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Organoleptic evaluation of low fat probiotic (*Lactobacillus acidophilus*) beverage prepared by whey and sorghum

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Abstract
The present investigation can focus a light on utilization of whey which is regarded as dairy pollutant and as well as bag of nutrients, underutilized cereal (sorghum) having a good nutrient profile with incorporation of beneficial bacteria (*Lactobacillus acidophilus*) in form of beverage. Such probiotic beverages are good source of nutrition and thus promote the health of consumer. In present study the highly acceptable sample of beverage was LAC1P3 in comparison to its counterpart samples with 8.3±0.28 score in organoleptic evaluation. LAC1P3 scored for color and appearance, flavor and taste, and consistency with 8.3±0.28, 8.1±0.32, and 8.2±0.25 respectively. Prepared selected beverage was good in terms of its taste, flavor, and consistency and highly acceptable by trained panelists who judged it on 9 point hedonic scale.

Keywords: Whey, *Lactobacillus acidophilus,* sorghum, organoleptic evaluation, probiotic

1. Introduction
India is the leading milk producer in the world with annual milk production of around 114 million tones. With an average increase of 2.5-3% in milk production more and more of surplus milk is available for conversion to value added products. It is estimated that around 4-5% of total milk produced is converted into chhana and paneer. During conversion of milk into these traditional dairy products substantial amount of acid whey is generated (expected volume 78-80 million tones) which is generally discharged into municipal sewage. Disposal of whey remains a significant worldwide problem for the dairy industry.

Average composition whey is approximately 93% water and contains about 50% of total solids present in the milk of which lactose is the main constituent. Whey proteins constitute less than 1% of dry matter Beucler *et al.,* (2005) [4].

There is an increased awareness all over the world on the potential utilization of whey, primarily because of pollution, preventive regulation, and economic conditions. Whey and whey derived products besides being an excellent nutritional ingredient have a wide ranging and excellent functional characteristics supplying flavor, consistency, color and overall appearance in variety of foods. An attempt is therefore made to produce the nutritionally improved fermented beverage using dairy by-product, whey in conjunction with cereals and beneficial organisms that may provide health benefit to the consumer of all age group.

Whey can be fermented using lactic acid bacteria or probiotic bacteria. The use of probiotic bacteria for fermentation enhances the nutritive value and health quality of the product. One of the most important factors is the chosen probiotic strain since it determines the unique flavor and texture of the end product Maity *et al.,* (2008) [3]. On the health parlance, sorghum has strong anti-proliferative activity against colon cancer cells Yang *et al.,* (2009) [2]**.** Dairy Products are the main carriers of probiotics and have led the market for many years. This relationship has existed for more than centuries, when people consumed large amounts of fermented milks such as kefir, kurut, and yogurt Fontana *et al.,* (2013) [1].

Material and Methods
Raw materials
Skim milk procured from student training dairy, Warner College of Dairy Technology, SHUATS, Allahabad. Sorghum, sugar procured from local market of Allahabad. Whey is prepared from skim milk. Stabilizer purchased from Kamala Scientific Corporation, Allahabad. Culture of *Lactobacillus acidophilus* was obtained from National Dairy Research Institute (NDRI) Karnal.

Preparation and clarification of acidic whey

Procedure

Skim milk was taken into the container and pasteurized it at 80 ºC temperature. Citric acid palates of 3 gm were dissolved in 150 ml distilled water and heat it by using gas burner. Temperature was measured of both skim milk as well as citric acid solution by using calibrated dairy thermometer. Then added citric acid into the skim milk slowly, with the help of ladle mixed it. Citric acid solution added until get green color of whey then separation of whey from paneer done with the help of double folded muslin cloth. Figure1.shows flowchart of whey preparation appended below.

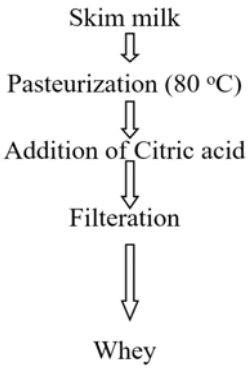

Fig 1: Flowchart of preparation of acidic whey

Preparation of low fat probiotic beverage using whey and sorghum

Procedure

Skim milk and whey prepared from skim milk was used for base material of low fat probiotic beverage. In base material cereal was added at different level for each sample combination. Then addition of stabilizer, then mixing and mixture was pasteurized at 63 ºC for 30 minutes and cooled at below 40 ºC. Then 2 % of prepared mixture, culture was added to it. Incubated at (37-42 ºC)/ 6 hours and sugar syrup 12% was added into it, agitated it. Then homogenization at 250 to 300 psi was done and prepared beverage was filled into pre-sterilized bottles and corked tightly and stored at (4 ºC±1).

Organoleptic evaluation of low fat probiotic beverage prepared from whey, sorghum, and *Lactobacillus* species

The low fat probiotic beverage were subjected to organoleptic evaluation for color & appearance, flavor & taste, consistency, and over all acceptability by semi trained panelists on 9 point hedonic scale**.** From the given 9 samples LAC1P3 was selected best on the basis of sensory characteristics such as color & appearance, flavor & taste, consistency, and overall acceptability. Figure 2 shows the flowchart of preparation of beverage appended below.

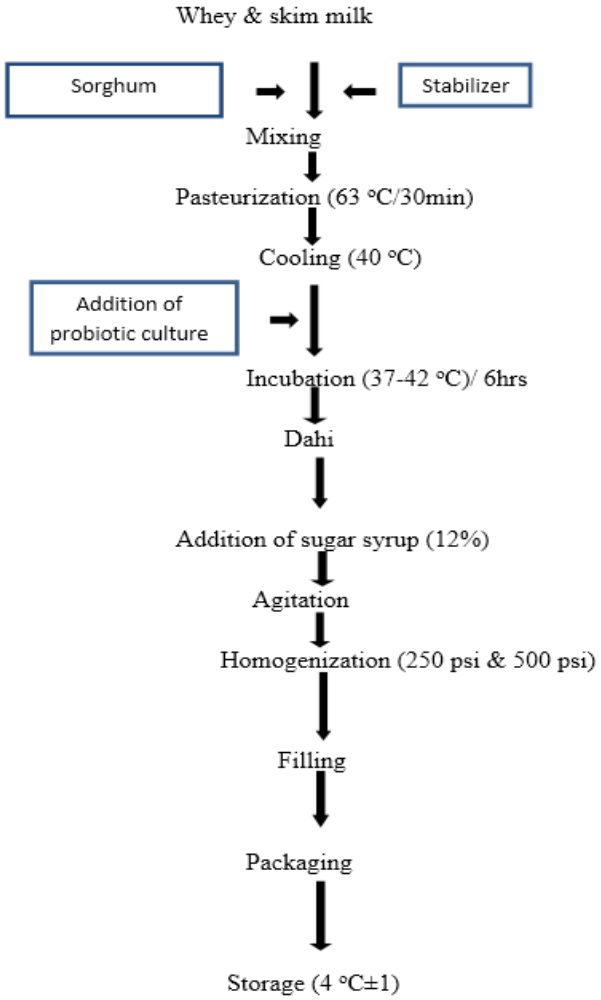

Fig 2: Flowchart of preparation of low fat probiotic (*Lactobacillus acidophilus*) beverage prepared by whey and sorghum

Results and Discussion

Table 1: Organoleptic characteristics score chart of low fat probiotic (*Lactobacillus acidophilus*) beverage prepared by whey and sorghum

Treatment	Color & Appearance	Flavor & Taste	Consistency	Overall acceptability
LAC1P1	6.4± 0.50	7.1± 0.15	6.6±0.10	6.5±0
LAC1P2	7.3 ± 0.10	7.6± 0.10	7.6±0.11	7.3±0.28
LAC1P3	8.3 ± 0.15	8.1± 0.32	8.2±0.25	8.3±0.28
LAC2P1	6.3 ± 0.10	6.3± 0.28	6.4±0.20	6.3±0.28
LAC2P2	7.2 ± 0.10	7.1± 0.28	7.5±0	7±0
LAC2P3	7.6 ± 0.32	7.8± 0.28	7.9±0.10	7.6±0.28
LAC3P1	5.9 ± 0.28	6.1± 0.28	6.5±0	6.1±0.28
LAC3P2	7± 0.05	7± 0.50	7.1±0.28	7±0
LAC3P3	7.3 ± 0.50	7.6± 0.28	7.7±0.20	7.5±0

Values are represented in mean ± stdev.

Color & Appearance

Results shows that for color and appearance score was for LAC1P1 (6.4±0.50), LAC1P2 (7.3±0.10), LAC1P3 (8.3±0.15), LAC2P1 (6.3±0.10), LAC2P2 (7.2±0.10), LAC2P3 (7.6±0.32), LAC3P1 (5.9±0.28), LAC3P2 (7±0.05), and LAC3P3 (7.3±0.50). The highest score obtained by LAC1P3 sample of beverage with score 8.3±0.15. It shows that this sample was best among others in color & appearance in sensory test.

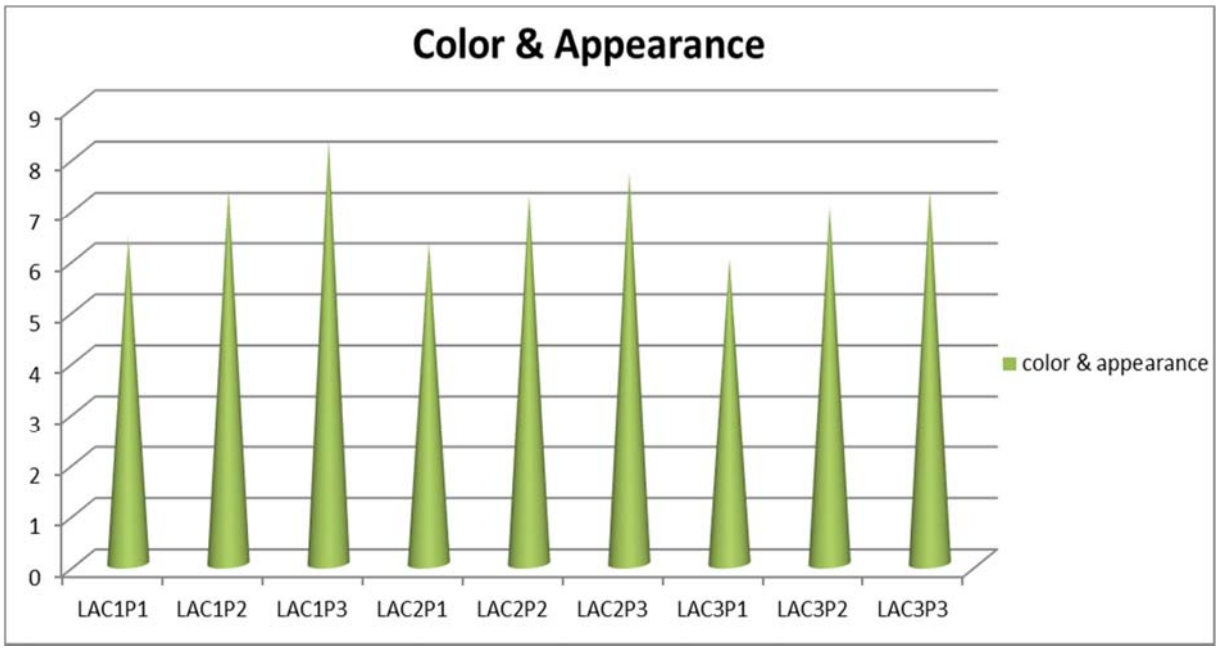

Fig 3: Graphical representation of parameter of color & appearance

Flavor & Taste

Results shows that for flavor & taste score was for LAC1P1 (7.1± 0.15), LAC1P2 (7.6± 0.10) LAC1P3 (8.1± 0.32), LAC2P1 (6.3± 0.28), LAC2P2 (7.1±0.28), LAC2P3 (7.8± 0.28), LAC3P1 (6.1± 0.28), LAC3P2 (7±0.50), and LAC3P3 (7.6±0.28). The highest score obtained by LAC1P3 sample of beverage with score 8.1±0.32. It shows that this sample was best among others in flavor & taste in sensory test.

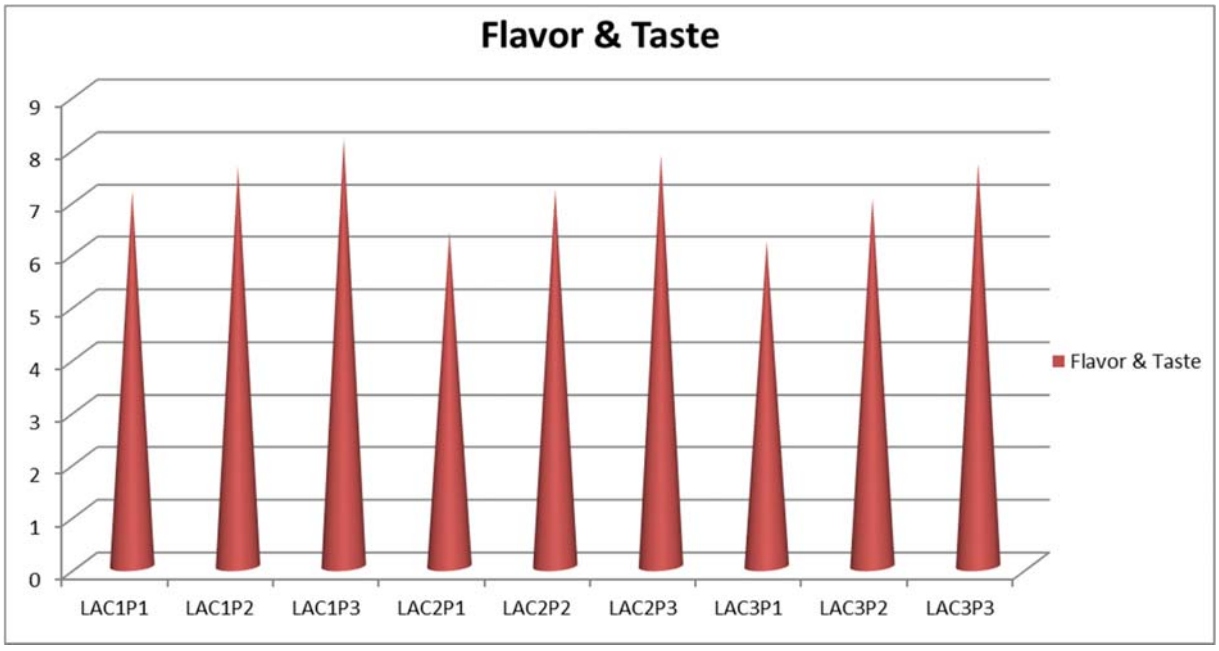

Fig 4: Graphical representation of parameter of Flavor & Taste

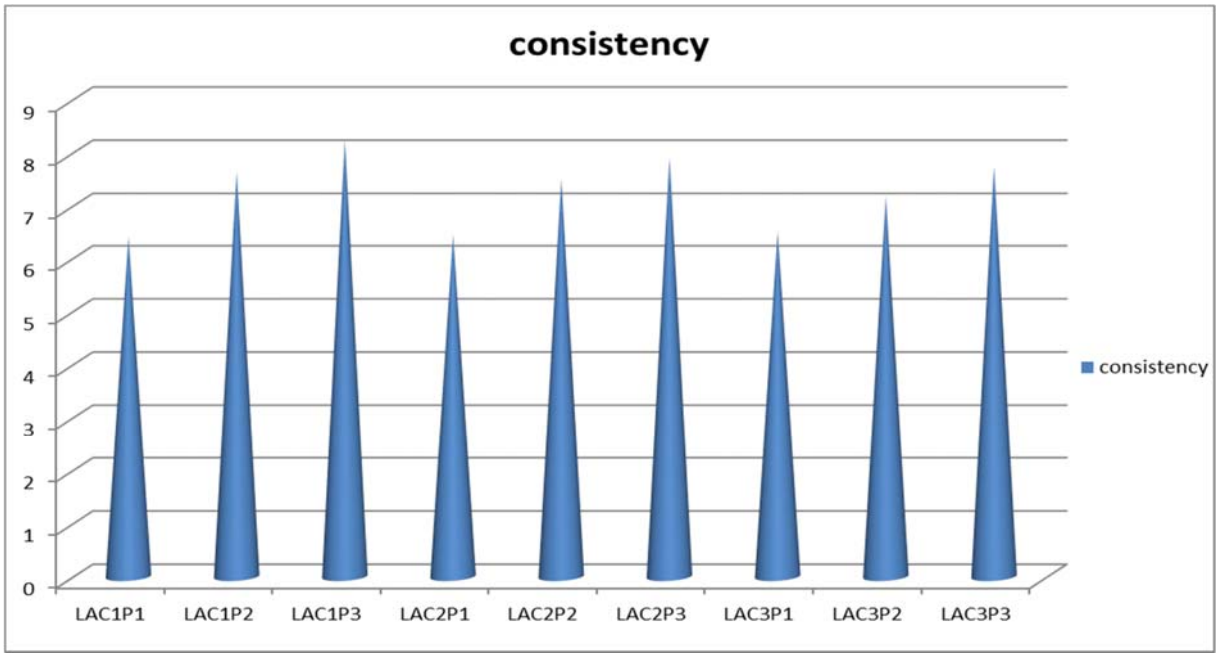

Fig 5: Graphical representation of parameter of Consistency

Consistency

Results shows that for consistency score was for LAC1P1 (6.6±0.10), LAC1P2 (7.6±0.11) LAC1P3 (8.2±0.25), LAC2P1 (6.4±0.20), LAC2P2 (7.5±0), LAC2P3 (7.9±0.10), LAC3P1 (6.5±0), LAC3P2 (7.1±0.28), and LAC3P3 (7.7±0.20). The highest score obtained by LAC1P3 sample of beverage with score 8.2±0.25. It shows that this sample was best among others in consistency in sensory test.

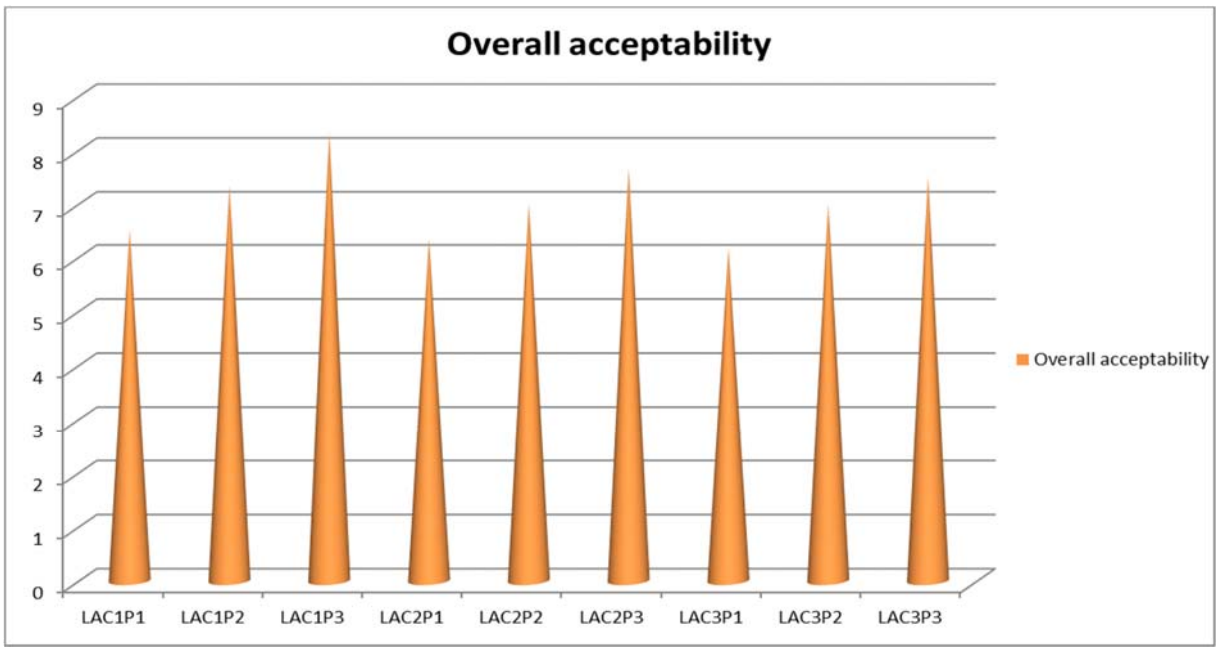

Fig 6: Graphical representation of parameter of Overall acceptability

Overall acceptability

Results shows that for overall acceptability score was for LAC1P1 (6.5±0), LAC1P2 (7.3±0.28) LAC1P3 (8.3±0.28), LAC2P1 (6.3±0.28), LAC2P2 (7.0±0), LAC2P3 (7.6±0.28), LAC3P1 (6.1±0.28), LAC3P2 (7±0), and LAC3P3 (7.5±0). The highest score obtained by LAC1P3 sample of beverage with score 8.3±0.28. It shows that this sample was best among others in overall acceptability in sensory test.

Conclusion

The organoleptic test on 9 point hedonic scale conducted for all nine samples of low fat probiotic beverage prepared by whey and sorghum by trained panelists and from obtained results it concluded that sample LAC1P3 was found highly acceptable. For this sample color & appearance, flavor & taste, consistency and overall acceptability scores were 8.3 ± 0.15, 8.1± 0.32, 8.2±0.25, and 8.3±0.28 respectively. Obtained results were statistically analyzed and result shows in mean ± stdev.

Acknowledgement
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References

1. Fontana L, Bermudez-Brito M, Plaza-Diaz J, Mu˜noz-Quezada S, Gil A. Sources, isolation characterization and evaluation of probiotics. Brit J Nutr. 2013; 109:S35-50.
2. Yang L, Browing JD, Awika JM. Sorghum 3-deoxyanthocyanins poses strong phase II enzyme inducer activity and cancer cell growth inhibition properties. J. Agric. Food Chem. 2009; 57(5):1798 -1804.
3. Maity TK, Rakesh K, Misra AK. Development of healthy whey drink with *Lactobacillus rhamnosus*, *Bifidobacterium bifidum* and *Propionibacterium freudenreichii* subsp. *Shermanii*, *Mljekarstvo.* 2008; 58:315-325.
4. Beucler J, Drake M, Foegeding EA. Design of a beverage from Whey permeate, *Journal of Food Science*, 2005; 70:277-285.
5. Gupta SK. Sensory evaluation in food industry. Indian Dairyman, 1976; 28(7):293-295.