Tea Association of the U.S.A. Inc.

Tea Fact Sheet – 2013

Tea is the most widely consumed beverage in the world next to water, and can be found in almost 80% of all U.S. households. It is the only beverage commonly served hot or iced, anytime, anywhere, for any occasion. On any given day, over 158 million Americans are drinking tea.

Annual Consumption: (U.S.)	In 2012, Americans consumed well over 79 billion servings of tea, or over 3.60 billion gallons. About 84% of all tea consumed was Black Tea, 15% was Green Tea, and a small remaining amount was Oolong and White Tea.
Daily Consumption: (U.S.)	On any given day, over one half of the American population drinks tea. On a regional basis, the South and Northeast have the greatest concentration of tea drinkers.
Iced Tea Consumption:	Approximately 85% of tea consumed in America is iced.
Ready-To-Drink Iced Teas:	Over the last ten years, Ready-To-Drink Tea has grown more than 15 fold. In 2012, Ready-To-Drink sales were conservatively estimated at $4.8 billion and this trend continues in 2013.
Tea Bags, Loose Tea & Iced Tea Mixes:	In 2012, over 65% of the tea brewed in the United States was prepared using tea bags. Ready-to-Drink and iced tea mix comprises about one fourth of all tea prepared in the U.S., with instant and loose tea accounting for the balance. Instant tea is declining and loose tea is gaining in popularity, especially in Specialty Tea and coffee outlets.
Current Sales:	2012 continued the trend of increased consumer purchases of tea. Retail supermarket sales alone surpassed the $2.25 billion dollar mark. Away-from-home consumption has been increasing by at least 10% annually over the last decade. Total sales have increased 16% since over the last 5 years.
Anticipated Sales: (U.S.)	The industry anticipates strong, continuous growth over the next five years. This growth will come from all segments driven by convenience, interest in the healthy properties of tea, and through the continued discovery and appreciation of unique, flavorful and high-end Specialty Tea.
Varieties:	Black, Green, Oolong and White teas all come from the same plant, a warm-weather evergreen named *Camellia sinensis*. Differences among the four types of tea result from the various degrees of processing and the level of

oxidization. Black tea is oxidized for up to 4 hours and Oolong teas are oxidized for 2-3 hours. As a result, the tea leaves undergo natural chemical reactions, which result in taste and color changes, and allow for distinguishing characteristics. Green & White teas are not oxidized after leaf harvesting, so they most closely resemble the look and chemical composition of the fresh tea leaf. Oolong tea is midway between Black and Green teas in strength and color.

Grown In:

Much of the world's tea is grown in mountainous areas 3,000 – 7,000 feet above sea level, situated between the Tropics of Cancer and Capricorn in mineral-rich soil. Leading tea-producing countries include Argentina, China, India, Indonesia, Kenya Malawi, Sri Lanka, Tanzania and Taiwan.

History:

Tea is nearly 5,000 years old. It was discovered in 2737 BC by Chinese Emperor Shen-Nung, also known as the "Divine Healer," when as legend goes, some tea leaves accidentally blew into the Emperor's pot of boiling water.

In the 1600's, tea became highly popular throughout Europe and the American colonies. Tea played a dramatic part in the establishment of the United States of America. In 1767 the British Government put a tax on the tea used by American colonists. Protesting this "taxation without representation," the colonists decided to stop buying tea and refused to allow tea ships to be unloaded. One December night in 1773, men dressed as Native Americans boarded British ships in Boston Harbor and threw more than 300 chests of tea into the sea. While not the only instance of teas being thrown overboard in protest of the British tax on tea, this most famous Boston Tea Party was said to be a principle act leading to the Revolutionary War.

Anna, Duchess of Bedford, is credited with creating *Afternoon Tea* in 1840, when she began taking tea with a light snack around 4:00 p.m. to ward off "that sinking feeling."

High Tea originated with the rural and working class British, who would return to their homes at about 6:00 p.m. for a meal of potted meats, fish, cheese, salads, sweets, and a pot of strong tea. The U.S. played an important role in the history of tea, inventing the tea bag and iced tea, both in 1904. Recently, the U.S. has led the rest of the world in

marketing convenient Ready-To-Drink forms of tea in bottles.

Environmental Qualities:

Tea is an all-natural and environmentally sound product from a renewable source. The tea plant is naturally resistant to most insects; oxidation of the tea leaf is a natural process; and, many tea packers use recycled paper for packaging.

Tea is a refreshing beverage that contains no sodium, fat, carbonation, or sugar. It is virtually calorie-free. Tea helps maintain proper fluid balance and may contribute to overall good health.

Tea contains flavonoids, naturally occurring compounds that are believed to have antioxidant properties. Tea flavonoids often provide bioactive compounds that help to neutralize free radicals, which scientists believe, over time, damage elements in the body, such as genetic material and lipids, and contribute to chronic disease.

Health Qualities:

Every day, new findings from the international scientific community lend credibility to tea's healthy properties. Recent research has explored the potential health attributes of tea through studies in humans, animal models and through *in vitro* laboratory research. For the most part, studies conducted on green and black tea, which are both from the *Camellia sinensis* plant, have yielded similar results. Recent research suggests that tea and tea flavonoids may play important roles in various areas of health and may operate through a number of different mechanisms still being explored.

As research continues, here are some exciting recent findings:

Heart Health:

Human population studies have found that people who regularly consume three or more cups of Black Tea per day have a reduced risk of heart disease and stroke.[11-15] The current body of research suggests that drinking tea can offer significant heart health benefits ranging from reducing heart attack risk to lowering Low Density Lipoprotein (LDL) cholesterol, or "bad" cholesterol, with benefits seen with just one cup and upwards of six cups a day. A Harvard study found that those who drank a cup or more of black tea per day had a 44% reduced risk of heart attack.[1] In a large population based study, adults who drank just over two cups

of green tea per day reduced their risk of death from cardiovascular disease by 22-23%.[2] Additionally, a US Department of Agriculture study found that participants who drank five cups of black tea per day along with a diet moderately low in fat and cholesterol reduced their LDL cholesterol by about 11% after three weeks.[3]

Certain Cancers:

More than 3,000 published research studies exist that evaluate the role tea—whether white, green, oolong or black—and tea compounds, such as epigallocatechin gallate (EGCG), may play in cancers of various sites. Benefits to gastrointestinal health reaped by tea-drinking seem to be cumulative and dependant upon the amount of tea consumed per day as well as the number of tea-drinking years. One study found that women who consumed the equivalent of 2.5 cups of tea per day had a 60% reduction in rectal cancer risk, compared with women who drank less than 1.2 cups of tea daily.[4] An additional study found tea drinkers to have an approximate 42% reduced risk of colon cancer compared to non-tea drinkers. Men who drank more than 1.5 cups of tea per day were found to have a 70% lower colon cancer risk.[5] One study showed that participants who drank iced black tea and citrus peel had a 42% reduced risk of skin cancer[6] and hot black tea consumption was associated with a significantly lower risk of the most common form of skin cancer, squamous cell carcinoma.[7]

Neurological Decline:

Age-related declines in memory and cognition occur naturally, but research suggests that modifiable factors, such as diet and exercise, may help slow the progression of age-related neurodegeneration.[16-17] Research indicates recommendations to improve heart and cardiovascular function are also neuroprotective.[16-17] The benefits of tea that help improve biomarkers for reducing risk of heart disease may improve brain health too. The antioxidants in tea may be one way to help protect brain cells from environmental insults from free radicals. [18-20] In addition, L-theanine in tea has been shown to directly affect areas of the brain that control attention and ability to solve complex problems.[21-23] A recently published long-term study of nearly 30,000 adults found that drinking three or more cups of tea per day was associated with a 69% reduced risk of

developing Parkinson's disease.[8] According to research presented at the 2007 Scientific Symposium on Tea and Health, theanine, an amino acid that is for the most part uniquely found in tea (green and black), may help prevent age-related memory decline. This human-based data is supported by recent animal studies utilizing theanine.[9] Another recent animal study shows that green tea may have protective effects against Alzheimer's disease.[10]

Metabolism, Obesity and Body Composition:

Several studies suggest drinking calorie-free tea may help with weight management.[24-35] Preliminary research suggests that tea flavonoids help elevate metabolic rate, increase fat oxidation and improve insulin activity.[24,26,28, 33-35] Tea catechins can also provide modest shifts in metabolism that may improve weight loss and maintenance.[24,28,34,35]

Tea and Reduced Risk of Osteoporosis:

Although high caffeine intake has been suggested to be a risk factor for reduced bone mineral density (BMD), drinking tea has been linked to higher bone mineral density (BMD) and has been shown to boost bone-building markers and improve muscle mass, both of which may reduce the risk for osteoporosis and fracture.[36-41] Compared to non-tea drinkers, tea drinkers have been found to have a higher BMD.[36]

Caffeine Content: Tea is naturally low in caffeine. A cup of Black Tea, for example, contains about 40 milligrams of caffeine.

Cost Per Serving: Prepared in the home, tea costs about three cents per serving, cup or glass. Tea continues to remain one of the most economical beverages available.

Tea: The smart choice for today and the millennium.

Key Tea Terms:	Antioxidant: A substance that helps prevent or delay oxidative damage caused by reactive oxygen and or reactive nitrogen species. Oxidative damage to the body, cells and tissues may contribute to diseases like cancer and heart disease. Phytochemicals: Naturally occurring plant compounds. Many phytochemicals are thought to play a role in decreasing the risk of cancer and heart disease and may boost the immune system. Some phytochemicals such as tea flavonoids are also antioxidants.

	Flavonoids: A class of polyphenolic phytochemicals found in tea that are effective antioxidants. Tea flavonoids and related bio-active compounds in tea may play important roles in various areas of heath and may operate through a number of different mechanisms still being explored. Flavonols: A group of flavonoids found in tea and many fruits and vegetables that are antioxidants and are thought to contribute to some of the potential health benefits in these plant foods. They include rutin, quercetin and kaempferol. Epigallocatechin gallate (EGCG): The principle catechin in Green and Black Teas. EGCG is a strong antioxidant and has been shown to reduce formation of lung, esophageal and skin tumors in animal models of human cancer. Theanine: An amino acid commonly found in tea that can cross the blood-brain barrier, therefore has psychoactive properties. It may reduce mental and physical stress, and may produce feelings of relaxation by increasing levels of gamma-aminobutyric acid (GABA), serotonin, dopamine, and alpha wave activity.

[1] Sesso HD, Gaziano JM, Buring JE, Hennekens CH. Coffee and tea intake and the risk of myocardial infarction. Am J Epidemiol 1999;149:162-7.

[2] Kuriyama S, Shimazu T, Ohmori K, Kikuchi N, Nakaya N, Nishino Y, Tsubono Y, Tsuji I. Green tea consumption and mortality due to cardiovascular disease, cancer, and all causes in Japan: the Ohsaki study. JAMA. 2006 Sep 13;296(10):1255-65.

[3] Davies MJ, Judd JT, Baer DJ, Clevidence BA, Paul DR, Edwards AJ, Wiseman SA, Muesing RA, Chen SC. Black tea consumption reduces total and LDL cholesterol in mildly hypercholesterolemic adults. J Nutr. 2003 Oct;133(10):3298S-3302S.

[4] Dora I, Arab L, Martinchik A, Sdvizhkov A, Urbanovich L, Weisgerber U. Black tea consumption and risk of rectal cancer in Moscow population. Ann Epidemiol. 2003 Jul; 13(6): 405-11.

[5] Su LJ, Arab L. Tea consumption and the reduced risk of colon cancer -- results from a national prospective cohort study. Public Health Nutr. 2002 Jun; 5(3): 419-25.

[6] Hakim IA, Harris RB. Joint effects of citrus peel use and black tea intake on the risk of squamous cell carcinoma of the skin. BMC Dermatol. 2001; 1(1): 3. Epub 2001 Aug 01.

[7] Hakim IA, Harris RB, Weisgerber UM. Tea intake and squamous cell carcinoma of the skin: influence of type of tea beverages. Cancer Epidemiol Biomarkers Prev. 2000 Jul; 9(7): 727-31.

[8] Hu G, Bidel S, et al. Coffee and tea consumption and the risk of Parkinson's disease. Mov Disord. 2007 Aug 21: [Epub ahead of print]

[9] Egashira N, Ishigami N, et al. Theanine prevents memory impairment induced by repeated cerebral ischemia in rates. Phytother Res. 2007 Aug 17; [Epub ahead of print]

[10] Rezai-Zadeh K, Shytle D, Sun N, Mori T, Hou H, Jeanniton D, Ehrhart J, Townsend K, Zeng J, Morgan D, Hardy J, Town T, Tan J. Green tea epigallocatechin-3-gallate (EGCG) modulates amyloid precursor protein cleavage and reduces cerebral amyloidosis in Alzheimer transgenic mice. J Neurosci. 2005 Sep 21;25(38):8807-14.

[11] Larsson SC, Virtamo J, Wolk A. Black tea consumption and risk of stroke in women and men. Ann Epidemiol. 2013 Mar;23(3):157-60.

[12] 13. Arab L, Liu W, Elashoff D. Green and Black Tea Consumption and Risk of Stroke. A Meta-Analysis. Stroke. 2009;40(5):1786-92.

[13] Hakim IA, Alsaif MA, Alduwaihy M, Al-Rubeaan K, Al-Nuaim AR, Al-Attas OS. Tea consumption and the prevalence of coronary heart disease in Saudi adults: results from a Saudi national study. Prev Med 2003;36(1):64-70.

1[4] Geleijnse JM, Launer LJ, Van der Kuip DA, HofmanA, Witteman JC. Inverse association of tea and flavonoid intakes with incident myocardial infarction: the Rotterdam Study. Am J Clin Nutr 2002 May;75(5):880-6.

1[5] Peters U, Poole C, Arab L. Does tea affect cardiovascular disease? A meta-analysis. Am J Epidemiol 2001;154(6):495-503.

[16] Scarmeas N, Luchsinger JA, Schupf N, Brickman AM, Cosentino S, Tang MX, Stern Y. Physical activity, diet, and risk of Alzheimer disease. JAMA 2009 Aug 12; 302:627.

1[7] Alzheimer's Association. (n.d.) Prevention and Risk of Alzheimer's and Dementia: Heart-Head Connection. Retrieved from http://www.alz.org/research/science/alzheimers_prevention_and_risk.asp#heart

[18] Mandel SA, Amit T, Kalfon L, Reznichenko L, Youdim MBH. Targeting multiple neurodegenerative diseases etiologies with multimodal-acting green tea catechins. J Nutr 2008;138:1578S–83S.

[19] Egashira N, Ishigami N, et al. Theanine prevents memory impairment induced by repeated cerebral ischemia in rates. Phytother Res. 2007 Aug 17; [Epub ahead of print].

[20] Rezai-Zadeh K, Shytle D, Sun N, Mori T, Hou H, Jeanniton D, Ehrhart J, Townsend K, Zeng J, Morgan D, Hardy J, Town T, Tan J. Green tea epigallocatechin-3-gallate (EGCG) modulates amyloid precursor protein cleavage and reduces cerebral amyloidosis in Alzheimer transgenic mice. J Neurosci 2005 Sep 21;25(38):8807-14.

[21] Kelly SP, Gomez-Ramirez M, Montesi JL, Foxe JJ. L-Theanine and caffeine in combination affect human cognition as evidenced by oscillatory alpha-band activity and attention task performance. J Nutr 2008;138:1572S–7S.

[22] Pack S, Jung IC, Lee WK, et al. A Combination of Green Tea Extract and L-Theanine Improves Memory and Attention in Subjects with Mild Cognitive Impairment: A Double-Blind Placebo-Controlled Study. *J Med Food*. 14 (4) 2011, 334–343.

[23] De Bruin EA, Rowson MJ, Van Buren L, Rycroft, JA, Owen GN. Black tea improves attention and self-reported alertness. 2011. *Appetite*, 56: 235-240.

[24] Vernarelli JA, Lambert JD. Tea consumption is inversely associated with weight status and other markers for metabolic syndrome in US adults. Eur J Nutr 2012 Jul 10.

[24] Hursel R, Viechtbauer W, Dulloo AG et al. The effects of catechin rich teas and caffeine on energy expenditure and fat oxidation: a meta-analysis. *Obes Rev* 2011 Jul;12(7):e573-81.

[25] Hursel R, Viechtbauer W, Westerterp-Plantenga MS.The effects of green tea on weight loss and weight maintenance: a meta-analysis. Int J Obes (Lond). 2009 Sep;33(9):956-61. Epub 2009 Jul 14.

[26] Dulloo AG, Duret C, Rohrer D, Girardier L, Mensi N, Fathi M, Chantre P, Vandermander J. Efficacy of a green tea extract rich in catechin polyphenols and caffeine in increasing 24-h energy expenditure and fat oxidation in humans. Am J Clin Nutr 1999 Dec;70(6):1040-5.

[27] Chantre P, Lairon D. Recent findings of green tea extract AR25 (Exolise) and its activity for the treatment of obesity. Phytomedicine 2002;9(1):3-8.

[28] Venables MC, Hulston CJ, Cox HR, and Jeukendrup AE. Green tea extract ingestion, fat oxidation, and glucose tolerance in healthy humans. Am J Clin Nutr 2008;87(3):778-84.

[29] Nagao T, Hase T and Tokimitsu I. A green tea extract high in catechins reduces body fat and cardiovascular risk in humans. Obesity. 2007 Jun;15:1473-83.

[30] Nagao T, Komine Y, Soga S, Meguro S, Hase T, Tanaka Y, Yokimitsu I. Ingestion of a tea rich in catechins leads to a reduction in body fat and malondialdehyde-modified LDL in men. Am J Clin Nutr 2005 Jan;81(1):122-9.

3[1] Tian C, Ye X, Zhang R, Long J et al. Green Tea Polyphenols Reduced Fat Deposits in High Fat-Fed Rats via erk1/2-PPARγ-Adiponectin Pathway. PLoS One. 2013;8(1):e53796.

3[2] Murase T, Nagasawa A, Suzuki J, Hase T, Tokimitsu I. Beneficial effects of tea catechins on diet-induced obesity: stimulation of lipid catabolism in the liver. Int J Obes Relat Metab Disord 2002;26(11):1459-64.

3[3] Murase T, Haramizu S, Shimotoyodome A, Tokimitsu I. Reduction of diet-induced obesity by a combination of tea-catechin intake and regular swimming. Int J Obesity 2005 Oct:1-8.

3[4] Shimotoyodome A, Haramizu S, Inaba M, Murase T, Tokimitsu I. Exercise and green tea extract stimulate fat oxidation and prevent obesity in mice. Med Sci Sports Exerc 2005 Nov;37(11):1884-92.

3[5] Murase T, Haramizu S, Shimotoyodome A, Tokimitsu I, Hase T. Green tea extract improves running endurance in mice by stimulating lipid utilization during exercise. Am J Physiol Regul Integr Comp Physiol. 2006 Jun;290(6):R1550-6.

[36]Hegarty VM, May HM, Khaw K-T. Tea drinking and bone mineral density in older women. Am J Clin Nutr 2000;71:1003-7.

3[7] Wu CH, Yang YC, Yao WJ, Lu FH, Wu JS, Chang CJ. Epidemiological evidence of increased bone mineral density in habitual tea drinkers. Arch Intern Med 2002 May 13;162(9):1001-6.

3[8] Devine A, Hodgson JM, Dick IM, Prince RL. Tea drinking is associated with benefits on bone density in older women. Am J Clin Nutr 2007;86(4)1243-7.

3[9] Lloyd T, Rollings NJ, Kieselhorst K, Eggli DF, Mauger E. Dietary caffeine intake is not correlated with adolescent bone gain. J Am Coll Nutr 1998;17:454-7.

[40] Lloyd T, Johnson-Rollings N, Eggli DF, Kieselhorst K, Mauger EA, Cusatis DC. Bone status among postmenopausal women with different habitual caffeine intakes: a longitudinal investigation. J Am Coll Nutr 2000;19:256-61.

[41] Shen CL, Chyu MC, Yeh JK, Zhang Y, Pence BC, Felton CK, Brismee JM, Arjmandi BH, Doctolero S, Wang JS. Effect of green tea and Tai Chi on bone health in postmenopausal osteopenic women: a six-month randomized placebo-controlled trial. Osteoporos Int 2012; 23(5):1541-52.