

# Studies on Formulation and Quality Evaluation of Instant Brown Rice Kheer Mix

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## Abstract

Studies on formulation of Instant brown rice kheer mix were successfully done. Brown rice is rich in dietary fiber content. It is responsible for reduction of insulin and glycemic indices. All the dry ingredients are ground in fine powder and mix well for preparation of instant brown rice kheer mix. The various varieties of rice are used for preparation of various formulation of instant rice kheer mix. Among the prepared 3 samples, Sample T3 which prepared by Brown rice have superior qualities as compare to sample T1 and T2 which prepared by wada Colum and indrayani rice respectively. The Instant brown rice kheer mix product has chemical composition such as Ash (2.6 %), Moisture (3.6 %), Fat (7.6 %), Carbohydrate (69.85 %), Protein (17.5 %) and Energy (417.8 Kcal). It was concluded that the instant brown rice kheer mix can be stored in Aluminum pouches or HDPE pouches at room temperature for 3 months. So the Instant brown rice kheer mix can satisfy the consumer in acceptance quality.

**Keywords: Brown Rice, value addition, sensory evaluation, Quality analysis, aluminum pouch, storage study**

## I. INTRODUCTION

Kheer is a delicious Indian dessert which is popular throughout the country and enjoyed by the all of the society. Conventionally it is prepared by partial whole milk powder, Sugar powder and Rice powder. Because of change in food habits and and life style of people convenience food Ready to eat or Ready to serve foods and ready mixes for different food products are gaining popularly.(Kadam et. al., 2011).

Kheer is rice – based sweetened dairy dessert immensely popular in the Indian sub-countries and Middle-East countries. It is obtain by cooking pre-soaked rice in the boiling milk with simultaneous concentration that leads to a reasonably thick consistency ranging from a viscous fluid to a semi-solid rice pudding- like (UK, USA) and Amazake-like (Japan) milk-rice dairy dessert. It is often garnished with raisins, cashew nuts, pistachios or almonds and flavored with cardamom, saffron etc.(Borad et. al., 2017).

Kheer is a traditional Indian dairy product. It occupies a special position in Indian Diet due to high nutritional and sensory properties, from the ancient time. The Hindu Kheer is derived from Sanskrit word 'Ksheer' for milk and 'Kshrika' for any dish prepared with milk. Kheer is popular all over the country, as a pre-eminent milk delicacy. It has been associated with festivities and celebrations from the time immemorial. Kheer is Known by different names in different parts of the country, such as 'Kheer' is North Western region, 'Payasam' Southern region, 'Payas' in Eastern region, 'Phirni' in Northern region and 'Kheech' in Mewar region of Rajasthan.(Mukhekar et. al., 2019).

Kheer has been known to mankind since times immemorial. It was used as sweet dish at all the ceremonial occasions and festivals and is relished by all age groups thought to be a very nutritious food. It is closely resembles "rice pudding" a popular desert in the United states and in North and Central Europe.(Mukhekar et. al., 2019)

A sweetened dish of rice cooked in milk first finds mention as 'payasa' in Buddhist-Jain literature in 400 B.C. Payasam is milk based delicacy popular in the southern parts of India. It resembles Kheer of North India and has similar ritualistic connotations. Kheer from jowar is mentioned in the fourteenth century 'Padmavat' of Gujrat. Today, other cereals and cereal products (vermicelli, sevlan, Phirni) are also used in kheer preparation.(Barela and Shelke, 2017).

Kheer or Payasam is an extremely popular heat desiccated cereal based, sweetened indigenous milk product. In addition to the milk nutrients, Kheer also contains nutrients from rice, sugar and other additives. Sadly, as is the case with other indigenous milk products, concrete attempts have been lacking in developing a large-scale production process of manufacture. A big thrust in the research and development is evident in the last decade or so in this direction.(Sarode et. al., 2007).

Rice (*oryza sativa*) is a one of the most important crop in the world belongs to family Poaceae approximately 95% of its production is in Asia. Brown rice is a superior to other polished rice as it has high dietary fiber, a mild laxative which prevents gastrointestinal disorders and healthy food for diabetic patients.(Krishnaveni and Dhanalakshmi, 2014).

Brown rice is whole grain rice, reduces insulin and glycemic indices and also offers other health benefits. The brown rice contains magnesium, a mineral which act as cofactor for more than 300 enzymes. (Krishnaveni and Dhanalakshmi, 2014).

The conversion of paddy into brown rice involves many processes such as Cleaning, Parboiling, Drying, Dehusking, Partial Milling, Packing and Storage. (Nambi et. al., 2017).

Brown rice contains Proteins(8.80g ), Carbohydrate(78.25g), Fat(1.80g), Dietary Fiber(3.9g), Potassium(58.50mg), Magnesium(94.1mg), Selenium(29.7mcg), Iron(6.05mg), and Sodium(53mg) per 100g. Brown Basmati rice contains 355kcal energy and 0mg cholesterol per 100g. (Nambi et. al., 2017).

Brown rice contains phytochemicals such as Alkaloid, Glycoside, Phenolic Compound, Tannin and Flavonoid qualitatively. Quantitatively it was found to be rich in carbohydrate but the content of amino acid and protein was low compared to carbohydrate.(Krishnaveni and Dhanalakshmi, 2014).

## II. MATERIAL & METHODS

### A. Procurement of Raw Material

Raw materials required during present investigation were procured from local market of Saralgaon such as Brown rice, Dairy whitener, Sugar, cashew, almond and cardamom etc. Most of the chemicals and equipments used in this investigation were of analytical grade which are obtained from College of Food Technology Saralgaon, Thane.

### B. Physical Properties of Instant Brown Rice Kheer Mix

The colour of Instant Brown Rice Kheer Mix was determined by visual observations; the Bulk density of Instant Brown Rice Kheer Mix was measured by measuring cylinder. The Texture of Instant Brown Rice Kheer Mix was determined by Texture meter.

### C. Chemical Properties of ingredients and Instant Brown Rice Kheer Mix

Proximate composition such as moisture, ash, crude fat, crude protein and crude fiber of all the Ingredients and Crackers incorporated with quinoa Seed was determined according to the procedures given in AOAC (2000). For moisture determination samples were dried in oven at 130°C for 60 minutes. For ash determination samples were placed in muffled furnace at 550°C to burn out all carbon compounds leaving in organic part (ash). Fat was determined by fat extraction unit by using n. Hexane. For fiber determination, samples were treated with 1.25% Sulphuric acid and Sodium Hydroxide solution. After filtration of digested material it was washed with hot water and then ignited. By calculating loss of weight after ignition, crude fiber contents were determined. Protein contents were determined by using Kjeldahls unit.

### D. Sensory Evaluation of Instant Brown Rice Kheer Mix

Prepared product were evaluated for sensory characteristics in terms of appearance, color, flavor, aftertaste, texture and overall acceptability by 10 semi-trained panel members comprised of academic staff members using 9- point Hedonic scale. Judgments were made through rating the product on a 9 point Hedonic scale with corresponding descriptive terms ranging from 9 'like extremely' to 1 'dislike extremely'. The obtained results were recorded in sensory score card.

### E. Statistical Analysis of Instant Brown Rice Kheer Mix

The analysis of variance of the data obtained was done by using completely randomized design (CRD) for different treatments as per the method given by Panse and Sukhatme (1967). The analysis of variance revealed at significance of  $p < 0.005$  level S.E and C.D. at 5 percent level is mentioned wherever required.

### F. Formulation of Instant Brown Rice Kheer Mix

Ingredients	Treatments			
	T0	T1 (Wada Colum)	T2 (Indrayani)	T3 (Brown Rice)
Rice Powder	0g	30g	30g	30g
Sugar powder	0 g	30 g	30 g	30 g
Dairy Whitener	0 g	30 g	30 g	30 g
Cashew Nut Powder	0 g	3 g	3 g	3 g
Almond Powder	0 g	3 g	3 g	3 g
Coconut Powder	0 g	3 g	3 g	3 g
Cardamom Powder	0 g	1 g	1 g	1 g

Where,

T0- Kheer prepared by conventional method.(Control sample)

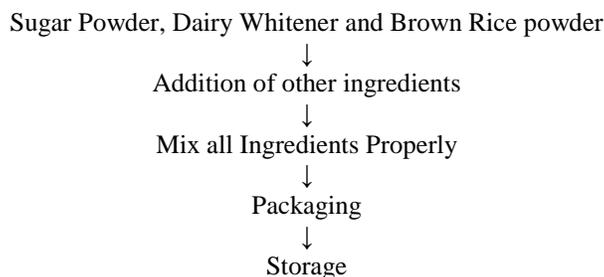
T1- Used Wada Colum Rice Powder.

T2- Used Indrayani Rice Powder.

T3- Used Brown Rice Powder.

Kheer prepared with incorporation varying in varieties of Rice powder were investigated. The formulation was made by Sugar Powder, Dairy Whitener and other varieties of Rice Powder viz., 30:30:30 percent respectively and 10 percent of Almond-Cashew-Coconut Powder. . Sample T3 Brown Rice Powder was organoleptically acceptable and used for further study.

### G. Process of Instant Brown Rice Kheer Mix



### H. Preparation of Brown rice Kheer Mix

For preparation of Kheer from Brown Rice Kheer Mix Powder use 300ml of water for 100gm Instant Kheer mix. Boil water on low gas flame by the addition of Instant Kheer mix and then keep boiling these mixtures for 10 to 12 min.

## III. RESULTS AND DISCUSSION

### A. Physical Properties of Instant Brown Rice Kheer Mix

Parameters	Brown Rice Kheer Mix
Colour	Brownish
Texture	Soft and Fine
Bulk Density	0.6 g/L

Instant Brown Rice Kheer Mix was Brownish which was determined by visual observation. The texture of Instant Brown Rice Kheer Mix is soft and fine. Bulk Density of Instant Brown Rice Kheer Mix is 0.6 g/L.

### B. Chemical Properties of Instant Brown Rice Kheer Mix

Parameters	Instant Brown Rice Kheer Mix (T <sub>3</sub> )
Ash	2.6 %
Moisture	3.6 %
Fat	7.6 %
Protein	17.5 %
Carbohydrate	69.85%
Energy	417.8 kcal

The data on chemical properties of Instant Brown Rice Kheer Mix viz. moisture, fat, protein, ash, Carbohydrate and Energy was carried out and the results obtained were Moisture content in Instant Brown Rice Kheer Mix was found to be (3.6%), Fat (7.6%), Ash (2.6%) Protein (17.5%), Fat (7.6%), Carbohydrate (69.85%) Energy (417.8%) respectively, it concluded that Instant Brown Rice Kheer Mix rich in Protein.

## IV. SENSORY EVALUATION

### A. Sensory Evaluation of Instant Brown Rice Kheer

Sample	Colour	Flavour	Taste	Consistency	Appearance	Overall Acceptability
Control(T <sub>0</sub> )	8	8	9	9	9	8.6
T <sub>1</sub>	7	8	8	7	7	7.4
T <sub>2</sub>	7	7	8	7	7	7.2
T <sub>3</sub>	9	9	8	9	9	8.8

In the sensory evaluation of prepared 4 formulation of Instant Rice Kheer Mix i.e T<sub>0</sub>, T<sub>1</sub>, T<sub>2</sub> and T<sub>3</sub>. The sample T<sub>3</sub> is more acceptable as compared to sample T<sub>1</sub> and T<sub>2</sub> by the panel members. The sample T<sub>3</sub> which prepared by the Brown rice have the effective colour and consistency than the sample T<sub>2</sub> and T<sub>3</sub> which prepared By the Wada Colum and Indrayani Rice. T<sub>3</sub> sample also get highest score than other sample. The overall acceptability of sample T<sub>3</sub> was 8.8 points while other samples points are T<sub>0</sub> (8.6), T<sub>1</sub> (7.4), T<sub>2</sub> (7.2).

## V. CONCLUSION

Conclusively, it emerges that the formulation and standardization of recipe for Instant Brown Rice Kheer Mix was carried out successfully prepared by using Brown Rice powder, Sugar Powder, Dairy Whitener and other ingredients. The health benefits of Brown Rice and product having some enrichment. As regards the organoleptic qualities of Instant Brown Rice Kheer prepare from Kheer Mix was excellent followed by nutritional quality particularly protein, Carbohydrate and energy content increased in Instant

Brown Rice Kheer Mix. This type of value addition by way of nutrient/enrichment does certainly help to provide good source of carbohydrate and energy. So, the product can be satisfy the consumer in accepts and quality.

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