

Tea leaves and health

Some studies have suggested that tea can slow down some cancers and reduce the risk of heart disease. The protective agents in tea seem to be a group of compounds called catechins. However, other studies have failed to establish any health benefits and research is ongoing.

Tea is a popular drink worldwide. It is made from the leaves of the plant *Camellia sinensis*, a close relative to the camellia plant found in Australian gardens.

Four types of tea

There are four main types of tea:

- **White tea** – made from minimal, very quick processing of young tea leaves or new growth buds, leaving the leaves close to 'fresh'.
- **Green** – made by quickly steaming or heating the leaves to prevent breakdown (oxidation) of the catechins.
- **Oolong** – this is more processed than green tea, but is not processed for as long as black tea.
- **Black (fermented)** – made by further processing of leaves, including exposure to heat, light and crushing.

Why teas are different

The major difference between types of tea is their degree of oxidation (exposure to oxygen). Excessive oxidation is thought to be unhealthy. It is suggested that white and green teas may have greater health benefits than black or oolong tea.

Traditionally, green (unfermented) tea is favoured in Asian countries, while Western countries tend to prefer black (fermented) tea due to the strong flavours from fermentation. Oolong (semi-fermented) tea has characteristics between green and black teas. White tea is a rarer and more expensive tea from a particular part of China but is gaining popularity worldwide. All varieties contain caffeine, a nervous system stimulant, although there are de-caffeinated versions of some teas.

Protective compounds in tea

Polyphenols including flavonoids are naturally occurring plant chemicals (called phytochemicals) that are found in tea and have strong antioxidant properties. Antioxidants are agents that protect cells against damage caused by free radicals and reduce the damage caused by low density lipoprotein (LDL) or 'bad' cholesterol in the blood. Tea contains a particular variety of polyphenols known as catechins. Catechins are considered to have properties that protect or act against cancer (anticarcinogenic), tumours (antitumorigenic) and unwanted genetic changes (anti-mutagenic).

Health benefits of tea – the research is unclear

Recent international research has suggested that regular tea drinking can slow down certain cancers and reduce the risk of diseases such as heart disease. Most reports showing a positive correlation with cancer prevention appear from studies using green tea compared with black tea. However, other epidemiological studies have contradicted these findings. One reason may be to do with the low bioavailability of tea catechins (they are not easily absorbed into the body) in humans and animals. Another reason may be the presence of naturally occurring microorganisms in the gut (microbial flora or microbiota) that influences the absorption of these antioxidants.

More research is needed to determine the exact health benefits of tea drinking but it is suggested that tea benefits the bodies' immune function, gut function, normalises blood pressure, reduces cardiovascular disease (CVD) risk, diabetes and dental decay.

Heart disease and tea

High blood cholesterol levels have been associated with coronary heart disease. There are two types of blood cholesterol. Low density lipoprotein (LDL), which blocks the arteries, and high density lipoprotein (HDL) which reduces LDL levels.

It is believed that the polyphenols in tea help prevent atherosclerosis, a condition where fatty deposits cause narrowing of the arteries.

According to Japanese research, green tea reduces the levels of LDL, or 'bad' blood cholesterol, and may reduce the risk of coronary heart disease. European studies have found that regular tea drinking protects against heart disease. One study found that the risk was 36 per cent lower for tea drinkers.

Inflammation is also believed to play a role in heart disease. The polyphenols in tea have a mild anti-inflammatory action in animal studies. Preliminary research also indicates that tea polyphenols may reduce the activity of platelets, which are the clotting agents of the blood. This is good, because 'sticky' blood is more likely to form artery-blocking clots.

Cancer and tea

Prostate cancer is common in older men. Rates of this type of cancer are significantly lower in Asian countries than in the West, but science is hesitant to assume that green tea is the key factor. However, recent American research has found that the some chemicals found in tea could be capable of slowing the growth of prostate cancer.

In 2010 an Australian study was conducted into the effects of tea consumption on ovarian cancer risk. The study found that women who consume green tea or black tea have a reduced risk in developing ovarian cancer. Unlike most other studies, it found black tea to be effective in reducing ovarian cancer risk; however its effects are not as strong as green tea.

Japanese studies investigating the effects of tea on cancer have found that up to 10 cups of green tea a day can:

- Reduce the spread of cancer to other parts of the body (metastasising)
- Slow down the growth of the cancer
- Reduce the likelihood of cancer developing in the first place.

Several other animal and human trials have indicated that tea can also protect against cancers of the mouth, stomach, pancreas, bowel, digestive system, and the bladder in women. However, other studies have found no evidence to suggest that tea has a protective influence against cancer. A recent review highlights the potential of substances found in green tea to protect against colon, skin, lung, prostate, and breast cancer.

Liver disease and tea

Oxidative stress and inflammation play a major role in acute liver (hepatic) injury and liver disease. Green tea catechins appear to suppress or reduce the severity of liver injury in animal studies. Again, further studies are required to understand if green tea polyphenols, or a combination of several tea components, really cause anti-inflammatory activity in humans. Animal studies so far suggest that green tea supplements may be useful to reduce inflammatory and oxidative stress in human liver conditions.

Contributing factors

Some studies have found that tea drinkers have a lower risk of CVD than coffee drinkers, and it would be tempting to give tea catechins the credit. However, associated lifestyle factors need to be taken into account. For instance, coffee drinkers are more likely to be cigarette smokers which increase their risk of heart disease. One of the difficulties is isolating the effects of tea from all the countless associated health and lifestyle factors that also influence the development of disease. Research is ongoing.

Decaffeinated tea

The process of decaffeinating tea may damage the phenolic substances. Since most studies have researched the effects of caffeinated tea, it can't be assumed that decaffeinated varieties will offer the same health benefits. Some people have also considered that addition of milk to tea causes problems with the absorption of catechins in the gut, but this is not the case.

Herbal teas

Herbal teas are made from a variety of different plants and can include parts other than the leaves, including flowers and roots. Most herbal teas don't contain any *Camellia sinensis* leaves. Whether or not they offer the same potential health benefits in relation to heart disease as green and black tea is not clear.

Where to get help

- Your doctor
- An Accredited Practising Dietitian, contact the Dietitians Association of Australia

Things to remember

- Some studies have suggested that drinking tea can slow down certain cancers and protect against heart disease.
- The protective agents in tea seem to be a group of polyphenols called catechins, which have a variety of effects on the human body.
- Decaffeinated or herbal teas may not offer the same protective influence as green and black teas.
- More research is needed before there is firm evidence for these benefits.

This page has been produced in consultation with, and approved by:

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