Improving the Quality of Ghanaian Parboiled Rice

Training Manual

What is Good Quality Rice?

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Session 1

What is good quality rice?

Objective:
The objective of this session is to investigate the factors that affect rice quality and to determine who is responsible for producing good quality rice.

Parboiled rice is a manufactured product. This means that raw materials undergo certain processes to produce the final product.

The quality of any manufactured product is only as good as the quality of the raw materials and the controls exercised during processing.
The quality of parboiled rice produced in Ghana is very variable, even though the same raw materials and processes are used throughout the three northern regions of Ghana.

WHICH FACTORS AFFECT QUALITY?

Rice quality is assessed by a number of factors, some of which can be attributed to the grain itself, these are known as ***intrinsic factors***. Other quality factors are introduced by the way the grain is grown, handled and processed, these are known as ***induced factors***.

Climate, fertiliser application, harvesting practices, storage, parboiling processes, milling, transport and marketing can all have an effect on quality.

Practical Exercise 1

In groups, use the flip chart paper provided to make a list of the physical factors which **you** think affect the quality of parboiled rice grains.

By each of the quality factors say whether you think this is an intrinsic or an induced factor.

Discuss the lists you have drawn up and compare them with the factors listed overleaf.

Intrinsic factors (genetically controlled)	**Induced factors (introduced during handling and processing)**
• Yield • Density • Size • Composition • Colour • Scent • Dormancy	• Yield • Foreign matter • Mixed varieties • Maturity • Infestation/infection • Cracked grain • Sprouted grain • Milling degree • Physical damage • Parboiled grain • Age

WHO IS RESPONSIBLE FOR RICE QUALITY?

Everyone involved in the production chain!

If rice quality is to be improved it must be a team effort

So, who is involved in the rice quality team?

- Breeders
- Farmers
- Traders

- Millers
- Parboilers
- Market traders
- Consumers

Anyone else?

- Policy makers
- Economists
- Food Technologists
- Agronomists
- Extension workers
- Ghana Standards Board
- Funding Agencies
- Engineers

Practical Exercise 2

Have another look at your list of factors that affect quality. Which members of the production team can have an impact on each factor?

HOW CAN WE PRODUCE BETTER QUALITY PARBOILED RICE?

If the quality of local parboiled rice is to be improved it is vital that everyone in the production team is "quality aware". Everyone in the team must play his or her part.

There are two ultimate goals:

- **To maintain or increase the quantity of rice available for sale**
- **To ensure that it is acceptable to consumers.**

Both are of equal importance.

Everyone in the production team has an important part to play in order to achieve those goals.

Successful teams **communicate** and plan their tactics **together!** That is why workshops such as this are so important. They make sure that everyone involved in the production of parboiled rice understands the difficulties experienced throughout the chain and can play an important part in seeking solutions to those problems.

GOOD MANUFACTURING PRACTICE, GOOD ACRICULTURAL PRACTICE AND THE HACCP APPROACH TO PRODUCT SAFETY AND QUALITY.

As we have already discussed, parboiled rice is a manufactured product. There is no single person responsible for product quality.

Changing legislation, competition from imported products, increased consumer expectations mean that all members of the production chain should be looking at how to control and improve their part of the chain. This can be achieved by adopting the principles of **Good Manufacturing Practice (GMP),** that is to say, all manufacturers (and members of the manufacturing team) should:

- Have a moral responsibility to produce safe, good quality food.
- Comply with relevant legal requirements regarding quality and safety.
- Satisfy customer requirements.
- Be aware of cost constraints.
- Try to minimise differences (both intrinsic and induced) in the raw materials used.
- Ensure that processing is carried out safely and effectively.

Some important members of the production team for parboiled rice are, of course, the farmers, since they are responsible for producing the primary raw material, the paddy. Farmers should be aware of the principles of **Good Agricultural Practice (GAP).** These are very similar to those of GMP and include:

- Correct use of pesticides, herbicides and fertilisers (agro-chemicals).
- Proper land preparation (especially in irrigated and bunded fields).
- Ensure that each field has a uniform stand of crop (to facilitate harvesting).
- Timely draining of fields prior to harvesting (principally in irrigated fields).
- Timely harvesting.
- DO NOT LET HARVESTED PADDY TOUCH THE GROUND.
- Do not over-dry paddy (if drying after harvesting is required).
- Paddy should only be threshed on concrete floors or on tarpaulins.
- Protect from insects and rodents in storage.

Rice parboiling in Ghana is predominantly a “cottage industry” – it is estimated that in excess of 100,000 women are actively involved in the parboiling process alone. This means it is very difficult to control all the processors to ensure that a uniform product is made.

There is one very large parboiling plant in Ghana. This venture has not been successful due to difficulties in supply and control of the raw materials. In large manufacturing plants such as this, the owners usually adopt a **HACCP approach** to product quality and safety. This means **Hazard Analysis at Critical Control Points** and is a systematic approach to identify and control a hazard. Many countries now have legislation that requires manufacturers to apply HACCP principles to the production of all food products.

However HACCP analysis must be carried out on every individual process and requires detailed records to be kept, this is clearly impractical for the present parboiled rice production system in Ghana. HACCP evolved from the

implementation of Good Manufacturing Practices, Good Hygienic Practices and Good Agricultural Practices – so implementing these throughout the production chain is a good place to start! In the following sessions we will examine each stage of the production chain to identify where the difficulties are and make recommendations for improvement.

In conclusion to this session:

- In order to define quality we must now decide which quality attributes are important at each stage of the production and marketing chain.

- In order to understand and improve quality we must also look at all the factors which have contributed to the (lack of quality) of the product so that problem areas can be identified and addressed.