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Physical Properties and Sensory Evaluation of Egg Based Whey Beverage

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ABSTRACT

This study was conducted to evaluate the organoleptic and sensory quality of egg based whey beverage. There were three different levels of egg percentage like 4%, 6% and 8% with three different types of essence as Mango, Orange and Kewada and three levels of sugar like 10%, 12% and 14% added for preparation of egg based whey beverage. The sensory evaluation of various attributes like flavour, colour and appearance, sweetness 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 evaluation, it was found the most liking egg based whey beverage that was prepared by using 6% egg, Orange essence and 12% sugar and least liked sample which was prepared by using 8% egg with kewda essence and contained 14% sugar.

Key words: *Organoleptic quality, Sensory quality whey beverage, Egg*

INTRODUCTION

Whey is the major by-product obtained during the preparation of dairy products such as cheese, channa, paneer, and shrikhand. In India, there has been a considerable increase in the production of direct acidified indigenous milk products such as channa resulting in an increased availability of whey[6]. About 2 million tones of whey, containing about 130,000 tonnes of valuable milk nutrients, are produced annually in India[2]. Whey obtained during paneer and cheese production is divided into rennet whey and paneer whey (acid). The whey contains 93.60 water, 6.40 total solids, 4.80 lactose, and 0.73 protein, 0.50 fat and 0.50 minerals (%).

Many researchers has been fortified whey with different type of fruit juices like pine apple, mango, guava, water melon, bottle guard etc. which are improving viscosity, TSS, flavour, nutritional value etc of whey, but these are not enhancing protein and valuable minerals in the beverage. On the sense of protein and minerals, egg will improve nutritional quality of whey beverage instead of fortification with juices. Eggs are an important source of high quality protein.

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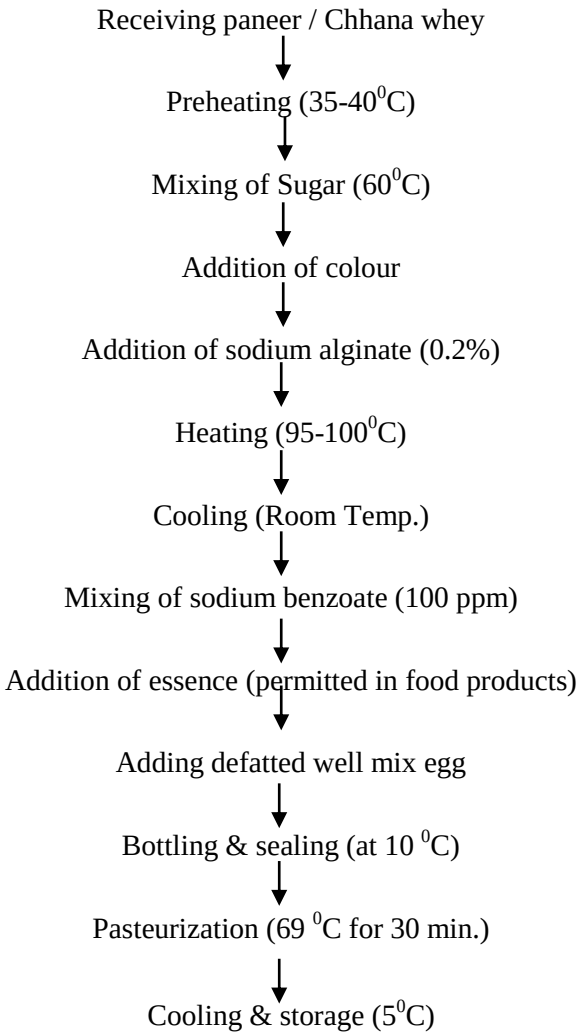
On the evaluation scale most commonly used for assessing protein, egg protein is at the highest point, 100, and is used as the reference standard against which all other foods are assessed. This is because of the essential amino acid profile and the high digestibility of egg protein. When assessed against a range of different measures of protein quality (protein digestibility corrected amino acid score; biological value; net protein utilisation; protein efficiency ratio; protein digestibility) eggs rank consistently high, even against other high quality sources of protein such as beef and cows' milk. 12.6% of the weight of the edible portion of the egg is protein and it is found in both the yolk and the albumen. Although protein is more concentrated around the yolk, there is in fact more protein in the albumen. Egg protein is a rich source of the essential amino acid leucine, which is important in modulating the use of glucose by skeletal muscle and in facilitating muscle recovery after exercise[7]. It has therefore been postulated that this would be advantageous to people undergoing endurance training. In comparison with other high protein foods, eggs are a relatively inexpensive source of protein.

METHODS AND MATERIALS

Manufacture egg based whey drink



There were three levels of egg percentage like 4% (A1), 6% (A2) and 8% (A3) with three different types of essence as Mango (B1), Orange (B2) and Kewada (B3) and three levels of sugar like 10% (C1), 12% (C2) and 14% (C3) added for preparation of egg based whey beverage. The sensory evaluation of various attributes like flavour, colour and appearance, sweetness 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[5].

RESULT AND DISCUSSION

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

Flavour:

The combination of A2xB2xC2 got maximum flavour score (8.47) whereas the least score (7.12) found in A3xB3xC3. The highest flavour score found in the sample which was prepared by using 6% egg with orange essence and contained 12% sugar while lowest score found in sample which was prepared by using 8% egg with kewda essence and contained 14% sugar. These results were found to be statistically significant (P<0.05, CD=0.164), Wadhawa *et al*[8].

Colour and appearance

The sample A2xB2xC2 got maximum colour and appearance score (8.15) whereas the least score (6.80) found in A3xB3xC3. The highest colour and appearance score found in the sample which was prepared by using 6% egg with orange essence and contained 12% sugar while lowest score found in sample which was prepared by using 8% egg with kewda essence and contained 14% sugar. These results were found to be statistically significant (P<0.05, CD=0.164), Dube, *et al*[1].

Sweetness

The combination of A2xB2xC2 got maximum sweetness score (7.99) whereas the least score (6.64) found in A3xB3xC3. The highest sweetness score found in the sample which was prepared by using 6% egg with orange essence and contained 12% sugar while lowest score found in sample which was prepared by using 8% egg with kewda essence and contained 14% sugar. These results were found to be statistically significant (P<0.05, CD=0.164), Shende, *et al*[4].

Overall acceptability

The combination of A2xB2xC2 got maximum overall acceptability score (8.20) whereas the least score (6.85) found in A3xB3xC3. The highest overall acceptability score found in the sample which was prepared by using 6% egg with orange essence and contained 12% sugar while lowest score found in sample which was prepared by using 8% egg with kewda essence and contained 14% sugar. These results were found to be statistically significant (P<0.05, CD=0.164), Shende, *et al.*[4] and Wadhawa *et al*[8]. The interaction combination of in 6% egg and Orange essence, 6% egg and 12% sugar, 6% egg, Orange essence and 12% sugar, Orange essence, 12% sugar got the maximum sensory score and also found to be superior over all other interactions.

Table 1: Sensory quality of egg based whey beverage

Combinations	Flavour	Colour and appearance	Sweetness	Overall acceptability
A1B1C1	7.92	7.6	7.44	7.65
A1B1C2	8.17	7.85	7.69	7.90
A1B1C3	7.87	7.55	7.39	7.60
A1B2C1	8.12	7.8	7.64	7.85
A1B2C2	8.37	8.05	7.89	8.10
A1B2C3	8.07	7.75	7.59	7.80
A1B3C1	7.72	7.4	7.24	7.45
A1B3C2	7.47	7.15	6.99	7.20
A1B3C3	7.67	7.35	7.19	7.40
A2B1C1	8.02	7.7	7.54	7.75
A2B1C2	8.27	7.95	7.79	8.00
A2B1C3	8.27	7.95	7.79	8.00
A2B2C1	7.97	7.65	7.49	7.70
A2B2C2	8.47	8.15	7.99	8.20
A2B2C3	8.27	7.95	7.79	8.00
A2B3C1	8.17	7.85	7.69	7.90
A2B3C2	7.82	7.5	7.34	7.55
A2B3C3	8.07	7.75	7.59	7.80
A3B1C1	7.77	7.45	7.29	7.50
A3B1C2	7.82	7.5	7.34	7.55
A3B1C3	8.07	7.75	7.59	7.80
A3B2C1	7.77	7.45	7.29	7.50
A3B2C2	8.02	7.7	7.54	7.75
A3B2C3	7.97	7.65	7.49	7.70
A3B3C1	7.62	7.3	7.14	7.35
A3B3C2	7.87	7.55	7.39	7.60
A3B3C3	7.12	6.8	6.64	6.85

Table 2: CD and SE d of egg based whey beverage

Factors	CD	SEd
A	0.164	0.082
B	0.164	0.082
AxB	NS	0.141
C	NS	0.082
AxC	NS	0.141
BxC	NS	0.141
AxBxC	NS	0.245

CONCLUSION

The study of this investigation revealed that the sensory attributes of egg based whey beverage found to be highest in 6% egg, Orange essence and 12% sugar found to be superior over all other factors. The least score found in sample which was prepared by using 8% egg with kewda essence and contained 14% sugar. In regard of most liking sample was 6% egg, Orange essence and 12% sugar that was superior over all other combinations and inferior sample was 8% egg with kewda essence and contained 14% sugar.

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