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Jaybhay Vishnu Bhagwan
MSc Agri Dairy science,
Rajarshri Chhatrapati Shahu
Maharaj, College of Agriculture,
Kolhapur, Maharashtra, India

KB Kamble
MSc Agri Dairy science,
Rajarshri Chhatrapati Shahu
Maharaj, College of Agriculture,
Kolhapur, Maharashtra, India

DD Patange
Associate Professor, Rajarshri
Chhatrapati Shahu Maharaj,
College of Agriculture, Kolhapur,
Maharashtra, India

DK Kamble
Professor, Rajarshri Chhatrapati
Shahu Maharaj, College of
Agriculture, Kolhapur,
Maharashtra, India

Sensory evaluation of Shrikhand Sold in Kolhapur City

Jaybhay Vishnu Bhagwan, KB Kamble, DD Patange and DK Kamble

Abstract

Shrikhand is one of the important fermented milk product which derive its name from the Sanskrit Word 'shrikhirni' meaning a curd prepared with added sugar flavoring agent, fruits and nuts. It is an indigenous semisoft whole milk product prepared using *chakka* (strained dahi/ chhaka). *Shrikhand* is popular in western part of southern peninsula of India. Hence, present study was undertaken to evaluate the quality of *shrikhand* sold in Kolhapur city for its sensory qualities. Preliminary survey was conducted in market of Kolhapur city to know the availability of *shrikhand* samples and on the basis of survey five brands of *shrikhand* were selected. These brands were coded with KS_1, KS_2, KS_3, KS_4, and KS_5. Packed pouch (package) of selected brands were collected from the market and brought to laboratory under condition for further analysis. It was observed that the sensory qualities of *shrikhand* were significantly ($p<0.05$) affected by the market samples of *shrikhand* sold in Kolhapur city. For colour and appearance the highest mean score (7.50 ± 0.06) was obtained by sample KS_1 fallowed by KS_2 (7.2 ± 0.04). The mean score for body and texture were ranged from 6.05 to 7.84 whereas, the average flavour score of market sample of *shrikhand* ranged from 6.32 to 7.77. The maximum score 7.29 for sweetness was allotted to the sample KS_1 fallowed by sample KS_4 7.18 and KS_5 7.18. From these data, it was observed that all the samples were showed acceptability in between liked slightly (Score 6) to liked very much (score 8) when judged on '9' point hedonic scale.

Keywords: Shrikhand, *Chakka,* Kolhapur city, Sensory evaluation

Introduction

A newly born infant is unable to ingest and assimilate nutrient from any food source other than milk. Consequently, milk has to provide all the growth promoting nutrients in an easily acceptable form. Milk helps to balance human diet by supplementing good quality protein, calcium and vitamins. It is tasty, cool in nature. Such milk is also utilized in the form of various milk products by applying various processes to milk, including fermentation, heat desiccation, heat acid coagulation, fat concentration, freezing, etc. Amongst these process, fermentation of milk by suitable starter culture is economical and having several health benefits. It is estimated that about 9.1 per cent of the total milk produced in India is converted in to various fermented milk products (Chauhan, *et al.,* 2013) [3].

Shrikhand is prepared from lactic fermented curd. The curd is partially strained through a cloth to remove the whey and thus produce a solid mass called 'Chakka which is base for *Shrikhand*' preparation. Required amount of suger is added to chakka along with nuts, fruits, fruit products, colour, flavour, etc., and the product is kneaded well to obtain a smooth homogenous mass called *Shrikhand* (De, 2008)

Shrikhand is highly perishable dairy product with an average shelf life of 1or 2 days at room temperature under Indian conditions. Its shelf life mainly depends on the initial quality of milk used for its manufacture and post processing contamination, *Shrikhand* which was once made only by the *halwais* is now made by commercial dairies due to the fact that besides popularity and cost effectivenesss *halwais* were not able to meet the quality standards required by consumers and growing demand of the product using age old techniques (Salunkhe *et al.*, 2005).

Despite so much of market size the *Shrikhand* manufacturing is still unstandardized process. Market studies carried out by Upadhyay *et al*. (1975) [8]. In view of current liberalization programme, more dairy units are coming up and *Shrikhand* manufacture being one of the most profitable business as pointed out by Aneja (1992) [2] that is raw material cost is only 29 per cent of sales prices as compared to 90 per cent for milk and 65 per cent for paneer

Corresponding Author:
Jaybhay Vishnu Bhagwan
MSc Agri Dairy science,
Rajarshri Chhatrapati Shahu
Maharaj, College of Agriculture,
Kolhapur, Maharashtra, India

(a traditional product), the demand for traditional products will be maintained. Kolhapur is the top most districts in buffalo milk production in Maharashtra. At present, Kolhapur District Milk Union (Gokul), Milk Union, Yelgud Milk Union, Shahu Milk Union are the key leader in collecting and processing of milk in the district. Number of branded *Shrikhand* is being prepared and marketed in Kolhapur district. Since then no information on sensory, chemical and microbiological quality of *shrikhand* in this area is available whereas, on other side, the product growth in the market ha sincreased substantially in last few years. Hence, the present study deals with the analysis of differently branded *Shrikhand* sold in Kolhapur city.

Material and Methods
The study entitled, 'Sensory Evaluation of *shrikhand* sold in Kolhapur city' was undertaken in the laboratory of Division of Animal Science and Dairy Science of college of Agriculture, Kolhapur, MPKV, Rahuri (Maharashtra).

Materials
All the required glassware's was used to analyze *shrikhand* for different parameters throughout the study. Different equipments were used viz. Weighing balance, Autoclave, pH meter and refrigerator.

Selection of Brands of *Shrikhand*
Preliminary survey was conducted in the Kolhapur market, to know the brands and to ascertain the availability of *shrikhand* throughout the study period. On the basis of survey, five brands of *shrikhand* have been selected and considered for this study.

Collections of *Shrikhand* Samples
Shrikhand of predetermined brands has been collected from the local market and brought to the laboratory as and when required to complete analysis. The samples were brought in the chilled condition and stored under refrigerated temperature till its use for analytical purpose.

Sample Details
KS_1 -   Market *shrikhand* sample-1
KS_2 -   Market *shrikhand* sample- 2
KS_3 -   Market *shrikhand* sample- 3
KS_4 -   Market *shrikhand* sample- 4
KS_5 -   Market *shrikhand* sample- 5

Methods
Sensory Quality of *Shrikhand*
The refrigerated ($7 \pm 1\ ^0c$) stored *shrikhand* samples were subjected to sensory evaluation. The panel of five semi-trained judges from Division of Animal Husbandry and Dairy Science, College of Agriculture, Kolhapur were provided for sensory evaluation. The sensory quality i.e. Colour and appearance, body and texture, flavour, consistency and overall acceptability of *shrikhand* samples was evaluated as per '9' point hedonic scale (IS: 6273, part II, 1971). Samples were served in three-digit number coded container and placd in random manner, different *shrikhand* samples were placed along with water (to rinse the mouth) in laboratory, and panellists were instructed to evaluate each sample by blind tasting as per the standard score card for organoleptic evaluation.

Result and Discussion
Sensory Evaluation of *Shrikhand*
Most famous five brands of *shrikhand* samples sold in Kolhapur city were procured periodically from pre-identified shops within two to three hrs of receiving the products from

producer/ manufacturer. The *shrikhand* containers were kept in ice boxes during transportation from shop to laboratory then store in refrigerator temperature to the judges for sensory evaluation. The sensory evaluation of *shrikhand* samples was conducted by five semi trained judges. To minimize the differences, the panellists were acquainted with quality attributes and the defects generally associated with *shrikhand* samples. Nine point hedonic scales were provided to the panellists to evaluate the *shrikhand* samples. Each sample was given code which was changed from trial today trial so as to avoid its identity. The samples were evaluated for flavour, body and texture, colour and appearance, sweetness and overall acceptability. The numerical scores given by the judge for the individual quality attribute were contributed to get means and these means were subjected to statistical analysis. The results for sensory quality of *shrikhand* are discussed here as under.

1 Colour and Appearance
The colour is an important parameter from aesthetic point of view and variations were observed in colour and appearance of market samples of *shrikhand*. Score allotted by the judges for colour and appearance of market *shrikhand* samples is presented in Table 1.

Table 1: Score allotted by the judges for the colour and appearance of *shrikhand* samples samples sold in Kolhapur city

Shrikhand samples	Score
KS_1	$7.50^e \pm 0.06$
KS_2	$7.20^d \pm 0.04$
KS_3	$7.02^c \pm 0.05$
KS_4	$6.80^b \pm 0.08$
KS_5	$6.46^a \pm 0.03$
Standard Error	0.09
CD at 5 %	0.25

* Means of six replications within column followed by the same letter are not significantly different at $P < 0.05$

It is seen from table 1 that the average scores obtained for colour and appearance attribute of market sample are different significantly ($P<0.05$). According to statistical analysis sample KS_1 (7.50 ± 0.06) was significantly superior to other samples, while sample KS_5 (6.46 ± 0.03) was inferior to other samples.

Shaikh *et al.,* (2009) [7] reported that colour of fermented milk products depends on the colour of milk or caramelized colour obtained during heating of the milk or added color material. Similar finding was also reported by Ali *et al.,* (2002) [1] in yoghurt samples marketed in Mymensingh town of Bangladesh.

2 Body and texture
Score allotted by the judges for body and texture of market *Shrikhand* samples is presented in Table 2. All the samples showed a significant difference ($P<0.05$) in body and texture quality. The mean score of body and texture score of *Shrikhand* samples of brands under study were ranged from 6.05 ± 0.04 to 7.84 ± 0.05 (Table.4.2). The highest mean score (7.84 ± 0.05) for body and texture was obtained by KS_1 samples whereas, minimum score (6.05 ± 0.04) was recorded to KS_3 sample. The highest score for body and texture of *Shrikhand* of KS_1 might be because of sample was homogeneous showing no signs of wheying off and good consistency.

Table 2: Score allotted by the judges for body and texture of *shrikhand* samples sold in Kolhapur city.

Shrikhand samples	Score
KS$_1$	7.84^e ± 0.05
KS$_2$	7.67^d± 0.04
KS$_3$	6.05^a± 0.04
KS$_4$	7.30^c± 0.09
KS$_5$	7.00^b± 0.07
Standard Error	0.10
CD at 5 %	0.27

* Means of six replications within column followed by the same letter are not significantly different at $p < 0.05$

It is observed from the table 4.2 that ate average scores obtained for body and texture attribute of market samples KS$_1$ (7.84 ± 0.05) was significantly superior, Samples KS$_3$ (6.05 ± 0.04) observed statistically inferior to other samples. The (KS$_3$) show minimum score may be due to loose body and texture.

3. Flavour

The quality of any product is greatly determined by its flavour, which in turn determines its acceptability. The assessment of flavour of different brands of *shrikhand* under study is presented in the Table 3.

Table 3: Score allotted by the judges for flavour of *shrikhand* samples sold in Kolhapur city

Shrikhand samples	Score
KS$_1$	7.77^e ± 0.03
KS$_2$	7.44^c ± 0.05
KS$_3$	6.32^a ±0.05
KS$_4$	7.51^d±0.08
KS$_5$	7.10^b ±0.04
Standard Error	0.09
CD at 5 %	0.23

* Means of six replications within column followed by the same letter are not significantly different at $p < 0.05$

The average scores allotted for flavour of market samples are presented in table 3. It is seen from the table 4.3 that the average scores obtained for flavour attribute of market samples are differed significantly ($P<0.05$). samples KS$_1$ (7.77 ± 0.03) was significantly superior to other samples. While, samples KS$_3$ (6.32 ±0.05) was inferior to other samples.

4 Sweetness

Table 4: Score allotted by the judges for sweetness of *shrikhand* samples sold in Kolhapur city

Shrikhand samples	Score
KS$_1$	7.29^c ± 0.06
KS$_2$	6.31^b ± 0.05
KS$_3$	6.11^a ± 0.04
KS$_4$	7.18^c ± 0.03
KS$_5$	6.01^a ± 0.05
Standard Error	0.04
CD at 5 %	0.19

* Means of six replications within column followed by the same letter are not significantly different at $p < 0.05$

The average score allotted for sweetness as a sensory attribute of market samples of presented in table 4. It is revealed from the table 4 the average score obtained for sweetness of market samples showed significant ($P<0.05$) variations. Sample KS$_1$ (7.29 ± 0.06) was significantly superior, which was at par

with sample KS$_4$ (7.18 ± 0.03), while samples KS$_5$ (6.01 ± 0.05) was inferior to other samples which showed minimum sugar content in it. Sample KS$_5$ was at par with sample KS$_3$ (6.11 ± 0.04).

5 Overall acceptability

Table 5: Overall acceptability on the basis of score allotted by judges.

Shrikhand samples	Score
KS$_1$	7.35^d ± 0.03
KS$_2$	7.23^d ± 0.11
KS$_3$	6.50^a ± 0.03
KS$_4$	7.08^c ± 0.05
KS$_5$	6.75^b ± 0.04
Standard Error	0.08
CD at 5 %	0.43

* Means of six replications within column followed by the same letter are not significantly different at $p < 0.05$

Table 5 showed that the average scores obtained for overall acceptability of market samples are significant ($P<0.05$). Sample KS$_1$ (7.35 ± 0.03) was superior and at par with sample KS$_2$ (7.23 ± 0.11). Overall acceptability of sample S3 (6.50 ± 0.03) was least. From these data, it was observed that all the samples were acceptable and rated in between liked slightly (Score 6) to liked very much (score 9) when judged on 9 point hedonic scale. Similar trend was noticed for sensory quality i.e. colour and appearance, body and texture, flavour, acidity and overall acceptability. These results are different from those reported by Yonous *et al.,* (2002) for market quality of fermented products.

Conclusions

From the result it is concluded, that on the basis of sensory evaluation, studied here, KS$_1$ and KS$_4$ brands of *shrikhand* was significantly superior over the other brand under study. The wide variation was found among the market *shrikhand*, due to use of different ingredients. It is need to establish quality standards and enforcement of restriction on the quality of *shrikhand* in market.

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