



E-ISSN: 2278-4136  
P-ISSN: 2349-8234  
JPP 2018; SPI: 2856-2857

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## Study the physico-chemical attributes of kheer mix

**Anita Kashyap, Mayank Mehra and Yogita Kashyap**

### Abstract

Significant difference was observed in case of all physical parameters such as bulk density, particle density, porosity and cooking time kodo based and kutki based kheer mixes. The increased the millet grit in kheer mixes decreases the particle density and porosity percentage of kheer mixes. The preparation time of kheer increased with increases the level of millet grits in mixes, it indicated that the percentage of incorporation of grits directly proportional to the time required for preparation.

**Keywords:** *Kheer, Kodo, Kutki, Physio-Chemical Attributes*

### Introduction

Kodo millet (*Paspalum scrobiculatum*) is important millet of Madhya Pradesh. It grain is easily preserved and proves as a good famine reserve. The grain is recommended as a substitute for rice to patients suffering from diabetes disease. The grain contains 8.3% protein, 1.4% fat, 65.9% carbohydrates, 2.9% ash, 5.2 g fibre, 35 mg calcium, 188 mg phosphorus and provides energy 353kcal. Little millet (*Panicum miliare*) grain being nutritionally superior to rice and wheat, provide cheap proteins, minerals and vitamins to poorest of the poor, where the need for such ingredients is the maximum. Practically devoid of grain storage pests, the little millets have indefinite storage life. Grain contains 7.7% protein, 7.6% fibre, 17mg calcium, 9.3 mg iron. Generally it is used as a cooked rice, kheer, thin porridge, dosa, sattu, halwa. Skim milk powder (SMP) is mainly produced by spray-drying of fluid pasteurized milk and the finish product composition is not more than 1.5% fat by wt. with a shelf-life (at 25°C) of 12-18 months (ADPI, 1998). Dry milk or powder milk is a product obtained by the removal of water and fat from whole milk, usually fat percent of whole milk powder is minimum 26% and maximum 40%, for partially skimmed milk powder minimum 1.5% and maximum 2.5%. For all types of powder milk water content ranges from 3-5% (ADPI, 1998). Sugar is the generalized name for sweet, short-chain, soluble carbohydrates, many of which are used in food. Sugars are found in the tissues of most plants, but are present in sufficient concentrations for efficient extraction only in sugarcane and sugar beet. Cane sugar contains 99.4% carbohydrate, 0.1% protein, 0.4% moisture (Gopalan *et al.* 1996). The term Instant food mix where in some of the ingredients are premixed. It is simple, convenient, and easy and fast to refer to that prepare.

Convenience foods provide the housewives novelty, convenience, reducing the drudgery and satisfaction of preparing at home. The ready mixes provide hygienic products of standard and uniform quality with good shelf life. Nutritionally also these products are rich and wholesome.

### Materials and Methods

The present investigations on "Study the Physico-Chemical Attributes of Kheer Mix" were carried out in the Department of Food Science and Technology, College of Agriculture, JNKVV, Jabalpur (M.P.) during the year 2015-16.

### Food commodities

Rice (*Oryza sativa*), Kodo (*Paspalum scrobiculatum*), Kutki (*Panicum miliare*) were procured from sarvamangalam (Natural product) other material such as Dairy whitener, cane sugar and packaging materials were purchased from the local market of Adhartal, Jabalpur (M.P.).

### Chemicals and Glass wares

The chemicals used in the present work were of standard grades from BDH, MERCK, and Himedia Standard 'Corning' or 'Borosil' made glassware's were used.

### Preparation of millets grits

Millets were thoroughly cleaned to remove dirt, stone, dust, wood, insect excreta/feathers and

add mixture of other food grains. The cleaned graded material were milled, washed and soaked in 20ml water for 2 hours then dried for 4-5 hour till the material was completely dried

having 8-10 per cent moisture content and ground in the electric grinder to make grits, sautéing the grits with using 5% fat.

### Treatment combinations

**Table 1:** Different formulation of kheer mixes

	Treatment	Rice	Kodo	Kutki	Sugar	Dairy whitener(dw)
Kodo based kheer mixes	K0 (Control)	25	-		37.5	37.5
	K1	-	20		37.5	42.5
	K2	-	25		37.5	37.5
	K3	-	30		37.5	32.5
Kutki based kheer mixes	K0(Control)	25		-	37.5	37.5
	Ku1	-		20	37.5	42.5
	Ku2	-		25	37.5	37.5
	Ku3	-		30	37.5	32.5

K0- Rice: Sugar: Dairy Whitener (25:37.5:37.5)

K1- Kodo: Sugar: Dairy Whitener (20:37.5:42.5) Ku1- Kutki: Sugar: Dairy Whitener (20:37.5:42.5)

K2- Kodo: Sugar: Dairy Whitener (25: 37.5:37.5) Ku2- Kutki: Sugar: Dairy Whitener (25: 37.5:37.5)

K3- Kodo: Sugar: Dairy Whitener (30:37.5:32.5) Ku3- Kutki: Sugar: Dairy Whitener (30:37.5:32.5)

### Procedure for preparation of instant kheer mixes

- Soaked the milled kodo and kutki for 2 hours, dried for 4-5 hours till moisture become 8-10% then make grits using electric grinder then grits were sautéing for 5-10 minute with using 5% fat.
- Mixed soatening Kodo/kutki grits with cane sugar powder and dairy whitener thoroughly.
- Packed the instant mix in various packaging materials (Polypropylene, low density polyethylene and aluminum foil bags) at ambient temperature.

### Preparation of kheer from instant kheer mixes

Kheer was prepared from kheer ready-mix having different combinations of ingredients. Kheer ready-mix was added to the water which was about to boil. The quantity of water required per 100 g. of kheer ready-mix was standardized. About 600 ml water required to reconstitute 100 g. of kheer ready-mix into kheer of desired consistency. Continuous stirring was done while adding kheer ready-mix to the water. The mixture was kept at simmering temperature over a low fire with constant stirring to avoid scorching. Cooking was continued for 10 to 15 min.

After achieving desired consistency the kheer was immediately cooled to room temperature.

### Results and Discussion

Physical and cooking characteristics of the developed

products (viz. Bulk density, Particle density, Porosity, Cooking time and hunter colour value) instant kheer mixes were determined and the mean score values are showed in table 1.

Bulk density of kodo and kutki based kheer mixes was decreased as compare to control sample, maximum bulk density was recorded in K1 & K3 (kodo based kheer mix) and Ku3 (kutki based kheer mix), whereas minimum was recorded in K2 (kodo based kheer mix) and Ku1 (kutki based kheer mix). From the results, it was found that supplementation of millet grits decreased the rate of bulk density of kodo and kutki based kheer mixes.

Maximum particle density and porosity of kodo and kutki based kheer mixes, were found in K1 (kodo based kheer mix) and Ku2 & Ku3 (kutki based kheer mixes), whereas minimum particle density and porosity percent were found in K2 & K3 (kodo based kheer mix) and Ku1 (kutki based kheer mixes).

The data showed that the increased the millet grit in kheer mixes decrease the particle density and porosity percentage of kheer mixes. The preparation time of kheer increased with increases the level of millet grits in mixes, it indicated that the percentage of incorporation of grits directly proportional to the time required for preparation. These finding have been supported by Balasubramanian and Vishwanathan (2010).

**Table 1:** Physical and cooking characteristics of kheer mixes

	Parameters	Bulk density (g/ml)	Particle density(g/ml)	Porosity (%)	Cooking time (min)
Kodo based Kheer mixes	K0 (Control)	0.68	2.50	72.56	15.00
	K1	0.67	1.90	66.14	10.00
	K2	0.63	1.70	64.27	10.10
	K3	0.67	1.70	61.93	10.00
	SEm±	0.057	0.066	0.052	0.459
	CD at 5%	0.158	0.210	0.164	1.44
Kutki based Kheer mixes	K0 (Control)	0.68	2.50	72.58	15.00
	K1	0.64	1.50	58.32	10.10
	K2	0.67	1.60	59.34	10.00
	K3	0.68	1.60	59.41	10.00
	SEm±	0.057	0.057	0.052	0.042
	CD at 5%	0.181	0.180	0.166	1.33

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