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Nutritional and Health Potential of Guava Fruit and its Value-added Products

Sheetal[1*], Monika Sood[2], Julie D. Bandral[3] and Nishu[4]

[1]M.Sc. Research Scholar, [2]Associate Professor, [3]Professor, [4]PhD. Scholar,
Division of Post Harvest Management[1,2,3,4],
Sher-e-Kashmir University of Agricultural Sciences and Technology-Jammu, Chatha, 180009, Jammu and Kashmir.
[*]Corresponding author: sheetalbhagat700@gmail.com

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Introduction:

Guava is scientifically known as *Psidium guajava* L. Guava is an edible fruit produced on an evergreen shrub or small tree in the Myrtaceae family. Guava is also known as common guava, and its origin is unknown, however, it grows natively in regions of tropical America. Guava is a tropical fruit that ripens quickly and is one of the most perishable fruits. Guava fruit has a shelf life of about 2 - 3 days at room temperature. There are several species of guavas, including common guava or apple guava, which contains the largest fruits of all and is the type most usually found in stores. The weight of guava fruit ranges between 150 and 250 g. It is a highly productive and profitable fruit crop. Several nutritionists consider guava to be a "SUPERFRUIT" because of its ease of growing, availability and a long list of health advantages. The therapeutic benefits of guava fruit, leaf and other plant parts are well established in traditional medicine. Because each portion of the guava tree has economic worth, it is grown on a commercial basis. One well-known nutritional benefit of guava consumption is its high Vitamin C content, which performs a variety of immunological activities and protects the body from free radicals (Vora *et al*., 2018).

Nutritional Composition of Guava Fruit:

Guava is high in protein, carbohydrates, vitamins, minerals and other macro and micronutrients that are renowned health boosters. Guava fruit is regarded as the richest source of vitamin C and other nutrients such as vitamin A, phosphorus, iron and calcium. It also contains polyphenols, flavonoids, saponins and other antioxidants. Because of its nutritional qualities such as protein (0.1 - 0.5 g), fat (0.43 - 0.7 g), carbohydrates (9.1 - 17 g), crude fibre (0.9 - 1 g), and calories (77 - 86 g). The total sugar content of guava fruit is

around 8.92 g. It contains vitamins such as thiamine (0.067 mg), riboflavin (0.04 mg), niacin (1.084 mg) and vitamin B6 (0.11 mg). Iron (0.26 mg), magnesium (22 mg), manganese (0.15 mg), phosphorous (40 mg), potassium (417 mg), sodium (2 mg), zinc (0.23 mg), and lycopene (5204 µg) are also found in guava fruit (Gavahne *et al*., 2022).

Health Benefits of Guava Fruit:

- Guava contains a lot of phytochemical antioxidants such as quercetin, carotenoids, vitamin C and polyphenols. They work as powerful antioxidants, neutralising free radicals produced by the body and suppressing cancer cell proliferation.
- It contains a substantial amount of dietary fibre, which is essential for the prevention and treatment of constipation and haemorrhoids.
- Gallic acid, catechins, epicatechins, rutin, naringenin, and kaempferol are the enzymes that block pancreatic cholesterol esterase, resulting in lower blood cholesterol levels.
- When consumed without the peel, guava fruits have the ability to lower blood sugar levels.
- Guava is potent in ascorbic acid and iron, which aid to reduce pulmonary congestion and mucus production while also keeping pathogens out of the respiratory system.
- It can also be used to heal toothaches and ulcers due to its astringent characteristics.
- The enhanced potassium and fibre content of guava fruit has been found to result in significant decreases in blood pressure and blood lipids when eaten on a regular basis.
- It contains a high concentration of pectin, which reduces blood lipids by delaying meal absorption, minimising the risk of cardiovascular disease.
- Guava is effective in the treatment of diarrhoea because it inhibits microbial proliferation, releases additional mucus from the gut, and so aids in the binding of loose stools (Mathpal and Rathore, 2022).

Value-added Products of Guava Fruit:

1. **Guava Pulp:**
   Guava pulp processing is an easy way to store guava fruits. To avoid nutritional breakdown, add a small amount of potassium metabisulphite (0.005 - 0.2%) to the guava pulp and store it at room temperature (2-5°C). Cold or hot extraction processes can be used for pulp extraction. Hot techniques necessitate a preheating step in which the fruits are blanched prior to extraction with hot water or steam. Cold methods, on the other hand, entail pulping clean fruits without preheating, resulting in the higher quality pulp but lower yields as compared to hot methods.

2. **Blended Ready-To -Serve Beverages:**
   Guava fruit pulp has been used in the production of different blended, ready-to-drink beverages in various ratios by blending it with other fruits such as anola, papaya, and pineapples. It improves the appearance, nutritional value, and flavour.
3. **Guava Pomace:**

Guava pomace is a type of prepared waste that is provided at the end of the manufacturing process. To extract the juice, guava fruits were used. A cabinet tray drier was utilised to dry guava pomace, which could precisely manage the appropriate drying temperature between 20 and 150 °C. Guava pomace, with a high moisture content, can be dried at 65 °C.

4. **Guava Leathers:**
   Guava leather is made by dehydrating a leathery layer of fruit purée. Leathers can be eaten raw or cooked into a sauce. Guava leather contains more protein and fat than other types of leather. It has a much stronger fruitiness fragrance and overall attractiveness, as well as improved compositional properties.
5. **Guava Dehydrated Slices:**
   Firm and ripe guava fruits can be used to make dehydrated guava goods such as dehydrated guava slices. Osmo-dried guava slices were prepared by cutting guava fruits into 1.5 cm thick slices, coring them and then immersing them in various amounts of sugar syrup solution containing 0.05% KMS and 0.10% citric acid for variable periods and temperatures.
6. **Guava Juice:**
   Guava juice is prepared from either fresh fruits or guava pulp. The juice is extracted by pressing the guava fruits through a hydraulic filter press or by diluting them with water and subsequent filtration of the pulp. The juice is typically milky, necessitating the application of pectic enzymes to produce clearer, readily filtered juice (Gavahne *et al*., 2022).
7. **Guava Nectar:**
   Guava nectar is a drink prepared from guava fruit. It is normally created by crushing fresh guava fruits and using the ensuing guava pulp to create a rich, sweet juice with a lot of flavour. Guava nectar has a variety of applications, ranging from mixed cocktails to pure drinking and it is particularly popular in tropical countries. It is available in various stores, often pasteurised and shelf-stable. Guava nectar specifications: TSS (12.5° - 13° Brix), acidity (0.15%) and pH (3.4 – 4) (Kumari *et al*., 2017).

8. **Guava Shrikhand:**
   Shrikhand was created by boiling skim milk, cooling it in a batch pasteurizer at 30 °C, adding Lactic Acid Bacteria (LAB) starting culture and thoroughly mixing it with a mixer. The temperature of the pre-sterilized storage tank was kept at 37 °C for the incubation phase, which lasted 8 to 12 hours. After the curd had properly been set, it was moved to another vessel with a clean, moist muslin cloth. This chakka has been completely blended with sugar and guava powder to get a homogenous consistency, either manually or mechanically. It is usually packaged in polystyrene cups and kept in the fridge (Gavahne *et al*., 2022).
9. **Guava Jelly:**

The main product made from fresh guava fruits is jelly. Fresh guava fruits that are slightly underripe are utilised to make jelly. Jelly is a semi-solid substance made by boiling clear strained fruit extracts devoid of pulp with the necessary amounts of sugar, citric acid, and pectin. It should have a minimum of 65% total soluble solids and a minimum of 45% fruit component. The jelly should have an appealing purplish-red colour, a pleasing scent, and a pleasant flavour (Kumari *et al*., 2017).

10. **Guava Jam:**

Jam is a product that is prepared by boiling fruit pulp with enough sugar to make a relatively thick consistency that is solid enough to hold the fruit tissues in place. It can be made from just one type of fruit or from two or more. For every 55% sugar, 45% fruit pulp should be utilised. The FPO jam criteria is 68.5% TSS, 45% fruit pulp, and 0.5-0.6% acid (citric acid) per 100 g.

Conclusion:

Guava is well renowned for its culinary and nutritional benefits all over the world. Guavas were also named super fruit due to their high contents of folic acid, dietary fibre, potassium and minerals. Some post-harvest losses occurred as a result of faulty handling, shipping, and processing, with 20 to 25% of guava spoiling before reaching the customer. Guava is one of the greatest crops for value addition. Many innovative technologies for value addition in guava have been developed and there is enormous potential for diverse guava value-added products. Guava goods such as RTS, nectar, guava leather and many others are very essential. Therefore, it can be concluded that guava has certain pharmacological effects, as well as the produced goods, taste fantastic, had a high nutritional value, retained the original fruit flavour and are safe to consume.

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