IJNRD.ORG ISSN : 2456-4184
INTERNATIONAL JOURNAL OF NOVEL RESEARCH AND DEVELOPMENT (IJNRD) | IJNRD.ORG
An International Open Access, Peer-reviewed, Refereed Journal

NUTRIENT ANALYSIS AND SENSORY EVALUATION OF PREPARED EDIBLE SEED INCORPORATED COOKIES

J.R.Shiny Joe[1], S.Hajathu Nisha[2], R.Lakshmi Shree[3]
Assistant Professor[1,3] , PG Student[2]
Thassim Beevi Abdul Kader College for Women ,
Kilakarai

ABSTRACT
Formulation and evaluation of edible seed incorporated healthy cookies. The main objectives of this study were to make the edible seed-enriched nutri-cookies and analyze the proximate component present in the developed product. Biscuits prepared by adding different quantity of edible seed (Jackfruit seed, Flax seed, pumpkin seed, and sunflower seed) flour were most accepted by the panel members on 9-point hedonic scale of sensory evaluation. Proximate analysis in which moisture, protein, fat, fibre, carbohydrate, energy and ash value had been calculated and the mean value of the analysis are respectively- Moisture (4.6%), Fat (24.5gm/100gm), Protein (10.8gm/100gm), Carbohydrate (58.7gm/100gm), Fibre (4.1gm/100gm), Ash 0.5% and Energy (498.5kcal/100gm). Hence, the biscuit is nutritious and especially for Diabetic patient and other diseases Condition.

Keyword: Jackfruit seed, Flax seed, pumpkin seed, and sunflower seed

I.INTRODUCTION

Baked foods are popular among consumers due to their taste and widespread availability in the type of biscuits, cookies, muffins, cakes, and more. Cookies and biscuits are among the foremost consumed bakery products, as they are able to eat, are cheap, and are available in a wide selection of flavours **(Ifesan B.O et al., 2020)**.

The enrichment of food products could be a consequential idea to treat explicit nutritional insufficiencies. Food enrichment also elevates healthiness in humanity and averts chronic diseases. The identification and evolution of fortifying agents that may guarantee good product quality and maximise the bioavailability of essential nutrients create technical and scientific challenges for nutritionists **(Revathy, M. N. et al., 2013)**.

Pumpkin seeds are loaded with nutrients and medicinal properties, because of which these seeds are, used for remedial purposes everywhere the globe. In Arab countries, roasted pumpkin seeds are often eaten as snacks after roasting and salting. The addition of those seeds will be considered an honest substitute for nutritional enhancement of food products **(Gorgonio, C. M. S., et al., 2011).**

Jackfruit seed flour is flour created from jackfruit seeds that are dried and mashed. Jackfruit seed flour is employed as an alternate substance for flour or wheat substitution. In several parts of South India, the seeds are collected from the ripe fruit, dried in daylight, and stored adequately to be used at the proper time of year. Jackfruit seed powder is used as flour in bakeries and confectionary products by mixing it with flour and different inexpensive flours **(Hossain et al., 2014).**

Flaxseed has nutrients, purposeful properties, and health benefits of bioactive molecules. Oilseeds contain a smart quantity of linoleic acids, omega 3 fatty acids, protein, dietary fibre, lignin, and ALA. ALA is useful for child brain development, reducing blood lipids and vessel disease **(Morris et al., 2007)**.

The current study is intended to develop a widely consumed foodstuff, i.e., cookies, with the incorporation of pumpkin seeds for nutritional enhancement and to judge the chemical composition and sensory parameters of supplemented cookies.

Objectives of the study

The specific objectives of the study were as follows:

1. To make the edible, seed-enriched nutri-cookies
2. To guage the sensory qualities of prepared cookies
3. To analyse the nutrients present within the prepared cookies

II REVIEW OF LITERATURE

Medicinal Uses of Selected Seeds

The nutritional and antioxidant properties of jackfruit seeds haven't yet been fully explored. Jackfruit Seeds provide an ample supply of protein, fiber, and starch. Jackfruit is additionally an expensive source of the many minerals like N, P, K, Ca, Mg, S, Zn, Cu, etc **(Maurya & Mogra et al., 2016).**

The jackfruit seed powder is created into a stew and given to cure irritable bowel syndrome, stop anaemia, boost vision, and Improve Immunity.They are low in sugar but high in fiber, making them suitable for diabetics and obese people **(Tolkachev et al., 2000).**

Flax seed is believed to bring mental and physical endurance by fighting fatigue and controlling the ageing process.Flaxseed has properties like Madura (balances the skin Ph),picchaila (lubricous), Balya (improves strength or elasticity of the skin), Grahi (improves moisture holding capacity of skin), Tvagdoshahrit (removes skin blemishes), Vranahrit (wound healing), and is helpful in vata (skin) disorders including dryness, undernourishment, and lack of lustre **(Moghaddasi et al., 2011).**

Palm sugar is therapeutically valuable. Seasoning medicines made with palm sugar are employed for treating enteric fever, dangerous breathing, colds, anaemia, cough, high pressure, Hansen's disease, and respiratory disease.

Functional Properties of Selected Seeds

Sunflower oil is high in monounsaturated fatty acid and polyunsaturated fatty acid. These fatty acids reduce cholesterin. These fatty acids and total cholesterol decrease the possibility of artery disease. Phytosterol is found in high amounts (270–289mg/100gm) in sunflower seeds, which are efficient in reducing cholesterol,increasing immunity and reducing the chance of carcinoma **(Phillips KM et al., 2005).**

Flaxseed has been shown to scale back the first risk markers for and incidence of mammary and colonic carcinogenesis in animal models. Flaxseed has recently gained attention within the area of disorder primarily because it's the richest known source of both omega-3 fatty acid (ALA) and therefore the phytoestrogen, lignans, similarly as being a decent source of soluble fibre **(Ueshima H et al., 2007)**.

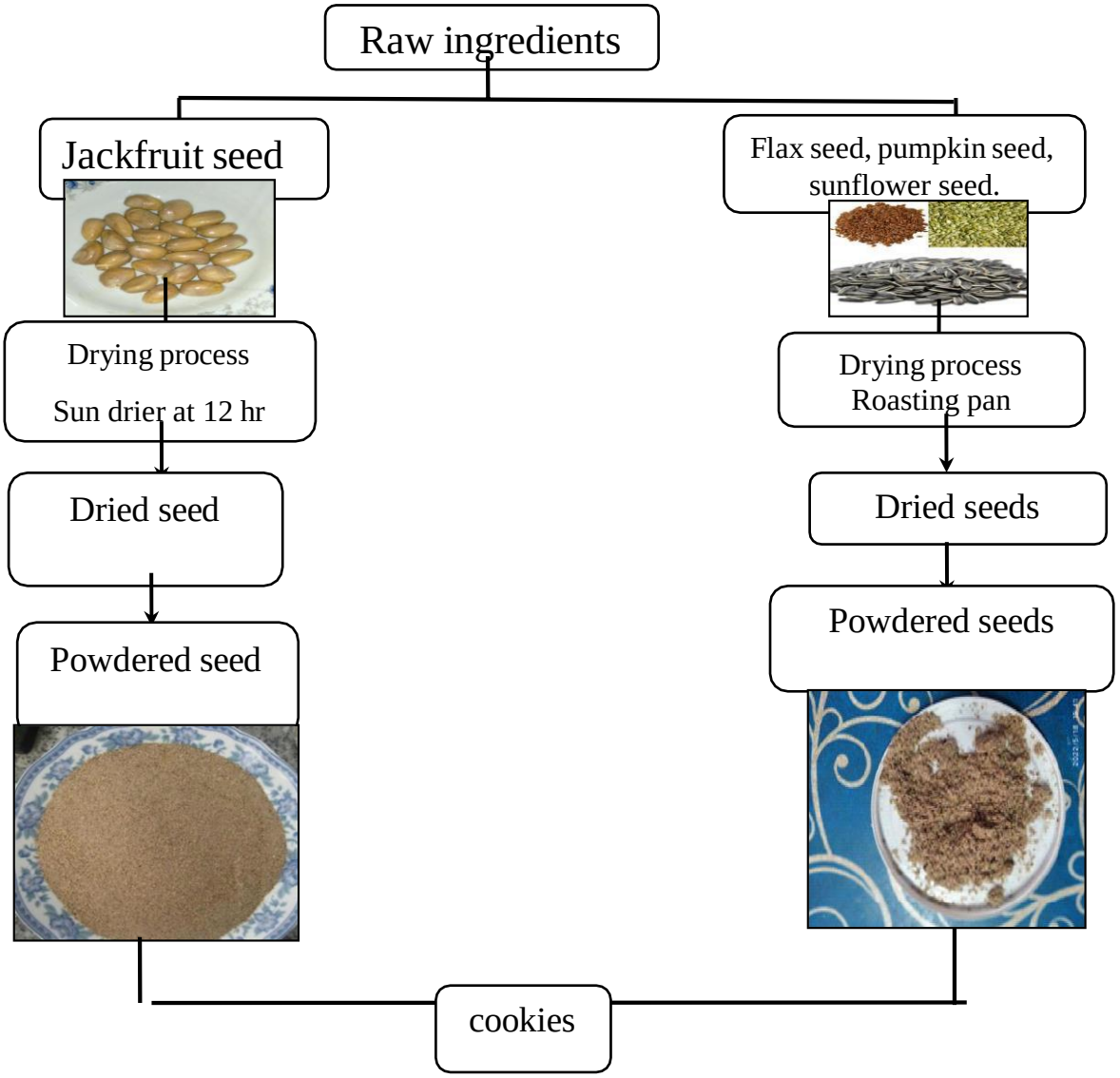
Jackfruit contains many classes of phytochemicals like carotenoids, flavonoids, volatile acid sterols, and tannins, with varying concentrations betting on the variability. Carotenoids are a category of natural pigments present in plants, animals, algae, and microorganisms that impart yellow-reddish hues. additionally to their colourant properties, they need carotene activity and are known to own beneficial effects on several chronic degenerative diseases, like cancer, inflammation, disorder, cataract, and age-related devolution **(de Faria A. F et al., 2009)**.

When consumed, omega-3 fatty acid, the omega-3 fat found in flaxseed, promotes bone health by helping to forestall excessive bone turnover when consumption of foods rich within these omega-3 fats leads to a lower ratio of omega-6 to omega-3 fats in the diet **(Griel AE et al., 2007)**.

III METHODOLOGY

Measurement of the dried seeds powder in 100g cookies

Ingredients	Quantity
Artocarpus heterophyllus(jackfruit seed)	40 gms
Linum usitatissimum(flax seed)	5 gms
Cucurbita maxima(pumpkin seed)	30 gms
Helianthus annuus(sunflower seed)	5 gms



Flowchart of processing of selected edible seeds

ANALYSING NUTRITIONAL PROPERTIES OF EDIBLE SEEDS INCORPORATED COOKIES

The physical and chemical properties such as ash, moisture, energy, carbohydrates, protein, fat, fibre, iron, and calcium of the obtained edible seed cookies are analysed.

PREPARATION OF EDIBLE SEEDS INCORPORATED COOKIES

Palm sugar was ground smoothly and obtained. The mixture of butter and salt was added to palm sugar and whipped continuously. Then, sieved wheat flour and edible seed powder were added to the mix with predetermined quality, and soft dough was prepared. The dough was sheeted to thickness and cut to form a circular shape. Cut parts were placed in a greased pan and baked for 20 minutes at 100 °C in the oven. After baking, the cookies were cooled to room temperature and packed in airtight containers (Loza et al., 2017).

SENSORY EVALUATION OF DEVELOPED COOKIES

Sensory evaluations were made with the help of panel members. Each individual was provided with a score card to assess the appearance, taste, texture, flavour, and colour of the developed cookies. A 9-point hedonic scale is used for sensory evaluation.

RESULTS AND DISCUSSION

The result of the present study, entitled "NUTRIENT ANALYSIS AND SENSORY EVALUATION OF EDIBLE SEEDS INCORPORATED COOKIES", is presented under the following headings:

1. Proximate composition of selected ingredients
2. B. Determination of the nutrient content of the cookies
3. Qualitative determination of the physiochemical properties of the cookies
4. Sensory analysis of developed cookies

DETERMINATION OF NUTRIENT CONTENT IN THE COOKIES.

The developed cookies were analysed for their macro-nutrient composition for energy, carbohydrates, protein, fat, and fibre.

DETERMINATION OF MACRO NUTRIENTS CONTENT IN THE COOKIES

Sample (100g)	Energy (g)	Carbohydrates (g)	Fibre (g)	Fat (g)	Protein (g)	Ash (g)	Moisture (g)
cookies	**498.5 kcal**	**58.7 g**	**4.1 g**	**24.5 g**	**10.8 g**	**0.5%**	**4.6%**

The nutrient content of the cookies is high, and it's represented within the table. The energy content of the cookies is 498.5 kcal. Energy comes from three main nutrients: carbohydrates, protein, and fats, with carbohydrates being the foremost important energy source. In cases where carbohydrates are depleted, the body can use protein and fat for energy.

The protein content of the cookies is 10.8 gms Protein is important to assembling and repairing body tissues and fighting viral and bacterial infections. Antibodies and system cells on proteins are system powerhouses. Protein levels in cookies that are moderate can aid within the fight against infections.

The table shows that the fibre content of the cookies is 4.1 g. Dietary fibre helps to enhance laxation and forestall constipation by increasing faecal bulk and reducing bowel transit time.

DETERMINATION OF MICRO NUTRIENTS CONTENT IN THE COOKIES

SAMPLE (100g)	IRON (mg)
cookies	**8.0 mg**

The protein content of cookies is 10.8 gms Protein is important to assembling and repairing body tissues and fighting viral and bacterial infections. Antibodies and system cells on proteins are system powerhouses. Protein levels in cookies that are moderate can aid within the fight against infections.

The table shows that the fibre content of the cookies is 4.1 g. Dietary fibre helps to enhance laxation and forestall constipation by increasing faecal bulk and reducing bowel transit time.

C.MEAN SCORES OF OVERALL ACCEPTABILITY OF THE DEVLOPED EDIBLE SEEDS INCORPORATED COOKIES

S.no	Prepared edible seeds incorporated in cookies	apperance	flavour	taste	colour	texture	Overall acceptability
1.	100 gms	7.8	9.5	6.0	8.2	7.2	8.5

The table indicates the mean scores of the overall acceptability of the developed edible seeds incorporated into cookies. The appearance and taste of the cookies were highly acceptable by panel members. The texture and taste were also excellent.

SUMMARY AND CONCLUSION

The present study entitled "NUTRIENT ANALYSIS AND SENSORY EVALUATION OF EDIBLE SEEDS INCORPORATED COOKIES''

Based on the study, it is all over that the cookies made with the incorporation of jackfruit seed flour 40 g, flax seed 5 g, pumpkin seed 30 g, seed 5 g, and flour 100 g showed higher sensory scores (appearance, crispiness, texture, taste, and overall acceptability). The protein, ash, fiber, moisture, energy, carbohydrates, and iron content in jackfruit seed flour incorporated cookies were over in flour cookies. macromolecules seemed to increase with seed weight, but remained below the tolerance level in optimised products.

The macro and micronutrient content of the developed seed powder is then subjected to the determination of macro and micronutrients. The cookies contain 498.5 kcal of energy, 24.5 gms of fat, 10.8 gms of protein, 58.7 gms of carbohydrates, 4.1 gms of fibre, 8.0 gms of iron, 0.5% of ash, and 4.6% of moisture.

The seeds of cardamom are considered cooling and stimulating and have carminative, stomachic, diuretic, cardiotonic, and abortifacient properties. they have been used to treat bronchitis, haemorrhoids, strangury,renal and vesical calculi, anorexia, dyspepsia, and gastropathy .

The jackfruit seed powder is formed into a stew and accustomed treat irritable bowel syndrome, anemia, improve vision, and boost immunity.

The study shows that the cookies made by artocarpus heterophyllus, Linum usitatissimum, Cucurbita maxima, mirasol, and Elettaria cardamomum contain various nutrients which have anti-cancer properties and anti-diabetic properties. The cookies also contain micro and macronutrients. It can help with reducing diabetes, constipation, iron deficiency anemia,and other symptoms.

VI.BIBLIOGRAPHY

1. Chandrika U. G., Jansz E. R., Warnasuriya N. D. Analysis of carotenoids in ripe jackfruit (*Artocarpus heterophyllus*) kernel and study of their bioconversion in rats. *Journal of the Science of Food and Agriculture*. 2004;85(2):186–190. doi: 10.1002/jsfa.1918. [CrossRef] [Google Scholar]
2. de Faria A. F., de Rosso V. V., Mercadante A. Z. Carotenoid composition of jackfruit (*Artocarpus heterophyllus*), determined by HPLC-PDA-MS/MS. *Plant Foods for Human Nutrition.* 2009;64(2):108–115. doi: 10.1007/s11130- 009-0111-6. [PubMed] [CrossRef] [Google Scholar]

3. Gorgonio, C. M. S., Pumar, M. and Mothe, C. G. 2011 Macroscopic and physicochemical characterization of a sugarless and gluten-free cake enriched with fibers made from pumpkin seed (cucurbita maxima L) flour and cornstarch. Cienc Technol Aliment Campinas 31: 109-118.

4. Griel AE, Kris-Etherton PM, Hilpert KF, Zhao G, West SG, et al. (2007) An increase in dietary n-3 fatty acids decreases a marker of bone resorption in humans. Nutr J 6: 2.
Hossain, M. T. (2014). Development and quality evaluation of bread supplemented with jackfruit seed flour. *International Journal of Nutrition and Food Sciences*, *3*(5), 484. http://dx.doi.org/10.11648/j.ijnfs.20140305.28

5. Ifesan B.O., Femi-Ajayi O., Adeloye J.B., Ifesan B.T. Quality assessment and consumer acceptability of cookies from blends of wheat flour and pumpkin (*Cucurbita* spp.) seed flour. *Himal. J. Appl. Med. Sci. Res.* 2020;1:1–
7. [Google Scholar]

6. Maurya, P., & Mogra, R. (2016). Assessment of consumption practices of jackfruit (Artocarpus heterophyllus lam.) seeds in villages of Jalalpur block district Ambedarnagar (U.P.) India. Remarking, 2, 73-75.

7. Phillips KM, Ruggio DM, Ashraf-Khorassani M. (2005) Phytosterol composition of nuts and seeds commonly consumed in the United States. J Agric Food Chem ;53(24):9436-45.

8. Revathy, M. N. and Sabitha, N. 2013 Development, quality evaluation and pupularization of pumpkin seed flour incorporated bakery products. Int J Food Nutr Sci 2: 40-41.

9. Ueshima H, Stamler J, Elliott P, Chan Q, Brown IJ, et al. (2007) Food omega-3 fatty acid intake of individuals (total, linolenic acid, long-chain) and their blood pressure: INTERMAP study. Hypertension 50: 313-319.