



ISSN Print: 2394-7500
ISSN Online: 2394-5869
Impact Factor: 5.2
IJAR 2015; 1(9): 261-263
www.allresearchjournal.com
Received: 02-06-2015
Accepted: 05-07-2015

Surya Pal Chaudhary
M.Sc. (Food Technology)
Warner school of food and
dairy technology,
Sam Higginbottom Institute of
Agricultural, Technology &
Sciences, Allahabad - 211007
Uttar Pradesh, India.

Shanta Peter
Assistant Professor,
Warner school of food and
dairy technology,
Sam Higginbottom Institute of
Agricultural, Technology &
Sciences, Allahabad - 211007
Uttar Pradesh, India.

Correspondence:
Surya Pal Chaudhary
M.Sc. (Food Technology)
Warner school of food and
dairy technology,
Sam Higginbottom Institute of
Agricultural, Technology &
Sciences, Allahabad - 211007
Uttar Pradesh, India.

Development of smoothies from banana pulp and orange juice

Surya Pal Chaudhary, Shanta Peter

Abstract

In the millennium we are witnessing the upward trend in nutritional and health awareness which has increased the consumer demands. The present investigation was made with an attempt to development of smoothies from banana pulp and orange juice by adding of different level yoghurt, For control smoothies was mixed standard 100% banana pulp, 30% yoghurt, 0.1% fruit pectin, 20% sugar (T₁) was standard to 90% banana pulp, 10% orange juice, 30% yoghurt, 0.1% fruit pectin, 20% sugar, (T₂) was standard to 80% banana pulp 20% orange juice, 0.1% fruit pectin, 20% sugar, (T₃) was standard to 70% banana pulp, 30% orange juice, 30% yoghurt, 0.1% fruit pectin, 20% sugar. In the smoothies sample of different treatment and control the chemical analysis (moisture, total solid, protein, fat, pH, titrable acidity, reducing sugar and total sugar, ascorbic acid) was done for estimating its nutritional contents and also the organoleptic characteristics like (flavor and taste, colour and appearance, body and texture, consistency) was evaluated by trained panelist using 9 point hedonic scale. The highest value was observed in treatment (T₂).

Keywords: Fruit smoothies, sensory analysis, quality, new product development.

Introduction

Smoothies are thick in consistency and are normally consumed fresh or preserved for short periods (1-3 weeks) by storing in the refrigerator after pasteurization or freezing. Walking *et al.* (2010) [3] suggested a mild thermal pasteurisation for preservation of smoothies' type beverages when compared to processing by pulsed electric field. Keenan *et al.* (2011) [2] utilised thermal and high hydrostatic pressure processing for preserving fruit smoothies consisting of apples, strawberries, banana and oranges for better retention of colour, polyphenols and other quality attributes. Literature available on juice blends indicated the possibility to use common and under-utilized fruits, vegetables, and medicinal plants in the preparation of RTS beverages or health drinks by blending spice extracts (Bhardwaj and Pandey, 2011). In recent time, the demand for fresh fruit juices and smoothies with high quality level has been growing quickly. Structure of food and its physico-chemical characteristics have a significant effect in the mouth and thus, on the sensory perception (Wilkinson, Dijksterhuis, & Minekus, 2000). Texture is a quality attribute that is critical in influencing the acceptability of raw and processed fruits so it is of primary concern in product development

To increase the intake of phytochemicals, the food industry offers smoothies as an alternative or addition to the consumption of fresh fruits and vegetables. Smoothies belong to fruit juices and this term is used since 70 years, primarily in the USA and UK, recently also in Germany. Their production is based on the usage of the total fruits, which are processed to pulp or puree, partially with pieces. Smoothies are blended beverages containing fruit, fruit juice, ice, yoghurt, milk; and are a popular way of consuming fruit (SafeFood, 2009). These products are typically purchased freshly prepared from juice bars or as a processed product (mildly pasteurised) from the chilled section of retail outlets. Despite worsening global economic conditions, smoothies remain a popular and convenient way of consuming fruit. In fact, the world smoothie market is projected to touch \$9 billion by the year 2015 (Global Industry Analysts, 2010). This is primarily driven by rising health consciousness among consumers, on-the-go consumption, convenience, and perceived fresh like taste offered by smoothies. The aim of this study is to develop new high quality products based on mixtures

of pressed and squeezed fruit without adding preservatives, stabilizers or chemical correctors of pH and acidity. For this purpose, some mixtures of several pressed fruit banana and orange, have been made.

Preparation of smoothies

Preliminary trials were conducted to prepare smoothies (100 g each) using fruit pulp and orange juice. Smoothies based on fruit pulps were prepared using banana (90%), orange juice (10%) of T₁ and addition of other ingredients namely yoghurt and sugar. All smoothies were prepared without addition of water, and citric acid. The smoothies were analysed for brix: acid ratio and evaluated for their acceptability by a panel of 10 judges. Fruit pectin (0.1%) was added to the smoothies and to maintain the body structure of fruit pulp.

Materials and Methods

Materials Fresh fruits viz., banana (*Musa paradisiaca*), orange (*Citrus sinensis*) and yoghurt and sugar were procured from local fruit market of Allahabad India. Fruit pectin were procured warner school of food and dairy technology lab SHIATS Allahabad.

Extraction of fruit pulps / juices

Fruits were thoroughly washed under tap water. Fruit pulps from banana were extracted using a fruit pulper. Orange juice extractor for recovery of juicer machine. The juices were strained through double layered muslin cloth to remove bigger pulp particles and seed.

Physico-chemical analysis

Fruit pulps and juices were analyzed initially for total soluble solids (°brix) by using a hand refractometer, acidity as percent citric acid by titration with standard alkali, pH, reducing sugars (%) and total sugars (%) using Lane and Eynon's method and protein by Kjeldhal method, fat, ash, vitamin C content as described by Ranganna (1986).

Sensory analysis

The products were subjected to sensory evaluation using a 9-point Hedonic scale where, score 1 is for 'dislike extremely' and 9 for 'like extremely' by a panel of 10 judges.

Statistical analysis

All physico-chemical analyses were conducted in triplicate and mean values \pm SD were computed and reported. The data on physico-chemical analysis and the scores of each sensory attributes.

Results and Discussion

Data on overall sensory score of smoothies are present in Table no1 and physico-chemical analysis of fruit smoothies are presented in Table 2. It was observed that among the fruit smoothies higher brix (24.04°) and moisture (76.47%), protein (3.40%), fat (2.32%), ash (0.67%), reducing sugar (6.88%), total sugar (18.72%), Ph (4.42) titratable acidity (0.80%) and highest ascorbic acid content (0.68%) was observed in fruit smoothies. Fruit pulp and grape juice based smoothies were given to panelists for sensory analysis and asked for comments for preliminary screening. Smoothies with uneven colour, high acidity and incompatible flavours werer

Table 1: Overall sensory scores of smoothies from banana pulp and orange juice.

| Parameter | T ₀ | T ₁ | T ₂ | T ₃ |
|-----------------------|----------------|----------------|----------------|----------------|
| Colour and appearance | 7.61 | 7.20 | 7.94 | 7.12 |
| Flavour and taste | 7.19 | 7.26 | 7.96 | 7.62 |
| Body and texture | 7.24 | 7.68 | 8.23 | 7.22 |
| Consistency | 7.19 | 7.42 | 8.12 | 7.40 |

Table 2: Physico-chemical analysis of fruit smoothies from banana pulp and orange juice.

| Parameter | T ₀ | T ₁ | T ₂ | T ₃ |
|-----------------|----------------|----------------|----------------|----------------|
| Moisture% | 75.96 | 76.08 | 76.22 | 76.46 |
| TSS% | 24.04 | 23.92 | 23.78 | 23.54 |
| Protein% | 3.34 | 3.36 | 3.38 | 3.40 |
| Fat% | 2.22 | 2.26 | 2.28 | 2.32 |
| Ash% | 0.67 | 0.62 | 0.55 | 0.44 |
| Reducing sugar% | 6.84 | 6.88 | 6.96 | 7.24 |
| Total sugar% | 18.72 | 18.62 | 18.54 | 18.36 |
| pH | 4.42 | 4.28 | 4.10 | 3.82 |
| Acidity% | 0.62 | 0.70 | 0.76 | 0.80 |
| Ascorbic acids% | 0.21 | 0.29 | 0.63 | 0.68 |

Conclusion

In view of experimental result obtained during the present investigation, it may be concluded that the smoothies sample of treatment T₂ was like much by the pannel of judge for organoleptic analysis and the overall acceptability was also more for treatment T₂.The sample T₂ was found the best in microbial analysis, with less yeast and mould count no coliform present during research. Therefore it may be concluded that, there is great scope of manufacturing fruit smoothies using banana pulp and orange juice supplemented with yoghurt as is it prove to have nutritional properties which lead to health benefits and good for all age group people

References

1. Bhardwaj RL, Pandey S. Juice blends - A way of utilization of under-utilized fruits, vegetables, and spices: a review. *Critical Reviews in Food Science and Nutrition*. 2011; 51:563-570.
2. Keenan DF, Brunton N, Gormley R, Butler F. Effects of thermal and high hydrostatic pressure processing and storage content of polyphenol and some quality attributes of fruit smoothies. *Journal of Agricultural and Food Chemistry*. 2011; 59:601-607.
3. Walking RM, Noci F, Cronin DA, Lyng JG, Morgan DJ. Shelf life and sensory attributes of a fruit smoothie – type beverage processed with moderate heat and pulsed electric fields. *LWT Food Science and Technology*. 2010; 43:1067-1073.
4. Balaswamy K, Prabhakara Rao PG, Nagender A, Satyanarayana A. Preparation of sour grape (*Vitis vinifera*) beverages and evaluation of their storage stability. *Journal of Food Processing and Technology*. 2011; 2:3.
5. Raffaella Di Cagno, Giovanna Minervini, Carlo Rizzello G, Maria De Angelis, Marco Gobbetti. Effect of lactic acid fermentation on antioxidant, texture, color and sensory properties of red and green smoothies, 2011, *Food Microbiology* 28 (2011), 1062e1071.
6. Palgan Muñoz A, Noci F, Whyte P, Morgan DJ, Cronin DA, Lyn JG. Effectiveness of combined Pulsed Electric Field (PEF) and Manothermosonication (MTS) for the control of *Listeria innocua* in a smoothie type beverage.

- Food Control. 2011; 25; 621e625.
7. Markus Walkling-Ribeiro, Francesco Noci, Denis A Cronin, James G Lyng, Desmond J Morgan. 2009. Shelf life and sensory attributes of a fruit smoothie-type beverage processed with moderate heat and pulsed electric fields. *LWT - Food Science and Technology*. 43 (2010) 1067e1073.
 8. Cramargo GA, mieli J, moura SCSR, luccas V, gremer S. Rheological characteristics of açaí and passion fruit smoothies fortified with ripe banana pulp. In *Anais X VII world congress of the international commission of agricultural engineering (CIGR) book of abstracts*. Qubic, Canada 2010.
 9. Safood. Self-life of sensory attributes of a fruit smoothies type beverage with nutritional content of smoothies, 2009, 4-24.
 10. Luchwood D. Smoothies sailing. *Prepared food*. 2008; 177(4): 13e15, 18.