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Studies on cost of manufacture for assessment supplementary cereal based fermented functional milk

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Abstract
The study was undertaken with the objective of estimating the cost of cereal based fermented functional milk prepared by barley flour, flaxseed flour. A total four combinations of milk barley flour, flaxseed flour, date syrup and skim milk powder were prepared in four replication one as a control and remaining four as experimental all the standard ingredient were purchased from local market the result of the study revealed that the production of cost of controlled cereal based fermented functional milk was lower (76.14/lit.) Compared to all functional milk Rs. (81.34/lit.) which may be attributes to higher cereal based fermented functional milk.

Keywords: cereal based functional milk, date syrup, barley flour, skim milk powder, and cost of production

Introduction
Milk and milk-derived products have constituted a significant part of the diet of all groups at all ages. Amongst those milk products, fermented milks are of great importance worldwide because of their nutritional, organoleptic and shelf-life properties that are significantly improved when compared with its raw material i.e. milk. Fermented milks are developed as a means of preserving nutrients of milk. Fermented milks including dahi, yogurts are considered as an ideal vehicle for the delivery of many beneficial microorganisms' viz. probiotics and prebiotics in addition to the microflora of human gastrointestinal tract (Gadhiya *et al* 2015). Therefore, fermented milk is the most popular group of functional food.

Lactic Acid Bacteria (LAB) been widely used as starter culture for the manufacturing of various fermented dairy products such as dahi, lassi and whey beverages. LAB and their food products are thought to confer a variety of important nutritional and therapeutic benefits and have many documented health promoting or probiotic effects in humans such as inhibition of pathogenic organism, antimutagenic and reduction of blood cholesterol (Shiby and Mishra, 2013) Cereal based functional fermented milk fulfils the nutrient requirements of an under nutrition person as it provides proper energy, protein, vitamins and minerals. The ingredient of the cereal based functional fermented milk includes whole barley flour, flax seed, date syrup and milk which supplements the nutrients required for an undernourished. The barley supplements with protein, dietary fiber, the B vitamins, niacin and several dietary minerals like manganese and phosphorous. Also flax seed provides omega 3 fatty acid which protect against heart disease, lower triglycerides, decreased risk with higher blood levels, inflammation etc. Omega-3 fatty acids are important for normal metabolism. Mammals are unable to synthesize omega-3 fatty acids, but can obtain the shorter-chain omega-3 fatty acid ALA (18 carbons and 3 double bonds) through diet and use it to form the more important long-chain omega-3 fatty acids. It is known that animal food is a good source of omega 3 fatty acids but vegetarian diet lacks.

Material and Method
The experiment was carried out in the research laboratory of department of Dairy Technology, Warner College of Dairy Technology, Sam Higginbottom University of Agriculture, Technology and Sciences, Allahabad. Milk, Skim milk, Flaxseed powder, Whole Barley Flour, Date Syrup was obtained from the local market of Allahabad. Cultures were procured from Student's Training Dairy SHUATS, Allahabad.

The treatment combination used is as follows
- **T1-** Toned milk- 100ml, Skim milk powder- 5%, Whole barley flour-4%, Date syrup- 10%, Flaxseed powder-0.5%.
- **T2-** Toned milk- 100ml, Skim milk powder- 5%, Whole barley flour-4%, Date syrup- 10%, Flaxseed powder-1%.
- **T3-** Toned milk- 100ml, Skim milk powder- 5%, Whole barley flour-4%, Date syrup- 10%, Flaxseed powder-2%.
- **T4-** Toned milk- 100ml, Skim milk powder- 5%, Whole barley flour-4%, Date syrup- 10%, Flaxseed powder-3%

The present study was undertaken for manufacturing of cereal based fermented milk product. The present investigation was carried out to see the possibility of incorporating barley flour, flax seed powder, and date syrup into the indigenous milk product dahi and the results obtained from the analysis were subjected to sensory characteristics of cereal based fermented milk product.

Procedure Adopted For Manufacturing of Cereal Based Fermented Milk Product
The experimental product was prepared by using toned milk with fat-3.0% and SNF-8.5%. The milk was homogenised

and heated to 90ºC for 2 min. then the milk was cooled at 30-32ºC. After cooling, 5% of skim milk powder was added while continuous stirring to increase the SNF to 11%. Barley flour with 4% was then mixed with the milk. After this addition of flax seed powder was done in variation with T_1 having 0.5%, T_2 having 1%, T_3 having 2% and T_4 having 3%. 10% Date syrup is mixed with the ingredients and is properly mixed with an electrical mixer. Finally 2% bacterial culture was added and the mix was then packed in air tight containers/ polystyrene cups which were capped and incubated at 37ºC for 8 hours. The fermented milk product prepared was cooled and stored in refrigerator less than 5ºC.

Fig 1: cereal based fermented milk product Result and Discussion

The costs of the ingredients are very important factor besides other factors in determining the cost of production. It is considered as basis for price fixation and determines the profit. The price of the product is depending on the cost of the production. The cost of experimental cereal based fermented milk was calculated, which is shown in the table below. The data regarding cost (Rs) of fermented milk, Development of cereal based fermented milk from a mix of Toned milk-, Skim milk powder, Whole barley flour, Date syrup and Flaxseed powder sample of different treatments are presented in table and following observations were made.

Table 1: Cost of Production for cereal based fermented milk Prepared by Toned milk-, Skim milk powder, Whole barley flour, Date syrup and Flaxseed powder.

Treatment	Milk	Barly flour	Flaxseed flour	Skim milk powder	Date syrup	Overhead Rs/gm	Yield	Total cost Rs./lit
Rate Rs./Lit	46	30	60	360	340			
T_1	58.7	0.061	0.022	0.828	1.479	20	780 ml.	81.34
T_2	58.2	0.060	0.045	0.817	1.462	20	790 ml.	80.50
T_3	56.78	0.059	0.045	0.817	1.426	20	810 ml.	79.04
T_4	54.11	0.054	0.012	0.759	1.254	20	850 ml.	76.14

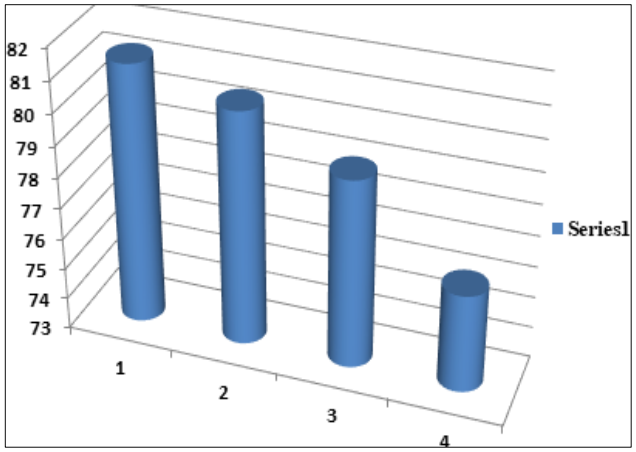

Fig 2: Graphical Data Cost of Production Data

Production cost of control fermented milk was found Rs.T_1 81.34 the production cost ranged depending upon the price of the ingredients in experimental cereal based fermented milk. it can also be observed that the highest mean cost Rs was recorded in cereal based fermented milk by toned milk, skim milk powder, whole barley flour, date syrup, flaxseed powder in sample of T_2 Rs(80.50) followed by T_3 Rs(79.04), T_4 Rs(76.14).

Conclusion

On the basis of the results obtained during the study it is concluded that flax seed flour and barley flour along with date syrup can be successfully employed for the preparation of cereal based milk product. Malnutrition or malnourishment is a condition resulting from eating a diet in which nutrients are either not enough or are too much that the diet causes health problems. It involves calories, protein, carbohydrates, vitamins or minerals. Malnutrition is of two types: under nutrition which means not having enough nutrients and over nutrition which means too much of nutrients. Malnutrition is often used specifically to refer to under nutrition. If under nutrition occurs during pregnancy, or before two years of age, it might result in permanent problems with physical and mental development. Extreme starvation, may have symptoms that include: a short height, thin body, very poor energy levels, and swollen legs and abdomen. People might also suffer from diseases due to lack of immunity due to under nutrition. Cereal based functional fermented milk fulfils the nutrient requirements of an under nutrition person as it provides proper energy, protein, vitamins and minerals. The ingredient of the cereal based functional fermented milk includes whole barley flour, flax seed, date syrup and milk which supplements the nutrients required for an undernourished.

Fig 3: cereal based fermented milk.

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