

## Chemical Composition of Kheer Prepared from Cow Milk Blended with Sweet Potato (*Ipomea Batatas L.*)

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**Abstract:** Kheer was prepared from cow milk blended with sweet potato (*Ipomea batatas L.*) in the Dairy Technology laboratory, Department of Animal Husbandry and Dairy Science, Dr. PDKV, Akola. Kheer prepared from five different combinations of cow milk and sweet potato paste i.e 97.50 per cent cow milk with 2.50 per cent rice T1 (control), 95:05(T2), 90:10(T3), 85:15(T4) and 80:20 (T5) was analyzed for chemical composition and it was found that maximum fat, protein, total sugar, ash and total solids content was recorded in kheer prepared from 97.50 per cent cow milk with 2.50 per cent rice T1 (control) i.e 7.50, 6.31, 15.80, 1.42 and 49.44 per cent, respectively. While maximum moisture and SNF content were recorded in kheer prepared from 80:20 (T5) i.e 53.16 and 41.40 per cent, respectively.

**Keywords:** Cow milk, Sweet potato, Rice, Kheer, Chemical Composition.

### INTRODUCTION

Kheer is heat desiccated sweetened and concentrated milk confection prepared with addition of non dairy ingredients like rice, wheat, sugar, tapioca, semolina, carrot, bottle gourd, etc. and occasionally nuts spices such as saffron, cardamom, almond and pistachio etc. also used in kheer. It is considered to be a nutritious food for people of all ages and is characterized by sweet, nutty and pleasant flavour that is highly acceptable to the Indian palate. It closely resembles 'rice pudding' a popular dessert in the United States and in north and central Europe. Sweet potato was grown as starchy food crop throughout the tropical, subtropical and frostfree temperate climatic zone in the world. Besides starch they were rich in dietary fibers, vitamin A, C, B6. All cultivars were more or less sweet flavoured. Despite the name "sweet", it is actually a good food for diabetes the tuber was used to treat asthma. Preparation of kheer from cow milk blended with sweet potato is one of well known practice and also accepted in market, hence

during this investigation an effort were made to determine the chemical composition of such kheer samples prepared from various combinations of cow milk and sweet potato.

### MATERIALS AND METHODS

The present investigation on "Chemical composition of kheer prepared from cow milk blended with sweet potato" was carried out in the Department of Animal Husbandry and Dairy Science, Post Graduate Institute, Dr. PDKV, Akola. The experiment was planned with different combinations of cow milk and sweet potato paste i.e. 97.50 per cent cow milk with 2.50 per cent rice T1 (control), 95:05(T2), 90:10(T3), 85:15(T4) and 80:20 (T5).

Method of preparation of kheer suggested by De (1980) was used with slight modification. While preparing sweet potato kheer, the cow milk was taken in an iron karahi and heated on gentle fire. At the time of boiling, milk was stirred with the help of stainless steel ladle in a circular manner. At this

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stage in the treatment T1, 2.5 parts of boiled rice and sugar @ 8 per cent weight of cow milk and cardamom powder 1 per cent were added in the milk. Then gentle boiling of milk was done till the evaporation of 40 per cent of cow milk. In other treatments of combinations, sweet potato paste was added instead of replace with rice as per treatment combinations.

Kheer was analyzed for moisture, fat, protein, total sugar, ash, SNF and total solids was determined as per BIS specifications. Fat content of kheer was determined by Gerber method as described in IS: 1224 (part I), 1977. Protein content by estimating the per cent nitrogen by Micro Kjeldahl method as recommended in IS: 1479 (Part II), 1961. Moisture content was determined according to methods described in ISI Handbook of Food Analysis, (1964). Data obtained from all five treatments with five replications was statistically analyzed with completely randomized design by adopting standard method of analysis of variance as suggested by Panse and Sukhatme (1967).

## RESULTS AND DISCUSSION

The data obtained for chemical composition *i.e.* moisture, fat, protein, total sugar, ash, SNF and total solids were tabulated and presented in table 1.

### Moisture (%)

It is revealed from Table 1 that, average moisture content of kheer prepared from cow milk blended with sweet potato were 50.56, 51.98, 52.32, 52.78 and 53.16 per cent in treatments T1, T2, T3, T4 and T5 respectively. The highest moisture was noticed in

treatment T5 (53.16%) *i.e.* kheer prepared from cow milk with 20 per cent sweet potato paste and lowest moisture was in T1 (50.56%) treatment *i.e.* kheer prepared from 97.5 per cent cow milk mixed with 2.5 per cent rice without addition of sweet potato paste (control). The observations reported for moisture content of kheer by Dadge (2013) was found that addition of sweet potato in kheer increase the moisture from 44.95 (T1) to 51.15 (T3) per cent.

### Fat (%)

The average fat content of kheer prepared from cow milk blended with sweet potato were 7.50, 7.02, 6.42, 5.92 and 5.40 in treatment T1, T2, T3, T4 and T5 respectively. The fat content was higher in T1 *i.e.* (7.50 %) kheer prepared from 97.5 per cent cow milk plus 2.5 per cent rice without addition of sweet potato paste (control). Lowest fat content in kheer was observed in T5 (5.40 %) *i.e.* kheer prepared from cow milk with 20 per cent sweet potato paste. The fat per cent decreases with increase in the proportion of sweet potato paste blended with cow milk. This might be due to lowest fat content in sweet potato than cow milk. Solunke (2012) who recorded that the fat content in T1 treatment (control) was highest (7.23%) among all the treatments however lowest fat content.

### Protein (%)

Protein content was ranges from 4.14 to 6.31 per cent. The average protein content was 6.31, 5.58, 5.48, 4.48 and 4.14 per cent for T1, T2, T3, T4 and T5 treatments respectively. Treatment T1 has highest protein content (6.31%) while treatment T5 has lowest (4.14%) protein content *i.e.* addition of sweet potato

**Table 1**  
Chemical composition of kheer prepared from cow milk blended with sweet potato

Chemical composition (%)							
Treatments	Moisture	Fat	Protein	Total Sugar	Ash	SNF	Total solids
T1	50.56	7.50	6.31	15.80	1.42	41.94	49.44
T2	51.98	7.02	5.58	15.51	1.15	41.00	48.02
T3	52.32	6.42	5.48	14.90	1.04	41.26	47.68
T4	52.78	5.92	4.48	14.30	0.98	41.30	47.22
T5	53.16	5.40	4.14	13.76	0.90	41.44	46.84
SE(M) ±	Sig.	Sig.	Sig.	Sig.	Sig.	Sig.	Sig.
CD at 5%	0.102	0.056	0.072	0.068	0.041	0.097	0.102

decreases the protein content of kheer. Chaudhary (1989) who reported an average chemical composition of protein in kheer 5.44 per cent.

### Total Sugar (%)

The average total sugar content of kheer prepared from cow milk blended with sweet potato were 15.80, 15.51, 14.90, 14.30 and 13.76 per cent in T1, T2, T3, T4 and T5 treatments respectively. The total sugar content was higher in treatment T1 *i.e.* 15.80 per cent. kheer prepared from 97.5 per cent cow milk plus 2.5 per cent rice without addition of sweet potato paste (control) and lowest in T5 (13.76 per cent) *i.e.* kheer prepared from cow milk with 20 per cent sweet potato paste this might be due to lower sugar content in sweet potato. Dhande (2014) observed that increase the Ash gourd pulp in burfi, decrease the total sugar per cent due to the lower total sugar content in the ash gourd pulp.

### Ash (%)

The average ash content was 1.42, 1.15, 1.04, 0.98 and 0.90 per cent for T1, T2, T3, T4 and T5 treatments respectively. The ash content was higher in treatment T1 (1.42 per cent) and lowest in treatment T5 (0.90 per cent) *i.e.* addition of sweet potato decrease the ash content of kheer. Dadage (2013) who reported that the average total ash content of kheer was decrease due to addition of sweet potato paste in buffalo milk which supports the present trend.

### Solid Not Fat (%)

Solid not fat content in kheer was 41.94, 41.00, 41.26, 41.30 and 41.44 per cent for T1, T2, T3, T4 and T5 treatments respectively. The solid not fat content was higher in treatment T1 (41.94%) and lowest in treatment T2 (41.00%). The solid not fat was increasing trend by increase in level of sweet potato. This might be due to fat content was very less in sweet potato. Dhande (2014) reported that SNF content in burfi was increased with increase in the level of ash gourd pulp which supports the present trend.

### Total Solids (%)

The average total solids content of kheer prepared from cow milk blended with sweet potato were

49.44, 48.02, 47.68, 47.22 and 46.84 per cent for T1, T2, T3, T4 and T5 treatments respectively. The total solids content was higher in treatment T1 (49.44%) and lowest in treatment T5 (46.84%). This may be due to moisture per cent was increased in blended kheer by addition of sweet potato. Barela (2011) reported that the total solid content of kheer increases with increasing the level of coconut milk which is in agreement of present results.

### CONCLUSION

From the present study it is concluded that the fat, protein, total sugar, ash, and total solid were decreases with addition of sweet potato paste, while moisture and solid not fat increases with increasing level of sweet potato. Good quality kheer can be prepared by using 90:10 cow milk to sweet potato paste ratio with 8% sugar level which had pleasant flavour, smooth body and texture and light yellowish to milky colour.

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