GOOD PRACTICES FOR PARBOILED RICE

Extension and Advisory Support

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Overview

This picture block is made to facilitate the training sessions of rice processors on good practices for obtaining parboiled rice. Its structure as pictures on the front and text on the back helps the facilitator to convey the key messages for the improvement of current practices. The facilitator should internalize the contents of the picture block so as to unwind a participatory and chronologically the different steps of the process of getting parboiled rice.

Questions and answers on the back of the picture block serves as a guide to the facilitator. The answers are not be given by the trainers but by the trainees. The trainer helps by showing the picture and rephrasing the question to “discover” the right answers during the training session.

The implementation of good practices for parboiling ensures good quality parboiled rice for the market and a lot of money to the processor.

Aminat (the lead figure in this picture bloc) is parboiling rice. The good practices she uses are shared in this document.

About CARI

The Competitive African Rice Initiative (CARI) is commissioned by the Federal Ministry of Economic Cooperation and Development of Germany. The programme is supported by the Bill & Melinda Gates Foundation, the Walmart Foundation and Agro-industry.

In Nigeria, it is implemented by GIZ in cooperation with FMARD, Agricultural Development Projects in the states, private businesses and civil society and non-governmental organisations.

The goal of CARI is to significantly improve the livelihoods of 120,000 rice farmers in Nigeria, Ghana, Burkina Faso and Tanzania by increasing the competitiveness of domestic rice supply to meet increasing regional demand.

About SEWOH/AgrINet

The global Programme Green Innovation Centres for the Agriculture and Food Sector is part of the OneWorld – No Hunger Initiative of the Federal Ministry for Economic Cooperation and Development of Germany. The programme aims to use innovation in the agricultural and food sector to boost the incomes of smallholders, create more employment opportunities (particularly in food processing), and to increase regional food supplies in the project’s rural target areas. Green innovation centres is implemented in Benin, Burkina Faso, Cameroon, Ethiopia, Ghana, India, Kenya, Malawi, Mali, Nigeria, Togo, Tunisia and Zambia.

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Drawings: Kayode Ogunwale, Nigeria
Other training materials available

The below training material and their content are linked to the GAP training.

Doing good business with quality irrigated dry season lowland rice

Farmer Business School
Training notebook & workbook
Production system
Rice, Cow pea, Egusi

Name:

Nigeria
June 2015

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Good Agricultural Practices of Quality Rainfed Lowland Rice
Extension and advisory support

Farmer Business School
What is it about?

Training Module
for Nigeria

Healthy Nutrition of rural smallholder families
September 2015

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1. **Material and Equipment needed for the process of obtaining parboiled rice**

Q1: Which materials and equipment does Aminat use for parboiling?

A: For getting parboiled rice, she uses:

- Pot
- False bottom;
- Sack to trap hot steam;
- Paddy rice;
- Scale to measure the quantity of paddy and rice before and after parboiling
- Source of clean water;
- Rice husk or firewood
- Bowl / bucket;
- Calabash;
- Clean basket to wipe paddy rice;
- Plastic or aluminum strainer;
- Improved tripod stand or stove;
- Spatula (stick) to stir;
- Clean tarpaulin or clean drying area;
- Wood shaped rake to spread the rice during drying.
2. Hygienic Conditions for a Good Rice Parboiling

Q1 : What are the hygienic conditions that Aminat respects when she parboiles rice?

A : She

– always wash hands with clean water and soap before every operation;
– keeps fingernails short and clean;
– removes bracelets, rings and other jewelry before starting each operation;
– covers her hair with a clean scarf;
– puts on clean clothes and shoes;
– keeps the environment / place of work always clean;
– washes with soap and water the whole processing equipment to use and then wipes with a clean white cloth.
3. Selection and Purchase of Paddy Rice

Q1: What paddy quality Aminat uses for processing?
A: It takes unique variety, clean paddy, free of impurities and dry well (moisture rate 12-14%).

Q2: How can she determine if the paddy is dry?
A: She uses the salt method:
   - Mix in a bottle (e.g. bottled mayonnaise) two volumes of paddy with one salt volume, then close and stir thoroughly;
   - If the paddy glue on the cover, this indicates that it is not dry enough

Q3: What rice varieties are best appreciated by consumers?
A: The FARO varieties are the best in terms of organoleptic and physical characteristics with good fragrance (aroma).

Q4: Where did Aminat buy the paddy?
A: She bought the paddy with a group or cooperative with a contract.

NB: Each variety of rice will be steamed separately.
4. Winnowing and Sorting of Paddy

Q1: What is the operation that follows the choice of paddy rice?
A: Aminat cleans the paddy by winnowing followed by sorting.

Q2: How does Aminat winnow her paddy?
A: She...
   – lifts paddy rice contained in a basin to the height of the head, then slowly poured into another bowl placed on a tarpaulin or on a clean drying area;
   – transfers rice to the wind direction so as to rid it of light impurities (dust, immature rice grains, some animal and plant organisms, etc.);
   – ensures the operator remains adjacent to the wind direction to prevent impurities getting to the eyes or on the body
   – can also use a mechanical winnower.

Q3: How does Aminat sort paddy after winnowing?
A: She...
   – places and rubs the paddy winnowed on the surface of the sorting screen or a plant sieve placed over a basin, so as to allow the impurities such as: brown rice, small diameter stones, etc. fall down into the basin.
   – then switches to hand picking of pebbles, off-type and wild grains from the paddy
   – could also use a de-stoner.
5. Washing and Dewatering of Paddy Rice

Q1: What is Aminat doing here?
A: She is washing the paddy

Q2: How is she washing the paddy rice?
A: She ...
   – pours the paddy winnowed and sorted in clean water so that the water overflow the paddy rice (1 volume of paddy to 1.5 volumes of water);
   – stirs the rice paddy in water and remove immature emerging with a sieve;
   – rubs in palm of the hand, paddy submerged in water to rid it of dirt including dust and other impurities.
   – repeats wash with clean water two to three times; paddy is clean when the wash water is colorless.
   – drains clean paddy through a strainer
6. Soaking Paddy

Q1: How do you soak the paddy rice?
A: It is necessary to:
   – Transfer the drained paddy in a plastic drum or barrel;
   – Put water in a pot and heat to a temperature of 70-80° C. This temperature coincides with the time when bubbles appear in the water and a slight vapor at the surface;
   – Pour hot water into the barrel to cover the rice;
   – Close the drum and leave all the rest for cooling for about 10-12 hours.

Q2: What is the importance of soaking?
A: Soaking increases the moisture content of the rice grains necessary for parboiling

NB: If the soaking time is insufficient, all paddy grains will not be well soaked with water from which will emerge different colors of rice after hulling;
   – Soaking for long period of time results to bad smell that makes parboiled rice unpleasant to consume
7. Re-Washing and De-Watering Again

Q1: How does Aminat wash and drain her rice after soaking?
A: She...
   – washes paddy rice with clean water;
   – collects washed paddy rice with a strainer and leave heavier stones in the bottom of the basin;
   – puts the recovered rice in a bowl and then transfer it to a basket placed on a bucket to carry draining;
   – One washing is usually sufficient.

NB:
   – The pigment from brick-red color husked paddy can stain other paddy; Washing again is necessary to rinse the paddy rice pigments dissolved in water.
   – In addition to the re-washing, she further removes stones.
8. Steaming

Q1: What is steaming?
A: The steaming treatment is a pre-cooking for paddy rice before it is de-husked. But the paddy is actually not cooked.

Q2: How does Aminat steam her paddy
A: She...
   – puts the steaming pot on fire (preferably on an oven ball or tripod stand) with clean water until boiling. The amount of water is 4-5 litres per 25 kg of paddy;
   – When the water is boiling, she places a false bottom in the pot to prevent contact between paddy and bottom of the pot on one hand and between paddy and water on the other hand;
   – puts the paddy in the pot and closes it;
   – waits for 20 to 30 minutes for the steaming. She further wait until the steam covers the entire paddy and the husks open. The end of treatment is marked by an opening of paddy husks;
   – then removes the parboiled paddy from the steaming pot for drying.
9. Sun Drying Parboiled Paddy

Q1: What is the purpose of drying?
A: The purpose of drying is to reduce moisture rate of parboiled paddy grains up to 13% (or 10%) to allow safe storage before milling.

Q2: Where does Aminat dry the parboiled paddy.
A: She
- dries it in the sun;
- spreads the parboiled paddy out on a tarpaulin or a well-washed and dried concrete drying yard;

Q3: How does Aminat dry parboiled paddy in the sun?
A: She …
- spreads the grains in the sun in a very thin layer. She prefers a wooden form of rake for spreading the grains.
- let parboiled paddy dry in the sun for 1 and half to 2 hours;
- re-spreads parboiled paddy with rake from time to time for uniform drying;

NB: Sun-drying is complete when the envelope paddy comes off when rubbed between the palms of both hands. At this time, the moisture content of the paddy is about 21%.
Q1: How does Aminat dry her parboiled paddy in the shade?
A: She ...
   – Returns to a clean room where the drying continues in the shade, after sun drying;
   – In the room, the parboiled paddy must be spread to dry (about 10% moisture);

Q2: For how long Aminat continues to dry her parboiled paddy?
A: She...
   – does the shade drying for at least 16 hours of time;

Q3: How does she know that the paddy is ready?
A: She..
   – discovers that the end of drying in the shade is marked by easy removal of the husks simply by rubbing paddy in the palms of both hands;
   – knows that well-dried parboiled paddy can be stored in good conditions for at least 3 months.
11. Milling of Parboiled Paddy

Q1: How does Aminat mill her parboiled paddy?
A: She...
   - performs milling of parboiled paddy in a rice mill;
   - Then proceeds to the winnowing of milled rice if the mill used does not have winnower;

NB: Note that the good quality parboiled rice has uniformly colored grains, shiny, without foreign bodies and with low breakage rate (below 15%).
12. Sorting of Parboiled Rice

Q1: How does Aminat sort out her grains rice after milling?
A: She sorts out parboiled rice using a sieve or make a visual sorting.

Q2: How does Aminat sort grains through a sieve?
A: She rolls parboiled rice through the sieve to remove the small sized grains, dust, small sized stones and other impurities.

NB: This is already a first calibration level.
The resulting broken parboiled rice can be consumed (as rice paste) or sold to restaurants.

Q3: How does Aminat sort her grains visually?
A: She...
   - spreads parboiled rice obtained after sorting screened on a light background support (tray);
   - removes all visible impurities (stones, mottled grains, grains with black dots, red beans and all kinds of impurities) for small batches of parboiled rice.
   - ensures that the rice is free from all impurities, the same batch of parboiled rice will have to be sorted by three people one after the other in a job chain.
13. Parboiled Rice Packaging

Q1: How does Aminat pack parboiled rice?

A: She...

- weighs the rice she wants to pack with a scale;
- ensures that the scale calibrator is placed at zero balance prior to weighing;
- observes the weight indicated on the packaging; This weight is the net weight of the rice;
- makes a plastic package, use the sealer;
- makes a package with a PP bag (commonly called bag of fertilizer), use the sewing machine;
- ensures that for 1-2 kg of rice, use the plastic packaging and for greater quantities, use PP bags.
14. Parboiled Rice Storage

Q: How does Aminat store her parboiled rice?
A: Aminat …
– arranges a place of aerated storage and sheltered from the weather;
– puts the parboiled rice bags on wooden pallets to avoid direct contact with the ground;
– arranges bags of paddy overlapping each other in “one-over-two” and “two-over-one” cross-arrangement (or cross-orientation);
– stores the rice in separate bags batches;
– leaves a space between the top of the bags and the ceiling to allow for inventory control by staff.