

New NIST reference materials for green tea

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Green tea has been long prized not only for its taste but also for purported health benefits and medicinal value. Use of these green tea reference materials will improve the measurement precision and accuracy of measurements of constituents in green tea products available as dietary supplements. Credit: Baum/NIST

The National Institute of Standards and Technology (NIST) has released a suite of green tea reference materials to help manufacturers evaluate the composition of their products and assure researchers of the accuracy of analytical methods for studying the human health effects of this popular beverage and dietary supplement. The new standard reference materials (SRMs) were prepared as part of an ongoing collaboration with the National Institutes of Health Office of Dietary Supplements.

People have cultivated and consumed tea for at least the past 3,000 years and perhaps much longer than that. The origin of the use of *Camellia*

sinensis (green tea), indigenous to Southeast Asia, is the subject of competing legends. Although there are various versions of the story, Chinese legend records that Emperor Shen Nong discovered the rejuvenating effects of tea when a few leaves fell into his pot of boiling water nearly 5,000 years ago.

Green tea, which is made from the leaves of the plant that are dried without allowing them to oxidize, has been long prized not only for its taste, but also for purported health benefits and medicinal value. Beginning with Shen Nong, proponents have claimed that green tea improves digestion and [heart health](#).

Green tea is rich in antioxidants, notably the phytochemical class "catechins," which some researchers believe account for its potential health benefits. This has spurred interest in studying the chemistry of green tea and its extracts and in evaluating amounts of these antioxidant substances during and after the manufacture of green tea dietary supplements.

The NIST green tea SRMs are natural matrices, meaning they are derived directly from the plant. Unlike purified chemicals, reference materials of this type allow researchers to measure a well-known sample with all the chemical complexity of the natural product. Using as many as five methods of analysis, NIST and collaborating laboratories have determined concentrations of seven catechins and gallic acid, three xanthine alkaloids (including caffeine), theanine, and toxic elements (arsenic, cadmium, lead and mercury) in SRMs 3254 *Camellia sinensis* (Green Tea) Leaves, 3255 *Camellia sinensis* (Green Tea) Extract, and SRM 3256 Green Tea-Containing Solid Oral Dosage Form.

These SRMs are the first green tea-containing reference materials with certified values for catechins. It is anticipated that use of the [reference materials](#) will improve the measurement precision and accuracy of

measurements of constituents in [green tea](#) products available as dietary supplements.

SRMs are among the most widely distributed and used NIST products. The agency prepares, analyzes and distributes more than 1,200 different carefully characterized materials that are used throughout the world to check the accuracy of instruments and test procedures used in manufacturing, clinical chemistry, environmental monitoring, electronics, criminal forensics and dozens of other fields. For more information, see NIST's SRM website at www.nist.gov/srm/.

SRMs 3254 through 3256 are available from NIST. See the Dietary Supplement Materials (includes nutraceuticals and herbs) Web page at www-s.nist.gov/srmors/viewTableH.cfm?tableid=79 for further information and to order.

Provided by National Institute of Standards and Technology

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