Health benefits of tea and wine

These brief reports (selected from many others filed for possible future use in a book on the subject!) suggest that tea and wine are potentially powerful health enhancers! My thanks to Simon Martin for helping me collect these.

Note: Some of these reports are taken from press reports, while others contain citations as to their original sources. The press reports do not all offer clear indications as to the origin of the information.
These reports are offered for interest only, and are not meant to be seen as definitive scientific evidence of benefits or a recommendations for self-application.

Tea helps prevent development of chronic disease

Detailed multidisciplinary research on the effect of tea and the associated tea polyphenols has led to major advances on the underlying mechanisms. In most studies, green and black tea have similar effects, including :

1) Tea polyphenols are powerful antioxidants that may play a role in lowering the oxidation of LDL-cholesterol, with a consequent decreased risk of heart disease, and also diminish the formation of oxidized metabolites of DNA, with an associated lower risk of specific types of cancer.
2) Tea and tea polyphenols selectively induce Phase I and Phase II metabolic enzymes that increase the formation and excretion of detoxified metabolites of carcinogens.
3) Tea lowers the rate of cell replication and thus the growth and development of neoplasms.
4) Tea modifies the intestinal microflora, reducing undesirable bacteria and increasing beneficial bacteria.

The accumulated knowledge suggests that regular tea intake by humans might provide an approach to decrease the incidence of and mortality from major chronic diseases

J. H. Weisburger. 1999. Tea and health: the underlying mechanisms. Proc Soc Exp Biol Med. 220. 4. 271-275

Osteoporosis prevention

Hip fractures related to poor bone mineral density (BMD) are a significant cause of illness in elderly women. Hegarty et al studied a group of 1256 women ages 65-76 living near Cambridge, UK of whom 1134 were tea drinkers. Skeletal measurements were taken at the lumbar spine, femoral neck, greater trochanter, and Ward's triangle. Tea drinking was highly associated with greater BMD at all sites with the exception of the femoral neck. The beneficial effect of tea on BMD occurred independent of factors such as the addition of milk, coffee drinking, smoking, or the use of hormone replacement therapy. The tea drinkers overall had a 5% greater mean BMD than non-tea drinkers. The authors equate this difference with a 10-20% decline in fracture risk.

Hegarty VM, et al. Tea drinking and bone mineral density in older women. Am J Clin Nutr 2000; 71:1003-7

Cancer / DNA and tea

Whether tea really helps prevent cancer is still under debate, but research in its favour is piling up. In one of the largest studies to date, Iowa researchers found that tea may be a powerful cancer fighter, according to a study published in the July 1996 issue of the American Journal of Epidemiology. The study of more than 35,000 postmenopausal women showed that those who drank at least two cups of black tea a day were 40 percent less likely to develop urinary tract cancer and 68 percent less likely to develop cancer in the digestive tract than women who did not drink tea. Other research shows that tea may be a promising weapon in the fight against cancers of the stomach, bladder, esophagus and prostate. Moreover, a study in China concluded that smokers who drink tea have a lower incidence of lung cancer,

J.H Weisburger Second International Symposium on Tea and Human Health. April 1999

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Tea intake is inversely related to blood pressure in older women.

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Tea is rich in polyphenols, which have activities consistent with blood pressure-lowering potential.
The effects of long-term regular ingestion of tea on blood pressure remain uncertain.
We investigated the relationships of tea intake and a biomarker of exposure to tea-derived polyphenols (4-O-methylgallic acid) with blood pressure in a cross-sectional study of 218 women > 70 y old. Clinic blood pressures were measured and tea intake was assessed using a 24-h dietary recall; 4-O-methylgallic acid was measured for the same period in a 24-h urine sample.
Mean (95% CI) daily tea intake was 525 (475, 600) mL.
Mean systolic and diastolic blood pressures were 138.1 (135.6, 140.6) and 73.5 (72.1, 74.9) mm Hg. Higher tea intake and higher 4-O-methylgallic acid excretion were associated with significantly lower systolic ($P = 0.002$ and $P = 0.040$, respectively) and diastolic ($P = 0.027$ and $P < 0.001$, respectively) blood pressures. A 250 mL/d (1 cup) increase in tea intake was associated with a 2.2 (0.8, 3.6) mm Hg lower systolic blood pressure and a 0.9 (0.1, 1.7) mm Hg lower diastolic blood pressure.
The observed associations for both tea intake and 4-O-methylgallic acid are consistent with the hypothesis that long-term regular ingestion of tea may have a favorable effect on blood pressure in older women.
Hodgson JM, Devine A, Puddey IB, Chan SY, Beilin LJ, Prince RL J Nutr. 2003 Sep;133(9):2883-6.

Black Tea May Help Get Blood Circulating
By Amy Norton
NEW YORK (Reuters Health) - A cup of black tea may give a quick boost to blood flow to the heart, the results of a small study suggest.
In an experiment with 10 healthy men, Japanese researchers found that blood-flow in the coronary arteries improved two hours after the men drank black tea. The same was not true of a caffeinated drink used for comparison.
Numerous studies have suggested that tea drinking may do a heart good, with effects on cholesterol, blood clotting and blood vessel function being among the proposed mechanisms.

The new study, reported in the American Journal of Cardiology, suggests it also has a more immediate beneficial effect. The authors suspect that black tea improved the dilation of the men's blood vessel, allowing better blood flow.

Tea is rich in antioxidant compounds called flavonoids, and these may be the key to the beverage's potential heart benefits, study co-author Dr. Kenei Shimada of Osaka City University told Reuters Health.

For the study, the researchers used a special ultrasound method to gauge "coronary flow velocity reserve" or CFVR. This reflects how much blood-flow can speed up when demands are put on the heart, and paints a picture of the healthiness of the coronary circulation.

Shimada's team measured the CFVR of each of the men after they drank either black tea or a caffeinated beverage, and found that it increased significantly after the black tea.

"The results of this study suggest that black tea consumption has a beneficial effect on coronary circulation," the researchers report.

They speculate that the flavonoids in black tea improve the functioning of the lining of the blood vessels, increasing how much the vessels dilate in response to blood flow. Dysfunction in this lining, called the endothelium, is one of the things that goes wrong as heart disease develops.

It's not clear what the long-term implications of the findings on CFVR might be, but Shimada said research has shown coronary flow reserve to be related to heart disease risk.

Larger studies, particularly in people with coronary artery disease, are needed to establish how tea affects the coronary circulation, the researchers conclude.

American Journal of Cardiology, June 1, 2004

Tea and HIV

Tea May Offer Treatment to Fight HIV - Japan Study

by Christopher Doering

WASHINGTON (Reuters) - Japanese researchers said on Monday they had discovered a molecule in tea that could block the spread of the AIDS

The lab findings could offer a novel way to combat the HIV infection by preventing the virus from spreading throughout the body, scientists said.

Current treatments that target HIV fight the infection after it has spread.

Scientists at the University of Tokyo, led by Kuzushige Kawai, found a compound called epigallocatechin gallate or EGCG, the element believed to

contain most of the health benefits found in green tea, rapidly attaches to the doorways that the AIDS virus uses to invade cells.
HIV prefers to infect cells called CD4 T-cells, and uses a molecular doorway called the CD4 receptor to do so.
By bonding with the CD4 molecule first, EGCG effectively prevents the HIV virus from attaching -- at least in lab dishes.
"This potentially opens up an avenue for preventing HIV infections," said Dr. William Shearer, a professor at Baylor College of Medicine in Houston, who wrote an editorial that accompanied the study. "Is there something here that mother nature is trying to tell us?"
Writing in the Journal of Allergy and Clinical Immunology, the researchers said they are still looking to explain why EGCG is attracted to CD4 molecule, in the hope of making it work even better.
Earlier studies have showed that people who drink a lot of tea have lower rates of cancer, heart disease and rheumatoid arthritis. In September, the U.S. Department of Agriculture found people who drank black tea saw their cholesterol drop between 7 and 11 percent.
Simply drinking tea would probably not be enough to prevent HIV infection, Shearer said. If EGCG is shown to work in a living animal, it would have to be concentrated, perhaps in a pill.
The lab study found that EGCG attached to 80 percent of CD4 receptors after five minutes and to virtually all of them after 30 minutes.
The popularity of tea has soared during the last decade.
According to the Tea Association of the United States, total sales of tea in 2002 were $5.03 billion, up from $1.84 billion in 1990.

Catechin inhibits tumour formation
Catechins, found abundantly in fruits and vegetables are powerful antioxidants (Nakao 1998)
Microscopic imaging of colon cancer cells showed organized actin stress fibres, characteristic of adherent cells, became ‘reorganised’, when treated with catechin. Same study showed catechin reduced the invasive capacity of HT-29 colon cancer cells and also modulates integrin-mediated signaling in colorectal cancer cell lines, in enterocytes and tumours. (Weyant 2001)
Catechin is readily absorbed. A good source is red wine, where fermentation enhances bioavailability. Effective dosage is estimated to be contained in 500ml red wine daily (less if diet contains apples, onions, grapes, chocolate)(Hackett 1983, Bell 2000)

Nakao M et al 1998 Alkyl peroxy radical scavenging activity of catechins Phytochemistry 49:2379-2382
Weyant M et al 2001 Catechin inhibits intestinal tumor formation Cancer Research 61:118-125
Hackett A et al 1983 Metabolism and excretion of [catechin] in man following oral administration. Xenobiotica 13:279-286.
Bell J et al 2000 Catechin in human plasma after ingestion of single serving reconstitute

White wine does you good
(London *Times* May 21 2002)
Mark Henderson - Science Correspondent

Researchers at The University of Buffalo found that people who drink a few glasses of white wine on a regular basis have stronger lungs than those who never touch it. The results of the study were presented (20 May 2002) at The American Thoracic Society's annual conference in Atlanta, Georgia.
Holger Schunemann, the study's leader, said: "This finding may indicate that nutrients in wine are responsible for the positive effect of alcoholic beverages on lung function. Red wine in moderation has been shown to be beneficial for the heart, but in this case the relationship was stronger for white wine."
1,555 volunteers completed questionnaires that assessed alcohol consumption and other aspects of their lifestyles.
They then took two standard lung-function tests that measured forced vital capacity (FVC) — and the volume that can be expelled in one second (FEV1).
Both a recent and a lifetime history of moderate wine drinking, particularly with white wine, were associated with high readings for FVC and FEV1 lung capacity.
The benefits probably come from compounds such as phenols and flavonoids, abundant in wine, which reduce oxidative stress..