



ISSN Print: 2664-844X
ISSN Online: 2664-8458
NAAS Rating (2025): 4.97
IJAFA 2025; 7(10): 622-626
www.agriculturaljournals.com
Received: 07-08-2025
Accepted: 10-09-2025

RB Devkate

P.G. Student, Department of
AHDS, College of Agriculture,
Latur, Maharashtra, India

KR Chavan

Assistant Professor,
Department of AHDS
College of Agriculture,
Dharashiv, Maharashtra, India

AT Shinde

Associate Professor,
Department of AHDS, College
of Agriculture, Latur,
Maharashtra, India

DS Chauhan

Professor, Department of
AHDS, College of Agriculture,
Latur, Maharashtra, India

ST Waghmare

P.G. Student, Department of
AHDS, College of Agriculture,
Latur, Maharashtra, India

Corresponding Author:

RB Devkate

P.G. Student, Department of
AHDS, College of Agriculture,
Latur, Maharashtra, India

Effect of different levels of avocado (*Persia americana*) pulp incorporated in shrikhand

RB Devkate, KR Chavan, AT Shinde, DS Chauhan and ST Waghmare

DOI: <https://www.doi.org/10.33545/2664844X.2025.v7.i10i.930>

Abstract

The present experiment was conducted at Department of Animal Husbandry and Dairy Science, College of Agriculture, Latur (VNMKV) during 2024-25. The *shrikhand* was prepared by blending 5, 10 and 15 percent of avocado Pulp. The physico-chemical analysis of developed product with 0, 5, 10 and 15 percent avocado pulp (T₁, T₂, T₃ and T₄) showed significant increase in percent fat from (9.43, 10.28, 11.50 and 12.35), Moisture content (43.47, 44.51, 46.19 and 46.88) and ash content (0.80, 0.83, 0.87 and 0.93). The percent protein and Total solid content of *shrikhand*, decreased significantly from 8.25, 7.84, 7.43 and 7.18 percent and 56.53, 55.49, 53.81 and 53.12 percent, respectively. The percent acidity was decreased significantly from 1.24 to 1.18, 1.07 and 0.96 and pH was increased significantly (4.45, 4.53, 4.62 and 4.70) due to higher level of addition of avocado pulp in *shrikhand*.

Keywords: Physico-chemical analysis, avocado pulp, acidity, shrikhand

Introduction

India is the world's top milk producer, with 239.30 million tonnes produced annually in 2023-24 compared to 230.58 million tonnes in 2022-23, recording a growth rate of 3.83%. The per capita availability of milk has reached 471 grams per day during the year 2023-24, which is more than the world average of around 329 grams per day in 2023^[1].

In India, fermented milk products utilize 7% of total milk produced and are primarily include *dahi*, *lassi* and *shrikhand*. These products have long been known for their nutritional and therapeutic value and play a crucial role in preparation of vitamin B-complex in human body. Several lactic acid bacteria produce natural antibiotic which help to prevent abdominal diseases. (Devi *et al.*, 2018)^[4]. *Shrikhand* is a traditional Indian dessert made by fermentation of milk. It has semi solid and recognized for its sweetish sour flavour and therapeutic properties. In Gujrat cuisine *shrikhand* is served as side dish with breads like as *poori* (typically "*khaajapoori*" which is a savory fried flaky bread) or as dessert. It is commonly offered as part of a vegetarian thali in Gujrat restaurants and is famous as part of wedding feasts. It is often served chilled as a contrast to hot and spicy curry^[2]. Avocado is also known as 'Superfood' because of its unique nutritional composition, Phytochemical content and health benefits. In addition to its use as food, Avocado has been traditionally used for several medicinal purposes including hypotensive, hypoglycemic, anti-viral, anti-diarrheal and cardiovascular disease. Avocado pulp is also utilized in several dermatological compositions such as anti-aging agents, UV protection agents, emulsions for dry skin.

The present experiment on "Preparation of *shrikhand* blended with Avocado (*Persia americana*) pulp" was undertaken to find out physico-chemical properties of developed *shrikhand*.

Materials and Methods

The research was conducted during 2024-2025 in the Department of Animal Husbandry and Dairy Science, College of Agriculture, Latur, Vasantao Naik Marathwada Krishi Vidyapeeth, Parbhani.

Materials

Collection of Materials

Buffalo milk (6% fat and 9% SNF) was procured from local market of Latur city (Natural Milk Pvt. Ltd., Latur). White crystalline cane sugar was collected from local market. Standard dahi culture (NCDC-167) was procured from NDRI, Karnal. Avocado fruit was collected from local market.

Methods

Preparation of Shrikhand blended with avocado (*Persia americana*) pulp

Treatment combination

Shrikhand blended with avocado pulp was prepared by using 35% sugar by weight of chakka and avocado pulp as per treatment.

T₁-100 Parts of *Chakka* (Control)

T₂-95 Parts of *Chakka* and 5 Parts of Avocado fruit pulp by weight

T₃-90 Parts of *Chakka* and 10 Parts of Avocado fruit pulp by weight

T₄-85 Parts of *Chakka* and 15 Parts of Avocado fruit pulp by weight

Procedure for Preparation of shrikhand blended with Avocado pulp.

The *shrikhand* was prepared as per procedure given by

Andarepatil (2020). The buffalo milk (6% fat and 9% SNF) was heated at 80-85 °C for 15 minute and cooled up to room temperature 37 °C. After cooling milk was inoculated with Standard *dahi* culture (NCDC-167) @ 2 percent and incubated at 37 °C for 8-10 hrs. prepared *curd* was transferred in muslin cloth and hanged for removal of the whey for 6-8 hrs. The *chakka* obtained after draining were weighed. The *chakka* was used as base material for preparation of *shrikhand*. This *chakka* was mixed with sugar powder @ 35 percent and Avocado fruit pulp as per the treatment was added in *shrikhand*.

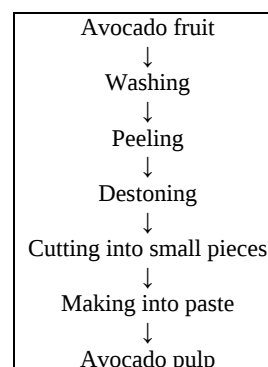


Fig 1: Preparation Avocado pulp Pandey *et al.* (2020)

Preparation of shrikhand blended with avocado pulp

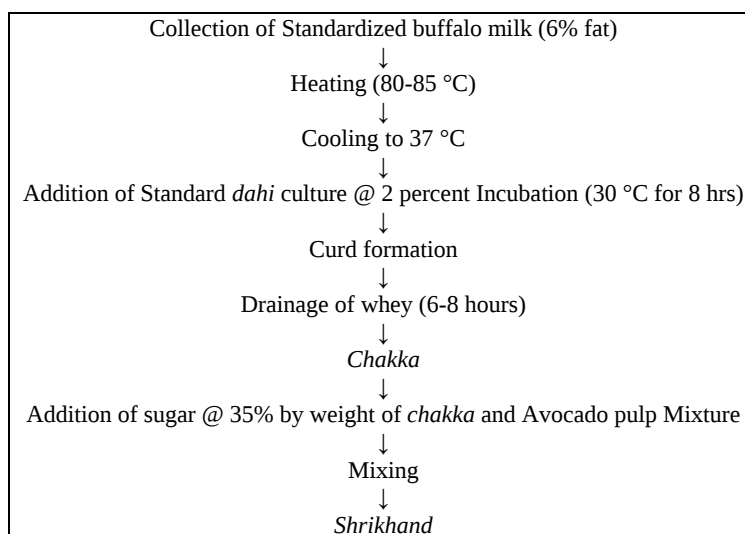


Fig 2: Flow chart of Avocado (*Persea americana*) pulp blended *shrikhand*

Physico-chemical analysis

Titration acidity, pH, fat, protein, moisture, total solids, ash. Titration acidity of sample was determined as per method outlined in IS 1479 (Part-I) (1960) (7), The fat content was determined by using Gerber's method described in in IS: 1224 (Part II) (1977) (8). The percent protein content of

shrikhand was determined by using Lowry method (1951). Moisture, total solids and ash percent was determined by methods described in IS: SP (Part XI) 1981.

Results and Discussion

Acidity of shrikhand blended with avocado pulp

Table 1: Acidity of *shrikhand* blended with avocado pulp

Treatment	Replication				Mean
	R ₁	R ₂	R ₃	R ₄	
T ₁	1.23	1.26	1.21	1.24	1.24
T ₂	1.16	1.19	1.17	1.19	1.18
T ₃	1.09	1.07	1.03	1.07	1.07
T ₄	0.92	1.02	0.94	0.96	0.96
SE±0.0141	CD at 5% 0.0434				

The values with different small letter superscripts row wise differ non significantly at 5 percent level of significance.

The mean value of percent acidity for control sample T₁ (1.24) and *shrikhand* blended with avocado pulp treatments T₂ (1.18), T₃ (1.07) and T₄ (0.96) were respectively. the percent acidity of control sample T₁ (1.24) was significantly higher than the treatment combinations. The percent Acidity decrease in *shrikhand* blended with avocado pulp significantly as it is low acidic fruit.

Kumar *et al.* (2019) reported that addition of litchi pulp at 5, 10 and lactulose at 3, 6 and 9 percent results in decreased percent acidity content in developed product from 0.91 to 0.85.

pH of *shrikhand* blended with avocado pulp

Table 2: pH of *shrikhand* blended with avocado pulp (percent)

Treatment	Replication				Mean
	R ₁	R ₂	R ₃	R ₄	
T ₁	4.46	4.41	4.48	4.43	4.45
T ₂	4.51	4.49	4.56	4.54	4.53
T ₃	4.66	4.58	4.64	4.61	4.62
T ₄	4.73	4.66	4.71	4.69	4.70
S.E±0.0159	C.D at 5% 0.0491				

The values with different small letter superscripts row wise differ non significantly at 5 percent level of significance.

The mean pH value of control sample and treated samples T₁ (4.45), T₂ (4.53), T₃ (4.62) and T₄ (4.70) were respectively. Lowest pH value observed in T₁ (4.45) and highest pH value in T₄ (4.70). The pH values of treatments increased towards increase in level of avocado pulp. Kumar *et al.* (2019) developed *shrikhand* by incorporating

Lactulose at 3, 6, 9 and litchi pulp 5 and 10 percent respectively, results increased in pH content in developed product from 5.34 to 5.71.

Fat content of *shrikhand* blended with avocado pulp

Table 3: Fat content of *shrikhand* blended with avocado pulp (percent)

Treatment	Replication				Mean
	R ₁	R ₂	R ₃	R ₄	
T ₁	9.50	9.20	9.70	9.30	9.43
T ₂	10.10	10.30	10.20	10.50	10.28
T ₃	11.30	11.40	11.50	11.80	11.50
T ₄	12.40	12.30	12.60	12.10	12.35
SE±0.1103	CD at 5% 0.3401				

The values with different small letter superscripts row wise differ non significantly at 5 percent level of significance.

Mean value of percent fat content in control sample T₁ (9.43) and *shrikhand* blended with avocado pulp T₂ (10.28), T₃ (11.50) and T₄ (12.35) percent respectively. Lower fat content observed in control sample T₁ (9.43) and higher fat content in T₄ (12.35). The result indicated that increase in fat content towards higher level of addition of avocado pulp was due to higher fat (unsaturated fat) content in avocado fruit. Masih *et al.* (2020) who mentioned that addition of maize milk in *shrikhand* at the rate of 10, 20 and 30 percent results in increased percent fat content in the developed product from 0.10 to 0.36.

Protein content of *shrikhand* blended with avocado pulp

Table 4: Protein content of *shrikhand* blended with avocado pulp (percent)

Treatment	Replication				Mean
	R ₁	R ₂	R ₃	R ₄	
T ₁	8.26	8.21	8.38	8.16	8.25
T ₂	7.93	7.76	7.87	7.81	7.84
T ₃	7.49	7.31	7.56	7.34	7.43
T ₄	7.13	7.29	7.08	7.22	7.18
SE±0.0483	CD at 5% 0.1488				

The values with different small letter superscripts row wise differ non significantly at 5 percent level of significance.

Mean value of percent protein content of control sample T₁ (8.25) and *shrikhand* blended with avocado pulp T₂ (7.84), T₃ (7.43) and T₄ (7.18) percent respectively. higher protein content observed in control sample T₁ (8.25) and lowest protein content in T₄ (7.18). The result showed that significant decrease in protein content towards higher level of addition of avocado pulp was due to low protein content

of avocado fruit than *chakka*. Kedaree *et al.* (2021) who reported that addition of kiwi fruit in *shrikhand* at the rate of 10, 15 and 20 percent which results in declined in percent protein content of developed product from 12.90 to 10.85.

Moisture content of *shrikhand* blended with avocado pulp

Table 5: Moisture content of *shrikhand* blended with avocado pulp (percent)

Treatment	Replication				Mean
	R ₁	R ₂	R ₃	R ₄	
T ₁	43.73	43.21	43.67	43.27	43.47
T ₂	44.38	44.69	44.43	44.52	44.51
T ₃	46.23	46.09	46.31	46.13	46.19
T ₄	46.84	46.97	46.79	46.92	46.88
SE±0.0816	CD at 5% 0.2514				

The values with different small letter superscripts row wise differ non significantly at 5 percent level of significance.

mean value of percent moisture content for control sample and *shrikhand* blended with avocado pulp were T₁ (43.47), T₂ (44.51), T₃ (46.19) and T₄ (46.88) percent respectively. The lowest percent moisture content found in control sample T₁ (43.47) and highest moisture content in T₄ (46.88). The

result indicated that moisture content significantly increased in *Shrikhand* towards higher level of addition avocado pulp it could be due to higher moisture content (72.30 percent) of avocado fruit.

Similar observations on moisture content recorded by Chavan *et al.* (2022) prepared *shrikhand* by addition of jamun pulp at 10, 20 and 30 percent results in increased moisture content in developed product from 40.18 to 48.64.

Total solid content of *shrikhand* blended with avocado pulp

Table 6: Total solid content of *shrikhand* blended with avocado pulp (percent)

Treatment	Replication				Mean
	R ₁	R ₂	R ₃	R ₄	
T ₁	56.27	56.79	56.33	56.73	56.53
T ₂	55.62	55.31	55.57	55.48	55.49
T ₃	53.77	53.91	53.69	53.87	53.81
T ₄	53.16	53.03	53.21	53.08	53.12
SE±0.0816	CD at 5% 0.2514				

The values with different small letter superscripts row wise differ non significantly at 5 percent level of significance.

Mean value of percent Total solid content for control sample T₁ (56.53) and *shrikhand* blended with avocado pulp were T₂ (55.49), T₃ (53.81) and T₄ (53.12) percent respectively. The percent Total solid content of control sample T₁ (56.53) was significantly higher than T₄ (53.12) treatment combination. The result indicated that total solid content significantly decreased in *Shrikhand* towards higher level of addition avocado pulp it could be due to higher moisture content (73.2 percent) of avocado fruit.

Sameem *et al.* (2020) studied physico-chemical properties of *shrikhand* prepared by using dragon fruit pulp at 3, 6 and 9 percent and observed that total solid content in developed product was decreased from 57.33 to 53.48.

Ash content of *shrikhand* blended with avocado pulp

Table 7: Ash content of *shrikhand* blended with avocado pulp (percent)

Treatment	Replication				Mean
	R ₁	R ₂	R ₃	R ₄	
T ₁	0.81	0.76	0.82	0.79	0.80
T ₂	0.84	0.80	0.87	0.82	0.83
T ₃	0.87	0.83	0.91	0.86	0.87
T ₄	0.92	0.89	0.96	0.93	0.93
SE±0.0148	CD at 5% 0.0458				

The values with different small letter superscripts row wise differ non significantly at 5 percent level of significance.

Mean value of percent Ash content for Control sample T₁ (0.79) and *shrikhand* blended with avocado pulp was for T₂ (0.83), T₃ (0.87) and T₄ (0.93) percent respectively. Highest percent ash content was observed T₄ (0.93) than T₁ (0.80) control sample.

The results of present experiment are similar with Deshmukh (2021) who prepared *shrikhand* by using date pulp at 10, 20 and 30 percent and observed that incorporation of date pulp results in increased in ash content of developed product from 0.85 to 1.05.

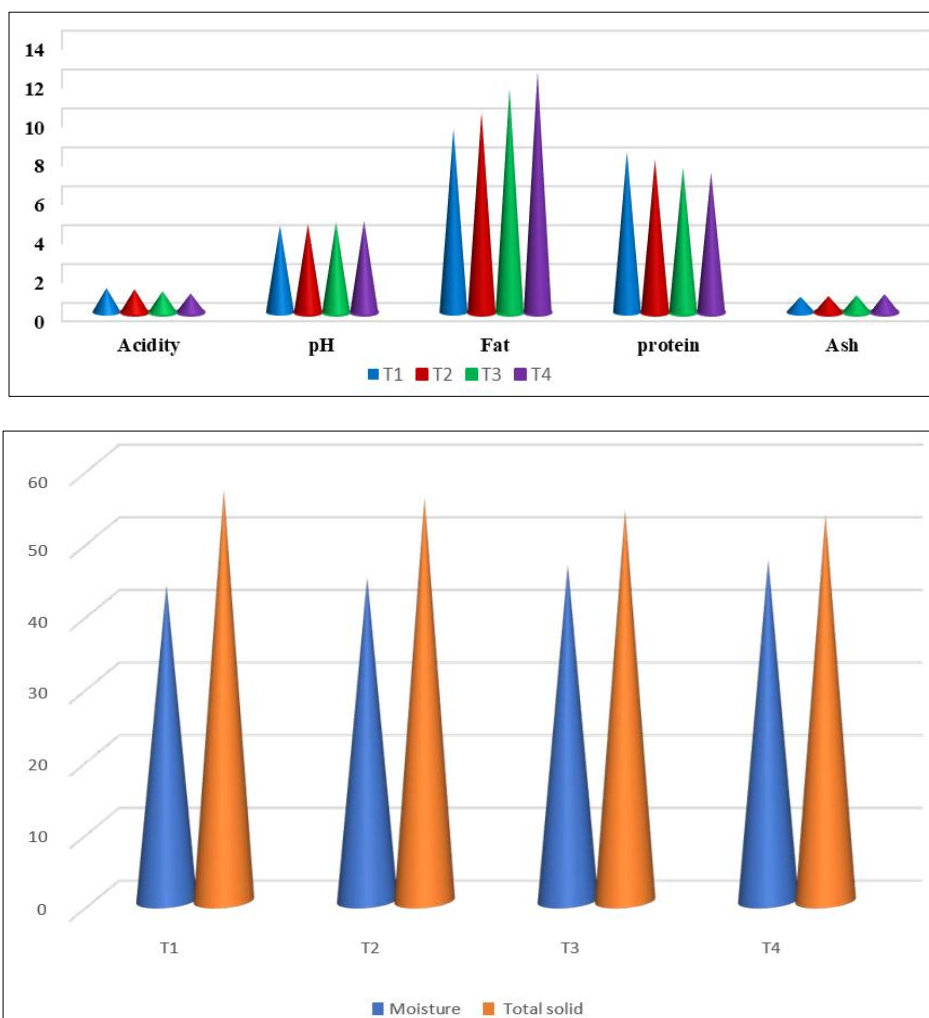


Fig 3: Physico-chemical properties of *shrikhand* blended with Avocado (*Persia americana*) Pulp

Conclusion

The value added, nutritional *shrikhand* could be prepared by with avocado pulp. From the results of physico-chemical analysis, it could be concluded that 5 percent avocado pulp could be added in *shrikhand* without affecting taste and overall acceptability of developed product.

References

1. Anonymous. Annual report of 2023-24. Department of Animal Husbandry and Dairying, Ministry of Fisheries, Animal Husbandry and Dairying, Government of India; 2024 [cited 2024 Oct 21]. Available from: <https://dahd.nic.in/sites/default/files/FINALREPORT2024ENGLISH.pdf>
2. Andharepatil PS. Preparation of shrikhand blended with dragon fruit (*Hylocereus undatus*) pulp [PhD thesis]. Parbhani: Vasantao Naik Marathwada Krishi Vidyapeeth; 2020.
3. Deshmukh MS. Studies on preparation of shrikhand by using buffalo milk and date (*Phoenix dactylifera*) pulp [MSc thesis]. Parbhani: Vasantao Naik Marathwada Krishi Vidyapeeth; 2021.
4. Devi R, Khanna N, Argade A, Ahlawat SS. Utilization of soy milk in strawberry pulp-based shrikhand for development of a novel fermented milk product. The Pharma Innovation Journal. 2018;7(1):91-93.
5. Ferreira da Vinha A, Silva CS, Soares MDO, Barreira S. Avocado and its by-products: Natural sources of nutrients, phytochemical compounds and functional properties. Current Research in Agricultural and Food Science. 2020;1:82-96.
6. Bureau of Indian Standards. Indian Standard: 1479, Part III. Method of test for dairy industry—Microbiological analysis of milk. New Delhi: Bureau of Indian Standards; 1962.
7. Bureau of Indian Standards. IS:1224, Part I. Determination of fat by Gerber method (revised). New Delhi: Indian Standards Institution, Manak Bhavan; 1977.
8. Bureau of Indian Standards. IS:SP 18, Part XI. Methods of test for dairy industry—Rapid examination of milk. New Delhi: Indian Standards Institution, Manak Bhavan; 1981.