

# CINNAMON

## INTRODUCTION



Cinnamon tree is a small evergreen tree belonging to the laurel family or Lauraceae. The bark of the tree is dried and ground and used as spice. Cinnamon is among the world's most widely used spices and is relatively inexpensive.

There are two main varieties of cinnamon: *Cinnamomum cassia* and *Cinnamomum verum* or *C. zeylanicum*.

*C. verum* is known as the 'true cinnamon'. It is originally from Sri Lanka. It is lighter in color, sweeter, and has a more delicate flavor than *C. cassia*. It is also known as Mexican cinnamon, preferred by chefs and bakers. *C. cassia* has a stronger taste, is

darker, and has more of the active ingredient, cinnamaldehyde than *C. verum*.

Cinnamon is used to flavor cereals, grain-based dishes, and fruits. In the far eastern countries, cinnamon is also used to flavor meats, poultry, fish, vegetables, tea, and coffee in addition to fruits and grains.

Cinnamon has components that are thought to offer some health benefits. It contains antioxidants called proanthocyanidins and other active ingredients which are found in the water-soluble portions, not the fat soluble components of cinnamon!. Proanthocyanidins are strong antioxidants and it is through these properties that cinnamon is believed to produce its associated health effects.

## COMMON TYPES OF CINNAMON

**INDIAN CASSIA** (*C. tamala*) is native to India.

**INDONESIAN CASSIA** (*C. burmanni*) or Padang cassia.

**SAIGON CASSIA** (*C. loureirii*) is native to Indonesia.

**OLIVER'S BARK** (*C. oliveri*) from Australia.

**MOSSOIA BARK** (*Cinnamomum*) is from Papua New Guinea.

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### SPECIAL POINTS OF INTEREST

True cinnamon comes from Sri Lanka.

Cinnamon contains antioxidants. Cinnamon helps regulate blood glucose and insulin levels.

Cinnamon normalizes blood lipids such as triglycerides, total cholesterol, HDL, and LDL cholesterol.

Water soluble compounds from cinnamon can help reduce inflammation and could be used as an adjuvant in inflammatory diseases.

# DIABETES

According to the Centers for Disease Control, approximately 8.3% of the U.S. adult population is currently diagnosed with type 2 diabetes. Type 2 diabetes is the most common form of diabetes and is characterized by high blood glucose levels, thirst and weight loss.

High blood glucose levels in diabetes are reduced by medications such as insulin. Some new treatments in the future may include cinnamon. In an early groundbreaking study, 60 subjects divided into 6 groups were given 0, 1, 3, or 6 grams of cinnamon daily<sup>2</sup>. After 40 days, all three levels of cinnamon reduced the mean fasting serum glucose from 18 to 29%, while there was no change in the placebo groups. This suggests that cinnamon has a protective effect on blood glucose levels.

Cinnamon extract proved to be similarly effective in Type 2 diabetic subjects that consumed an extract for 40 weeks equaling

to 1 gram of cinnamon<sup>3</sup>. Those receiving the cinnamon extract had significantly lower blood glucose levels than in the placebo group.

In another study, type 2 diabetic subjects had reduction in their blood glucose levels equal to that of taking medications to treat diabetes when they consumed cinnamon for 12 weeks<sup>4</sup>.

An analysis of 10 different clinical studies showed that cinnamon taken for 4 to 18 weeks reduced the levels of fasting plasma glucose<sup>5</sup>. Cinnamon had no effect on hemoglobin A1c levels.

Cinnamon can also increase the potency of insulin. Individual who were insulin resistant had high insulin levels but did not react to it. Consumption of cinnamon improved the potency of insulin and helped move the glucose in the cells<sup>6</sup>.

**Spices such as cinnamon, cloves, bay leaves, and turmeric display insulin-enhancing activity.**

# BLOOD LIPIDS

Cinnamon has been shown to reduce blood lipid levels. The effect of *C. cassia* extract at different dosages was studied in a type 2 diabetic animal model. The mice were divided into groups that received either the placebo, or cinnamon extract once a day for six weeks. Researchers found that after six weeks of cinnamon administration, serum HDL-cholesterol levels were significantly higher and the concentration of triglyceride and total cholesterol were significantly lower. The lipid profile became much healthier.

An analysis of several clinical studies showed that cinnamon taken for 4 to 18 weeks, depending on the study, reduced the levels of fasting total cholesterol, low LDL cholesterol and triglycerides<sup>5</sup>. Cinnamon also increased the levels of HDL or 'good' cholesterol. Another study found that 1 to 6 grams of cinnamon a day reduced triglycerides (23-30%), LDL cholesterol (7-27%), and total cholesterol (12-26%)<sup>2</sup>. This suggests that inclusion of cinnamon in the diets of individuals with Type 2 Diabetes will reduce blood lipids and reduce the risk for cardiovascular risk factors.



**Cinnamon can be used to flavor tea.**

**Powdered Cinnamon**



## ANTIMICROBIAL ACTIVITY

Several phytochemicals from plants have been found to be antimicrobial, which means they inhibit the growth of bacteria, viruses, fungi and mycoplasma. Cinnamon inhibits the growth of several common bacteria, and is therefore an antimicrobial agent. Both the fat soluble and water soluble compounds of cinnamon are effective. Many bacteria have become resistant to the common antibiotics due to overuse and misuse of the medications. This is particularly problematic in the developing world where diseases such as typhoid fever are common with 27 million cases a year<sup>7</sup>. An essential oil extract of cinnamon was found to inhibit the growth of several bacteria including bacteria that causes typhoid, enteritis and diarrhea<sup>7</sup>.

In another study, cinnamon bark oil was found to be the most effective against mycobacteria. Some mycobacteria have

become resistant to many common antibiotics and to combat an infection, a combination of antibiotics with cinnamon bark oil can be used to increase potency of the existing antibiotics and to eliminate the infection<sup>8</sup>.

In the United States, bacterial contamination of foods cause 48 million cases of foodborne illnesses annually<sup>9</sup>. Although food preservatives are used to inhibit bacterial growth, additional plant derived compounds could help to eliminate many cases of infection. Cinnamon oil and water extracted components were found to inhibit the growth of thirteen common bacteria that can cause food borne illnesses<sup>10</sup>. Cinnamon extracts could be safely added to foods to prevent bacterial growth.

**The majority of cinnamon sold in supermarkets in the United States is *C. cassia*.**

## INFLAMMATION

Inflammation is a protective response to an agent that irritates the system and is exhibited by swelling, redness and heat. Inflammation occurs when the body releases various compounds at the site of injury to start the healing process. Many compounds are used as anti-inflammatories, including plant compounds from cinnamon that can be taken internally or applied externally to the injured site. When cinnamon is added to tea, a myriad of healthful compounds are released that are antiinflammatory and inhibit the production of many harmful chemicals such as nitric oxide, cyclooxygenase (COX-2), prostaglandins and other compounds that can cause damage to cells<sup>11, 12</sup>. Cinnamon extracts are effective in reducing the number of harmful cells that invade the affected site while at the same time increasing the presence of protective cells and promoting the production of anti-inflammatory compounds.

Cinnamon extract can influence the activity of genes for inflammatory compounds<sup>13</sup>. The polyphenols from cinnamon reduced the activation of the genes resulting in lowered amount of inflammatory compounds being released and a reduction in inflammation. Cinnamon could potentially be used as an accompanying therapy together with traditional medications in many diseases such as arthritis, lupus, multiple sclerosis and diabetes.



**Cinnamon and star anise**



**Cinnamon Sticks**

# CULINARY USES

Cinnamon is a widely used spice. It is used in cooking in the Americas, Europe, Asia, the Middle East, and the Caribbean Islands. In the United States cinnamon is used in cookies, cakes, sweet breads, muffins, and hot drinks. Powdered cinnamon is the most commonly used form. Powdered cinnamon combined with sugar is a common topping on cakes, pies, and other sweet dishes. It is used as a flavoring in many ready-made cereals, flavored coffees and teas, such as Chai.

Cinnamon is many times combined with other spices such as cloves, cardamom, all-spice and ginger in dishes such as cookies, cakes and pies. Cinnamon is part of some spice mixtures such as curries, masala spices, Chinese Five Spice, pickling spice mixtures and even some barbeque seasonings. It is also an important part of Jerk Seasoning mixtures.

In the Middle East, India and other countries, cinnamon is also used in savory dishes and meats. A mixture of cinnamon and other strong spices is used to tone down the gaminess and strong flavor of certain meats. Cinnamon and other spices were originally used to preserve meats before refrigeration, in addition to other methods such as smoking, salting and drying. Some main dishes such as stews and casseroles also call for stick cinnamon. If cinnamon stick is left in a dish or drink, the flavor intensifies over time.

Cinnamon should be stored in in an airtight jar, in a cool dark cupboard. Ideally, you would want to grind our own spice each time you need it to keep it fresh.

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