



COMPLETE

HEALTH TEA



The Miracle of Green Tea:

Next to water, tea is the **second most consumed beverage in the world**. Many studies have shown that tea has many **benefits** - including when it comes **to your health**.

Tea is derived from the *Camellia sinensis* plant and is classified into three major categories: **Green Tea**, Oolong Tea, and Black Tea. Of these types of tea, Green Tea is the most well-known, since it has been used in ancient medicine to cure **many types of ailments**.

Green Tea is different from other types of tea because it has undergone **less processing**. Since it does not undergo the extensive fermentation process like other teas, many of its antioxidants, particularly catechins, **are preserved**.

The **antioxidant activity** of catechins has been known for a variety of health benefits, including **cancer prevention, promotion of oral health, easing rheumatoid arthritis, and antibacterial activity**. Now, Green Tea is also gaining fame for reducing cholesterol.

Most studies involving the **cholesterol-lowering effects** of Green Tea involve the use of Green Tea's active ingredient, catechin extract, as opposed to the beverage itself. The mechanism of action is largely unknown, but it appears to increase LDL receptor activity in the liver, prevent absorption of cholesterol in the intestines, lower low density lipoprotein (LDL), raise high density lipoprotein (HDL), and lower total cholesterol.

No other food or drink has been reported to have as many health benefits as Green Tea. The Chinese have known about the health benefits of Green Tea since ancient times, using it to treat everything **from headaches to depression**. Green Tea has been used as a medicine in China for at least 4,000 years.

Today, scientific research in both Asia and the West is providing hard evidence for the health benefits long associated with drinking Green Tea. For example, in 1994 the Journal of the National Cancer Institute published the results of an epidemiological study indicating that drinking Green Tea **reduced the risk of oesophageal cancer in Chinese men and women by nearly sixty percent**. University of Purdue researchers recently concluded that a compound in Green Tea **inhibits the growth of cancer cells**.

What makes green tea so special?

The secret of Green Tea lies in the fact it is rich in catechin polyphenols, particularly epigallocatechin gallate (EGCG). **EGCG is a powerful anti-oxidant**. Besides inhibiting the growth of cancer cells, **it kills cancer cells without harming healthy tissue**.

It has also been effective in **lowering LDL cholesterol levels, and inhibiting the abnormal formation of blood clots**. The latter takes on added importance when you consider that thrombosis (the formation of abnormal blood clots) **is the leading cause of heart attacks and stroke**.

To sum up, here are a few of the major medical conditions in which drinking Green Tea is reputed to be helpful:

- **Atherosclerosis:**

Population-based clinical studies indicate that the antioxidant properties of Green Tea may help prevent atherosclerosis, particularly coronary artery disease. (Population-based studies means studies that follow large groups of people over time or studies that are comparing groups of people living in different cultures or with different dietary habits.) Researchers aren't sure why Green Tea reduces the risk of heart disease by lowering cholesterol and triglyceride levels. Studies show that black tea has similar beneficial effects. **In fact, researchers estimate that the rate of heart attack decreases by 11% with consumption of 3 cups of tea per day.**

- **High Cholesterol:**

Research shows that Green Tea lowers total cholesterol and raises HDL ("good") cholesterol in both animals and people. One population-based clinical study found that men who drink Green Tea are more likely to have lower total cholesterol than those who do not drink Green Tea. Results from one animal study suggest that polyphenols in Green Tea may block the intestinal absorption of cholesterol and promote its excretion from the body. In another small study of male smokers, **researchers found that green tea significantly reduce blood levels of harmful LDL cholesterol.**

- **Cancer:**

Several population-based clinical studies have shown that both Green and Black teas help protect against cancer. For example, cancer rates tend to be low in countries such as Japan where people regularly consume Green Tea. Emerging clinical studies suggest that the polyphenols in tea, especially Green Tea, may play an important role in the prevention of cancer. **Researchers also believe that polyphenols help kill cancerous cells and stop their progression.**

Bladder Cancer: Only a few clinical studies have examined the relationship between bladder cancer and tea consumption. In one study that compared people with and without bladder cancer, researchers found that women who drank Black Tea and powdered Green Tea **were less likely to develop bladder cancer.** A follow-up clinical study by the same group of researchers revealed that bladder cancer patients (particularly men) who drank Green Tea **had a substantially better 5-year survival rate than those who did not.**

Breast Cancer: Clinical studies in animals and test tubes suggest that polyphenols in Green Tea **inhibit the growth of breast cancer cells.** In one study of 472 women with various stages of breast cancer, researchers found that women who consumed the most Green Tea **experienced the least spread of cancer** (particularly premenopausal women in the early stages of breast cancer). They also found that women with early stages of the disease who drank at least 5 cups of tea every day before being diagnosed with cancer were **less likely to suffer recurrences of the disease after completion of treatment.** However, women with late stages of breast cancer experienced little or no improvement from drinking Green Tea. In terms of breast cancer prevention, the studies are inconclusive. In one very large study, researchers found that drinking tea, green or any other type, was not associated with a reduced risk of breast cancer.

However, when the researchers broke down the sample by age, among women under the age of 50, those who consumed 3 or more cups of tea per day were 37% less likely to develop breast cancer compared to women who didn't drink tea.

Ovarian Cancer: In a clinical study conducted on ovarian cancer patients in China, researchers found that women who drank at least one cup of Green Tea per day survived longer with the disease than those who didn't drink Green Tea. In fact, those who drank the most tea, lived the longest.

Colorectal Cancer: Clinical studies on the effects of Green Tea on colon or rectal cancer have produced conflicting results. Some clinical studies show decreased risk in those who drink the tea, while others show increased risk. In one study, women who drank 5 or more cups of Green Tea per day had a significantly lower risk of colorectal cancer compared to non-tea-drinkers. There was no effect in men, however. Other studies show that regular tea consumption may reduce the risk of colorectal cancer in women. Further research is needed before researchers can recommend green tea for the prevention of colorectal cancer.

Oesophageal Cancer: Studies in laboratory animals have found that Green Tea polyphenols inhibit the growth of oesophageal cancer cells. For example, one large-scale population-based clinical study found that Green Tea offered significant protection against the development of oesophageal cancer (particularly among women).

Lung Cancer: While Green Tea polyphenols have been shown to inhibit the growth of human lung cancer cells in test tubes, few clinical studies have investigated the link between Green Tea consumption and lung cancer in people. One population-based clinical study found that Okinawan Tea (similar to Green Tea but partially fermented) was associated with decreased lung cancer risk, particularly among women.

Pancreatic Cancer: In one large-scale clinical study researchers compared Green Tea drinkers with non-drinkers and found that those who drank the most tea were significantly less likely to develop pancreatic cancer. This was particularly true for women -- those who drank the most Green Tea were half as likely to develop pancreatic cancer as those who drank less tea. Men who drank the most tea were 37% less likely to develop pancreatic cancer.

Prostate Cancer: Laboratory studies have found that Green Tea extracts prevent the growth of prostate cancer cells in test tubes. In a large clinical study conducted in Southeast China researchers found that the risk of prostate cancer declined with increasing frequency, duration and quantity of Green Tea consumption.

Skin Cancer: The main polyphenol in Green Tea is epigallocatechin gallate (EGCG). Scientific studies suggest that EGCG and Green Tea polyphenols have anti-inflammatory and anticancer properties that may help prevent the onset and growth of skin tumours.

Stomach Cancer: Laboratory studies have found that Green Tea polyphenols inhibit the growth of stomach cancer cells in the test tubes, but clinical studies in people have been less conclusive. In two studies that compared Green Tea drinkers with non-drinkers,

researchers found that people who drank tea were about half as likely to develop stomach cancer and gastritis (inflammation of the stomach) as those who did not drink Green Tea.

Further clinical studies are underway to determine whether Green Tea helps reduce the risk of stomach cancer. Although Green Tea is considered safe for people at risk for stomach cancer, it is too soon to tell whether Green Tea reduces the likelihood of developing this disease.

- **Inflammatory Bowel Disease (IBD):**

Green Tea may help reduce inflammation associated with Crohn's disease and ulcerative colitis, the two types of IBD. If Green Tea proves to be helpful for preventing colon cancer, this would be an added benefit for those with IBD because they are at risk for colon cancer.

- **Diabetes:**

Green Tea has been used traditionally to **control blood sugar in the body**. Animal studies suggest that Green Tea may help prevent the development of type 1 diabetes and slow the progression once it has developed. People with type 1 diabetes produce little or no insulin, a hormone that converts glucose (sugar), starches, and other foods into energy needed for daily life. **Green Tea may help regulate glucose in the body**. Clinical studies have found that daily supplementation of the diet with Green Tea extract powder lowered the haemoglobin A1c level in individuals with borderline diabetes.

- **Liver Disease:**

Population-based clinical studies have shown that men who drink more than 10 cups of Green Tea per day are less likely to develop disorders of the liver. **Green Tea also seems to protect the liver from the damaging effects of toxic substances such as alcohol**. Animal studies have shown that Green Tea helps protect against the development of liver tumours in mice. Results from several animal and human studies suggest that one of the polyphenols present in Green Tea, known as catechin, may help treat viral hepatitis (inflammation of the liver from a virus). In these studies, catechin was isolated from Green Tea and used in very high concentrations. It is not clear whether Green Tea (which contains a lower concentration of catechins) confers these same benefits to people with hepatitis.

- **Weight Loss:**

Clinical studies suggest that Green Tea extract may **boost metabolism and help burn fat**. One study confirmed that the combination of Green Tea and caffeine **improved weight loss and maintenance** in overweight and moderately obese individuals. Some researchers speculate that substances in Green Tea known as polyphenols, specifically the catechins, are responsible for the herb's **fat-burning effect**.

- **Prevents Food Poisoning:**

Catechin, the bitter ingredients of Green Tea in Green Tea **effectively kills bacteria which causes food poisoning and also kills the toxins produced by those bacteria.**

- **Controls High Blood Pressure:**

Catechin suppresses production of angiotensin II which leads to high blood pressure.

- **Lows Blood Sugar:**

Catechin and polysaccharides are effective in lowering blood sugar.

- **Slows Down The Aging Process:**

Consuming agents that are effective **antioxidants will slow the aging process.** Green Tea is rich in **vitamin E**, which works as an antioxidant. Also, catechin in Green Tea is as very strong antioxidant.

Rooibos Research Around the World

Several research groups around the world have invested time and money in investigating **the health benefits of Rooibos**, resulting in a steady increase in the number of Rooibos research articles in the international scientific literature in the past 10 to 15 years.

The Japanese research fraternity has taken an especially keen interest in the health-boosting properties of Rooibos and published a number of research reports since 1990. More recently, some interesting findings have been reported from Pakistan and Slovakia.

The product's reported antioxidant properties and medicinal value have given Rooibos a **great deal of credibility and exposure in health-conscious markets abroad.** Most of the studies to date have been done on laboratory animals, such as rats.

Key findings reported include:

- **Rooibos and Heart Health:**

Chrysoeriol, an antioxidant in Rooibos, **can prevent and treat vascular disease in people.** This is the latest findings from scientists in Japan where Rooibos has been extensively researched in the past 20 years. Chrysoeriol is able to **inhibit the migration of smooth muscle cells inside the aorta, a key cause of atherosclerosis** (narrowing or hardening of the arteries). The research was done on human aorta cells. They recommend the use of chrysoeriol to prevent and treat the repeated narrowing of blood vessels following coronary angioplasty. During angioplasty a small balloon is used to open up a blocked or narrowed heart artery. Another study has found that Rooibos can **promote heart health by inhibiting the activity of a specific enzyme that is responsible for cardiovascular disease.**

• **Rooibos to Treat Inflammatory Bowel Disease - also in Children:**

Oxidative stress in the body can lead to inflammation and several other diseases. Japanese researchers are recommending Rooibos as a safe and useful way to reduce oxidative stress, especially also in children. A group of researchers from Tokyo's Juntendo University School of Medicine published their findings in the journal *Paediatrics International*, March 2009. This study focused on colitis, a disease causing open sores (ulcers) in the colon. **They found that Rooibos was able to increase antioxidant activity, thereby reducing the damage caused to DNA by oxidative reactions.**

• **Rooibos and Brain Tissue:**

Rats given free access to Rooibos from the age of 3 to 24 months had far less oxidative damage in brains compared to rats that drank plain water. This could possibly open the door for the treatment of Alzheimer's with Rooibos.

• **Rooibos and Immune Systems:**

Researchers have shown that Rooibos **promotes the production of antibodies** when immune systems are challenged either in vitro or in vivo. This could also open up a new area of exploration regarding Rooibos.

• **Rooibos Anti-Viral Properties:**

Rooibos delays the recurrence of herpes simplex virus in humans. There is still a huge potential for future research into the anti-viral properties of Rooibos.

• **Rooibos Skin Deep:**

Some Rooibos studies have shown Rooibos inhibits (slows down) certain inflammatory skin diseases and makes the skin less sensitive to damage from the sun.

• **Rooibos and Liver Disease:**

A team of researchers in the Slovak Republic investigated the therapeutic value of Rooibos in an rat model concluded that the consumption of Rooibos as a rich source of natural antioxidants could be recommended as a readily available, safe and effective hepatoprotector (a substance to help protect the liver) in patients with liver diseases. Their findings were published in the *Journal of Physiology Research* in 2004.

• **Rooibos and Cancer Research Abroad:**

Laboratory studies (in vitro) have shown that quercetin and luteolin, two of the flavonoids in Rooibos, are potent antioxidants that can cause cancer cells to "commit suicide" (a process referred to as apoptosis). Quercetin also **slowed down tumour growth and prevented metastasis** (spreading of the disease to other parts of the body) in study on cancer of the pancreas. Luteolin and quercetin slowed down the increase in thyroid and colon cancer cells, respectively. Although studies like these show quercetin and

luteolin are strong antioxidants, they are only present in very low quantities in Rooibos. Researchers have not yet determined whether enough of either of these two flavonoids are present in Rooibos and absorbed by the body to have beneficial effects. Orientin, another abundant flavonoid in Rooibos, **is a potent free radical scavenger**. It halved the number of cancer-associated changes in human blood cells that have been exposed to radiation.

- **Medicinal use of Rooibos as Bronchodilator, to Lower Blood Pressure; and as agent to combat Abdominal Spasms and Diarrhoea:**

In December 2006 researchers at the Aga Khan University Medical College in Karachi, Pakistan published a study in the European Journal of Nutrition, concluding that there was a sound basis for the wide medicinal use of Rooibos. Their study focused on the possible effects of Rooibos to lower blood pressure, as well as its possible use as a bronchodilator and antispasmodic. The researchers worked on tissue preparations as well as animal models. In another research article, published in November 2006, researchers from the same university reported on the use of Rooibos to relieve abdominal spasms and diarrhoea. Based on animal models, they concluded that it was justified to use Rooibos **to treat hyperactive gastrointestinal disorders**.

- **Rooibos Boosts Anti-Oxidant Levels in Blood:**

A human study with 15 healthy volunteers proved for the first time that the antioxidants in Rooibos are potent enough to **measurably elevate the antioxidant levels in blood, thereby boosting the body's internal defence systems against disease**. The effect peaks about one hour after drinking 500 ml Rooibos tea. Villano, D., Pecorari, M., Testa, M.F., Raguzzini, A., Stalmach, A., Crozier, A., Tubili, C., Serafini, M. 2010. Unfermented and fermented rooibos teas (*Aspalathus linearis*) increase plasma total antioxidant capacity in healthy humans. Food Chemistry 123, 679-683.

- **Rooibos can Prevent or Slow Down Cancer:**

The ability of South African herbal teas (Rooibos and Honey bush extracts) to act as 'chemopreventors' in skin cancer was highlighted by a South African research team using an animal model. They showed that topical (external) application of tea fractions significantly suppressed tumour growth in mice with skin cancer, when using processed and unprocessed tea. Marnewick, J.L., Joubert, E., Joseph, S., Swanevelder, S., Swart, P., Gelderblom, W.C.A., 2005. Inhibition of tumour promotion in mouse skin by extracts of rooibos (*Aspalathus linearis*) and honey bush (*Cyclopia inter media*), unique South African herbal teas. Cancer Letters 224, 193-202.

South African researchers collaborated to compare the potential of different kinds of tea (Rooibos, Honey bush, black oolong and green tea) to suppress mutations, and thereby prevent cancer. Their results confirmed that the phenolic compounds in herbal tea extracts have a **strong anti-mutagenic effect** (in vitro study using cell lines). Van der Merwe, J.D., Joubert, E., Richards, E.S., Manley, M., Snijman, P.W., Marnewick, J.L., Gelderblom, W.C.A., 2006. A comparative study on the antimutagenic properties of aqueous extracts of *Aspalathus linearis* (rooibos), different *Cyclopia* spp. (honey bush) and *Camellia sinensis* teas. Mutation Research 611, 42-53.

• Rooibos and Cancer:

The research team working on Rooibos at the Medical Research Council has been investigating the effect of Rooibos on various kinds of cancer for several years. They are working with human cells in the laboratory as well as with live animals, mostly rats and mice. The programme on Mycotoxins and Experimental Carcinogenesis (PROMEC) is lead by Professor Wentzel Gelderblom, Professor Elizabeth Joubert of the Agricultural Research Council's institute Infruitec-Nietvoorbij, Stellenbosch, is a key partner in most of these projects. The SA Rooibos Council as well as CANSA (The Cancer Association of South Africa) contribute to the research funding. Recent and ongoing studies at the MRC include:

• How Rooibos Protects against Cancer:

Studies at the MRC shows that Rooibos reduces cancer-associated changes in animal cells by protecting cells against DNA damage, or mutagenesis. Cancer develops in several steps and mutagenesis is one of the first steps. During mutagenesis the genetic material (or DNA) of a cell is changed because of excessive exposure to mutagens. Mutagens are physical or chemical agents that can change the DNA in the cell. Mutagens are found in cigarette smoke, sunlight or chemical substances such as hydrogen peroxide. This change in the DNA is known to be a major cause of cancer. Rooibos offers protection (or chemoprevention) against these mutagens in more than one way:

- **It is a potent antioxidant, which means that it 'scavenges' free radicals.** These are highly reactive molecules that are also produced during normal processes in the human body. Free radicals can damage the DNA of cells, but antioxidants bind to the free radicals and inactivate them before they can cause any damage.

- **Rooibos also increases the antioxidant status of the liver.**

- **Rooibos stimulates the liver enzymes that break down carcinogens in the body.** Ongoing exposure to carcinogens such as certain kinds of toxins and cigarette smoke, will eventually lead to cancer.

• Rooibos Research References:

More than a 100 scientific articles relevant to Rooibos research have been published in the South African and international scientific literature since the 1960's. The references for some key articles are listed (alphabetically according to first author) below:

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