



WAXY RICE PROCESSING



AATMANIRBHAR BHARAT

**PM Formalisation of Micro Food Processing
Enterprises Scheme (PM FME Scheme)**

Introduction

- India is cultivating various variety of rice and it occupies around one quarter of total cropped area.
- Rice cultivation contributed around 45 % of the total food grain production and plays a vital role in national food security system.
- Rice has many cultivars and adapted under various environmental conditions.
- It is a nutritious cereal crop and is the main source of energy.
- In the state of Assam, nearly 41 traditional waxy rice varieties are cultivated. The different important bora cultivars are Jotabora, Malbhogbora, Gandhibora, Khamtibora, Ghewbora, Maubora etc. Among these, Bora variety is popular.
- Generally, rice is composed of amylose and amylopectin.

Introduction

- ❖ In waxy rice the amount of amylopectin is quite higher than amylose content.
- ❖ Amylopectin is a highly branched molecule and gives sticky nature to rice.
- ❖ The grains of the glutinous rice are opaque and cooked sticky.
- ❖ Therefore, Bora rice possesses adhesive properties and suitable for making different traditional products like Pithas, flaked rice, sandohguri, etc.
- ❖ Many communities in the region also prepare high class rice beer out of bora rice.
- ❖ It is also suitable for development of drug delivery devices.
- ❖ Glutinous rice seems to have attracted many companies outside the state for preparation of instant and packet food, etc.
- ❖ The food items prepared from this class of rice has a great demand not only in the local and domestic market but it has export potential too.

Paddy to Rice Processing

- **Parboiling:** Parboiling is an important step before milling of paddy. It is a hydrothermal treatment which improve the head rice count and increase the yield of rice.



Advantages of parboiling

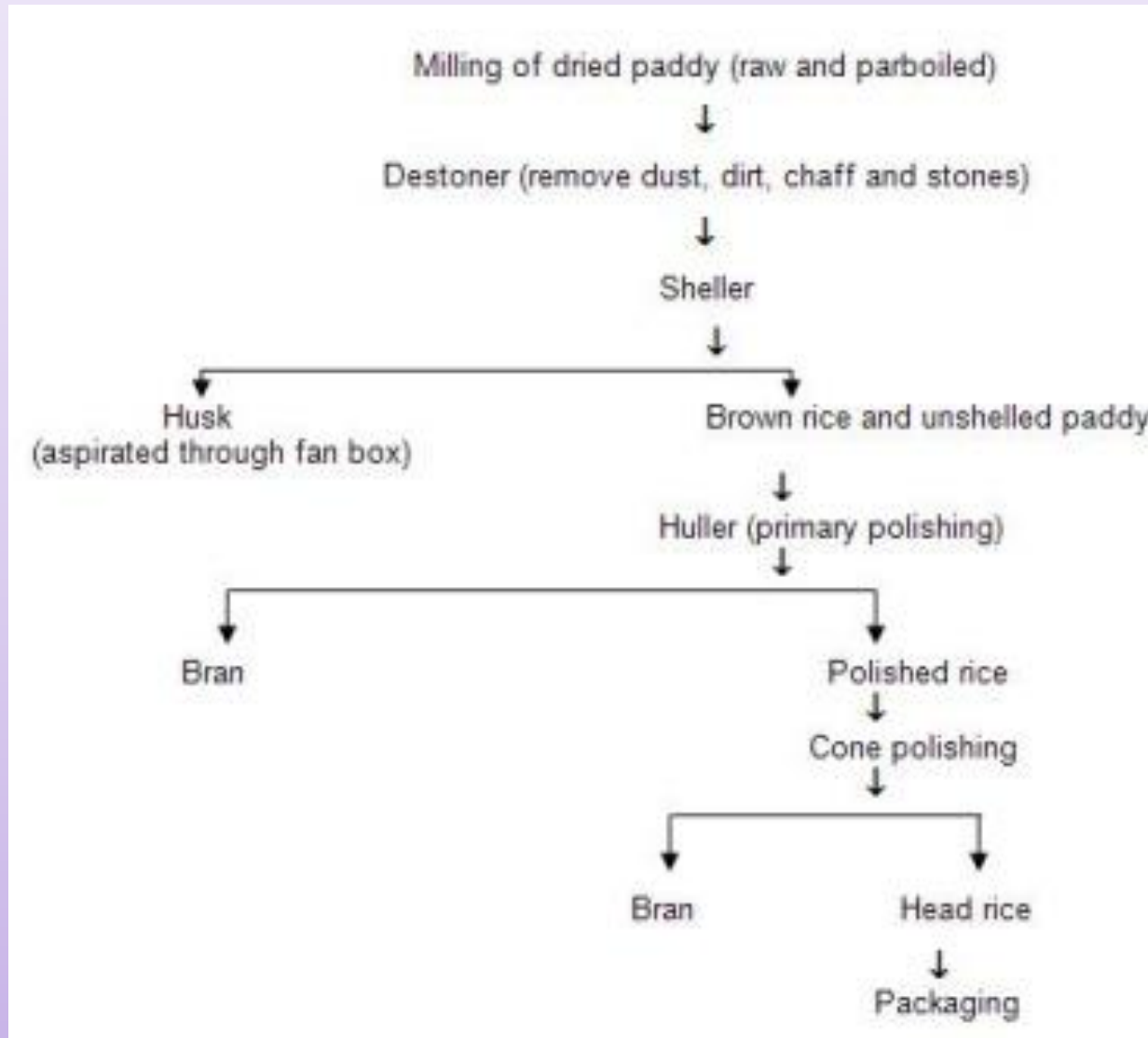
- Smooth surface finish and increase the head rice count.
- Loss of soil during cooking is also less.
- Cooking quality of rice increased
- More nutrient retention in rice.

Disadvantages of parboiling

- It develops a relatively darker colour compared to raw rice.
- The traditional parboiled process produces an undesirable smell.
- Parboiled rice takes more time to cook to the same degree of softness than raw rice.
- Because of long soaking in traditional process, mycotoxins may develop in parboiled rice and cause health hazards.
- Parboiling process requires an additional investment of capital.

Milling of Paddy

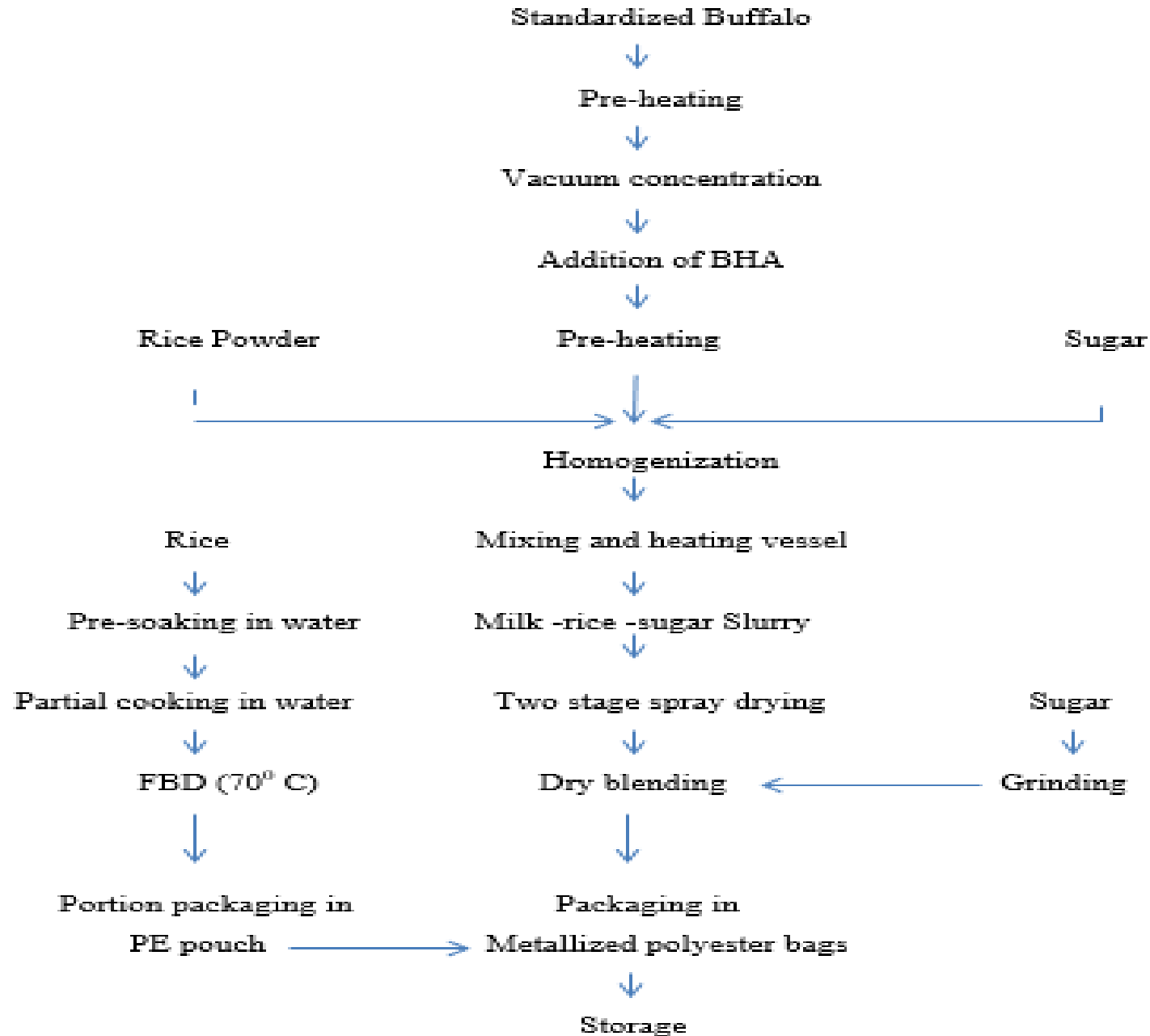
After parboiling, paddy is subjected to milling to make rice. The processing steps of milling is given below.



Instant Kheer Mix

- ❑ Kheer has very limited shelf life.
- ❑ Instant kheer mix is a shelf-stable product, it would offer significant value addition and product diversification for Indian dairy industry.
- ❑ The manufacture of an instant rice-based *kheer* mixes by separate drying-cum-instantization of concentrated milk in a spray dryer and rice grains in a fluidised bed dryer.
- ❑ It involves spray drying of the admixture of milk concentrate and rice flour (preheated to partially pre-gelatinize the rice starch) along with sugar in two stage spray dryer followed by fluidized bed drying to make the powder which has excellent reconstitution properties.
- ❑ Readily rehydrable rice grains obtained by a technology which involved partial cooking of rice, its conversion into a paste, subsequent extrusion and dehydration in air dryer.

Flow Diagram-Instant Kheer Mix



Rice Flour

- ✓ Rice flour can be used in making rice-based food products such as biscuits, cakes, noodles and other rice-based snacks.
- ✓ Rice flour is a unique over other flour because It eases in digestion
- ✓ Make as carrier of food colour and preservatives
- ✓ Bland taste
- ✓ Hypoallergenic properties
- ✓ Low in fat helps in absorbing fat
- ✓ Low in protein and helps in making essential baked products
- ✓ Can be made from broken rice makes it more cost effective
- ✓ High value lysine than similar cereal flours and therefore could be easily fortified with high lysine food than the other cereals



Method of rice flour production

- ✓ Its production process is different from wheat, maize and millet flour production process.
- ✓ Rice flour is made by grinding broken milled rice and there are generally three methods adopted for flour preparation of rice. 1. Wet grinding 2. Semidry grinding 3. Dry grinding

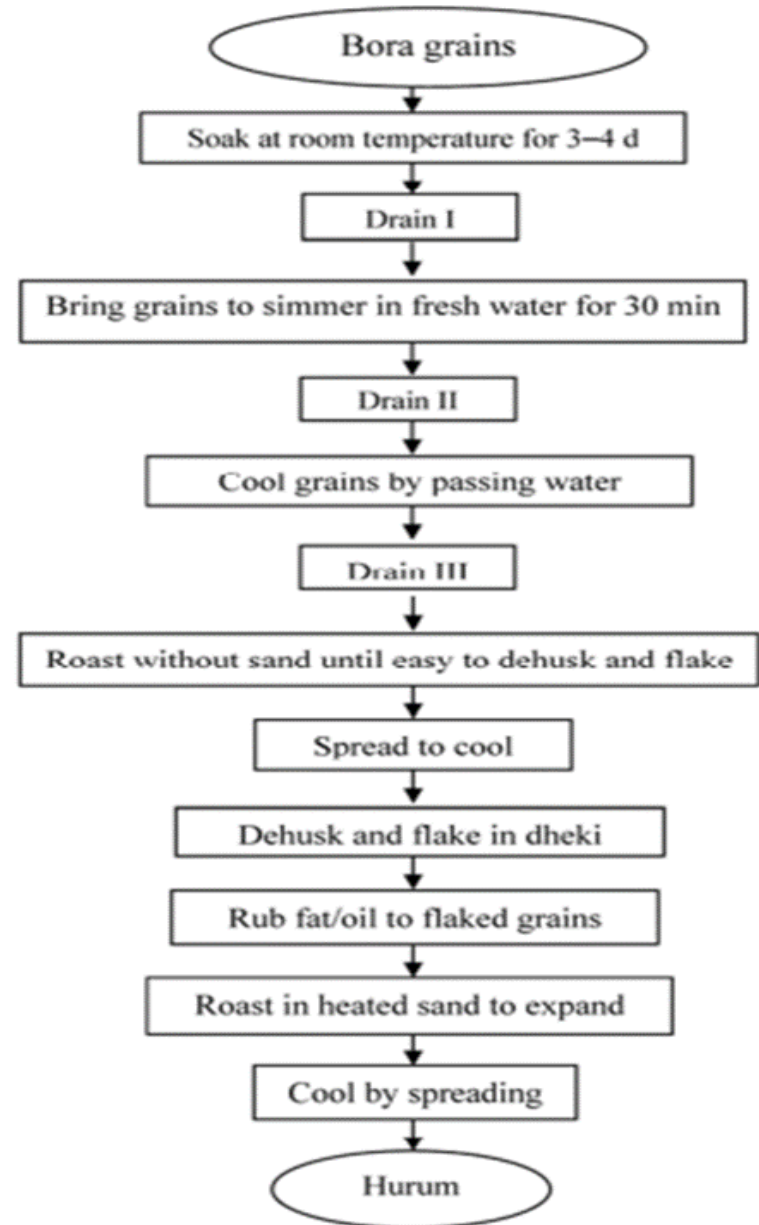
1. Wet grinding: It is a traditional method to prepare rice flour. In this process, firstly rice is soaked in water followed by grinding, filtering, drying, sieving and packaging.

2. Dry grinding: In this method rice is directly grind to produce fine powder. It is cost effective, required less energy but need machine having good grinding capacity.

3. Semidry grinding: In this process, rice is soaked in water and then excess water is removed with the help of dryer before grinding. The obtained flour having good physico-chemical characteristics than other grinding methods.

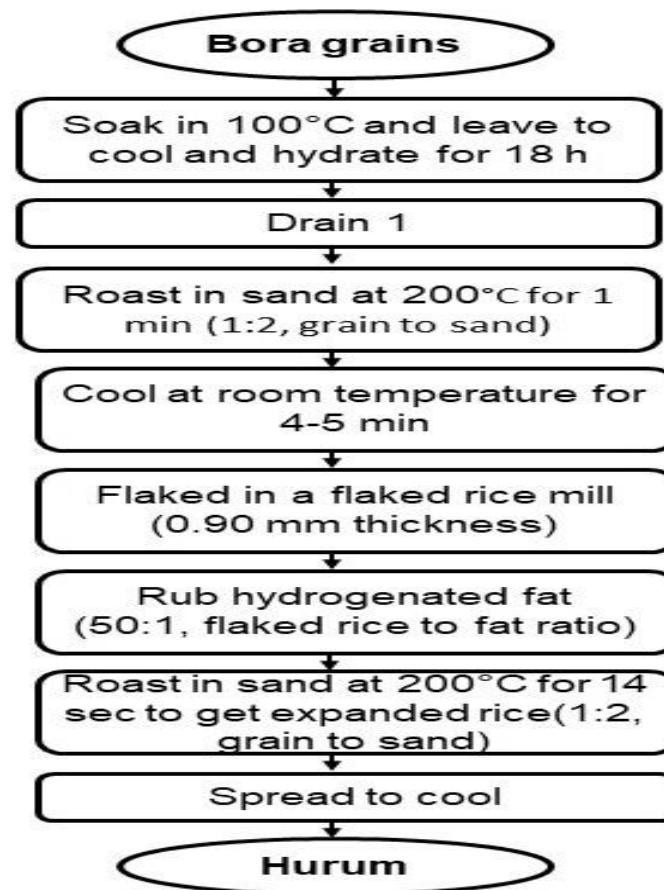
Hurum

- Hurum is an expanded rice produce made from waxy Bora rice.
- This product is traditionally taken with milk and sugar or jaggery.
- The final product is translucent in colour.
- This is due to less amylose content in waxy rice.
- Its processing is entirely different from puffed rice..



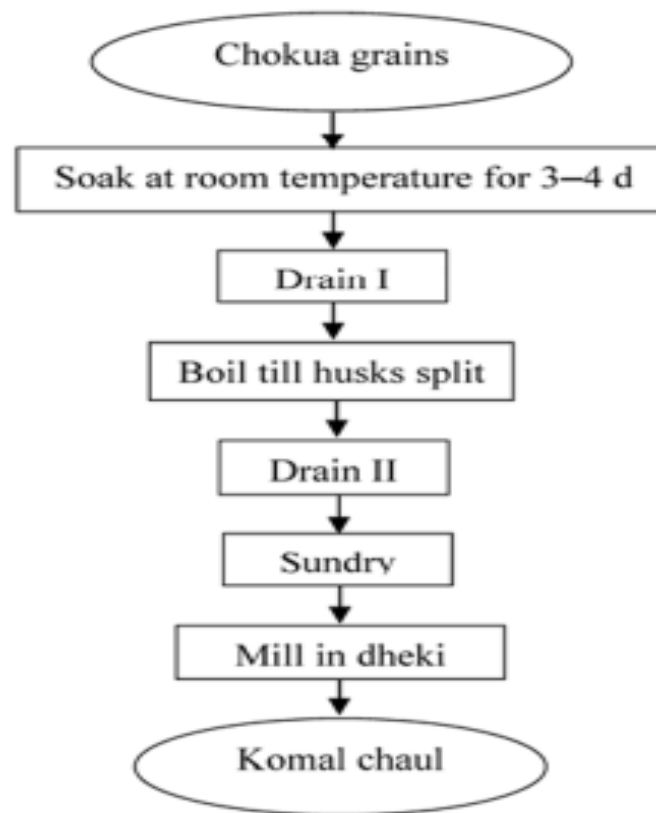
Hurum

- Traditional process is very time consuming.
- So, the researchers tried to make process simpler and can be taken for small-scale processing unit.
- The optimised process of making Hurum is given in following steps.



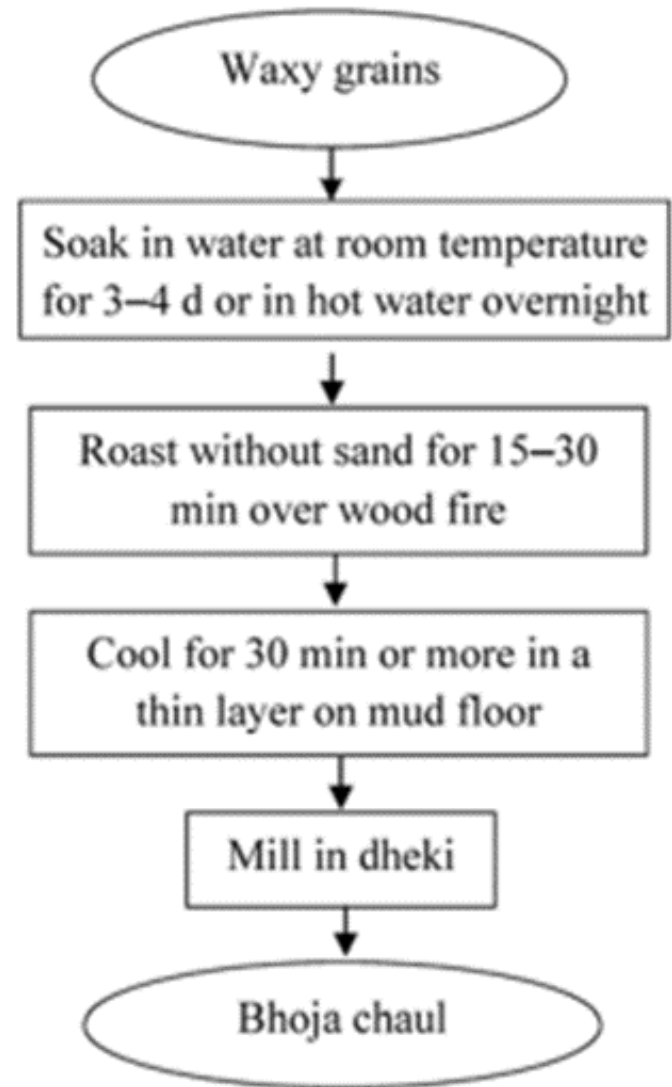
Komal Chaul

- This is a type of quick cooking rice and made from waxy variety of rice.
- After processing, this can be taken after simply soaking in lukewarm water.
- This product is very much acceptable for making ready-to-eat product.
- This preparation is an old age traditional method of Assam and made from low amylose content waxy rice variety.
- Komal chaul is generally taken with curd and jaggery.
- The dish is high in carbohydrate and minerals, especially iron.



Bhoja Chaul

- Bhoja chaul in simple terms is a dry-heat parboiled rice product.
- Unlike the common puffed rice, Bhoja chaul grains do not undergo excessive structural and morphological disorganization during the process.
- The product is relish with milk cream, curd and jaggery.
- The desirable characteristics of Bhoja chaul are the roasted aroma and colour, a sticky and chewy texture and appearance of the rice grains clinging together to form the lump.



Sandahguri

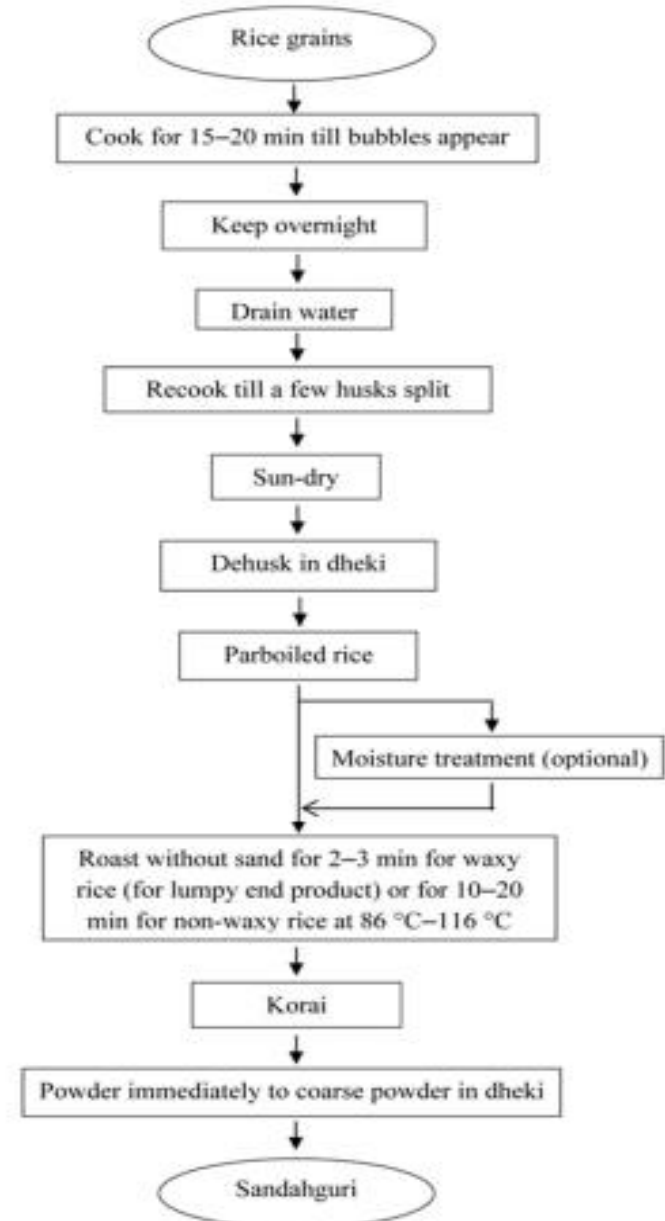
- ❑ Sandahguri is obtained as a coarsely ground powder of parboiled rice.
- ❑ Generally, Chokua rice variety is to be preferred over others rice variety to make Sandahguri.
- ❑ Traditionally, obtained powder is taken with hot milk and jaggery or sugar.
- ❑ The product is thick, cohesive and porridge like consistency.
- ❑ The desirable characteristics is strong roasted aroma.



Korai

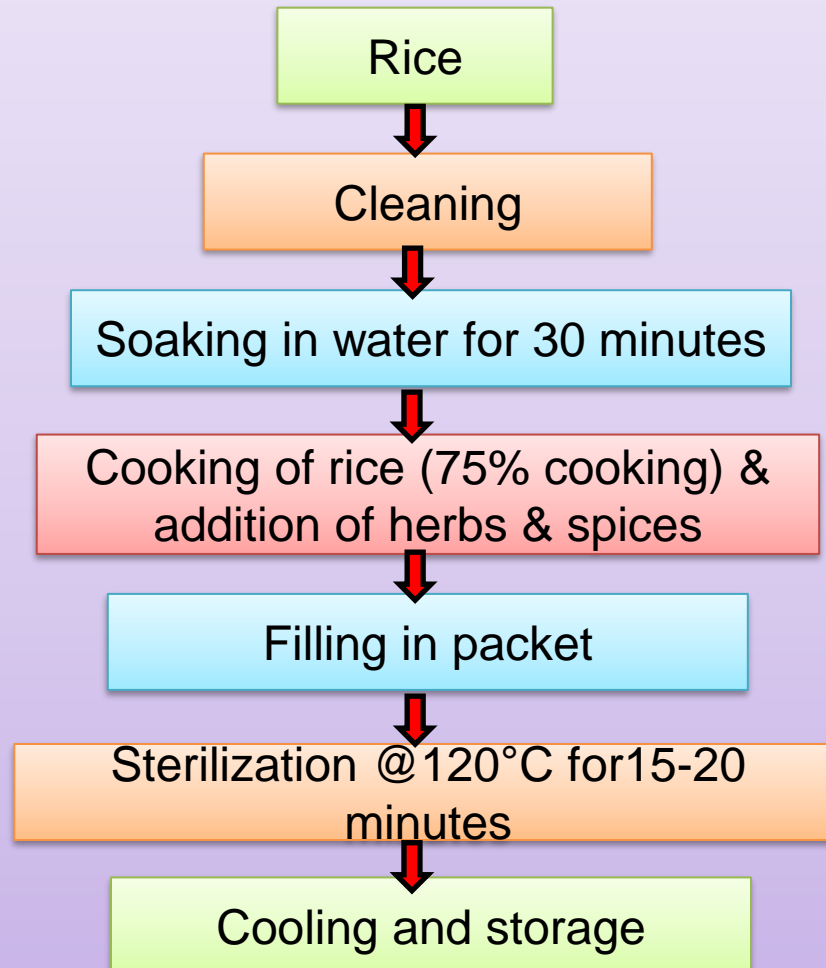


Sandahguri



Ready to Eat (RTE) rice processing

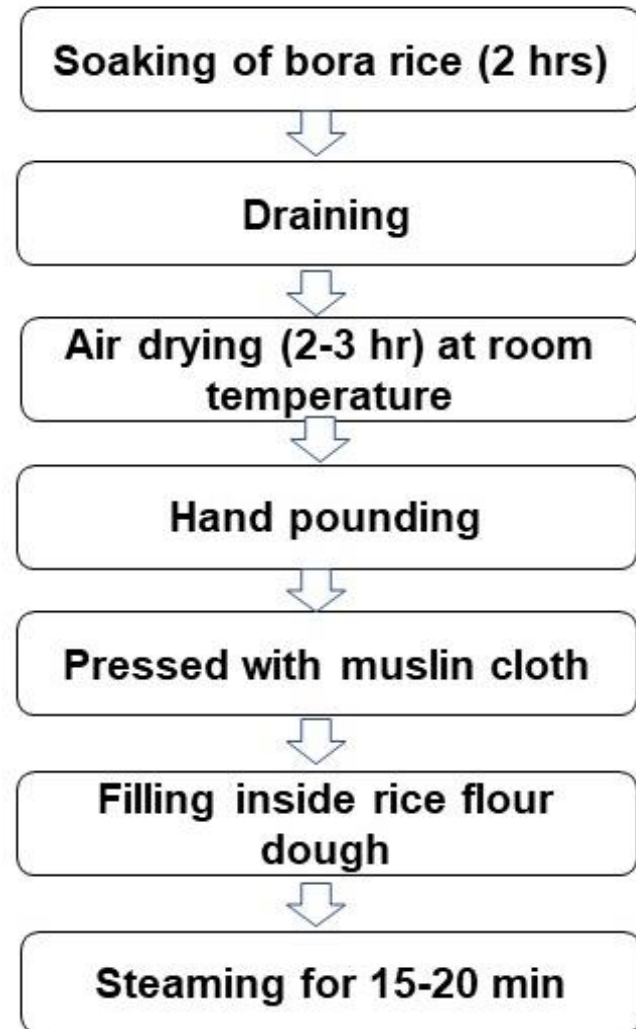
- ✓ Ready to eat foods are the precooked food which can be consume directly.
- ✓ Before RTE preparation food products are pre-cleaned, precooked and retort in flexible package or canned.
- ✓ The advantages of RTE are time saving, convenient and value for money.



**Process flow
diagram of RTE rice
processing**

Pithas

- Pithas are the traditional preparation of Assam.
- It can be sweet or salty and made from the rice flour dough.
- It can be made in different shapes and expresses the artistic mind of the homemaker women.
- Some version of Pithas contains fillings or garnish.
- Few may be shaped after cooking. This recipe is generally taken with tea or made during some special festivals like Bihu.
- Pithas can be steamed, fried in oil or ghee, roasted over fire, baked or rolled over a tawa (hot plate).
- Til-pitha is very common amongst other Pithas and is made with filling of sesame and jaggery.





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