



Microbial evaluation of *Shrikhand* prepared from carrot powder

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Abstract

Shrikhand is a semi solid, sweetish, whole milk product, prepared by lactic fermentation of milk. The curd (dahi) obtained is partially strained through a muslin cloth to remove the whey to yield chakka.. The *Shrikhand* was prepared from buffalo milk by supplementing with different levels of carrot powder with different treatment and the microbial quality was carried out. In present study the *Shrikhand* was prepared using carrot powder in different levels i.e 0% ,3%, 5%, 7% and 9% in different treatments i.e T₀, T₁, T₂, T₃ and T₄ respectively .The microbiology in storages total plate count and yeast and mould was increased but treatment T₄ TPC and YMC lower growth as compare to treatment T₀.coliform count was absent in shrikhand during overall storage period.

Keyword: Carrot powder, *Shrikhand* , TPC, Yeast Mould, coliforms

Introduction

Shrikhand is one of the important fermented milk products which derive its name from the Sanskrit word “Shikharani” meaning a curd prepared with added sugar, flavouring agents fruits and nuts. It has the nutritive goodness of fermented milk products. The fermented dairy products play an important role in synthesis of vitamin B complex in human body and in prevention of stomachic diseases, as several lactic organisms produce natural antibiotics. It is prepared from cow, buffalo or mixed milk. Consumption of *Shrikhand* is reported to be effective in treatment of many diseases like diarrhoea, acidity, gastro-intestinal (Patel and Schequen, 1999).

Shrikhand is a traditional fermented dairy product which is mainly consumed in western part of the country. The curd is partially strained through a muslin cloth to remove the whey to produce a solid mass called chakka .This chakka is mixed with the require amount of sugar to yiel *Shrikhand* (De,1982) The *Shrikhand* is popular desert and froms parts of a delicious supplement on religious functions,partaculary in the stae of Maharashtra, Gujarat,karnataka and some parts of South India (Aneja etal .2002) Today shoppers are looking for foods that provide good health and disease prevention .Low fat fermented foods are advised

as part of a balanced diet for those with obesity and cardiovascular disease because they help the human body produce vitamin B complex and avoid gastrointestinal issues.(Singh et al., 2017)

One of the more popular vegetables for human nutrition is the carrot (*Dascus carota L.*). It is categorised as a vitaminized food and high in beta carotene, ascorbic acid, and tocopherol. (Hashimota T et al 2004).The intake of carrot as potent antioxidants, appear to be associated with better health. It is not only preventing vitamin A deficiency but also cancer and other diet related human diseases (Salwa et al 2004). Carrots are good source of iron and vitamins A and C but lack in protein and fat. As consumers move towards functional foods with specific health benefits, blending yoghurt with carrot powder will provide consumers with a nutritionally balanced food

Material & Methods

The present investigation was carried out in the Department of Dairy Science & Microbiology. Toshniwal ACS College Sengaon. Dist Hingoli.

Buffalo milk was brought from the local market. Milk was standardized to 6.0 per cent fat and 9.0 per cent SNF. Carrot powder used as value added for preparation of *Shrikhand* was manufacture by bhoom Industry LTD.

Treatment details

The following treatment was conducted to decide the levels of Carrot powder on the basis of Chakka. It is decided that Carrot powder is acceptable at the level of 5 per cent on the basis of Chakka. The details of treatments were as follows.

T₀ :- *Shrikhand* prepared with 100 % buffalo milk

T₁ :-Addition of 3 % carrot powder in *Shrikhand* on the basis of Chakka

T₂ :-Addition of 5 % carrot powder in *Shrikhand* on the basis of Chakka

T₃ :-Addition of 7 % carrot powder in *Shrikhand* on the basis of Chakka

T₄ :-Addition of 9 % carrot powder in *Shrikhand* on the basis of Chakka

Preparation of *Shrikhand* by using carrot powder: -

Fresh Buffalo milk having 6.0 per cent fat and 9.0 per cent SNF was standardized. The standardized milk was pasteurized at 72 ± 20 °C for 10 minutes and was cooled at 38-40°C and then inoculated by lactic starter culture and incubated at 40°C for 10 hours until a firm coagulum (dahi) was formed. The dahi was transferred to muslin cloth and hanged for 8 hours to remove the whey and formed a solid mass called Chakka .The chakka was blended with sugar (45 % of Chakka) and carrot powder was mixed in chakka as per the treatments 0% ,3%,5%,7% and 9% of carrot powder for the treatment T₀,T₁,T₂,T₃,T₄ respectively. The *Shrikhand* was packed in sanitized polystyrene cups, sealed and kept for storage at 7°C in refrigerator. The fresh and stored sample was analysed for microbial changes during storage in terms of Total Plate Count ,Yeast and Mould and Couliform count.

Microbiological analysis

The standard Plate count *Shrikhand* samples was determined as per procedure described in IS:5402 (1962), using pore plate method was used to enumerate the standard plate counts in *Shrikhand* samples. The yeast and mould count of *Shrikhand* samples was determined as per the procedure described by Anshu et.al. (2014), Using Potato Dextrose Agar (PDA) of Hi- media was used to enumerate yeast and mould counts in the *Shrikhand* samples. The coliform count of market samples of *Shrikhand* was determined as per the Procedure described in IS: 5404, (1995) using violet Red Bile Agar (VRBA).of Hi-media was used to enumerate the coliform counts in *Shrikhand* samples.

Result and Discussion

The *Shrikhand* samples of various treatments were subjected for determination of microbial counts viz. Standard Plate Count, Yeast and mould, Coliform. The microbial changes were recorded at interval of 7 days. The results obtained from the present investigation as well as relevant discussion is summarized under following points.

Total Plate Count (log cfu g⁻¹)

The data of Total Plate Count (TPC) of *Shrikhand* prepared using different levels of carrot powder during storage at 7°C is presented in Table 1 and graphically in Fig 1.

Treatments	Storage Periods (Days)				
	0	7	14	21	28
T0	1.45	1.79	2.05	2.45	3.11
T1	1.44	1.77	1.96	2.41	2.94
T2	1.43	1.73	1.93	2.36	2.89
T3	1.42	1.69	1.9	2.31	2.81
T4	1.41	1.65	1.88	2.25	2.76

Table 1. Total plate count changes in *Shrikhand* prepared by using carrot powder during storage at 7°C

It was observed from the table ,the mean total plate count (log cfu g⁻¹) of *Shrikhand* using different treatment during storage (0 to 28 days) the treatment T₀ was ranged from 1.45 to 3.11 cfu g⁻¹, for control sample, 1.44 to 2.94 cfu g⁻¹ of treatment T₁ (3% carrot powder),1.43 to 2.89 cfu g⁻¹ for treatment T₂ (5% carrot powder),1.42 to 2.81 cfu g⁻¹ of treatment T₃ (7% carrot powder) and 1.41 to 2.76 cfu g⁻¹ of treatment T₄ (9% carrot powder) respectively. During 0 days in storage period all treatment were non-significant with each other and 7, 14, 21 and 28 days of storage all were significant difference with each other. From the above results it showed that the mean value of total plate count (log cfu g⁻¹) a significantly increasing trend with increasing storage days and treatment T₀ and T₄ microbial load were decreased with increases the carrot powder in *Shrikhand*. Sunil kumar etal (2011) observed the similar results during the refregeated storage of *Shrikhand* from apple pupl and celosia argeta. Gube (2016) also reported the similar increase in total plate count while studying the microbiological quality of *Shrikhand* from black carrot juice.

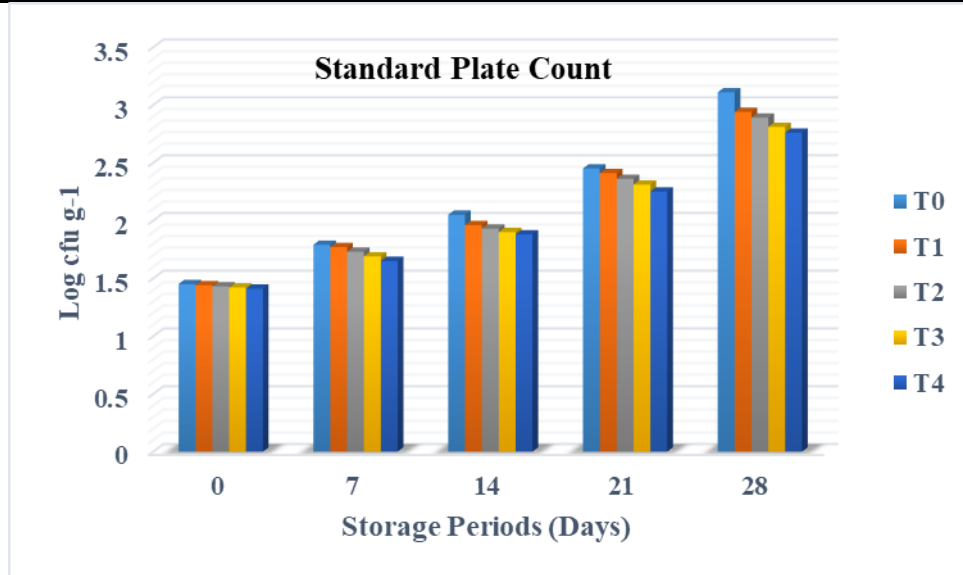


Fig 1. Total plate count changes in *Shrikhand* prepared by using carrot powder during storage at 7⁰C Yeast and mould Count (log cfu g⁻¹)

The data on yeast and mould count of *Shrikhand* prepared using carrot powder in different levels during storage at 70C is presented in table 2 and graphically in Fig 2.

Treatments	Storage Periods (Days)				
	0	7	14	21	28
T0	2.39	3.56	3.94	4.68	5.45
T1	2.37	3.51	3.88	4.59	5.35
T2	2.39	3.46	3.84	4.53	5.31
T3	2.37	3.41	3.79	4.45	5.21
T4	2.38	3.36	3.74	4.38	5.12

Table 2. Yeast and mould changes in *Shrikhand* prepared by using carrot powder during storage at 7⁰C

It was observed from the table ,the mean Yeast and Mould (log cfu g⁻¹) of *Shrikhand* using different treatment during storage (0 to 28 days) the treatment T₀ was ranged from 2.39 to 5.45 cfu g⁻¹, for control sample, treatment T₁ was ranged from 2.37 to 5.35 cfu g⁻¹ for (3% carrot powder), treatment T₂ was ranged from 2.39 to 5.31 cfu g⁻¹ for (5% carrot powder) , treatment T₃ was ranged from 2.37 to 5.21 cfu g⁻¹ for (7% carrot powder) and treatment T₄ was ranged from 2.38 to 5.12 cfu g⁻¹ for (9% carrot powder)respectively. During 0 days in storage period all treatment were non-significant with each other but 7, 14, 21 and 28 days of storage all were significant difference with each other. From the above results it showed that the mean value of yeast and mould (log cfu g⁻¹) a significantly increasing trend with increasing storage days and treatment T₀ and T₄ microbial load were decreased with increases the carrot powder in *Shrikhand*. Landge etal (2011) conducted the study with ashwagandha powder for preparation of *Shrikhand* and observed the *Shrikhand* storage in refrigeration at 7⁰C.They concluded that yeast and mould increases with increases storage periods. Similar observation was also observed with Prajapati *et al* (1973)

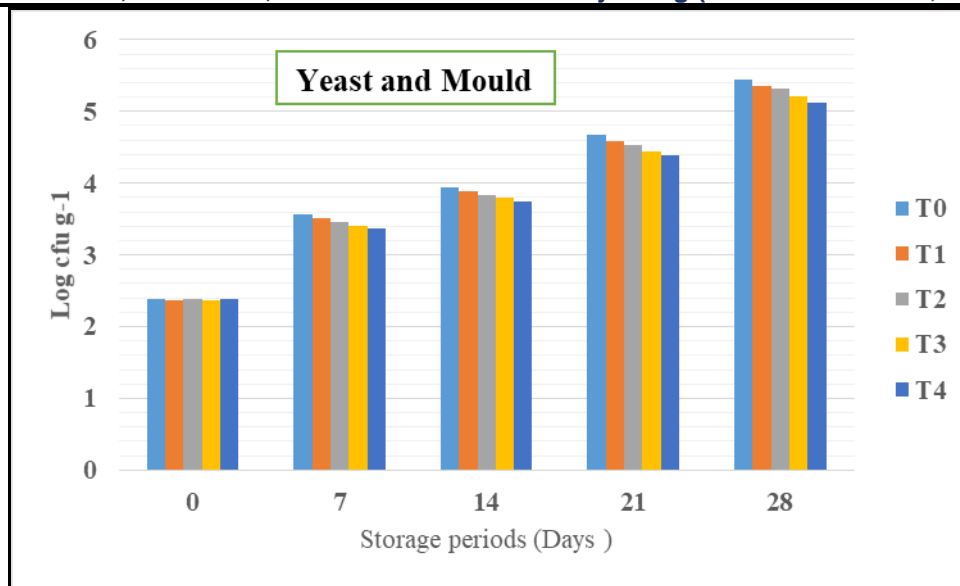


Fig 2. Yeast and Mould changes in *Shrikhand* prepared by using carrot powder during storage at 7⁰C Coliform count

Growth of Coliform count is not suitable for fermented milk products because of the low pH and acidity of the fermented milk inhibits the growth of these microorganism. It was observed that coliform were absent in fresh as well as in all treatment samples of *Shrikhand* in storage at 7⁰C. The absence of coliform is mostly due to low pH, high acidity and sugar concentration of the product, which prevent the growth of microorganism. Karthikeyan (1993) noted similar finding for *Shrikhand*. It is evident that the coliform are adversely affected during storage of *Shrikhand*

Conclusion

The present investigation was conducted to evaluate the microbiological quality of *Shrikhand* prepared by using carrot powder. In these during storage the increasing trend in TPC and Yeast and mould was observed. The total plate count and Yeast and mould increases with storage period. Whereas, the coliforms are absent during storage.

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