic material for describing paddy rice dehulling methods is required.



Key steps:

While delivering this activity, pass through the following steps:

Step 1: Introduce the activity and ask trainees to answer the following question:

- What do you understand by the term paddy rice de-hulling?
- Propose the purpose of paddy rice dehulling.
- Suggest the factors that can influence de-hulling of paddy rice
- What could be the de-hulling method of paddy rice?

Step 2: Ask trainees to write their findings on papers, flip chart, blackboard, or white board.

Step 3: Engage trainees to present their answers.

Step 4: Provide the expert view and clarify ideas by using didactic materials.

Step 5: Address any questions or concerns.

Step 6: Ask trainees to read the key readings 2.3.1. in trainee manual



Points to Remember

- Dehulling of paddy rice is a critical step in rice milling, as the husk is inedible and must be separated from the grain to produce brown rice before further processing.
- While de-hulling paddy rice, you are recommended to consider the de-hulling factors and select appropriate method to be used.



Practical Activity 2.3.2: Perform de-hulling of paddy rice



Notes to the trainer

- Trainer is supposed to demonstrate how to perform dehulling of paddy rice.
- For the effective delivery it is recommended to avail paddy rice for dehulling and required tools and equipment.



Key steps:

While delivering this activity, pass through the following steps:

- Step 1:** Introduce the activity and ask trainees to go to the paddy rice processing workshop to perform dehulling of paddy rice.
- Step 2:** Explain the task and provide clear work instruction (PPE, Time allocated, ...)
- Step 3:** Demonstrate how to perform dehulling of paddy rice. While demonstrating explain de-hulling methods and procedures.
- Step 4:** Ask trainees to perform dehulling paddy rice.
- Step 5:** Verify whether the paddy rice is dehulled and provide feedback where necessary.
- Step 6:** Ask trainees to read the key readings 2.3.2. in trainee manual



Points to Remember

- For effective paddy rice dehulling, select the appropriate method, and respect dehulling procedure.



Application of learning 2.3.

You are requested to organize a field visit to any rice processing plant located nearby your school and ask trainees to participate in de-hulling of paddy rice and then generate report of the activity.

Checklist:

SN	Criteria	Indicators	Score	
			Yes	No
1	Paddy rice is well dehulled	1.1 Manual methods applied		
		1.2 Mechanical methods used		
		1.3 Time is respected		
		1.4 Report is done		
2	Field visit report is well done	2.1 Trainee identification is mentioned		
		2.2 Company identification is mentioned		
		2.3 Key competencies gained are described		
		2.4 Recommendations are mentioned		



Indicative content 2.4: Whitening and polishing of brown rice



Duration: 4hrs



Theoretical Activity 2.4.1: Description of whitening and polishing of brown rice



Notes to the trainer:

- Trainer may use small groups for describing whitening and polishing brown rice.
- The use of audio visuals as didactic material for whitening and polishing of brown rice is required.



Key steps:

While delivering this activity, pass through the following steps:

Step 1: Introduce the activity and ask trainees to answer the following question:

- How can you define the following terms?
 - Whitening?
 - Polishing?
- Provide purposes of whitening and polishing brown rice.
- Suggest the effect of whitening and polishing brown rice.
- What are the rice byproducts do you know?

Step 2: Ask trainees to write their findings on papers, flip chart, blackboard or white board.

Step 3: Asks trainees to present their answers and choose the correct ones.

Step 4: Provide the expert view and clarify ideas by using didactic materials.

Step 5: Address any questions or concerns.

Step 6: Ask trainees to read the key readings 2.4.1. in trainee manual



Points to Remember

- Rice whitening and polishing are main processes in the production of white rice as they serve to make the grains smooth and shiny, which is often preferred in the market and extended shelf life.



Practical Activity 2.4.2. Whitening brown rice



Notes to the trainer

- Trainer is supposed to demonstrate how to apply whitening and polishing methods of brown rice.
- For the effective delivery it is recommended to vail brown rice and required tools and equipment for brown rice whitening and polishing.



Key steps:

While delivering this activity, pass through the following steps:

- Step 1:** Introduce the activity and ask trainees to go to the food processing workshop to apply whitening and polishing methods for brown rice.
- Step 2:** Explain the task and provide clear work instruction (PPE, Time allocated, ...)
- Step 3:** Demonstrate how to apply methods for whitening and polishing brown rice.
- Step 4:** Ask trainees to apply methods for whitening and polishing brown rice.
- Step 5:** Verify whether the brown rice is whitened and polished, provide feedback where necessary.
- Step 6:** Ask trainees to read the key readings 2.4.2. in trainee manual



Points to Remember

- Select the appropriate whitening method that can remove as much as possible bran layer while maintaining nutritional content and minimize breakage of whitened rice.



Application of learning 2.4.

Organize a field visit to any rice processing plant and by then request your trainees to participate in whitening and polishing of brown rice.

Checklist:

SN	Criteria	Indicators	Score	
			Yes	No
1	Brown rice is well whitened and polished	Brown rice is whitened		
		White rice is polished		
		By products are removed		
2	Field visit report is well done.	2.1 Trainee identification is mentioned		
		2.2 Company identification is mentioned		
		2.3 Key competencies gained are described		
		2.4 Recommendations are mentioned		



Indicative content 2.5: Checking the quality of milled rice



Duration: 4hrs



Practical Activity 2.5.1. Checking the quality of milled rice



Notes to the trainer

- Trainer is supposed to demonstrate how to check the quality of milled rice
- For the effective delivery it is recommended to avail milled rice and all instrument and protocol for checking quality of milled rice.



Key steps:

While delivering this activity, pass through the following steps:

- Step 1:** Introduce the activity and ask trainees to go to the food processing workshop to check the quality of milled rice.
- Step 2:** Explain the task and provide clear work instructions (PPE, Time allocated, ..)
- Step 3:** Demonstrate how to check the quality of milled rice.
- Step 4:** Ask trainees to check quality of milled rice.
- Step 5:** Verify whether the quality of milled rice is checked and provide feedback where necessary.
- Step 6:** Ask trainees to read the key readings 2.5.1 in trainee manual
- Step 7:** Ask trainees to perform the task provided in application of learning 2.5.



Points to Remember

- While checking the quality of milled, both intrinsic and extrinsic characteristics are considered to ensure milled rice safety and quality.



Application of learning 2.5.

Organize a school workshop and ask trainees to go to check the quality of milled rice of (5kgs) within 2hours.

Checklist

Criteria	Indicators	Score	
		Yes	No
Quality of milled rice is well checked.	Extrinsic quality is checked		
	Total aflatoxin is tested		
	Moisture content is measured		
	Time is respected		



Learning outcome 2 end assessment

Written assessment

1) Read the statement below and Answer by **true (T)** if it is correct or **false(F)** if it is wrong.

- a) Cleaning paddy rice is a process of removing impurities such as straw, chaff, stones, pebbles, soil, dust, weed seeds and other impurities from paddy rice.

Answer: True.

- b) Mechanical Dehulling Methods rely on human effort and simple tools to efficiently remove the husk from large quantities of paddy rice.

Answer: false

- c) Rice Whitening is the process of smoothing and enhancing the appearance of white rice to make it shiny.

Answer: false

- d) Extrinsic characteristics refer to the external features and attributes of milled rice that can be observed or measured from the outside of the grains

Answer: true

2) Read the following statement and answer by circling a letter corresponding to the correct answer.

- a) One of the following is not the extrinsic defect of milled rice.

- i) Broken kernel
- ii) Heat damaged.
- iii) Immature rice
- iv) Moisture content

Answer: iv) Moisture content

- b) The following is by product in rice milling **EXCEPT**

- i. Rice bran
- ii. Rice husks
- iii. Brown rice
- iv. Brewer's rice

Answer: I) Brown rice

- c) Which one is not the purpose of polishing

- i. Aesthetic Enhancement

- ii. Increase Market Value
- iii. Increase Shelf Life
- iv. To convert brown rice into white rice

Answer: iv) to convert brown rice into white rice

- d) The following are disadvantages of using mortar and pestle in dehulling rice **EXCEPT**
- i. Consume more electricity.
 - ii. labour intensive.
 - iii. time consuming.
 - iv. low efficiency

Answer: I) consume more electricity

- 3) Match the machines that are used in paddy rice cleaning in **column A** with their description in **column B**. Write the corresponding letter in the answers column.

ANSWER	Column A	Column B
.....	A. Aspirators	i. Machines use a combination of screens, air blowers, and gravity separators to remove larger impurities like straw, chaff, and stones.
.....	B. Destoners	ii. Used for detecting and removing metal contaminants from paddy rice.
.....	C. Magnetic Separator	iii. Machines used to remove stones, sand, and other heavy particles from paddy rice
.....	D. Pre-cleaners	iv. machines use strong air currents to separate lighter impurities like dust and chaff from the heavier rice grains
.....		v. Machine used to remove black coloured paddy rice.

Answers:

- A) iv
- B) iii
- C) ii
- D) i

- 4) Complete the following statement by using correct terms in the brackets (Rice bran, Rice whitening, Rice husks, Rice polishing, brewer's rice. De-hulling)
- a) is the process of removing the bran layers from brown rice
 - b)is the process of smoothing and enhancing the appearance of white rice by polishing its surface to make it shiny.
 - c) is the outer layer of the brown rice grain, rich in nutrients like Fiber, vitamins B1, B6, and E, and minerals.

- d)is hard outer covering of the paddy rice, constituting 20-25% of its weight, is made up of silica and lignin.
- e) is broken rice grains, generated during milling and polishing, were once considered waste but are now finding new uses

Answers:

- a) Rice whitening
- b) Rice polishing
- c) Rice bran
- d) Rice husks
- e) Brewers rice

Practical assessment

Golden Ltd is rice processing company located in Huye district. Few days ago, their customers complained that quality of milled rice is of poor quality due to husks, and red rice that is being presented in final products. You are requested to make a sample of a well milled rice by milling 10kg of paddy rice. All activity should be done within 2 hours and all required material, tools and equipment are available at Golden Ltd.

Checklist:

SN	Criteria	Indicators	Score	
			Yes	No
1	Paddy rice is well-cleaned	1.1 The cleaning method is Applied		
		1.2 Wastes are separated		
		1.3 Waste disposal methods applied		
2	Physical hazards of paddy rice are well checked	2.1 Stone and gravel are removed		
		2.2 Metals are removed		
		2.3 Glasses are removed		
		2.4 Plastics are removed		
		2.5 Wood and plants debris are removed		
		2.6 Insects and insects' part are removed		
3	Paddy rice is well de-hulled	3.1 Dehulling is done		
		3.2 Brown rice is separated from Hulls.		
4	Brown rice is well whitened and polished	4.1 Whitening is done		
		Polishing is done		
		4.2 By product are removed		
5	The quality of milled rice is well checked	5.1 Extrinsic defects are checked		
		5.2 Moisture content in milled rice is measured		
		5.3 Total Aflatoxin in milled rice is tested		

END



Further information to the trainer

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Learning Outcome 3: Store the Milled Rice



Indicative contents

3.1 Grading of milled rice

3.2 Packaging of milled rice

3.3 Labelling of milled rice

3.4 Storage parameters of milled rice

Key Competencies for Learning Outcome 3: Store the Milled Rice

Knowledge	Skills	Attitudes
• Description of methods and factors of milled rice grading. • Description of packaging materials of milled rice. • Description of labelling methods and information for milled rice. • Explanation of storage conditions and parameters of milled rice.	• Grading milled rice • Filling milled rice • Sealing milled rice • Labelling milled rice • Storing milled rice	• Being accurate while grading milled rice. • Being honest while packaging milled rice. • Being careful while storing milled rice.



Duration: 15 hrs

Learning outcome 3 objectives:



By the end of the learning outcome, the trainees will be able to:

1. Identify correctly the factors influencing grading of milled rice.
2. Describe properly grading methods applied for milled rice.
3. Describe correctly types of packaging materials used for packaging milled rice.
4. Identify properly labelling information used for milled rice packaging.
5. Describe correctly labelling methods used for milled rice storage.
6. Explain correctly parameters and conditions for milled rice storage.
7. Grade properly milled rice according to grading conditions.
8. Package correctly milled rice as required in milled rice storage.

9. Fill properly milled rice according to filling requirement.
10. Seal correctly milled rice according to sealing requirement.
11. Label properly milled rice according to labelling standards.
12. Store effectively milled rice according to storage conditions.



Resources

Equipment	Tools	Materials
• Packaging machine • Labelling machine • Filling machine • Grading machine • Moisture meter • Stitching machine • Electronic balance	• Insect killer • Balance • Hygrometer • Thermometer • Pallet • Sieves	• Packaging materials • Glue • Thread • Labels



Advance Preparation:

Before delivering this learning outcome, you are recommended to:

- Avail a classroom and paddy rice processing workshop.
- Avail sample of milled rice with different size and colour.
- Avail packaging, filling, and sealing materials.
- Prepare teaching aids and didactic materials (manuals/guides, audio-visuals, protocols, ...)



Indicative content 3.1: Grading of milled rice



Duration: 4 hrs



Theoretical Activity 3.1.1: Description of factors and methods for grading milled



Notes to the trainer:

- Trainer may use small groups for describing grading methods and factors consider while grading milled rice.
- The use of didactic materials such as video for describing grading methods for milled rice is required.



Key steps:

While delivering this activity, pass through the following steps:

Step 1: Introduce the activity and ask trainees to answer the following questions:

- i. What do you understand by the term grading?
- ii. What is the purpose of grading milled rice?
- iii. What do you think should be the factors to consider while grading for milled rice?
- iv. Suggest the methods used for milled rice grading?

Step 2: Ask trainees to write their answers/findings on papers, flip chart, blackboard, or white board.

Step 3: Engage trainees to present their answers.

Step 4: Provide the expert view and clarify ideas by using didactic materials.

Step 5: Address any questions or concerns.

Step 6: Ask trainees to read the key readings 3.1.1 in trainee manual.



Points to Remember

- You are recommended to perform milled rice grading to ensure standardization, fair pricing and consumer preference.
- While grading milled rice, consider the type and quality of raw material, processing techniques and milling technologies used and post-processing handling conditions.



Practical Activity 3.1.2: Grading milled rice



Notes to the trainer

- The trainer may use individual based activity and he/she is supposed to demonstrate how to grade milled rice.
- Avail milled rice and tools used in grading milled rice.
- Videos may be used as didactic materials while grading milled rice.



Key steps:

While delivering this activity, pass through the following steps:

- Step 1:** Introduce the activity and ask trainees to go in food processing workshop to grade milled rice.
- Step 2:** Explain the task and provide clear work instructions (PPE, time allocated)
- Step 3:** Demonstrate how to grade milk and explain the procedure for milled rice grading.
- Step 4:** Ask trainees to grade milled rice and monitor the procedure.
- Step 5:** Verify whether milled rice is properly graded and provide feedback where necessary.
- Step 6:** Ask trainees to read the key readings 3.1.2 in trainee manual.
- Step 7:** Ask trainees to perform the task provided in application of learning 3.1.



Points to Remember

- For effective milled rice grading use appropriate method. the choice of method should depend on the level of precision, efficiency, and available resources.



Application of learning 3.1.

Suppose that in your school store, there are (10) ten sacs of milled rice supplied by ABC company. Ask your trainees to go in school store the and grade milled rice. Tools and equipment are available in school store.

Checklist :

Criteria	Indicators	Score	
		Yes	No
Milled rice is well graded	Milled rice samples are collected		
	Grading methods are applied		
	Grading procedures are respected		



Indicative content 3.2: Packaging of milled rice



Duration : 4 hrs



Theoretical Activity 3.2.1: Description of packaging materials of milled rice



Notes to the trainer:

- Trainer may use small groups for describing packaging of milled rice.
- Trainer may use drawings, pictures, or videos as didactic materials for describing packaging materials of milled rice.



Key steps:

While delivering this activity, pass through the following steps:

Step 1: Introduce the activity and ask trainees to answer the following questions:

- i. What do you understand by term packaging?
- ii. What could be the purpose of packaging milled rice?
- iii. Give out the types of packaging materials of milled rice.
- iv. Suggest the selection criteria of packaging materials of milled rice.

Step 2: Ask trainees to write the answers on papers, flip chart, blackboard, or white board.

Step 3: Asks trainees to present their answers and choose the correct one.

Step 4: Provide the expert view and clarify ideas by using didactic materials.

Step 5: Address any questions or concerns.

Step 6: Ask trainees to read the key readings 3.2.1 in trainee manual.



Points to Remember

- Milled rice must be packaged in appropriate packaging material to ensure protection and preservation.



Practical Activity 3.2.2: Packaging milled rice



Notes to the trainer

- The trainer may use individual based activity for packaging milled rice.
- Avail packaging materials for milled rice.
- The use of videos for demonstrating milled rice packaging is required.



Key steps:

While delivering this activity, pass through the following steps:

- Step 1:** Introduce the activity and ask trainees to go in food processing workshop to perform milled rice packaging.
- Step 2:** Explain the task and provide clear work instructions (PPE, Time allocated, ...)
- Step 3:** Demonstrate how to perform milled rice packaging and explain the procedure.
- Step 4:** Ask trainees to package milled rice and monitor the procedure.
- Step 5:** Verify whether milled rice is properly packaged and provide feedback where necessary.
- Step 6:** Ask trainees to read the key readings 3.2.2 in trainee manual.
- Step 7:** Ask trainees to perform the task provided in application of learning 3.2.



Points to Remember

- You are recommended to package properly the milled rice to ensure protection and preservation.
- While packaging milled rice, make sure that it is weighed accurately, use appropriate packaging materials, fill and seal effectively.



Application of learning 3.2.

Organise a field visit to the rice processing industry and ask trainees to package milled rice.

Checklist :

SN	Criteria	Indicators	Score	
			Yes	No
1	Milled rice is well packaged	Packaging materials are selected		
		Filling methods are applied		
		Sealing methods are applied		
2	Field visit report is well done	Trainee identification is mentioned		
		Company identification is mentioned		
		Key competencies gained are described		
		Recommendations are mentioned		



Indicative content 3.3: Labelling of milled rice



Duration : 4 hrs



Practical Activity 3.3.1: Performing labelling of milled rice



Notes to the trainer

- The trainer may use individual based activity for labelling milled rice.
- Avail tools, material and equipment used for labelling milled rice.
- Trainer may use video as didactic material.



Key steps:

While delivering this activity, pass through the following steps:

- Step 1:** Introduce the activity and ask trainees to go in the food processing workshop and perform milled rice labelling.
- Step 2:** Explain the task and provide clear work instructions (PPE, Time allocated,)
- Step 3:** Demonstrate how to label milled rice and explain the procedure.
- Step 4:** Ask trainees to label milled rice and monitor the procedure.
- Step 5:** Verify whether milled rice is properly labelled and provide feedback where necessary.
- Step 6:** Ask trainees to read the key readings 3.3.1 in trainee manual.
- Step 7:** Ask trainees to perform the task provided in application of learning 3.3.



Points to Remember

- While labelling milled rice, you are recommended to mention all necessary information about the product.



Application of learning 3.3.

Ask your trainees to perform the following task: “Suppose that your uncle owns a rice processing industry and one of his workers in charge of labelling is seek. You are called to help him to label the milled rice so that it can reach the market”.

Checklist

Criteria	Indicators	Score	
		Yes	No
Milled rice is well labelled	Labelling materials are selected		
	Labelling methods are applied		
	Labelling procedure is respected		



Indicative content 3.4: Storage parameters of milled rice



Duration : 3 hrs



Practical Activity 3.4.1: Storing milled rice



Notes to the trainer

- The trainer may use individual based activity for monitoring storage parameters for milled rice.
- The use of audio visuals as didactic for storing milled rice.



Key steps:

While delivering this activity, pass through the following steps:

- Step 1:** Introduce the activity and ask trainees to go in food processing workshop to store milled rice.
- Step 2:** Explain the task and provide clear work instructions (PPE, Time allocated, ...)
- Step 3:** Demonstrate how to store milled rice and explain storage parameters for milled rice.
- Step 4:** Ask trainees to store milled rice and monitor the storage parameters.
- Step 5:** Verify whether milled rice is properly stored and provide feedback where necessary.
- Step 6:** Ask trainees to read the key readings 3.4.1 in trainee manual.
- Step 7:** Ask trainees to perform the task provided in application of learning 3.4.



Points to Remember

- By adhering to the storage parameters, you can ensure that milled rice retains its quality for an extended period.



Application of learning 3.4.

Suppose that the School Manager of your school has bought rice to feed trainees. Ask your trainees to go in the school store and help to store properly the milled rice to be used in six months.

Checklist

Criteria	Indicators	Score	
		Yes	No
Milled rice is well stored	Packaging is properly done		
	Temperature is well controlled		
	RH is well controlled		
	Moisture content is maintained		
	Insects are controlled		



Learning outcome 3 end assessment

Written assessment

1. Answer by **True** if the statement is correct or by **False** if the statement is not correct
 - a. Grading creates a universal system for classifying rice based on specific criteria. This allows buyers and sellers to misunderstand the quality of rice they are dealing with.
 - b. Higher-grade rice will fetch a minimum price, while lower-grade rice may be used for animal feed.
 - c. The quality and quantity of paddy rice affect the nutritional value, cooking properties, and moisture content at which rice is millet
 - d. Advanced milling machines designed by reputable manufacturers tend to produce higher-quality milled rice with fewer broken grains.

Answer:

- a) **False**
 - b) **False**
 - c) **True**
 - d) **True**
2. Circle the letter corresponding to the correct answer.
 - A. The following is the main purpose of visual inspection in milled rice grading:
 - i. Determine moisture content of milled rice.
 - ii. Assess nutritional value.
 - iii. Assess discoloration, broken kernels, foreign material and presence of pests and insect.
 - iv. Predict shelf life of milled rice.

Answer: iii

- B. These are selection criteria for packaging material for milled rice **Except**
 - i. Product Compatibility
 - ii. Material Type
 - iii. Cost Efficiency
 - iv. Labelling information
 - v. Sustainability

Answer: iv

- C. The following are important information found on labels **Except**
 - i. Brand Name and Logo
 - ii. Product name

- iii. Net Weight
- iv. Nutritional Information
- v. Grading Information
- vi. None above

Answer: vi

3. Fill the following sentences with correct words corresponding to storage parameter for milled rice: (Moisture, light, temperature, relative humidity and nitrogen)

- i. Milled rice should be stored at of around 12-13%.
- ii. should be kept below 60% to prevent moisture absorption by the rice, which can lead to spoilage.
- iii. can cause oxidation in milled rice leading to deterioration in flavor and quality.
- iv.range of 50°F to 70°F (10°C to 21°C) is generally recommended for optimal storage conditions to prolong shelf life.

Answer:

- i) **Moisture content**
- ii) **Relative humidity**
- iii) **Light**
- iv) **Temperature**

Practical assessment

Ask your trainees to perform this task: “ABC is a rice processing industry located in Nyagatare District. Last year the industry encountered the problem of rice spoilage due to poor storage of milled rice . You are required by the industry, to perform the following tasks: grade, package, fill, label, and store milled rice”.

Checklist:

SN	Criteria	Indicators	Score	
			Yes	No
1	Milled rice is well graded	1.1 Milled rice samples are collected		
		1.2 Grading methods are applied		
		1.3 Grading procedures are respected		
2	Milled rice is well packaged	2.1 Packaging materials are selected		
		2.2 Filling methods are applied		
		2.3 Sealing methods are applied		
3	Milled rice is well labelled	3.1 Labelling materials are selected		
		3.2 Labelling methods are applied		
		3.3 Labelling procedure is respected		
4	Milled rice is well stored	4.1 Temperature is well controlled		
		4.2 RH is well controlled		
		4.3 Moisture content is properly maintained		
		4.4 Insects are well controlled		



Further information to the trainer

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