

# A Review: Application of Jackfruit Seed Flour in Food Industry

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**Abstract** - Jackfruit is a native from India but its national fruit of Bangladesh. The word jackfruit comes from Portuguese ja-ca, which converts into chaka from Malayalam language. Jackfruit tree can reach up to 80 feet in height. Jackfruit has integrity of maintaining skin and mucosa because in which vitamin A is present. Jackfruit cures anemia by iron which present per 100 gm contain 0.60 mg. It contains some vitamins like vitamin A, vitamin C, thiamine, riboflavin also some minerals like calcium, potassium, iron, sodium, zinc and niacin and also many other nutrients. It has very low calories content that is 100 gm of jackfruit contain only 94 calories. Utilization of jackfruit seed flour in preparation of bread, biscuits, cake, cookies, noodles, chapati at different proportion to ascertain the acceptable level of incorporation. The application of jackfruit seed flour were tested as a substrate for the production of pigments by *Monascus purpureus* grown using solid state fermentation. The review suggested that application of jackfruit seed flour has a great potential in developing bakery product without affecting sensory quality. Addition of jackfruit seed flour resulted in nutritionally superior products, particularly enriched with mineral and fiber content.

**Key Words:** Jackfruit, Health benefits, Native, Jackfruit seed and Flour.

## 1. INTRODUCTION

The jackfruit tree is a big tropical fruit tree native to India that grows in abundance throughout the country's warmer regions, particularly in Bengal, Bihar and the Deccan. The fruit grows on the trunk and primary branches. They are round and oblong in shape and weigh up to 25 kilograms. The word jackfruit derives from the Portuguese word ja-ca, which is pronounced chaka in Malayalam. (Shreeletha., 2017). Jackfruit is grown all around Bangladesh, but especially in the month of Jaishtha and Ashir (Saha et al., 2016).

In India overall region under jackfruit cultivation is around 32,600 ha and jack fruit is generally grown in south India states Kerala, Tamil Nadu except in other states like Assam Bihar. In most effective Karnataka, jackfruit is grown on an area of 10,004 ha with a manufacturing of 2,42,296 tonnes according to year (Butool and Butool et al., 2013). India is the world's largest producer of jackfruit and is known as the "Motherland" of the jackfruit. It is through that jackfruit originated in the India rain forests of the Western Ghats

and is now grown throughout the lowlands of south and Southeast Asia. (Kumari and Divekar et al., 2017).

## 1. Chemical composition of jackfruit seed:

The seeds of the jackfruit are high in protein. The protein obtained from jackfruit seed is cholesterol free. Iron is abundant in jackfruit seed. (Kumari et al., 2018). The jackfruit seed are also high in carbohydrate and protein as well as fibre and vitamin B complex. The Chinese believed that jackfruit pulp and seed can help to counteract the effect of alcohol (Butool and Butool et al., 2015). The unripe and ripe edible parts of the jackfruit are high in phenolic acids, which are beneficial to human health (Singh et al., 2015). Jackfruit seed contain lignans, isoflavones, saponins, all phytonutrient (V.D. Nandkule et al., 2015). Crude protein and carbohydrate contents of jackfruit seed flour reported as 13.49% and 70.713% (Abraham and Jayamuthugai et al., 2014).

## 2. Health benefits of Jackfruit seed:

Jackfruit is a rich source of dietary fiber. This makes it a good laxative improving digestion and helps cure ulcer. And fibre content it also helps to protect the colon mucous membrane from cancer causing chemicals. Jackfruit has a low caloric content where 100g of jackfruit contains only 94 cal (Satheeshan K.N et al., 2019). The antimicrobial and antibacterial properties of jackfruit seeds help to prevent pathogens from entering the body. Jackfruit seed are high in soluble fibre, which helps to bulk up the stool and make it easier to eliminate. It also detoxifies the colon and maintains healthy digestion and also prevents cardiovascular diseases (Kumari et al., 2018). It inhibits the herpes simplex virus type 2 and has proved to be useful for the evaluation of the immune status of human immunodeficiency virus 1 (HIV1) infected patients (Abraham et al., 2014).

## 3. Technology for Jackfruit seed Processing:

The seed of the jackfruit has been used for more than just peeling. Nowadays jackfruit seed is extensively processed, and it is becoming a new trend to use jackfruit seed for a variety of purposes. Approximately 75% of the jackfruit seed is ground into flour (Cheok et al., 2015). Seed are first sorted and then cleaned before being processed into

flour.cleaning is followed by roasting,which is done at the right temperature.when roasting is done at 160 degrees,nutrients like as protein are retained well due to the lower moisture content.The roasted seed is next dried in a tray dryer or a cabinet dryer before being milled in a flour mill.After drying the flour is likewise prepared in same way(Ekeejiofor et al.,2014)The seed of the jackfruit is ground with coffee meal to make raw jackfruit meal.In Mexico,jackfruit is also used to make boiled jackfruit the seed in coffee meal(Jose et al.,2017).Today,numerous treatments are used to make seed flour such as boiling and roasting dried seed flour(Ete-Ejiofor et al.,2014).

#### 4. Preparation of Jackfruit seed flour:

Various methods for making jackfruit seed flour have been proposed in the literature below is a list of the most prevalent methods.

1. Lye peeling
2. Heat processing
3. Mechanical processing method

##### 1. Lye peeling:

Satheeshan et al.(2019)used lye peeling method for preparation of jackfruit seed were collected and treated with 3% sodium hydroxide for 4-5min to remove the thin brown spermoderm.lye peeled seed were sliced into thin chips and dried in a cabinet dryer at 60-70 degree celcius to a constant moisture content.Dried chips were powdered in a hammer mill and sieved(ISS 35 mesh) to obtain fine flour.

##### 2. Heat processing method :

Nisar et al.(2021)used heat processing method for preparation pf jackfruit seed flour.In this method jackfruit seed were soaked in water for few min then remove brown spermoderm.fleshy white cotyledon were sliced and placed in direct sun for several hours.then packaged and stored.

##### 3. Mechanical processing :

Mechanical processing method for jackfruit seed flour ,in this method jackfruit seed soaked in water for few min then removing thin brown spermoderm.The pieces of jackfruit seed were spread on the tray and placed into cabinet tray dryer at 45 degree celcius temperature.then grinding and sieving procedure was completed.then packaged and stored at a room temperature.This method used Nisar et al.,(2021)for the preparation of jackfruit seed flour.

#### 5. Functional properties of jackfruit seed flour:

Sr No.	Parameter	Flour Value
1.	Water absorption capacity	104.30
2.	Oil absorption capacity	116.0
3.	Dispersibility	25.2
4.	Swell power	3.62
5.	Percent solubility	1.66

(source:Butool 2013)

Seed are commonly used to improve the flour functional nutritional or organoleptic qualities.In the processing industry functional qualities are critical for the development of new products The results of an experiment to determine jackfruit seed flours water and oil absorption capabilities,dispersibility,swelling power,and percent solubility.The flour has sufficient water and oil absorption capabilities as measured by 104.30 ml/100g and 116ml/100g(Butool et al.,2013).The physical quality of a bakers product,such as swelling and softness,is determined by the foaming properties of jackfruit seed flour.the lower of the bulk density value, the less difficult it is to transport and package the product.

#### 6. Proximate analysis of jackfruit seed flour:

Satheeshan (2019) studied the seed flour for some important characteristics parameters such as moisture crude protein crude fiber is 9.97%,12.1,1.23% also ash is 2.04 and crude fat is 3.12.The jackfruit seed flour sieved through ISS 35 mesh. Abraham (2014) studied that the sieved jackfruit seed flour was subjected for proximate analysis and the results indicates that the seed flour contains 7.758% of moisture, 2.317% of crude fat, 2.472% of crude ash, 13.49% of crude protein, 3.25% of crude fibre, 70.713% of carbohydrates, 357.66 k cal/100g of energy.

#### 7. Applications:

The recomended scopes for utilization of jackfruit seeds flour are common bakery products like bread,cookies and cake.extruded products like snacks,noodles and breakfast cereals.also baby food etc(Akter 2018).

##### 7.1 Noodles:

7.2 Nandkule et al.(2015) carried out research on preparation of noodles incorporated with jackfruit seed flour up to 20% seed flour is incorporated in it and its protein and dietary fibers increased.Different levels of jackfruit seed flour,soya flour and pearl millet flour were added in the ratio of 85:15 ,75:25 and 65:35 for the development of noodles and its quality were analyzed.(Kumari et al., 2018) and result indicated that samples of jackfruit seed, soybean and pearl

millet flour added noodles. For all addition levels contained more protein ,fat,calcium, iron, fibre and energy as compared to control sample.

7.3 Bread:

Butool and butool (2013)investigated the use of jackfruit seed flour to replace wheat flour in various proportions (10%, 20%).The dry ingredients as well as the salt and baking powder were thoroughly mixed before sieving through a 1mm sieve. If jackfruit seed flour was found to boost the crude fibre content of bread,it was supplemented.the created items organoleptic characteristics such as colour,texture,appearance,flavour and overall acceptability were judge to be extremely acceptable.Sivaranjini et al(2020) carried out research on preparation of bread out on preparation of bread incorporated with jackfruit seed flour I.e. non-germinated and germinated incorporated at varying proportions (5,10,15,20) into bread.acceptable level of incorporation was 5% for non-germinated seed flour and 10% for germinated seed flour.

7.4 Chapatti:

Sultana et al.,(2014) investigated the use of jackfruit seed flour to reparation of chapatti.They claim that jackfruit seed flour may replace up to 25% of wheat flour while maintain sensory acceptance.Preservatives such as alcohol,vinegar,benzoates and sorbates can extend the shelf life of such chapattis to 3 to 4 days at room temperature and up to 30 days when refrigerated.(Sultana et al., 2014) Many researchers have previously used jackfruit seed starch or flour as an alternative to wheat flour to produce gluten free pastry products due to its low viscosity and lack of gluten protein.

7.5 Halwa:

Satheeshan et al., (2019) carried out research on preparation of halwa incorporated with jackfruit seed flour. Partial replacement of jackfruit pulp with jackfruit seed flour at 10:90 was selected as the best combination. And also were at its nutritive value .taste and flour to the proposed halwa was accepted by consumers.some of the studies are summarized in table. 1

**Table -1: Replacement of wheat flour by jackfruit seed flour**

Sr no	Types of Food	% Replacement	References
01.	Noodles	20%	Nandkule et al.(2015)
02.	Pasta	5,10,15,20%	Abraham et al.(2014)
03.	Bread	10%,20%	Butool et al.(2013)
		5,10,15,20%	Sivaranjini et al.(2020)
04.	Chapatti	25%	Sultana et al.(2020)
05.	Halwa	10:90%	Satheeshan et al.(2019)

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**4. CONCLUSIONS**

According to the information gathered in this review, adding jackfruit seed flour to wheat flour has a lot of potential for creating baked products that retain their sensory attributes. Products with higher nutritional value with the addition of jackfruit seed flour were especially rich in fibre and minerals. Additionally, according to the research, seed flour's functional qualities make it a good choice for making processed foods. It may be inferred from the nutritional information, practical qualities, and general attractiveness of these seeds that they can be processed and used for a variety of tasks. The common bakery items (bread, cookies, and cake), extruded products (snacks, noodles, and breakfast cereals), baby foods, etc. are recommended scopes for using jackfruit seed flour. Starch and protein can also be extracted from these seeds.The majority of the research under consideration found that turning jackfruit seed flour into value-added products helps to maintain the income of jackfruit farmers by increasing their return..

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