Study the Effect of Addition of Kinnow Juice on Sensory Properties of *Kalakand*

Abstract Kalakand was prepared from buffalo milk (standardized with 6 per cent fat and 9 per cent SNF) with constant level of sugar (6 per cent by volume of milk) and different levels of kinnow juice (10, 15, 20 and 25 part by vol. of milk). It was observed that the overall acceptability score for treatment T1, T2, T3, T4 and T5 were 8.31, 8.37, 8.54, 8.19 and 7.83 respectively. As the level of kinnow juice in kalakand increases the overall acceptability score also increases upto treatment T3, thereafter it was decreased. The treatment (T3) comprises kinnow juice @ 15 per cent secured maximum score with 8.54 and lowest score was found to be 7.83 in treatment T5.

Key words: Sensory evaluation, kalakand, Kinnow juice, Flavour, Color and appearance, Body and texture and Overall acceptability

Introduction: Milk is a food of outstanding interest, not least because it was designed to be a complete food for young growing animals. A balanced diet is essential for proper health and growth.Among the indigenous milk products kalakand occupies a prominent place in India especially in the eastern part of India. Now a day's getting popular in northern and central part of India. Kalakand is the indigenous milk product obtained by heat Desiccation /concentration of whole standardized milk with subsequent addition of Proper coagulant and sugar. Among the indigenous milk products kalakand occupies a prominent place in India especially in the eastern part of India. Now a day's getting popular in northern and central part of India. Kalakand is the indigenous milk product obtained by heat Desiccation /concentration of whole standardized milk with subsequent addition of Proper coagulant and sugar. Kinnow is a member of Rutaceae family that belongs to order Sapindales and Class magnoliopsida. Kinnow has 3rd rank after banana and mango. Indian states like Panjab, Haryana, Rajasthan, Himachal Pradesh, Jammu and Kashmir are major Growing regions. Kinnow has origin in South East Asia. Worldwide, it is well known for its medicinal properties and nutrients rich juice (Chopra et al., 2004; Kelebek et Al., 2008) **[1], [2]**. Kinnow juice is good source of vitamin-C and various antioxidant Compounds that are require to sustain healthy life style Hence, considering the benefits of fruits in the human diet with respect to its Nutritional, medicinal values and technological properties, it was decided to

undertake Research work on, "**Study the Effect of Addition of Kinnow Juice on Sensory Properties of *Kalakand***".

Materials and Method

Treatment details

Kinnow Juice was added at different levels viz., 0, 10, 15, 20 and 25 percent on the basis of parts of milk in T1, T2, T3 T4 and, T5 .

Treatment details:

Preparation of *kalakand* with addition of kinnow juice following treatment combinations was taken for study:

T1= 100 parts of Buffalo milk + 0 parts of kinnow juice.

T2= 90 parts of Buffalo milk + 10 parts of kinnow juice.

T3= 85 parts of Buffalo milk + 15 parts of kinnow juice.

T4= 80 parts of Buffalo milk + 20 parts of kinnow juice.

T5= 75 parts of Buffalo milk + 25 parts of kinnow juice.

In above all preparation, sugar will be added @ 6 % of original volume of milk.

Preparation of *kalakand*:

The preparation of *kalakand* from buffalo milk standard method are used given by De (1982) **[3]** with slight modification.

Buffalo milk

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Filtration/clarification

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Standardization (6 per cent fat and 9 per cent SNF)

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Boiling of milk (20-25 minutes)

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Addition of citric acid @ 0.02 % (w/v of milk)

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Stirring till semisolid consistency

↓

Addition of kinnow juice (40°C)

↓

Addition of sugar @ 6 per cent and mix well

↓

Keep on low fire for five minutes with continuous stirring

↓

Setting of Kalakand in greased trays

↓

Cool and store at room temperature (25-30°C).

Flow-diagram preparation of kalakand with addition of kinnow juice.

Sensory evaluation of the product

Sensory evaluation of *kalakand* was carried out by the panel of judges selected from the staff of Department Of Animal Husbandry and Dairy, College of Agriculture, Parbhani. It will be evaluated for colour and appearance, flavour, body and texture, and overall acceptability. Score card will provide to all judges, comparing "9-point hedonic scale" developed by Quarter Master Food and Container Institute, U.S.A. (Gupta, 1976). **[4]**

Statistical Analysis:

The data obtained will be analyzed statistically by using Completely Randomized Design (CRD) as per Panse and Sukhatme (1985). **[5]**

RESULTS AND DISCUSSION

Table no. 1 Effect of various level of kinnow juice on sensory properties of *kalakand.*

Treatments	**Flavour**	**Colour and appearance**	**Body and texture**	**Overall acceptability**
T1	8.17	8.50	8.26	8.31
T2	8.25	8.44	8.42	8.37
T3	8.49	8.57	8.58	8.54
T4	8.19	8.23	8.22	8.19
T5	7.91	7.69	7.91	7.83
CD@5	0.1110	0.2212	0.2466	0.0470

1. Flavour of kinnow juice *kalakand*

Flavour of *kalakand* was the sum of taste and aroma. Under different treatment combination kinnow juice *kalakand* was determined. The average flavour score for control *Kalakand* (T1) and *Kalakand* prepared from different level of kinnow juice viz. 10, 15, 20 and 25 per cent (T2, T3, T4 and T5) are depicted in Table 1. It may be apparent from table 1 the

flavour score for various treatments ranged between 7.91 to 8.49. The score for treatment T3 (8.49) was maximum followed by T2 (8.25), T4 (8.19), T1 (8.17) and T5 (7.91). The acceptable maximum score was for treatment T3 (8.49) which have 15 parts of kinnow juice. The lowest score was recorded in treatment T5 (7.91) which contain 25 parts of kinnow juice having maximum acidity contain. This showed that as the level of kinnow juice increases, the flavour score of *kalakand* also increases to treatment T3 (15 parts of kinnow juice), but in treatment T4 (20 parts of kinnow juice) and T5 (25 parts of kinnow juice) the flavour score decreases. It showed that the level of kinnow juice at treatment T3 are the best as compare to rest of all treatments.

The result obtained from research work are discord with Sawant (2006) **[6]** of *kalakand* due to addition of sapota pulp and found that the increase in level of sapota pulp decrease flavour score

The result obtained from research work are discord with Dhanawade *et. al*. (2006) **[7]** of *kalakand* due to addition of safflower milk and found that the increase in level of safflower milk decrease flavour score from treatment T0 to T3 (8.75 to 6.40).

2. Colour and appearance of kinnow juice *kalakand*

Colour of any product is ideal and basic sensory cognition that appeals to the consumer for its acceptability or rejection. Colour and appearance score of kinnow juice *kalakand* under different treatment combination was determined. The average score for control *Kalakand* (T1) and *Kalakand* prepared from different level of kinnow juice viz. 10, 15, 20 and 25 per cent (T2, T4, T4 and T5) are depicted in Table 1.

It may be apparent from table 1 the colour and appearance score for various treatments ranged between 7.69 to 8.57. The score for treatment T3 (8.57) was maximum followed by T2 (8.51), T1 (8.44), thereafter it was decreased from treatment T4 (8.23) and T5 (7.69). The highest acceptable score was for T3 (8.57) which have 15 parts of kinnow juice. The lowest score was for treatment T5 (7.69) with very dull appearance having 25 parts of kinnow juice. Among the added levels of kinnow juice, the highest score for colour and appearance was *kalakand* having 15 parts of kinnow juice with faint orange colour and appeared fresh whereas *kalakand* obtained from 25 parts of kinnow juice gave dark shades with totally dull appearance which was not liked so many judges. The significant differences were found between treatments T1, T2, T4, T4 and T5 respectively. From the above results, it was found that treatment T3 (15 parts of kinnow juice) was best among all other treatments.

The result obtained from research work are discord with Dhanawade (2006) of preparation of kalakand with safflower milk and reported that that increase level of safflower milk the colour and appearance score decreased from treatment T0 (8.80), T1 (7.80), T2 (7.40) and T3 (6.40) T4 respectively.

Body and texture of kinnow juice *kalakand*

Body and texture of kinnow juice *kalakand* under different treatment combination was determined. Body and texture affect physical nature of *kalakand*. The average body and texture score for control *Kalakand* (T1) and *Kalakand* prepared from different level of kinnow juice viz. 10, 15, 20 and 25 per cent (T2, T3, T4 and T5) are depicted in Table 1.

It may be apparent from table no. 1 the body and texture score for various treatments ranged between 7.91 to 8.58. The score for treatment T3 (8.58) was maximum followed by T2 (8.42), T1 (8.26), T4 (8.22) and T5 (7.91) respectively. The acceptable highest score was for treatment T3 (8.58) which have 15 parts of kinnow juice. The lowest score was for treatment T5 (7.91) which have 25 parts of kinnow juice and formed more granular texture in *kalakand* by increasing acidity. The results show that the treatment T3 (15 parts of kinnow juice) indicate that the alter significant body and texture, whereas increasing level of kinnow juice which affect body and texture of *kalakand* they form sticky body and big granular texture. This may due to the increase in moisture content and acidity in *kalakand* with addition of kinnow juice.

The result obtained from research work are discord with Dhanawade (2006) of preparation of kalakand with safflower milk and reported that that increase level of safflower milk the body and texture score decreased from treatment T0 (8.42), T1 (7.80), T2 (7.58) and T3 (7.00) respectively.

4. Overall acceptability of kinnow juice *kalakand*

Overall acceptability of *kalakand* under different treatment combination of kinnow juice *kalakand* was determined. The average Overall acceptability score for control *Kalakand* (T1) and *Kalakand* prepared from different level of kinnow juice viz. 10, 15, 20 and 25 per cent (T2, T3, T4 and T5) are depicted in Table 1. It may be apparent from table no. 1 the Overall acceptability

score for various treatments ranged between 7.83 to 8.54. The score for treatment T3 (8.54) was maximum followed by T2 (8.37), T1 (8.31), T4 (8.19) and T5 (7.83). The acceptable maximum score was for treatment T3 (8.54) which has 15 parts of kinnow juice. The lowest score was recorded in treatment T5 (7.83) which contain 25 parts of kinnow juice. Since the score of all the samples were above 5.5, it was defined that kinnow juice which prepared under all treatments was acceptable. Total sensory score of kinnow juice *kalakand* differed significantly due to the different levels of kinnow juice added. Among all the samples, T3 sample has greasier with grainy texture, good flavour with no deleterious effect on colour and appearance. It was having significant natural flavour of kinnow juice and smooth to granular texture. Therefore, it was liked by all judges among all the treatments including control sample.

Verma (2018) **[8]** narrated the overall acceptability score of *kalakand* blended with coconut milk and sapota pulp. In that score was 7.5, 8.0, 8.4 and 8.9 which however described that overall acceptability score increased first then it goes on decreasing.

CONCLUSION

The level of addition of Kinnow juice (10, 15, 20 and 25 part) was standardized on the sensory sensory score for higher and lower level than the standardized level of kinnow juice addition.

From the results of present investigations, it was revealed that:

1) Kinnow juice could be successfully used in preparations of dairy product like *kalakand*.

2) Use of kinnow juice treatment T3 (15 parts of kinnow juice) of *kalakand* preparation was more acceptable and desirable.

3) For all sensory evaluation scores, it was observed that treatment T3 (15 parts of kinnow juice) was superior to other treatments with respect to colour and appearance, body and texture, flavour and overall acceptability.

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