



## Effect of different levels of ash gourd pulp for manufacturing functional kalakand

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**ABSTRACT :** The present investigation was made with an attempt to develop Kalakand by addition of an Ash gourd at different level of concentration using buffalo milk. The basic aim of study was to find out the quality parameters of Kalakand prepared by addition of Ash gourd. The data collected on different aspects were tabulated and analyzed statistically using the methods of analysis of variance and critical difference, control Kalakand was standardized with 6% sugar in 500 ml buffalo milk without ash gourd. Treatment  $T_1$  was standardized to 15% Ash gourd, 6% sugar in 425 ml buffalo milk,  $T_2$  was standardized to 25% Ash gourd, 6% sugar in 375 ml buffalo milk and  $T_3$  was standardized to 35% Ash gourd, 6% sugar in 325 ml buffalo milk. Physicochemical analysis (protein, fat, total solids, moisture, ash) was done for estimating its nutritional content and organoleptic characteristics (flavour and taste, body and texture, colour and appearance, overall acceptability) using 9 point hedonic scale. According to the analysis, treatment  $T_1$  with 15% Ash gourd pulp was found to be the best among the three. Thus, product acceptability judged by organoleptic evaluation and therapeutic value, the treatment can be rated as  $T_1 > T_0 > T_2 > T_3$ .

**KEY WORDS :** Ash gourd, Buffalo milk, Kalakand.

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### INTRODUCTION

Milk and milk products have been recognized as significant contributors of important nutrients to the human diet. Among the indigenous milk products, Kalakand occupies an important place and found to be attractive product amongst all the classes of consumers. Kalakand is partially desiccated milk product with caramelized flavour and granular texture prepared from acidified milk. The granular mass is fused and held together in loosely compact body. The colour of Kalakand varies from off-white to light caramel colour. Being a whole milk concentrate, Kalakand is a good source of protein, mineral, energy giving fat and lactose. It is 4-6 times more nutritious in terms of per unit weight and calorific value.

Kalakand and its sensory qualities can be altered by addition of Ash gourd pulp. Ash gourd is used to treat summer fevers, obesity, because it is low in calories and it prevents conversion of sugar into fats. It also helps in boosting memory and other elements. In Ayurveda, the fruit is used to treat

: epilepsy, lung diseases, asthma, coughs, urine retention and  
: internal haemorrhage. Considering the important aspects of  
: Ash gourd, an effort was made in this study to use different  
: levels of Ash gourd pulp for quality Kalakand using the  
: technique of manufacture as recommended by De (1982).

### MATERIAL AND METHODS

: First of all control Kalakand ( $T_0$ ) was made from buffalo  
: milk without addition of Ash gourd pulp. For experimental  
: Kalakand, buffalo milk was filtered and clarified at 35-40°C,  
: then it is cooled at 5°C standardized to 6% fat and 9% SNF.  
: Then the milk was boiled for 15 minutes and citric acid (1%)  
: was added. It was then desiccated upto 30% moisture. Now  
: Ash gourd pulp was added  $T_1$  (85:15),  $T_2$  (75:25) and  $T_3$  (65:35).  
: Sugar was added @ 6% and further desiccated. Kalakand was  
: set and allowed to cool at room temperature. The samples  
: were analyzed for physicochemical, microbial and organoleptic  
: qualities as per ICAR manual in Dairy Chemistry (1972) and  
: Indian standard (1980)

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### RESULTS AND DISCUSSION

: The data collected on different aspects as per plan were

tabulated and statistically analyzed as per Chandel (1991), Table 1 showed average data obtained on different parameters.

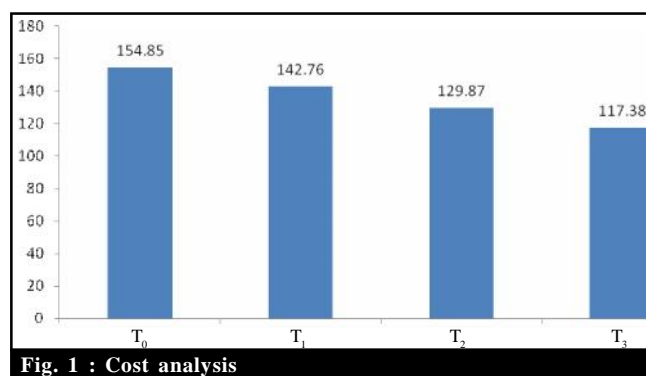
**Physico- chemical properties:**

The highest mean for protein percentage in Kalakand blend with Ash gourd pulp was T<sub>1</sub>=15.92, followed by T<sub>2</sub>(15.12), T<sub>0</sub> (18.85) and T<sub>3</sub> (13.42). The differences between the treatments were significant. The highest mean for fat percentage in Kalakand blend with Ash gourd was T<sub>0</sub>=20.69, followed by T<sub>1</sub>(15.79), T<sub>2</sub>(11.51), and T<sub>3</sub> (9.26). The differences were significant. The highest mean for total solids content in Kalakand was T<sub>0</sub>=73.31, followed by T<sub>1</sub>(67.20), T<sub>2</sub>(62.84) and T<sub>3</sub> (53.38). The treatments differ significantly. The highest mean for moisture percentage in Kalakand blended with Ash gourd was T<sub>3</sub>=44.58, followed by T<sub>2</sub>(37.14) T<sub>1</sub>(32.71), T<sub>0</sub>(26.68). The highest mean for ash percentage in Kalakand was in T<sub>3</sub>=3.47, followed by T<sub>2</sub>(3.34), T<sub>1</sub>(3.18) and T<sub>0</sub>(2.72). The treatment didn't differ significantly. The highest mean for acidity percentage was found in T<sub>0</sub>=0.75, followed by T<sub>2</sub>(0.68), T<sub>1</sub>(0.67) and T<sub>3</sub>(0.59). The highest mean for yield in Kalakand was found in T<sub>0</sub>=27.45, followed by T<sub>1</sub>(26.87), T<sub>2</sub>(26.52), and T<sub>3</sub> (26.06).

The highest mean for SPC (10<sup>3</sup>/g) was recorded in Kalakand blend with Ash gourd pulp was T<sub>0</sub>=8, followed by T<sub>1</sub>(8), T<sub>2</sub>(8) and T<sub>3</sub> (8). All the samples of Kalakand didn't show the presence of coliform. Thus the product was proved to be in good quality.

**Organoleptic parameters:**

The highest mean for flavour and taste for Kalakand



**Table 1 : Average of different physico -chemical parameters**

Parameters (%)	Treatments			
	T <sub>0</sub>	T <sub>1</sub>	T <sub>2</sub>	T <sub>3</sub>
Protein	18.85	15.92	15.12	13.42
Fat	20.69	15.79	11.51	9.26
Total Solids	73.31	67.20	62.84	53.38
Moisture	26.68	32.71	37.14	44.58
Ash	2.72	3.18	3.34	3.47
Acidity	0.75	0.67	0.68	0.59
Yields	27.75	26.87	26.52	26.06

**Table 2 : Microbial parameters**

Parameters	Treatments			
	T <sub>0</sub>	T <sub>1</sub>	T <sub>2</sub>	T <sub>3</sub>
Standard plate count	8	8	8	8
Coliform	Nil	Nil	Nil	Nil

**Table 3 : Organoleptic parameters**

Parameters	Treatments			
	T <sub>0</sub>	T <sub>1</sub>	T <sub>2</sub>	T <sub>3</sub>
Flavour and taste	8.0	8.16	7.44	6.75
Body and texture	7.92	8.08	7.64	7.38
Colour and appearance	8.10	8.24	7.64	7.48
Overall acceptability	8.11	8.16	7.90	7.50

**Table 4 : Cost analysis parameters**

Parameters	Treatments			
	T <sub>0</sub>	T <sub>1</sub>	T <sub>2</sub>	T <sub>3</sub>
Cost	154.85	142.76	129.87	117.38

blended with Ash gourd was  $T_1=8.16$ , followed by  $T_0(8)$ ,  $T_2(7.44)$  and  $T_3(6.75)$ . There were significant difference found among the treatments. The highest mean for body and texture was found in  $T_1=8.08$ , followed by  $T_0(7.92)$ ,  $T_2(7.64)$  and  $T_3(7.38)$ . The highest mean for colour and appearance was found in  $T_1=8.24$ , followed by  $T_0(8.10)$ ,  $T_2(7.64)$  and  $T_3(7.48)$ . There were significant difference found among the treatments. The highest mean for overall acceptability was found in  $T_1=8.16$ , followed by  $T_0(8.11)$ ,  $T_2(7.90)$  and  $T_3(7.50)$ . There were significant difference observed among the treatments.

#### Cost analysis:

The data regarding cost of Kalakand blended with Ash gourd pulp was found as cheapest in  $T_3=117.38$ , followed by  $T_2(129.87)$ ,  $T_1(142.76)$  and  $T_0(154.85)$

The results obtained from the statistical analysis revealed that the Ash gourd can be satisfactorily used for Kalakand

making. As per experiment,  $T_1$  with 15% Ash gourd pulp was found to be best among the three.

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