

Study on the Sensory and Physicochemical Characteristics of the Tulsi (*Ocimum tenuiflorum*) Enriched Whey under Refrigeration Storage Keeping the View for the Utilization of Whey as the Source of Added Income to Rural Economy

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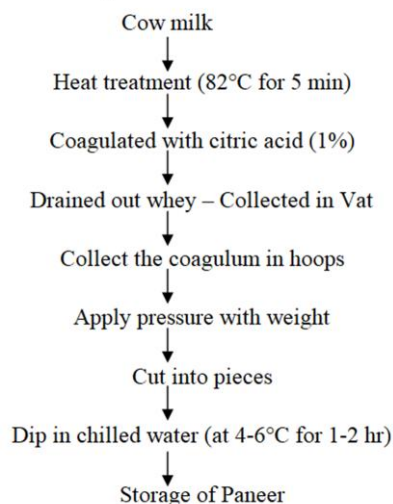
INTRODUCTION

Milk plays an important role in the diet of such persons as a source of animal proteins. India is the largest milk producer in the world 22 percent of global production. Over the previous three decades, world milk production has increased by more than 59 percent. The importance of milk and milk products has been recognized since Vedic times and it is considered to be complete food (Gupta 1999). About half the milk produced is consumed in the liquid form and the remaining is used to prepare products such as ghee, curd, butter, khoa, paneer, cheese, chhana, ice cream and milk powders.

Paneer is an important indigenous product which is obtained by heat treating the milk followed by acid coagulation using suitable acid viz. citric acid, lactic acid, tartaric acid, alum, sour whey. The whey formed is removed to some extent through filtration and pressing. More than About 7 % of milk produced in India is converted into paneer.

METHODS:

Flow diagram of Paneer manufacture



Preparation of Tulsi (*Ocimum tenuiflorum*) juice

Tulsi leaves were sorted out and washed with potable water thoroughly and juice was prepared by heating Tulsi at 65 °C for 5 min in 1:4 amount of water. The heat treated Tulsi was crushed in the juice maker along with the water to obtain a fine paste. It was then filtered through a clean, sanitized fine double layered muslin cloth to obtain Tulsi juice and kept at refrigeration temperature (7±10 °C) until used.

Preliminary trials on the basis of the sensory evaluation on seven point hedonic scale was conducted for the final level, 10% of the level was considered as the best suited. The tulsi juice was added in the whey and the further study for the sensory and physicochemical characteristics was done in the tightly packed container under refrigeration temperature (5±1°C) and studied at 0, 5 and 7 days of storage.

Sensory Evaluation:

The sensory quality of samples will be evaluated using 7 point hedonic scale, The marks given by the different panelist will be calculated and result thereafter will decide the level of the different added ingredients. Where, 7 to 1 denotes Excellent, very good, Good, Average, Poor, Very poor, Unacceptable respectively. A sensory panel from post-graduate students and staff of Veterinary College, ANDUAT Kumarganj Ayodhya, evaluated the product for different quality attributes viz., appearance, consistency, texture, flavor, sedimentation and mouth feel and overall acceptability.

Physico chemical analysis :

Acidity:

Whenever an acid an alkali solution are brought together, they combine to neutralize each other. The point at which neutralization is complete can be determined by adding an indicator (a substance which assumes different colours in acid an alkaline medium). The neutral point is that point at which one drop of acid or alkali solution is capable of bringing about a marked change in the colour of indicator. For determining the acidity of milk phenolphthalein

indicator is utilized. This indicator is colourless in acid or neutral solution and becomes pink even in slightly alkaline solution.

Titrateable acidity of the sample will be calculated Formula (FAO, 1986)

$$\% \text{ Acidity} = \frac{\text{No. of ml of N/10 NAOH used}}{\text{weight of milk}} \times 0.009 \times 100$$

Clot on boiling

It is based on the fact that milk samples having high acidity, due to bacterial growth, are coagulated when heated to boiling temperature. Samples of milk having poor stability due to disturbed salt balance also shows signs of coagulation when heated to boiling, however, the acidity at which milk coagulates in such a test varies greatly, depending upon the salt composition of milk. Transfer 5 ml of milk sample to the test tube, Place the tube in boiling water bath and hold for about 5 min, Remove the tube and rotate it gently in an almost horizontal position and observe for presence of any precipitated particles, Presence of any precipitated particles is an indicative of positive result.

Storage:

The evaluation of the product was done in the tightly packed container under refrigeration temperature (5±1°C) and studied at 0, 5 and 7 days of storage.

Sensory attributes such as appearance, consistency, texture, flavor, sedimentation and mouth feel of the product was rated “very good” to “excellent” up to 7th day of storage while the overall acceptability was rated “very good” on the 7th day of storage and was appreciated on sensory grounds. The result showed a decrease in the pH level of 6.1 and 5.8 on 0 and 7th day of storage, which comes under the medium acid whey. The acidity value showed a linear increase from 0.18 and 0.32 on 0 day and 7th day of storage respectively. The COB test was found negative up to 7th days of storage. The product was found suitable for the consumption up to 7th day of storage.