

DOI No.: <http://doi.org/10.53550/EEC.2023.v29i06s.078>

Development and Value Addition in Guava (*Psidium guajava* L.) Cheese through various edible Seed Kernels

Gore Subhash, V.M. Prasad, Annjoe V. Joseph, Vijay Bahadur and B. Mehra

Horticulture (Fruit Science), Naini Agricultural Institute, Sam Higginbottom University of Agriculture, Technology & Sciences SHUATS Prayagraj, U.P., India

(Received 4 June, 2023; Accepted 10 August, 2023)

ABSTRACT

Field experiment was conducted during year 2022-2023 at the Post Harvest Laboratory of Horticulture Department, Naini Agricultural Institute, Sam Higginbottom University of Agriculture, Technology & Sciences, Prayagraj to study "Development and value addition in Guava (*Psidium guajava* L.) cheese through various edible seed kernels" The experiment was conducted in Completely randomized design (CRD) with nine treatments replicated thrice. Total number of treatments were nine with different edible seed kernels such as pumpkin, muskmelon watermelon and Cuddapah almond (chirongi) seed. The treatment (T2 Guava pulp + Sugar (1:1) + Pumpkin seed kernel (powdered seed) 5%) was found superior in respect of parameters like TSS (0Brix), pH, acidity (%), ascorbic acid (mg/100g), reducing sugar (%), non-reducing sugar (%), total sugar(%), Colour score texture flavour taste overall acceptability. Benefit cost Ratio was found highest (2.37) in the treatment (T2 Guava pulp + Sugar (1:1) + Pumpkin seed kernel (powdered seed) 5%).

Key words: Guava, Cheese, Seed kernels.

Introduction

Guavas are plants of Myrtle family (Myrtaceae) genus *Psidium* (meaning "pomegranate" in Latin), which contains about 100 species of tropical shrubs and small trees. These are native to Mexico, Central America and Northern South America, and are now cultivated and naturalized throughout the tropics and subtropics in Africa, South East Asia, the Caribbean, sub-tropical regions of North America and Australia. Guava (*Psidium guajava* L.) is known by different names such as Amrud, Piyara, Peru, Koyya, Jamakaya, Seed Pandu, etc. It is a small tree or shrub of 2 to 8 m in height with wide spreading branches. Major guava producing states are Uttar

Pradesh, Maharashtra, Bihar, Andra Pradesh, Gujarat, Madhya Pradesh, Karnataka (Chavan *et al.*, 2015).

It has been aptly called the "Apple of Tropics" and "Poor man's apple". It is the fourth most important fruit crop in India in area and production after mango, banana and citrus. The major producers of guava in the world are India, China, Thailand, Pakistan, Mexico, Indonesia, Brazil, Bangladesh, Philippines, Nigeria. The two important varieties of guava commercially grown in India are 'Allahabad Safeda' and 'Lucknow-49' or 'Sardar'. Both of them are considered good for processing. In India, guava occupies an area of 2.36 lakh ha with an annual production of 31.98 lakh MT. The major guava producing

states in India are Maharashtra, Madhya Pradesh, Uttar Pradesh, Karnataka, Tamil Nadu, Gujrat and Bihar. In Maharashtra, guava occupies an area of 0.40 lakh ha with an annual production of 3.24 lakh MT.

Materials and Methods

The present investigation entitled "DEVELOPMENT AND VALUE ADDITION IN GUAVA (*Psidium guajava* L.) CHEESE THROUGH VARIOUS EDIBLE SEED KERNELS." was laid out in the Post Harvest Laboratory of Horticulture Department, Sam Higginbottom University of Agriculture, Technology and Sciences, Prayagraj during the year 2022-2023.

The treatments were (T0: Guava pulp + Sugar), (T1: Guava pulp + Sugar (1:1) + Pumpkin seed kernel (Coarsely crushed seed) 5%), (T2: Guava pulp + Sugar (1:1) + Pumpkin seed kernel (powdered seed) 5%), (T3: Guava pulp + Sugar (1:1) + Watermelon seed (Coarsely crushed seed) 5%), (T4: Guava pulp + Sugar (1:1) + Watermelon seed (powdered seed) 5%), (T5: Guava pulp + Sugar (1:1) + Muskmelon seed (Coarsely crushed seed) 5%), (T6: Guava pulp + Sugar (1:1) + Muskmelon seed (Coarsely crushed seed) 5%), (T7: Guava pulp + Sugar (1:1) + Cuddapah almond (chirongi) seed (Coarsely crushed seed) 5%), (T8: Guava pulp + Sugar (1:1) + Cuddapah almond (chirongi) seed (powdered seed) 5%).

Results and Discussion

TSS

Among all the different treatment combinations used in guava cheese the treatment T5 - Guava pulp + Sugar (1:1) + Muskmelon seed (Coarsely crushed seed) 5% had the highest total soluble solid (0Brix) measuring (78.9 0Brix), followed by T1 Guava pulp + Sugar (1:1) + Pumpkin seed kernels (Coarsely crushed seed) 5% measuring (78.7), While the treatment T7 - Guava pulp + Sugar (1:1) + Cuddapah almond (Chirongi) seed (Coarsely crushed seed) 5% had the lowest total soluble solid (0Brix) measurement (72.4 0Brix)

pH

Results related to the pH showed that the treatment T2 - Guava pulp + Sugar (1:1) + Pumpkin seed ker-

nel (powdered seed) 5% had the lowest pH measuring (3.5), followed by T0 Control (Guava pulp + Sugar) measuring (3.5), while the treatment T6 - Guava pulp + Sugar (1:1) + Muskmelon seed (powdered seed) 5% had the highest pH measurement (4.1).

Acidity

Results related to the acidity showed that the treatment T5 - Guava pulp + Sugar (1:1) + Muskmelon seed (Coarsely crushed seed) 5% had the lowest acidity measuring (0.68), followed by treatment T8 - Guava pulp + Sugar (1:1) + Cuddapah almond (Chirongi) seed (powdered seed) 5% measuring (0.715), while the treatment T2 - Guava pulp + Sugar (1:1) + Pumpkin seed kernel (powdered seed) 5% had the maximum acidity measurement (0.92).

Ascorbic acid

Results related to the ascorbic acid showed that the treatment T2 - Guava pulp + Sugar (1:1) + Pumpkin seed kernel (powdered seed) 5% had the maximum ascorbic acid measuring (32.94 mg/100g), followed by treatment T1 - Guava pulp + Sugar (1:1) + Pumpkin seed kernel (Coarsely crushed seed) 5% measuring (31.51 mg/100g), while the treatment T0 - Control (Guava pulp + Sugar) had the lowest ascorbic acid measurement (23.6mg/100g).

Reducing sugar

Results related to the reducing sugar showed that the treatment T0 - Control (Guava pulp + Sugar) had the maximum reducing sugar measuring (27.81), followed by treatment T1 - Guava pulp + Sugar (1:1) + Pumpkin seed kernel (Coarsely crushed seed) 5% measuring (27.6), while the treatment T4 - Guava pulp + Sugar (1:1) + Watermelon seed (powdered seed) 5% had the lowest reducing sugar percentage measurement (25.23).

Non reducing sugar

Results related to the non reducing sugar showed that the treatment T4 - Guava pulp + Sugar (1:1) + Watermelon seed (powdered seed) 5% had the lowest non reducing sugar percentage measuring (22.98), followed by treatment T5 - Guava pulp + Sugar (1:1) + Muskmelon seed (Coarsely crushed seed) 5% measuring (23.46), while the treatment T6 - Guava pulp + Sugar (1:1) + Muskmelon seed (powdered seed) 5% had the maximum non reducing sugar percentage measurement (30.43).

Total sugar

Results related to the total sugar showed that the treatment T2 - Guava pulp + Sugar (1:1) + Pumpkin seed kernel (powdered seed) 5% had the maximum total sugar percentage measuring (49.94), followed by treatment T1 - Guava pulp + Sugar (1:1) + Pumpkin seed kernel (coarsely crushed seed) 5% measuring (47.44), while the treatment T4 - Guava pulp + Sugar (1:1) + Watermelon seed (powdered seed) 5% had the minimum total sugar percentage measurement (41.19).

Sensory qualities of guava cheese

Colour

Results related to the colour showed that the treatment T2 - Guava pulp + Sugar (1:1) + Pumpkin seed kernel (powdered seed) 5% had the highest colour score measuring (8.03), followed by treatment T5 - Guava pulp + Sugar (1:1) + Muskmelon seed (Coarsely crushed seed) 5% measuring (7.8), while the treatment T0 - Control (guava pulp) had the least colour score measurement (6.16).

Texture

Results related to the texture showed that the treatment T2 - Guava pulp + Sugar (1:1) + Pumpkin seed kernel (powdered seed) 5% had the highest texture score measuring (7.93), followed by treatment T5 - Guava pulp + Sugar (1:1) + Muskmelon seed (Coarsely crushed seed) 5% measuring (7.5), while the treatment T1 - Guava pulp + Sugar (1:1) + Pumpkin seed kernel (Coarsely crushed seed) 5% had the least texture score measurement (6.13).

Flavour

Results related to the flavour showed that the treat-

ment T2 - Guava pulp + Sugar (1:1) + Pumpkin seed kernel (powdered seed) 5% had the highest flavour score measuring (8.1), followed by treatment T5 - Guava pulp + Sugar (1:1) + Muskmelon seed (Coarsely crushed seed) 5% measuring (7.63), while the treatment T0 - Control (guava pulp + Sugar) had the least flavour score measurement (6.13).

Taste

Results related to the taste showed that the treatment T2 - Guava pulp + Sugar (1:1) + Pumpkin seed kernel (powdered seed) 5% had the highest taste score measuring (8.03), followed by treatment T5 - Guava pulp + Sugar (1:1) + Muskmelon seed (Coarsely crushed seed) 5% measuring (7.56), while the treatment T8 - Guava pulp + Sugar (1:1) + Cuddapah almond (Chirongi) seed (powdered seed) 5% had the least taste score measurement (6.5).

Overall acceptability

Results related to the overall acceptability showed that the treatment T2 - Guava pulp + Sugar (1:1) + Pumpkin seed kernel (powdered seed) 5% had the highest overall acceptability score measuring (8.03), followed by treatment T5 - Guava pulp + Sugar (1:1) + Muskmelon seed (Coarsely crushed seed) 5% measuring (7.66), while the treatment T4 - Guava pulp + Sugar (1:1) + Watermelon seed (powdered seed) 5% had the least overall acceptability score measurement (6.4).

Conclusion

Based on findings of the present experiment it may be concluded that treatment T2 {Guava pulp + Sugar (1:1) + Pumpkin seed kernel (powdered seed) 5%.} was found superior in respect of all the param-

Table 1. Data regarding all the parameters in different treatments.

Treatment	TSS	pH	Acidity	Ascorbic acid	Reducing sugar	Non reducing sugar	Total sugar	Colour	Texture	Flavour	taste	Overall acceptability
T0	75.9	3.5	0.872	23.6	27.8	24.2	46.03	6.16	6.2	6.3	6.6	6.6
T1	78.3	3.6	0.739	31.5	27.6	25.8	47.4	6.9	6.1	6.5	6.5	6.8
T2	78.1	3.5	0.924	32.9	27.4	28.7	49.9	8.03	7.9	8.1	8.03	8.03
T3	76.5	3.6	0.906	29.1	26.2	26.5	45.8	6.8	6.5	6.7	6.7	6.6
T4	75.5	3.6	0.843	31.2	25.2	22.9	41.1	6.4	6.3	6.7	6.5	6.4
T5	78.9	4.08	0.683	28.4	25.4	23.4	41.9	7.8	7.5	7.6	7.5	7.6
T6	78.2	4.1	0.919	29.7	26.04	30.4	43.08	7.03	6.4	6.6	6.9	6.3
T7	72.4	3.7	0.835	23.8	26.6	23.5	44.6	7	6.7	6.8	6.8	6.8
T8	77.4	3.6	0.715	31.3	25.3	24.1	42.4	6.5	6.1	6.63	6.5	6.7

eters pH (3.513), Ascorbic acid (32.94 mg/100g), Total sugar (49.94%) Colour score (8.03), Texture score (7.93), Flavour score(8.1), Taste score(8.03) and Overall acceptability score (8.03). The highest net returns (Rs. 562.5) and higher benefit cost ratio (2.37:1) was also found superior in T2 {Guava pulp + Sugar (1:1) + Pumpkin seed kernel (powdered seed) 5%.

References

- Acharya, G.C., Mohanty, P., Kar, D.S., Lenka, J. and Pattanaik, K. 2022. Value addition in wood apple (*Limonia acidissima* L.) . *The Pharma Innovation Journal*. 11(1): 1673-1676
- Attri, S., Dtiman, A. K., Kaushal, M. and Sharrna, R. 2014. Development and storage stability of Papaya (*Cacica papaya* L) toffee and leather. *International Journal of Farm Sciences*. 4(3): 117-125.
- Bhatt, D.K. and Verma, S. 2016. A study on development of herbal food product-bael (*Aegle marmelos*) fruit toffee. *Journal of Environmental Science, Toxicology and Food Technology*. 10(3): 5-14.
- Bhokre, C. K., Rodge, A. B., Ghatge, P. U. and Chilkawar, P. M. 2010. Preparation and evaluation of banana toffee. *Beverage and Food World*. 37(9): 50-51.
- Chavan, U.D., Pawar, U.B. and Pawar, G.H. 2015. Studies on preparation of mixed toffee from guava and strawberry. *Journal of Food Science and Technology*. 52(10): 6791-6797.
- Chavan, U.D. and Shaikh, J.B. 2015. Standardization and preparation of guava leather. *International Journal of Advanced Research in Biological Sciences*. 2(11): 102-113.
- FSSAI, 2011. Food Safety and Standard Regulations. Food Safety and Standard Authority of India, New Delhi, 287-448.
- Goyat, S., Singh, K. and Singh, A. 2008. Effect of different recipes on the quality of mango toffee. *Haryana Journal of Horticultural Sciences*. 37: 255-258.
- Gupta, R. and Singh, B. 2012. Optimization of osmo-convective dehydration process for the development of honey-ginger candy using response surface methodology. *Drying Technology*. 30(7): 750-759.
- Kannaujiya Ankit, D.S. Bunkar, D.C. Rai, Uday Pratap Singh and Vikas Patel, 2018. Process optimization for the development of papaya candy and its shelf-life evaluation. *The Pharma Innovation Journal*. 7(4): 80-85.
- Rai, S., Sethi, V. and Jayachandran, K.S. 2005. Storage studies in guava cheese. *Annals of Agro-Bio Research*. 10(1): 97-100.
- Shabi, M., Singh, D., Prasad, V. M. and Deepanshu. 2018. Studies on value addition of guava cheese. *The Allahabad Farmer*. 74(1): 47-53.
- Shukla R., Shukla S. K. and Patakh, S. 2018. Sensory evaluation of guava cheese prepared from different varieties. *International Journal of Current Microbiology and Applied Biosciences*. 7(2): 780-789.
- Sinha, M. and Mishra, S. 2017. Effect of value addition on guava-cheese with medicinal herbs under ambient storage condition (*Psidium guajava* L.) cv. Allahabad Safeda. *International Journal of Pure and Applied Sciences*. 5(3): 559-566.
- Sucheta, 2013. Development and evaluation of cheese and toffee from guava-mango blends. Choudhry Charan Singh Haryana Agriculture University, Hisar, India.