

NUTRITIONAL VALUES OF CITRUS FRUITS: DIFFERENTIATIONS TO ATTRACT MASS AND NICHE MARKETS WORLDWIDE

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ABSTRACT

Worldwide one of the most demanded, studied and consumed fruit is 'citrus'. Concurrently its production has been increasing considerably for the last few years. Besides delicious taste, citrus fruits contain numerous vitamins, minerals and other useful elements. Citrus has always been considered a good source of Vitamin-C. In addition, the unique composition of vitamins, minerals, fibers and other compounds in citrus fruits help people avoiding some chronic diseases.

Key-words: Citrus fruits, *Citrus reticulata*, nutritional status

INTRODUCTION

The term fruit is generally applied to that part of the plant which develops from flowers and has seeds. The chief appeal of many of the fruits is that they taste sweet, yet are relatively low in calories. All fruits are usually the main source of Vitamin C, B, I, A and G. They also contain sufficient quantity of minerals like Calcium, Phosphorus and Iron. (Aslam, 1998) The term citrus may be referred to a family of trees that are grown in warm region, have edible fruit, thick rind and pulpy flesh. High juice contents, nutritional values and distinct taste have made citrus fruits unique among all the other fruits. Citrus fruits can be defined as: A fruit covered by soft thick, loose peel, comprising several segments, full of juice and pulp. The flesh of citrus fruits is pulpy which contains many small glands full of fragrant oil and covered by thick rind. All citrus trees are evergreen with glossy green leaves and bear white and pink flowers. Citrus trees grow well in hot, semi- dry climate. Citrus fruits family includes Orange, Mandarin, Tangerine, Grapefruit, Pumelos, Tangelos, Citron Kumquat, Lime and Lemon. Brazil and USA are the two giants in production of citrus fruits worldwide. The Sao Paulo state of Brazil is the center of citrus production and processing, whilst Florida has the greatest number of citrus trees and produces more sweet oranges than any other US states. China, Mexico, Spain and Italy are also leading citrus producing countries. Pakistan is usually ranked tenth in the production of citrus fruits and the leader in kinno mandarin throughout the world. Citrus is the leading fruit of Pakistan in terms of area, production and export, contributing around 50% of the total fruit production and about 25% of the country's fruit export (Anon., 2003-04).

Nutritional values of citrus fruits

Besides appealing look and delicious taste, citrus fruits also contain substantial quantity of useful vitamins, minerals, fibers and other chemical compounds (Table 1). Citrus fruits are generally characterized as cholesterol, fat and sodium free fruits with comparatively high proportion of fiber and Vitamin C. Nutritionists, all over the world are generally of the view that a diet including a variety of fruits and vegetables, especially citrus fruits and juices, may be the best way for people to consume enough Vitamin C. " Diets low in fat and rich in fruit and vegetable, containing Vitamin C and A may reduce the risk of some types of cancer. People need to consume Vitamin C each day to replenish their body's supply of water-soluble nutrients (Tillotson, 1996). It is also usually believed that taking Vitamin C from fresh fruits is better than that of supplements because in this way other minerals present in citrus fruits can also be obtained

In addition to the basic significance of Vitamin C like repairing body tissue, maintaining healthy gums etc., there is a growing body of medical researchers that supports health benefits of anti-oxidants such as Vitamin C, foliate, dietary fiber (including soluble fiber) and other vitamins and minerals found in citrus fruits. Some of the important applications of the compounds present in citrus fruits are summarized below:

Citrus fruits contain several photochemical and nutraceuticals, including vitamin-C that have antioxidant properties and reportedly reduce the risk of cardio vascular diseases and some forms of cancers. The Food and Drug Administration (FDA) USA has concluded that low fat diets, high in fresh fruits and vegetables containing fibers may reduce the risk of heart diseases. Researchers at the National Cancer Institute and The American Cancer Society have maintained that low fat diet, high in Vitamin-C food may help reduce the risk of some types of cancers (Anon., 2001).

Table 1. Nutritional value of citrus fruits (100 g serving).

Nutrients	Units	Orange	Grapefruit	Lemon	Lime
Energy	(calories)	50	44	44	53
Vitamin C	(mg)	49	40	45	27
Vitamin A	(IU)	190	80	20	---
Calcium	(mg)	33	17	14	14
Phosphorus	(mg)	23	18	10	10
Water	(g)	87.2	88.8	89.3	86.0
Protein	(g)	0.9	0.5	0.9	0.8
Fat	(g)	0.2	0.2	0.6	0.1
Iron	(mg)	0.4	0.3	0.1	0.1
Copper	(mg)	0.3	0.03	0.1	---
Vitamin B-1	(mg)	0.08	0.04	0.04	0.04
Vitamin B-4	(mg)	0.03	0.02	---	---
Citric Acid	(%)	1.42	1.28	7.07	---
Fiber	(g)	0.3	0.3	0.9	---
Carbohydrates	(g)	11.20	10.10	8.70	12.30
Nicotinic Acid	(mg)	0.20	0.20	0.10	0.10

Source : Citrus fruits, Agriculture Information Center, Agriculture Bureau, Government of Pakistan, 1995 p.62

Another feature of citrus fruits is that it boosts absorption of non-heme iron (iron found in plants, not in meat). Drinking a glass of citrus juice before having spinach, salad etc. the body absorbs two to four times as much iron. It is especially good for young women, female athletes and vegetarians (Anon., 2002). Citrus fruits provide adequate quantity of Folic - acid and vitamin-B, which may reduce the risk of certain birth defects. The US Food and Drug Administration maintained that women of child bearing age can drastically reduce the risk of birth defects by consuming plenty of fruits and vegetables to maintain adequate level of foliate - the most frequently use diet source of foliate is orange juice.

Table 2. Comparison of nutritional values of citrus fruits and juices with other beverages.

Popular Beverages (8 fl oz or 237 ml)	Calories (K Cal)	Vitamin C (mg)	Potassium (mg)
Fresh squeezed Kino/Orange juice	45***	76**	260 P
Fresh squeezed grapefruit juice*	90	82	250
Kino or Orange juice from concentrate	60 P	75	250
Grapefruit juice from concentrate*	100	80	260
Apple juice*	116	02	296
Cola*	107	0	0
Top sports drink*	56	0	24
Coffee*	08	0	165
Tea♣	48	0	300

* A guide to 100% pure Florida grapefruit juice, Florida Department of Citrus.

** Kinno prime product of Pakistan, Cargo News, 1991.

*** Citrus fruits, Department of Agriculture, Govt. of Punjab. P.62.

♣ Dawn, Advertisement Supplement, May 1 2002

Furthermore taking citrus fruits and juices diminish the risk of stroke by nearly a third. Frequent use of citrus may also help prevent kidney stone, a painful and unpredictable disease.

- A comparative study of citrus fruits and juices with other popular beverages reveals that citrus fruits and juices possess a good nutritious combination of vitamins, potassium and calories (Table 2). Considering the importance of Vitamin C, it can be safely said that no other beverage is as nutritious and refreshing as citrus. In other words citrus fruits and juices not only give refreshment but also supplement diet requirements of vitamins, potassium and calcium.
- In addition to Vitamin C, citrus fruits and juices also contain substantial quantity of Vitamin A, Calcium, Phosphorus and water. Nutritionists believe that the proportion of different vitamins, minerals and water present in citrus fruits is almost ideal and not present in any other fruit or juice. The daily diet of average Pakistani lacks vitamins and minerals. Adequate use of citrus fruit can compensate such deficiencies and prevent from many dental diseases (Hussain and Saeed, 1998). Taking 200 to 250 gm serving of citrus fruits or juices may fulfill the daily requirements of many important vitamins and minerals.

CONCLUSION

Citrus fruits, because of their unique characteristics, should be given more importance in our daily diet. Use of citrus juice instead of tea, cola and other soft drinks would generate long lasting benefits. Consistently using adequate quantity of citrus not only fulfill body requirements of many vitamins and minerals but also considerably reduces risk of many common and chronic diseases.

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