

What's the buzz? How Energy Products Reform Caffeine and Sugar

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As sources of energy for foods and beverages, caffeine and sugar are as established as fossil fuels. But like fossil fuels, these building blocks of energy-boosting foods and beverages are being looked at more critically.

High energy is one of the oldest nutraceutical/functional claims for foods and beverages. Red Bull has been giving you wings since 1987. Euromonitor estimates the domestic energy drink market at \$11.7 billion last year, up 25 percent since 2012.

Some big players are getting involved (or deepening their involvement). Coca-Cola is developing Coca-Cola Energy, an extra-caffeinated version of its flagship beverage (to the consternation of Monster Beverages, with which it has a distribution deal); Amazon is rolling out a new energy drink under its private-label Solimo brand.

Coca-Cola Energy gets most of its energy from a heavy dose of caffeine – more than three times as much as its flagship product. Big doses of caffeine and sugar have been staples of energy-boosting foods and beverages for a long time (although many of them also come in sugar-free versions). Red Bull, the oldest major energy-drink brand and the top seller in the U.S., has 80mg of caffeine and 27g of sugar per serving for its mainstream product, as does No. 2 brand Monster. Clif Bar, the U.S. category leader in energy bars, which features a rock climber on its label, delivers 21g or more of sugar per serving.

Caffeine and sugar, of course, are desirable in energy-product formulations because they impart a powerful short-term “buzz.” But energy-boosting products have been criticized over their caffeine and sugar content for a long time. Both the World Health Organization and the American Academy of Pediatrics have issued warnings that consumers, especially young ones, should limit or even eliminate consumption of them.

The issue goes back, as it often does, to definitions. What does it mean to “boost energy,” and how does that tie in to the larger concept of health?

Dietitian Nancy Farrell Allen, a teacher and spokesperson for the Academy of Nutrition and Dietetics, points out that in theory, energy comes only from the calories found in macronutrients – carbohydrates, proteins and fats. As for substances like caffeine, “perhaps the energy boost one might feel is due to the stimulant effect of these ingredients,” she says. “Think of caffeine – no calories associated with it, but it does raise our blood pressure, heart rate, etc., and that is not necessarily healthy.”

And consumers are starting to look at energy as an aspect of overall health, meaning that many are unwilling to do unhealthy things just for an energy spike. They're more interested in the long term.

According to research by the Hartman Group, nearly a third of consumers, across all age groups, feel that their energy level "urgently needs to get better." They see this as an ongoing issue: "Today, we hear consumers talk about energy as a problem that has developed into its own distinct health concern on par with issues like controlling weight and physical fitness," Hartman researchers wrote in a 2015 newsletter.

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Forms for formulations

Formulators of products for the energy market who are determined to reap the energy-boosting benefits of caffeine or sugar therefore have an incentive to use them in forms that at least can be perceived as healthier.

With sugar, a common strategy is to move away from standard sucrose to other forms, presenting them as healthier carbs that aid athletic recovery. For example, [Malt Products Corp.](#) is marketing MaltRite, its malted barley extract, as a potential component in sports recovery drinks.

Company president Amy Targan acknowledges that in the U.S., malted barley extract is mostly used in flavored malt-based alcoholic beverages. "However, Europe, especially Germany, has been on the forefront of recognizing non-alcoholic malt-based beverages as a sports recovery drink, and there are a number of U.S. companies working with our MaltRite to develop of new sports recovery drinks," she says.

The key to MaltRite as an ingredient in energy drinks is the molecular structure of its sugar. The molecule of standard table sugar, or sucrose, comprises a fructose and a glucose molecule; the sugar in MaltRite is mainly maltose, which consists of two glucose molecules.

"All sugars aren't created equal," Targan says. "Glucose is a far more useful sugar than fructose, as it is utilized by the body far more functionally. While glucose is actively sought after by our cells and brains, fructose goes directly to the liver because the human body thinks it is a toxin." She also says that other beneficial nutrients of malted barley include polyphenols, antioxidants, protein, essential amino acids, vitamins and minerals such as phosphate and folates.

Endure energy drink from Kill Cliff Inc. is sweetened with Palatinose, which has components similar to table sugar but a lower glycemic index.

Beet it

Another variety of sugar with a purportedly more beneficial chemical structure is being marketed by [Beneo Inc.](#) Palatinose, derived from sugar beets, is being used in more than 40 products in the U.S., including sports-related beverages like Endure, from [Kill Cliff Inc.](#), and Xe Lite, from [Well Beyond LLC](#).

Palatinose is the trade name for isomaltulose, which, like sucrose, comprises a fructose and a glucose molecule. But due to its molecular bond structure, Palatinose has a lower glycemic index than sucrose, meaning it's ingested more slowly. This improves the body's metabolism, prompting it to burn more fat and produce less insulin.

Palatinose "provides natural energy in a balanced way with less blood glucose fluctuation and steadier insulin release," says Kyle Krause, Beneo's product manager for functional fiber and carbohydrates, North America. "This results in an improved metabolism, which helps the body to burn more fat for energy, while conserving much-needed glycogen in muscles to avoid 'hitting the wall' or 'bonking.' "

The [Québec Maple Syrup Producers](#) are also trying to market their form of sugar as beneficial to athletic performance. At a recent symposium, the trade group presented a University of Montreal study showing that maple sugar provides the same amount of carbohydrates, and energy, as the sugar in commercial sports drinks, with a more pleasing, less acidic taste.

"Maple syrup can provide an alternative to commercial sports drinks as it contains sugar that is unprocessed, free of coloring and additives," says Jonathan Tremblay, an associate professor of kinesiology and exercise science at the University of Montreal, who helped conduct the study. He adds that maple sugar "contains many bioactive elements" with potential health benefits, although he acknowledges that he knows of no commercial sports drinks now being marketed that use pure maple syrup or maple water.

Farrell Allen says that determining whether one form of sugar is healthier than another "goes back to the elusive definition of what one calls 'healthy.' " She points out that glucose and fructose have the same chemical structure but different atomic structures; this difference gives fructose a sweeter taste. As to whether it's unhealthier than glucose or any other form of sugar, "I do not see an issue if one chooses to use fructose as an ingredient, as it occurs naturally in fruits and honey," she says.

Natural caffeine

Status as a naturally occurring ingredient also has the potential to rehabilitate that other staple of energy drinks and foods: caffeine. If anything, caffeine is a bigger potential villain than sugar, due to the danger of bad cardiac and other effects.

A 16-year-old Indiana boy died in 2017 from cardiac arrhythmia, apparently from caffeine intoxication brought on by consuming several caffeine-laden products, including an energy drink, in a short period of time. That tragedy led an Indiana legislator to introduce a bill establishing a minimum age of 18 for energy drink sales, but the bill died this spring without a hearing.

Mati energy drinks use guayusa instead of standard, synthetic caffeine.

Much of the caffeine used as an ingredient is synthetically produced, from urea and other chemicals. But some energy drink makers are turning to natural sources of caffeine to get a more benign boost.

Mati Healthy Energy is a line of energy drinks that rolled out in 2016 and is now retailing in more than 2,000 stores throughout the Southeast, including Whole Foods, Fresh Market, Earth Fare and Harris Teeter. Its active ingredient is guayusa, a kind of tea brewed from the leaves of a tree native to the Amazon.

“We like to say that not all caffeine is created equal and the body processes the natural caffeine in guayusa much differently than the other synthetic caffeine on the market,” says Eric Masters, CEO of Mati Healthy Energy. “The guayusa leaf is very unique – it contains theobromine, which acts as a natural time release for the caffeine, so consumers get a nice, steady boost of energy and focus without any jittery spikes or crashes.”

Marketers of energy-boosting products may still want to use sugar and caffeine as the building blocks of their formulations. But selecting the right kinds of those staples can go a long way toward alleviating consumers’ concerns and tapping into their current desires.