



E-ISSN: 2278-4136

P-ISSN: 2349-8234

www.phytojournal.com

JPP 2020; Sp 9(5): 527-529

Received: 23-09-2020

Accepted: 27-10-2020

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Effect of strawberry pulp on physico-chemical properties of lassi

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Abstract

The present investigation cow milk was standardized to 3.5 per cent fat for the preparation of lassi, the starter culture *Streptococcus lactis* sp. *Diacetylactis* were added in to standardized cow milk and incubate at 22-25 °c for 8-12 hrs. The lassi was prepared by adding 10 per cent water and 10 per cent sugar in curd. The strawberry pulp was added @ 0, 5, 10, 15 and 20 per cent. The data obtained after chemical analysis of fat, protein, total solids, ash, acidity, pH. The superior treatment was T4 with 8.72 score of overall acceptability with 15 per cent strawberry pulp. As the level of strawberry pulp increased beyond treatment T4 then the acceptability was decreased. The chemical composition of lassi was affected due to addition of Strawberry pulp. The fat, protein and titratable acidity of lassi was decreased, while the pH, ash and total solids of lassi were increased from treatment T1 to T5.

Keywords: cow milk, lassi, strawberry, blending, chemical composition

Introduction

Lassi is a popular indigenous fermented milk beverage, which is usually prepared by mixing dahi and water in required proportions. It is served on very large scale in cold drink shops and restaurants during summer in almost every state in India. The fermented milk products are prepared by the action of microorganisms by adding starter culture which modify the substrates and are thus generally palatable, safe and nutritious. (Campbell Platt, 1994, Anonymous, 2006) [6, 2]. Strawberry have anti-bacterial properties used to protect against typhoid epidermises. This property is due to the presence of a variety of plant nutrients, bioflavonoids. Strawberry is a sweet and energy giving fruit. It is a good laxative and stimulates digestion. Addition of strawberry pulp to lassi results into nutritionally rich lassi which also has better sensory acceptance as compared to plain lassi. Considering this facts, present investigation on “Effect of Strawberry Pulp on Physico-chemical Properties of Lassi” was undertaken with main objective to study the physico-chemical properties of lassi.

Material and Methods

Fresh, clean, composite samples of cow milk procured from the livestock farm of Department of Animal Husbandry and Dairy Science, Dr. Panjabrao Deshmukh Krishi Vidyapeeth, Akola and standardized at 3.5 percent fat and used for lassi preparation. Fully ripened Strawberry fruits were procured from the local market of Akola for the preparation of lassi, while selecting the strawberry, stage of ripening, size, colour and taste were considered so that there should not be variation in the quality of the pulp to be extracted from the fruits. Those were washed with clean water. The leaves was removed. The pulp was extracted and converted into homogenous mass with the help of mixer. The freeze-dried culture of *Streptococcus lactis* sp. *diacetylactis* was procured from local market in Akola city, the culture were maintained in the laboratory in sterilized milk. Bulk culture were prepared by incubating the sterilized milk in 250 ml round bottom flask and incubated at 37±1 °C for 12-16 hrs in incubator.

Treatment details

In the present investigation five treatments of various combinations of lassi and strawberry pulp were studied with five replications as T1 (100: 00), T2 (95: 05), T3 (90: 10), T4 (85: 15), T5 (80: 20), In all treatment water and sugar was added @ 10 per cent respectively in curd.

Physico-Chemical analysis of lassi

The titratable acidity content of lassi determined by method described I.S. 1479 (1960) Part -I. The pH content of lassi measured at room temperature by digital pH meter IS: 1479 (Part-II) 1961. The fat content of lassi determined by Gerber's method as in IS: 1224 (Part II) (1977). The protein content of sample determined by macro Kjeldal method as per method prescribed

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by Indian Standard Institute in Handbook of Food Analysis, Dairy Products, Part I (1998). The total solids determined as per the methods described in IS: SP (Part II) 1981. The ash content determined by the method given by IS: SP (Part II) 1981.

Results and Discussion

The results in respect of physico-chemical analysis of lassi blended with different level of strawberry pulp were tabulated in Table 1.

Fat: It is seen from table 1, that average fat content of lassi in treatments 3.55, 3.43, 3.32, 3.23 and 3.13 per cent respectively. The average fat per cent was significantly highest (3.55) in treatment T1. While fat percentage was lowest (3.13) in treatment T5 prepared with 20 per cent level of strawberry pulp. The result obtained agreement to the result by Ghule *et al.* (2015)^[8, 9] observed that fat percentage of lassi was decreased with increase in strawberry pulp. Desai (1994)^[7], Shelar (2001)^[31], Avtade (2007), and Shakuntala Jadhav (2016)^[12] who reported that with increased in level of fruit pulp there was proportionately decreased in fat content of yoghurt.

Protein: The protein percentage is significantly highest (3.49) in the plain lassi while protein content was lowest (2.71) in 20 per cent T5 strawberry pulp. It is observed from the present study that as increase in strawberry pulp increases there was decrease in protein content. Similar results were reported by

Shuwu (2011)^[14] observed that there was decrease in protein percentage with addition of fruit pulp control (2.20), Honey (2.00), pineapple (1.98), Banana (2.10) protein percentage was observed. Ghule *et al.* (2015)^[8, 9] that protein percent is increased with increased with strawberry pulp.

Total solids: The statistical analysis show that the total solid per cent was decreased with addition of strawberry pulp. It was seen that as the level of strawberry pulp increases the total solids content decreases in lassi. This may be due to low total solids content of strawberry. The result obtained in present study is not agreement with the result reported by Ghule *et al.* (2015)^[8, 9], Shakuntala Jadhav (2014) and Gavhane *et al.* (2015)^[8] who noted that with the increase in the levels of strawberry pulp, custard apple pulp and honey, there was proportionate increase in the level of total solids content in lassi.

Ash: The ash percentage was significantly highest (1.09 %) in lassi prepared with strawberry pulp (T5) while ash content was lowest (0.72 %) in lassi prepared without addition of strawberry (T1). The result of present study are agreement to the result of Ghule *et al.* (2015)^[8, 9] that with increased in the strawberry pulp increased the ash content in lassi. The result of present study are not agreement to the result of Shuwu (2011)^[14] and Gavhane *et al.* (2015)^[8] who reported that with the increase in the levels of honey and papaya pulp, there was proportionate decrease in the level of ash content in lassi.

Table 1: Effect on chemical composition of lassi prepared from cow milk blended strawberry pulp. (per cent)

Treatments (cm: sp)	Mean values of five replications in per cent					
	Fat	Protein	Total solids	Ash	Acidity	pH
T ₁ (100:00)	3.55	3.49	12.62	0.72	1.02	4.31
T ₂ (95:05)	3.43	3.29	11.47	0.82	0.92	4.42
T ₃ (90:10)	3.32	3.14	11.36	0.91	0.82	4.53
T ₄ (85:15)	3.23	2.94	11.23	1.00	0.71	4.61
T ₅ (80:20)	3.13	2.71	11.10	1.09	0.62	4.71
'F' test	Sig	Sig	Sig	Sig	Sig	Sig
SE(m)+/-	0.007	0.01	0.009	0.04	0.06	0.004
CD at 5%	0.022	0.03	0.026	0.12	0.18	0.012

(cm cow milk, sp-strawberry pulp, * $P < 0.05$)

Acidity: The acidity percentage was highest (1.02 %) in lassi prepared without addition of strawberry pulp (T1) while acidity content was lowest (0.62 %) in lassi prepared with addition of 20 per cent strawberry pulp (T5). It was observed that addition of different level of strawberry pulp had decreases on acidity of lassi.

pH: The results indicated that with the increase in level of strawberry, there was significant increase in pH percentage of lassi. These result agreement with the result given by Ghule *et al.* (2015)^[8, 9] who reported that with increased strawberry pulp in lassi decreased in acidity. Aparna Labade (2007), Shuwu (2011)^[14], Gavhane *et al.* (2015)^[8] who reported that with the increase in the levels of pineapple, honey, musk melon there was proportionate decrease in the level of titratable acidity content in lassi.

Conclusion

Physico-chemical properties of lassi i.e, fat, protein, total solids and acidity were decreases while pH and ash were increased due to increase in rate of addition of strawberry pulp.

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