

Research Paper :

Utilization of paneer whey for the preparation of whey corn flour soup

ANISHA VERMA, NEHA SINGH AND R. CHANDRA

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See end of the article for authors' affiliations

Correspondence to:

ANISHA VERMA

Department of Food and Nutrition, Halina School of Home Science, Higginbottom Institute of Agriculture Science and Technology (D.U.), ALLAHABAD (U.P.) INDIA

ABSTRACT

Whey is a major source of energy giving lactose, vitamin, minerals and good source of heat promoting whey protein. The present work was conducted with the objectives to prepare whey corn flour soup and studying its organoleptic and chemical properties. The experiment was replicated six times and the data obtained during the investigation were statistically analyzed by using analysis of variance (ANOVA) and critical difference (CD) techniques. Whey corn flour soup prepared by admixture of water and whey in ratio of 1:1, 1:2, 1:3 served as T₁, T₂ and T₃, respectively. The quality of whey corn soup was compared to that of the control T₀, corn flour soup prepared from water. Sensory evaluation of prepared whey corn flour soup was carried out using the nine points Hedonic scale. Fat, protein, carbohydrate and total solid were found to be highest in treatment T₃ (1:3) 1.283, 0.63, 7.0 and 10.612, respectively. T₂ (1:2) recorded highest scores in flavour and taste, consistency, colour and appearance and overall acceptability. Whey based ready to serve beverage offers the advantages of convenience for busy consumers.

Key words : Whey, Paneer, Chhana, Corn flour soup, Beverages, By-products

Whey is an excellent beverage base and genuine thirst quencher, nutritious and possesses medicinal properties but treated as waste dairy by-product. On one side, it controls the pollution and on the other hand adds value to the products. Paneer whey contains water 93.6 per cent, fat 0.5 per cent, protein 0.4 per cent, lactose 5.1 per cent and ash 0.4 per cent (Day, 1977). Paneer whey soup increases the appetite and it is also helpful in case of diarrhea and liver problems. On the other hand paneer whey soup contains good amount of carbohydrate, fat, protein and minerals. So, that keeping the above mentioned reasons in the mind, we have utilized the whey for the preparation of whey corn soup. The present study was conducted with the objectives to find out the feasibility of utilizing whey for soup making and to find out the chemical and organoleptic quality of whey corn flour soup.

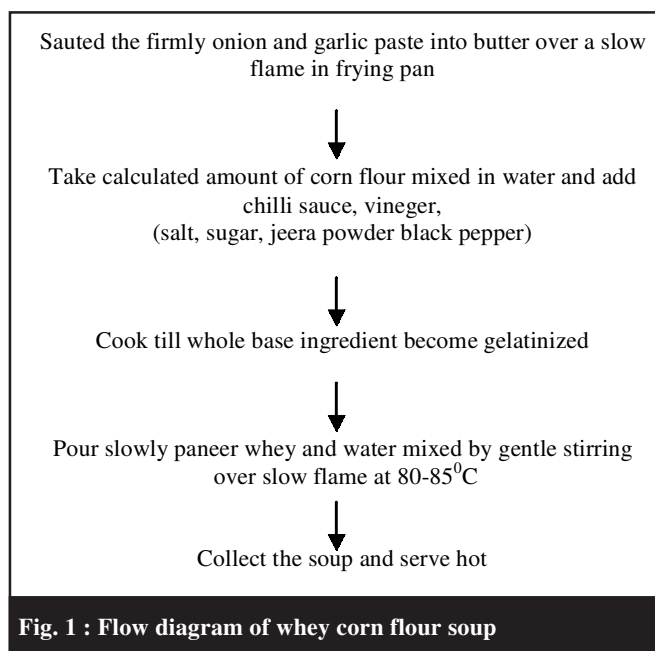
METHODOLOGY

The research work was carried out in the research laboratory of Department of Dairy Technology, Allahabad Agricultural Institute-Deemed University, Allahabad.

Collection of ingredients:

Skimmed milk and whey were collected from Students Training Dairy Allahabad Agricultural Institute, Deemed University. Other ingredients were collected from local market of Allahabad.

Development of whey corn flour soup:



Detail of treatments and replications:

T₀ control= Corn flour soup prepared without addition of whey, T₁ = Corn flour soup prepared with addition of whey in the ratio of 1:1, T₂ = Corn flour soup prepared with addition of whey in the ratio of 1:2, T₃ = Corn flour soup prepared with addition of whey in the ratio of 1:3

Chemical analysis of product:

Protein content was determined by Micro-Kjeldahl method using digestion and distillation system (BIS 1961).

Fat content was determined by modified Gerber centrifuge method (BIS 1977).

A total solid was determined as per the procedure laid down in the AOAC (1980).

The total sugar content was determined by subtracting moisture, fat, protein and ash from 100.

The pH content was determined through digital pH meter.

Organoleptic evaluation of corn flour soup:

Panel of five judges did sensory evaluation of corn flour soup by using a scorecard based on 9-point hedonic scale (Srilaskhmi, 2006).

Statistical analysis:

The data obtained for various parameters were analyzed statistically using analysis of variance and critical difference techniques (Panse and Sukhatme, 1969).

FINDINGS AND DISCUSSION

The data collected on different parameters as per methodology have been tabulated and analyzed statistically. The results obtained from the analysis are presented in Table 1 and 2 and discussed accordingly.

The results presented in Table 1 shows that the average per cent fat in whey corn flour soup samples T_0, T_1, T_2 and T_3 were 0.908, 1.23, 1.24 and 1.083,

respectively. Treatment T_3 contained higher percentage of fat. Earlier, Dyanchenko (2006) observed that whey based herbel mango pulp beverages was richer in fat. The fat content in the product indicated significant difference. The average per cent protein in whey corn flour soup samples T_0, T_1, T_2 and T_3 were 0.33, 0.6, 0.6 and 0.63, respectively. Treatment T_3 contained higher percentage of protein than the other samples. The findings are similar to those observed by Chidandaian *et al.* (2002) that chicken whey soup was richer in protein than chicken soup. The protein content in the product indicated significant difference. Table 1 shows that the average per cent carbohydrate in whey corn flour soup samples T_0, T_1, T_2 and T_3 were 3.25, 5.75, 6.58 and 7.0, respectively. The per cent carbohydrate in whey corn flour soup sample T_3 was higher than of other samples. The findings are similar to those observed by Kesarkar (2002) in which the carbohydrate content was increasing significantly in the whey based coffee beverages.

Corn flour soup prepared with addition of whey in the ratio of 1:3(T_3) scored highest average percentages of pH (5.28) and total solid (10.612). The significant difference in fat, protein, carbohydrate, pH and total solid content of whey corn flour soup was due to the different proportions of whey and water, which was used in different treatment combinations.

The highest average of flavour and taste scores (7.76) was recorded in T_2 followed by T_3 (7.7), T_1 (7.53) and T_0 (7.1), which show the non-significant difference among the treatment combination (Table 2). The highest average colour and appearance and consistency scores were recorded in T_2 (8.1 and 7.5) and lowest scores in T_0 (7.5 and 7.4), respectively. It indicates that the treatments had no-significant difference ($P \leq 0.05$) on the colour and appearance and consistency scores of whey corn flour soup.

Non-significant difference ($P \leq 0.05$) in overall acceptability was found among the treatments. The average of overall acceptability scores (7.88) was recorded in T_2 followed by T_3 (7.85), T_1 (7.82) and T_0 (7.43).

Conclusion:

On the basis of findings it can be concluded that the whey corn flour soup prepared by using admixture of whey and water in ratio of 1:2 was found to be best in flavour and taste, colour and appearance, consistency and overall acceptance. T_3 was found to be the best in carbohydrate, protein, fat and total solids.

Table 1 : Average chemical composition of prepared whey corn flour soup

Treatments Parameters	T_0	T_1	T_2	T_3	Result
Fat	0.908	1.23	1.24	1.080	S
Protein	0.33	0.6	0.60	0.63	S
Carbohydrate	3.25	5.75	6.58	7.0	S
pH	5.28	5.22	4.76	4.74	S
Total solids	5.188	8.5	9.394	10.612	S

S-Significant

NS-Non significant

Table 2 : Average organoleptic attributes of prepared whey corn flour soup

Treatments Parameters	T_0	T_1	T_2	T_3	Result
Flavour and taste	7.1	7.53	7.76	7.7	NS
Colour and appearance	7.5	7.8	8.1	7.9	NS
Consistency	7.6	7.4	7.6	7.5	S
Overall acceptability	7.43	7.82	7.88	7.85	NS

S-Significant

NS-Non significant

Authors' affiliations:

N. SINGH AND R. CHANDRA, Department of Foods and Nutrition, Hilina School of Home Science, Sam Higginbottom Institute of Agriculture Sciences and Technology, Deemed University, ALLAHABAD (U.P.) INDIA

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