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To study the sensory attributes of litchi juice fortified *Dahi*

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Abstract
In modern time people wants to take every nutritive value in one product, which have high demand in every country. So, by analyzing all prospects, new process of *Dahi* preparation was developed which will increase the nutritive value as well as impart better sensory characteristics. During the development of the product, different level of Litchi juice was added, and most appropriate level was analyzed through sensory analysis of the product. Litchi juice was added at the rate of 10%, 15%, 20% on the basis of milk and sugar was kept at the rate of 5% of milk weight. During the course of analysis, it was found that, product containing Litchi juice in concentration of 15% was most suitable on sensory basis and was selected for further analysis. Ultimately, we can say that, functional value of *Dahi* can be increased by the addition of Litchi juice up to a significant extent.

Keywords: sensory attributes, litchi juice, *Dahi*

Introduction
Milk and milk products are important food for vegetarians as these are the only source of animal protein to them. Being perishable by nature it gets spoiled easily if not stopped properly or converted into other products. Since time immemorial, a significant proportion of milk has been used in India for preparing a wide variety of dairy delicacies. *Dahi* is of great importance in Indian subcontinent since ancient times. It is a dairy product that has being used in ritual ceremony which is known as "*Panchamrita*" (a mixture of five foods) which is generally distributed as Prasad at the end of the Pooja. *Dahi* is a popular product of milk that is consumed either in the main course of the meal, a refreshing drink or dessert. Due to its so many benefits, curd is one of the most popular food items around the world. The benefits of curd that you experience are usually due to the nutrients available in this dairy product. For instance, if you consume 170.10g of curd, you will provide your body with 100-150 calories, 2g of saturated fat, 3.5g of fat, 20g of sugar and about 8-10g of protein. It also provides your body with about 20% of your daily vitamin D portion with 20% of your daily calcium value.
The litchi (*Litchi chinensis* Sonn.) An important sub-tropical evergreen fruit crop belonging to family *Sapindaceae*, is believed to have originated in China, where it has been grown in Southern Guangdong state for thousands of years. India is the second largest producer of litchi in the World after China. Other major producing countries are Thailand, Australia, South Africa, Madagascar and Florida in US. In India Presently, litchi is cultivated on 93 thousand Ha with total production exceeding 568 thousand MT (2016-17). In Bihar Cultivated large area 32.10 thousand Ha and production was 198.00 thousand MT (2016-17) (http://www.agricoop.nic.in, 2018). Considering the health benefits of the litchi fruit is low in calories and rich in dietary fibres, so it is very good choice for weight conscious individuals. Research studies suggest that oligonol, a low molecular weight polyphenol found abundantly in litchi fruit. Oligonol has been found to have several anti-oxidants, anti-influenza virus actions. In addition, it helps improve blood flow in organs, reduce weight, and protect skin from harmful UV rays. Litchi fruit is rich sugar ranging from 40.2 to 90 mg per 100 g of pulp, it also contains protein (0.8-0.9%), fat (0.3%), pectin (0.424%) and minerals (0.7%), specially calcium, phosphorus and iron.

Materials and Methods
The present investigation was conducted at the laboratory of Department of Animal husbandry and dairying, Institute of Agricultural Sciences, Banaras Hindu University. The Litchi Fortified *Dahi* was evaluated on 9-point hedonic scale [Moroney (1975)]. Evaluation was done by panel of judges comprising of 15 most experienced members from the Department of Animal Husbandry and Dairying and Other Department of Institute of Agricultural Sciences,

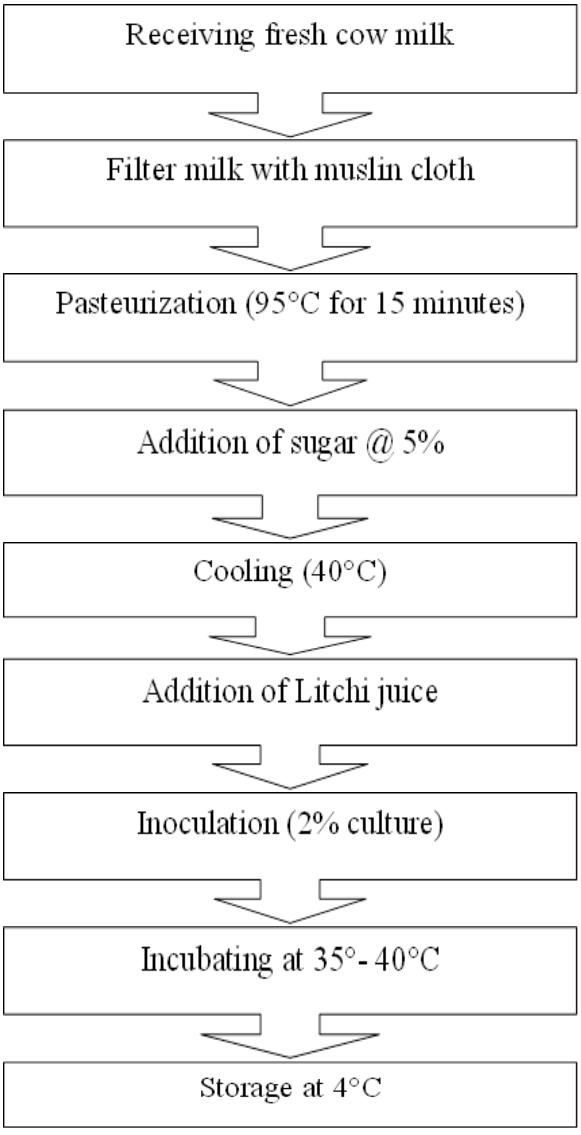
Banaras Hindu University. The Scores were compiled, and average score was estimated for each attribute of samples.

Various combination of preparation of litchi fortified *Dahi*

Treatment	Cow Milk (ml)	Litchi juice (ml)	Sugar
T_0 (0%)	200	0	0
T_1 (10%)	200	20	5%
T_2 (15%)	200	30	5%
T_3 (20%)	200	40	5%

(0% to 20% -Amount of litchi juice on the basis of milk)

Flowchart of litchi fortified *Dahi*



Results and Discussion

The panels of judges consisting of fifteen members were given samples of fresh samples of *Dahi* from four treatments for evaluation of their organoleptic qualities. Each treatment was given code numbers, which was changed during each replication to avoid its identity. The score was given by the judges for individual quality attributes was computed to get means and these means were subjected to statistical analysis.

Colour and appearance of litchi fortified *Dahi*

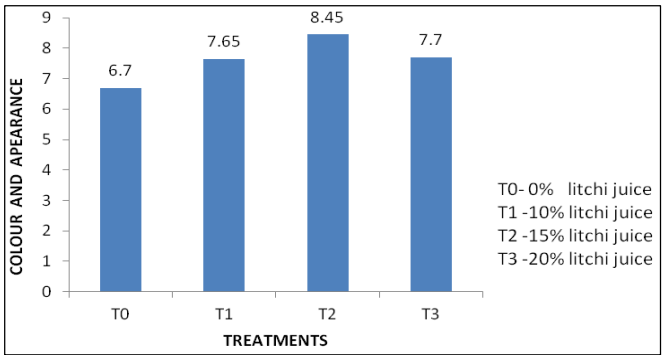
Statistical analysis showed that there was significant difference score in different *Dahi* samples. Highest flavor score was found in T_2 (8.45) which was attractive and hard uniform body smooth and glossy surface without any free wheying off on top. In addition of litchi juice there were not any changes in colours. Lowest score was obtained in T_0 (7.59).

Colour and appearance of litchi fortified *Dahi*

Treatment	R_1	R_2	R_3	R_4	Total	Mean
T_0	6.70	6.80	6.60	6.70	26.80	6.70
T_1	7.80	7.50	7.60	7.70	30.60	7.65
T_2	8.50	8.45	8.40	8.45	33.80	8.45
T_3	7.65	8.00	7.60	7.55	30.80	7.70
TOTAL	30.65	30.75	30.20	30.40		

Analysis of variance of colour and appearance in litchi fortified *Dahi*.

For comparing	SE(d)	CV%	SE.m.±	CD
Product	0.092421	1.714141	0.065352	0.209071



Graphical presentation of Colour and appearance of litchi fortified *Dahi*

Body and texture

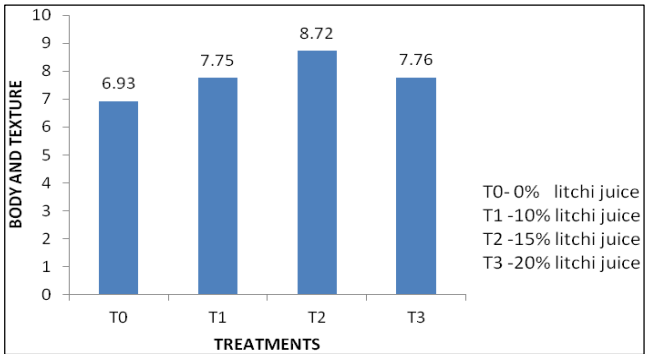
Statistical analysis showed that there was significant difference score in different *Dahi* samples. Highest score was found in T_2 (8.72) litchi fortified *Dahi* were smooth and glossy while cut surface was firm and free from crack and gas bubbles. The *Dahi* sample T_0 (6.93) obtained lowest score than other samples of *Dahi*. This score was minimum as it had too weak body and there was wheying off *Dahi*.

Body and texture of litchi fortified *Dahi*

Treatment	R_1	R_2	R_3	R_4	Total	Mean
T_0	7.00	6.95	6.92	6.85	27.72	6.93
T_1	7.70	7.75	7.80	7.75	31.00	7.75
T_2	8.70	8.72	8.74	8.72	34.88	8.72
T_3	7.77	7.71	7.80	7.76	31.04	7.76
Total	31.17	31.13	31.26	31.08		

Analysis of variance of body and texture in litchi fortified *Dahi*.

For comparing	SE(d)	CV%	SE.m.±	CD
Product	0.031136	0.565248	0.022016	0.070434



Graphical presentation of body and texture of litchi fortified *Dahi*

Flavour

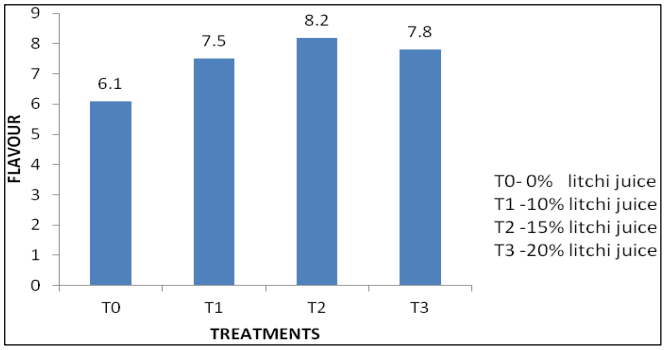
Statistical analysis showed that there was significant difference score in different *Dahi* samples. Highest score was found in T_2 (8.2) litchi fortified *Dahi* as it a contain delicate, pleasant and sweetish acid taste with maximum aroma. The lowest score was found in T_0 (6.1), as it had no fruit juice and therefore lesser development of pleasant aroma as well as taste.

Flavour of litchi fortified *Dahi*

Treatment	R_1	R_2	R_3	R_4	Total	Mean
T_0	6.30	6.10	5.95	6.05	24.40	6.1
T_1	7.55	7.60	7.50	7.70	30.35	7.5
T_2	8.25	8.20	8.30	8.30	33.05	8.2
T_3	7.85	7.80	7.85	7.86	31.36	7.8
Total	29.95	29.7	29.6	29.91		

Analysis of variance of flavour in litchi fortified *Dahi*

For comparing	SE(d)	CV%	SE.m.±	CD
Product	0.031136	0.565248	0.022016	0.070434



Graphical presentation of body and texture of litchi fortified *Dahi*

Overall acceptability

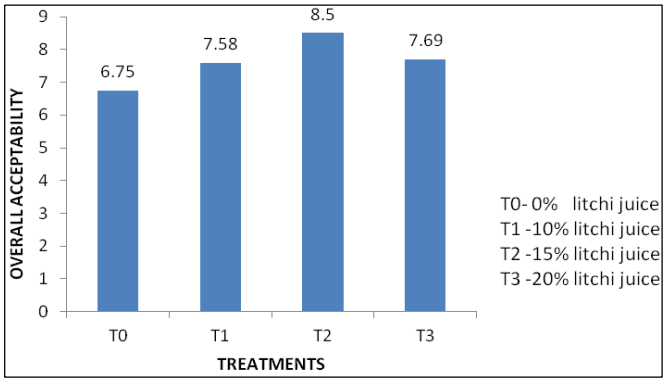
Statistical analysis shows that all samples of *Dahi* were significantly differ from each other for overall acceptability. Litchi fortified *Dahi* of treatment T_2 (8.5) secure highest score as compared to other samples of *Dahi*. People always need new flavor products that can attract them, litchi is the fruit called as "Queen" so this new litchi fortified *Dahi* was accepted. The sample of *Dahi* was prepared by 15% litchi juice. The T_2 *Dahi* were attractive pleasant flavour, smooth, and firm body and consistency and glossy surface without any free wheying off from litchi fortified *Dahi*. The lowest score was obtained in T_0 (6.75) because there were no use of litchi juice, so as compared to litchi fortified *Dahi* the normal *Dahi* as lower acceptability.

Overall acceptability of litchi fortified *Dahi*

Treatment$	R_1	R_2	R_3	R_4	Total	Mean
T_0	6.80	6.70	6.70	6.80	27.00	**6.75**
T_1	7.67	7.75	7.50	7.40	30.32	**7.58**
T_2	8.45	8.50	8.60	8.45	34.00	**8.50**
T_3	7.70	7.76	7.50	7.80	30.76	**7.69**
Total	30.62	30.71	30.3	30.45		

Analysis of variance of overall acceptability in litchi fortified *Dahi*

For comparing	SE(d)	CV%	SE.m.±	CD
Product	0.084705	1.570006	0.059896	0.191617



Graphical presentation of overall acceptability of litchi fortified *Dahi*

Conclusion

This experiment was conducted to increase the utilization of litchi fruit for producing nutritional value increased *Dahi*, i.e litchi fortified *Dahi*. In the production of litchi fortified *Dahi* different level of litchi juice was added as 10%, 15%, and 20% and sugar at 5% level constant in each treatment. In this experiment there was four replications of each treatment and control and three treatments was done in the dairy laboratory. Process optimization of litchi fortified *Dahi* was done by the result of sensory study. It was found that *Dahi* sample prepared by 15% litchi juice and 5% sugar get highest score for overall acceptability on 9-point Hedonic scale. Litchi fortified *Dahi* and normal *Dahi* colour was same i.e. cream white colour. Body and consistency was smooth and glossy while cut surface was firm and free from crack and gas bubbles. Flavour was delicate, pleasant and sweetish acid taste with maximum aroma due to litchi flavour present in it so taste and smell also increased. Wherever, in 10% litchi juice prepared *Dahi* there was absence of good flavour and in case of 20% Litchi juice fortified *Dahi*, the flavour was more than adequate level.

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