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Bringing Diners Back to the Table

demographic redirection
promoting whole grains
ingredient first timers
formulating for energy

by Linda Milo Ohr

Awake, Alert, and Energized

It used to be that the energy market was targeted at athletes looking to prolong their workouts or boost their levels during performances or competitions. While this is still an important segment of the market, energy levels are now a concern for general consumers and weekend warriors. Take a look at the beverage shelf in the supermarket or convenience store and this is quite apparent.

For example, in the June 2013 issue of *Costco Connection*, the company introduced its newest *Kirkland Signature™* product, *Kirkland Signature Extra Strength Energy Shot*. The shots are described as a convenient way to enhance energy levels and stay focused and alert throughout the day. The sugar-free and zero-carbohydrate energy shot features a 2,300 mg energy blend designed to provide instant energy that lasts for hours. The special formulation includes B vitamins and beneficial amino acids, including L-tyrosine, L-phenylalanine, and taurine.

Here is a look at some of the ingredients that are believed to affect energy levels, including ribose, botanicals, vitamins, amino acids, and slow-digesting carbohydrates.

Amino Acids

Amino acids are often used in energy-promoting products. Taurine, for example, is commonly found in popular beverages to boost energy.

A unique dipeptide ingredient, *Sustamine™*, from Kyowa Hakko USA, New York, N.Y. (www.kyowa-usa.com, www.sustamine.com), combines the amino acids L-alanine and L-glutamine to work

performance and visual reaction time using water mixed with *Sustamine* compared to plain water. The study included 10 players with collegiate experience, including current and former Division I athletes, and was conducted in four trials. Each trial consisted of a 40-minute basketball game with controlled time-outs for rehydration. During the first trial, the subjects could not rehydrate, followed by the three trials where the subjects could consume only water or water with *Sustamine* at two different doses.

The subjects lost approximately 2.3% of body mass during the trial where no fluids were given. Their jumping power remained strong, but shooting accuracy and visual reaction time showed a tendency to be impaired. A 12.5% difference in shooting performance was noted between the trial where no hydration was allowed and the one where the subjects drank 1 g of *Sustamine* in 500 milliliters of water, and an 11% increase was seen between the trial where the subjects consumed *Sustamine* and the one where only water was consumed. The researchers concluded that rehydrating with *Sustamine* appeared to maintain basketball skill performance and visual reaction time to a greater extent than water only.

Botanicals

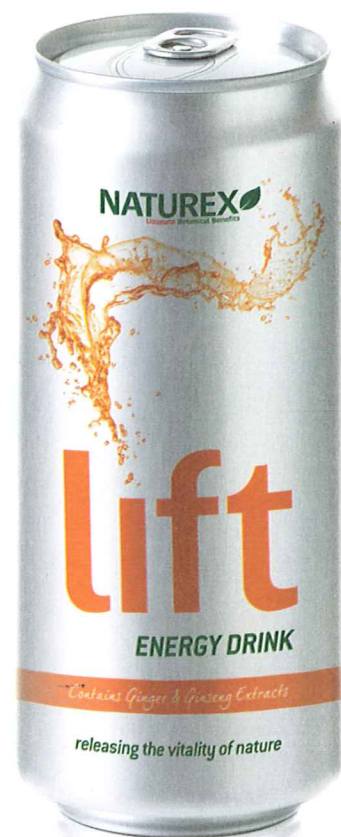
At the 2012 Health Ingredients Europe, Naturex Inc., South Hackensack, N.J. (www.naturex.com), showcased a new energy drink concept that enables beverage companies to develop products that appeal to the kinds of consumers who do not usually

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buy energy drinks. *Lift* is a natural and refreshing fruit-flavored carbonated drink formulated with ginger and ginseng extracts—two botanical ingredients associated with energy-boosting properties. Colored with paprika extract, *Lift* has been designed to resonate with women and consumers ages 35 and older. According to Naturex, these

on multiple levels to help rehydrate the body and sustain energy levels during exertion. The ingredient's dipeptide structure is quickly and easily absorbed by the body, giving muscles the amino acids they need faster.

Hoffman et al. (2012) showed that collegiate female basketball players maintained better skill



Ginger and ginseng extract, which have energy-boosting properties, are being used in some energy drinks. Photo courtesy of Naturex Inc.

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Consumers can add caffeine and energy-boosting vitamins to water by using Vitamin Squeeze. The caffeine is derived from tea leaves. Photo courtesy of Ecosentials LLC

demographic groups have traditionally been overlooked by the energy drinks sector even though together they represent more than half of all consumers (Naturex, 2012).

The ginger and ginseng extracts used to formulate *Lift* are part of Naturex's *NAT healthy*™ ingredients portfolio of botanical extracts. Examples of other natural energy-boosting ingredients in the portfolio include maca, rhodiola, guarana, yerba mate, and rosehip.

A rhodiola ingredient is offered by P.L. Thomas & Co. Inc., Morristown, N.J. (www.plthomas.com). Adaptogens like rhodiola provide energy while helping the body adapt to stress. *RhodiLife*™ supports sustained energy and promotes wellness, physical performance, and an increased capacity to handle stress and support mood. The ingredient's unique "fingerprint" composition consistently provides the spectrum of nutrients found in the

root of the plant, which are responsible for its biological activity.

P.L. Thomas also offers açai as another ingredient solution that gives a cleaner, healthier form of energy. Açai grows in the Amazon rainforest where it is commonly used in the local diet because of its high nutritional value and because it is an excellent source of energy. The rich purple fruit, with high antioxidant concentrations, is an excellent source of calcium, iron, phosphorus, vitamins B-1, B-2, B-3, C, and E, and essential fatty acids.

Tea leaves are also used as a natural source of caffeine. The product, *Vitamin Squeeze*™, from Ecosentials LLC, Phoenix, Ariz. (www.vitamin-squeeze.com), utilizes pure, natural caffeine extracted from tea leaves. It provides 40–60 mg of natural caffeine, approximately the same amount present in an 8-oz cup of coffee. *Vitamin Squeeze* has 120% of a day's vitamin C requirement as well as 100% of vitamins B-3, B-5, B-6, and B-12, 50% of vitamin D, and electrolytes, zinc, and chromium. *Vitamin Squeeze Powder Water Enhancers* are available in *Multi-Vitamin*, *Energy*, and *Weight Control* formulas.

Vitamins

B vitamins are often present in energy-boosting products because they are important facilitators of cell metabolism and energy production. B vitamins such as thiamin (B-1), riboflavin (B-2), and niacin (B-3) are critical for the operation of metabolic cycles in the body that generate adenosine triphosphate (ATP), the body's energy currency. Other important B vitamins include folate and cobalamin (vitamin B-12), which are involved with red blood cell production and cell division, as well as pyridoxine (vitamin B-6), which is needed for protein synthesis (Chaudhari, 2011).

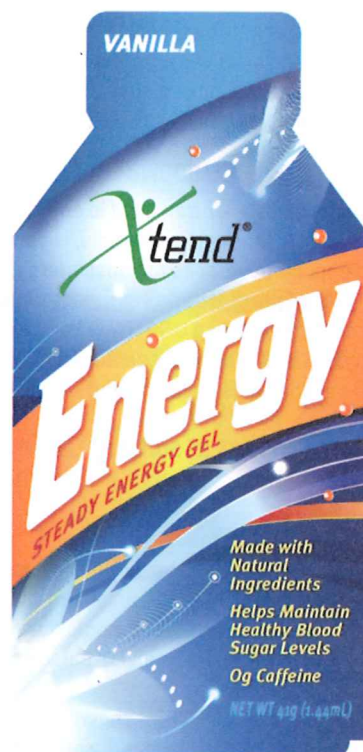
At the Vitafoods Europe 2013 in Geneva, Switzerland, SternVitamin GmbH & Co. KG, Ahrensburg, Germany (www.sternvitamin.de), focused on several concepts for specific target groups, including drinks

for athletes and "energy drinks for love." The "love booster" drinks contained vegetable substances like damiana extract powder. The premix from the SternVit BV series is available in two variants, one for women and one for men. The mixture for women contains the plant extracts ginseng and damiana and also L-arginine, magnesium, and the vitamins B-6, B-12, and C. Besides damiana and guarana extract, the "stimulator" for men contains vitamins B-1, B-6, B-12, and C.

Slow-Digesting Carbohydrates

Slow-digesting carbohydrates offer the advantage of sources of sustained energy. *Xtend*® sucromalt from Cargill Inc., Minneapolis, Minn. (www.cargillfoods.com), is full-caloric carbohydrate syrup that is ideal for use in foods in which steadier energy delivery or an attenuated blood glucose response is desired because it is slowly

Some ingredients promise the advantage of sustained energy over longer periods of time. Photo courtesy of Cargill Inc.



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digestible and has a low glycemic index. It is 70% as sweet as sugar and versatile enough to use in numerous product categories.

Dammann et al. (2013) showed that sucromalt may help attenuate the perceived decline in mental and physical energy and rise in mental and physical fatigue that can occur 4–5 hours after ingestion of a

beverage with a high glycemic index. In this cross-over study, 44 healthy adult subjects consumed a beverage formulated with either 75 g of sucromalt (experimental product) or glucose (control product) in the morning. Then they completed a questionnaire rating their levels of mental and physical energy and fatigue over the next five hours. The results showed that participants reported significantly greater mental and physical energy, delayed physical fatigue, and a trend toward less mental fatigue with sucromalt compared to glucose, particularly 4–5 hours after consumption. The researchers said that further research is needed to confirm these findings and to better understand why sucromalt may be advantageous from a metabolic perspective beyond its effect on postprandial glycemic response.

Isomaltulose is another slowly digesting carbohydrate that provides an innovative energy source in food and drinks. At the 2012 Food Ingredients Asia in Jakarta, Indonesia, BENEIO Inc., Morris Plains, N.J. (www.beneio.com), gave insight into its *Palatinose*[™] isomaltulose. *Palatinose*, which is naturally derived from sugar beet, provides the full carbohydrate energy in the form of glucose over a longer period of time. Being low-glycemic, it releases energy in a balanced way without sudden peaks and drops of the blood glucose level. With its slow but complete absorption and hydrolysis, *Palatinose* provides a constant and extended stream of energy out of its caloric value of 4 kcal/g for muscles and brain, making it ideal for all those who want to maintain and optimize their physical and mental performance.

The ingredient more evenly provides the desired energy from glucose for those involved in endurance activities. This allows the maintenance of fat burning at a higher level, meaning that the body gains energy from its own fat reserves to a greater extent. Ideally, this allows the body's own carbohydrate reserves to be saved for the benefit of longer endurance.

Ribose

D-ribose (or simply ribose) is a simple, 5-carbon monosaccharide, or pentose sugar. The body uses ribose to regulate the synthesis of ATP, the primary energy molecule of the cell. ATP is critical for maintaining normal energy-related functions. Ribose also provides the structural backbones of DNA and RNA, certain vitamins, and other important cellular compounds.

At the 2013 Research Chefs Association Annual Conference & Culinary Expo, Bioenergy Life Science Inc., Ham Lake, Minn. (www.bioenergyribose.com), showed how products formulated with

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ribose can help to improve energy levels, fight fatigue, and boost exercise recovery. Prototypes available for tasting included *Fruit Snack Chews* made with ribose and *Dark Chocolate-flavored* and *Greek Yogurt Cranberry Cinnamon-flavored Protein Ribose Balls* that were also formulated with whey crisps.

Bioenergy Life Science is the only provider of the pure and patented *Bioenergy Ribose*. The company has amassed a large body of scientific literature on the uses of ribose for people across all age ranges and health categories.

Carnitine

L-carnitine is a nutrient essential for energy metabolism and is responsible for transporting long-chain fatty acids across the mitochondrial membrane for subsequent fat breakdown and energy generation. The effectiveness of *Carnipure™* has been demonstrated in various human studies,

which Lonza Inc., Allendale, N.J. (www.lonza.com), conducted in collaboration with major universities and research centers around the world. Studies show that *Carnipure* tartrate supplementation can support recovery after exercise. Researchers observed a decrease in the production of free radicals, less tissue damage, and reduced muscle soreness after exercise in recreationally trained athletes following 3 weeks of *Carnipure* tartrate supplementation. These effects were found to be dose-dependent, present both in young and old, male and female subjects. The supplementation with *Carnipure* tartrate was found to induce an increase in muscle oxygen consumption, providing a potential mechanism for reduced hypoxic stress following resistance exercise. **FT**



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