

SENSORY ANALYSIS OF WHEY-BASED WATERMELON BEVERAGE

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Abstract: A study was conducted to develop watermelon juice incorporated whey beverage by using whey, sugar, and watermelon juice. This study was designed to analyze sensory properties of watermelon juice incorporated sweetened whey drink. The treatments were divided into control (0), T1 using 5 per cent, T2 using 10 per cent and T3 using 15 per cent watermelon juice. Sensory analysis of the treatments showed a significant difference ($P>0.01$). Watermelon juice added treatments T2 scored high by the sensory panel. Watermelon juice sweetened whey drink can be prepared by using 10 per cent of watermelon juice with highest consumer acceptability as compared to the control. Addition of watermelon juice in the preparation of whey drink increased the deliciousness and nutritional value of the whey beverage.

Keywords: Whey beverage, watermelon juice, Sensory properties.

INTRODUCTION

Whey is the liquid obtained during coagulation of milk by using acid and/or rennet or physico-chemical process for the preparation of cheese, paneer, chhana, chakka and casein. Whey contains about 80-90 per-cent of the volume of milk that is used for production these products. It contains about half of the milk solids in which nutritional components such as lactose, protein and minerals are present in large amount. The paneer whey contains sodium (mg/l) 350, potassium (mg/l) 1300, calcium mg/l 480, magnesium mg/l 59, chloride mg/l 1349, citrate mg/l 6750, zinc $\mu\text{g/L}$ 280, total protein 0.41 per cent, fat 0.01 per cent, lactose 4.5, total solids 5.8, pH 5.5 (Nupur and Gandhi, 2009). Almost all the quantity of whey is being wasted creating pollution to the water sources. Disposal of whey possesses a serious problem of environmental pollution due to the presence of high organic matter. By adding some simple ingredients in the whey like sugar, colour, flavor it improves the nutritive value, taste and acceptability. Many attempts have been reported on utilization of whey in the formulation of various dairy products (Cruz *et al.*, 2009 and Naik *et al.*, 2009). There is a lot

of scope to explore the possibility of its utilization in beverage industries (Sakhale *et al.*, 2012).

Water melon (*Citrulus lanatus*) is native to tropical Africa and it is a popular thirst-quencher during summer days. Watermelon juice is a very rich source of carotenoid called lycopene. Lycopene is proven to be an effective oxygen radical scavenger as well as protective agent against heart diseases and various types of cancers (Perkins-veazie and Collins, 2004). Therefore present investigation was carried out to study the sensory acceptability of beverage and also enhance the nutritional qualities of whey watermelon beverage (to increase the deliciousness of the product).

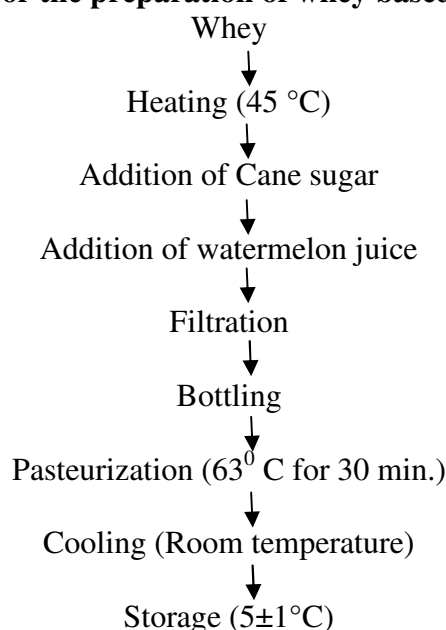
MATERIALS AND METHODS

Fresh cow milk was procured from the livestock farm, Veterinary College and Research Institute, Namakkal, sugar, citric acid salts and ripened mango was purchased from the local market and the watermelon juice was extracted and was used in the preparation of whey drink.

Preparation of whey: Whey prepared as per De, (2004).

Preparation of watermelon juice: Good quality watermelons were cleaned with hot water. The watermelon were cut into small pieces after removing the seeds and make it juice aseptically then refined by passing it through the muslin cloth.

Preparation of whey watermelon beverage: The treatments were divided into control without the addition of watermelon juice and the treatments T1, T2, T3 and T4 by using 0, 5, 10 and 15 per cent watermelon juice respectively. The whey drink was prepared by mixing the whey with the addition of cane sugar at rate of 12 per cent and watermelon juice as in Table 1. The flow chart for the preparation of whey watermelon beverage is shown in Figure 1. After cooling the whey drink was subjected to sensory evaluation by 9 point hedonic scale (Amerine *et al.*, 1965).

Figure 1. Flow chart for the preparation of whey based watermelon beverage**Table 1. Quantity of ingredients for 100 gram of whey drink**

Ingredients	Control	T ₁	T ₂	T ₃
Paneer whey	88.00	83.00	78.00	73.00
Sugar	12.00	12.00	12.00	12.00
Watermelon juice	0	5.00	10.00	15.00
Total	100.00	100.00	100.00	100.00

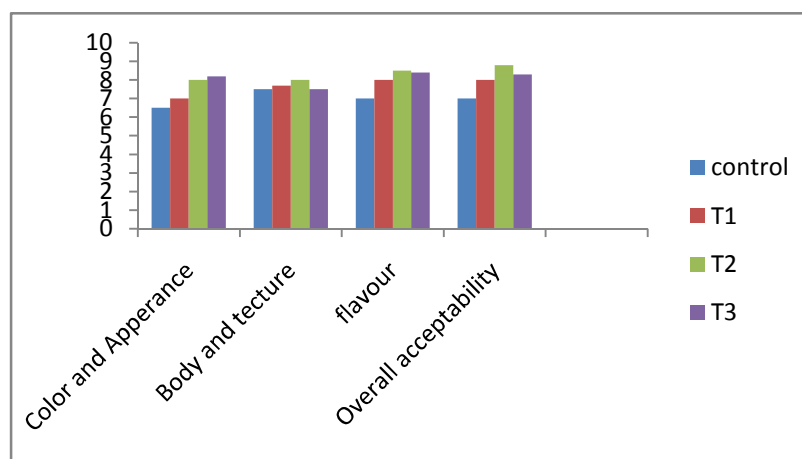
RESULTS AND DISCUSSION

The finished product from all the treatment combinations was served to the judges. The scores given for various parameters for the sensory evaluation were compiled analyzed and results are presented in figure 1.

It was observed from figure 1 that the whey beverage in which 10 per cent watermelon juice (T₂) was blended with whey scored the highest the score. The colour intensity was due to incorporation of varied proportion of watermelon juice. But incorporation of different levels of watermelon juice has not affected the scoring by the judges. All treatment combinations studied were found to be significant ($P>0.01$) with each other. Sensory analysis of the treatments showed a significant difference ($P>0.01$) among the treatments for colour, taste, flavour, texture and overall acceptability. The score in respect of flavour ranged from 7.0 to 8.5 for T₂. The overall acceptability of whey based watermelon beverage blending with 10 per cent (T₂) were found to be superior.

Watermelon added treatments scored a high value by the sensory panel and result was in line with Ritu *et al.*, (2007) who reported that addition of guava pulp increased the consumer acceptability. Among all treatment 10 per cent added watermelon whey beverage showed higher sensory scores compared others.

Figure1. Sensory analysis of whey drink for various treatments



Conclusion

It can be concluded that whey based mango drink can be prepared by using 10 per cent of watermelon juice with highest consumer acceptability as compared to the control. Whey contains about half of the milk solids and addition of watermelon in the preparation of whey drink increased the deliciousness and nutritional value.

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