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Our December 2017 Newsletter for Healthy Living

The Benefits of Black Tea

A warming cup of tea offers many comforts, especially when the temperature begins to dip, but while the advantages of green tea are many and well noted, there's another type — black tea — shown by recent research to positively impact not only weight control but to lead to a healthier gut microbiome in the process. The precise benefit stems from the way black tea (and green tea, too) can change the ratio of gut bacteria, decreasing the percentages of a type previously linked to obesity, and increasing bacteria associated with lean body mass, Prevent Disease reports. Research from the University of California published in the European Journal of Nutrition revealed that not only may drinking black tea change your gut microbiome for the better, it may also improve your gut function.

Lead study author Susanne Henning explains: *"Our new findings suggest that black tea, through a specific mechanism through the gut microbiome, may also contribute to good health and weight loss in humans. The results suggest that both green and black teas are prebiotics, substances that induce the growth of good microorganisms that contribute to a person's well-being."* It now appears that both green and black teas have metabolism-boosting effects, with green tea working via your bloodstream and black tea via your gut bacteria. In addition, antioxidant polyphenols in both green and black tea fight against free radicals, helping to ensure proper function of DNA and cell membranes.

However, by altering your gut microbiome, black tea helps prevent weight gain and obesity, making it "anti-obesogenic." Psychology Today explains part of the mechanism for how this works, as well as the importance of intestinal health: *"Each of us has trillions of microorganisms and diverse bacterial communities, commonly known as microbiome or gut microbiota, residing in our gastrointestinal tract at any given time. Microbiota is a diverse ecological community of microorganisms that are generally a combination of both beneficial 'good bacteria' and potentially harmful bacteria. The human gut is similar to that of a mouse and generally harbors over 100 trillion microorganisms. Microbiome colonies begin to reside within our intestines immediately after birth and are vital to the healthy development of our immune system and are associated with various important neurobiological and physiological functions."*

> ***"...green and black teas are prebiotics, substances that contribute to a person's well-being."***

Four groups of mice involved in the research were given different diets to compare over a four-week period: low-fat/high-sugar; high-fat/high-sugar; high-fat/high-sugar plus green tea extract; and high-fat/high-sugar plus black tea extract. Evaluating the results, the scientists found that the mice given the green or black tea extracts dropped the same amount of weight as the ones who were fed a straight low-fat diet. Simultaneously, samples were collected from the large intestines of the mice so their bacteria could be accounted for, as well as from their liver tissues so they could measure their fat deposits.

The scientists' findings indicated that the mice that had ingested the tea extracts exhibited a change in the ratios of two significant microbiome family groups. The first was a decrease in Firmicutes bacteria linked to obesity, with an upsurge in Bacteroidetes that had in previous studies been associated with lean body mass. Only mice that had ingested black tea showed an increase in Pseudobutyrivibrio, with the added increase in the intestinal formation of short-chain fatty acids, which the team explains may be the bacteria that make the difference in how black tea and green tea change the way energy is metabolized. The molecules in green tea, being smaller, are absorbed directly into your bloodstream and liver, while black tea stays in your intestinal tract because the molecules are larger. The study authors explain: "When black tea molecules stay in the intestinal tract, they enhance the growth of beneficial bacteria and the formation of microbial

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All articles in this newsletter are for the purpose of nutritional information only and should not be considered a substitute for professional medical advice.

K2 and Cardio Health

Vitamin K is a fat-soluble vitamin that is well-known for its role in preventing osteoporosis. However, there are two different kinds of vitamin K, each providing its own set of health benefits. Vitamin K1 is primarily responsible for blood clotting, whereas vitamin K2 works synergistically with calcium, magnesium and vitamin D to impart a number of important health benefits, including but not limited to: preventing hardening of the arteries (atherosclerosis) and lowering risk of heart attack; directing calcium to your bones, making them stronger, and your teeth to help prevent cavities; creating insulin to stabilize your blood sugar (keeping your system sensitive to maintaining correct amounts), thereby protecting against diabetes and helping to prevent metabolic problems associated with obesity; suppressing genes that can promote cancer while strengthening genes that promote healthy cells; supporting growth and development of the fetus during pregnancy; supporting healthy immune function; and, enhancing your ability to utilize energy as you exercise improving overall performance.

A recent article in Life Extension Magazine also highlights the cardiovascular benefits of vitamin K2. Importantly, a double-blind, placebo-controlled study published in 2015 found that taking 180 micrograms (mcg) per day of vitamin K2 (MK-7 form) for three years improved arterial stiffness in postmenopausal women, especially those who had a high degree of arterial stiffness. At the end of the study, the treatment group had a 5.8 percent lower stiffness index beta (a parameter of arterial stiffness) and a 3.6 percent lower carotid-femoral pulse wave velocity (a test that measures arterial stiffness). The placebo group, on the other hand, saw a 1.3 and 0.22 percent increase in these measurements respectively.

"The fact that there was a reversal in arterial stiffness compared to placebo is quite remarkable."

This study has been lauded as significant because while previous studies have only been able to show an association, this is the first to confirm that long-term use of vitamin K2 in the form of MK-7 does improve cardiovascular health. Prior to this study, it was unclear whether taking additional vitamin K2 could actually reverse calcification of the arteries that had already occurred.

As noted in Life Extension: "*This is the first long-term human trial showing improvements in measures of arterial stiffness in response to long-acting vitamin K2. While the 5.8 percent and 3.6 percent improvements might not appear substantial, when realizing that calcification often worsens with age, the fact that there was a reversal in arterial stiffness compared to placebo is quite remarkable… This provides us all with an opportunity to restore more youthful flexibility to aging blood vessels and other soft tissues.*"

Other previous studies have also clearly demonstrated vitamin K2's importance for heart health and longevity. In the Rotterdam Study, which ran for 10 years, those who consumed the greatest amounts of K2 had the lowest risk of cardiovascular disease and cardiovascular calcification, and the lowest chance of dying from cardiovascular disease. People who consumed 45 mcg of K2 daily lived seven years longer than people getting 12 mcg per day.

Vitamin K2 is found primarily in animal-based foods (MK-4) and fermented foods (MK-7). Not all bacteria make K2, so only certain fermented foods will contain it; only grass fed animals will develop naturally high K2 levels. For these reasons, most commercial yogurts are virtually devoid of vitamin K2, and while certain types of cheeses, such as Gouda, brie and Edam are high in K2, others are not. One of the best ways to get plenty of vitamin K2 from your diet it is to regularly eat home-fermented vegetables made with a special starter culture designed with bacterial strains that produce vitamin K2.

Reference: *Longevitylive.com* October 27, 2017. *Nutraingredients.com. Life Extension* November 2017. *Thrombosis and Haemostesis* 2015 May; 113(5):1135-44. *Journal of Nutrition* November 2004, 134; 3100-3105 (The Rotterdam Study).

The Benefits of Black Tea, *continued from page one*

metabolites involved in the regulation of energy metabolism."

Black tea can retain its robust flavor for several years, while green tea typically goes flat if it's not used within a year. All tea comes from Camellia Sinensis, a white-flowered evergreen; the basic difference between black and green tea stems from their production methods: black tea undergoes full oxidation and fermentation while green tea doesn't. Besides containing caffeine and polyphenols, one 8-ounce cup of black tea contains several other unique and health-beneficial properties, Nutrition Data reports: amino acids, proteins, potassium, major minerals, manganese, riboflavin, folate and magnesium. Different colors and flavors of tea depend on the way the plant is processed. The darker the tea, generally the longer it has been oxidized, or exposed to oxygen. When you're buying tea, pay attention to the processing methods, which is why you might choose organic teas. Conventional tea may have undergone a heavy dose of pesticide spray. Another problem with tea may be exposure to toxins from soil and water, such as heavy metals and fluoride. A clean growing environment is essential to producing a pure, high-quality tea.

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When you think of all the Chinese sages who've ingested probably thousands of cups of tea in their lifetimes, it's no surprise that drinking tea can even help prevent dementia by 50 percent, and peoples' risk for Alzheimer's disease could be reduced by 86 percent, according to another study. In fact, "the protective role of tea consumption on brain function is not limited to a particular type of tea — if the tea is brewed from tea leaves, such as green, black or oolong tea." So from your brain down to your gut, drinking black tea boosts your health in multiple ways.

Reference: *Prevent Disease* October 17, 2017. *European Journal of Nutrition* September 30, 2017. **Medical News Today** October 3, 2017. *Psychology Today* October 24, 2017. *Nutrition Data* 2014. *The Journal of Nutrition, Health & Aging* December 2016; 20 (10):1002-9.

Thinking About the Bugs

If you've ever gone on a road trip, you probably have distinct memories of bugs flying at, and smashing on, your windshield — along with the inevitable cleanup the mess necessitated afterward. If you think about it for a minute, though, you may realize that it's been awhile since your windshield was covered with insects. This may initially seem like a good thing, but this occurrence, dubbed the "windshield phenomenon" by entomologists, is an ominous warning — a canary in the coal mine that the environment is in grave danger.

It's also not all in your head. Insects are vanishing right before our eyes, at a rate that's at once sobering and alarming. Declines in certain insect groups like bees, butterflies and even moths have been apparent for some time, according to researchers of a recent study published in PLOS One. However, their study looked at total flying insect biomass over a period of 27 years in 63 protected areas in Germany to assess the bigger picture. Using malaise traps, which are large, tent-like traps used for catching flying insects, the researchers set out to estimate trends in the number of flying insects in the region between 1989 and 2016. A 76 percent decline was revealed, seasonally, while a midsummer decline of 82 percent in flying insect biomass was also recorded. The declines occurred regardless of habitat type and could not be explained solely by changes in weather, land use or varying habitat characteristics.

The researchers noted: *"Loss of insect diversity and abundance is expected to provoke cascading effects on food webs and to jeopardize ecosystem services … This yet unrecognized loss of insect biomass must be taken into account in evaluating declines in abundance of species depending on insects as a food source, and ecosystem functioning … "* The ramifications of disappearing insects should not be taken lightly. It's estimated that 80 percent of wild plants depend on insects for pollination, and 60 percent of birds depend on them for food. Further, the "ecosystem services" provided by insects as a whole is estimated at $57 billion annually in the U.S. alone, the researchers noted, so "[c]learly, preserving insect abundance and diversity should constitute a prime conservation priority." While increasing attention has been given to declines in bees and butterflies, the data suggest that "it is not only the vulnerable species, but the flying insect community as a whole, that has been decimated over the last few decades." The researchers described the significant decline as "alarming," made even more so because the traps were placed in nature preserves that are meant to protect ecosystem functioning and biodiversity. Still, nearly all (94 percent) of the protected areas included in the study were enclosed by agricultural areas, giving clues as to why so many insects may be disappearing.

"Loss of insect diversity and abundance is expected to provoke cascading effects on food webs…"

After observing the massive decline in flying insects in under 30 years, the researchers then began looking into potential driving mechanisms. Landscape and climate changes were not strongly associated with the declines, according to their analysis, so they suggested other "large-scale factors," like agricultural intensification, may be involved: *"Agricultural intensification (e.g., pesticide usage, year-round tillage, increased use of fertilizers and frequency of agronomic measures) that we could not incorporate in our analyses, may form a plausible cause … Part of the explanation could therefore be that the protected areas (serving as insect sources) are affected. Increased agricultural intensification may have aggravated this reduction in insect abundance in the protected areas over the last few decades … Agricultural intensification, including the disappearance of field margins and new crop protection methods has been associated with an overall decline of biodiversity."*

The application of chemicals in agriculture is now so commonplace that it seems necessary, but pesticide usage can be cut — without harming yields. A 2015 study found that IPM techniques reduced pesticide use while boosting crop yields in a meta-analysis of 85 sites in 24 countries. Some were even able to eliminate pesticide use entirely using techniques such as crop rotation and pheromone traps to capture insect pests. One of the lead researchers, John Tooker, associate professor of entomology, Penn State said in a news release: *"Substantial research exists supporting the value of IPM for pest control. It is the best chance we have of conserving beneficial insect species while maintaining productivity in our farm systems."*

It's now common knowledge that deforestation leading to the tragic loss of vast swatches of rainforest is devastating the environment. Lesser known is the fact that U.S. prairies are equally as diverse and important to the ecosystem as rainforests; they're also similarly threatened. Since the early 1800s, grasslands in North America have decreased by 79 percent — and in some areas by 99.9percent, largely to plant vast swatches of chemically intensive genetically engineered (GE) corn and soy. Unfortunately, this two-crop planting cycle of GE corn and soybeans has become the dominant model in the Midwest, thanks to the federal farm policy that subsidizes these crops to the detriment of the environment. Choosing grass-fed products like grass-fed beef and dairy is a solution that we can all take part in. Arbor Farms partners with Idyll Farm (Northport), Lamb Farm (Manchester), Graham's Organics (Rosebush), Hilhof Dairy (Hersey) - farmers who use diverse cropping methods, raise animals on pasture, and utilize other methods of regenerative agriculture to protect beneficial insects. You can also take steps to make your own backyard friendlier to your insect friends, by eliminating the use of pesticides and other chemicals and planting a diverse variety of native flowers and other plants.

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Reference: *Science* May 10, 2017. *PLOS One* October 18, 2017. *Penn State News* December 7, 2016. *Insects 2015, 6(1): 152-82.*

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