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Coffee...For Your Health?

By C. J. Prince

Globally, somewhere between 400 and 500 billion cups of coffee are consumed each year, and, as a commodity, the bean ranks second only to petroleum in terms of dollars traded worldwide. And its future may be even brighter. Although coffee is currently enjoyed around the world as a beverage that delivers bold, rich flavors and a caffeine kick, new scientific research suggests that it may benefit our health and wellness as much as it pleases our palates.

The diminutive coffee bean, only a fraction of an inch in length, belies enormous complexity within, says Joseph A. Rivera, founder of information portal Coffechemistry.com and Coffee Intelligence, a technical consultancy for the specialty coffee industry. "It contains more than 1,000 compounds. For comparison, chocolate only has about 250, and wine, maybe 450," says Rivera, a chemist who has been studying coffee for more than a decade. "That's pretty amazing."

While not all of coffee's compounds are useful, over the past few years scientists have found quite a few that bear nutritional fruit, and they've been hard at work attempting to extract the bean's most healing properties for use in supplements, powders, and topical creams.

ANTIOXIDANT EXTRACTS FROM THE "SKIN"

The coffee fruit, in its original unpicked form, has multiple layers: the red outer skin called the exocarp; the pulp beneath; the slimy layer of mucilage, called the parenchyma; and the beans buried inside. The mucilage has long been known to contain valuable polyphenols, a group of chemicals rich in antioxidants that remove "free radicals," or potentially damaging chemicals, from the body. But until recently, nobody had figured out a practical method for processing it into consumable form without it fermenting and releasing harmful mycotoxins, a naturally occurring chemical compound produced by fungi that, if ingested, can be fatal.



Then, an organic chemist from Serbia named Dusan Miljkovic, working with Jeff VanDrunen, president of biotech firm VDF FutureCeuticals, came up with a new technology to get around that. "We developed a process of cultivation, harvesting, and subsequent quick-drying that eliminates the possibility of mycotoxins being generated,"

explains FutureCeuticals general manager John Hunter.

The proprietary technology enabled them to create a new product, the CoffeeBerry, and the related line of Whole Coffee Fruit powder and extract products, which are marketed for use in a variety of foods, beverages, and supplements. This antioxidant-rich formula, derived from the whole fruit of the *coffea* plant, packs quite a wallop, nutritionally speaking: according to Hunter, one gram of CoffeeBerry Whole Powder provides the same antioxidant benefit as 33 grams of its nearest competitor—the blueberry.

CHLOROGENIC ACID FOR WEIGHT LOSS AND DIABETES PREVENTION

One of the coffee bean's many organic compounds is chlorogenic acid, an antioxidant that slows down the release of glucose into the bloodstream after a meal. Although chlorogenic acid is found in the roasted coffee bean and drinkable java beverages, its highest concentration is found in the raw, unroasted green bean, says Chris Fields, vice president of scientific affairs for Applied Food Sciences, an Austin, Texas-based company that specializes in the development and marketing of technologies used in foods, beverages, and nutritional supplements. AFS manufactures the extract Green Coffee Antioxidant (GCA).

This past October, researchers from the University of Scranton joined with the Health Sciences Clinic at Trinity Hospital in Bangalore, India, to conduct a 22-week study to test the efficacy of GCA in overweight adults. (India currently has the world's largest diabetes population.) With no real change in diet, study subjects experienced significant reductions in both body weight and body mass index when they were taking GCA, as opposed to the placebo. "It can basically manage insulin in your body," says Fields. These results, along with those of other studies on the effect of chlorogenic acid on glucose uptake, suggest that GCA could potentially be an effective nutraceutical for reducing and possibly preventing obesity and Type 2 diabetes.

Approved anti-obesity drugs have been scarce in the U.S., and many have been taken off the shelves after dangerous side effects were discovered. In June, the FDA approved Belviq, or lorcaserin, developed by Arena Pharmaceuticals, for the treatment of obesity—the first such approval since 1999. But if the new drug is

priced similarly to market predecessors, around \$3 per capsule, the twice-a-day regimen would add up to \$180 per month. And such drugs are typically not covered by insurance. Supplements made with GCA, on the other hand, typically retail at less than \$20 a bottle for what roughly amounts to a 30-day supply, meaning they could offer a budget-friendly alternative.

TREATING WRINKLES WITH TOPICAL APPLICATION

Ingestion isn't the only way to reap the oxidizing benefits of the coffee bean. Fields and her team at Applied Food Sciences recently completed a clinical study in Denver at the Rocky Mountain Laser Clinic that measured the effects of coffee applied topically to the skin for treatment of various issues, including wrinkles and pigmentation, or age spots. Until recently, it was challenging at best to experiment with topical solutions, because the polyphenols in coffee are highly water-soluble, and therefore oxidize too quickly. "So within an hour's time, it lost its potency," explains Fields. But her team was able to apply encapsulation technology to protect the polyphenols and keep it on the skin for a longer period of time, allowing it to do its work as an antioxidant. "It was clearly shown to reduce skin pigmentation and rebuild collagen to reduce wrinkles," she says.

Last year, a study on mice conducted at Rutgers University, in collaboration with researchers from the University of Washington, suggested that caffeine applied topically to the skin through sunscreen could inhibit sunlight-induced skin cancer by directly absorbing damaging ultraviolet light. Although Fields cautioned that no one product can prevent skin cancer, she says she believes a future application of sunscreen incorporating caffeine would make good sense. FDA regulations for over-the-counter supplements are not nearly as stringent as they are for drugs—supplement makers must only ensure their products are not harmful—so a caffeinated sunscreen might not be that far off in the U.S.

FutureCeuticals' Hunter says this is only the beginning. "We think it won't be long before people will realize that coffee is going to help them not get Type 2 diabetes, age better, stay healthy, be a little smarter, if you will—that's what we see," he says. "We're going to find out that coffee as a whole is a good friend to us."

***C.J. Prince** has written for numerous national publications and websites, including *Entrepreneur Success*, *Working Mother*, *Institutional Investor*, *U.S. News & World Report*, *NAFE Magazine*, *MSNBC*, *TheStreet.com*, and *U.S. Airways Magazine*. She is the author of "Hiring," a guide to best hiring practices for managers at all levels, and has been a guest on *CNBC* and *NPR's "Marketplace."**

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