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# Assessment of Consumption Practices of Jackfruit *(Artocarpus heterophyllus lam.)* Seeds in Villages of Jalalpur Block District Ambedarnagar (U.P.) India

**Pooja Maurya**
Research Scholar,
Deptt. of Foods and Nutrition,
College of Home Science
MPUAT, Udaipur,
Rajasthan

**Renu Mogra**
Professor,
Deptt. of Foods and Nutrition,
College of Home Science
MPUAT, Udaipur,
Rajasthan

**Abstract**

A survey was accomplished in five villages from Jalalpur Block, district Ambedkar Nagar (Uttar Pradesh) to assess the consumption practices of jackfruit seeds as production and consumption of jackfruit is high in these areas. Information on use of jackfruit seed in daily diet and traditional preparations, cooking methods preservation techniques, medicinal uses and other aspects of consumption of seed was gathered. Results revealed that majority of subjects consumed jackfruit seed in summer and rainy season both. Dishes prepared from jackfruit seed were seed pickle, vegetable and roasted seeds (74%), frying, roasting and boiling were the cooking methods used by majority of subjects (89.10%). They eat seeds dishes in lunch, dinner and between the meals. Few of them consumed dishes at any time in the season. 28percent subjects stored the jackfruit seeds 1-2 months at ambient temperature. Methods for storage were sun drying and sugar, salt, oil, vinegar and turmeric were used as preservatives. When asked that whether jackfruit seed should be promoted for consumption or not, majority of them (68%) subjects responded positively. Only 44percent respondents were aware about the benefits of seeds (16% medicinal benefits, 8% nutritional benefits and 20% economic benefits). Consumption of jackfruit seeds was found in physiological conditions such as pregnancy, lactation and old age also.

**Keywords**: Consumption Practices, Cooking Methods, Physiological Benefits.

**Introduction**

There are many lesser known and underutilized crops, having potential value as human and animal foods have been focused for research purpose in recent years. *Artocarpus heterphullus lam* belongs to moraceae family. India is a largest cultivator and producer of jackfruit named as poor's man fruit found more in rural areas rather than urban areas. Jackfruit seeds comprises around 10-15percent of total fruit weight (Bobbio *et al*.1978). Seeds are light brown in colour, oval or oblong ellipsoid or rounded in shapes, 2-3 cm in length, 1-1.5 cm in diameter and found approximately 500 seeds in a fruit. Seeds are rich source of carbohydrates (38gm) protein (7gm), provides 184kcal energy 1 gm fat in 100gm of seeds and also good source of vitamins, minerals and fiber (3.9gm). Fiber helps to fill up, making easier to weight loss and may lower the risk of heart disease ( high cholesterol, high blood pressure) and constipation. Jackfruit seeds also contains resistant starch, which is helpful in improving blood sugar controlling and keeping a healthy gut. Being a good source of thiamine and riboflavin both of B vitamins helps turn to the food eat in to energy and keep a healthy skin, eyes and hair. Riboflavin also acts as an antioxidant which helps in preventing damage to cells from free radicals. Minerals like zinc, iron, calcium, copper, potassium and magnesium whereas zinc is an important element for immune function, iron and copper for forming red blood cells and calcium for forming strong bones. Human body needs potassium for maintain proper blood pressure levels and magnesium for regulating blood sugar levels. Consumption of jackfruit seeds provides a number of phytochemicals or plant chemicals some of them may be like polyphenols, having antioxidant activity and other phytochemicals found in jackfruit seeds include saponins, which may have some anticancer activity and flavonoids, which helps limit the risk for blood clots (Jessica, 2015).

Jackfruit seeds contain antimicrobial effects helping to preventing contamination with bacteria that cause food borne illness (Theivasanthi and

Alagar, 2011). According to Haq (2006) seeds contains 2 lectins known as jacalin and artocarpin. Jacalin has potential application for evaluation of immunological status of patient infected with human immunodeficiency virus. In spite of having lots of medicinal, nutritional and physiological benefits the jackfruit seeds are underutilized. Jackfruit seeds are generally discarded or steamed and eaten as a snack or used in making some local dishes. People eat jackfruit raw, ripe and cooked by making several delicious dishes but only flesh is not enormous, jackfruit seed is also edible and can be eaten. Jackfruit seeds are consumed as roasted, as flour or boiled, sometimes eaten as canned curry, tomato sauce, a sweet, syrup or brine. Addition of jackfruit seed in the diet is a genius way to make food nutritious (Jessica, 2015). Hence the study was planned to gather information related to jackfruit production, consumption practices of jackfruit and seeds, methods of cooking and storage of seeds, reasons for consumption (including medicinal, traditional, nutritional and economical benefits of seeds) and discarding of seeds were studied. This information will help the people toknow the way of consuming jackfruit seeds and its health benefits.

**Methodology**

Five villages from Jalalpur block, District Ambedkar Nagar (Uttar Pradesh) were selected randomly to assess the consumption practices of jackfruit seed as production and consumption of jackfruit is high in these areas. From each village 10 families were selected randomly, making a total 50 families for collection of data. Housewives of each family were contacted. A survey was done using a questionnaire, containing questions related to background information, use of jackfruit seed in daily and traditional preparations, cooking methods, preservation techniques, medicinal uses and other aspects of consumption of jackfruit and jackfruit seed. Results were statistically analysed by using percentage frequency and data were summarized and presented using tables.

**Research Findings and Discussion**

**General Information**

Regarding the background information majority of the respondents were of the age > 45 years (46%), and (30% respondents between the age 35- 45 years, 20 % were between the age 25-35 and 4% between the age 0-25 years). All of them 58% respondents were literate and engaged in government services (ASHA, Anganwadi worker and principle). The respondents belonged 50percent joint and 50percent nuclear family. Majority of respondents (52%) ranged from the annual family income 20,000 - 40,000. Jackfruit tree was growing by 74percent respondent in their household (60% one tree, 14% two tree) with annual production (0-1quintal-52%,1-2 quintal-16% and >2 quintal 6%). Respondents who did not have tree they purchase from market or get from neighbours, relatives and friends in the season.

**Consumption Practices of Jackfruit Seed**

Jackfruit seeds can be eaten like as chestnuts or processed to produce chutney powder for seasoning or gluten free powder for baking (APAARI, 2012). Table1 depicts the consumption practices of jackfruit seeds, 74 percent consumed jackfruit seeds by using cooking methods frying, roasting and boiling. A similar findings reported by Roy and Joshi (1995) in India the seeds are boiled in sugar and eaten as dessert. Another result reported by Jessica (2015) seeds are generally steamed, roasted and eaten as snack or used in some local dishes.

Respondents stored seeds for one or two months (28%) by storage method (sun drying) and used preservatives (salt, sugar, oil, turmeric and vinegar) keeping at ambient temperature, respondents who did not stored seeds gave reason like humid climate, ripening period is too short, which do not enable for person to process the seed for storage, insufficient technical and scientific know how, for storage and preservation. 60percent respondents discarded seeds and few (12%) used seeds for making animal feeds. When asked for whether the seeds should be promoted for consumption or not majority (68%) of them responded positively.

Soma and Santa, (2015) reported that jack fruit is highly seasonal and seeds have shorter shelf life, hence seeds gone waste during the seasonal glut. Roasted and dried seeds can be ground to make flour. Hence seed flour can be an alternative emissary product, which can be stored and utilized, both for value addition of food products and to blend with other grain flours as wheat flour without affecting the functional and sensory quality. Prakash *et al.(*2009) also reported that Jackfruit seeds are recalcitrant and can be stored in cool, humid conditions up to a month.

**Table 1**

**Consumption Practices of Jackfruit Seed**

| Information | Frequency | Percentage (n=50) |
|---|---|---|
| **Seasons for Seed Consumptions (April- July)** | | |
| Summer+ rainy | 20 | 40 |
| Rainy | 17 | 34 |
| Not consumed | 13 | 26 |
| **Utilization of JFS for Making Dishes** | | |
| Yes | 37 | 74 |
| No | 13 | 26 |
| **Preferred Dishes from Jackfruit Seed** | **Frequency** | **Percentage (n=37)** |
| Pickle, Vegetable, Roasted Seeds | 29 | 78.37 |
| Only roasted seeds | 4 | 10.80 |
| Only vegetable | 4 | 10.80 |
| **Cooking Methods** | | |
| Frying, roasting, boiling | 33 | 89.10 |
| Roasting | 4 | 10.80 |
| **Preferred Meal Times** | | |
| Lunch | 3 | 8.10 |
| Between meals | 8 | 21.62 |
| Dinner | 4 | 10.80 |
| One or two times in a day in season | 17 | 45.94 |
| Not fixed time | 5 | 13.50 |
| **Storage of Jackfruit Seeds** | **Frequency** | **Percentage (n=50)** |
| Yes | 14 | 28 |
| No | 36 | 72 |
| **Duration of Storage** | | |
| < one month (7-20 days) | 8 | 16 |
| 1-2 months | 3 | 6 |

| | | |
|---|---|---|
| > 2 months | 3 | 6 |
| Discarded | 30 | 60 |
| Used as animal feed | 6 | 12 |
| **Reasons for Discarding** | | |
| Disliking | 13 | 26 |
| Having no knowledge about cons. & cooking method | 16 | 32 |
| Digestion problem | 7 | 14 |
| **Jackfruit Seeds Should Promoted for Consumption** | | |
| Yes | 34 | 68 |
| No | 14 | 28 |
| Not responded | 2 | 4 |

According to Ethnichealth, (2013) many parts of South Indian states jackfruit seeds are collected from the ripe fruit, sun-dried and stored for use in rainy season. Different variety of recipes prepared either by roasting as a snack or added to curries in place of lentils.

**Reasons for Consumption of Jackfruit Seed**

Jackfruit seeds are rich source of starch (22%) and dietary fiber (3.9%) which is healthy for the human health. Several components lie as Lignans, Isoflavones, Saponins and phytonutrients having anticancer, antihypertensive, antioxidant, antiulcer and anti-aging properties; are present in the Jackfruit seeds (Epainassist, 2016). Table 2 shows reasons for consumption of jackfruit seed whereas 44percent respondents were aware about the benefits of jackfruit seeds (medicinal benefits-16% knew seeds are helpful in blood pressure, nutritional benefits- 8% believed that seeds make body healthy gives protein and energy, 20% people having monetary benefits by selling the seeds).

According to Epainassist, (2016) jackfruit seeds may be eaten either roasted or boiled or may be preserved with syrup to be taken orally. Boiled jackfruit seeds contains 31.1 percent protein, 66.2 percent carbohydrate and 1.3 percent crude lipid which are highly nutritious and excellent for human health. Seeds also help in preventing constipation, a good source of protein with high solubility near neutral pH, may help prevent and treat metal stress and nervousness, having low water and fat absorption capacities helps in prevention of obesity, have high potassium content and so lowers blood pressure (Ethnichealth, 2013). Fresh extract from seeds are also useful in the treatment of diarrhoea and dysentery (Anonymous, 2006).

**Table 2**

**Reasons for Consumption of Jackfruit Seed**

| **Uses** | **Seed** | | |
|---|---|---|---|
| Medicinal | **F** | **% (n =50)** | **Reason** |
| | 8 | 16 | Blood pressure |
| Nutritional benefits | 4 | 8 | Energy, protein, |
| Religious / festive value | - | - | - |
| Economic | 10 | 20 | Monetary benefits |
| Have no knowledge | 28 | 56 | - |
| **Uses in Physiological Conditions** | | | |
| Pregnancy | - | - | - |
| Lactation | - | - | - |
| Old age | 1 | 2 | Bone |
| Not specific conditions can eat in all conditions | 29 | 58 | - |
| Have no knowledge | 20 | 40 | - |

Jackfruit seeds are also helpful in maintaining bone health, being rich in magnesium which is an essential nutrient necessary in absorption of calcium and works along with calcium to aid strengthen the bone and protect body from various bone related disorders like Osteoporosis (Epainassist, 2016).

**Conclusion**

Jackfruit is a multipurpose species providing food, timber, fuel, fodder and medicinal and industrial products. Jackfruits as raw and ripe attracted people due to their taste and aroma but seed gone waste, yet mostly peoples are unknown about the medicinal, nutritional, physiological and economical benefits. Various delicious dishes can be prepared by the seeds which are also included in this paper. If people knew technical methods of storage, preservation techniques and appropriate cooking methods of seeds shelf life can be increased and may be helpful for the health.

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