Medicinal Properties in Whole Foods

by Gina L. Nick, PhD, ND
Chief Scientific Officer at Longevity Through Prevention, Inc.¹
Phone: 866-587-4622 x702 • Fax: 866-587-4622 • E-mail: drgina@LTponline.com
P.O. Box 6936 • Laguna Niguel, California 92677 USA
www.LTponline.com

“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 physiologic actions of known constituents and combinations of constituents, as they naturally occur in apples, highlighting their medicinal and nutritive mechanisms of action in preventing lung cancer and optimizing lung capacity.

Whole Foods Bestow Lung Cancer Protection and Improve Lung Function

Apples contain well-recognized medicinal and nutritive constituents that offer profound benefit in protecting the health of, and optimizing lung function. These constituents include the antioxidants quercetin and vitamin C, along with other flavonoids and vitamins, pectins, tannins and fruit acids like malic acid.

Researchers are not entirely clear on why apples offer a scientifically documented benefit in protecting lung health and improving lung function, particularly in those individuals suffering from lung cancer and asthma. Most postulate that antioxidant protection may be a key mechanism of action. It has been proposed that the antioxidant flavonoid quercetin may play a major role.¹² Additionally, pectins and pectin-like rhamnogalacturonans found in apples have pronounced mutagenic effects in vitro.³ 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.⁴⁶ It is also believed that pectin lowers β-glucuronidase activity, a key enzymatic step in carcinogen activation and tumor initiation.

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.⁷ This may contribute to an overall chemoprotective effect in lung carcinogenesis.

Research on Apples and Lung Cancer

Researchers¹ have documented a statistically significant inverse relationship between lung cancer risk and food sources high in the flavonoid quercetin (onions and apples) after controlling for smoking and intake of saturated fat and β-carotene in a population-based, case-controlled study conducted in Hawaii (Table 1). This research, published in the Journal of the National Cancer Institute, found that increased intake of foods containing flavonoids, like those found in apples, have the potential to cut the risk of lung cancer in half.

This is the second study to link apple consumption to reduced risk of lung cancer. While it is well established that consumption of fruits and vegetables is linked to a reduced risk of lung cancer, this study, which builds on the results of an earlier study⁸ published in the American Journal of Epidemiology, shows that the cancer protective effect largely stems from the flavonoid quercetin found in apples.

In 1997, researchers⁹ reported on a 25-year study of 10,000 Finnish men that found that intake of antioxidant flavonoids, and in particular the consumption of the flavonoid quercetin (which

Table 1. Odds ratio for lung cancer in the highest vs. the lowest quartiles for apple intake in a Hawaiian population. An odds ratio of 1.0 indicates no difference (Q1). Parentheses indicate 95% CI. Other foods high in isoflavones are shown for comparison. Of these, only apples and onions are high in quercetin. Adapted from Le Marchand et al.¹

<table>
<thead>
<tr>
<th></th>
<th>Q1 (lowest)</th>
<th>Q2</th>
<th>Q3</th>
<th>Q4 (highest)</th>
<th>Two-sided P for trend</th>
</tr>
</thead>
<tbody>
<tr>
<td>Apple</td>
<td>1.0</td>
<td>0.9 (0.6-1.4)</td>
<td>1.0 (0.6-1.6)</td>
<td>0.6 (0.4-1.0)</td>
<td>0.03</td>
</tr>
<tr>
<td>Onion</td>
<td>1.0</td>
<td>1.4 (0.9-2.3)</td>
<td>0.9 (0.5-1.4)</td>
<td>0.5 (0.3-0.9)</td>
<td>0.001</td>
</tr>
<tr>
<td>Red wine</td>
<td>1.0</td>
<td>0.8 (0.4-1.8)</td>
<td>0.7 (0.4-1.2)</td>
<td>——</td>
<td>0.20</td>
</tr>
<tr>
<td>Soy products</td>
<td>1.0</td>
<td>1.6 (1.0-2.7)</td>
<td>1.2 (0.7-2.2)</td>
<td>1.0 (0.5-1.8)</td>
<td>0.28</td>
</tr>
</tbody>
</table>

Table 2. Cross-sectional analysis: Differences in forced expiratory volume in one second (FEV1) in mL associated with increases in the frequency of apple intake from baseline. Adapted from Butland et al.²

<table>
<thead>
<tr>
<th>Frequency of apple consumption</th>
<th>N</th>
<th>(1) Adjusted for age, height, and smoking</th>
<th>(2) Adjusted for body mass index, smoking</th>
<th>(3) Adjusted for social class, work exercise, and leisure exercise</th>
<th>(4) Adjusted for total energy intake</th>
</tr>
</thead>
<tbody>
<tr>
<td>None</td>
<td>645</td>
<td>0 (baseline)</td>
<td>0 (baseline)</td>
<td>0 (baseline)</td>
<td>0 (baseline)</td>
</tr>
<tr>
<td>1</td>
<td>270</td>
<td>97.1 (32.2-191.0)</td>
<td>75.7 (-15.7-167.1)</td>
<td>49.3 (-40.9-189.6)</td>
<td>44.5</td>
</tr>
<tr>
<td>2-4</td>
<td>753</td>
<td>159.9 (99.2-229.5)</td>
<td>102.9 (34.6-171.1)</td>
<td>84.7 (17.2-152.1)</td>
<td>88.0</td>
</tr>
<tr>
<td>&gt;5</td>
<td>433</td>
<td>291.8 (211.2-372.4)</td>
<td>185.7 (104.9-266.5)</td>
<td>146.6 (66.5-226.8)</td>
<td>138.1</td>
</tr>
<tr>
<td>Test for trend</td>
<td></td>
<td>p&lt;0.001</td>
<td>P&lt;0.01</td>
<td>P&lt;0.001</td>
<td>P&lt;0.001</td>
</tr>
</tbody>
</table>

142 TOWNESEND LETTER for DOCTORS & PATIENTS – JUNE 2004
provided 95% of the total flavonoid intake in the population studied), reduced the incidence of lung cancer. After adjusting for other fruits and vegetables in the diet, researchers noted an inverse association between consumption of apples and lung cancer risk. In fact, the likelihood of lung cancer among those who ate the most apples fell by 58% relative to those who ate fewer apples.

**Research on Apples and Overall Lung Function**

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).

The researchers found that good lung function was associated with high intakes of vitamins C, E, and beta-carotene, citrus fruits, apples, and fruit juices. However, after they took into consideration factors such as body mass, smoking history, and exercise, the only food that seemed to make a significant difference was apples.

In fact, eating five or more apples a week was linked to slightly better lung function. The lung capacity in those individuals who ate apples was 138 millilitres higher, as compared to those who did not eat apples. 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.

Researchers from the University of Nottingham in the United Kingdom reported similar findings. A nine-year population study of 2,633 adults found that apple eaters have better lung function and lower risk of respiratory disease such as asthma than non-apple eaters.

**Research on Apples and Asthma**

Apples also appear to play a significant role, along with pears, in offering protection against asthma. A recent cross-sectional study designed to evaluate the relationship between diet and asthma found that among the wide variety of fruits and vegetables studied, apples and pears provided superior protection against asthma. The study, conducted in Australia, involved 1,607 young adults aged 20-44 and the results were published in the American Journal of Clinical Nutrition.

An earlier study, completed in 2001, demonstrated similar findings. This was a population-based case-control study of 1,471 adults in the United Kingdom, conducted by researchers from London's King's College and the University of Southampton. The study examined the effects of dietary antioxidants on asthma risk and severity. The researchers discovered that people eating at least two apples per week resulted in a 22-32% decreased risk of developing asthma as compared to those that ate less than that. The medicinal properties inherent in apples also demonstrate benefit in preventing chronic obstructive pulmonary disease in long-term heavy smokers.

**Research on Apples and COPD in Smokers**

A preliminary case control study, completed by researchers from the University of Groningen in the Netherlands offers some evidence that apples may also bestow protection against chronic obstructive pulmonary disease (COPD) in long-term smokers. These researchers reported that eating fruits and vegetables, and in particular an apple a day, may reduce smokers' risk of developing COPD, based on their case-control study of long-term heavy smokers. This is the first known study to suggest smokers could benefit from increased apple consumption.

**Final Thought**

Researchers are still not clear on what the entire medicinal profile of an apple is and exactly how it functions to protect lung tissue and prevent lung-related health challenges. What we do know is that the fruit offers a simple and effective means of protecting the health of the lungs. After reviewing the available research on the conditions that benefit from increased apple consumption, including chronic obstructive pulmonary disease in heavy smokers, asthma, a general decline in lung function and lung cancer, the use of this inexpensive, readily accessible whole food turns out to be an important primary or complementary therapy for anyone battling the effects of compromised lung function.

**Excerpts reprinted with permission from the book Clinical Purification: A Complete Treatment and Reference Manual by Dr. Gina L. Nick.**

**References**


**Attention Healthcare Practitioners**

Join LTP for peer discussion groups as a paid independent consultant and be the first to receive new research & clinically relevant data

If you choose to participate you will:
- Help direct the focus of future studies & products
- Enjoy dinner with a group of your peers
- Discuss presented data amongst your peers
- Discuss experiences as a practitioner
- Be paid for your time and expertise

To participate go to www.LTPonline.com and click on the link that says "Healthcare Practitioner Questionnaire" on the top left side of the home page.
Copyright of Townsend Letter for Doctors & Patients is the property of Townsend Letter Group and its content may not be copied or emailed to multiple sites or posted to a listserv without the copyright holder's express written permission. However, users may print, download, or email articles for individual use.