

# Benefits and Uses of Pineapple

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## Functional benefits

Pineapple (*Ananus comosus*, Bromeliaceae) is a wonderful tropical fruit having exceptional juiciness, vibrant tropical flavour and immense health benefits. Pineapple contains considerable calcium, potassium, fibre, and vitamin C. It is low in fat and cholesterol. Vitamin C is the body's primary water soluble antioxidant, against free radicals that attack and damage normal cells. It is also a good source of vitamin B1, vitamin B6, copper and dietary fibre. Pineapple is a digestive aid and a natural Anti-Inflammatory fruit. A group of sulfur-containing proteolytic (protein digesting) enzymes (bromelain) in pineapple aid digestion. Fresh pineapples are rich in bromelain used for tenderizing meat. Bromelain has demonstrated significant anti-inflammatory effects, reducing swelling in inflammatory conditions such as acute sinusitis, sore throat, arthritis and gout and speeding recovery from injuries and surgery. Pineapple enzymes have been used with success to treat rheumatoid arthritis and to speed tissue repair as a result of injuries, diabetic ulcers and general surgery. Pineapple reduces blood clotting and helps remove plaque from arterial walls. Studies suggest that pineapple enzymes may improve circulation in those with narrowed arteries, such as angina sufferers. Pineapples are used to help cure bronchitis and throat infections. It is efficient in the treatment of arteriosclerosis and anaemia. Pineapple is an excellent cerebral toner; it combats loss of memory, sadness and melancholy. Pineapple fruits are primarily used in three segments, namely, fresh fruit, canning and juice concentrate with characteristic requirements of size, shape, colour, aroma and flavour.

## Potential Anti-Inflammatory and Digestive Benefits

Bromelain is a complex mixture of substances that can be extracted from the stem and core fruit of the pineapple. Among dozens of components known to exist in this crude extract, the best studied components are a group of protein-digesting enzymes (called cysteine proteinases). Originally, researchers believed that these enzymes provided the key health benefits found in bromelain, a popular dietary supplement containing these pineapple extracts. In addition, researchers believed that these benefits were primarily limited to help with digestion in the intestinal tract. However, further studies have shown that bromelain has a wide variety of health benefits, and that many of these benefits may not be related to the different enzymes found in this extract. Excessive inflammation, excessive coagulation of the blood, and certain types of tumor growth may all be reduced by therapeutic doses of bromelain when taken as a dietary supplement. Studies are not available, however, to show these same potential benefits in relationship to normal intake of pineapple within a normal meal plan.

Bromelain extracts can be obtained from both the fruit core and stems of pineapple. Potentially important chemical differences appear to exist between extracts obtained from the stem versus the fruit core. However, the practical relevance of these differences is not presently understood. Most of the laboratory research on bromelain has been conducted using stem-based extracts, however.



Although healthcare practitioners have reported improved digestion in their patients with an increase in pineapple as their "fruit of choice" within a meal plan, there are no published studies that document specific changes in digestion following consumption of the fruit (versus supplementation with the purified extract. However, it is suspected that the fruit core will eventually turn out to show some unique health-supportive properties, including possible digestion-related and anti-inflammatory benefits.

### **Antioxidant Protection and Immune Support**

Vitamin C is the body's primary water-soluble antioxidant, defending all aqueous areas of the body against free radicals that attack and damage normal cells. Free radicals have been shown to promote the artery plaque build-up of atherosclerosis and diabetic heart disease, cause the airway spasm that leads to asthma attacks, damage the cells of the colon so they become colon cancer cells, and contribute to the joint pain and disability seen in osteoarthritis and rheumatoid arthritis. This would explain why diets rich in vitamin C have been shown to be useful for preventing or reducing the severity of all of these conditions. In addition, vitamin C is vital for the proper function of the immune system, making it a nutrient to turn to for the prevention of recurrent ear infections, colds, and flu.

### **Manganese and Thiamin for Energy Production and Antioxidant Defenses**

Pineapple is an excellent source of the trace mineral manganese, which is an essential cofactor in a number of enzymes important in energy production and antioxidant defenses. For example, the key oxidative enzyme superoxide dismutase, which disarms free radicals produced within the mitochondria (the energy production factories within our cells), requires manganese. Just one cup of fresh pineapple supplies 128.0% of the DV for this very important trace mineral. In addition to manganese, pineapple is a good source of thiamin (Vitamin B1) that acts as a cofactor in enzymatic reactions central to energy production.

### **Protection against Macular Degeneration**

Fruits are more important than carrots for eye sight. Data reported in a study published in the *Archives of Ophthalmology* indicates that eating 3 or more servings of fruit per day may lower the risk of age-related macular degeneration (ARMD), the primary cause of vision loss in older adults, by 36%, compared to persons who consume less than 1.5 servings of fruit daily.

In this study, which involved over 110,000 women and men, researchers evaluated the effect of study participants' consumption of fruits; vegetables; the antioxidant vitamins A, C, and E; and carotenoids on the development of early ARMD or neovascular ARMD, a more severe form of the illness associated with vision loss. While, surprisingly, intakes of vegetables, antioxidant vitamins and carotenoids were not strongly related to incidence of either form of ARMD, fruit intake was definitely protective against the severe form of this vision-destroying disease. Three servings of fruit may sound like a lot to eat each day, but pineapple can help you reach this goal. Add fresh pineapple to your morning smoothie, lunch time yogurt, any fruit and most vegetable salads. For example, try adding chunks of pineapple to your next coleslaw or carrot salad.



## Nutritional Value

Given here is the value of different nutrients in 100 grams of pineapple.

Calcium - 16 mg  
 Energy- 52 Calories  
 Carbohydrates - 13.7 gm  
 Dietary Fibre - 1.4 gm  
 Iron - 0.28 mg  
 Magnesium - 12 mg  
 Protein - 0.54 g  
 Phosphorus - 11 mg  
 Potassium - 150 mg  
 Vitamin A - 130 I.U  
 Vitamin B1 - 0.079 mg  
 Vitamin B2 - 0.031 mg  
 Vitamin B3 - 0.489 mg  
 Vitamin B6 - 0.110 mg  
 Vitamin C - 24 mg  
 Zinc - 0.10 mg

## Nutritional and Health Benefits

One of the juiciest fruits that is absolutely a delight to eat is the pineapple. It can be taken with whipped cream, custard or just like that. Pineapple juice is equally yummy and refreshing and is one of the favorite drinks of many people during hot weather. The best part about pineapples is that it is loaded with nutrients and beneficial enzymes, which ensures that you not only have a healthy body but also a glowing complexion.

Pineapple is known to be very effective in curing constipation and irregular bowel movement. This is because it is rich in fibre, which makes bowel movements regular and easy.

For any kind of morning sickness, motion sickness or nausea, drink pineapple juice. It works effectively in getting rid of nausea and vomiting sensation.

It has virtually no fat and cholesterol and is loaded with essential nutrients and vitamins that are needed by the body for overall growth and development.

Juice from fresh pineapple can be used to relieve bronchitis, diphtheria and chest congestion. Not only does it have enough amounts of Vitamin C, but it also contains an enzyme called Bromelain, which is known to dissolve and loosen up mucus.

Pineapple is effective in getting rid of intestinal worms and also keeps the intestines and kidneys clean. It is effective in flushing out the toxins from the body, thus making the metabolism healthy.

Pineapples are very rich in manganese and even a single cup of pineapple is supposed to contain a good amount of it. This mineral is required for the growth of healthy bones and tissues.



High content in Vitamin C ensures that oral health remains in top condition always. It helps prevent gum disease and also prevents the formation of plaque, thus keeping the teeth healthy.

## Food Uses

In Puerto Rico and elsewhere in the Caribbean, Spaniards found the people soaking pineapple slices in salted water before eating, a practice seldom heard of today.

Field ripe fruits are best for eating fresh, and it is only necessary to remove the crown, rind, eyes and core. In Panama, very small pineapples are cut from the plant with a few inches of stem to serve as a handle, the rind is removed except at the base, and the flesh is eaten out-of-hand like corn on the cob. The flesh of larger fruits is cut up in various ways and eaten fresh, as dessert, in salads, compotes and otherwise, or cooked in pies, cakes, puddings, or as a garnish on ham, or made into sauces or preserves. Malaysians utilize the pineapple in curries and various meat dishes. In the Philippines, the fermented pulp is made into a popular sweetmeat called *nata de pina*. The pineapple does not lend itself well to freezing, as it tends to develop off flavours.

Canned pineapple is consumed throughout the world. The highest grade is the skinned, cored fruit sliced crosswise and packed in syrup. Undersize or overripe fruits are cut into "spears", chunks or cubes. Surplus pineapple juice used to be discarded after extraction of bromelain (q.v.). Today there is a growing demand for it as a beverage. Crushed pineapple, juice, nectar, concentrate, marmalade and other preserves are commercially prepared from the flesh remaining attached to the skin after the cutting and trimming of the central cylinder. All residual parts cores, skin and fruit ends are crushed and given a first pressing for juice to be canned as such or prepared as syrup used to fill the cans of fruit, or is utilized in confectionery and beverages, or converted into powdered pineapple extract which has various roles in the food industry. Chlorophyll from the skin and ends imparts a greenish hue that must be eliminated and the juice must be used within 20 hours as it deteriorates quickly. A second pressing yields "skin juice" which can be made into vinegar or mixed with molasses for fermentation and distillation of alcohol.

In Africa, young, tender shoots are eaten in salads. The terminal bud or "cabbage" and the inflorescences are eaten raw or cooked. Young shoots, called "*hijos de pina*" are sold on vegetable markets in Guatemala.

### Food Value Per 100 g of Edible Portion\*

Moisture	81.3-91.2 g
Ether Extract	0.03 0.29 g
Crude Fibre	0.3-0.6 g
Nitrogen	0.038-0.098 g
Ash	0.21-0.49 g
Calcium	6.2 37.2 mg
Phosphorus	6.6-11.9 mg
Iron	0.27-1.05 mg



Carotene	0.003-0.055 mg
Thiamine	0.048-0.138 mg
Riboflavin	0.011-0.04 mg
Niacin	0.13-0.267 mg
Ascorbic Acid	27.0-165.2 mg

\*Analyses of ripe pineapple made in Central America.

Sugar/acid ratio and ascorbic acid content vary considerably with the cultivar. The sugar content may change from 4% to 15% during the final 2 weeks before full ripening.

## Toxicity

When unripe, the pineapple is not only inedible but poisonous, irritating the throat and acting as a drastic purgative.

Excessive consumption of pineapple cores has caused the formation of fibre balls (bezoars) in the digestive tract.

## Other Uses

### Bromelain

The proteolytic enzyme, bromelain, or bromelin, was formerly derived from pineapple juice; now it is gained from the mature plant stems salvaged when fields are being cleared. The yield of bromelain from stem juice is 2.15%. The enzyme is used like papain from papaya for tenderizing meat and chill proofing beer; is added to gelatin to increase its solubility for drinking; has been used for stabilizing latex paints and in the leather-tanning process. In modern therapy, it is employed as a digestive and for its anti-inflammatory action after surgery, and to reduce swellings in cases of physical injuries; also in the treatment of various other complaints.

### Fibre

Pineapple leaves yield a strong, white, silky fibre which was extracted by Filipinos before 1591. Certain cultivars are grown especially for fibre production and their young fruits are removed to give the plant maximum vitality. The 'Perolera' is an ideal cultivar for fibre extraction because its leaves are long, wide and rigid. Chinese people in Kwantung Province and on the island of Hainan weave the fibre into coarse textiles resembling grass cloth. It was long ago used for thread in Malacca and Borneo. In India, the thread is prized by shoemakers and it was formerly used in the Celebes. In West Africa, it has been used for stringing jewels and also made into capes and caps worn by tribal chiefs. The people of Guam hand-twist the fibre for making fine casting nets. They also employ the fibre for wrapping or sewing cigars. Pina cloth made on the island of Panay in the Philippines and in Taiwan is highly esteemed. In Taiwan, they also make a coarse cloth for farmers' underwear.



The outer, long leaves are preferred for fibre. In the manual process, they are first decorticated by beating and rasping and stripping, and then left to ret in water to which chemicals may be added to accelerate the activity of the microorganisms which digest the unwanted tissue and separate the fibres. Retting time has been reduced from 5 days to 26 hours. The retted material is washed clean, dried in the sun and combed. In mechanical processing, the same machine can be used that extracts the fibre from sisal. Estimating 22 leaves/kg, 22,000 leaves would constitute one tonne and would yield 22-27 kg of fibre.

### **Juice**

Pineapple juice has been employed for cleaning machete and knife blades and, with sand, for scrubbing boat decks.

### **Animal Feed**

Pineapple crowns are sometimes fed to horses if not needed for planting. Final pineapple waste from the processing factories may be dehydrated as "bran" and fed to cattle, pigs and chickens. "Bran" is also made from the stumps after bromelain extraction. Expendable plants from old fields can be processed as silage for maintaining cattle when other feed is scarce. The silage is low in protein and high in fibre and is best mixed with urea, molasses and water to improve its nutritional value.

In 1982, public concern in Hawaii was aroused by the detection of heptachlor (a carcinogen) in the milk from cows fed "green chop" leaves from pineapple plants that had been sprayed with the chemical to control the ants that distribute mealy bugs. There is supposed to be a one year lapse to allow the heptachlor to become more dilute before sprayed plants are utilized for feed.

### **Folk Medicine**

Pineapple juice is taken as a diuretic and to expedite labour, also as a gargle in cases of sore throat and as an antidote for sea sickness. The flesh of very young (toxic) fruits is deliberately ingested to achieve abortion (a little with honey on 3 successive mornings); also to expel intestinal worms; and as a drastic treatment for venereal diseases. In Africa the dried, powdered root is a remedy for edema. The crushed rind is applied on fractures and the rind decoction with rosemary is applied on hemorrhoids. Indians in Panama use the leaf juice as a purgative, emmenagogue and vermifuge.

### **Ornamental Value**

The pineapple fruit with crown intact is often used as a decoration and there are variegated forms of the plant universally grown for their showiness indoors or out. Since 1963, thousands of potted, ethylene treated pineapple plants with fruits have been shipped annually from southern Florida to northern cities as indoor ornamentals.

