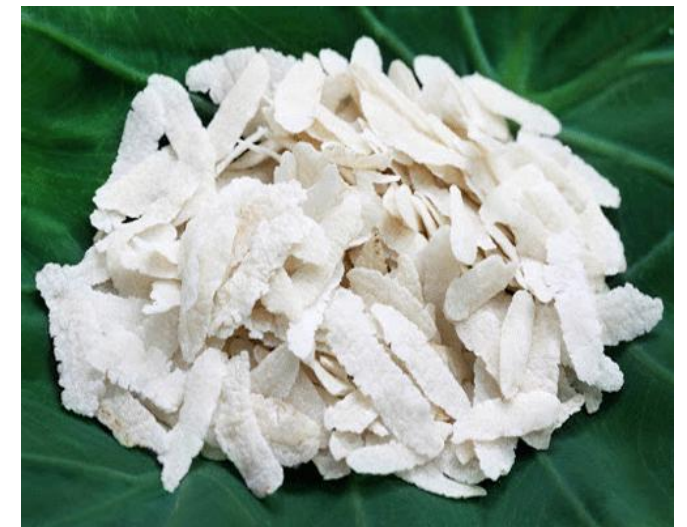




PUFFED AND FLAKED RICE PROCESSING [MURMURA AND CHIWDA]

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COMMON NAMES IN INDIAN STATES

PUFFED RICE:

English : Puffed Rice

Tamil : Pori

Malayalam : Pori

Telugu : Borugulu / Murmuralu

Kannada : Pori / Mandalu /
Mandakki

Hindi : Murmura

Bengali : Mudi

FLAKED RICE:

Aval – **Tamil, Malayalam**

Avalakki – **Kannada**

Poha and Chiwda– **Hindi**

Atukulu – **Telugu**

Paunva - **Gujarati**



PUFFED RICE

- Puffed Rice or Muri (Murmura) or Hurum is type of puffed grains from the Indian subcontinent.
- It is made from rice, commonly used in breakfast cereals or snacks food.
- It is served as a popular street food in India, Bangladesh and Nepal or street snacks in Korea.
- It is usually made by heating rice kernels under high pressure in presence of steam, through the method of manufacture varies widely.





NUTRITIONAL VALUE

Carbohydrate
78.57g per
100g

Protein
75.50g per
100g

Fat
0.95g per 100g

Ash 1.30g per
100g



Dietary Fiber
0.92 µg per
100g



MARKET POTENTIAL AND **MARKETING ISSUES**

- The most common sight today would be Bhel puri - is a savoury snack originating from the Indian subcontinent, and is also a type of chaat. It is made of puffed rice, vegetables and a tangy tamarind sauce.
- Puffed rice is a popular low cost breakfast cereal and snack used worldwide because of its ready to eat (RTE), lighter and crispness characteristics.
- India produces annually 89 million tonnes of rice, but, only 10% of it is converted to different value added products such as puffed rice, popped rice or flaked rice.

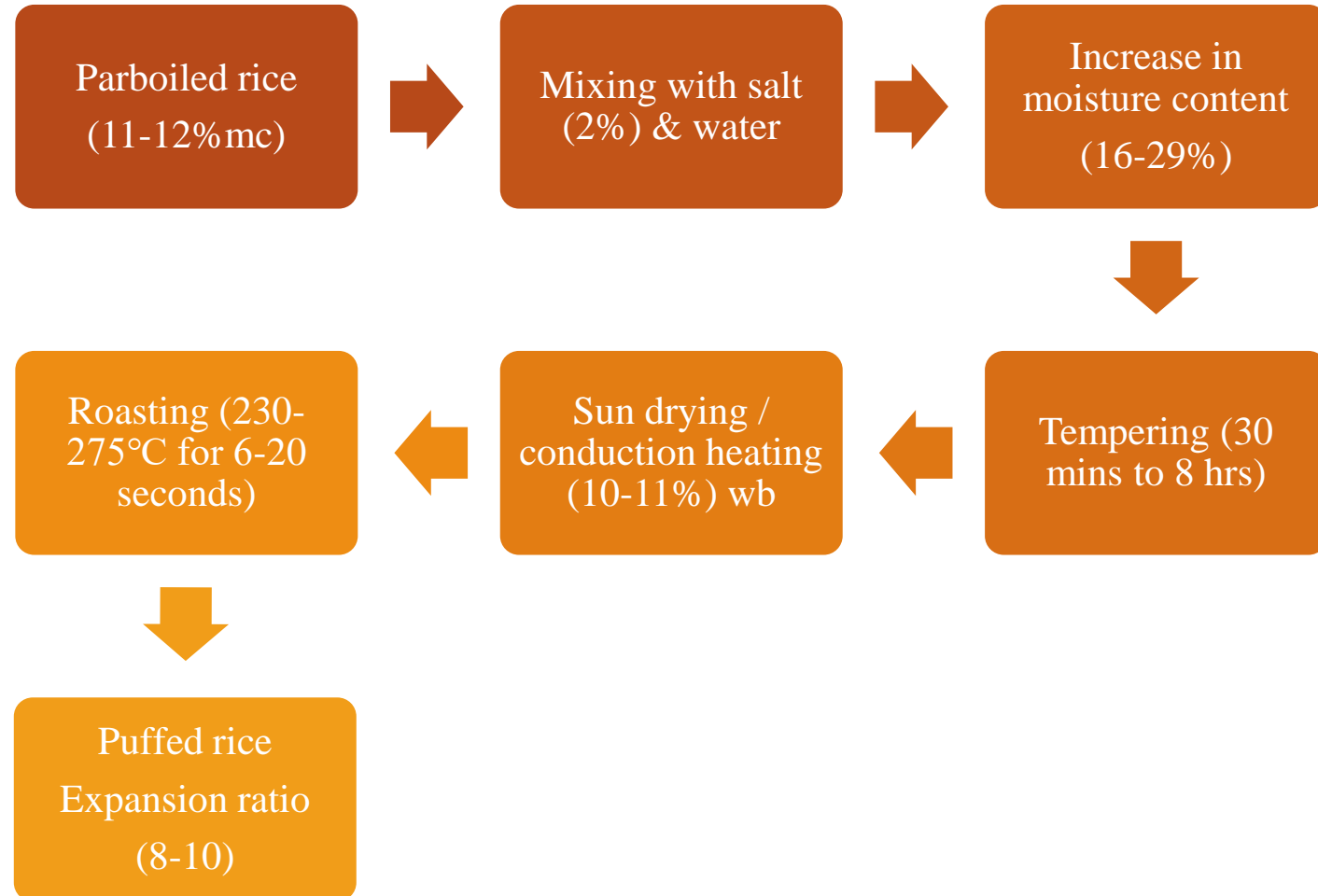


TYPES OF PUFFING OF RICE





SAND PUFFING – TRADITIONAL METHOD





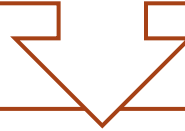
SAND PUFFING OF RICE



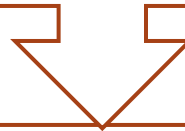


ROLLER PUFFING

Dough with moisture content of 8-18 percent is fed into the rolls with temperature of 190°C to 440°C



The rolls are heated by radiant heat or by circulation of high temperature fluid media inside the cylinder.



Puffed products are obtained at 6 to 7 % moisture content.



ROLLER PUFFING MACHINE



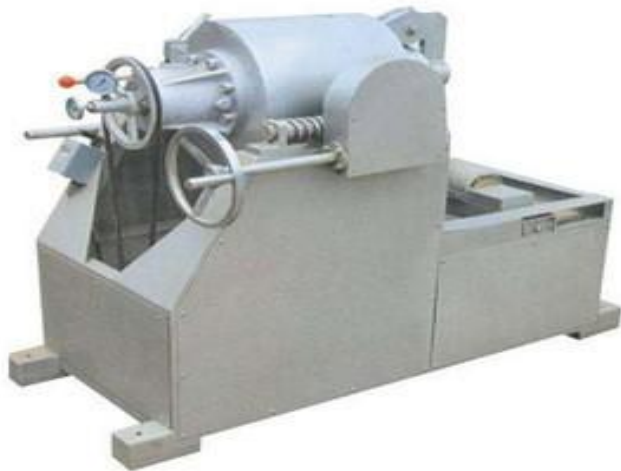
OIL PUFFING

- Pre heated rice (parboiled) is puffed in vegetable oil at 200 °C to 220 °C .
- Puffed rice produced by this method have the expansion ratio of about 5-7.



AIR PUFFING

- Blast of air at 200 °C to 300 °C for 7 to 10 seconds is given to pretreated rice at 10 to 12% moisture content .
- Puffed rice produced by this method have expansion ratio of about 8 - 10%





EXTRUSION PUFFING



The rice flour mix containing a 60-75% expandable starch base is moistened with water (or) steam



The resultant mass is compacted by a screw revolving inside a barrel, which may be heated by steam or electrical band heaters.



In some extruders, the rice premix is fed directly into the extruder.



The water and /or steam are injected into the barrel and mixed with the premix.



The pressurizing, shearing, and steam heating brings the dough to a temperature of around 150-175 °C and a pressure of 2.46 to 35.2 kg/cm² .



The dough pieces expands very rapidly as they leave the dice orifice



The expansion may even continue for a few seconds because the dough is hard and still flexible and water continue to boil off.



The pieces are further dried in hot air oven, cooled and packed.



EXTRUDERS USED FOR MANUFACTURING OF **PUFFED RICE**





GUN PUFFING

In this process raw milled rice and other grains can be puffed.

Pro-moistened pearled or unpearled grains are fed into a pressure vessel.

The sudden release of chamber pressure causes the superheated water to flash into steam resulting in porous structure of the puffed products.

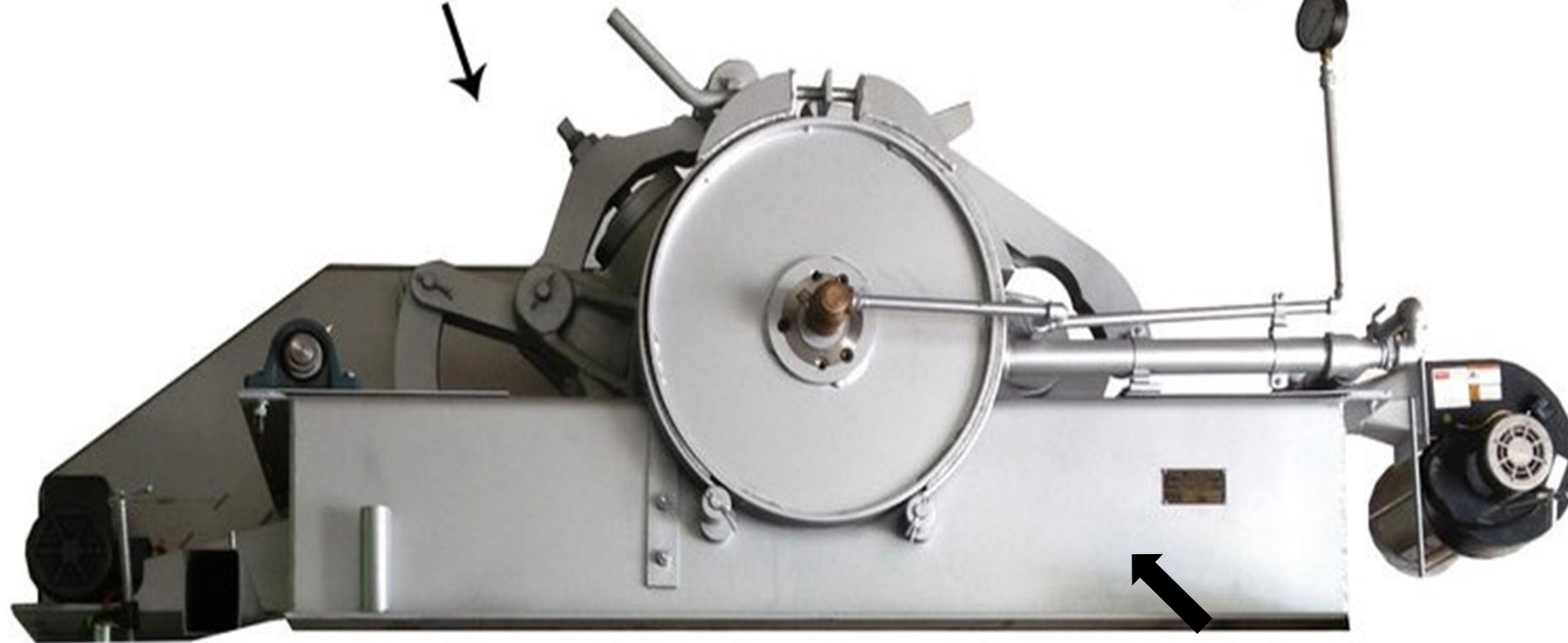
After a short cooking time, the gun is suddenly opened to produce puffed rice.



GUN PUFFING MACHINE

**Spins and heats up to
18 pounds of food**

Pressure reaches up to 200 psi



Puffs explode out



COMMERCIAL METHOD



The grain is conditioned to the correct level of moisture and pressurised to around 200PSI.



When the pressure is suddenly released, the pressure stored inside the kernel causes it to puff out.



This method produces a puffed rice which is spongy in texture.



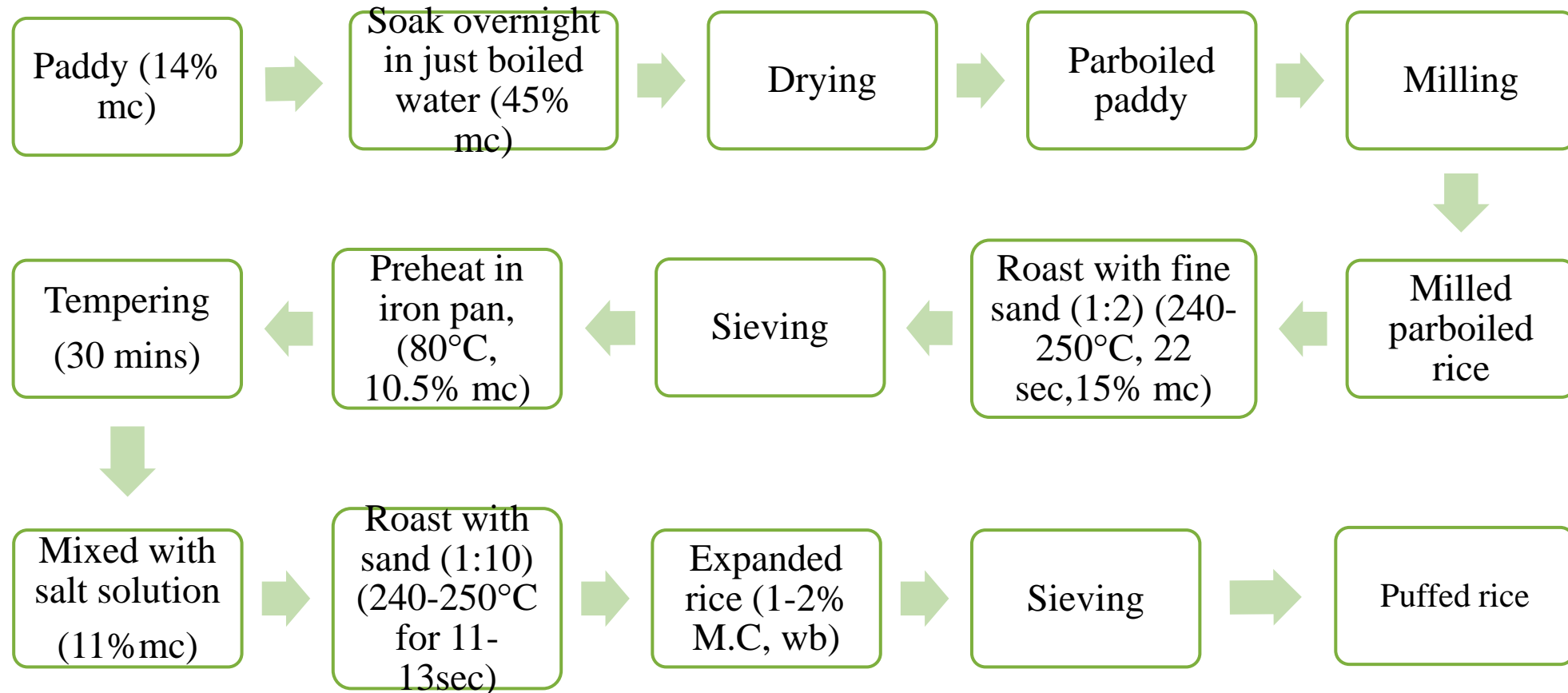
Puffed product should be maintained around 3 percent moisture in order to achieve the desired crispness.



It can also be made from white rice by heating it at high pressure & temperature.



PROCESS FLOWCHART





FLAKED RICE

- It is thin Crispy Snacks. It is mainly used as breakfast cereals.
- It has high content of fiber and calorific value.
- Easily be soaked in hot and cold water.
- Also known as pounded rice most commonly sold as poha or pawa
- Easy to cook and make a meal in minutes. Fine Flaked rice is good for making a snacks.
- Cleaned rice flakes can be fried quickly and then mixed with fried chillies, nuts, lentils and seasoned with salt and sugar



NUTRITIONAL VALUE





MARKET POTENTIAL AND MARKETING ISSUES

- Because of its nutritional values, it is consumed across all section of societies with different taste/food preferences. It is mass consumption item.
- The market is estimated to be growing annually up to 15-18%, and with modern retail providing new recipes of the contemporary products, Indian and Western, a strong wave of growth is anticipated.
- The demand of Rice flake in the market is immense and therefore its market position is splendid.
- With various food standards such as FSSAI, FSMS, ISI and ISO standards implementation and great/attractive pack, there can be huge market growth for manufacturer.



PROCESSING OF FLAKED RICE

- To make rice flakes, graded and sorted paddy is soaked in hot water for about 8 to 10 hours and then roasted with fine sand in roaster.
- Soaked paddy is flattened between rollers in a flaking machine until wafer thin.
- The paddy is pressed into fine flakes and bran is powdered and drops down through sieves.
- Flattened/flaked rice is mechanically dried.
- Depending on the weight of the rollers flakes of varying thickness from translucent to thick and opaque are manufactured.





SNACKS FOOD PREPARED FROM PUFFED RICE AND FLAKED RICE

Puffed rice
sweet balls
[Ladoo]



POHA [Made from
Flaked rice [Ciwda]]



Namkeen [Ciwda
Mix]



JHAL MURI



NAMKEEN
MURMURA MIX



Puffed Rice Served
with dished in
Nepal





**Puffed rice
coconut bars**



Lite chiwda



**Puffed rice
sugar bars**



Churumuri



**Puffed rice sweets in
bangladesh**



**Roasted
poha**





THANK YOU