

Utilization of *Chhana* Whey for Preparation of Vegetable Soup

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ABSTRACT

A study was conducted to utilize *chhana* whey in vegetable soup at different percentage of whey. In this study four different percentage of whey T₁(50%), T₂(60%), T₃(70%) and T₄(80%) were used for sweet corn soup. The quality of the whey soup was highly influenced and most acceptable as per physicochemical and organoleptic analysis. Then *chhana* whey was mixed with vegetable paste in ratio of 50:50 (T₁), 60:40 (T₂), 70:30 (T₃) and 80:20 (T₄). It was then cooked for 15 minutes. Product was ready to serve in hot condition. First of all vegetable paste was obtained by mixing tomato puree (20g), grinded pee (15g), grinded carrot (20g), Chopped green onion (15g), chopped cabbage (15g), Garlic and Ginger paste (10g), coriander powder (5g) and water (150ml).

Key words Vegetable paste, *chhana* whey, vegetable soup.

Soup is primarily a liquid food, generally served warm, made by combining ingredient such as meat and vegetables with stalk, juice, water or another liquid. Soup is a processed food product, especially ready to cook convenience and has an important role as a popular delicacy, because of their nourishing, appetizing, easily digestible and palatable qualities. Various formulated soups have gained popularity for their nourishing and appetizing qualities and have created there position in food habit of many countries (Ghosh, 1994). Whey is a by-product obtained during coagulation of milk by using acid/rennet for preparation of *chhana*, *Paneer* and Cheese. Whey is an excellent beverage base and genuine thirst quencher, nutritious and possess medicinal properties, but it is treated as a waste dairy by-products. The present investigation is planned with a view to utilize *chhana* whey for preparation of vegetable soup by adopting the technique of manufacture as per Singh, *et.al.*, 1994.

MATERIALS AND METHODS

First of all, vegetable paste was prepared by mixing tomato puree (20g), grinded pee (15g), grinded carrot (20g), Chopped green onion (15g), chopped cabbage (15g), Garlic and Ginger paste (10g), coriander powder (5g) and water (150ml). Further black pepper and cumin powder @ 0.5% was added. The paste was boiled for well mixing. At the end corn flour was added @ 1%. Now *chhana* whey and

vegetable paste was mixed at (50:50), (60:40), (70:30) and (80:20) ratio. The ratio was cooked for 15 minutes. Thus the soup was ready to serve. The samples were analyzed for physicochemical, microbial and organoleptic qualities as per procedure laid down by ICAR manual in Dairy chemistry and microbiology (1972).

RESULTS AND DISCUSSION

The data obtained on different aspects as per plan were tabulated and statistically analyzed as per Chandel, 1991. Table 1 showed average data obtained on different parameters.

Physicochemical properties:

The highest mean for carbohydrate percentage in whey vegetable soup was in T₄=6.46, followed by T₃(6.42), T₂(6.26), T₀(6.08) and T₁(5.50). The differences among the treatments were significant. The highest mean for protein percentage in whey vegetable soup was in T₄=6.78, followed by T₃(6.20), T₂(5.72), T₁(5.50) and T₀(5.10). The differences among the treatments were significant. The highest mean for fat percentage in the product was in T₄=0.68, T₃(0.54), T₂(0.44), T₁(0.36) and T₀(0.18). There were significant differences found among the treatments. The highest mean for ash percentage in whey vegetable soup was found in T₀(1.52), followed by T₁(1.42), T₂(1.26), T₄(0.88) and T₃(0.04). The differences among the treatments were significant. The highest mean for moisture percentage was found in T₀(87.08), followed by T₁(86.46), T₂(85.92), T₃(85.80) and T₄(85.24). The differences among the treatments were significant. The highest mean for total solids content was in T₄(14.78), followed by T₃(14.20), T₂(13.68), T₁(13.52) and T₀(12.90). The differences among the treatments were significant.

Table 1. Average of different physicochemical parameters.

| Parameters(%) | Treatments | | | | |
|---------------|----------------|----------------|----------------|----------------|----------------|
| | T ₀ | T ₁ | T ₂ | T ₃ | T ₄ |
| Carbohydrate | 6.08 | 5.50 | 6.26 | 6.42 | 6.46 |
| Protein | 5.10 | 5.50 | 5.72 | 6.20 | 6.78 |
| Fat | 0.18 | 0.36 | 0.44 | 0.54 | 0.68 |
| Ash | 1.52 | 1.42 | 1.26 | 0.04 | 0.88 |
| Moisture | 87.08 | 86.46 | 85.92 | 85.80 | 85.24 |
| Total Solids | 12.90 | 13.52 | 13.68 | 14.20 | 14.78 |

Microbial Parameters:

The highest mean for SPC ($10^3/g$) in whey vegetable soup was in $T_3=48.60$, followed by $T_0(42.20)$, $T_2(41.70)$, $T_4(39.60)$ and $T_1(39.00)$. The differences were non-significant among the treatments. The highest mean for yeast and mold count ($10^1 /g$) was found in $T_1(2.70)$, followed by $T_2(2.10)$, $T_4(2.10)$, $T_0(2.00)$ and $T_3(1.70)$. The differences among the treatments were non-significant. All the samples did not show the presence of coliform. Thus, the product was good interms of indicated hygienic point of view.

Table 2. Microbial Parameters

| Parameters | Treatments | | | | |
|----------------|----------------|----------------|----------------|----------------|----------------|
| | T ₀ | T ₁ | T ₂ | T ₃ | T ₄ |
| SPC | 42.20 | 39.00 | 41.70 | 48.60 | 39.60 |
| Yeast and mold | 2.20 | 2.70 | 2.10 | 1.70 | 2.10 |
| Coliform | Nil | Nil | Nil | Nil | Nil |

Organoleptic Parameters:

The highest mean for colour and appearance was found in $T_0(7.94)$, followed by $T_1(7.80)$, $T_2(7.80)$, $T_3(7.72)$ and $T_4(7.54)$. There were no significant differences found among the treatments. The highest mean for taste and flavour was found in $T_3(7.76)$, followed by $T_0(7.54)$, $T_4(7.48)$, $T_2(7.36)$ and $T_1(7.04)$. The differences among the treatments were significant. The highest mean for consistency of the product was found in $T_0(7.88)$, $T_3(7.78)$, $T_4(7.62)$, $T_1(7.54)$ and $T_2(7.52)$. There were no significant differences found among the treatments.

Table 3. Organoleptic Parameters

| Parameters | Treatments | | | | |
|-----------------------|----------------|----------------|----------------|----------------|----------------|
| | T ₀ | T ₁ | T ₂ | T ₃ | T ₄ |
| Colour and Appearance | 7.94 | 7.80 | 7.80 | 7.72 | 7.54 |
| Taste and Flavour | 7.54 | 7.04 | 7.36 | 7.76 | 7.48 |
| Consistency | 7.88 | 7.54 | 7.52 | 7.78 | 7.62 |

Overall acceptability of the product:

Table 4 and Fig.1 showed the overall acceptability of whey vegetable soup. The highest mean for overall acceptability score was found in $T_3(7.96)$, followed by $T_0(7.80)$, $T_4(7.62)$, $T_1(7.40)$ and $T_2(7.28)$. There were significant differences among the treatments.

Table 4. Overall acceptability of whey vegetable soup

| Replication | Treatments | | | | |
|----------------|----------------|----------------|----------------|----------------|----------------|
| | T ₀ | T ₁ | T ₂ | T ₃ | T ₄ |
| R ₁ | 7.30 | 7.40 | 7.20 | 8.00 | 7.80 |
| R ₂ | 7.60 | 7.60 | 7.20 | 8.00 | 7.20 |
| R ₃ | 8.20 | 7.60 | 7.60 | 7.80 | 7.60 |
| R ₄ | 8.00 | 7.40 | 7.40 | 8.00 | 7.60 |
| R ₅ | 7.90 | 7.00 | 7.00 | 8.00 | 7.90 |
| Mean | 7.80 | 7.40 | 7.28 | 7.96 | 7.62 |

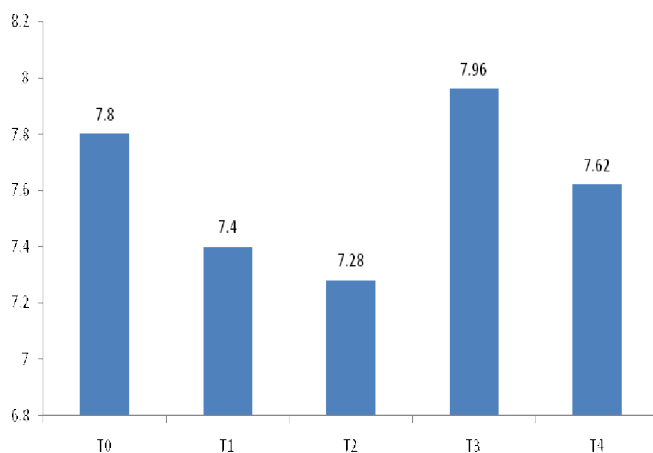


Fig. 1. Average percentage of overall acceptability of whey vegetable soup.

On the basis of the experimental data it can be concluded that whey vegetable soup has a great scope and market potential for the consumer, as it is low in calorie and a nutritious beverage.

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