

## Chemical analysis of whey based pineapple

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■ **ABSTRACT** : Whey is a nutritious byproduct from cheese, *Chhana* and *Paneer* containing valuable nutrients like lactose, proteins, minerals and vitamins etc., which have indispensable value as human food. The pineapple flavoured paneer whey beverage was prepared with the addition of different level of whey, sugar and pineapple flavour. 9 formulations were prepared for the chemical analysis on an average the pineapple flavoured paneer whey beverage of treatment T<sub>1</sub>, T<sub>2</sub>, T<sub>3</sub>, T<sub>4</sub>, T<sub>5</sub>, T<sub>6</sub>, T<sub>7</sub>, T<sub>8</sub>, and T<sub>9</sub> contained fat 0.36, 0.36, 0.36, 0.34, 0.34, 0.34, 0.32, 0.32 and 0.32 per cent, protein 0.62, 0.62, 0.62, 0.58, 0.58, 0.58, 0.54, 0.54 and 0.54 per cent, ash 0.41, 0.41, 0.40, 0.37, 0.37, 0.36, 0.34, 0.34 and 0.34 per cent, total solid 15.51, 15.51, 15.51, 17.30, 17.30, 17.30, 18.45, 18.45 and 18.45 per cent, Lactose 4.02, 4.02, 4.02, 3.85, 3.85, 3.85, 3.75, 3.75 and 3.75 per cent, respectively. The percentage of protein, ash, fat and lactose content of the product decreased with increasing level of sugar but the percentage of total solid content increased with increasing level of sugar.

■ **KEY WORDS** : Pineapple flavour, Paneer, Beverage

Whey is the watery liquid remaining after milk has been curdled and strained. It contains about half of the total solids of milk and source of precious nutrients like whey proteins, lactose, milk salts and most of water-soluble vitamins, lactoflavin which is responsible for green yellow colour of whey. Whey possess preventive and curative elements and is especially used to treat a wide variety of ailments such as arthritis, anemia and liver complaints. In India about 3 million tones of whey is produced annually containing about 2 lakh tone of valuable milk nutrients. Data say that, about 2.5 million tones of milk is being processed in nearly 200 dairy plants in India, and processing of 1 litre of milk generates about 8 to 10 litres of waste water depending on the type of products manufactured (Puranik, 1999).

Whey contains 93.94 per cent water hence it is too bulky and creates problem during storage and handling. Also the high lactose content cause rapid increase in acidity of raw whey, which complex for its utilization immediately after it is generated. There is an inversed awareness all over the world and the potential utilization of whey, primarily because of pollution prevention regulation, economic conditions and future needs to ease world food shortage (Horton, 1995).

Lactose in whey is suitable substrate for acidophilic

flora in the intestine for inhibit the growth of basophilic and putrefying micro-organisms. Lactose as compared to sucrose has low sweetness and low glycemic index and promotes healthy intestinal flora (Lifran *et al.*, 2000).

Chakka whey from cow milk contains minerals like Ca, Mg, P, Na, K, Cl, Cu, Fe and Zn at 113.50, 10.76, 73.62, 38.36, 130.20, 115.27, 0.0119, 0.057 and 0.370 mg/100 g, respectively. Buffalo milk chakka whey has higher concentration of Na, P and Cu and lower concentration of K and Cl than cow milk chakka whey. Total mineral contents of products ranges from 0.32 per cent for cow milk chakka whey to 0.65 per cent for buffalo milk chakka whey (Boghra *et al.*, 1998).

For better utilization of whey on small scale, an attempt has made to produce a soft drink, in the Department of Animal Husbandry and Dairying, C.S.A University of Agriculture and Technology, Kanpur (U.P.), since this could be produced at house hold level.

### ■ RESEARCH METHODS

#### Extraction of whey:

Good quality fresh cow milk was procured and then strained through muslin cloth. Then the milk was transferred to stainless steel vessel and brought to boiling by heating. The vessel was then removed from the fire. The coagulant

like citric acid (2.0%) was added slowly and stirred to have uniform mixing. Then the mass was poured over stretched piece of clean muslin cloth over another vessel to drain the whey. The clear drained whey was collected in vessels. The yellowish whey was used for preparation of whey beverage.

#### Preparation of beverage:

##### Chemical analysis:

The samples prepared were analyzed for chemical constituents using standard procedure: (fat, protein, lactose, ash, total solid).

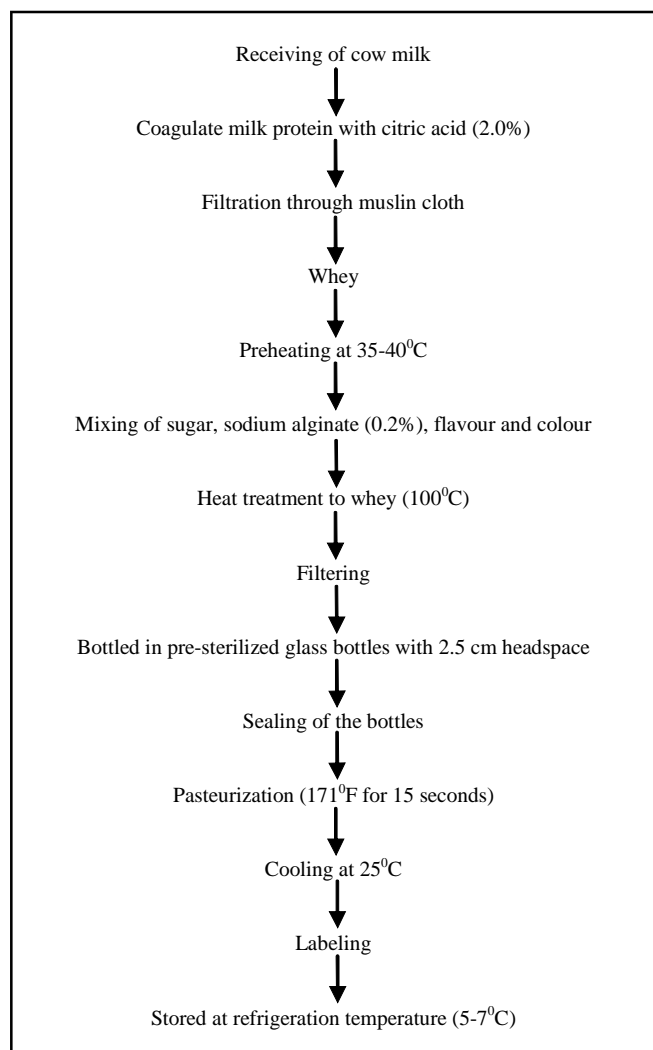


Fig. 1 : Flow chart for the preparation of whey based pineapple beverage

#### Statistical method:

The data obtained in the present investigation were tabulated statistically by using Factorial Completely Randomized Design

## RESEARCH FINDINGS AND DISCUSSION

The beverage samples were analyzed periodically for protein, fat, ash, lactose and total solid content.

#### Chemical composition of beverage:

##### Fat:

Table 2 indicates that the average fat content was significantly influenced by addition of level of sugar. The mean highest fat percentage was 0.36 per cent for the treatments T<sub>1</sub>, T<sub>2</sub> and T<sub>3</sub> and lowest mean fat percentage was 0.32 per cent for the treatments T<sub>7</sub>, T<sub>8</sub> and T<sub>9</sub>. The fat content in WBPB decreased when the level of sugar was increased. This was due to replacement of fruit beverage by sugar.

Table 1 : Average chemical composition of paneer whey

Constituents	Composition (%)
Fat	0.37
Protein	0.48
Lactose	4.74
Ash	0.37
Total solid	5.97

##### Lactose:

It is observed from Table 2 that the lactose content in WBPB significantly influenced by addition of sugar. The highest mean average lactose content was 4.02 per cent for the treatments T<sub>1</sub>, T<sub>2</sub> and T<sub>3</sub> and lowest mean lactose percentage was 3.75 per cent for the treatments T<sub>7</sub>, T<sub>8</sub> and T<sub>9</sub>. The lactose content in WBPB decreased when the level of sugar increased. This was due to replacement of fruit beverage by sugar.

##### Protein:

Table 2 indicates that the average protein content was significantly influenced by addition of level of sugar. The highest mean average protein content was 0.62 per cent for the treatments T<sub>1</sub>, T<sub>2</sub> and T<sub>3</sub> and lowest mean protein percentage was 0.54 per cent for the treatments T<sub>7</sub>, T<sub>8</sub> and T<sub>9</sub>. The protein content in WBPB decreased with the increase of sugar level. This was due to replacement of fruit beverage by sugar.

##### Ash:

The highest mean average ash content was 0.41 per cent for the treatments T<sub>1</sub> and T<sub>2</sub> and lowest mean ash percentage was 0.34 per cent for the treatments T<sub>7</sub>, T<sub>8</sub> and T<sub>9</sub>. The ash content in WBPB decreased when the level of sugar was increased. This was due to replacement of fruit beverage by sugar.

##### Total solid:

The data pertaining the total solid content of beverage with different levels of sugar and flavour are presented in

**Table 2 : Effect of different levels of sugar and pineapple flavour on chemical quality of beverage**

Treatments	Fat	Lactose	Protein	Ash	Total solid
T <sub>1</sub>	0.36	4.02	0.62	0.41	15.51
T <sub>2</sub>	0.36	4.02	0.62	0.41	15.51
T <sub>3</sub>	0.36	4.02	0.62	0.40	15.51
T <sub>4</sub>	0.34	3.85	0.58	0.37	17.30
T <sub>5</sub>	0.34	3.85	0.58	0.37	17.30
T <sub>6</sub>	0.34	3.85	0.58	0.36	17.30
T <sub>7</sub>	0.32	3.75	0.54	0.34	18.45
T <sub>8</sub>	0.32	3.75	0.54	0.34	18.45
T <sub>9</sub>	0.32	3.75	0.54	0.34	18.45

Table 2. It indicates that under different treatments, highest mean average total solid content was 18.45 per cent for the treatments T<sub>7</sub>, T<sub>8</sub> and T<sub>9</sub> and lowest mean total solid percentage was 15.51 per cent for the treatments T<sub>1</sub>, T<sub>2</sub> and T<sub>3</sub>. The total solid content in WBPB increased with increasing level of sugar.

The total solid content in the beverage significantly increased with increase in the different levels of sugar.

#### Conclusion:

It can be concluded that whey was found excellent for the development of whey based pineapple beverage. Good quality pineapple flavoured beverage can be prepared by addition of 12 per cent sugar and 0.2ml of pineapple flavour.

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