International Journal for Multidisciplinary Research (IJFMR)
E-ISSN: 2582-2160 ● Website: www.ijfmr.com ● Email: editor@ijfmr.com

Effect of Papaya Pulp and Basil Seeds on Sensory Attributes of Readyto-Serve Carbonated Functional Greek Yoghurt Whey Beverage

Miss. Rasha Hussain[1], Dr. Harinivenugopal[2], Mrs. Sujitha A.P[3], Dr. Arunkumar H[4]

[1]Miss, Safi Institute of Advanced Study
[2]Dr., Karnataka Veterinary Animal & Fisheries science
[3]Mrs., Safi Institute of Advanced Study
[4]Dr., Karnataka Veterinary Animal & Fisheries science

ABSTRACT
There has been a recent increase in the consumption of organic and natural foods and beverages, largely because of their outstanding nutritional and therapeutic advantages. This study aimed to investigate on the effects of different concentrations of papaya pulp (40%, 50%, 60%) and basil seeds (0.2%, 0.3%, 0.4%) on the sensory qualities of a ready-to-serve (RTS) carbonated functional Greek yogurt whey beverage. The collected data were analysed, resulting in the optimal formulation of the RTS carbonated functional Greek yogurt whey beverage using 50% papaya pulp and 0.3% basil seeds, as determined by the analysis.

Keywords: Papaya pulp, Greek yoghurt whey, Basil seeds

INTRODUCTION

Ready-to-serve foods are innovative creations which offers a range of nutritional advantages that promote health and wellness. RTS foods that have undergone a higher degree of processing compared to their raw counterparts. There is a rise in aseptically processed and packaged retail packs of ready-to-serve beverages, offering a nutritional uplift by adding fruit juices to sweeten aerated water (Yadav *et al*. (2013). According to the classification by The Nutrition Business Journal, functional foods are defined as food products that have been fortified with added or concentrated ingredients to levels that offer specific health benefits or enhance performance. Functional foods are deliberately formulated, which contain higher concentrations of bioactive compounds, nutrients, or other substances known to have physiological effects beyond basic nutrition (Keservani *et al*., 2010). Greek yoghurt whey is the liquid residue obtained after straining process in Greek yoghurt production, emerges as a thicker, creamier substance with increased protein content compared to traditional yogurt whey. Greek yoghurt whey possesses a more acidic Ph due to the fermentation process inherent in yoghurt-making, which further intensified during straining process and imparts a tangy taste (Uduwerella *et al*., 2017). *Carica papaya*, a perennial herbaceous plant, is renowned for its wide range of biological activities. Various components of this plant, including its seeds, leaves, fruits, peels, roots, and stems, have previously been acknowledged for their nutritional and medicinal benefits. The abundant amount of vitamins, natural minerals and low-calorie content holds a

notable nutritional value. Each part of the papaya plant has been utilized historically in the treatment of various ailments, such as wound healing, antibacterial properties, and anthelmintic effects. The presence of diverse phytochemicals in the extracts is believed to contribute its varied pharmacological properties. Papaya ranks highest among fruits for its fiber, niacin, thiamine, calcium, iron, folate, potassium, vitamin A, vitamin C, and riboflavin content (Alara *et al*., 2020). *Ocimum basilicum L*., widely recognized as basil or sweet basil. It is an annual herb with a pungent flavor belonging to the Labiatae family. The seeds are utilized to enhance fruit-infused beverages both aesthetically and functionally. It is rich in dietary fibre, these seeds holds a immense promise as a functional component. The mucilage derived from basil seeds has versatile properties including emulsification, foaming, thickening, stabilization, viscosity modulation, and gel formation, among others (Calderón Bravo *et al*., 2021

MATERIALS AND METHODS

The research was conducted at the Post Graduate Laboratory of Dairy Technology, Department situated in Dairy Science College, Regional Campus of Karnataka Veterinary, Animal and Fisheries Sciences University, Bengaluru. The production of RTS carbonated functional Greek yoghurt whey beverage utilized milk from Students Experimental Dairy Plant (SEDP) of Dairy Science College, Hebbal, Bengaluru. Streptococcus thermophilus and Lactobacillus delbrueckii ssp. Bulgaricus were included in the mixed culture used to make the yoghurt, which was procured from from Delvo DSL pvt Ltd. *Lactobacillus acidophilus* probiotic culture was procured from Department of Dairy Microbiology, of Dairy Science College, Hebbal, Bengaluru. Plastic cups with lids made of polypropylene (PP) were used to pack the carbonated functional Greek yoghurt whey beverage. The optimization process for creating the Ready To-Serve carbonated functional Greek yoghurt whey beverage involved papaya pulp and Basil seeds are illustrated in Figure 1.

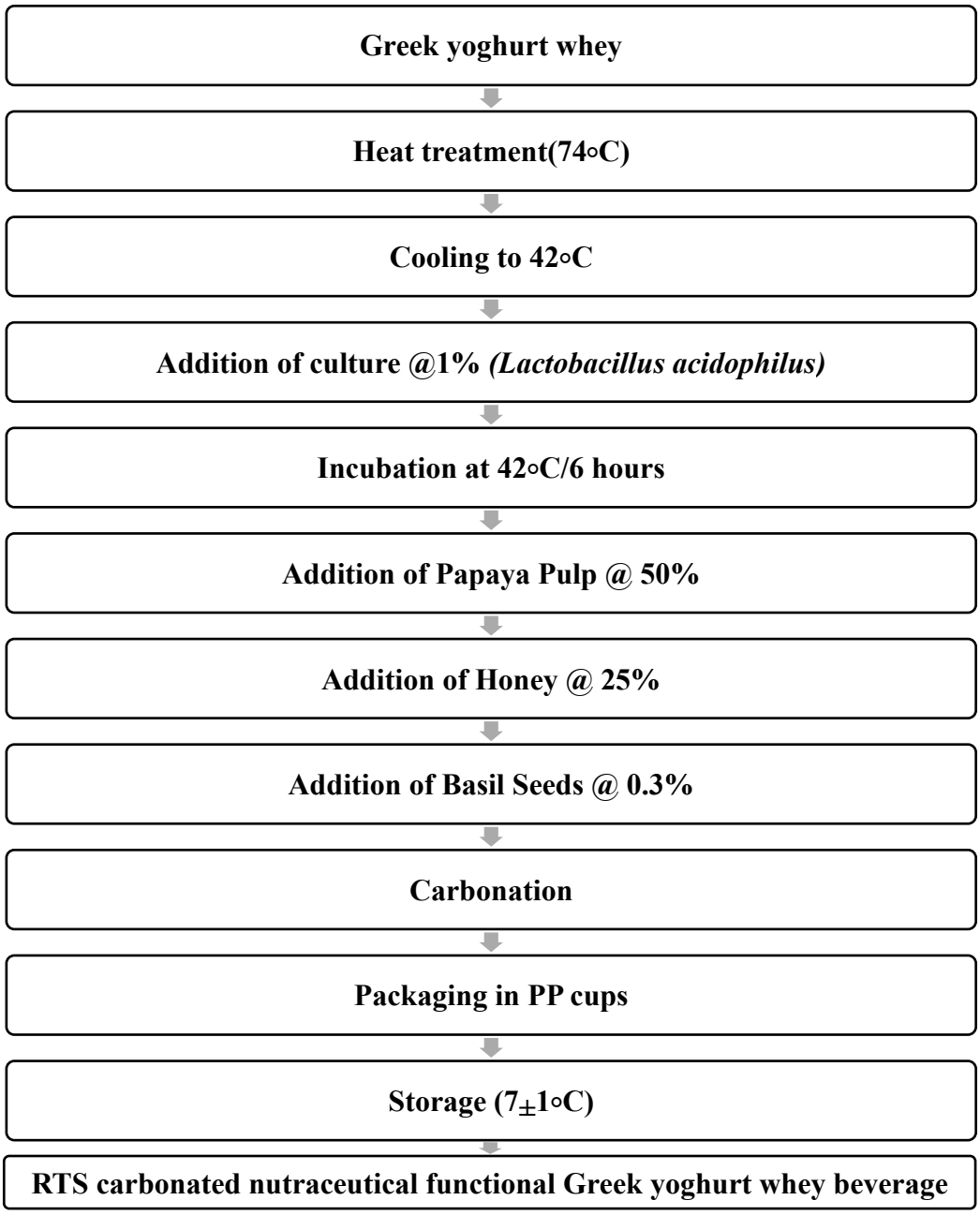


Figure 1: Flow chart of RTS carbonated nutraceutical functional Greek yoghurt whey beverage

Sensory Evaluation

A 9-point hedonic scale was be used by the selected panel of trained judges to evaluate the generated study sample's sensory qualities, including colour and appearance, body and texture, flavour, and overall acceptability. The highest-scoring output will be further used for statistical analysis Peryam and Pilgrim, (1957).

Statistical Analysis

Statistical Analysis will be conducted for obtained data using R Software (R. version 4.2.2) and other suitable statistical software to determine the significance and non-significance of the trials and the treatments.

RESULT AND DISCUSSION

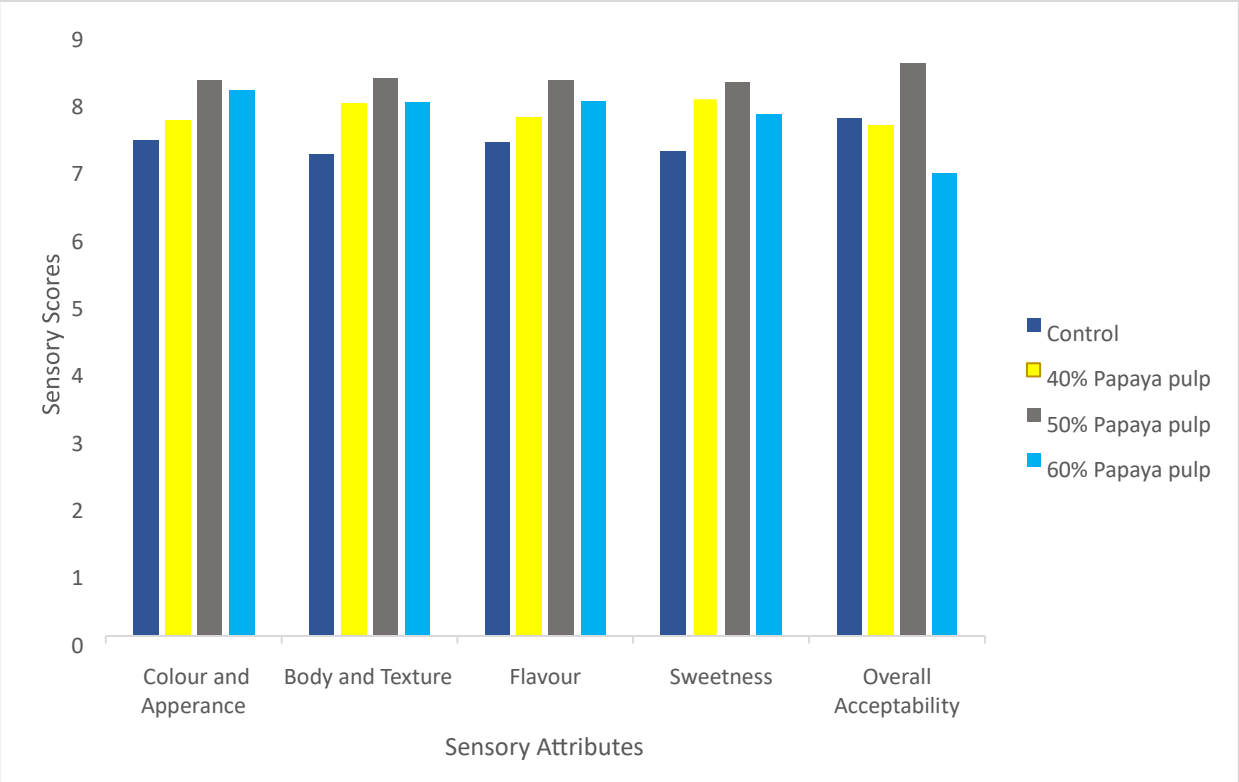
Effect of different levels of papaya pulp on sensory attributes of Greek yoghurt whey beverage

The findings regarding the impact of adding papaya pulp to yoghurt whey beverage on its color and appearance, body and texture, flavor, sweetness, and overall acceptability are detailed in Table 1. The inclusion of papaya pulp significantly influenced the color and appearance of the whey beverage. In the control sample, the mean sensory score for color and appearance was 7.37, while it rose to 7.66, 8.25, and 8.12 for yoghurt whey beverages with 40, 50 and 60 per cent papaya pulp, respectively. Regarding the body and texture, the observed sensory score for the control sample was 7.55. The experimental samples recorded scores of 7.91, 8.29, and 7.92. The average flavor scores achieved by Greek yoghurt whey beverage samples blended with different levels of papaya pulp. For the control sample, the sensory score for flavor was 7.33, while it increased to 7.70, 8.25, and 7.95. The mean sensory score for sweetness of the control sample was 7.20, which rose to 7.99, 8.22, and 7.75. The sensory scores awarded for the overall acceptability of the control Greek yoghurt whey beverage were 7.68, contrasting with 7.58, 8.50, and 6.88 for whey beverages with 40, 50 and 60 per cent papaya pulp, respectively. The Greek yoghurt whey beverage with 50 per cent papaya pulp achieved the highest average sensory scores compared to those with 40 and 60 per cent of papaya pulp addition. The result is justified with the following findings Tiwari (2000) conducted a study where mixtures of guava and papaya pulps in ratios ranging from 20 % to 40 % were prepared for a readyto-drink product. The goal was to enhance the colour characteristics, flavour, and overall acceptability of the beverage. Standardization included 15 % pulp content, 14°Brix total soluble solids, and 0.3 % acidity as citric acid. The blend with a guava-to-papaya ratio of 7:3 received higher sensory acceptance due to improved consistency and flavour. Additionally, this elaborately prepared beverage was highlighted as a source of vitamin C and carotene.

Table 1. Effect of different levels of papaya pulp on sensory attributes of Greek yoghurt whey beverage

Level of papaya pulp (%)	Colour and appearance	Body and texture	Flavour	Sweetness	Overall acceptability
Control	7.37^{a}	7.55^{a}	7.33^{b}	7.20^{a}	7.68^{a}
40	7.66^{a}	7.91^{a}	7.70$^{a\,b}$	7.99^{a}	7.58^{a}
50	8.25^{a}	8.29^{a}	8.25^{a}	8.22^{a}	8.50^{a}
60	8.12^{a}	7.92^{a}	7.95$^{a\,b}$	7.75^{a}	6.88^{b}
CD (P<0.05)	0.84	0.80	0.57	0.85	0.76

Figure 2. Effect of different levels of papaya pulp on sensory attributes of Greek yoghurt whey beverage



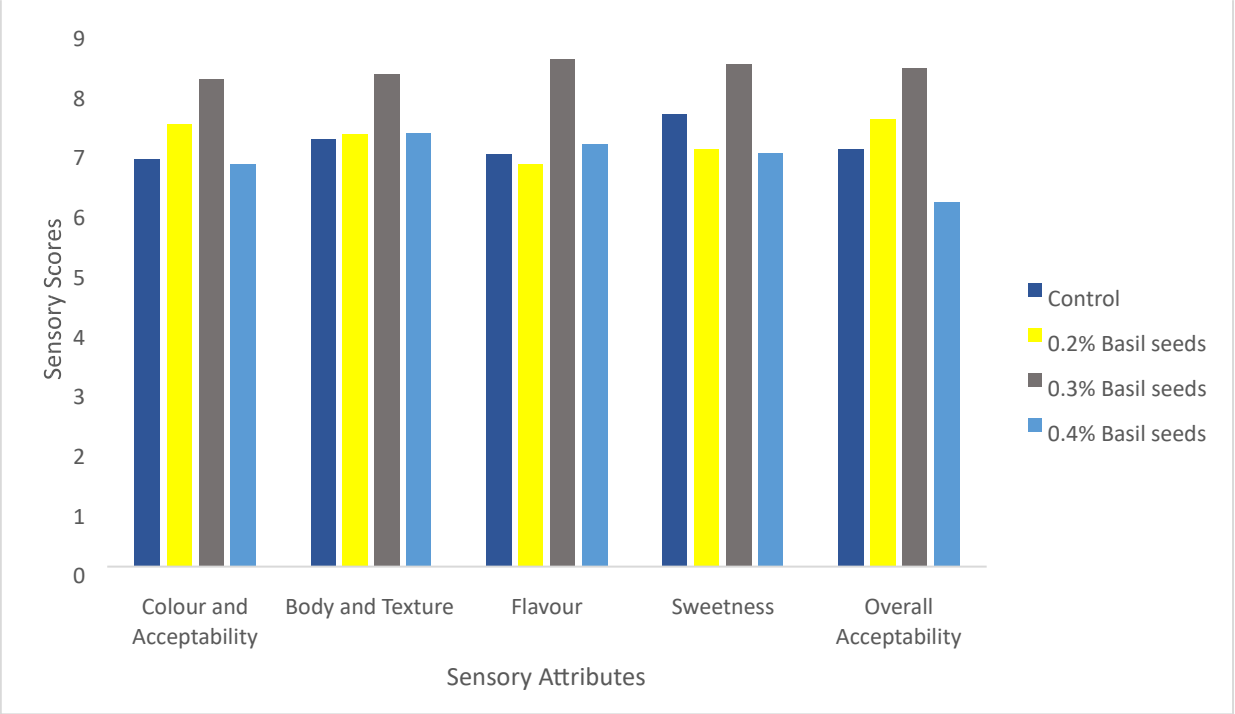
Effect of different levels of basil seeds on sensory attributes of Greek yoghurt whey beverage

The results pertaining to the effect of addition of basil seeds to Greek yoghurt whey beverage on colour and appearance, body and texture, flavour, and overall acceptability are presented in Table 2. Addition of basil seeds did not had any remarkable effect on colour and appearance of Greek yoghurt whey beverage. The mean sensory scores for colour and appearance for control sample was 6.83 as against 7.41, 8.16 and 6.75 for Greek yoghurt whey beverages added with basil seeds at 0.2, 0.3 and 0.4 per cent respectively. The highest sensory score with respect to colour and appearance was secured by Greek yoghurt whey beverage containing 0.3 per cent level of basil seeds. The observed sensory score for body and texture of control sample was 7.16. The experimental samples recorded 7.25, 8.25 and 7.27 out of 9.00. Basil seeds was added at levels of 0.2, 0.3 and 0.4 per cent respectively. The sensory scores with respect to flavour for control sample was 6.91 and it was 6.75, 8.50 and 7.08 out of 9.00 for Greek yoghurt whey beverage. The mean sensory score for sweetness of the control sample was 7.58, which rose to 7.00, 8.41, and 6.92. The sensory scores awarded for overall acceptability of control Greek yoghurt whey beverage was 7.00 as against 7.50, 8.36 and 6.10. The research result justifies the present research Abdhija *et al*., 2024 conducted a study on the addition of basil seeds at different percentage level in a treatment sample. The flavour and sweetness scores were 7.91, 8.00, and 6.57, and 8.00, 8.09, and 6.92, respectively, while the overall acceptability scores were 7.75, 8.16, and 6.90, respectively. The decrease in sensory scores with an increase in the percentage of addition may be attributed to the seeds swelling in water and retaining water between them, which noted a reduction in the desirability of texture with an increase in seed ratio.

Table 2. Effect of different levels of basil seeds on sensory attributes of Greek yoghurt whey beverage.

Level of basil seeds (%)	Colour and appearance	Body and texture	Flavour	Sweetness	Overall acceptability
Control	6.83[a]	7.16[b]	6.91[b]	7.58[a b]	7.00[b]
0.2	7.41[a]	7.25[b]	6.75[b]	7.00[b]	7.50[a b]
0.3	8.16[a]	8.25[a]	8.50[a]	8.41[a]	8.36[a]
0.4	6.75[a]	7.27[b]	7.08[b]	6.92[b]	6.10[b]
CD (P<0.05)	1.105	0.737	0.788	0.80	0.70

Figure 3. Effect of different levels of basil seeds on sensory attributes of Greek yoghurt whey beverage.



CONCLUSION

Consumption of organic and natural foods and beverages has been on the rise lately, primarily due to their excellent nutritional and therapeutic benefits. The research study explored the innovative idea in developing RTS carbonated functional Greek yoghurt whey beverage by incorporating functional ingredients such as papaya pulp and basil seeds. The developed product was subjected to sensory studies where the levels of functional ingredients were optimized. The final optimal formulation consists, 50% papaya pulp and 0.3% basil seeds and this combination received the highest scores. The developed functional carbonated Greek yoghurt whey beverage gives a nutritional enhancement of the product besides having therapeutic benefits.

REFERENCE

1. Alara, O.R., Abdurahman, N.H. and Alara, J.A. 2020. Carica papaya: comprehensive overview of the nutritional values, phytochemicals and pharmacological activities. *Advances in traditional medicine*:1-31.
2. Calderón Bravo, H., Vera Céspedes, N., Zura-Bravo, L. and Muñoz, L.A. 2021. Basil seeds as a novel food, source of nutrients and functional ingredients with beneficial properties: A review. *Foods*, **10**(7): 1467.
3. Keservani, R.K., Kesharwani, R.K., Vyas, N., Jain, S., Raghuvanshi, R. and Sharma, A.K. 2010. Nutraceutical and functional food as future food: A review. *Der Pharmacia Lettre*, **2**(1): 106-116.
4. Peryam, D.R. and Pilgrim, F.J. 1957. Hedonic scale method of measuring food preferences. *Food technology*.
5. Tiwari, R.B. 2000. Studies on blending of Guava and Papaya pulps for RTS beverage. *Indian Food Packer*, **54**(2): 68- 72.
6. Uduwerella, G., 2017. *A novel strategy for minimizing acid whey generation during Greek yoghurt production* (Doctoral dissertation, Victoria University).
7. Yadav, A., Chandra, S., Singh, J. and Kumar, V. 2013. Effect of storage conditions on physico-chemical, microbial and sensory quality of ready-to-serve banana beverage. *Madras Agricultural Journal:*100.