



"ASSESSING THE QUALITY OF WHEY-BASED MINT BUTTERMILK PRODUCED FROM DIFFERENT RAW MATERIAL"

Dairy Technology

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ABSTRACT

This paper involves preparation of Whey based buttermilk made from two different sources. The first source was adding 50% of water with curd and hanging the curd for 2-4 hours. Second source involved the usage of 100% whey from curd used for making Shrikhand. Different ingredients like Salt, Black Salt, Dry Mint, Mint Leaves and black pepper were added in buttermilk and whey. Mint was added in different proportions until the final acceptable taste was attained. The final product was evaluated as per chemical parameters and microbial parameters. Final products were evaluated on two chemical parameters: pH and titratable acidity (Lactic acid %) for a total period of 15 days. For microbial analysis, E. coli, Salmonella, Mesophilic Aerobic and Anaerobic Microorganisms were the parameters. The resultant final product was a nutraceutical drink not only providing health benefits but also utilizing the whey in the best possible manner. The cost of the formulated whey mint drink and Mint Buttermilk drinks (50 % curd and 50 % water) was Rs. 14 per litre and Rs. 37.50 /litre respectively. The study concluded that nutritionally rich whey-based herbal drinks could be recommended to all group of people.

KEYWORDS

Whey, Curd, Butter Milk, Mint, Salt.

INTRODUCTION

Whey from curd is a byproduct of dairy industry. It has valuable nutrients like lactose, proteins, minerals and vitamins. In the late 20th century, people used to prepare whey drink to save wastage and use it as a by-product. The chemical values of parameters such as acidity, pH was tabulated, the sensory evaluation was also done, and a comparative analysis was performed. Whey has various constituents (Smithers. 2008) like 45- 50% of total solids, 70% of lactose sugar, 20% of milk proteins and 70-90% of minerals and vitamins. Throughout the world, considerable work has been done with whey to utilize the nutritional values present in the product as well as to produce additional useful products such as Whey protein concentrates (WPC), Whey powder, Whey paste etc. Fermentation is the process, which is primarily used for converting whey into additional byproducts. A similar study was conducted to develop a whey drink with mint syrup containing 1 L of cottage cheese whey, 1 g of mint, 30 g of sugar, 25 ml of water and 4 g of citric acid. Unlike the 2g of peppermint, the third recipe has 3g of mint. The amount of whey, sugar and citric acid added in the second and third recipes were the same as the first recipe (G Larionov 2020).

A whey-based pineapple mint drink containing *Mentha arvensis* extract (0.3%) was prepared. The shelf life of the beverage was investigated under refrigerated, BOD (BOD removal) and room temperature storage and changes were measured during storage at 7-day intervals for up to 2 months. pH and acidity during storage were measured according to standard methods. The amount of whey varied between 80 and 83 ml per 100 ml of drink depending on the concentration of mint extract. Increasing mint extract from 0% to 1% improved the sensory value and overall acceptability of the beverage. The addition of 2% and 3% mint extract reduced the sensory value of the beverage and thereby reduced the quality of the beverage (Kapil Kumar 2017).

MATERIALS AND METHOD

Butter milk was prepared with curd and water, Whey obtained from hanging curd, Jeera powder, Black salt, salt, Whey water were from curd whereas mint leaves and dried mint is procured from the market as well as mint leaves from fields. Evaluate the physical, chemical, and sensory properties of whey-based herbal beverages. The approximate composition of whey including lactose (g/100 g), protein (g/100 g) and fat (g/100 g) was 4.28, 0.28 and 0.13 respectively. Whey (65%), sugar (11%), H1 - Brahmi extract (3%), H2 - mint extract (2%), H3 - Jalzeera powder (0.15%) is standardized for the composition of herbal drinks based on whey (Kanchana, 2021). The drink was divided into 4 different one portions and flavours namely rose, khus, chocolate and salt, jeera were added to each of the portions. Colours (0.3%) and

essence (0.3%) were added to develop the sweetness flavours, salt - jeera was developed using 0.4% and 0.6% salt, and jeera, respectively. Levels of these components. it was decided based on preliminary tests. FOS (5%) was added to all flavours of fermented beverages and mixed well. The final product was cooled to 5 °C and stored in a refrigerator (5-7°C) (Mini Sheth, 2016).

Preparation of mint whey drink: In a sterilized stainless steel vessel 1 Liter of whey is taken in a container and 15g of mint is added to the water, then 1g of salt, 3g of black salt, 1g of black pepper, 2g of jeera powder, 1g of pepper mint, 1g dry mint leaves and stored in a refrigeration at 6°C.

Preparation of mint Buttermilk: 1L of Buttermilk was taken in a sterilized stainless steel vessel. 15gm of mint was added in the same vessel and blended thoroughly to mix well. Then 1g of salt, 1gm black pepper, 3gm of black salt, 2gm Jeera powder, 1gm peppermint, 1gm dry mint leaves, were added and mixed well. Prepared mixture is stored at refrigeration condition at 6°C.

RESULTS AND DISCUSSION

Sensory evaluation of Mint Butter Milk and Mint Whey: Final product packed in bottles was stored at 50C for 15 days. Final product was drawn at intervals of every 7th day for the evaluation by organoleptic analysis. Final product was evaluated on a hedonic scale of 0 to 9 by 10 members. Samples prepared with different proportion of mint and mint leaves were subjected to sensory evaluation on colour, taste, appearance, flavor and overall acceptability with a time interval of 5 days/week during the storage period of 15 days.

Manufacturing sweet and salty low fat cultured milk beverages with mint as well as to find out the organoleptic quality of sweet and salty low fat cultured milk beverages with mint was the main objective. Mint extract was blended with curd in the ratio of 1, 2 and 3 percent and served as T1, T2 and T3 respectively and compared with control T0 (Srivastava 2011). The sample of whey drink were subjected to the organoleptic evaluation by a panel of five of five semi trained judges. Evaluation was done on a 9-point hedonic scale (IS: 6273-2, 1971).

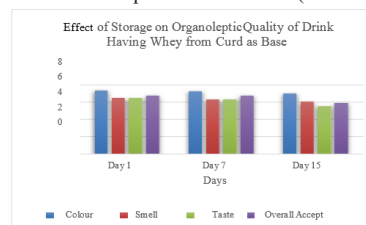
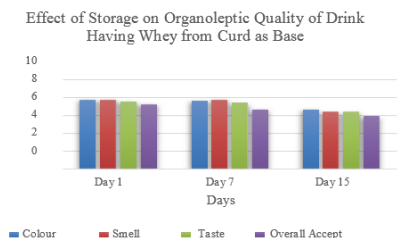


Fig.1: Effect of Storage on Organoleptic Quality of Drink Having Whey from Curd as Base

Organoleptic evaluation of the two samples was performed and it was found that the sample prepared from Buttermilk (50 % curd and 50 % water) as base was superior in terms of colour smell and taste with mean scores of 7.33, 7.29, 7.08 respectively, and it also had a superior overall acceptance score. The second sample having whey from curd as base had less mean scores in terms of colour smell and taste with mean scores of 7.20, 6.23, 6.06 respectively, and it also had a lesser superior overall acceptance score of 6.45.

**Fig.2:** Effect of Storage on Organoleptic Quality of Drink Having Buttermilk (50% Curd and 50% Water) as Base**Table 1:** Average of different physio-chemical parameters of Buttermilk (50 % curd and 50 % water) as base:

Days	Titrateable Acidity (Lactic acid %)	pH
Day 1	0.05	7.5
Day 7	0.08	6.5
Day 15	0.09	6.5
Mean value	0.07	6.83

Table 2: Average of different physio-chemical parameters of organoleptic quality of drink having whey from curd as base:

Days	Titrateable Acidity (Lactic acid %)	pH
Day 1	0.08	7.5
Day 7	0.08	6.5
Day 15	0.09	6.5
Mean value	0.08	6.83

Table 3: Microbial parameters of Mint Based Butter Milk and Whey Drink:

Parameter	Buttermilk (50 % curd and 50 % water) as base	Whey drink having whey from curd as base
Coliform	Absent CFU/ml	Absent CFU/ml
E. Coli	Absent in 10 ml	Absent in 10 ml
Salmonella	Absent in 25 ml	Absent in 25 ml

In terms of acidity, the second sample having whey from curd as base had more acidity (0.08% lactic acid) as compared to the other sample prepared from Buttermilk (50% curd and 50% water) as base (0.07% lactic acid). The pH value for both the samples was found to be same. The drink's storytelling ability was tested at 7 degrees Celsius for 20 days. As the mint extract was increased from 0 to 2%, three runs improved, decreasing the average organic secondary acidity and increasing the content of reducing sugars, resulting in a further 4% decrease in average quality. pH drops during storage and overall tolerance for variation is desirable for storage at refrigerator temperatures for up to 15 days (Ritika B. Yadav, 2010). Microbiological analysis was performed using the Food Microbiology Protocol Book. SPC found that in 1956, he was accepted under the PFA. No E. coli was detected in WBMMB (Hiralal, C.A. & Raj, J. D. 2014).

CONCLUSION

It was found that out of the two samples the sample having Buttermilk (50 % curd and 50 % water) as base – Sample 2 was liked more by the audience in comparison to the other sample having whey from curd as base- Sample 1. It was found that Sample 2 had more acceptances in terms of colour (81.44%), smell (81%), and taste (79%) in comparison to the sample 1, which had lesser percentage values: colour (80%), smell (69%), and taste (67%). The overall acceptability of sample 2 (73%) was also greater than sample 1 (72%). Therefore, it can be concluded that buttermilk containing drink as base was largely

accepted by the audience and has a chance of commercialization if the need arises

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