

Botanicals for Health

Special points of interest:

- > Cinnamon can increase insulin sensitivity
- > Ginger can help reduce chronic diseases
- > Lemongrass has been used against colds
- > Olive has other healthful components other than oil



Cinnamon

Botanicals for chronic disease prevention

Botanicals are phytochemicals from plants that have an impact on human health. Many of the plant phytochemicals act as anti-oxidants that get rid of many harmful compounds in the body. They are anti-inflammatory, antimicrobial, antitumor, cardiovascular system enhancing and cholesterol lowering compounds. They also influence the immune system and act as anti-diabetic compounds.

We consume many botanicals as part of our regular diet that offer health benefits beyond basic nutrition. Plants that can be part of a normal diet include aloe, anise, basil, bay leaf, cacao, cayenne, cinnamon, cloves, coffee, dill, eucalyptus, fennel, garlic, ginger, ginseng, geranium, lemon, lemongrass, lime, mint, mace, mustard, nutmeg, olive, oats, onion, orange, parsley, pomegranate, radish, rosemary,

sage, saffron, tamarind, tarragon, tea, thyme, and turmeric. These plants have specific phytochemicals that have been shown to kill cancer cells, reduce diabetes risk and to protect blood vessels against plaque formation. The types and numbers of phytochemicals in these and many other botanicals is in the thousands.

Many large scale studies have shown that plant phytochemicals offer protection against cancer and cardiovascular disease. In the Nurse's Health Study, a large scale, long term study on women showed that those consuming the most fruits and vegetables had reduced risk for colorectal cancer and cardiovascular disease. A similar large scale study on men called the Health Professionals Study found the same results. Several other large scale studies

over the years in Europe have found similar results.

One of the healthiest diets in the world, the Mediterranean Diet is high in fruits and vegetables, healthful oils and many botanicals. Typical botanicals as part of the Mediterranean diet are garlic, onion, mint, lime, orange, lemon, fennel, basil, bay leaf, dill, pomegranate, rosemary, sage, tarragon, and thyme. This diet is also high in olive oil, red wine and tomatoes. The Mediterranean diet is particularly good for heart health.



Basil, olive oil, tomatoes and mozzarella cheese are components of the Mediterranean Diet

Inside this issue:

Ginger	2
Lemongrass	2
Olive	2
Rosemary	3
Tarragon	3
Thyme	3
Turmeric	4

Cinnamon

Cinnamon has been used by folk medicine specialists around the world for treating diabetes, as an anti-bacterial and anti-fungal agent, and as an anti-oxidant. Most of the spices used in cooking such as cinnamon, cloves, and turmeric have the highest antioxidant values in foods. The antioxidant value of cinnamon is the second largest

of all foods. Cinnamon has several phytochemicals that have been identified for having important effects in the body such as increasing muscle and liver insulin sensitivity, reducing blood glucose, total cholesterol, and triglyceride levels while raising good (HDL) cholesterol. Several studies have shown that cinnamon can reduce blood pressure,

reduce cholesterol and blood glucose levels, and control several bacterial and fungal infections. Cinnamon is particularly effective in persons with Type 2 Diabetes. Cinnamon may also be helpful in cancer prevention by increasing certain enzyme activities.

Ginger

Because of its pungent taste and interesting aroma, ginger has been used since the ancient times as a spice. It remains an important cooking spice around the world. Ginger is the underground stem or rhizome of the plant *Zingiber officinale* Roscoe. Ginger has anti-inflammatory, anti-thrombotic, cholesterol-lowering, blood pressure-lowering, antimicrobial, antioxidant, antitumor and hypoglycemic properties. Because of these properties, it is no wonder

that some studies have linked the consumption of ginger with beneficial effects in:

- Heart Disease
- Cancer
- Hypertension
- Obesity
- Diabetes
- Osteoarthritis
- Bacterial infections

Ginger has been shown to possess anti-diabetic activity in a variety of animal studies and it

was able to reduce triglycerides and LDL cholesterol and to increase HDL cholesterol.

Ginger has been used in eastern medicine for the treatment of gastrointestinal ailments. The combined treatment of antibiotics and ginger were tested for the control and treatment of *Helicobacter pylori* infections. The treatment was effective and was shown to inhibit *H. pylori* growth.



Ginger

Plant phytochemicals protect against bacterial infections, free radical damage, and chronic disease development.

Lemongrass

Lemongrass or *Cymbopogon citratus* is grown in the warm climates for use as a flavoring in foods. Lemongrass is incorporated into many foods in Thailand and other South East Asian countries and in South America. It is used in soups, teas, meat and chicken dishes. The main component identified in lemongrass that has health benefits is citral. Lemongrass

has been used for nervous and gastrointestinal disturbances, high blood pressure, pain, vomiting, cough, fever, cold and joint pain in South East Asia and South America.

As an antiseptic and an astringent, lemongrass oil has also been used for various skin conditions. Lemongrass oil has also been found to be an effective fungicidal and has been

used as a treatment for ringworm and other fungal infections as well as a mosquito repellent.

When ingested, lemongrass oil suppresses certain enzymes in the cholesterol synthesis pathway and for this reason has been suggested to help reduce cholesterol levels.

Olive

The Mediterranean diet is one of the healthiest for heart health. Many believe that it is the monounsaturated fatty acid content that makes olive oil healthy. However, research show that olive oil has many compounds that make olive oil a functional food. Functional food gives health benefits beyond basic nutrition. It is now believed that it is those other compounds in

olive oil that offer protection against heart disease. The compounds in olive oil are strong anti-oxidants and are anti-inflammatory agents. They remove free radicals that cause damage inside blood vessels and cells. Arterial damage can occur after a meal when fat and other substances are absorbed as LDL particles. Preventing LDL oxidation is key, and com-

pounds in olives and olive oil can prevent LDL oxidation. They can also reduce total cholesterol and triglyceride levels. A component in olive oil, fruit and leaves known as oleuropein, has also been shown to inhibit cancer development, reduce the risk for Alzheimer's and even protect against peptic ulcer by inhibiting bacterial growth.



Olive oil



Rosemary

Rosemary

Rosemary *Rosmarinus officinalis* L. is an herb grown in many parts of the world, particularly in the Mediterranean region. It is used in foods and beverages and in cosmetics. Rosemary has a distinctive flavor when used in foods. It has been used in folk medicine as an antispasmodic, as a treatment for respiratory disorders and to stimulate hair growth.

Extract of rosemary has also been found to protect the liver

from various harmful chemicals and to reduce cancerous changes. The most important constituents of rosemary have antioxidant effects. As antioxidants they protect against free radical damage and oxidative stress which can cause cancer and aging. Rosemary and its constituents have a therapeutic potential in treatment or prevention of bronchial asthma, peptic ulcer, inflammatory diseases, liver toxicity, atherosclerosis, ischemic

heart disease, cataract, yeast and bacterial infections and cancer. There is also a component in rosemary that has been found to improve the health and maintenance of nerve tissue and stimulate new nerve growth. This could be particularly beneficial for prevention of Alzheimer's disease.

Tarragon

Artemisia dracunculus L. or Tarragon is a genus of aromatic and bitter plants of a large sunflower family Asteraceae. Tarragon has an impact on human health in many ways. The therapeutic properties were discovered in the Middle Ages when it was used to treat fever and upper respiratory infections, ulcers and plaque epidemics, to stimulate appetite and digestive

processes. Recent research on the health effects of Russian tarragon has focused on its influence on glucose and insulin levels in diabetes. *A. dracunculus* can impact lipid metabolism in the muscle, such as the use of fat for energy vs storage in the cell, and influencing the synthesis of new fat cells. Preliminary research in laboratory animals

shows improvement in insulin resistance with *A. dracunculus* and its use as a potential treatment for the metabolic syndrome. Components in *A. dracunculus* L. extract increased glucose transport into cells from the bloodstream. It also reduced glucose synthesis in the liver in diabetic laboratory animals.

High level of free radicals causes oxidative stress, which can cause chronic disease development and aging. This can be eliminated by antioxidants.

Thyme



Thyme

Thymus vulgaris L. is an important culinary herb used in many regions of the world, particularly in the Mediterranean region and the United States. It is used as an aromatic flavoring in sauces, stews, dressing, meats, poultry and seafood. It has also been used in teas. One of the therapeutic compounds in thyme is called thymol which is a strong antioxi-

dant and a biocidal agent. It is antibacterial and fungicidal. It has been used since early history as a preservative and an antibacterial agent. These properties allow thyme to be used as a preservative in foods. There are many other components that also act as strong antioxidants. Studies have shown that the essential oils in thyme have strong antioxidant effects and

can preserve lipid molecules from oxidation. The antioxidant property is effective in different components in the cell as well as in red blood cells. Research also shows that components in thyme can help detoxify harmful chemicals in the liver such as alcohol.

References:

Al-Sereitia MR, Abu-Amerb KM, Sena P. Indian J. Exp. Biol. (1999) 37: 124-131.
 Aggarwal S, et al. Int. J. Cancer (2004) 111: 679-682.
 Cicerale Q, Luas LJ, Keast RSJ. Curr. Op. Biotech. (2012) 23: 129-135.
 Funk JL, et al. J. Agric. Food Chem. (2010) 58: 842-849.
 Hatcher H, et al. Cell. Mol. Life Sci. . (2008) 65: 1631-1647.
 Imelouane et al. Int. J. Agric. Biol. (2009) 11(2): 205-208.
 Kahn A, et la. Diabetes Care (2003) 26: 3215-3218.
 Kato A, et al. J. Agric. Food Chem. (2006) 54: 6640-6644.
 Preedy VR, Watson RR. (Eds) (2010) Olives and olive oil in health and disease prevention. 1479 p. Academic Press.
 Suaeyun R, et al. Carcinogenesis (1997) 18(5): 949-955.
 WangZQ, et al. Metabolism (2008) 57: S58-S64.
 Wright LE, et al. J. Agric. Food chem. (2010) 58: 9498-9504.
 Xiong Z, et al. Pharmacol. Rep. (2011) 63: 1101-1108.
 Ye M-X, et al. J. Mol. Sci. (2012) 13: 3959-3978.

Pennington Biomedical Research Center

VISION

Our *vision* is to lead the world in eliminating chronic diseases.

MISSION

Our *mission* is to discover the triggers of chronic diseases through innovative research that improves human health across the lifespan. We are helping people live Well Beyond the Expected.

The Pennington Center has several research areas, including:

- Clinical Obesity Research
- Experimental Obesity
- Functional Foods
- Health and Performance Enhancement
- Nutrition and Chronic Diseases
- Nutrition and the Brain
- Dementia, Alzheimer’s and healthy aging
- Diet, exercise, weight loss and weight loss maintenance

The research fostered in these areas can have a profound impact on healthy living and on the prevention of common chronic diseases, such as heart disease, cancer, diabetes, hypertension and osteoporosis.

The Division of Education provides education and information to the scientific community and the public about research findings, training programs and research areas, and coordinates educational events for the public on various health issues.

We invite people of all ages and backgrounds to participate in the exciting research studies being conducted at the Pennington Center in Baton Rouge, Louisiana. If you would like to take part, visit the clinical trials web page at www.pbrc.edu or call (225) 763-3000



Turmeric powder

Turmeric

The yellow colored compound of turmeric was isolated in 1842 and was named curcumin. Because of its chemical structure, curcumin is a strong antioxidant and free radical scavenger and can therefore prevent diseases that involve damage caused by free radicals. Curcuminoids can inhibit factors that are involved in stimulation of the immune system when an individual is subjected to stressors such as radiation or infection. They have been shown to suppress the production of a number of

molecules involved in inflammatory conditions such as rheumatoid arthritis, psoriasis, cancer and asthma, and by external stressors. Curcuminoids stop the immune system from responding by blocking a reaction that would lead to a host of negative responses. They also decrease the levels of compounds that cause pain, fever and blood clotting. Curcuminoids can improve the antioxidant status in the body by increasing the circulation of antioxidant vitamin C and E, and enhancing other enzyme

systems. Eliminating the reactive oxygen species can help prevent LDL oxidation and reduce the risk for cardiovascular disease, cancer, diabetes, Alzheimer’s and alcoholic liver disease. There are several drugs that are used to treat blood lipids and insulin levels. Turmeric has the potential to be used as a natural compound to stabilize blood lipids and glucose levels by helping prevent lipid oxidation. Turmeric feeding had a positive effect on glucose and lipid levels in mice.

Pennington Nutrition Series
 # 92 12/12

Authors:

Heli Roy PhD, MBA, RD
Division of Education
 Philip Brantley PhD, Director
Pennington Biomedical Research Center
 Steven Heymsfield, MD,
 Executive Director

www.pbrc.edu