



GUAVA



Visvesvaraya Trade Promotion Centre (VTPC)
VTPC Building, Kasturba Road, Bengaluru-560001

PREFACE

With a robust agro potential the Country has, the Government of India has launched the One District One Focus Product Scheme (ODOFP) for agriculture sector by the Ministry of Food Processing Industries. Among its primary objectives, the ODOFP initiative aims to enhance the value of the products which is eventually expected to boost employment and income levels of the farmers. The identified products across the country is available at <https://www.nfsm.gov.in/odopstatecropsreport.aspx>

Karnataka has identified its product mix with high demand and export potential across all the districts. The implementing agency for this initiative is the Karnataka State Agricultural Produce Processing and Export Corporation Limited (KAPPEC), the nodal agency in the State.

VTPC being the nodal agency for promotion of exports from the State has made an attempt to draw the action plan district wise, to capture the potential, present status and future prospects in domestic and international markets. Besides, detailed insights have been provided into the biological description of the product, their local, national and international varieties, export-import analysis, HS codes. For a holistic perspective for those concerned, each report also provides SPS standards, processing technologies available, export grading and packing specifications, and suggested pivotal roles and responsibilities among the government departments, boards, corporations and Universities.

Presenting the Action Plan/Report for Guava, a ODOFP product mapped to Koppal district of Karnataka, formulated by VTPC. I sincerely hope that this ready reckoner with first-hand information regarding the farming sector would help all those concerned, especially the FPOs and food processing entrepreneurs who have a desire to focus on exporting this product.

S.R Satheesha

Director (Exports) & Managing Director



Table of Content

Page no.

Introduction	01
Popular Guava varieties across the World	03
Varieties of commercially grown guavas in India	06
Varieties of commercially grown guavas in Karnataka	08
Production data of Guava world-wide and India (State-wise)	09
World Export and Imports	10
Export performance of Guava in the last four years	11
Export Analysis of Guava and its products: 2021-22*	12
SPS -TBT Standards for Guava	14
Guava Fruit-Processing Technologies/Proposed Products	14
Action plan	16
Responsibility Matrix	17



Guava – hidden potential

Introduction

Guava (gwa:və) is a common tropical fruit cultivated in many tropical and subtropical regions. The common guava *Psidium guajava* (lemon guava, apple guava) is a small tree in the myrtle family (Myrtaceae), native to Mexico, Central America, the Caribbean and northern South America. The name guava is also given to some other species in the genus *Psidium* such as strawberry guava (*Psidium cattleianum*) and to the pineapple guava, *Feijoa sellowiana*. In 2019, 55 million tonnes of guavas were produced worldwide, led by India accounting for 45% of the total. Botanically, guavas are berries.

Guava fruits, usually 4 to 12 centimetres (1+1/2 to 4+1/2 in) long, are round or oval depending on the species. They have a pronounced and typical fragrance, similar to lemon rind but less sharp. The outer skin may be rough, often with a bitter taste, or soft and sweet. Varying between species, the skin can be any thickness and is usually green before maturity, but may be yellow, maroon, or green when ripe. The pulp inside may be sweet or sour and off-white ("white" guavas) to deep pink ("red" guavas). The seeds in the central pulp vary in number and hardness, depending on the species.

Culinary uses In Mexico and other Latin American countries, the popular beverage Agua fresca is often made with guava. The entire fruit is a key ingredient in this punch, and the juice is often used in culinary sauces (hot or cold), ales, candies, dried snacks, fruit bars, and desserts, or dipped in chamoy. Pulque de guava is a popular alcoholic beverage in these regions.

In many countries, guava is eaten raw, typically cut into quarters or eaten like an apple; it is also eaten with a pinch of salt and pepper, cayenne powder or a mix of spices (masala). In the Philippines, ripe guava is used in cooking sinigang. Guava is a popular snack in Taiwan, sold on many street corners and night markets during hot weather, accompanied by packets of dried plum powder mixed with sugar and salt for dipping. In East Asia, guava is commonly eaten with sweet and sour dried plum powder mixtures. Guava juice is popular in many countries. The fruit is also often included in fruit salads.

Because of its high level of pectin, guavas are extensively used to make candies, preserves, jellies, jams, and marmalades (such as Brazilian goiabada, Colombian and Venezuelan bocadillo), and as a marmalade jam served on toast. Red guavas can be used as the base of salted products such as sauces, substituting for tomatoes, especially to minimize the acidity. A drink may be made from an infusion of guava fruits and leaves, which in Brazil is called chá-de-goiabeira, i.e., "tea" of guava tree leaves, considered medicinal.

Main Constituents

Nutrients Guavas are rich in dietary fiber and vitamin C, with moderate levels of folic acid. Low in food energy per typical serving, and with few essential nutrients, a single common guava (*P. guajava*) fruit contains 257% of the Daily Value (DV) for vitamin C. Nutrient content varies across guava cultivars. Although the strawberry guava (*P. littorale* var. *cattleianum*) has only 39% of the vitamin C in common varieties, its content in a 100 gram serving (90 mg) still provides 100% of the DV.

Phytochemicals Guava leaves contain both carotenoids and polyphenols like (+)-gallicocatechin and leucocyanidin. As some of these phytochemicals produce the fruit skin and flesh color, guavas that are red-orange tend to have more polyphenol and carotenoid content than yellow-green ones.

Guava seed oil Guava seed oil, which may be used for culinary or cosmetics products, is a source of beta carotene, vitamin A, vitamin C, copper, zinc and selenium, and is particularly rich in linoleic acid.

The composition of fatty acids in guava seed oil are: Lauric acid < 1.5%; Myristic acid < 1.0%; Palmitic acid: 8-10%; Stearic acid: 5-7%; Oleic acid: 8-12%; Linoleic acid: 65-75%; Saturated fats: total 14%; and Unsaturated fats: total 86%.

Popular Guava varieties across the World

There are more than 30 varieties of Guavas grown in different regions.



Strawberry Guava Strawberry Guava also known as Cattley guava is classified as *Psidium cattleianum*. This cultivar is native to southeastern Brazil and was introduced into Hawaii in 1825. This species produces a bright red fruit with red or pink flesh and a taste of strawberry. This variety of Guava is available during summer but can produce fruits year-round in some tropical places.

Lemon Guava (Or yellow cherry guava): Its origin is from eastern Brazil and it best grows in subtropical climates. The tree's height is smaller than a standard guava tree. The lemon guava is also small in size, measuring around three to five centimetres in diameter. The tree blooms white flower and the fruit is colored yellow with a color yellow flesh. This species has a distinct taste which is similar to lemon and guava. It can be eaten both cooked and raw. This cultivar is also a common ingredient in making smoothies, frozen desserts, and tropical fruit salads.



Tropical White This guava variety of guava has yellowish green peels with a creamy white flesh. The tree blooms amazing white flowers with feathery stamens and has a sweet fragrance. The guava trees can reach a mature height of 15-30 feet and can start fruiting early as young as one year of its life. This variety of guava does best in subtropical temperatures and prefers medium moisture soil but the tree can adapt to various soil types. Thus, the tree can survive even during drought conditions; however some watering will avoid leaf wilting. It originated from Southern Mexico but has travelled to different places in the world, like Hong Kong, Hawaii, Africa, India, Asia, Southeast Asia, and the Pacific tropical regions.



Pineapple Guava Also known as Feijoa sellowiana, is a flowering plant native to Southern Brazil, Colombia, Uruguay, and eastern Paraguay. These fruits are ideal for dessert, salads, jams, and pies. It can also be eaten raw. Aside from the fruit, its white and purple flower is also edible.

Sweet White Indonesian Guava Psidium guajava is a fruitful guava tree originated from Indonesia. The tree produces large fruits that are round in shape, yellowish-green peel, and seedless cream flesh. Light pruning is recommended to allow slow growth of the tree. This is also to build strong tree roots to support the added weight of the fruits and strong air movement. Fruits are of irregular shape and yellow with thin skin, warty surface and swollen calyx end. Pulp is white, seedless, has good taste and aroma and has 240 mg vitamin C / 100 g pulp.



Red Indian Guava These are native to Florida and have a medium to large size fruit that has a strong and sweet-scented odour. It has a yellow and pink blushed peel with many small seeds. This cultivar's fruit can be eaten raw or even right after it is picked off as long as it is already ripened.

Mexican Cream Also known as 'Tropical Yellow', is yet another delicious guava variety. The tree of this variety grows upright and does not provide much canopy spread. It has a white-flesh, as well as a creamy and sweet taste. It is excellent for use in desserts.





Apple Guava These trees are native to Mexico and Peru but are easy to grow in most tropical areas. The small fruits are popular for making preserved items such as jams and jellies but can be eaten fresh or made into juice.

Giant Vietnamese Guava The largest of all guava fruit varieties, the Giant Vietnamese/Bangkok is full of vitamins and nutrients. It is used to make the globally popular guava juice, the Giant Vietnamese/Bangkok is considered by many as a super fruit.



Ruby Supreme: This variety produces baseball-sized fruits which turn yellow when ripe and have highly aromatic, sweet and pink flesh. Fruits can be eaten raw or made into jelly or juice. Surprisingly, this variety flowers and fruits year-round in cycles that last 60-90 days. The more sun and warmth they receive, the more fruits they produce. The yield is approximately 40 - 70 lbs per year.

Red Malaysian This cultivar is a great choice for adding interesting colour to the garden. The tree has red-tinted leaves which bear dark red fruits and very showy bright pink flowers.



Thai maroon Guava Thai Guavas are a special guava variety, with a softball-sized fruit and apple green skin that can range from bumpy to smooth. The flesh of Thai Maroon Guavas is white with pale yellow seeds and tends to be drier than the pink type of guavas. These Guavas are mildly sweet and have very little fragrance. When you eat it, the flesh is crunchy and seeds are hard.

Varieties of commercially grown guavas in India



Allahabad Safeda This is the most famous of all the available guava varieties whose trees bear a lot of fruits. The crown of the Allahabad Safeda guava tree is expansive and compact, mostly dome-shaped. The guavas of this variety are round in shape and not very large. The skin of the fruit is very mild and the flesh is white with not many seeds inside it. The smoothness of the skin and lesser seeds make this a widely loved variety. It is used for both serving on the table and processing purposes. The yield is nearly 13.69 kg/tree.

Sardar (Lucknow-49) The tree of the Safeda guava variety is lively, spreading and bountiful. It is weighty having huge and round-shaped fruits with primrose yellow skin shading. It has white fragile flesh and seeds are in bounty and harder than that of Allahabad Safeda. The plant has been used to treat inflammation, kidney infections and urinary tract infections; as a diuretic and as a stomach tonic. The yield is 144 kg per tree.



Arka Mridula The plans of this Guava variety are semi-vigorous in nature and spreading. Fruits are round in shape. It is a selection from open-pollinated seedlings of Allahabad Safeda. The skin is yellow in colour and smooth. The flesh is white and fruits are soft seeded. Hence, it is one of the best guava varieties for jelly making.

Lalit It is a high yielding pink-fleshed guava assortment delivered by Central Institute for Subtropical Horticulture, Lucknow for business development in guava developing zones of the nation. Fruits are of saffron yellow shading with a red tinge. It is reasonable for both table-serving and processing purposes. The jam produced using this assortment has a better flavour and appealing appearance. The yield is 100 kg per tree.





Shweta The tree produces medium size spherical fruits, which have velvety white skin with red spots and nearly-white flesh.

The assortment is developed by the Central Institute for Subtropical Horticulture, Lucknow. It is appropriate for business development and trading guavas. Fruits are appealing and highly nutritious, with an average yield of 151 kg per tree.

Allahabad Surkha One of the most loved guava varieties in India, it is a remarkable variety of enormous size with pink colour and has pulpy pink flesh. Trees are lively, dome-shaped and compact. The organic product is sweet and unequivocally enhanced with a couple of seeds.



Safed Jam This guava variety is a cross of Allahabad safeda and kohir. The fruit shape is usually round and the fruit pulp is thin with good taste. Seeds are soft and located at the core. The yield is 80.9 kg/plant.

Kohir Safeda Obtained from the cross between Kohir and Allahabad safeda, is the guava variety Safeda Jam. The fruits are large with bard seeds. The tree is large and bears profusely. You can get 90 to 100 kg of fruit per plant.

Arka Amulya It is a progeny from the cross Allahabad Safeda and Triploid. Plants are medium in vigour and spreading type. Fruits are round in shape. Skin is smooth and yellow in colour. Fruits on an average weigh about 180 - 200 g, the flesh is white in colour and firm.



Arka Kiran It is a pink pulp variety with an average fruit weight of 200-220g with medium-soft seeds. The crop will come to harvest only after two years of planting.

Varieties of commercially grown guavas in Karnataka

Apart from the varieties available in India, Indian Institute of Horticultural Research, Bengaluru has identified a few and developed a few of the below varieties of guava:

- **Chittidar** Fruits are almost round, white pulped, smooth-skinned with red spots on the skin having vitamin C content of 240 mg/100 g pulp.
- **Hafsi** Fruits are moderately big sized, spherical with thin skin. The pulp is red with good taste and flavour. Seeds are comparatively less in number but are hard.
- **Navalur** It is a variety grown in the Dharwad region of Karnataka. It is hardy in nature, drought tolerant and resistant to canker.
- **Red flesh** Fruits are medium-sized with red pulp almost round, and smooth-skinned. Seeds are plenty but soft. Fruits possess a sweet flavour and contain 386 mg vitamin C / 100 g pulp.
- **Apple colour** Fruits are medium-sized, round, the skin is red like an apple while the pulp is white, sweet with good flavour.
- **Pant Prabhat** A selection made at G.B. Pant University of Agriculture and Technology, Pantnagar. Plant growth upright, the tree is highly productive (100-125 kg). Fruits are medium-sized with smooth skin, and white pulp with medium-soft seeds.
- **Hisar Safeda** It is a cross between Allahabad Safeda and seedless sweet white Indonesian guava, developed at CSS HAU, Hisar. Plants are upright growth habits with compact crowns. Fruits are round with a smooth surface, creamy white pulp with a few soft seeds with high TSS (12-13oB).
- **Benaras** Fruits are round, medium to big in size, white pulp with good taste
Banarsi Surkha: Trees are medium-sized with broad crowns, round fruits with smooth surface, pink pulp with high seed content.
- **Hisar Surkha** It is from the cross Apple colour and Banarasi Surkha. The tree crown is broad to compact. Fruits are round, skin yellow with few red dots, and pink pulp with good TSS (12-13oB).
- **Smooth green** Fruits are round and medium sized. Skin is glossy and greenish yellow when matured. Pulp is white, good taste and flavour.
- **Nasik** Fruits are medium-sized, round, white pulp, sweet with good flavour.

Source: IIHR, Bangalore - <http://webapps.iihr.res.in:8086/cp-varieties1.html>

Production data of Guava world-wide

Rank	Country	Country 2020	Production Quantity 2020
1.	India	45.22%	24.75M
2.	Indonesia	6.61%	3.62M
3.	Mexico	4.34%	2.37M
4.	China	4.33%	2.37M
5.	Pakistan	4.28%	2.34M
6.	Brazil	3.9%	2.14M
7.	Malawi	3.54%	1.94M
8.	Thailand	3.03%	1.66M
9.	Bangladesh	2.65%	1.45M
10.	Egypt	2.55%	1.40M

Source: www.tridge.com

State-wise production data of Guava (2021-22)

No.	State	Production	Share (%)
1.	Uttar Pradesh	983.59	21.78
2.	Madhya Pradesh	776.75	17.20
3.	Bihar	434.41	9.62
4.	Andhra Pradesh	335.11	7.42
5.	Haryana	271.18	6.00
6.	Punjab	219.85	4.87
7.	West Bengal	203.56	4.51
8.	Chattisgarh	187.04	4.14
9.	Gujarat	175.33	3.88
10.	Karnataka	167.48	3.71
	Page Total	3,754.30	

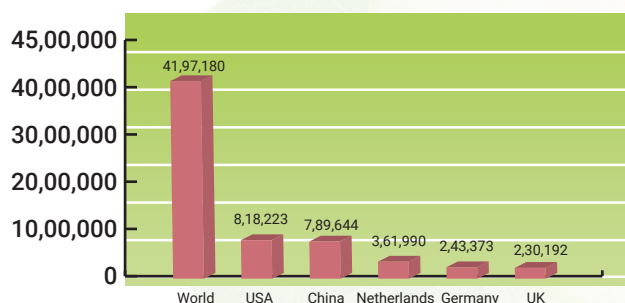
Source: APEDA Agri exchange.

World Export and Imports (2021)

080450: Fresh or dried guavas, mangoes, and mangosteens.

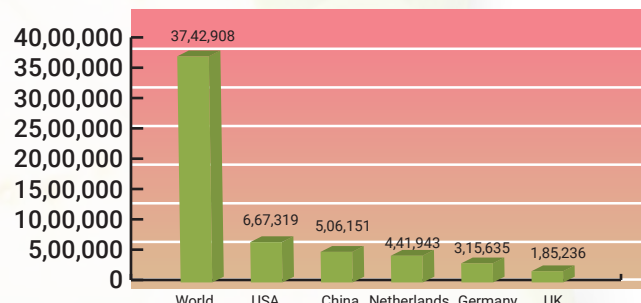
2021 Global Imports 4,197,180 USD.

No.	Country	Value USD
1.	USA	818,223
2.	China	789,644
3.	Netherlands	361,990
4.	Germany	243,373
5.	United Kingdom	230,192



2021 Global Exports 3,742,908 USD.

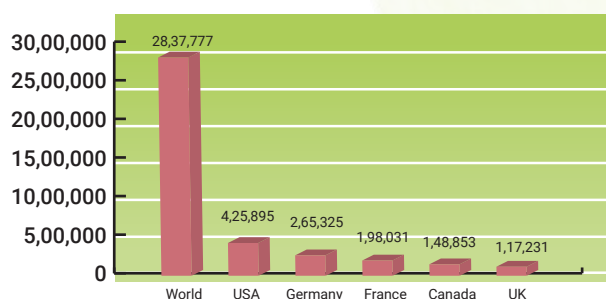
No.	Country	Value USD
1.	Thailand	667,319
2.	Mexico	506,151
3.	Netherlands	441,943
4.	Peru	315,635
6.	India	185,236



200799: Jams, jellies, marmalades, purées or pastes of fruit, obtained by cooking, whether or not containing added sugar or other sweetening matter (excluding citrus fruit and homogenized preparations of subheading 2007.10)

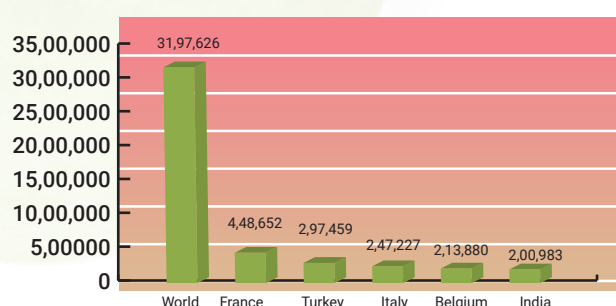
2021 Global Imports 2,837,777 USD.

No.	Country	Value USD
1.	USA	425,895
2.	Germany	265,325
3.	France	198,031
4.	Canada	148,853
5.	United Kingdom	117,231



2021 Global Exports 3,196,626 USD.

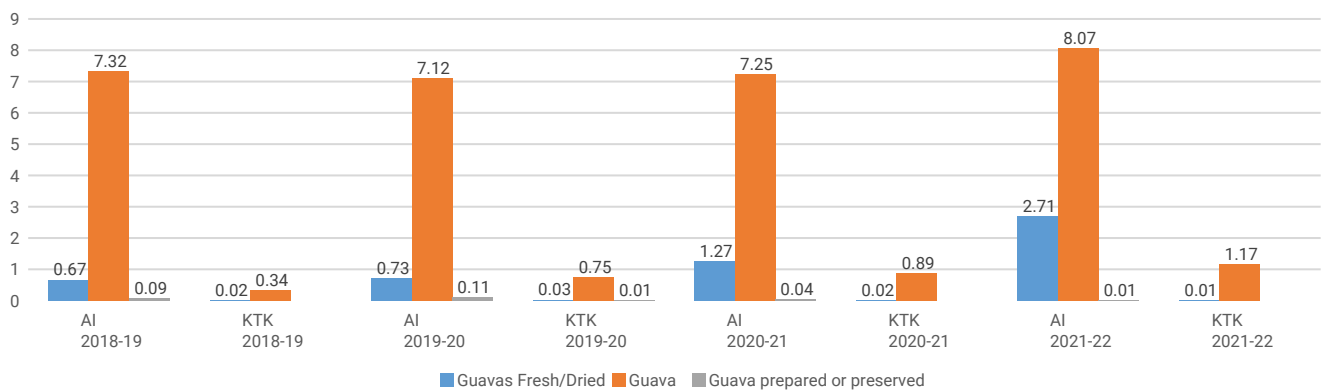
No.	Country	Value USD
1.	France	448,652
2.	Turkey	297,459
3.	Italy	247,227
4.	Belgium	213,880
6.	India	200,983



Source: ITC Trade map, Year – 2021.

Export performance of Guava in the last four years: All India and Karnataka.

No	HS Code	Description	2018-19		2019-20		2020-21		2021-22		Major
			AI	KTK	AI	KTK	AI	KTK	AI	KTK	
1.	08045010	Guavas Fresh/Dried	0.67	0.02	0.73	0.03	1.27	0.02	2.71	0.01	Nepal, UK & Tanzania
2.	20079920	Guava	7.32	0.34	7.12	0.75	7.25	0.89	8.07	1.17	Netherlands, Indonesia & Saudi Arabia
3.	20089994	Guava prepared or preserved	0.09	0.00	0.11	0.01	0.04	0.00	0.01	Nil	Nepal, Bhutan & Australia



Source: Exim analytics, DGCIS.

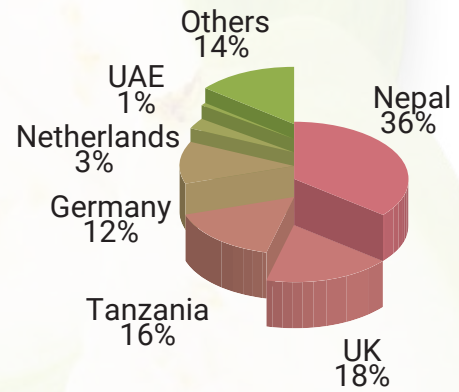
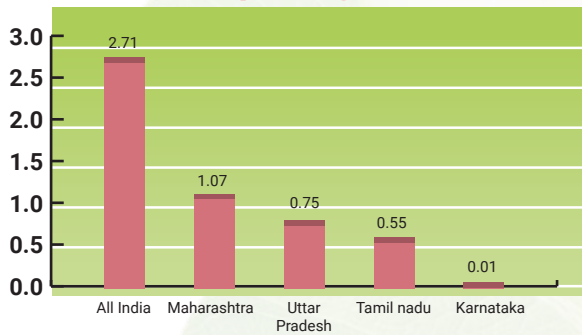


Export Analysis of Guava and its products: 2021-22*

08045010: Guavas Fresh/Dried

No.	State	Value USD Mn	Destination
0.	All India	2.71	Nepal, UK, Tanzania (+30)
1.	Maharashtra	1.07	UK, Germany, UAE (+22)
2.	Uttar Pradesh	0.75	Nepal, Sweden, UAE (+3)
3.	Tamil Nadu	0.55	Tanzania, Netherlands, Malaysia (+12)
11.	Karnataka	0.01	Qatar, Bahrain, Oman (+3)

Exporting states

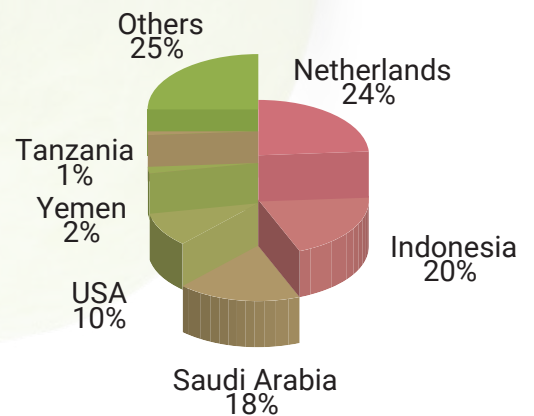
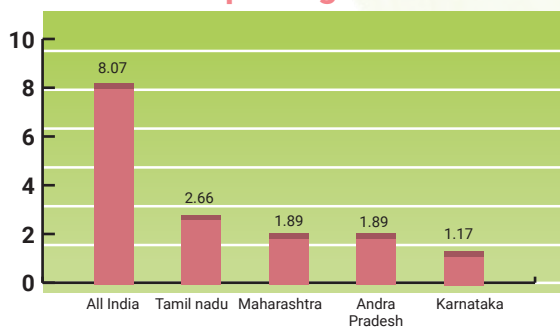


Importing Countries

20079920: Guava

No.	State	Value USD Mn	Destination
0.	All India	8.07	Netherlands, Indonesia, Saudi Arabia (+41)
1.	Tamil Nadu	2.66	Indonesia, USA, Netherlands (+26)
2.	Maharashtra	1.89	Saudi Arabia, Netherlands UK (+14)
3.	Andhra Pradesh	1.89	Yemen, Tanzania, Netherlands (+20)
4.	Karnataka	1.17	Indonesia, USA, Netherlands (+9)

Exporting states

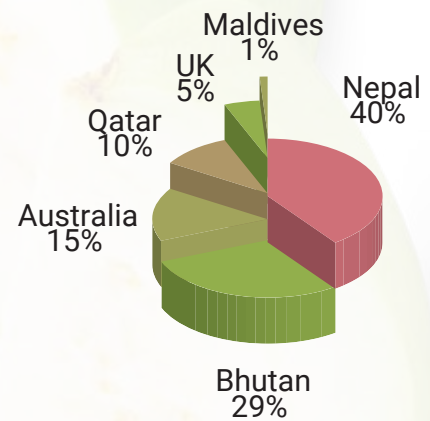
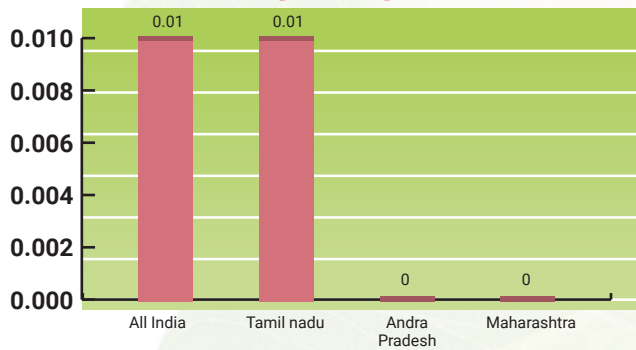


Importing Countries

20089994: Guava prepared or preserved

No.	State	Value USD Mn	Destination
0.	All India	0.01	Nepal, Bhutan, Australia (+3)
1.	Tamil Nadu	0.01	Nepal
2.	Andhra Pradesh	0.00	Bhutan
3.	Maharashtra	0.00	Australia, Qatar, Maldives
11.	Karnataka	Nil	NA

Exporting states



Importing Countries



SPS -TBT Standards for Guava

Size:

- A grade lesser than 350 grams and lesser than 95mm
- B 251-350 grams, 86-95 mm
- C 180-250 grams, 76-85 mm.

Varieties

Anakapalli, Banarasi, Bangalore, Chittidar, Hafshi, Nagpur Seedless, Smooth Green.

The principal pre-harvest strategy and post-harvest technology for reducing the post-harvest losses are as under :

- i) Pre-harvest treatment.
- ii) Correct stage of harvesting
- iii) Proper harvesting method
- iv) Proper curing
- v) Washing, cleaning and grading
- vi) Scientific packing
- vii) Pre-cooling
- viii) Cold storage
- ix) Suitable means of transport and
- x) Efficient marketing.



GUAVA FRUIT-PROCESSING TECHNOLOGIES & PROPOSED PRODUCTS

Dehydrated products

Guava powder is obtained by dehydration process which is an efficient alternative for storage of fruit, because the reduction of water activity is related to the decline of chemical and enzymatic reactions responsible for the deterioration of foods. Dehydration process is relied on extraction of water contained in foods up to a minimal level which is enough to their conservation for long time. Two food products (powders) were obtained by hot air drying or lyophilisation methods on the whole guava fruit.

Instant guava-drink-powder Samples are obtained by dehydrating the concentrated guava juice using different drying techniques. Dehydration of guava juice into powdered particles gives a considerable reduction in volume and is an effective method of prolonging the shelf life. Studies indicated that freeze dried product had superior sensory and nutritional qualities, though spray dried powder was stable and highly economical to prepare free flowing guava powder having good stability. Low caloric sweetened dehydrated guava slices is an intermediate moisture candy type product and is a readymade best food for diet conscious people of all ages and especially for diabetic patients. Samples treated with chemical preservatives found to have negligible microbial population throughout storage. Studies showed that guava slices treated with non-nutritive sweeteners were leathery in appearance due to severe loss of moisture. Maximum overall acceptability was found in the slices treated with potassium metabisulphite and ascorbic acid.

Guava pulp Guava pulp as such and in combination with other fruit pulp by blending could be utilized as a base for preparing different products. Guava pulp was prepared from guava cultivars - Allahabad Safeda, Lucknow-49, Apple color, chittidar and Red Fleshed.

Puree, juice and nectar Fruit processing into purée and juice production are the most important technologies. Preservation of characteristic nutrients, taste, flavor as well as color, long shelf-life, easy handling, and convenience, make juice a valuable and attractive product for both customers and the food industry. Guava puree is processed by juice processing plants and then frozen until supplied to the food company for manufacture into various juice blends. However, pasteurized guava puree undergoes deterioration during storage at frozen temperatures, resulting in development of off-flavor and decreased sensory quality of guava juice.

Jam, jelly and preserve Guava jelly is a sweet, apparent, semisolid, a bit resilient spread or preserve made from fruit juice and sugar boiled to a thick consistency. Storage of jellies for nine months at room temperature (23-30°C) and relative humidity 80 to 85% is possible. Color and flavor will be acceptable up to 210 days but after which the color and flavor of jellies will change due to fungal growth and incipient spoilage.

Guava preserves These are the result of the appropriate processing of the edible parts, with added sugars, water, pectin (0.5 to 1.5%), pH adjuster (3 to 3.4), besides other ingredients and permitted additives until reaching adequate consistency, assuring product stability. After the processing, the preserves should be packaged properly and stored under environmental conditions. Guava jam or preserves should have the colour characteristic of the product, varying from yellowish red to brownish red, odour and characteristic flavour reminiscent of guava and a gelatinous and solid appearance, allowing cutting.

Guava leathers Guava leather is prepared by dehydrating fruit puree into a leathery sheet. Leathers can be consumed as a confection or cooked to give a sauce. There is a dearth of information on the chemical and organoleptic properties of guava leathers in the tropics. Higher protein and fat content was found in guava leather.

Canned slices Guava in syrup is the product that maintains the original shape and appearance of the fruit. Such a process consists of soaking the fruit in syrup at high temperatures for a pre-determined period. The high sugar concentration of the syrup reduces the water activity (A_w), enhancing product shelf-life.

Minimal processing The minimal processing of fruits is defined as the process that eliminates non-edible parts, such as rinds, stems and seeds, followed by cutting, washing, classification, sanitization, centrifugation, packaging and storage, possibly including low levels of irradiation and whitening, making them ready-to-eat without losing their freshness, with good quality and degree of sanitization. Alcoholic beverages: Guava wine may prove to be a quality wine with alcohol (stimulant) and high contents of phenols and ascorbic acid (antioxidants) besides increasing the economic status of Indian farmers especially during period of glut. The chaptalized juice ("must") is treated with pectinase or a combination of enzymes and fermented with traditional yeasts at a temperature range of 22 to 30°C and inoculum size of 6 to 11% (v/v). Ageing and racking of guava wine improves the organoleptic and sensory characteristics of wine.

Source <https://www.researchgate.net/publication/338823595>

[_A_Review_of_Production_Losses_and_Processing_Technologies_of_Guava](#)

Action plan

- Though India is the largest producer of Guavas worldwide, our export ranking is quite low due to poor pre and post-harvesting procedures. Knowledge sharing about best post harvesting, storage, packaging and delivery of the graded goods is need of the hour. Horticulture department can facilitate in this regard.
- Compared to other states, Karnataka falls behind in production of this fruit though we have the required ecological conditions for the crop. Handholding and guidance from concerned authorities will improve our ranks nationally.
- Farmers need to be educated about export requirements and international quality standards of the fruit to curb the dominance of middlemen.
- Most modern pack house facilities need to be created to facilitate guava exports from Karnataka. It is suggested that training to packhouse workers about post-harvest handling technology and also about international quality standards must be imparted by Agriculture and Horticulture departments.

Responsibility Matrix

Sl.no.	Actions	Responsibility
1.	Research on good agricultural practices	Agricultural and Horticultural Universities, Karnataka
2.	Research on Pre and Post-harvesting procedures	Horticulture department, Govt. of Karnataka
3.	Farmer Sensitization program on available opportunities	Agriculture and Horticulture departments, Karnataka
4.	Inviting Exporters/entrepreneurs to Investors meet for contract farming and processing industries	Horticulture Department and DIC Districts
5.	Farmer database and aggregation of the produce	Horticulture department and related FPOs
6.	Export training, orientation and Market Intelligence	VTPC Karnataka

Regulators and Service providers

No.	Organization	Service	Contact
1.	APEDA	RCMC, Market survey and assistance.	1st Floor, Beeja Bhavan, Bellary Rd, Hebbal, Bengaluru -560024. E: apedabl@apeda.gov.in
2.	KAPPEC	PMFME Scheme	17, Richmond Rd, Shanthala Nagar, Richmond Town, Bengaluru - 560025. E: kappec1996@gmail.com
3.	DGFT	IEC, Customs and ICEGATE	6th floor, Kendriya Sadan, C & E Wing, 17th main, Koramangala 2nd Block, Koramangala, Bengaluru - 560034 E: bangalore-dgft@nic.in
4.	Plant Quarantine	Phyto Sanitary certification (SPS)	Hebbal-Boopasandra Road HA Farm Post, Bengaluru - 560024. E: dd-pqfsb-ka@nic.in
5.	BIAL Cool Port	Freight and Flight	KIAL Road, Devanahalli, Bengaluru -560300 W: http://www.aisats.in