



Effect of fat and sugar levels on acidity and total solids of shrikhand

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ABSTRACT : Shrikhand as a semi-soft, sweetish sour, whole milk product prepared from lactic fermented curd, the curd is partially strained through a muslin cloth to remove the whey and thus produce a solid mass called chakka. This chakka is mixed with the required amount of sugar to yield Shrikhand. The dish is very popular in Gujarat, Maharashtra and Karnataka. The buffalo milk was standardized to three fat levels *i.e.* 4 per cent (F_1), 5 per cent (F_2) and 6 per cent (F_3). During the preparation of Shrikhand three levels of sugar *i.e.* 30 per cent (S_1), 40 per cent (S_2), 50 per cent (S_3) was added and then the Shrikhand was put in plastic cups and earthen pots. The impact of all treatment individually and their interaction was studied on total solids and yield of Shrikhand. The results of present investigation yield useful information of productive utility for higher fat in Shrikhand the treatments $F_3 \times S_2$ showed better result. The highest amount of fat was evaluated in $F_3 S_2$. Individually higher total solid content in Shrikhand was observed for the treatment 6 per cent fat and 40 per cent sugar level. The treatment $F_3 \times S_2$ result in maximum TS content of Shrikhand. On the basis of sensory and chemical examination of buffalo milk shrikhand, the maximum yield of shrikhand was noted in $F_3 \times S_3$ sample followed by $F_2 \times S_2$ and minimum yield of shrikhand was noted in $F_1 \times S_1$ sample.

KEY WORDS : Fat, Sugar, Shrikhand, Sensory and chemical examination

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INTRODUCTION

Shrikhand as a semi-soft, sweetish sour, whole milk product prepared from lactic fermented curd, the curd is partially strained through a muslin cloth to remove the whey and thus produce a solid mass called chakka. This chakka is mixed with the required amount of sugar to yield Shrikhand (De, 1980) The dish is very popular in

Gujarat, Maharashtra and Karnataka. The Shrikhand word is derived from the Sanskrit root 'shrikha rani' meaning good nourishing food having high protein and calorific value.

The keeping quality of Shrikhand largely depends upon its initial micro flora like yeast, mould and other micro organism. Under ambient condition (30°C) it trends to spoil within 2-3 days. Under refrigerated condition (5°C) it can be kept for 40 days without deterioration. So in order to increase the milk availability during lean Periods (Summer months) the shrikhand preparation is best under Indian condition. With these view of utilization and industrial importance of milk entitled "Effect of fat and sugar on yield of shrikhand" was carried out.

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MATERIAL AND METHODS

The present investigation was carried out in the

Department of Animal Husbandry and Dairying, C.S.A.U.A. and T. Kanpur, India. The details of materials and various methods used for manufacture of shrikhand and its analysis in the laboratory. Materials detailed and Techniques used are given as under:

Milk :

Fresh buffalo milk is received from university Dairy Farm for the preparation of experimental Shrikhand. Milk has been standardized at 4 per cent, 5 per cent, 6 per cent for the preparation of Shrikhand.

Starter culture :

Streptococcus thermophilous and *Lactobacillus*

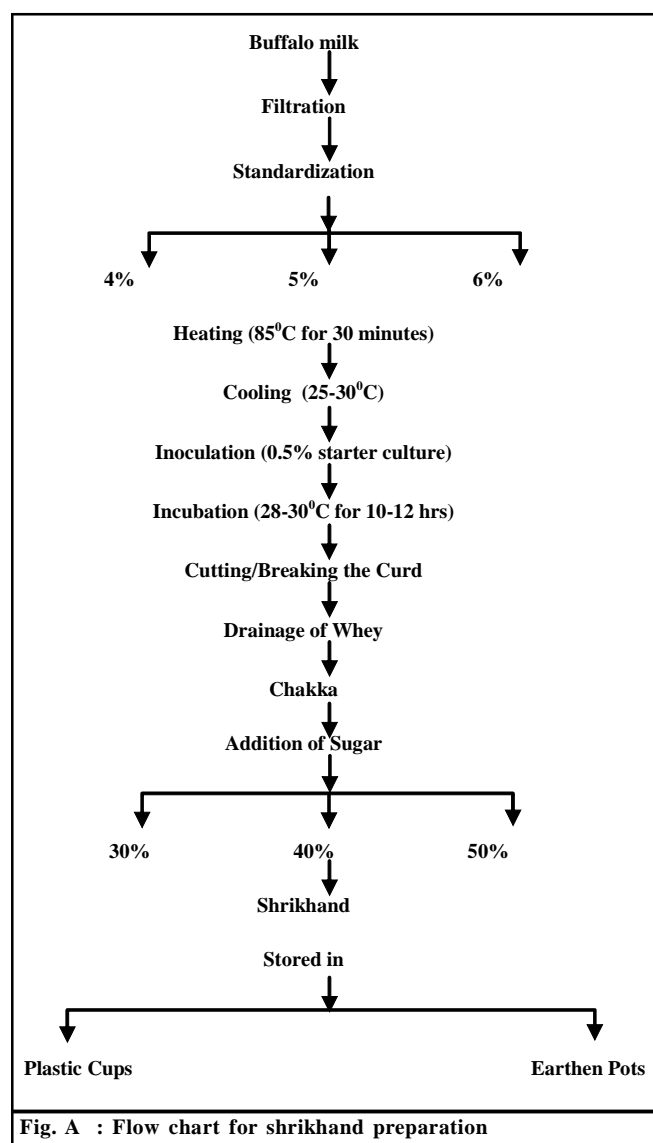


Fig. A : Flow chart for shrikhand preparation

sugericus

Sugar :

Commercial grade white crystalline sugar free from impurities was added as sweetening agent.

Colour and flavour :

No colour and flavour is added. Only natural colour and flavour of dahi is allowed to develop in control and experimental Shrikhand.

Packaging materials :

Plastic cup was used for packaging.

For preparing the *Shrikhand buffalo milk* was received from dairy from of C.S.A. University of Agriculture and Technology, Kanpur, then the milk was separated by the cream separator suitable culture was added and the *Shrikhand* was prepared as for the flow chart given (Fig. A):

Treatment details:

Fat levels: F₁ (4%), F₂ (5%) and F₃ (6%)

Sugar level on Chakka basis : S₁(30%), S₂ (40%) and S₃(50%)

Statistical analysis:

The experiment was laid in CRD with three replication

RESULTS AND DISCUSSION

The results of the present study as well as relevant discussions have been presented under following sub heads:

Acidity (%) :

Effect of different fat levels on acidity of Shrikhand:

Acidity of Shrikhand was significantly effected by different fat levels used in Shrikhand preparation. The most acidic Shrikhand was obtained for F₂ (1.066) and the least for the treatments F₁(0.900).

Effect of different sugar levels on acidity (%) of Shrikhand :

The acidity content of Shrikhand for different treatment of sugar levels had significant differences. The most acidity Shrikhand was obtained for S₁(1.300) and the least for the treatments S₃ (0.733).

Interactive effect of fat and sugar (FxS) on acidity content of Shrikhand :

The fat and sugar levels ($F_2 \times S_1$) (1.066) contained the maximum. Acidity and minimum acidity was found in $F_1 \times S_3$ (0.900).

fat level for total solid content in Shrikhand. The maximum total solid content in Shrikhand was recorded for F_3 (86.200) and the minimum total solid content in Shrikhand was recorded for F_1 (83.466).

Total solids contents (%) :

Effect of different fat level on total solid of Shrikhand:
The significant differences in treatment means of

Effect of different sugar level on total solid of Shrikhand :

The total solid contents of Shrikhand for different treatment of sugar level had significant differences. The

Table 1 : Effect of fat and sugar level on acidity of srikhand

Treatments	S ₁ (30%)	S ₂ (40%)	S ₃ (50%)	Mean
F ₁ (4%)	1.2	0.8	0.7	0.900
F ₂ (5%)	1.4	1.1	0.7	1.066
F ₃ (6%)	1.3	1.0	0.8	1.033
Mean	1.300	0.966	0.733	

Table 1 A : Anova for acidity of Srikhand. SE (d) CD Table

Source	D.F.	S.S.	M.S.S.	F Cal
Factor A	2	0.140	0.070	15.750**
Factor B	2	1.460	0.730	164.250**
A×B	4	0.080	0.020	4.500*
Error	18	0.0792	0.0044	
Total	26	1.759	0.824	
	C.D. (P=0.05)		SE(d)	
Factor A	0.066		0.031	
Factor B	0.066		0.031	
Treatments (A×B)	0.113		0.054	

NS=Non-significant

*, ** and *** indicate significance of values at P=0.05, 0.01 and 0.001, respectively

Table 2 : Effect of fat and sugar level on total solid of shrikhand

Treatments	S ₁ (30%)	S ₂ (40%)	S ₃ (50%)	Mean
F ₁ (4%)	75.20	83.00	92.20	83.466
F ₂ (5%)	75.60	84.90	91.03	83.844
F ₃ (6%)	76.90	88.00	93.70	86.200
Mean	75.900	85.300	92.311	

Table 2A : Anova for total solid of shrikhand SE (d) CD Table

Source	D.F.	S.S.	M.S.S.	F Cal
Factor A	2	39.4846	19.747	95.361***
Factor B	2	1220.527	610.263	2947.593**
A×B	4	14.198	3.547	17.144**
Error	18	3.726	0.207	
Total	26	1277.935	633.764	
	C.D. (P=0.05)		SE(d)	
Factor A	0.457		0.214	
Factor B	0.457		0.214	
Treatments (A×B)	0.786		0.371	

NS=Non-significant

*, ** and *** indicate significance of values at P=0.05, 0.01 and 0.001, respectively

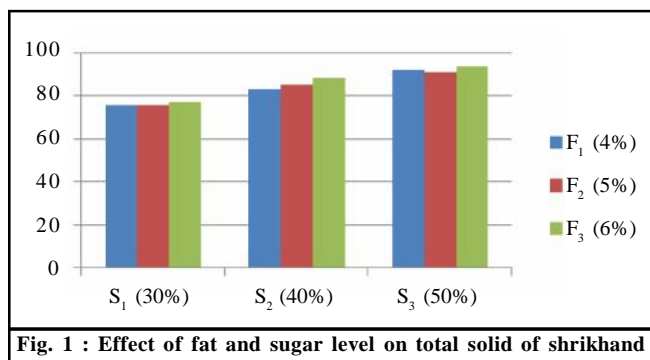


Fig. 1 : Effect of fat and sugar level on total solid of shrikhand

maximum amount of total solid was recorded S₃ (92.311) and the minimum amount of total solid was recorded S₁ (75.900).

Interactional effect fat and sugar (F_xS) on total solid content of Shrikhand :

The fat and sugar level F₃×S₃ (86.200) contained the maximum total solid and minimum total solid was found in F₁×S₁ (83.466).

On the basis of sensory and chemical examination of buffalo milk shrikhand samples prepared from different level of fat and sugar, it was concluded that 6 per cent fat and 40 per cent sugar was found to be better. The maximum yield of shrikhand was noted in F₃×S₃ sample followed by F₂×S₂ and minimum yield of shrikhand was noted in F₁×S₁ sample.

However, Kumar *et al.* (2013) found lower concentration of milk solids except ash and higher retention of moisture in shrikhand samples prepared from milk of 9.0 per cent SNF. These differences might be due to some deviation in the method of manufacturing of this product.

Singh *et al.* (2014) was investigated to suggest the best level of SNF for shrikhand making. The yield and sensory score of shrikhand increased with increase in the SNF content of milk. The total solids, protein, lactose and ash contents of shrikhand were found increased with the increase in the SNF content of milk but fat content reduced and the acidity of the product remained unchanged. At 13.0 per cent SNF level of milk, the product fulfilled all PFA specifications. Since, 13.0 and 15.0 per cent SNF levels were statistically similar with respect to sensory quality, hence, 13.0 per cent SNF level of milk has been recommended for shrikhand making at the commercial scale

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