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Entrepreneurial opportunities in

RICE

PROCESSING



Entrepreneurial Opportunities in Rice Processing

Rice is the staple food of more than half of the world population. The world rice production was forecasted at 756.7 million tonne by FAO in 2017. It is grown in over 100 countries but more than 90% of its production and consumption is concentrated in the South, East and Southeast Asian countries. India accounts for more than 21% of world production, ranking second only to China. The diet of a south Indian is incomplete without rice for at least one time in their meals.

Rice is a main source of carbohydrate and provides protein, fiber, vitamin and minerals. Generally, rice provides the bulk of daily calories for more than half the people throughout the world. It is generally consumed as whole grain in the form of raw milled rice or parboiled milled rice as table rice after boiling/cooking in water. The country is now self-sufficient in rice production and is also one of the leading exporters of rice in the world market. Indian Basmati rice has been a favorite among international rice buyers. Rice milling is the oldest and the largest agro processing industry of the country. Besides, value-added products from organic and medicinal rice varieties have good niche in domestic and export markets.

A wide range of rice and rice-based product like parboiled rice, quick-cooking rice, ready-to-eat convenience foods, rice flours, rice starch, cakes, puddings, baked breads and crackers, breakfast cereals and expanded rice products, extrusion-cooked, puffed rice snacks, noodles, pasta, baby/weaning foods, fermented foods, beverages and bran products have good demand in the market.

In its continuous stride to boost entrepreneurship in this sector Centre of Excellence in Post-Harvest Technology has developed innovative technologies and a variety of rice based food products. A few among them are summarized to provide a brief sketch of rice based products.

Brown rice

Brown rice is an unrefined and unpolished whole grain which is produced by removing the surrounding hull of the rice kernel and retaining the layer of nutrient filled bran. It is a whole grain that is relatively low in calories,



high in fiber, gluten-free and can be incorporated into a variety of dishes. Brown rice from traditional and organically grown paddy has more commercial value. Brown rice is a natural wholesome food rich in essential minerals such as manganese, iron, zinc, phosphorous, calcium, selenium, magnesium, and potassium. Its vitamin wealth includes vitamin B1, vitamin B2, vitamin B3, vitamin B6, folate, vitamin E and vitamin K. It is a source of protein and adds a good amount of fiber to our diet. Along with this,

it is also a provider of health-supportive vital fatty acids. Brown rice is a super whole grain which is packed with a high degree of healthy components. It extends its beneficial effects to many organs including the heart, digestion, brain, bones, muscles, cholesterol, and blood pressure.

Introduction of brown rice in the diet brings tremendous health:

- Brown rice has a low glycemic index which is helpful in reducing insulin surges and assists in the stabilization of blood sugar levels in the body.
- Provides a healthy digestive system
- Great option for maintaining healthy levels of cholesterol due to the presence of naturally occurring oils



Defatted rice bran

Defatted rice bran, a byproduct of rice milling is a rich source of dietary fiber and minerals. In the rice bran oil extracting process, oil is removed from the rice bran, resulting in de-oiled rice bran (defatted rice bran). Defatting markedly increases the proportion of dietary fiber and crude protein contents of rice bran. This defatted rice bran is incorporated to certain level 10-20% to the production of rice bran muffins and rice bran cookies.

Rice bran oil

Rice bran is a good source of edible / industrial oil with oil content from 16% to 25%. Rice bran oil is extracted by using hexane in solvent extraction plant. In less than 6 hours, rice bran passes through the conveyers to produce the crude form of rice bran oil. This oil is then sent to the refinery where crystal clear edible oil is manufactured.



Low FFA oil is used for edible purpose and high FFA oil is used for soap manufacturing. Rice bran oil is considered to be the best oil for heart, having fat reduction qualities.

Edible wax

Edible wax can be utilised for wax coating for passion fruit, mango, banana to extend its ripening and shelf life. The edible wax prepared from rice bran oil and honey bee wax is a viable alternative for chemical wax. Wax coating machine is developed under Centre of Excellence



in Post harvest Technology, Kerala Agricultural University could be used for edible wax coating of fruits and vegetables.

GABA rice

Germinated brown rice, also known as 'sprouted brown rice'. It is another popular form of brown rice attributing to its high nutritional value. The high nourishing content of the germinated brown rice is due to the presence of gama-aminobutyric acid (GABA). GABA rice can be obtained by soaking brown rice in water for 8 to 12 hours and allow for germination after draining the soaked water. This method for sprouting of brown rice has been considered best for obtaining the maximum amount of GABA and elevating the levels of proteins and good enzymes in the germinated brown rice. The process of germination also leads to significant increase in essential components. These nutrients aid in better absorption during digestion and prevent intestinal irritations, inflammations, and allergies. It can be stored in dried form to increase its shelf life without affecting its advanced nutritional worth.

Quick cooking rice

The accelerated pace of modern life has promoted new ways to consume rice such as instant rice/quick cooking rice. This rice is fully or partially cooked and dehydrated. Quick-cooking rice can be cooked within 5 min after rehydration and the cooking method is simple. Commonly practiced method to produce QCR is pressure cooking of high moisture rice followed by drying. High hydrostatic pressure processing is an innovative technique used to produce quick cooking rice.



Ready to eat rice

Ready-to-eat (RTE) rice products have gained much popularity in the last few decades due to the ease of cooking and fuel economy. Retort processing has long been used in food industry for shelf stable foods. RTE rice can be prepared through retort processing to extend the shelf stability of rice. The rice is boiled for 15 minutes and cooked. The rice is then hermetically sealed in retort pouch and thermally sterilized at 121°C. Ready to eat rice is available in foreign and Indian market.

Ready to cook pasta

Modern Indian consumers are mainly attracted to fast foods such as pasta and noodles. The refined wheat flour and maida, rich in gluten, are the major ingredients used for commercial pasta production. The gluten free pasta can be prepared from rice flour especially from varieties with medicinal values like Rakthashali, Navara etc. The rice flour fortified with ragi and maize flours can be used for pasta preparation. Incorporation of yam and moringa powders into rice flour provides nutrient enrichment to pasta. Pasta has shelf life of six months and is easy to cook. The rice pasta, prepared through pasta making machine, tastes better and provides healthy nutrients to the consumers who are attracted towards novel food.



Extruded RTE snacks

Extruded RTE snack products are commercially prepared from starch rich flours. RTE snacks are hot extruded products prepared through twin screw extrusion at high temperature. The rice flours can be utilised with different combinations to produce extruded snacks from rice. The rice flour fortified with ragi, maize, yam and moringa powder were prepared for RTE snacks with enriched micro nutrients like iron and other minerals. Since RTE snack is fat free it has got high market potential. Making RTE snacks more nutritive it will attract the all age group. Hence, Centre of excellence in Post-harvest technology has developed the processing technique for efficient preparation of RTE snacks.

Ethnic health mix

The health mix prepared from Navara and Rakthashali rice flour provides healthy nutrients to children. Fortification of rice flour with powders of ragi, maize, yam, moringa, sugar and banana powder can be used as ingredients for health mix. This ethnic health mix can be consumed by all age groups and it has got high market attention.

Mini parboiling unit

Parboiling is primary processing of paddy. Parboiling process results in considerable reduction in breakage during milling and improves the nutritional value of rice. Mini parboiling unit is used for parboiling of paddy in small scale. Soaking and steaming of paddy can be done in a single unit. This unit provides uniform and efficient steaming of paddy by maintaining residence time of paddy with steam. Its cost is around 0.5 to 10 lakhs. This mini parboiling unit is helpful for small business groups.

Mini rice mill

The basic objective of a rice milling system is to remove the husk and bran layers to produce an edible white rice kernel. Mini rice mill can be used effectively for milling of parboiled or raw paddy. Small rice mill with 1 to 5 t/h capacity are available in Indian market with cost range of Rs. 40,000 to 5,00,000/-. This mobile rice mill can attach to tractor and operated with PTO. Hence these mobile rice mills are helpful to use in hilly areas and places where electricity is not accessible. It also found its suitability in Self Help Group (SHG) of women.



Agri Business Incubator & Entrepreneurship development

New innovative technologies in value addition of rice have enabled entrepreneurs to gain powerful economy and customer satisfaction. Running an enterprise in rice processing will help to supply the demand of growing population. Undertaking suitable training to improve the confidence level of the entrepreneurs in commercialization of value addition is necessary. ABI will enable the entrepreneur to gain good experience in agro processing and running the business successfully. They promote growth through applying the innovative technology, and support economic development strategies for small business development.

KAU Agri Business Incubator (ABI) of Centre of Excellence in Post-Harvest Technology provides support and facilities to entrepreneurs by providing the information resources for value addition of rice, their process protocols, and related machineries. The hands on training on rice processing, value added products from rice, project report preparation on rice processing units and other related professional assistance which makes the entrepreneurs successful and achieve higher growth.



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