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Sensory quality of lassi prepared by using honey and stevia

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Abstract

The present investigation entitled, "Efficacy of herb extracts on oxidative stability of ghee" was undertaken in laboratory of Department of Animal Science and Dairy Science, Post Graduate Institute, Mahatma Phule Krishi Vidyapeeth, Rahuri, Dist. Ahmednagar, (M.S.) during period 2018-2019.

The present study entitled "Preparation of lassi using honey and stevia as sweetener" was carried out with the objective to replace cane sugar in lassi with honey and stevia. This is mainly important for diabetic patients who are restricted to take sugar because it can imbalance the blood sugar. The lassi was prepared by using standardized milk (3.5% fat and 8.5% SNF) with addition of 10% cane sugar (T₀), then lassi with 8% honey (T₁), 75µl stevia (T₂) and combination of thereof were prepared and evaluated for sensory.

So it may be concluded from the present study that, sensorily most acceptable lassi can be prepared by addition of honey (8%) + stevia (75µl) per 100 ml lassi.

Keywords: Lassi, honey, cane sugar, stevia and sensory

Introduction

India is highest milk producing country in the globe, ranks first since nineties. India is well known as 'Oyster' of the global Industry. Dairy industry in India has been withstanding rapid growth with about 5% per annum, The main objective of Indian dairy industry is to manage the natural resources in a manner to upgrade milk processing using innovative technologies. (Anonymous, 2018. <http://indiamirror.com>)^[2].

Total milk production in India is about 176.35 MT during 2017-18 out of which 50-55% is used as liquid and rest of which is processed to concentrated, heat desiccated, coagulated and fermented dairy products about which fermented products share 7%, include Dahi, lassi, cheese, yoghurt etc. (The Economic Times, sat. June 8 2019).

Lassi is a ready-to-serve, fermented dairy product obtained after the growth of selected culture, usually lactic *streptococci*, in heat-treated milk followed by sweetening with sugar. It has a creamy consistency, sweetish rich aroma, and mild to acidic flavor, which makes the product refreshingly palatable. It is consumed as a cold, refreshing therapeutic beverage usually in summer. Sweetened lassi is prepared by breaking up the curd into fine particles by agitation, addition of required amount of sugar, water, and flavor. In general, most of the Indian traditional dairy products contain high fat and high sugar. Being aware of the impact of fat on health, today's health conscious consumer is looking for the low or reduced calorie Indian traditional dairy products (Raju & Pal 2009).

Lassi is a traditional popular drink that is hugely popular among the continent. Lassi is blended with spices and sometimes fruit. Traditional lassi is a sweet, savory drink, sometimes flavored with ground and roasted cumin. However, salty lassi contain salt and other spices, instead of sugar. It also comes in different forms as sweet lassi, bhang lassi, fruit lassi etc. Lassi is an age-old Punjabi drink which is generally consumed after meal. It also have some other benefits as in digestion, stomach problems, probiotics, muscle mass, energy giving, bone health, summer drink. (<https://www.nddb.coop/services>).

It is light on the stomach and contains lactobacilli, healthy bacteria that lubricate the intestines and aid in smooth digestion. Lassi is a healthy and natural remedy for stomach bloating. It helps in preventing constipation and other stomach problems as well as helps in increasing the muscle mass. Lassi is rich in protein and thus helps in giving mass to the muscles.

Lassi is a healthy summer drink that helps cooling the body temperature during hot summer days and cures prickly heat.

Sweetened or unsweetened lassi is very good for stomach, it helps to reduce summer-related gastro-intestinal problems and improves metabolism.

Honey is a sweet, viscous, food substance produced by honey bees and some insects. Honey gets its sweetness from the monosaccharides fructose and glucose and has about the same relative sweetness as sucrose (granulated sugar). It has attractive chemical properties for baking and a distinctive flavor when used as a sweetener. It has been used in medicine for over 5,000 years. Honey can replace sugar in meals, providing a healthier option. However, they also add browning to a dish.

The Honey has powerful anti-bacterial properties on at least sixty species of bacteria. According to research-based reviews on honey, it has been shown to decrease the severity and duration of diarrhea. Honey also promotes increased potassium and water intake, which is particularly helpful when experiencing diarrhea. (<https://www.medicalnewstoday.com>)

Honey reduced night-time coughing and improved sleep quality in children with upper respiratory infection to a greater degree than the cough medicine dextromethorphan. The WHO recommends honey as a natural cough remedy. (Anonymous, 2007).

Honey can be added to food and beverages to sweeten the taste without the negative health impact of added sugars. Its sweet taste makes it a ideal substitute for sugars in diet. However, since honey is still a sweetener, it is important to remain mindful of how much honey being is used. (National Honey Board).

According to the united states Department of Agriculture (USDA) nutrient database, one table spoon of honey contains 64 calories, 17.3 gm of sugars and 0 gm of fat and protein.

Stevia is a small perennial herb belonging to the *Asteraceae* family, in the genus *stevia*. Its scientific name is *stevia rebaudiana*. Some commonly referred names are honey leaf plant, sweet chrysanthemum, stevia herb parts are very low in calories. Parts by parts, its dry leaves possess roughly 40 times more sweetness than sugar. This sweetness quality in stevia is due to several glycoside compounds including stevioside, steviol bioside, rebaudiosides A-E, and dulcoside sweet leaf stevia, sugarleaf, etc.

Since the application of artificial sweeteners in dairy products is new, qualitative as well as quantitative information on the sweeteners degradation in dairy systems is necessary. Approval of new sweeteners, combined with the key role played by sweetener blends in the production of foods and beverages, has led us to analyze the sweetener (stevia) in an indigenous dairy product viz. lassi. (V. Jorge, 2012).

The natural sweetener found in plant called stevia rubediana, which is native to Brazil and Paraguay. The active chemical compound in stevia is steviol glycoside. It is having sweetness 30-150 times than normal sugar. Stevia is heat stable, pH stable and not fermentable. (Indra Prakash, 2014).

The use of stevia as culinary herb was known to the native Guarani tribes of Paraguay since centuries. Recent scientific

trials firmly establish that this sweet leaf herb has, indeed, much health benefiting plant-derived photochemical compounds that help control blood sugar, cholesterol, blood pressure in addition to its worth as a natural sweetener. Consumers are becoming more and more health conscious because of awareness about the undesirable effect of excess calories, fat and sugar. The consumption of low calorie sweeteners is on the rise due to increase in the number of obese and diabetic persons. Stevia, low calorie sweetener have been shown to play useful role in aiding people lose and maintain weight. Preventing obesity is an important factor in reducing the risk of type II diabetes.

Stevioside is a non-carbohydrate glycoside compound. Hence, it lacks the properties that sucrose and other carbohydrates possess. Stevia extracts like rebaudioside-A, are found to be 300 times sweeter than sugar. Besides, being a near-zero calorie food ingredient, stevia extracts have several unique properties such as long shelf life, high-temperature tolerance, non-fermentative. (<https://www.healthline.com/health/food-nutrition>)

The synergistic combination of sweeteners, known as multiple sweetener approach, has been found to increase low-calorie product choices for the consumer, performance of certain low-calorie sweeteners in certain products, reduce costs, and improve product taste and stability. (V. Jorge, 2012)

Materials and methods

Collection of milk

Fresh composite crossbred cow milk was procured from Research cum Development Project on Cattle, located at the Central Campus, M.P.K.V., Rahuri, Dist. Ahmednagar. The milk was collected immediately after morning milking.

Starter culture

Freeze dried pure culture of LF-40 *Lactococcus lactis* sub. spp. *lactis*, *Lactococcus lactis* sub. Spp *diacetalactis* and *Lactococcus lactis* sub. spp *cremoris* were obtained from the National Dairy Research Institute, Karnal, Haryana.

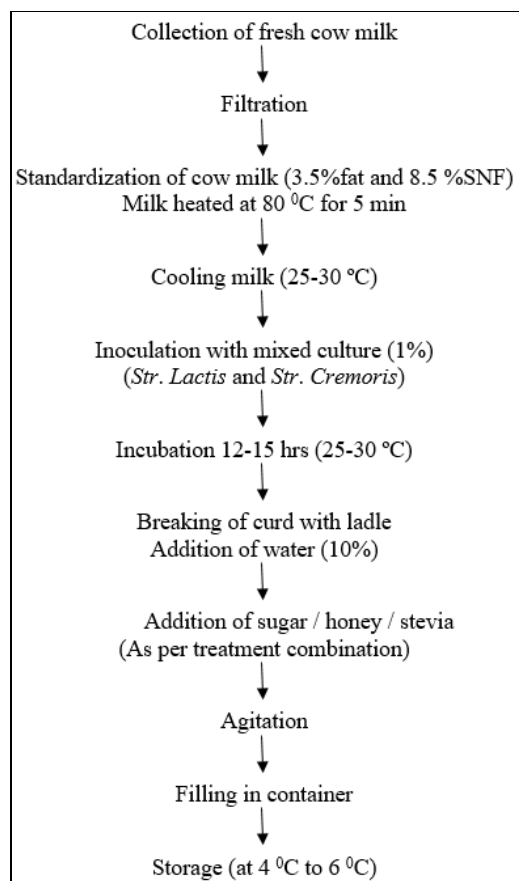
Preparation of Lassi

Fresh cow milk was standardized at 3.5 per cent fat level and 8.5 per cent SNF level using Pearson's square method.

Standardized cow milk was heated to 80 °C for 5 min and mixed thoroughly and cooled to 25-30 °C. The milk was inoculated by adding 1 per cent starter culture. The sterilized plastic cups of 150 ml capacity were filled with 100 ml of inoculated milk and covered with plastic lid. The filled cups were incubated at 25- 30 °C for 12-15 hrs. incubator to obtain good quality of curd.

The set curd was broken by slow agitation using domestic mixer or churner. The honey, sugar and chilled water were properly mixed with as per treatment in order to have a homogeneous mixture of lassi.

The lassi prepared by using honey an stevia was packed in 150 ml sterilized plastic cups and stored in refrigerator at 4 °C to 6 °C.



Flow diagram

Sensory evaluation of lassi

The quality of lassi was judged by sensory evaluation in respect of colour and appearance body and texture, flavor and overall acceptability by a trained sensory panel (minimum of 6 members) on a 9-point hedonic scale as prescribed by Amerine *et al.* (1965) [1].

Results and Discussion

Preliminary Trials

Preliminary trials were taken to optimize levels of honey, stevia and combination thereof based on sensory and organoleptic evaluation of the trials treatments selected for experimental analysis were, T₀ - Control, T₁ - 8% Honey, T₂ - 75 µl Stevia and T₃ - 8% Honey + 75 µl Stevia.

Overall acceptability

The overall acceptability is the consensus on the overall quality of the product. The sample of lassi prepared under this study were subjected to the judges to record the score on overall acceptability.

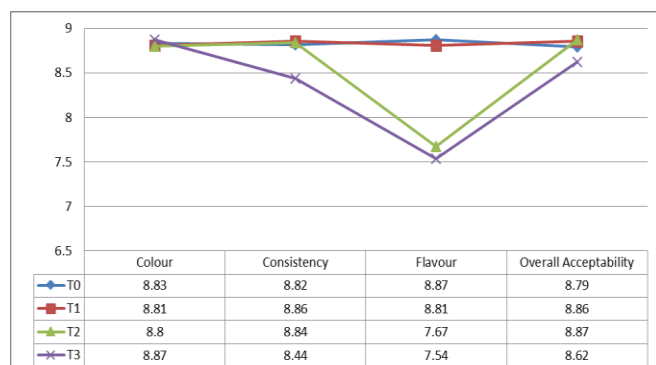


Fig 1: The data pertaining to this attribute is presented as under.

The non-significant variation ($P < 0.05$) were observed in the mean values of the scores allotted to the colour and appearance of lassi prepared under different treatments. The lassi prepared under T₁ and T₃ scored maximum i.e. 8.86 for both, honey and combination of thereof. The treatment T₀ and T₂ mean score was 8.81 (control and stevia lassi). The difference between values may be addition of honey that affect the consistency of the product.

The treatment of honey (T₂) had obtained score 8.84 as compared to treatments T₀ and T₂. Hence, it indicate that the honey resulted in better flavour to lassi. The results are correlated to the results of Desale (1995), who noticed that incorporation of 7.5 percent mango pulp gives flavor to lassi. Sensory quality of the lassi with treatments of T₀-Control (cane sugar used as sweetner), T₁-8% honey as sweetner, T₂-75 µl stevia as sweetner T₃-8% honey+75 µl stevia was determined using 9 point hedonic scale and applied for Colour and appearance, Consistency, Flavor of the lassi. The overall acceptability of control lassi scored the highest score T₀ - 8.87 and the final treatment i.e. (T₃ -8.62).

Conclusion

The lassi prepared with combination of honey and stevia (8% honey and 75 µl stevia) i.e. treatment (T₃) was superior among all the treatments.

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