International Journal of Chemical Studies

P-ISSN: 2349–8528
E-ISSN: 2321–4902
IJCS 2018; 6(4): 2183-2187

Received: 11-05-2018
Accepted: 19-06-2018

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To study the sensory characteristics of Herbal Honey *Lassi*

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Abstract
The purpose of our study was to investigate the effect of Honey and *Tulsi* (*Ocimum sanctum*) on sensory and chemical properties of herbal honey *Lassi* and the study was conducted with the possibility of developing a dairy product with health benefits beyond those of traditionally formulated products. Incorporation of honey at 3 levels, viz., 8%, 10% and 12% v/v was tested and *Tulsi* was incorporated with the rate of 2% on the basis of volume of *Lassi.* The best sensory score was observed in the case of 10% honey and 2% *Tulsi.* The chemical characteristics like Fat, moisture, protein content of the product shows decreasing trend and acidity, total solid and ash content shows increasing trend with increasing concentration of Honey. After analyzing the results we can say that, herbal honey *Lassi* can be prepared by using 10% honey and 2% *Tulsi* with increased functional property.

Keywords: *Tulsi*, Herbal, *Lassi*, functional, sensory

Introduction
During last 15 years, Milk Cooperatives have converted about 20.0 percent of milk procured into traditional and value-added products that offers about 20.0 percent higher revenue. This share of value-added products is estimated to increase to 30.0 percent by 2021-22. Consumption of value added dairy products are experiencing significant annual growth rates of around 15-20 percent due to rising disposable income, urbanization, dual income households and other demographic shifts. Cultured dairy products with many therapeutic properties are an excellent medium to generate an array of products that fit into the current consumer demand for health-based foods. Fermented milk products are known for their excellent nutritional characteristics due to improved digestion and absorption of amino acids and the presence of easily assimilable proteins resulting from proteolytic activity of starter cultures and increased content of vitamins (Sarkar, 2008).

Lassi, is a popular beverage in the western and northern states of India. *Lassi* contains appreciable amounts of milk protein, phospholipids and nutritive value of fermented milk product that are derived from the nutrients in form of various metabolites produced by lactic acid bacteria during fermentation. Fermented milk products are highly recommended to the lactose intolerance individuals because of the reduced lactose content. Besides this, lactic acid also helps in the absorption of calcium and phosphorous in the intestine.

Honey is an important and unique food product containing bioactive compounds derived from bees and plants. Bioactive components in honey which confers health benefits includes a number of flavonoids, phenolic acids, ascorbic acid, tocopherols, alkaloids, number of aromatic acids and carotenoids. In Ayurveda, therapeutic uses of honey are very well stated. Honey is used to cure ophthalmological disorders such as catarrhal conjunctivitis, keratitis, etc. (www.boloji.com/ayurveda/av045.htm). It can be used by diabetic patients. Honey also includes anti-inflammatory activity and anti-ulcerative activity. The hygroscopic nature of honey enables the wound to dry quickly, hence heals different types of wounds such as skin ulcers, leg ulcers, sickle cell ulcers, diabetic foot ulcers etc.

Ocimum sanctum popularly known as *'Tulsi'* in hindi and 'Holy basil' in english is one of the sacred herbs for Hindu in Indian subcontinent. It has versatile role to play in traditional medicine. Daily consumption of *Tulsi* is said to prevent disease, promote general health, wellbeing and longevity and assist in dealing with the stresses of daily life. In addition to these health-promoting properties, *Tulsi* is recommended as a treatment for a range of conditions including anxiety, cough, asthma, diarrhoea, fever, dysentery, arthritis, eye diseases, otalgia,

indigestion, hiccups, vomiting, gastric, cardiac and genitourinary disorders, back pain, skin diseases, ringworm, insect, snake and scorpion bites and malaria.

Material and Methods

The experiment studies were conducted in the department laboratory, Department of Animal Husbandry & Dairying, Institute of Agricultural Sciences, Banaras Hindu University, Varanasi (U.P.), India.

***Tulsi* (*Oscimum sanctum Linn.*):** *Tulsi* grown in the Vishwanath Temple situated in the university campus was used for the project work.

Milk: Fresh cow milk was procured from The Dairy Farm run and maintained by Institute of agricultural sciences, Banaras Hindu University.

Starter Culture: *Dahi* cultures required for the study were obtained from the Market.

Honey: "Sabour Honey" is used for preparation of *Lassi*. Sabour Honey is manufactured by "Bee keeping-cum-Honey Production Unit" Bihar Agricultural University (BAU), Sabour Bhagalpur, Bihar.

Sensory Evaluation of herbal honey *Lassi*: The product was subjected to the sensory evaluation by an expert panel of nine judges for colour and appearance, flavour, body and texture and overall acceptability criteria. The score given by them on 9 point hedonic scale were taken to determine the acceptability level of product.

Flow diagram for the preparation of herbal honey *Lassi*

Receiving of fresh cow milk
↓
Pre - heating (35 °C)
↓
Filtration / Clarification
↓
Standardization (at 4% fat and 9% SNF)
↓
Homogenization (176 kg/cm)
↓
Pasteurization (63 °C, 30 min)
↓
Heating (85 °C/15 min)
↓
Cooling (35±2 °C)
↓
Inoculation with starter cultures
↓
Incubation (42 °C) till desired acidity obtained
↓
Breaking of *Dahi* and cooling (< 7 °C)
↓
Mixing with mechanical stirrer
↓
Addition of honey (10%)
↓
Addition of *Tulsi* leaf extract (2%)
↓
Uniform mixing
↓
Pouring into earthen cups (100 ml)
↓
Storage at 7±1°C

The treatments used for present study

T_0	100 % *Lassi* + 0 % honey + 0% *Tulsi* extract
T_1	100 % *Lassi* + 6 % honey + 2% *Tulsi* extract
T_2	100 % *Lassi* + 8 % honey + 2% *Tulsi* extract
T_3	100 % *Lassi* + 10 % honey + 2% *Tulsi* extract
T_4	100 % *Lassi* + 12 % honey + 2% *Tulsi* extract

Results and Discussion

Sensory Analysis

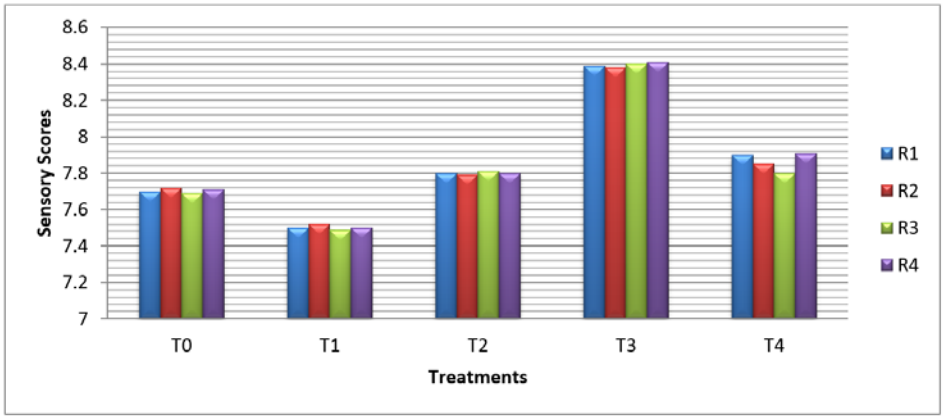
Flavour

Herbal honey *Lassi* added with 10 percent honey gave highest flavor score i.e. 8.16 among different levels of honey addition. The flavor score decreased from 8.20 to 7.30 with an average of 7.55 with different honey concentration. But statistically, the effect of honey on flavor score was non-significant. Significantly highest score (8.16 out of 9) was obtained by herbal honey *Lassi* with 10% honey and 2% *Tulsi* followed by herbal honey *Lassi* prepared with 12% honey and 2% *Tulsi* (7.75 out of 9).

Sensory score of flavour of herbal honey *Lassi* by different levels of honey and *Tulsi*:

Sr. No.	Treatment	Observations				Mean
		R_1	R_2	R_3	R_4	
1	T_0	7.40	7.38	7.44	7.50	7.73
2	T_1	7.3	7.35	7.39	7.42	7.36
3	T_2	7.5	7.48	7.49	7.45	7.48
4	T_3	8.1	8.20	8.18	8.16	8.16
5	T_4	7.7	7.80	7.79	7.71	7.75

SE(d)	CV%	SE. m. ±	CD
0.030221	0.559638	0.02137	0.065847



*T=Treatments of *Lassi* and *Tulsi* with various levels of honey. *R = represents different Replication of a treatment.

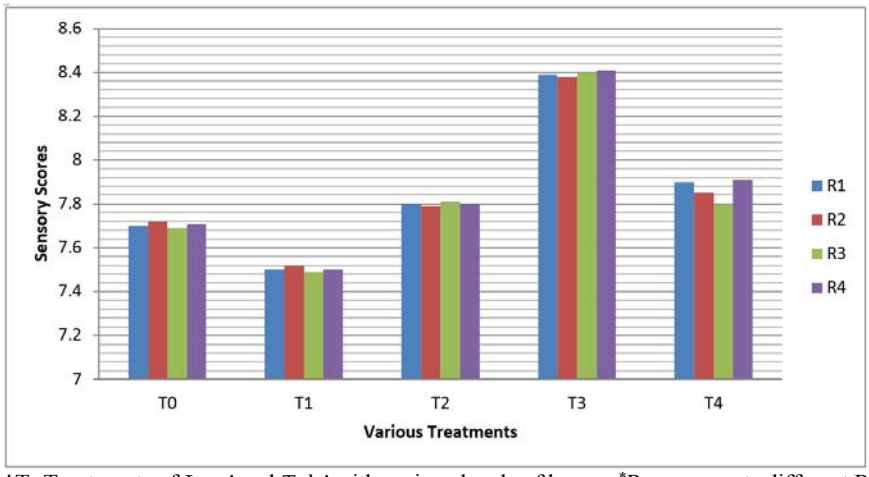
Sensory score for Flavour of herbal honey *Lassi* with different levels of honey:

Body & Texture

Sensory score of body and texture of Herbal honey *Lassi* with different levels of honey and *Tulsi*.

S. No	Treatment	Observation				Mean
		R_1	R_2	R_3	R_4	
1	T_0	7.50	7.51	7.49	7.52	7.51
2	T_1	7.60	7.61	7.59	7.62	7.61
3	T_2	7.80	7.79	7.81	7.75	7.61
4	T_3	7.89	8.10	7.90	8.00	7.97
5	T_4	7.60	7.59	7.62	7.61	7.79

SE(d)	CV%	SE. m.±	CD
0.033609	0.617683	0.023765	0.073228



*T=Treatments of *Lassi* and *Tulsi* with various levels of honey. *R= represents different Replication of a treatment.

Sensory score for Body and Texture of herbal honey *Lassi* with different levels of honey.

The body and texture of Herbal honey *Lassi* was significantly affected due to addition of honey. Statistically, there was significant ($P<0.05$) effect of honey and *Tulsi* on body and texture scores of Herbal honey *Lassi.* Due to less apparent viscosity the control samples gave the least body and texture score as compared to added samples. *Lassi* added with 10 percent honey scored the highest (7.97) followed by 12 percent (7.79).

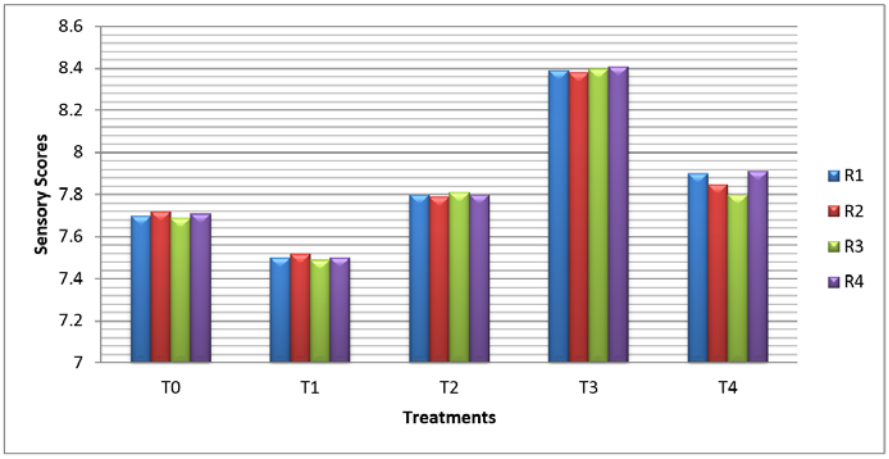
Colour & Appearance

The highest score was obtained by *Lassi* with 10 percent honey and 2 percent *Tulsi* (8.19). The remaining 8 percent and 12 percent treatment show significantly low score. Hence, it indicated that increase in level of honey resulted in better appearance and colour up to 10 percent honey 2 percent *Tulsi* and thereafter decreases gradually.

Sensory score of colour and appearance of herbal honey *Lassi* with different levels of honey and *Tulsi.*

S. No	Treatment	Observations				Mean
		R_1	R_2	R_3	R_4	
1.	T_0	7.8	7.7	7.79	7.81	7.78
2.	T_1	7.6	7.62	7.59	7.62	7.61
3.	T_2	7.8	7.79	7.81	7.81	7.80
4.	T_3	8.2	8.16	8.21	8.20	8.19
5.	T_4	7.6	7.59	7.62	7.59	7.60

SE(d)	CV%	SE. m.±	CD
0.017017	0.308715	0.012033	0.037077



*T=Treatments of *Lassi* and *Tulsi* with various levels of honey.*R= represents different Replication of a treatment.

Sensory score for Colour and Appearence of herbal honey *Lassi* with different levels of honey.

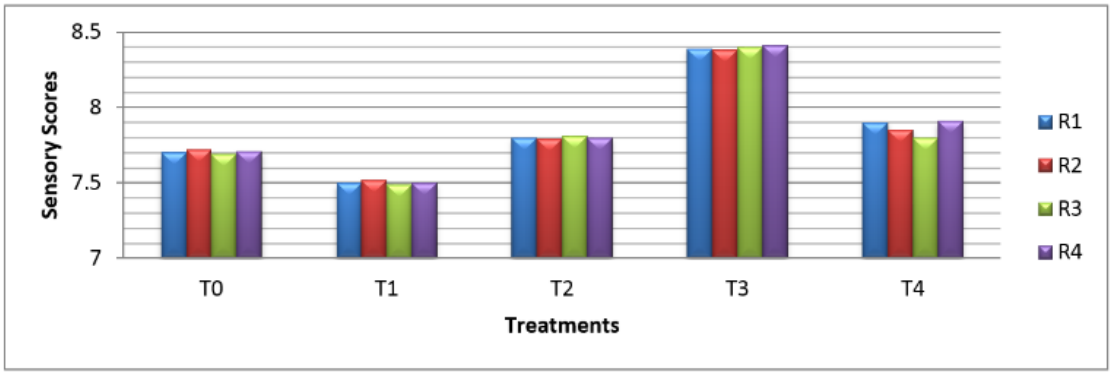
Overall Acceptability

Sensory scores of overall acceptability of herbal honey *Lassi* with different levels of honey and *Tulsi.*

S. No	Treatment	Observations				Mean
		R_1	R_2	R_3	R_4	
1	T_0	7.70	7.72	7.69	7.71	7.71
2	T_1	7.50	7.52	7.49	7.50	7.50
3	T_2	7.80	7.79	7.81	7.80	7.80
4	T_3	8.39	8.38	8.40	8.41	8.40
5	T_4	7.90	7.85	7.80	7.91	7.87

* T =Different Treatments *R = Replications

SE(d)	CV%	SE. m.±	CD
0.017416	0.313626	0.012315	0.037947



*T=Treatments of *Lassi* and *Tulsi* with various levels of honey. *R= represents different Replication of a treatment.

Sensory score for Overall acceptability of herbal honey *Lassi* with different levels of honey:

The overall acceptability of herbal honey *Lassi* was significantly affected due to addition of honey and *Tulsi* at different levels. The average score for overall acceptability attributes of Herbal honey *Lassi* prepared under each treatment ranged from 7.69 to 8.41.
The significant highest score of 8.40 was received by Herbal honey *Lassi* prepared with 10% honey and 2% *Tulsi* which was superior to remaining treatment.

Conclusion
Current trends and changing consumer needs indicate a great opportunity for innovation in development of herbal and plant based new value added dairy products. During sensory analysis, it was revealed that addition of honey at 10% level showed relatively high score for flavor, colour and appearance and overall acceptability as compared to control, 8% and 12% honey addition. Hence, honey concentration of 10% was selected for manufacturing of herbal honey *Lassi* and for further shelf-life study. So, from this study it can be concluded that *Tulsi* extract can be added to the *Lassi* at 2% level in combination with 10% honey.

References

1. AGMARK. Honey grading and marketing rules, section - In: AGMARK act, 2003, 1937, 2008, 3:2.
2. Aneja RP, Mathur BN, Chandan RC, Banerjee AK. Technology of Indian Milk Products, A Dairy India Publication, Delhi, 2003, 125-126.
3. Aneja RP, Mathur BN, Chandan RC, Banerjee AK. In: Technology of Indian Milk Products. A Dairy India Publication, Delhi, India, 2002, 8-10.
4. Aneja RP, Mathur BN, Chandan RC, Banerjee AK. Technology of Indian Milk Products. Dairy India Publication, 2001, 462.
5. Anon. Butter milk: A remedy for many diseases. Indian Dairyman. 2003; 55(6):21.
6. De S. Outlines of dairy technology. New Delhi: Oxford University Press, 1980.
7. Gupta SK, Prakash J, Srivastava S. Validation of claim of *Tulsi*, Ocimum sanctum Linn as a medicinal plant. Indian Journal of Experimental Biology. 2002; 40(7):765-773.
8. Indian Standards. IS: 1479. Methods of testing for dairy industry. Rapid examination of milk. Indian Standards Institution, New Delhi, 1960, I.
9. Prajapati JB, Nair BM. The history of fermented foods. In Fermented Functional foods edited by Edward R. Farnworth, CRC Press, Boca Raton, Florida. 2003, 1-25.