

Pomegranate

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A Fruit From Heaven



Pomegranate is an Iranian ancient fruit. It is originated in Persia and has been cultivated in Georgia, Armenia and the Mediterranean region for several millennia. Even though this fruit is not originated from China, one common nickname is Chinese apple. Pomegranate is known as winter jewels and Red Ruby. In the global functional food industry, pomegranate is often mentioned among a novel category of exotic plant sources called "Super fruits". It is a small tree up to five meter in height. The bark of the pomegranate tree is light down with red buds and young shoots. The leaves are small, opposite, glossy and almost evergreen. The large and attractive pomegranate flowers are orange-red. The fruit is between a lemon and a grapefruit in size. The characteristic large pomegranate fruits are crowned with a calyx and contain around 600 seeds in juice containing sacs. The seeds and surrounding pulp, ranging in color from white to deep red, called arils, are edible; indeed, the fruit of the pomegranate is a berry. There are some cultivars which have been introduced that have a range of pulp color such as purple. Pomegranates prefer a semi-arid mild-temperate to subtropical climate and are naturally adapted to regions with cool winters and hot summers. A humid climate adversely affects the formation of fruit. Pomegranates are drought tolerant and can be grown in dry areas with either a Mediterranean winter rainfall climate or in summer rainfall climates. In wetter areas, they are prone to root decay from fungal diseases. The pomegranate is equal to apple in having a long storage life. It is best maintained at a temperature of 0-5 centigrade (32 to 41 F). The fruits improve in storage, become juicer and more flavorful; may be kept for period of seven months within this temperature range and at 80 to 85 percent relative humidity, without shrinking or spoiling. At 95 percent relative humidity, the fruit can be kept only two months at 5 centigrade (41 F); for evidenced by faded, streaky pulp of flat flavor. They are tolerant of moderate frost, down to about -10 centigrade (14F). The tree can be severely injured by temperatures bellow-11.11 centigrade (12F). The tree adapts well to container culture and will sometimes fruit in a greenhouse. Pomegranates are also longlived.



The vigor of a pomegranate declines after about fifteen years. The pomegranate is self-pollinated as well as cross-pollinated by insects. Cross-pollination increases the fruit set. Wind pollination is insignificant. The pomegranate thrives on calcareous, alkaline soil and on deep, acidic range of soils in between these extremes. The fruit is nearly round, 2-1.2 to 5 inch. Wide fruit is crowned at the base by the prominent calyx. The though, leathery skin or rind is typically yellow overlaid with light or deep pink or rich red. The interior is separated by membranous walls and white, spongy, bitter issue in to compartments packed with sacs filled with sweetly acid, juicy, red, pink or whitish pulp or aril. In each sac there is one angular, soft or hard seed. High temperatures are essential during the fruiting period to get the best flavor. The pomegranate may begin to bear in one year after planting out, but two and half to three years is more common. Under suitable conditions the fruit should mature some five to seven months after bloom .The fruit can not be ripened off the tree even with ethylene treatment. Growers generally consider the fruit ready for harvest if it makes a metallic sound when tapped. The fruit must be picked before over maturity when it tends to crack open if rained upon or under certain conditions of atmosphere humidity, dehydration by winds, or insufficient irrigation. The fruit ships well, cushioned with paper or straw, wooden crates or, for nearby markets, in baskets. Pomegranates are relatively free of most pests and diseases. Minor problems are leaf and fruit spot and foliar damages by whit flies, thrips, mealy bugs and scale insects. The roots are seldom bothered by gophers but deer will browse on the foliage. Pomegranate is said to be a heaven fruit. It has different chemicals, which fights against Emphysema, Cancer and slow downs the cellular aging process. Some of the compositions are anti-oxidants and exist in pomegranate oil. The sweet pomegranate juice reduces chest ache and cough. The sour ones reduce the effect of heart attacks. Pomegranate is full of vitamins C, B, A, E and different kinds of Iron

form and other vital elements a diverse array of tannins- particularly hydrolysable tannins- and the most important anti-oxidants. Pomegranate also includes carbohydrates, acids, and minerals. Extract of pomegranate is also generally recognized as safe (GRAS) by FDA. Pomegranate juice includes sugar, tannin and malic acid. It is up to three times more potent an antioxidant than green tea. It is rich in fiber, potassium and niacin. Pomegranate juice is a powerful antioxidant and may be useful in neutralizing harmful free radicals in the body. Free radicals contribute to many conditions, from aging to cancer. Wild pomegranate seeds are sometimes used as a spice, known as "anardana", which literally means pomegranate (anar) seeds (Dana) in Persia, most notably in Indian and Pakistani cuisine but also as a replacement for pomegranate syrup in Persian and Middle Eastern cuisine. As a result of this, the seeds are separated from the flesh, dried for 10-15 days and used as an acidic agent for chutney and curry production. Many food and dietary supplement makers have found the advantages of using pomegranate extract (which have no sugar, calories or additives), instead of the juice, as healthy ingredients in their products. Many pomegranate extracts are essentially ellagic acid, which may only be observed into the body after consumption of punicalagins. In Iran, pomegranate juice is a very popular beverage. Most, simply, the juice sacs are removed from the fruit and put through a basket press. Otherwise, the fruits are quartered and crushed, or the whole fruit may be pressed and the juice strained out. Hydraulic extraction of juice should be at a pressure of less than 100 psi to avoid undue yield of tannin.



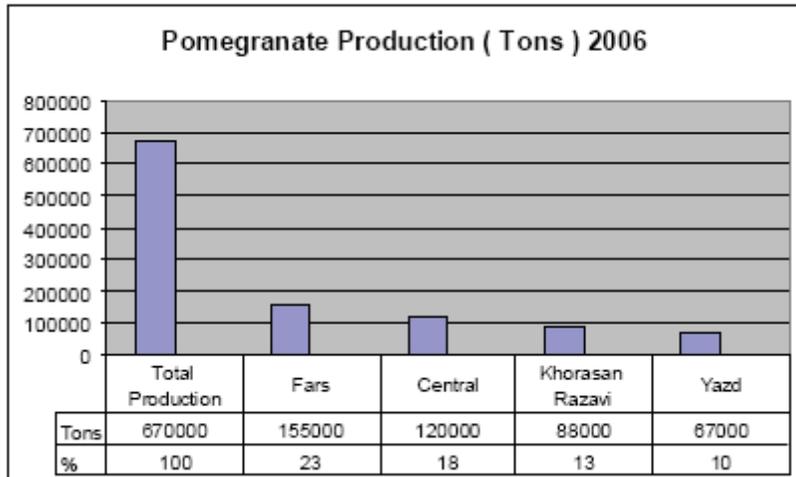
The juice from crushed whole fruit contains excess tannin from the rind (as much as 1.75 percent) and this is precipitated out by a gelation process. After filtering, the juice may be preserved by adding sodium benzoate or it may be pasteurized for 30 minutes, allowed to settle for two days, then strained and bottled. For beverage purposes, it is usually sweetened. The juice sacs may be frozen intact or the extracted juice may be concentrated and frozen. Pomegranate juice is widely made into grenadine for use in mixed drinks. In the Asiatic countries it may be made into thick syrup for use as a sauce. Juice of pomegranate has been found effective in reducing heart disease risk factors and it has been shown to reduce systolic blood

pressure. The juice of wild pomegranate yield citric acid and sodium citrate for pharmaceutical purposes. Pomegranate juice enters into preparations for treating dyspepsia and is considered beneficial in leprosy. The bark of the stem and root contains several alkaloids including isopelleteriene which is active against tapeworms. Either decoction of the bark, which is very bitter or the safer, insoluble Pelletierine Tannate may be employed. Overdoses are emetic and purgative, produce dilation of pupila, dimness of sight, muscular weakness and paralysis. All part of the pomegranate tree have been utilized as source of tannin for curing leather. The trunk bark contains 10 to 25 percent tannin; the root bark has 28 percent tannin content, the leaves 11 percent, and the fruit rind as much as 26 percent. The latter is a by-product of "anardana" industry. Both the rind and the flowers yield dyes for textiles and carpet. Ink can be made by steeping the leaves in vinegar. In Japan, an insecticide is derived from the bark. The pale-yellow wood is very hard and, while available only in small dimensions, is used for walking sticks and in woodcrafts. Because of their tannin content, extracts of the bark, leaves, immature fruits and fruit rind have been given as astringents to halt diarrhea, dysentery hemorrhages. Dried, pulverized flower buds are employed as a remedy for bronchitis. Leaves, seeds, roots and bark have displayed hypotensive, antispasmodic and anthelmintic activity in bioassay. Due to the vast usages of extracted tannin in industry, with establishing the tannin center, can produce this material in the country and also can export it in the future. In the world, production and consumption of pomegranate fruits are increasing. The fact that pomegranate fruit has different industrial usage fields such as fruit juice, conserve, vinegar, citric acid and medicine, lead to its gaining popularity in the world market. Producing the processing product of its fruit such as: pomegranate syrup, juice and extract, increases three times its value added. Iranian pomegranates are among the best in taste with red juicy arils and thin skin. It is natural and gardener produce pomegranate without any chemical fertilizers and pesticides. An important thing about Iranian pomegranate is the high diversity in the variety of this fruit. Iran has lots of variety of pomegranate with different taste. The major producers of pomegranates are Iran, Kazakhstan, Spain and United States. Covering some 60000 hectares of lands and producing around 670000 tons of pomegranates per annum, ***Iran has the first rank in producing and exporting of this fruit in the world.*** Different variety of pomegranate is produced almost in all parts of the country for example in the valleys, hillsides or steps and grown in the form of dry forming in the plains or in the large irrigated orchards. Pomegranates are mainly produced in the provinces of Fars, Central, Yazd, Kerman and Khorasan. The pomegranates produced in these provinces are highly demanded by European countries. However, Fars province, enjoying 13000 hectares of lands under cultivation (21 percent of total pomegranates under cultivation) produces about 155000 tons of pomegranates – 23 percent of Iran's pomegranates production per annum- and ranks the first and largest producer of the commodity in the country

by its foreign customers. The second province in producing pomegranates is Central province with 7500 hectares of lands under cultivation and producing 120000 tons pomegranates per annum. Khorasan Razavi province has 7100 hectares of pomegranate lands and produces 88000 tons each year. This province ranks the third producer in cultivating pomegranate. Yazd province reaches the next position, having 6190 hectares of lands under cultivation per year which its 70 percent goes for internal market and 30 percent is for export. The next province is North Khorasan which has 124 hectares of pomegranate lands and 707 tons production. Recent trends in the exports of the commodity are indicative of the fact that Iran's pomegranate export has steadily increased year by year. According to the figures, over 150000 tons of the products were exported to different European countries and to markets in Russia, Ukraine, Arab countries as well as the central Asian countries. The main countries to which Iran exports its pomegranate are: Britain, France, Spain, South Korea, Russia, Azerbaijan, United Arab Emirates, Netherlands, Armenia, Turkey, Bahrain, Germany, Japan and Ukraine.



Like many other agricultural products, the export of Iran's pomegranate is facing numerous hindrances most important of which are the lack of a decent transportation system, producers and exporters' inadequate knowledge in the field which prevents them from being familiar with the recent scientific and modern methods in packaging, preserving and marketing. In order to increase the level of production should rejuvenate and improve the old pomegranate gardens in some provinces. Also establishment and put in operation the processing pomegranate centers can improve qualitative and quantitative pomegranate production and cause to flourish its exportation



Pomegranate, aril only Nutritional value per 100 g (3.5 oz)	
Energy 70 kcal 290 kJ	
Carbohydrates	17.17 g
Sugars	16.57 g
Dietary fiber	0.6 g
Fat	0.3 g
Protein	0.95 g
Thiamin (Vit. B1)	0.030 mg
Riboflavin (Vit. B2)	0.063 mg
Niacin (Vit. B3)	0.300 mg
Pantothenic acid(B5)	0.596 mg
Vitamin B6	0.105 mg
Folate (Vit. B9)	6 µg
Vitamin C	6.1 mg
Calcium	3 mg
Iron	0.30 mg
Magnesium	3 mg
Phosphorus	8 mg
Potassium	259 mg
Zinc	0.12 mg
Source: USDA Nutrient database	