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

362 5th AVENUE, SUITE 1002, NEW YORK, NY 10001
TEL: 212-986-9415 • FAX: 212-697-8658 • www.teaUSA.org

January 24, 2025

Ms. Janet M. de Jesus, MS, RD
Office of Disease Prevention and Health Promotion (ODPHP)
Office of the Assistant Secretary for Health (OASH)
HHS; 1101 Wootton Parkway, Suite 420
Rockville, MD 20852

Re: Docket ID HHS-OASH-2024-0017- To Inform the Development of the *Dietary Guidelines for Americans*, 2025-2030

Dear Ms. de Jesus:

The Tea Association of the U.S.A., Inc. and the Tea Council of the USA is grateful for the opportunity to respond to the Scientific Report with comments to the U.S. Department of Agriculture and Health and Human Services (the departments) to develop the Dietary Guidelines for Americans (DGA) 2025-2030. The Tea Association of the U.S.A., Inc. is the recognized independent authority on tea, acting as the official voice for its members on issues related to the tea industry, particularly in the United States.

In these comments, we provide science-backed evidence for consideration by the departments regarding the importance of healthy beverage guidance. These comments are offered as the departments undertake the work of evaluating the Scientific Report in the development of the 2025-2030 DGA.

Tea Contains Important Health-Promoting Bioactives

Tea derived from the *Camelia sinensis* plant, such as black, green, oolong, dark, and white tea, has been extensively studied for several decades for its numerous health benefits. Tea contains health-promoting bioactive compounds, such as flavonoids, including flavan-3-ols and more specifically catechins ((-)-epigallocatechin-3-gallate (EGCG)), tannins, as well as amino acids like glutamine and L-theanine, caffeine, lignins, and xanthins.[1]

Tea is affordable, accessible and its bioactive compounds, which are predominately flavonoids, have been shown to reduce the incidence of chronic disease, reduce all-cause mortality, and overall improve the quality of life.[2,3]

The public relies on the DGA for beverage and food recommendations. We recognize that the term “bioactive” is used in the 2020 – 2025 DGA, and we encourage the departments to consider expanding the use of the term to name tea as a potent source of bioactive flavonoids.[4] We urge the departments to recognize the rigorous scientific process behind the daily intake recommendation for flavan-3-ols,[5,6] and to inform the public by using the term bioactive to describe tea flavonoids.

Tea drinkers have been shown to have approximately 20 times higher flavonoid intake when compared to those who don't drink tea, and noting tea in the DGA as a source of bioactive flavonoids can help convey this benefit to the public.[7]

Freshly Brewed Tea Has No Calories, No Sugar, and Contributes to Hydration

A 1-cup serving of unsweetened brewed tea is calorie-free, contains 0 g saturated fat, 7 mg sodium, and 0 g sugar.[8,9]

Black tea is shown to benefit hydration at rates similar to water.[10] Adequate water intake is important to maintain hydration and vascular volume, absorb metabolic heat, transport nutrients and waste, and as a solvent for biochemical reactions in the body.[11]

Both caffeinated and decaffeinated tea are hydrating beverages. The Food and Nutrition Board of the Institute of Medicine reference intakes for water state that caffeinated beverages appear to contribute to the daily total water intake at rates similar to that of non-caffeinated beverages. Caffeinated tea supplies up to approximately 50 mg of caffeine per cup, and evidence shows no effect on hydration with intakes of up to 400 mg of caffeine per day or the equivalent of eight cups of tea.[12,13]

True Tea is Affordable, Accessible, and Available to All Americans

We examined the availability of true teas at Walmart, dollar stores, and grocery stores in 17 of the poorest cities in the United States. We found it to be widely affordable, accessible, and available.

High-calorie, sugar-sweetened drinks are prominently available in underserved SCED communities.[14] Including a daily recommendation of at least two cups or glasses of tea daily can help guide Americans to choose tea and to consume it in amounts adequate to provide substantial benefits for weight management, management of diabetes, and improvement in markers of metabolic health.

Two Cups or Two Glasses of Tea Per Day Linked to Significant Health Benefits

Whether served iced or hot, unsweetened tea provides significant health benefits. Consuming tea throughout the day is the most efficacious way for the body to have access to a high level of the bioactive compounds found in tea. We urge the departments to continue to consider the health benefits of true teas and certain tea beverages and **to establish a daily recommendation of two cups or two glasses of unsweetened tea**.

- Two cups of green or black tea supplies 400-600 mg flavan-3-ols, which is the recommended daily intake shown to help reduce risk associated with cardiovascular disease and diabetes and improve a number of metabolic markers including blood pressure, cholesterol, and blood sugar.[5,15]

- Each 8 oz. cup of tea consumed by those over 65 years old was associated with a 10% lower risk of death from heart disease.[7]

- A 2021 umbrella review revealed that a consistent intake of two cups of tea per day has the potential to decrease risk of cardiovascular disease and its progression.[2]

Evidence-Based Benefits for Weight Management, Diabetes, and Metabolic Health

Heart disease is the number one cause of death in the United States.[16] Of people aged 18 and older, 11.6% have been diagnosed with diabetes, with an estimated 3.4% of people going undiagnosed.[17] Obesity prevalence is estimated at 41.9% among adults in the United States.[18]

With rates of heart disease, diabetes, and obesity at an all-time high, especially among those who are in underserved SCED communities,[19] it is more important than ever to recommend tea to these consumers.

Decades of peer-reviewed research have uncovered numerous health benefits associated with regular consumption of tea. We urge the departments to consider the role of tea in improving health population wide.

Benefits of Consuming Tea for Factors Related to Diabetes

In a randomized control trial of 30 subjects, Mahmoud et al found that three cups of black tea consumption resulted in lowered hemoglobin A1C, decreased expression of tumor necrosis factor-α and increased expression of anti-inflammatory cytokines, which may reduce oxidative stress. This suggests black tea may have a positive effect on long-term diabetes management.[20]

A randomized control trial of 66 subjects with type 2 diabetes and nephropathy found that drinking three cups of green tea had beneficial effects on total cholesterol, HDL cholesterol, and hemoglobin A1C levels with no adverse effects on renal function.[21]

In an animal study, obese rats given green tea polyphenols were found to have lower levels of hyperlipidemia, body fat synthesis, body weight and fat deposits, compared to the control group. Rats given the treatment also had activated protein kinase (AMPK) activation which resulted in greater insulin sensitivity, reduced de novo lipogenesis and decreased liver fat content.[22]

A recent review found higher habitual intakes of flavan-3-ol monomers, like those found in tea, were associated with a reduction in risk of T2DM (10%) and stroke (18%); and these data were calculated to be of moderate strength.[3]

A 2019 study found that substituting just one serving of unsweetened coffee or tea (about 150 grams or 5.3 fluid ounces) for one serving of a sugar sweetened beverages (about 250 grams or 8.8 fluid ounces, representing a standard portion size of these drinks) is associated with a 20% reduced incidence of type 2 diabetes. The case cohort analysis examined more than 340,000 people over eight European populations for 3.99 million person-years of follow up.[23]

A 2023 observational study of individuals without type 2 diabetes suggests that drinking green tea (mean intake = 443 mL, or about two to three cups per day) may improve glucose metabolism, marked by measures of fasting blood glucose, hemoglobin A1C, insulin, and homeostatic model assessment for insulin resistance (HOMA-IR) levels. The study suggests that

the catechins in green tea help suppress the abundance of the gut microbiota species *P. vulgatus,* which is shown to be associated with high blood glucose levels in this population.[24]

Consumption of Tea and Weight Management

Many studies suggest drinking calorie-free tea may help with weight management.[25-37] Preliminary research suggested that tea flavonoids help elevate metabolic rate, increase fat oxidation, and improve insulin activity.[25,29,30,35-38] Tea catechins can also provide modest shifts in metabolism that may improve weight loss and maintenance. [25,30,36,37]

In one review, researchers concluded that subjects consuming green tea and caffeine lost an average of 2.9 pounds within 12 weeks while adhering to their regular diet. The results of another meta-analysis suggest the increase in caloric expenditure is equal to about 100 calories over a 24-hour period. The weight loss benefits of tea vary based on many factors, but studies have found benefits with the equivalent of as little as 2.5 cups of green tea.[38]

Using data from the Polish *Health, Alcohol and Psychosocial Factors in Eastern Europe (HAPIEE)* cohort study, tea consumers who drank more than three cups daily, had a lower body mass index (BMI) and waist circumference.[39] Research has also found that tea consumption was associated with lower BMI values.[40]

As the departments develop the 2025-2030 DGA, the Tea Association of the U.S.A., Inc. and the Tea Council of the USA urges the departments to recommend tea for hydration and its many health-promoting bioactive compounds. Overall, tea drinking has been found to be a characteristic of healthy food and beverage consumption patterns and as such should be recommended to ensure consumers are aware and educated on its many health benefits.[41]

Considering tea is the best source of flavan-3-ols in the diet and with the daily recommendation for 400-600 mg flavan-3-ol consumption to help improve blood cholesterol, blood sugar, and blood pressure, including two cups of tea as part of the 2025-2030 DGA, and raising awareness of the bioactive compounds found in tea, can assist consumers in identifying and choosing tea for these health benefits.

Sincerely,

Peter F. Goggi
President
Tea Association of the U.S.A., Inc.

References:

1. Balentine D, Wiserman SA, Bouwens LCM. *Crit Rev Food Sci Nutr*. 1997;37:693–704.
2. Keller A, Wallace TC. Tea intake and cardiovascular disease: an umbrella review. Ann Med. 2021 Dec;53(1):929-944. doi: 10.1080/07853890.2021.1933164. PMID: 34396859; PMCID: PMC8366653.
3. Raman G, Avendano EE, Chen S, Wang J, Matson J, Gayer B, Novotny JA, Cassidy A. Dietary intakes of flavan-3-ols and cardiometabolic health: systematic review and meta-analysis of randomized trials and prospective cohort studies. Am J Clin Nutr. 2019 Nov 1;110(5):1067-1078. doi: 10.1093/ajcn/nqz178.

4. U.S. Department of Agriculture and U.S. Department of Health and Human Services. *Dietary Guidelines for Americans, 2020-2025.* 9th Edition. December 2020. Available at **DietaryGuidelines.gov**.
5. Crowe-White KM, Evans LW, Kuhnle GGC, Milenkovic D, Stote K, Wallace T, Handu D, Senkus KE. Flavan-3-ols and Cardiometabolic Health: First Ever Dietary Bioactive Guideline. Adv Nutr. 2022 Dec 22;13(6):2070-2083.
6. Yates AA, et al. (2021) Perspective: Framework for developing recommended intakes of bioactive dietary substances. Adv Nutr 2021;12:1087-99.
7. Chung M, Zhao N, Wang D, Shams-White M, Karlsen M, Cassidy A, Ferruzzi M, Jacques PF, Johnson EJ, Wallace TC. Dose-Response Relation between Tea Consumption and Risk of Cardiovascular Disease and All-Cause Mortality: A Systematic Review and Meta-Analysis of Population-Based Studies. *Adv Nutr*. 2020 Feb 19. pii: nmaa010. doi: 10.1093/advances/nmaa010.
8. FoodData Central. Beverages, Tea, Green, Brewed, Regular. Available at: https://fdc.nal.usda.gov/food-details/171917/nutrients
9. FoodData Central. Beverages, Tea, Black, Brewed, Made with Tap Water. Available at: https://fdc.nal.usda.gov/food-details/173227/nutrients
10. Ruxton CH, Hart VA. Black tea is not significantly different from water in the maintenance of normal hydration in human subjects: results from a randomised controlled trial. Br J Nutr. 2011 Aug;106(4):588-95. doi: 10.1017/S0007114511000456. Epub 2011 Mar 30. PMID: 21450118.
11. Institute of Medicine. 2005. Dietary Reference Intakes for Water, Potassium, Sodium, Chloride, and Sulfate. Washington, DC: The National Academies Press. https://doi.org/10.17226/10925.
12. Grandjean AC, Reimers KJ, Bannick KE et al. The effect of caffeinated, non-caffeinated, caloric and non-caloric beverages on hydration. *J Am Coll of Nutr* 2000; 19:591-600.
13. Maighan KJ, Griffin J. Caffeine ingestion and fluid balance: a review. *J Hum Nutr Diet* 2003; 16:411420.
14. Houghtaling B, Holston D, Szocs C, Penn J, Qi D, Hedrick V. A rapid review of stocking and marketing practices used to sell sugar-sweetened beverages in U.S. food stores. Obes Rev. 2021 Apr;22(4):e13179. doi: 10.1111/obr.13179. Epub 2020 Dec 16. PMID: 33331094; PMCID: PMC7988563.
15. Academy of Nutrition and Dietetics. Cardiovascular Health and Well-Being. Winter 2023. Vol. 2, No. 1 https://www.eatrightstore.org/dpg-and-mig-products/cv-well
16. Centers for Disease Control and Prevention. Heart Disease. Available at: https://www.cdc.gov/nchs/fastats/heart-disease.htm
17. Centers for Disease Control and Prevention. National Diabetes Statistics Report. Available at: https://www.cdc.gov/diabetes/php/data-research/index.html
18. Centers for Disease Control and Prevention. Adult Obesity Facts. Available at: https://www.cdc.gov/obesity/adult-obesity-facts/?CDC_AAref_Val=https://www.cdc.gov/obesity/data/adult.html
19. Lopez-Neyman SM, Davis K, Zohoori N, Broughton KS, Moore CE, Miketinas D. Racial disparities and prevalence of cardiovascular disease risk factors, cardiometabolic risk factors, and cardiovascular health metrics among US adults: NHANES 2011-2018. Sci Rep. 2022 Nov 14;12(1):19475. doi: 10.1038/s41598-022-21878-x. PMID: 36376533; PMCID: PMC9663590.
20. Mahmoud F, Haines D, Al-Ozairi, Dashti, A. Effect of black tea consumption on intracellular cytokines, regulatory T cells and metabolic biomarkers in type 2 diabetes patients. *Phyother Res.* 2016; 30: 454-62.
21. Yazdanpanah Z, Salehi-Abargouei A, Mozaffari Z, Hemayati R. The effect of green tea (*Camellia sinensis*) on lipid profiles and renal function in people with type 2 diabetes and nephropathy: a randomized controlled clinical trial. Front Nutr. 2023 Dec 14;10:1253275. doi: 10.3389/fnut.2023.1253275. PMID: 38162524; PMCID: PMC10755896.
22. Rocha A, Bolin AP, Cardoso CA, Otton R. Green tea extract activates AMPK and ameliorates white adipose tissue metabolic dysfunction induced by obesity. *Eur J Nutr.* 2016; 55(7): 2231-44.
23. Imamura F, Schulze MB, Sharp SJ, Guevara M, Romaguera D, et al. Estimated Substitution of Tea or Coffee for Sugar-Sweetened Beverages Was Associated with Lower Type 2 Diabetes Incidence

24. in Case-Cohort Analysis across 8 European Countries in the EPIC-InterAct Study. J Nutr. 2019 Nov 1;149(11):1985-1993. doi: 10.1093/jn/nxz156. PMID: 31396627; PMCID: PMC6825826.
25. Ito A, Matsui Y, Takeshita M, Katashima M, Goto C, Kuriki K. Gut microbiota-mediated associations of green tea and catechin intakes with glucose metabolism in individuals without type 2 diabetes mellitus: a four-season observational study with mediation analysis. Arch Microbiol. 2023 Apr 14;205(5):191. doi: 10.1007/s00203-023-03522-y. PMID: 37059897; PMCID: PMC10104920.
26. 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.
27. 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.
28. 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.
29. 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.
30. 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.
31. 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.
32. 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.
33. 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.
34. **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.
35. 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.
36. 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.
37. 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.
38. 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.
39. Hursel R, Westerterp-Plantenga MS. Catechin- and caffeine-rich teas for control of body weight in humans. *Am J Clin Nutr.* 2013 Dec;98(6 Suppl):1682S-1693S.
40. Grosso G, Stepaniak U, Micek A, Topor-Madry R, Pikhart, Szafraniec, Pajak A. Association of daily coffee and tea consumption and metabolic syndrome: results from the Polish arm of the HAPIEE study. *Eur J Nutr.* 2015; 54:1129-37.
41. Vieux F, Maillot M, Rehm CD, Drewnowski A. Tea Consumption Patterns in Relation to Diet Quality among Children and Adults in the United States: Analyses of NHANES 2011-2016 Data. *Nutrients*. 2019 Nov 3;11(11). pii: E2635. doi: 10.3390/nu11112635.
42. Vieux F, Maillot M, Rehm CD, Barrios P, Drewnowski A. The Timing of Water and Beverage Consumption During the Day Among Children and Adults in the United States: Analyses of NHANES 2011–2016 Data. *Nutrients*. 2019; 11(11):2707. https://doi.org/10.3390/nu11112707