

Natural Formulas Bolster Energy & Vitality

Products that can sustain focus and alertness attract all types of consumers, from gamers to weekend warriors.



By Lisa Olivo, Associate Editor07.03.19

Amid hectic lifestyles, and mounting demands of work, family, and fitness, consumers often feel depleted. To help boost energy and provide physical and mental vigor, many people seek targeted nutritional aids for support.

Energy-enhancing formulas have continued to flourish in recent years. Sales of health and wellness foods and beverages for energy in the U.S. earned \$15.57 billion in 2018, up a CAGR of 6.1% since 2013, according to Euromonitor International. Products classified within this category typically contain high levels of caffeine or the amino acid

taurine, the research firm noted. Other ingredients often associated with stimulating properties, such as guarana and ginseng are also common.

Cliff Barone, global ingredient marketing, [Lonza Consumer Health & Nutrition](#), Morristown, NJ, suggested that consumers today are “leading busier, more active lifestyles, which leads them to seek supplements that target energy and vitality.” For instance, research commissioned by Lonza found that 68% of supplement users in the U.S. reported needing more energy throughout the day (NMI SORD Proprietary Report for Lonza Consumer Health & Nutrition – US – 2,004 participants online, 2018).

To meet this growing audience, formulators and marketers in the nutrition marketplace are developing innovative ways to keep minds and bodies fueled and focused.

Energized Consumers

Where once consumers just looked for an immediate boost, today they’re seeking out clinically backed formulas that are natural, organic, clean label, and with proven scientifically-validated results.

Andrew Wheeler, corporate vice president of marketing for [FutureCeuticals](#) and Van Drunen Farms (Momence, IL) observed a push for “clean sources of enhanced energy, performance boosters, and protein all derived from natural, healthy foods like fruits, vegetables, and greens.” He pointed to a growing safety concern over the use of synthetic caffeine in energy drinks. “The consumer demand for a healthier, balanced, more natural caffeine source has grown significantly,” he added.

Millennials are a key force driving interest in energy, according to Sébastien Bornet, vice president of global sales and marketing at Switzerland-based [Horphag Research](#). He cited research from Mintel which found 61% of those ages 27-37 consumed energy drinks in 2015 (up from 55% in 2014), despite looming safety concerns. “Millennials are becoming more interested in incorporating regular health and wellness routines to live longer, healthier lives,” noted Bornet. “Energy and vitality are the key components in keeping up with these routines.” Likewise, baby boomers have their own wellness goals, Bornet stated, highlighting their interest in vitality, and preventive health measures associated with age-related cognitive decline and arthritis.

Barone added that Lonza’s own data revealed there was a 126% increase in U.S. millennial consumers looking for supplements to address lack of energy and fatigue, as measured between 2009 and 2017.

“Other groups that can benefit from supplements that target sustained energy, or mental and physical fatigue, include young adults enjoying late nights, or parents with hectic home and work lives,” noted Barone. “Plus, since energy can be released by fatty acid oxidation, or the breakdown of fats in the body by metabolism, energy and weight management supplements can be used to target both these key consumer trends.”

Elyse Lovett, senior marketing manager, [Kyowa Hakko](#), USA, New York, NY, said younger millennials and gen X-ers are using energy products to “be on top of their game, at school, at work, and even that working mom at home.” Meanwhile, she said baby boomers are using the same formulas for “keeping up with active lifestyles, getting in their best golf game or keeping

up with their grandchildren.”

Also discussing demands from baby boomers, Michael Crabtree, director of scientific affairs for [Bioenergy Life Science](#), Ham Lake, MN, indicated this generation is increasingly aware of the importance of preventive medicine, and consumers are taking responsibility for preserving their vigor with age. “Older adults typically focus more on energy-producing products and concepts as their bodies’ ability to produce energy—including ATP (Adenosine Triphosphate)—declines,” he explained. “The total energy of a living system is more complicated than the current biological model admits, which regards the energy aspect of biological function as reducible to the ATP molecule as the primary storehouse of chemical energy. But ATP levels must be maintained for the fundamental energy conversion pathways to function.”

Crabtree further explained that beyond the normal decline of energy production associated with aging, conditions such as heart disease, diabetes, and metabolic syndrome are a primary concern for the aging population. “The elevated presence of diseases also affects metabolism and reduces energy flow through the system.”

Products targeting energy and performance were once primarily sought out by the “gym athlete,” but increasingly, Americans are participating in outdoor activity to support healthy lifestyles.

Sara Perez Ojalvo, director, research and development, for [Nutrition 21](#), Purchase, NY, pointed to those interested in outdoor activities such as obstacle course races (i.e., Spartans and Tough Mudders), triathlons, marathons, bike riding, and kayaking, as an emerging audience for energy support. “As the United States sees a rise in outdoor activity (according to the Outdoor Industry Association), consumers are getting their workout outside in many different forms,” said Perez Ojalvo. “As more and more athletics develop outside of the gym doors, we are also seeing a new type of athlete emerge. The weekend warrior athlete leaves their 9-5 desk job on Friday and packs up for a mountain bike trip or a 5k with their family.” These outdoor athletes need energy too, she added. “They need something to keep them going and help with performance, but they might not be reaching for the same pre-workout supplement that their gym buddies rely on.”

Some are seeking energy formulas not just for physical energy, but for mental alertness and performance. Citing research from the National Center for Complementary and Integrative Health, Larry Kolb, president of [TSI USA Inc.](#), Missoula, MT, and director of TSI’s Innovative Products Division, said that next to multivitamins, energy products are the most popular dietary supplement consumed by American teens and young adults. He added that men ages 18-34 consume the most energy products. “Especially popular with athletes are pre-workout supplements, getting them pumped to work out and perform at their peak,” explained Kolb. “But almost everyone can use a little pick me up, avoiding the 2 pm work slump, or trying to keep up while we age.”

Dynamic Ingredients

In many popular multivitamin formulas, vitamins and minerals are the key micronutrients driving energy, according to Susan Piergeorge, MS, RDN, from [Rainbow Light](#), Santa Cruz, CA. She pointed to essential nutrients such as B vitamins—including thiamin (B1), riboflavin (B2), niacin (B3), pantothenic acid (B5), B6, biotin (B7), folate (B9), and B12—as ingredients that play a role in metabolizing protein, carbohydrates, and fat, converting them into energy. “B vitamins are a hallmark in a number of Rainbow Light multivitamins,” she said, adding that minerals such as

iron, zinc, magnesium, and iodine are also important in energy production. “They provide additional components in energy production, cellular metabolism, and supporting healthy muscle function. A number of Rainbow Light multivitamin/mineral supplements contain these vitamins and minerals in addition to our Superfoods and Digestive Support Blends.”

With more consumers pushing their bodies further than ever before physically—be it active individuals or busy consumers—Barone of Lonza said the demand for science-backed nutritional support for energy has never been higher. To support this growing demand, Lonza offers Carnipure L-Carnitine, which plays an essential role in the body’s energy metabolism by supporting the conversion of fat stores into metabolic energy.

“Backed by more than 30 years of experience and over 45 robust clinical trials conducted by Lonza in collaboration with major research centers, scientific evidence suggests that supplementation with high-quality Carnipure L-Carnitine increases fatty acid oxidation in healthy human subjects [Müller DM et al. *Metabolism*, 2002], thus providing a longer-lasting source of energy for the body, which can be also extremely beneficial to people who are interested in maintaining a healthy weight,” explained Barone.

Robuvit, a natural extract derived from French oak wood, has been shown in numerous peer-reviewed published studies to support energy and curb feelings of fatigue. Bornet said Robuvit supports energy “by working at the cellular level to support mitochondria—the powerhouse of the cell—to give you a noticeable boost.” The ingredient offers enhancing benefits while being a completely caffeine-free alternative.

A 2013 study published in *Phytotherapy Research* showed that general fatigue-sufferers who supplemented daily with Robuvit reported feeling more energy and fewer symptoms in as little as four weeks. The study, aimed at examining the psychological benefits of taking Robuvit, tested efficacy in subjects between 45 and 65 years old. “Another study in 2015 reported similar findings for individuals suffering from Chronic Fatigue Syndrome (CFS),” Bornet added.

Further, the extract’s energy benefits were studied in athletes. “A 2015 study published in *Minerva Cardioangiologica* evaluated the effects of Robuvit on performance and endurance in triathletes over a two-week triathlon training period,” Bornet explained. Athletes in the study reported heightened endurance and that they needed less recovery time between races, which in turn allowed for improved overall time, pace, and more sustained levels of energy throughout a triathlon event. “The study found that in the beginning stages, both groups (one group taking Robuvit and another as a control group) reported roughly the same times. However, after just two weeks, the group taking Robuvit experienced an 11% decrease in their overall time, while the control group decreased their time by 4%.”

Bioenergy Life Science offers several patented ingredients for energy, metabolic health, and anti-aging. Bioenergy Ribose is a well-known precursor of ATP, NAD (Nicotinamide Adenine Diphosphate), and NADPH (Nicotinamide Adenine Dinucleotide Phosphate) “all of which serve vital functions in a healthy cell but are even more central to an aging cell, as the normal processes by which these materials are produced decline in efficiency with age,” stated Crabtree.

The company also offers Bioenergy RiaGev, a unique blend of Ribose and niacin (vitamin B3). “It is possibly the most effective non-pharmaceutical vehicle for producing niacin metabolites and the subsequent active redox co-enzyme NAD+,” Crabtree claimed. “Your body needs relative concentrations of ATP and NAD for the cell to survive and because those levels

decrease with age, your body needs a way to help increase those levels. RiaGev is a great solution that uniquely combines Bioenergy Ribose and a form of vitamin B3 and is distinctly formulated to enter the pathway directly to more efficiently increase NAD.” He noted that RiaGev maintains and enhances mitochondrial health by boosting NAD levels and inducing creation of new mitochondria, thus promoting healthy mitochondria and bioenergetics, as well as healthy aging.

Nutrition21 recently introduced the ingredient Lepidamax, a patented blend of maca, *Lepidium peruvianum*, which has been linked to beneficial endpoints focused on enhancing male performance. “Recent clinical results [published in 2019 in the *Journal of Exercise and Nutrition*] show that Lepidamax significantly increases energy levels, sexual function, and strength in men,” noted Perez Ojalvo.

Furthermore, a pre-clinical study examining Lepidamax found it increased skeletal muscle energy metabolism by enhancing a process known as mitochondrial biogenesis (*The FASEB Journal*, 2018.). “To examine the molecular mechanism behind the energy-enhancing effects of Lepidamax, various mitochondrial markers were measured following exercise,” explained Perez Ojalvo. Results showed that the markers increased in the Lepidamax group compared to control. “These results support the beneficial effects of Lepidamax on enhancing endurance and energy metabolism and indicate that Lepidamax also has a unique mechanism to support physical endurance.”

Kyowa Hakko offers Cognizin, the branded form of citicoline, made from an innovative fermentation process to yield high quality and purity, explained the company’s Lovett. “Cognizin has been clinically studied in middle aged and adolescence to support focus, attention, and mental energy,” she said, adding that it is stable, soluble, Generally Recognized As Safe (GRAS), non-GMO, tasteless, and odorless.

Kolb with TSI USA Inc. said clinically validated PEAK ATP has been shown in numerous studies to support ATP production, which he called the “energy currency” of cells.

A 2017 study published in the *Journal of Strength and Conditioning Research* (M.C. Freitas et al.) found that administration of PEAK ATP at an acute dose of 400 mg ATP was found to improve athletic performance by 24% after just one single dose. Additionally, use of the nutritional ingredient at 400 mg ATP per day has been found to reduce muscular fatigue (*Journal of the International Society of Sports Nutrition*, 2012); increase muscular excitability, peak power, and post-exercise ATP levels (*Journal of the American College of Nutrition*, 2017); as well increase recovery and reduce pain (*The Journal of Arthroplasty*, 2014).

FutureCeuticals also offers an ATP-boosting formula marketed as ElevATP. The ingredient is a natural complex comprised of ancient peat and a proprietary apple polyphenol extract, which has been clinically shown to improve strength, power, and performance in resistance-trained athletes. A 2016 study published in *BMC Complementary and Alternative Medicine* found that ElevATP works by increasing the serum levels of ATP. Wheeler explained, “This is not exogenous ATP or a precursor, but rather an ingredient that helps the body provide higher levels of ATP via its own internal mechanisms. In this way ElevATP is non-stimulatory energy.”

Delivering standardized levels of natural caffeine energy, FutureCeuticals offers Coffeeberry Energy, which Wheeler called “an exogenous energy source,” that provides “organic caffeine and unique polyphenols from whole coffee fruit.” Coffeeberry Energy is derived from the entire coffee cherry, which is often considered food waste. The upcycled coffee cherry is hand-picked

and then extracted using a patented, eco-friendly processing method to create this ingredient. FutureCeuticals sources coffee fruit from farms that are certified Rainforest Alliance.

A 2016 study published in the journal *Nutrients* found that with a pre-load of Palatinose from Parsippany, NJ-based [BENEEO](#), endurance athletes “maintained a more stable blood glucose profile and higher fat oxidation, which resulted in improved cycling performance compared with maltodextrin. The randomized, double-blind, crossover trial compared the effects of Palatinose and maltodextrin on fuel flexibility—the switch between fat and carbohydrates as an energy source and the subsequent effect on performance. The study included 20 cyclists each consuming 750 ml of a 10% carbohydrate drink before undertaking a 90-minute endurance exercise at moderate intensity level (60% VO2 max) and a subsequent time trial performance test. Results found that athletes who consumed the drink containing Palatinose showed higher fat oxidation rates during the endurance trial and performed better in the subsequent sprint test. On average, the athletes finished the time trial an entire minute faster with the drink containing Palatinose and were able to pedal more powerfully in the final five minutes of the time trial, compared to the maltodextrin control. The researchers suggested the findings illustrate that the type of carbohydrate consumed plays an important role for fuel flexibility and endurance.

Applied Food Sciences’ ([AFS](#)) organic, Non-GMO Project Verified caffeine is derived from coffee and tea. Brian Zapp, creative director for AFS, Austin, TX, said that what makes it unique is its 95% potency. “It’s high spec,” he commented. “This is really your entry point for clean label, sustainably sourced ingredients.” Many botanical sources of caffeine also have rich polyphenol content, which promote and stimulate energy. “For instance, coffee has chlorogenic acid and tea has catechins, which provide antioxidant support,” noted Zapp.

However, Zapp said the most unique energy ingredient the company offers is guayusa, which also provides natural antioxidants and caffeine. “When we first began studying this ingredient we suspected it had a prolonged caffeine effect,” he explained. Further research uncovered a different mechanism of action. “It turns out it didn’t—all caffeine is metabolized the same. What we did discover, however, is that guayusa regulates the release of epinephrine. The body will have this natural ‘fight or flight’ adrenal response when you ingest caffeine. This is why if you have too much or if you’re sensitive to caffeine you’ll feel flighty or jittery, which is a side effect to that adrenal epinephrine response in the body.” Guayusa, however, regulates this release. Zapp said this allows consumers to “sit still, but still remain focused.”

Guayusa also impacts neurotransmitter function; serotonin, dopamine, norepinephrine levels are elevated higher than with just caffeine alone. “It makes you more alert, more stimulated, supports a better mood, makes you more motivated, but also doesn’t agitate consumers or lead to ‘nervous energy.’” Zapp believes this will be the “next generation of caffeine.”

He explained that historic use of guayusa validates this science. “In the Amazonian rainforest, Kichwa tribes referred to this botanical as ‘the night watchman.’ It allowed hunters to remain alert and awake on these long hunts, while also allowing them to sit still and remain focused.” In modern day consumers, Zapp sees huge potential for office workers, e-gamers, and in sports nutrition.

Vice president of marketing for Rancho Dominguez, CA-based [BI Nutraceuticals](#), Randal Kreienbrink, CFS, pointed to ingredients such as extracts from guarana, guayusa, and green tea as popular natural botanicals for vitality and focus. “Guarana has grown dramatically in recent years and has been up 6-10% annually, at least,” noted Kreienbrink. He added that guayusa is a newer ingredient finding success in the market U.S. market, which has also seen significant

growth. “Our natural energy ingredients are clean label, and we don’t use any chemical solvents in processing,” he said.

Sips, Shots, Snacks & More

Numerous energy drinks, shots, supplements, and snacks claim to give users the fuel they’re seeking.

In the supplement market, Rainbow Light offers several multivitamin gummy formulas that are formulated for extra energy. A Men’s Energy Multivitamin Gummy, Women’s Energy Multivitamin Gummy, and Teen Energy Multivitamin offer targeted nutritional combinations to support vitality, focus, and even mood, according to the company.

“Beverages still dominate for energy, but we’re also seeing snack food and bars expanding the landscape of new products. Some of these offerings are positioned for sports, but others focus on general wellness,” observed BI Nutraceuticals’ Kreienbrink.

An interesting area of expansion is in the cannabis market, he added. “Since we have offices in California, New York, and in Nevada where cannabis is legal for recreational as well as medical use, we’re seeing edibles that are combining guarana and guayusa with CBD. The CBD helps to support focus and energy, while guarana and guayusa provide an energy boost in a nootropic-like formula.” While BI does not sell products with THC, the company’s energy ingredients may be used in conjunction with such products within the legal cannabis market, with legality of products varying from state to state.”

Nutrition 21’s Perez Ojalvo observed a rise in formulas that tout “no crash,” “longer lasting energy,” and natural ingredients. “With today’s consumer, convenience is key for most. Ready-to-drink (RTD) beverages, drink mix stick packs, gels, and gummies are all easy to take on the go,” she said.

Formulas bolstered by standardized, scientifically-backed ingredients will yield the best results for manufacturers, stated Bornet of Horphag Research. “This helps to ensure that each product is consistent and of the highest quality for consumer use,” he urged. “Consumers are doing more research at the point of purchase to learn about ingredients, read what is on the product label, and decide on products that provide the best efficacy for their needs.”

Wheeler with FutureCeuticals and Van Drunen Farms observed the dominance of ready to mix (RTM) and RTD beverages ranging from sports drinks to functional waters. “Consumers are on the go and looking for easy and efficacious means to energy,” he said. Additionally, he pointed to successful energy applications with meal replacements, such as bars and on-the-go energy snacks “that both satisfy and energize.” He added, “It’s not only about powering through a workout, but powering through the day and feeling good.”

According to Barone with Lonza, innovative delivery formats such as gels, which he said “are highly bioavailable, convenient, and easy to use,” are appealing to a wide range of consumers. However, he suggested capsules remain the preferred dosage format among consumers. “Our data [NMI, 2018] shows that 42% of U.S. supplement users prefer capsules over any other delivery format,” said Barone. “Our Licaps liquid-filled capsules, for example, can support nutritional applications to answer to consumer demand, including bioavailability enhancement, taste and odor masking, combination products, and release profiles for sustained energy

throughout the day.”

Barone said Lonza’s other innovative dosage form technologies include beadlets, which enable product developers to formulate supplements into different release profiles to ensure they are delivered to the body throughout the day. “Suitable for use in capsules, ready-to-mix blends, and functional foods, beadlets also facilitate the combination of ingredients that are typically incompatible to maximize nutritional benefits. Tablet-in-capsule and lipid multi-particulate (LMP) technologies are further broadening out the delivery systems now available to manufacturers for supplements targeting energy.”

Category Challenges

Consumer demands are shaking up the energy ingredient market. “There is a battle between natural energy and synthetic, and the associated costs,” Wheeler said. With the recent push for clean label, natural sources of energy, he noted the market has “turned a corner” where consumers, much like with organics, “will now pay more for natural, clean-label forms of energy as opposed to synthetics.” He added that in dealing with major performance product manufacturers and healthy aging companies, and everything in between, FutureCeuticals/Van Drunen Farms has seen a noticeable shift to natural across the entire spectrum. However, he stressed that, ultimately, ingredients must work and need to offer “substantiated, marketable claims for wherever you position your products.”

While caffeine continues to lead in the energy market, concerns about safety, excessive use, and potential regulatory issues have raised red flags for consumers and governing bodies. As a result, Kolb sees increased consumer interest in non-stimulant caffeine substitutes. “The ‘over-caffeination’ of consumers due to increased consumption has led to a sharp increase in relaxation ingredients such as melatonin or L-Theanine, helping consumers to counteract the negative side effects of caffeine,” he said. “Caffeine is the standard for efficacy and ‘feel.’ Caffeine alternatives will have to match the benefits of caffeine in regards to alertness, focus, and attention. While research has confirmed increased mental focus and acuity from the use of caffeine, stimulant-sensitive individuals should assess their tolerance before using energy products containing caffeine.”

He cautioned that caffeine can have unwanted dose-dependent effects, contributing to feelings of nervousness or anxiousness. Critically, between 2007 and 2011, the number of energy drink-related visits to emergency departments doubled, and in 2011, one in 10 of these visits resulted in hospitalization, according to data from the National Institutes of Health.

The demand for sustained energy, rather than a jolt and crash, is not an easy thing to achieve, Barone noted. “Modified release for sustained energy is a challenge that companies and manufacturers struggle to meet within the energy marketplace. Specific categories of consumers, such as ‘working athletes’ may require sustained energy to stay focused throughout the day.” Therefore, he said it is important that manufacturers offer dosage form solutions that can achieve this end goal.

“Delivery efficiency is always a challenge when consuming any material orally,” said Crabtree of Bioenergy Life Science, with the digestive process often acting as a barrier. “During product development, maximizing the absorption of precursor materials into serum so they may become active in tissue is paramount.”

Furthermore, informing consumers and manufacturers about the different kinds of energy and

performance can be a hurdle, he said. “Developing an educational narrative erasing the interchangeable use of ‘energy’ and ‘stimulation’ is a challenging obstacle. In biophysics, the concept of energy is very poorly defined, and as we move into the public space, non-existent. This leaves the technically uninitiated consumer in a vulnerable position.”

Active Advancements

Experts noted some key consumer trends that will drive future growth in the energy market.

For example, according to Barone, gamers and those active in the world of “e-sports” will propel interest in formulas for vitality and concentration. “The rise of gaming, or ‘e-sports,’ where players need sustained energy levels and mental clarity to allow them to stay focused for several hours of continuous play at a time, places huge demands on the body,” he explained. “While it may not be a typical ‘sport,’ this raises a challenge for manufacturers to create dosage form solutions which will allow longer, modified release for sustained energy and focus.”

The demands of a rigorous education are also driving students to products supporting cognition and alertness. “College students are often looking for nutritional solutions to boost focus and clarity,” said Barone, “especially during exams periods. A category often underserved by supplements, college students turn to energy drinks to gain the sustained energy needed.”

Cognitive health will continue to hold major market share, according to Crabtree. “The average work schedule is heavier than ever. Exposure to technology and low-frequency noise in an urban environment produce a kind of sensory overload, which can produce declining mental faculties over time. As a result, nutritional products promoting cognition receive more attention every year. To achieve better quality of life and cognitive health, consumers of all ages are focused on nutritional variety in their diets: fruits, veggies, diverse protein intake, and the management of micronutrients to help reduce the impact of environmental stressors.”

Bornet predicted that as consumers become more aware of the health risks associated with highly caffeinated beverages, they will turn to safer, scientifically-validated formulas. “They’re now looking for clean labels, natural ingredients with proven benefits, and caffeine-free alternatives. Companies should tailor their offerings to meet these growing consumer needs and incorporate natural, clean ingredients into their energy formulations.”