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Organoleptic Evaluation of Low Calorie Shrikhand Prepared by Using Various Cultures

Ramji Lal, P.K. Upadhayay, Anoop Singh Chauhan* and Neeraj Gupta

Deptt. of Animal Husbandry & Dairying

C.S. Azad University of Agriculture & Technology Kanpur, U.P. India – 208002

*Corresponding Author E-mail: aschauhan7569@gmail.com

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ABSTRACT

This study was conducted to evaluate the organoleptic and sensory quality of low calorie shrikhand and also enhancing keeping quality, flavor, lowering cost of production. There were three different culture Streptococus lactic (A1), Streptococus cremoris (A2) and Streptococus diacetelactis (A3) used at two different incubation temperature as 30^0C (B1) and 37^0C (B2) for preparation of shrikhand. Four substances like, sucrose (C1) as control, saccharin (C2) and aspartame (C3) were used as sweetener in low calorie shrikhand. The sensory evaluation of various attributes like flavour, colour and appearance, sweetness body and texture and overall acceptability was done by a panel of five expert judges, selected from the Department of Animal Husbandry and Dairying, Chandra Shekhar Azad University of Agriculture and Technology Kanpur, U.P., using nine points "Hedonic scale" for food and dairy products. This process was replicated three times. After the evolution, it is concluded the maximum organoleptic acceptability of low calorie shrikhand was that contained streptococcus diaacetilactic culture at 37^0C incubation temperature with sucrose as sweetening agent fallowed by aspartame and saccharine.

Key words: *Organoleptic quality, Sensory attributes, Low calorie, Shikhand.*

INTRODUCTION

Fermented milk and milk products occupy a place in satisfying nutritional requirements of human being since the time antiquity. Fermented milk products have been well recognized to have therapeutic, anticholeterolemic, anticarcinogenic properties[2]. Amongst the various fermented milk products, dahi a well-known indigenous fermented milk products prepared by lactic acid fermentation is being converted in to *Shrikhand* because of its better shelf life.

Shrikhand in Sanskrit means "Sandal". Shrikhand, the product might have been so named because of its flavour, the cooling effect and the colour, the qualities, which it shares with sandal. However, the fact is that this word is originated from the Sanskrit word "Shrikharini" as mentioned in "Bhava-Prakash", the old classic.

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With the advent of time, the word "Shikharan" was derived from "Shikhrini". The later term is used for this product in Gujarat State. "*Shrikhand*" was later on modified as "*Shrikhand*" giving it Sanskrit touch, thereby suggesting that it might be a Sanskrit word, Hence in Maharashtra, Mysore and other states this product is known as "*Shrikhand*".

The[3], definition of probiotic is that they are "live microorganisms which when administered in adequate amounts confer a health benefit on the host". Fermented dairy products have long been an important component of nutritional diet. In the commercial manufacture of fermented products, starters containing specific genera, species and strains of cultures are used to generate desired flavor, body and texture characteristics. Lactic acid bacteria used as starters in the industrial production of dahi, *Shrikhand*, mishit doi, lassi, buttermilk and yoghurt. The lactic acid bacteria are naturally accepted as GRAS (Generally regarded as safe) for human consumption. The probiotic bacteria used in commercial products today are mainly members of the genera *Lactobacillus* and *Bifidobacterium*. Probiotic have been therapeutically, to modulate immunity, improve digestive process, prevent cancer, improve lactose intolerance, etc. Lactic acid bacteria decreases serum cholesterol levels and increases vitamin B content in the product[4].

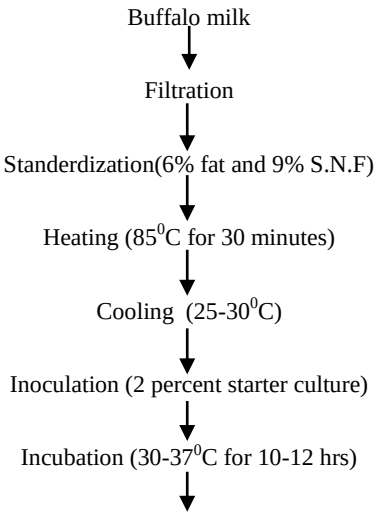
Today with much improved blends, the market share of intense sweeteners is much larger. It will continue to rise as sweeteners continue to improve. According to Calorie Control Council, an ideal sweetener should give the same sweetness as sucrose. In addition, it should be odourless, colourless, stable and readily soluble in food system. It should be functional, economically feasible, non-carcinogenic and non-toxic. Use of intense sweeteners has been allowed by PFA for the first time in the sweets like *halwa, khoa, burfi, rosogolla, gulabjamun* and other similar milk products.

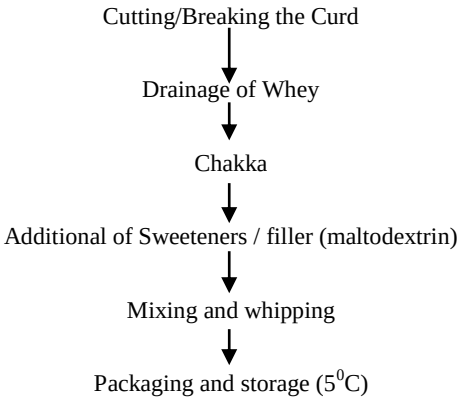
Since the application of intense sweeteners in indigenous dairy products is new, therefore quantitative information on the sweeteners in the dairy system is required. Considering the need of consumers for low calorie dairy products there is a considerable scope to study the effect of incorporation of fat replacers, intense sweeteners and bulking agents on the quality characteristics of shrikhand which isconsidered as highly calorific dairy product.

MATERIAL AND METHODS

PREPARATION OF SHRIKHAND:- For preparing the *Shrikhand buffalo milk* was received from dairy from of Chandra Shekhar Azad University of Agricultural and Technology Kanpur, then suitable culture was added and the *Shrikhand* was prepared as for the flow chart given below:

Flow Chart for Shrikhand Preparation





There were three different culture *Streptococus lactic* (A1), *Streptococus cremoris* (A2) and *Streptococus diacetelactis* (A3) used at two different incubation temperature as 30^{0}C (B1) and 37^{0}C (B2) for preparation of shrikhand. Four substances like, sucrose (C1) as control, saccharin (C2) and aspartame (C3) were used as sweetener in low calorie shrikhand. The sensory evaluation of various attributes like flavour, colour and appearance, sweetness body and texture and overall acceptability was done by a panel of five expert judges, selected from the Department of Animal Husbandry and Dairying, Chandra Shekhar Azad University of Agriculture and Technology Kanpur, U.P., using nine points "Hedonic scale" for food and dairy products. This process was replicated three times. The data on sensory evaluation, obtaining during the study were subjected for analysis of variance (ANOVA) as described by Snedecor and Cochran[8].

RESULT AND DISCUSSIONS

The results obtained from the present investigation as well as relevant discussion have been summarized under following heads:

Flavour:

The maximum flavor scores of experimental low calorie *Shrikhand* prepared using various cultures at two different incubation temperatures with three different sweetening agents was 8.3 while minimum flavour score was 7.3 for $A_3xB_2xC_1$ and $A_1xB_1xC_2$, respectively. The combination that contained streptococcus diaacetilactic culture at 37^{0}C incubation temperature with sucrose as sweetening agent got maximum flavour score and minimum flavour score was found to the sample that contained streptococcus lactic incubated at 30^{0}C with sachcharine sweetening agent. All the factors and their interactions were found to be non significant on flavour score (P>0.05) Singh *et al.*[7].

Body and Texture

The finest body and texture score was 8.1 while worst body and texture score was 7.1 in sample of $A_3xB_2xC_1$ and $A_1xB_1xC_2$, respectively. The combination that contained streptococcus diaacetilactic culture at 37^{0}C incubation temperature with sucrose as sweetening agent got maximum body and texture score and minimum body and texture score was found to the sample that contained streptococcus lactic incubated at 30^{0}C with sachcharine sweetening agent. All the factors and their interactions were found to be non significant on flavour score (P>0.05) Patel *et al.*[6].

Colour and appearance

The maximum colour and appearance score of *Shrikhand* prepared using various cultures at two different incubation temperatures with three different sweetening agents was 8.2 while minimum colour and appearance score was 7.2 for $A_3xB_2xC_1$ and $A_1xB_1xC_2$, respectively. The combination that contained streptococcus diaacetilactic culture at 37^{0}C incubation temperature with sucrose as sweetening agent got maximum colour and appearance score and minimum colour and appearance score was found to the sample that contained streptococcus lactic incubated at 30^{0}C with sachcharine sweetening agent. All the factors and their interactions were found to be non significant on flavour score (P>0.05) While de Koning L *et al.*

Sweetness

The maximum sweetness score of *Shrikhand* prepared using various cultures at two different incubation temperatures with three different sweetening agents was 8.5 while minimum sweetness score was 7.5 for $A_3xB_2xC_1$ and $A_1xB_1xC_2$, respectively. The combination that contained streptococcus diaacetilactic culture at 37^0C incubation temperature with sucrose as sweetening agent got maximum sweetness score and minimum sweetness score was found to the sample that contained streptococcus lactic incubated at 30^0C with sachcharine sweetening agent. All the factors and their interactions were found to be non significant on flavour score (P>0.05) Alam *et al.*

Overall acceptability

The maximum Overall acceptability score of *Shrikhand* prepared using various cultures at two different incubation temperatures with three different sweetening agents was 8.5 while minimum Overall acceptability score was 7.5 for $A_3xB_2xC_1$ and $A_1xB_1xC_2$, respectively. The combination that contained streptococcus diaacetilactic culture at 37^0C incubation temperature with sucrose as sweetening agent got maximum Overall acceptability score and minimum Overall acceptability score was found to the sample that contained streptococcus lactic incubated at 30^0C with sachcharine sweetening agent. All the factors and their interactions were found to be non significant on flavour score (P>0.05) Jain *et al.*[5].

CONCLUSION

The study of this investigation revealed that the most liking culture of low calorie shrikhand was containing streptococcus diaacetilactic culture fallowed by *Streptococus cremoris* and *Streptococus lactic.* The favourable incubation temperature was 37^0C fallowed by 30^0C and the sucrose as sweetening agent preferred over aspartame and saccharine. After the evolution, it is concluded the maximum organoleptic acceptability of low calorie shrikhand was that contained *streptococcus diaacetilactic* culture at 37^0C incubation temperature with sucrose as sweetening agent fallowed by aspartame and saccharine.

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