



Original Research Article

Development and nutrient, antioxidant and microbial analysis of muskmelon and whey water and probiotic incorporated squash

C.K.Deepa and V.Krishnaprabha*

Department of Nutrition & Dietetics, Dr. N. G. P. Arts and Science College, Coimbatore, India

*Corresponding author

ABSTRACT

Keywords

RTS
beverage;
Whey water
and Musk
melon.

An RTS beverage was prepared by using Whey water and Musk melon incorporated probiotic drink. Product developed with Whey protein at 60% incorporation received highest acceptability score. No statistically significant difference was found between the control and Whey protein incorporated Musk melon squash. The Nutrient content of V₂ was higher than other variations. It study was concluded that incorporation of Whey water and probiotic can prevent our body from various disease conditions and it has wonderful health benefits.

Introduction

Production of Ready to serve [RTS] beverages from fruit pulps of some underutilized fruit plants has helped to reduce their fruits being wasted during the fruiting season. Ready to serve (RTS) beverages contains at least 10% juice and 10% total soluble solids besides about 0.3% acid. Beverages are consumed by all age groups to quench the thirst, as social drinks and for health and medicinal values. Musk melon (*Cucumis melo*) is a beautiful, juicy, tasty fruit of the *curcurbitaceae* family. Muskmelons are very low in calories (100g fruit Contains 34 calories) the fruit is rich in numerous health promoting poly-phenolic compounds, vitamins and minerals that are absolute for optimum health. Melons are naturally low in fat and sodium, have

no cholesterol and provide many essential nutrients such as potassium, in addition to being a rich source of beta carotene and vitamin C. Musk melon can reduce the risk of Cancer Cantaloupes are particularly beneficial to people with heart disease as they have large amounts of an anticoagulant known as adenosine. They also have high levels of potassium which benefits those with high blood pressure. Whey contains many organic and inorganic components. It can replace the much of the loss of electrolytes, vitamins, amino acids and other organic components. Whey has prophylactic effects against tuberculosis and arthritis. Whey and whey based products have relatively high lactose content, which forms a suitable substrate for Probiotic in the intestine. Whey has

anticarcinogenic activity apart from immunoglobulin, active peptides and growth factors, which stimulate cell growth.

The consumption of Probiotic products is helpful in maintaining good health restoring body vigour and in combating intestinal and other disease disorders. Probiotic have health benefits such as Maintenance of normal intestinal microflora, Enhancement of the immune system, Probiotic or their fermented products may also play a role in blood pressure control, with animal and clinical studies documenting antihypertensive effects of probiotic ingestion. Decreasing the pH by production of lactic acid, which suppresses the putrefactive and other undesirable bacteria in the intestines.

For the above beneficial effects, Probiotic and Whey water incorporated with Musk melon to develop a protein and antioxidant rich Ready to serve beverage. Hence the present study was under taken to formulate Probiotic and Whey water incorporated Musk melon squash.

Materials and Methods

Musk melon and other ingredients were procured from the Kanhangad. Whey water was prepared with the help of standard procedures. The Musk melon squash was standardized in different three variations were prepared by adding 50%, 40% and 30 % Whey water to 50%, 60 % and 70 % Musk melon juice. The probiotic microorganism (*L.acidophilus*) was inoculated at room temperature (37degree C at 48 hrs) and added in the beverage. A nine point hedonic score card was used for the attributes like colour, flavor, texture, taste, and overall acceptability.

Organoleptic evaluation

Organoleptic evaluation is a scientific method that evokes, measures, analyzes the products as perceived through the senses of sight, smell, taste and sound. Prepared Squash was given to 25 semi trained panel members for evaluating the organoleptic characteristic of the product. Sensory characteristics of the products such as colour, appearance, flavor, taste and consistency were evaluated. A nine point hedonic scale was used for sensory evaluation.

Analysis of Nutrients

The nutrient analysis was performed for standard samples and most acceptable forms of Whey water incorporated Musk melon squash. The parameters selected for the analyzis like energy, protein, fat, calcium, iron, phosphate, β -carotene, VitaminC, casein and total antioxidant activity. The physico-chemical constituents like acidity, pH, TSS, total sugar, reducing sugar were analysed with standard procedures. Microbial analysis was done using standard plate count method.

Results and Discussion

Oraganoleptic evaluation

The mean value and standard deviation for colour and appearance showed that V₂ got higher value than other variations. The results were shown in Table I.

Physicochemical properties such as acidity, pH, TSS, Reducing sugar, Total sugar were analyzed by using standard procedure. Freshly prepared Whey water incorporated Musk melon Squash contained 45.0(⁰ bx) of TSS in the control

Table.1 Organoleptic evaluation

| Sl.No | Criteria | Control | V ₁ | V ₂ | V ₃ |
|-------|-----------------------|------------|----------------|----------------|----------------|
| 1 | Colour and appearance | 8.44±1.083 | 6.68±1.4057 | 7.44±0.86 | 7.28±1.27 |
| 2 | Flavour | 8.16±1.06 | 6.72±1.24 | 7.4±1.04 | 6.4±1.38 |
| 3 | Consistency | 8.4±1 | 7.04±1.20 | 7.28±1.02 | 7.44±1.12 |
| 4 | Taste | 8.2±1.322 | 6.78±1.392 | 7.6±0.912 | 6.36±1.075 |
| 5 | Overall acceptability | 8.36±1.220 | 6.88±1.0967 | 7.6±1.224 | 6.56±1.260 |

Mean±SD

Table.2 Physicochemical parameters of formulataed RTS Beverage

| S.No | Parameter | Control | V ₁ | V ₂ | V ₃ |
|------|----------------|-----------|----------------|----------------|----------------|
| 1 | pH | 4±0.12 | 4.5±0.92 | 3.5±0.56 | 4.5±0.64 |
| 2 | Acidity | 1.3±0.03 | 2±0.06 | 2.2±0.03 | 2.4±0.01 |
| 3 | TSS | 45±2.3 | 31±1.6 | 32±1.9 | 33±2.1 |
| 4 | Reducing sugar | 10.6±3.21 | 10.3±2.93 | 10.2±2.23 | 10.4±2.34 |
| 5 | Total sugar | 35±1.11 | 33.2±1.21 | 34±0.98 | 34.2±1.29 |

Table.3 Nutrient content of Muskmelon squash

| S.No | Parameter | Control | V ₁ | V ₂ |
|------|-----------|-----------------|-----------------|-----------------|
| 1 | Energy | 131.97±1.07Kcal | 103.00±2.09Kcal | 113.80±1.06Kcal |
| 2 | Protein | 0.60 ± 0.15g | 2.20 ± 0.50g | 1.20 ± 0.32g |
| 3 | Fat | 0.0g | 0.0g | 0.0g |
| 4 | Calcium | 33.00 ±2.07 mg | 47.00 ±2.08 mg | 40.00±3.04 mg |
| 5 | Iron | 0.10mg | 0.20mg | 0.22mg |
| 6 | Phosphate | 14.00 ± 0.57 | 45.00 ± 2.08 | 38.00 ±1.03 |
| 7 | Caesin | - | 1.5% | 0.9% |

Table.4 Antioxidant content of the Whey water and probiotic incorporated Muskmelon squash

| S.No | Parameter | Control | V ₁ | V ₂ |
|------|-------------------------|-------------------|-------------------|-------------------|
| 1 | Beta carotene | 2569.10± 95.15c** | 2800.00±123.10a** | 2965.00± 37.12v** |
| 2 | Vitamin c | 35.00 ± 1.01c** | 22.00 ± 1.06a** | 27.00 ± 1.07 b** |
| 3 | Total antioxidant value | 3410.0 ± 3.43c** | 5340.0± 5.39** | 5400.0 ± 7.84b** |

sample. Variation 3 got higher brix value 33⁰(bx) respectively. The total sugar score of the control and experimental sample ranged as 35.0 g, 33.2 g, 34 g and 34.2 g respectively. Teotia et al (1997) reported that total sugar of the Musk melon squash was slightly decreased during 0-6 months. The reducing sugar score of the control and experimental sample ranged as 10.6g, 10.3 g, 10.2 g and 10.4 g respectively. The pH score of the control and experimental sample ranged as 4, 4.5, 3.5 and 4.5 respectively.

Nutrient analysis was done by using a standard procedure. V₁ got high energy value (131.97±1.07Kcal) . V₁ got high protein value (2.20 ± 0.50g). V₂ got high calcium content (47.00 ±2.08 mg). Phosphate content of the V₂ (45.00 ± 2.08) is high. The presence of casein was analyzed for both variations from that V₁ got 1.5 % higher value.

From the above Table IV it was clear that Musk melon squash is rich in antioxidant. And the total antioxidant activity was higher for Variation II. Control got high Vitamin C content than Variations. The beta carotene content V₂ higher value (2965.0IU) than others.

References

Ashwathi, P. And Yadav, M.C. Effect of incorporation of liquid dairy by product on chemical characteristics of

- soy fortified biscuits.J. Fd.sci.Technol.,2000, 31, 158-161.
- Aslam S, Hamill RJ, Musher DM. Treatment of *Clostridium diffi*
- Badet C, Richard B, Debat MC, Flaujac PM, Dorignac G. 2004. Adaptation of salivary Lactobacillus strains to xylitol. Arch Oral Biol 49:161-4.
- Bengmark S. Ecological control of the gastrointestinal tract. The role of *cile*-associated disease: old therapies and new strategies. Lancet
- Clarke JG, Peipert JF, Hillier SL et al. Microflora changes with the use of a vaginal microbicide. SexTransm Dis 2002; 29:288-93.
- Cohen LA. Diet and Cancer. *Scientific American*. 2575:47. Charteris WP, et al. Antibiotic susceptibility of potentially probiotic *Bifid bacterium* isolates for human gastrointestinal tract. *Lett Appl*.
- Dr.ShyamaprasadSarkar,MnabendraMandalan,ChaitaliChakraborty(2007)"Beneficial effects of probiotics used as food".Beverage and Food World.Page 40.Infect Dis. 2005;5:549-57. DOI: 10.1016/S1473-3099(05)70215-2.
- Kale R V,Bochare R N,Tadkalskar A V , and Satwase A N(2013)"Stability of probiotic fruit and vegetable juices under cold storage:areview"Beverage and food world,page 33.
- PareekN,Gupta A, Sengar R(2013) Preparation of healthy fruit based carbonated whey beverages by using whey and mausam by juice at house

hold level”Beverage and food world.
volume 40,pages 55-56,No 2.

Seethalakshmi M, Dhanapriya P,
Govindammal D, Shankar M, And
Mayilaganan M (2009),”Productin
and analysis of whey protein biscuits
for ovo vegetarian community. Indian
journal of nutrition and dietetics,
volume-47, page 317 Sudesh Jood,
Neelm Khetarpaul, RajniGoyal
(2011)” Efficacy of barley based
probiotic food mixture in treatment of
pathogenic E.coli induced diarrhoea in
mice”Journal of foo science
technology.pages-200-201.

Swati Shrivastava and Goyal J.K 2007,
Therapeutic benefits of pro and
prebiotics:a review.Indian food
industry “volume 26 page 44.