

# Green Tea

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**G**reen tea is unfermented tea produced from the leaves of *Camellia sinensis*. Due to minimal processing required to produce green tea, it is richer in polyphenols (flavonoids and catechins) than oolong or black tea. Together with caffeine, catechins are believed to play a role in energy metabolism, which advocates claim results in weight loss.

**PREPARATIONS:** Most commonly available as loose tea or as teabags, green tea is also available as an extract (GTE) in capsules, tablets, liquid gel caps, and liquid formulations. Other commercial preparations claiming weight loss include creams and soap, and a variety of food products such as energy drinks and ice-cream.

**COMMON NAMES:** green tea extract, tea extract, Japanese tea, green sencha tea.

**LATIN NAME:** *Camellia sinensis*

**ACTIVE CONSTITUENTS:** Compounds claimed to generate powerful medicinal and therapeutic properties are catechin, epicatechin, epicatechin gallate, epigallocatechin, and epigallocatechin gallate (EGCG). Of these, EGCG accounts for 40% of the total catechin content and is the most widely studied compound.

**MANUFACTURER CLAIMS:** Green tea is purported to be a powerful antioxidant that is useful in assisting weight loss by increasing physical performance and energy expenditure. Several manufacturers claims that green tea improves brain function, supports cardiovascular health by lowering blood pressure and cholesterol, and lowers the risk of type 2 diabetes. It has also been

suggested as a treatment for various cancers, depression, neurodegenerative diseases, stroke, kidney stones, osteoporosis and liver damage, among others.

**EVIDENCE FOR EFFICACY:** It is proposed that green tea catechins reduce body fat by stimulating the sympathetic nervous system, increasing energy expenditure and promoting fat oxidation. Several studies have shown positive results with a trial on 12 healthy men, following acute ingestion of GTE, showing a 17% increase in fat oxidation and 13% increase in glucose tolerance during moderate intensity exercise. Although this may sound promising for weight loss, a 2012 Cochrane systematic review showed that while there was a trend towards the loss of bodyweight, reduction in BMI and waist circumference in those consuming GTE, findings were not significant. Furthermore, the preparations had no significant effects in maintaining weight loss in subjects.

**ADVERSE EFFECTS:** Consumed as a tea in moderate amounts, green tea is likely to be safe; however high levels of catechins, such as that found in GTE, have been reported to cause serious liver injury in susceptible individuals. Although the evidence is inconclusive, studies suggest that GTE be taken with food to minimise the risk of liver damage. Furthermore the caffeine in green tea can cause mild to severe adverse reactions including headache, insomnia, tremor, convulsions and confusion, can worsen anxiety, hypertension, irritable bowel syndrome, and may interfere with iron absorption. In pregnancy and/or breastfeeding no more than two cups of green tea per day is recommended.

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Herbal medicines are a popular health care choice, but few have been tested to contemporary standards. **POTION OR POISON?** summarises the evidence for the potential benefits and possible harms of well-known herbal medicines.

### Summary message

Green tea may provide several health benefits as result of its high antioxidant activity, but in relation to weight loss, results are marginal. While animal trials have shown promise, many published studies have shown that green tea causes only a small, non-significant, weight loss. Furthermore, no significant effects were reported on the maintenance of weight loss. Significant interactions may occur as result of the high caffeine content in GTE, and care should be taken with stimulant drugs, antihypertensives and anticoagulants. Several reports of hepatotoxicity have been documented with GTE, which appears to be minimised if taken with food. Pregnant or breastfeeding women should not drink more than 2 cups of green tea per day, and children should not consume amounts greater than that found in food.

**DRUG INTERACTIONS:** Stimulant drugs should be avoided with green tea. Moderate interactions could occur with adenosine, oral contraceptives, antibiotics, antidepressants (MAOIs), anticoagulants and antiplatelet drugs, clozapine, lithium, theophylline, verapamil and any hepatotoxic drugs. All interactions cited are as result of the caffeine content in green tea or GTE.

### Key references

1. Jurgens TM, Whelan AM, Killian L, Doucette S, Kirk S, Foy E. Green tea for weight loss and weight maintenance in overweight or obese adults. *Cochrane Database Syst Rev.* 2012;12:CD008650.
2. Sarma DN, Barrett ML, Chavez ML, Gardiner P, Ko R, Mahady GB, et al. Safety of green tea extracts: a systematic review by the US Pharmacopeia. *Drug Saf.* 2008;31(6):469–84. doi:10.2165/00002018-200831060-00003
3. Venables MC, Hulston CJ, Cox HR, Jeukendrup AE. Green tea extract ingestion, fat oxidation, and glucose tolerance in healthy humans. *Am J Clin Nutr.* 2008;87(3):778–84.