

Black and Green Tea: How do they differ?

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Introduction

Both green tea and black tea come from the leaves of the plant *Camellia sinensis*, however the processing that the leaves undergo to make the final tea is different. The leaves for black tea are fully oxidized while those from green tea are lightly steamed before being dried.

Green tea and Black tea processing

When *Camellia sinensis*' finished product is non-oxidized it is known as green tea. This is done by a partial withering then steaming and parching followed by rolling and drying and then a final firing and you get the result of a non-oxidized green tea.

Black tea starts by an indoor withering followed by rolling then it goes through a fermentation stage then the final firing and the result is oxidized black tea.

Black teas mostly come from plantations in Africa, India, Sri Lanka and Indonesia while green teas come from countries in the Far East such as China and Japan.

Flavonoid content of black and green teas

Black and green teas both contain similar amounts of flavonoids however they differ in the chemical structure. Green teas contain more of the simple flavonoids called catechins, while the oxidation that leaves undergo to make black tea converts these simple flavonoids to the more complex varieties called theaflavins and thearubigins. Flavonoids in black and green tea will differ dependent on the variety of leaf, growing environment, manufacturing, particle size of ground tea leaves and infusion preparation.

Flavonoids in green and black tea

On the average of 100 grams of green tea the flavonoid catechins amount is about 14.2 grams while on the average of 100 grams of black tea the flavonoid catechins is about 4.0 grams.

Theaflavins in green tea are 0 grams while in black tea there are .94 grams. Flavonol glycosides in green tea are .64 grams and in black tea there are .47 grams. Flavone C glycosides in green tea are .086 grams and in black tea there are .051. Total polyphenols in green tea are 16 grams and in black tea 15.6 grams. The majority of polyphenols in tea are flavonoids. Oolong tea is a partially fermented leaf, with a flavonoid profile midway between green and black tea.

The health benefits of flavonoids

Although the oxidization process modifies the type of flavonoids present, the total level and their overall antioxidant activity, is similar in both teas. Research is now suggesting that antioxidants, such as those found in both green and black tea may have a protective role to play in certain conditions such as heart disease, stroke and some cancers.

The health benefits of green tea

Green tea specifically has been associated with protection against certain types of cancer, including lung cancer, stomach cancer and its precancerous condition, gastritis. Moreover, an observation study in Japan found that the regular consumption of green tea (more than three cups a day) might be protective against recurrence of breast cancer in the early stages.

The possible protective of green tea is unclear, although a number of in vitro and animal studies are attempting to explain this, including a study that found that the green tea polyphenol-epigallocatechin (EGC) inhibited the DNA replication in leukemia cells, resulting in the death of these cells.

Further work is still required in understanding the protective antioxidant action of black and green teas. In one in vitro study, black tea was found to be more efficient than green tea as a chemopreventor against certain free radicals, oxygen and nitrogen species.

However, in another study both green tea and black tea were equally able to protect against Nitric Oxide toxicity.

In addition to its potential ant carcinogenic and antioxidant effects, other studies have shown green tea to have anti-inflammatory, antithrombotic, cholesterol lowering, antiviral and antibacterial properties.

Although the scientific evidence demonstrating the health benefits of green tea is increasing it is not yet conclusive and provides an interesting area for future research.

Green tea and skin protection

A number of animal studies have shown that topical treatment or oral consumption of green tea polyphenols; inhibit chemical carcinogen or ultraviolet radiation-induced skin tumors in different animal models. Treatment of green tea polyphenols to skin has been shown to have beneficial effect on the biochemical pathways involved in skin inflammation, cell proliferation and chemical tumor promoters. These results have been confirmed in a human model, where topical application of green tea polyphenols

protected against UV light induced DNA damage. Based on results mainly from animal studies, many companies are now supplementing their skin care products with green tea extracts. However, the effects on human skin are still not well understood and further research in this field is required.

Green tea extract and weight loss

Preliminary research published in the American Journal of Clinical Nutrition suggest that an extract from green tea may help with weight loss by speeding up fat oxidation. In this study, researchers conducted a 6 week study of 10 healthy men in their 20's and found that those men who were given a green tea extract used more calories in

a day than those who did not. Further research is required before any firm conclusions about green tea and weight loss can be drawn.

Caffeine Content of Green Tea and Black Tea

Black and Green teas are both produced from the plant *Camellia sinensis* so both green tea and black tea naturally contains caffeine.

Which to drink?

The health benefits gained from drinking black and green tea are comparable, both helping towards promoting health and well being. The decision about which to drink is simply a matter of taste.

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