Value Added Products of Broken Rice

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<td>Break Even Point (BEP)</td>
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<td>TCI</td>
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<td>Cost of Project</td>
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Value Added Products of Broken Rice

- Liquid Glucose from Broken Rice
- Rice Flakes from Broken Rice (Used In Beer Industry)
- Fructose Syrup from Broken Rice (HFS 90%)
- Rice Starch
- Rice Flour

Rice is a staple food for more than half of the world population. Broken or ground rice refers to the fragments of rice grain obtained by milling. Broken rice is separated after the polishing phase and has the same chemical composition as white rice. As a food, it is basically energetic in nature, as its most important components are carbohydrates. The use of broken rice is common in animal fodder. It is often used in the manufacture of feed for very young animals (early weaning) and for pets.

Broken rice is appealing, easy to use and high in calories. It is used for all types of livestock and is particularly suitable due to its rich caloric value and low fibre content. In the case of dogs and piglets, the rice is heat-treated, as this has a beneficial effect on bowel health and the consistency of the faeces, helping to reduce the severity of pathogenic enteric processes. It is also used in the brewing industry, where it is mixed with barley. It is also used in the production of arak (aniseed flavoured, distilled, colourless drink), and is a raw material for rice flour, used in baby food, breakfast cereals, rice wine, rice liqueur, sake, and prepackaged and canned foods.

Value addition also enhances the profitability of rice production. A wide range of product development like processed and canned, ready-to-eat products, vitamin, iron or calcium enriched flaked or puffed rice, flavoured rice, starch extraction from broken rice and so on are nowadays getting popular. Value-added products from organic rice and therapeutic value medicinal rice varieties have good niche in domestic and export markets.

Byproducts from the rice milling process have high amounts of nutrients when compared to white rice itself. Rice straw, rice hull, broken rice, rice germ, rice bran, rice bran oil and wax are the byproducts from the rice industry. These byproducts usually have basic applications in their original form, but now can be used as raw materials for different value-added research or in food applications with functional properties.

Rice byproducts not only contain various types of functional components, but also contain dietary fiber. The fiber can be mostly found in rice hull and the types of fiber present include cellulose, hemicellulose, lignin and hydrated silica. Because of the high fiber content in rice hull and rice bran, they are used as ingredients by the bakery industries to increase the fiber content and improve the nutrition of bakery products.

Liquid Glucose

Liquid Glucose is an aqueous solution of nutritive saccharide obtained by starch hydrolysis, by using Rice as raw material, which is purified and concentrated to required solids. It is usually odorless and clear yellow colored viscous liquid sweet syrup which is processed and stored under hygienic conditions. It has wide application and is particularly useful where high concentrations of invert sugars are required. It also has such advantages as anti-crystalline, a lower freezing point and high degree of sweetening power relative to sucrose.

Features

- Prevents crystallization
- Improvise brightness & transparency
- Reduce sweetness in candies
- Enhanced crispiness & moistness
- High viscosity
- Shapes the frozen desserts
Applications of Liquid Glucose

- **Sweetener:** Liquid Glucose is an ideal additive for sweets, confectionary, biscuits, Ice creams, Jams, Jellies, preserves pastries & liquors due to its moderate sweetness & nutritive value. It also forms the base of artificial honey.

- **Pharmaceutical:** It is a valuable ingredient of cough syrups and other vitamin based tonics. It is also used as a granulating agent, for tablet coatings.

- **Others:** Tobacco, Leather, Shoe Polish, etc. Tobacco industry uses liquid glucose to impart flavor, texture & stability in chewing tobacco & cigarettes. In the leather industry, Liquid Glucose is used in the tanning process for pliability and to add body to the leather. In shoe polish, the addition of 5% - 10% Liquid Glucose prevents it from caking and helps give a quicker & better shine. Liquid glucose is also used as a raw material for gluconic acid, kojic acid and citric acid.

Rice Flakes from Broken Rice (Used In Beer Industry)

Rice flakes are tasty flakes that are created using rice grains. Rice Flakes, Maize Flakes and Millet Flakes are generally known as Brewery Adjuncts. These are used by breweries to enhance color, flavor & smoothness of beer.

Rice flake or ‘Chiwra’ is a traditional food in India. Improvements have been made in the traditional method of making poha, resulting in more yield and less breakage. The unit operations involve cleaning, soaking, roasting, shelling, polishing, flaking, sieving and drying. The by-products are economically utilised. The husk is utilised as a fuel for heating the soak water and also in grain roaster. The bran is rich in oil (18-25%), stabilised and used for oil extraction. The broken flakes are used in making traditional food items.

Fructose Syrup from Broken Rice (HFS 90%)

High fructose rice syrup, with starch and broken rice as the raw materials, is a kind of mixed syrup with main ingredients of glucose and fructose formed through zymin liquidation, saccharification and isomerization reaction etc. Its sweet taste is close to sucrose, but stronger than sucrose in taste sensory sweetness. Compared with castor sugar, it has refresher mouth-feel; the sweet taste disappears faster as the temperature become lower.

This is a natural sweetener produced by adding enzymes that convert the starch of rice into sugar. The Rice Fructose Syrup is widely used in beverages, fruit drinks, carbonated drinks, cakes, breads, jams, tinned fruits and dairy foods.

Rice Fructose finds wide application in health foods and beverages, due to its inherent nature of being ‘Natural’, ‘Non GM’, ‘Allergen Free’, ‘Gluten Free’ ‘Organic’ and has ‘Low Glycemic Index’ (fewer calories). Being a plant source, Rice Fructose is suitable for ‘Vegan’ and ‘Vegetarian’ foods. Rice Fructose makes a great base for pollen-free table top sweeteners, such as pancake syrup, breakfast sweetener, oney substitute, etc. Rice Fructose is a good bulking agent for natural and blended sweeteners. Rice Fructose is a perfect healthy alternate to High Fructose Corn Syrup.

Rice Starch

Rice starch, largely used in laundry work, is normally prepared from broken white rice. Rice starch is a natural polymeric carbohydrate and the main component of rice. In its native form it is an insoluble white powder consisting of both amylose and amylopectin. Just like rice it can differ greatly in composition and structure.

Rice starch has a very fine granularity with granules having about the same size as fat globules, making it a possible fat replacer. After heating with water it forms a gel with a smooth and creamy texture.

Rice starch also has a neutral taste and clear white colour, assuring preservation of the authentic taste and colour of your food product.

Main Advantages of Rice Starch:

- Neutral taste
- White colour
- transparent gel
- Soft creamy texture, possible fat replacer
- GMO-, gluten- and allergen free
- Great digestibility

**Rice Starch Applications**

Rice starch can be used in a large number of applications, including
- baby foods and organic infant meals
- ready-to-eat meals
- soups & sauces
- cereals and cereal bars
- confectionery coatings
- organic food products

**Rice Flour**

Rice flour is made from finely milled rice. Rice flour is nutritious and is extensively used to make fresh rice noodles and sweets. It is also used in various other applications, including to thicken coconut milk to reach a smooth and creamy consistency. Rice flour is obtained from either brown rice or white rice.

Rice flour has become increasingly popular as a raw material for extrusion cooking in the food industry. Rice flour is a type of flour which is made from milled rice. It is considered as a decent substitute for wheat flour, which often hampers the functioning of digestive system. Key property of rice flour is that it restricts liquid separation therefore it is used a thickening agent for recipes to be kept in refrigerator.

**Market Outlook**

**Liquid Glucose from Broken Rice**

Food & beverages was the largest market for glucose over the past few years and the trend is anticipated to continue over the forecast period on account of growing demand for bakery goods and confectioneries. Increasing demand of energy drinks which contains a significant amount of glucose on account of maintaining a healthy lifestyle also has been the reason for this rapid growth rate in the food & beverage sector. However, non-food uses of glucose including pharmaceutical, cosmetics and paper-making is likely to witness fastest growth over the next seven years owing to the expansion of these end-use industries.

Global glucose market is expected to witness a rapid increase in demand due to the rise in consumption of glucose syrup over the forecast period. Glucose syrup accounts for a majority share in the global starch derivatives market owing to its wide range use in the manufacture of candy products and is poised to grow at a very intense rate by the end of 2020. Some other derivatives of glucose include maltodextrin, hydolysates and cyclodextrin. Glucose is primarily used along with sugar as it exhibits complimentary characteristics to natural sugar such as preventing sugar from crystallizing, reducing stickiness of sugar and retention of extra moisture.

Glucose is extensively used as an additive in pharmaceuticals and nutrition foods owing to its high energy content. Over the past few years, there has been an increasing use of glucose in the form of tablets or medicine for patients having low blood sugar. Growth of the pharmaceutical industry is expected to augment demand for glucose over the forecast period.

**Rice Flakes from Broken Rice (Used in Beer Industry)**

The Rice Flakes market is segmented into meat, poultry and seafood, bakery & confectionary, alcoholic – beverages, dairy, tobacco products, non-alcoholic – beverages, frozen and fruit & veg, syrup, seasoning, oils, & general food, grain products, and pet food. Among these segments, the meat, poultry and seafood market accounts for the largest share in the global Rice Flakes market.

**Fructose Syrup from Broken Rice (HFS 90%)**
The global rice syrup market is projected to register a CAGR of 3.8% in terms of value during the period of forecast, due to various factors influencing the market. The increasing use of rice syrup in developing an alternative ingredient for table sugar and sweeteners has fuelled its popularity among consumers in recent years. Growing demand for organic and natural sweeteners has been observed, owing to the increasing health consciousness among consumers and product developers. However, there are very few natural sweeteners available in the market right now. Due to this, it is expected that there will be launches of new products with natural ingredients, such as rice syrup, which is anticipated to drive the growth of the global rice syrup market during the forecast period. In Europe, rice syrup is the most preferred natural sweetener used in food processing industries. There has been rising demand for rice syrup from food service industries such as hotels, quick service restaurants, and cafes in recent years. As a natural sweetener, rice syrup plays an important role in providing sufficient sweetness to various foods such as pancakes, muffins, salads, chilled beverages, and others, making them delicious succulents. In the food service industry, rice syrups are also used for dressing and decorating these foods in order to attract consumers.

With an increase in agriculture across the globe, natural ingredient cultivation has been witnessing a surge. Along with the increasing production of rice for staple consumption, brown rice, as a natural ingredient, has witnessed great demand for its industrial processing as a sweetener. This is primarily attributed to the increased awareness about the benefits of crops such as brown rice in recent years.

**Rice Starch**

The global rice starch market has gained lucrative growth with the increasing demand for processed food. The growing urbanization has its direct influence on the rice starch market to flourish. This market had the valuation of US$176 mn in 2018, and it is expected to reach US$252 mn by 2024, at a robust CAGR of 5.68% between 2018 and 2026. The market is driven by various end-user industries from food to cosmetics and so on.

The global rice starch market is segmented by type and application. In terms of type, the market is segmented into food-grade rice starch and industry grade rice starch. Where the food grade rice starch is exclusively produced for the food and beverage business; industry grade rice starch is mostly used for pharmaceutical, cosmetics, and other industrial use. In terms of application, the market is segmented into the food industry, cosmetic and personal care industry, pharmaceutical industry, and others.

Geographically, the global rice starch market is segmented as North America, Latin America, Europe, Asia Pacific, Middle East, and Africa. Asia Pacific has come up as the most dominant region in global rice starch market, where China and India are being the most prominent countries with high demand. The market is also being lucrative in Europe and North America, where the usage of processed food, cosmetics, and pharmaceutical products are very high.

**Rice Flour**

Global Rice Flour Market is valued over US$ 727 million in 2018 and will register a CAGR of 4.57% during the forecast period.

Rising health concerns among people and the increasing need for a gluten-free diet are facilitating the growth of flour market. Excess gluten concentration in food can pose a serious threat to human health and may lead to anemia, osteoporosis, intestinal damage, and infertility in the long run. Naturally gluten-free property of rice is likely to favor higher adoption of rice flour in near future. People in North America and Europe have been among the first consumers of pre-gelatinized or gluten-free flour over other flours due to rising health responsiveness.

While the global sales of rice flour reached a value worth US$ 712.9 Mn in 2017, the market is expected to thrive at a moderate CAGR of 4.4% over the forecast period, attaining a value of US$ 1,003.1 Mn by the end of 2025.
A key factor driving the growth of the market is increasing awareness about gluten-free products. The increasing awareness about celiac disease due to consumption of grains such as wheat, rye, and barley has increased the demand for non-gluten or gluten free products. As rice flour is gluten free, there has been a significant rise in its demand. Gluten is a general name for the protein found in grains including wheat, barley, rye, spelt, and other grains. Some people's digestive systems are known to be intolerant to gluten. If left undiagnosed, it can lead to Celiac disease, which is a severe form of gluten intolerance. People, therefore, have started avoiding foods containing gluten, leading to a perceptible growth of the gluten-free food market. This trend is favorable for the growth prospects of the global rice flour market. By source, global rice flour market is bifurcated into white rice and brown rice where white rice is leads the segment in terms of revenue however, brown rice is anticipated to witness significant adoption in the upcoming years. On basis of type, the same market is segmented into long grain, medium & short grain and pre gelatinized among which medium & short grain segment is estimated to contribute to a larger share of the market. By origin, the market is bifurcated into organic and conventional, out of which conventional method is anticipated to witness rapid growth. On basis of application, the market is segmented into bakery & confectionary, breakfast solutions and baby food among which breakfast solutions is anticipated to hold larger market share.

Tags
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