

Nutrition and Health Info-Sheet

For Health Professionals

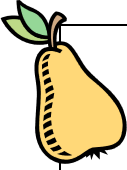
Produced by
Karrie Heneman, PhD,
Sheri Zidenberg-Cherr, PhD
UC Cooperative Extension
Center for Health and
Nutrition Research
Department of Nutrition
University of California
Davis, CA 95616-8669
November 2007

Some Facts About Catechins

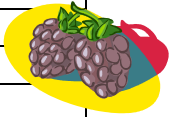
What are catechins?

Catechins are phytochemical compounds found in high concentrations in a variety of plant-based foods and beverages. Based on their structure, catechins are classified as flavanols and include the following compounds: catechin, epicatechin, epigallocatechin, epicatechin gallate, and epigallocatechin gallate. High concentrations of catechin can be found in red wine, broad beans, black grapes, apricots and strawberries; epicatechin concentrations are high in apples, blackberries, broad beans, cherries, black grapes, pears, raspberries, and chocolate; and epigallocatechin, epicatechin gallate, and epigallocatechin gallate are found in high concentrations in tea (1). Below is a list of the catechin content of various foods.

Table 1: The Catechin Content of Various Foods (2)



Food	Catechin Content (mg/100g)	Epicatechin Content (mg/100g)	Epigallocatechin, Epicatechin Gallate, & Epigallocatechin Gallate (mg/100g)
Red Table Wine	7.0	3.3	0.1
Brewed Green Tea	2.6	8.3	114.3
Brewed Black Tea	1.5	2.1	23.1
Cocoa	0.00	26.2	0.00
Milk Chocolate	2.1	6.3	0.00
Dark Chocolate	12.0	41.5	0.00
Apples	0.9	6.1	0.6
Blackberries	37.1	4.7	0.8
Fava Beans	8.2	7.8	4.7
Cherries	1.3	7.0	0.4
Black Grapes	10.1	8.7	2.8
Pears	0.3	3.8	0.8
Raspberries	1.6	4.1	1.0



Are there beneficial effects associated with consumption of catechins?

Consumption of catechins has been associated with a variety of beneficial physiological effects including increased plasma antioxidant activity, increased brachial artery dilation, increased fat oxidation, and increased resistance of LDL to oxidation (1).

There seems to be a lot of media attention given to red wine, chocolate, and tea. Are these really “super foods”?

As shown in Table 1 red wine, chocolate, and tea are all high in catechins, in addition to a variety of other polyphenolic compounds. Below is a summary of the research that has looked at the effects of consuming these foods:



- **Red Wine:** Research has investigated the relationship between consumption of red wine and a variety of chronic diseases including lung cancer, prostate cancer, and cardiovascular disease.

- *Cardiovascular disease:* Consumption of red wine is associated with a reduction in endothelin-1 (a molecule involved in blood pressure regulation), a reduction in myocardial ischemic reperfusion injury, increased HDL, decreased platelet aggregation, increased fibrinolysis, and increased antioxidant activity (3).
- *Lung Cancer:* In one recent investigation, consumption of red wine was associated with a reduced risk of lung cancer in comparison to those who did not consume any red wine (4).
- *Prostate Cancer:* In middle aged men, a 6 percent decrease in risk of prostate cancer has been observed for every glass of red wine consumed per week (5).
- *Conclusions:* The American Heart Association does not recommend consumption of alcohol to reduce risk of cardiovascular disease and the American Cancer Society recommends limiting consumption of alcoholic beverages. If adults choose to drink alcoholic beverages, the Dietary Guidelines 2005 recommends they do so in moderation. Moderation is considered 1 drink (defined as 12 oz. beer, 4 oz. of wine, 1.5 oz. of 80-proof spirits, or 1 oz. of 100-proof spirits) per day for women and 2 drinks per day for men (6).

- **Chocolate:** Kuna Indians, an island dwelling population that consumes high levels of cocoa (≥ 5 cups per day), have low rates of elevated blood pressure or hypertension (7). Furthermore, epidemiological research of elderly men suggests that consumption of cocoa containing foods is associated with a reduced risk of cardiovascular and all cause mortality (8).



- *Cardiovascular disease:* Consumption of chocolate or cocoa has been associated with a variety of cardiovascular benefits including decreased LDL oxidation, decreased platelet activation and function, increased antioxidant capacity, decreased oxidative stress, increased HDL concentration, increased prostacyclin levels, decreased leukotriene levels, increased Nitric Oxide bioactivity, improved endothelial function, lower systolic and diastolic blood pressure, improved insulin sensitivity, decreased insulin resistance, decreased free radical induced hemolysis, improved vasodilation of brachial artery, and decreased LDL cholesterol (10). Furthermore, in one recent investigation, consumption of approximately 30 kcals of dark chocolate daily for eighteen weeks was associated with decreased blood pressure (11).
- *Conclusions:* The Dietary Guidelines for Americans 2005 recommends that the average person (those who consume 2,000 calories per day) consume 1,733 calories of nutrient dense foods (fat-free or lowfat foods from the six core food groups of grains, vegetables, fruits, milk, meat and beans, and oils) and only 267 “discretionary calories” (added fats and sugars) (6). In light of current chocolate research, it may be beneficial to include a small piece of dark chocolate (equal to 30 kcals) as part of your daily discretionary calorie allotment.

- **Tea:** Tea has been consumed by Asian populations for thousands of years and is purported to have numerous beneficial effects on health. Research has investigated the relationship between tea and several related issues including cardiovascular disease, cancer, weight management, diabetes, Alzheimer's disease, and bone density.

- *Cardiovascular Disease:* Epidemiological evidence suggests that consumption of tea is inversely associated with myocardial infarction (12). Tea flavonoids have been found to have vasculoprotective, antioxidative, antithrombogenic, anti-inflammatory, and lipid-lowering properties, which may be responsible for the reduced risk of cardiovascular disease (13). Unfortunately, it is not known if all these actions also occur in the body. Therefore, researchers still do not have a true understanding of the mechanism behind the cardioprotective effects of tea consumption.



- *Cancer:* According to the American Cancer Society, consumption of green tea has been associated with a reduced risk of skin, esophagus, stomach, colon, pancreas, lung, bladder, prostate, and breast cancer. Unfortunately, the results from human studies are contradictory; therefore, consumption of tea solely for cancer prevention is not recommended (14).

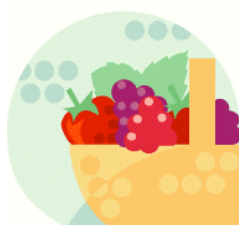
- *Weight Management:* Despite promising findings in experimental systems, there is limited long-term human evidence to support the consumption of green tea for weight loss (15).

- *Type II Diabetes:* Current research investigating the relationship between consumption of flavonoid rich food and risk of type 2 diabetes has not found a significant relationship between tea consumption and risk of this disease (16, 17).

- *Alzheimer's Disease:* Current epidemiological research investigating Alzheimer's Disease does support a protective effect tea consumption (18).

- *Bone Density:* In a recent investigation with elderly women (70-85 years), tea consumption was associated with a higher hip bone mineral density at the end of the study and, during the five year course of the study, with a lower hip bone mineral density loss. The findings from this investigation were in support of previous research (19).

- *Conclusions:* Current research supports an inverse relationship between consumption of tea and risk of cardiovascular disease and loss of bone mineral density. In light of these findings, replacing a daily cup of coffee or caffeinated soda with a cup of unsweetened tea may prove to be beneficial to overall health, but no specific recommendations regarding tea consumption can be made.



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* Production of this material was supported by a grant from the Vitamin Cases Consumer Settlement Fund, created as a result of an antitrust class action. One of the purposes of the fund is to improve the health and nutrition of California consumers.

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