

Medicinal properties in Apple

"Functional foods," "nutraceuticals," "designer foods" and "medicinal foods" are terms that describe foods, and key ingredients isolated from foods, that have non-nutritive or tertiary functional properties. Researchers, healthcare practitioners, laypersons, and the popular media use these words interchangeably. The purpose of this article is to detail valid scientific information available on the lung-protective properties of apples.

Apple trees are cultivated throughout the Northern Hemisphere, occasionally growing wild. The saying, "**an apple a day keeps the doctor away,**" has some basis in fact, as apple pectin holds preventive activity in cancer and cardiovascular disease. Preliminary evidence suggests a positive relationship between lung function and consumption of five or more apples per week (Butland, et al., 2000). An inverse association may exist between lung cancer risk and foods containing quercetin, found in high concentrations in apples (Le Marchand, et al., 2000).

Apple pectin is the soluble fiber fraction of the apple fruit. Pectin comes in liquid or dried form and the source is the solid fruit residue with 10-20% pectin in the dried mass (Fleming, 2000). The pectin is extracted from the dried residue at pH 1.5-3 and at temperatures ranging from 60-100[degrees]C.

Known Medicinal Constituents

The most well-recognized and evaluated medicinal constituents found in apples include:

- ❖ Quercetin and other flavonoids
- ❖ Pectins
- ❖ Tannins
- ❖ Vitamins, especially ascorbic acid (3-30 mg/100 g)
- ❖ Fruit acids, chiefly malic acid

Role of Apple in Ranger Syrup



Indications for Use

Apples and apple pectin are indicated for use in the following health challenges:

- ❖ Impaired lung function
- ❖ Lung cancer
- ❖ Colon cancer
- ❖ Diarrhea and constipation
- ❖ Toxic accumulation and toxicity syndromes

Mechanisms of Action

It is unknown by what mechanism apples may affect lung function or lower the risk of lung cancer. It has been proposed that the antioxidant flavonoid quercetin may play a major role (Le Marchand, et al., 2000; Butland, et al., 2000). Pectins and pectin-like rhamnogalacturonans found in apples have pronounced antimutagenic effects against 1-nitropyrene induced mutagenicity in vitro (Hensel, A. and Meier, K., 1999). In vitro, pectin polysaccharides most likely interact directly with cells (*Salmonella typhimurium*) to sterically protect them from mutagenic attack.

As well, apple pectin decreases the incidence and number of dimethylhydrazine- and azoxymethane-induced colon tumors in rats (Ohkami, H. et al., 1995; Tazawn, K. et al., 1997; Tazawa, K. et al. 1999). It is also believed that pectin lowers [beta]-glucuronidase activity, a key enzymatic step in carcinogen activation and tumor initiation in the colon.

In the intestine, apple pectin is a bulk-forming agent similar to psyllium and prevents diarrhea and constipation by a similar mechanism. Pectin also may modify intestinal bacterial enzyme activity in favor of a reduction of toxic breakdown products in the gut (Mallett, A. K. et al., 1987). This may contribute to a chemoprotective effect in colon carcinogenesis.

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Research

Apples in lung function and lung cancer

Researchers (Le Marchand, et al., 2000) found a statistically significant inverse relationship between lung cancer risk and food sources high in the isoflavone quercetin (onions and apples) after controlling for smoking and intakes of saturated fat and [beta]-carotene in a population-based, case-controlled study conducted in Hawaii (Table 1).

A long-term cross-sectional analysis of a cohort of 2512 Welshmen aged 45-59 living in Caerphilly, Wales between 1979 and 1983 found that lung function was linearly associated with dietary apple intake (Table 2) (Butland, et al., 2000).

This study additionally found that the age-related decline in lung function over five years in these men was offset by consuming five or more apples per week during the study period (Butland, et al., 2000).

These clinical results coupled with the results of earlier trials strongly suggest that apples:

- ❖ Protect against cancer, primarily lung cancer
- ❖ Improve lung function

Contraindications

- ❖ None known

Side Effects

- ❖ No adverse reactions are known to occur with consumption of apple fruit or isolated pectin. However, apple seeds contain potentially toxic levels of hydrogen cyanide that, if used incorrectly, can be dangerous.

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Possible Interactions with Drugs

- ❖ None known

Possible Interactions with Herbs and other Dietary Supplements

- ❖ Insufficient reliable information available

Possible Interactions with Diseases or Conditions:

- ❖ None known

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Nutritional Value of Apple

The apple is a highly nutritive food. It contains minerals and vitamins in abundance. The food value of the apple is chiefly constituted by its contents of sugar, which ranges from 9 to 51 per cent. Of this, fruit sugar constitutes 60 per cent and glucose 25 per cent and cane sugar only 15 per cent.

Food Value		Minerals and Vitamins	
Moisture	84.6%	Calcium	10 mg
Protein	0.2%	Phosphorus	14 mg
Fat	0.5%	Iron	1 mg
Minerals	0.3%	Vitamin A	40 IU**
Fibre	1.0%	Small amounts of Vitamin E, and B Complex	
Carbohydrates	13.4%		
	100%	Calorific Value - 59	
*Values per 100 gms edible portion		**International Unit	

The skin of apple should not be discarded when taking it in raw form as the skin and the flesh just below it contain more vitamin C than the inner flesh. The vitamin content decreases gradually towards the center of the fruit. The skin also contains five times more vitamin A than the flesh.

- ❖ Apple contains Pectin and Malic acid.
- ❖ Iron contained in the apple helps in formation of blood.

Role of Apple in Ranger Syrup



- ❖ Raw apples are good for constipation.
- ❖ Cooked or baked apples are good for diarrhea.

Apples have been found useful in acute and chronic dysentery among children. Ripe and sweet apples should be crushed into pulp and given to the child several times a day.

Apples are of special value to heart patients. They are rich in potassium and phosphorus but low in sodium. It is also useful for patients of high blood pressure.

Apple is also said to be beneficial to gout patients caused by increase of uric acid in blood.

Apples, boiled to a jelly, make a very good liniment for rheumatic pains. They should be rubbed freely on the affected area.

Sweet apples are valuable in dry hacking cough.

Apples are useful in kidney stones.

The apple peel water is an excellent medicine for the inflamed eyes as eyewash. The over-ripe apples are useful as a poultice for sore eyes. The pulp is applied over the closed eyes.

Tooth-decay can be prevented by regular consumption of apples, as they possess a mouth cleansing property.

The apple is the best fruit to tone up a weak and run-down patient. It removes deficiencies of vital organs and makes the body stout and strong. It tones up the body and the brain as it contains more phosphorus and iron than any other fruit or vegetable. Its regular consumption with milk promotes health and youthfulness and helps build healthy and bright skin.

Apple...

- ❖ A member of the rose family, the apple has a compartmented core and is classified as a pome fruit.

Nutritional Value

- ❖ The apple may not be the nutritional standout of the fruit bowl, but if an apple is eaten, it will provide you with respectable amounts of soluble and insoluble fiber, some vitamin C and beta-carotene (if you eat the peel), and potassium and boron.
- ❖ The fruit is fibrous, juicy and nonsticky, making it a good tooth –cleaner and a gum stimulator.
- ❖ Apples contain pectin and are an alkaline food.

Health Benefits

- ❖ Can reduce blood cholesterol levels, especially “bad” LDL type cholesterol. Pectin, a soluble fibre in apples, is thought to play a key part in this.
- ❖ Counters constipation and diarrhoea. The specific combination of fibre types and fruit acid in apples is probably responsible for their well-known ability to prevent and treat constipation. The liquid- gelling pectin and the natural antiviral properties in apples explain their traditional use for diarrhoea.
- ❖ Traditionally used for arthritis, rheumatism and gout. The apple’s benefits for digestion and the disposal of unwanted substances from the body support its reputation for helping joint problems. This may be due to a combination of actions: fruit acids that improve digestion, the antioxidant effect of the flavonoid quercetin and pectin’s ability to increase elimination.
- ❖ May improve defences against illness.