The Science of SPORTS NUTRITION

Developing, understanding sports nutrition ingredient science to drive market success
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Sports Ingredient Science Update: Popular and Emerging Sports Nutrition Ingredients Garner Increased Attention From Researchers

Before becoming a true innovation, an idea must first be scientifically explored—put to the test, if you will. Steve Myers details the most pertinent research of the hundreds of new sports nutrition studies that hit the pages of peer-reviewed journals in 2016.

Carbohydrates for Energy, Performance

High molecular weight (HMW) carbohydrates are starting to attract attention for their benefits in beverages to support energy and performance, suggests Hiroki Himeno, Ph.D., Glico Nutrition Co. Ltd.

Science is a Cornerstone of Formulation

The practice of additive or synergistic ingredient selection in formulation has become ubiquitous in the industry over the last half decade. There are many valid reasons for this, explains Bruce Kneller, Giant Sports International.

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Rick Collins, Esq., Collins Gann McCloskey & Barry PLLC, discusses the potential impact of the Trump Administration on sports nutrition regulations and how brand owners be prepared.

Viewpoint: Ingredients and More

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Leaders and Trends in Intellectual Property: Sports Ingredient Science

A review of nutritional supplement trademark applications and registrations found more than 7,000 that included the term “sport,” and variations thereof, in the list of goods and services, reports Andreas Baltatzis and Gideon Eckhouse, KramerAmado PC.

Takeaways for Your Business

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Ingredients and More

Two months into 2017, we are still wondering how this year will unfold. For the sports nutrition industry, the challenges will be familiar, as the segment’s relentless quest for new, innovative ingredients to enhance energy, strength and performance leans into the wind, hoping the Donald Trump Administration eases the scrutiny and action against key ingredients and companies.

Supplement industry veteran Jim Lassiter provides insights on how NDI regulation may affect the sports nutrition industry, drawing from his deep experience in quality control and regulatory affairs (see page 33).

Beyond regulatory matters, companies in this segment continue to work hard to make permanent sports nutrition consumers of the thousands of active consumers migrating from the mainstream natural products industry.

All of this means ingredient research and development is as important as ever. Formulators will be looking for not just the cool new compound, but also for marketable and defensible claims to help products stand out. On page 36, Phil Chang from Hubba offers keys considerations to avoid overpromising and underdelivering on sports product claims. And for a formulator’s perspective, check out the short piece (page 29) by Bruce Kneller, a longtime sports nutrition industry product expert who will be speaking about formulation at the upcoming Ingredient Marketplace event in Orlando, April 18 to 20.

The sports nutrition program will also feature renowned sports industry attorney Rick Collins, who contributed an article to this Digital Magazine (page 31) on the regulatory outlook, including potential Trump Administration impact.

At the heart of this Digital Magazine is ingredient science, and yours truly reviewed the top research publications over the past year that focused on performance, energy, muscle development and recovery (page 5). There is a special focus on carbohydrates in sports nutrition beverages, including info on why osmality may be a key characteristic (page 25).

Investing in research and science is a big undertaking, and many companies try to maximize their return by securing intellectual property (IP) for their innovations. On page 38, IP attorneys Andreas Baltatzis and Gideon Eckhouse, from Kramer Amado, look at trends in patent and trademark applications by sports-focused nutrition companies.

So, pause at this crossroad to see the path behind you and the journey in front of you. There is always another game, match, meet and race, and this special Sports Ingredient Science Digital Magazine is designed to help you train for competition.
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Science and technology have changed how athletes train and recover. What they put into their bodies has also changed dramatically. These developments go hand-in-hand, as medical advances and new research discoveries drive nutrition innovation, and vice versa.

Before becoming a true innovation, an idea must first be scientifically explored—put to the test, if you will. In the sports nutrition world, this means a series of safety, pilot and clinical research studies.

During 2016, hundreds of new sports nutrition studies hit the pages of peer-reviewed journals, most notably the Journal of the International Society for Sports Nutrition (ISSN) and Medicine & Science in Sports & Exercise.

Companies have many reasons to invest in such research. First and foremost, is to know more about an ingredient or formula, including its safety and efficacy. Also, like most nutrition products, sports nutrition products rely heavily on benefit claims to drive sales. These claims must be substantiated by research. Borrowing science only has limited value, at best, as the characteristics of one version of an ingredient may not be the same or elicit the same performance as another version. This is why INSIDER’s coverage of specific studies often includes the brand name of the ingredient or product used in the study.

For instance, a multi-ingredient pre-workout formula from MusclePharm was researched for its effect on power, strength and performance by a team of nutrition and performance scientists from the University of South Florida, Tampa. Results of the crossover study showed a small group of male recreational and competitive athletes who took the Assault™ sports supplement experienced increased anaerobic peak and mean...
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power, compared to placebo and baseline values. There were no significant differences in upper and lower body power or upper body strength.

The Assault supplement used in the study contained vitamins, minerals (e.g., electrolytes), beta-alanine (as Carnosyn®, from Natural Alternatives International), tyrosine, red beet extract, ribose, cinnamon bark extract (as Cinnulin PF®, from Integrity Nutraceuticals), creatine nitrate, arginine nitrate, glutamine nitrate, branched chain amino acids (BCAAs), taurine, caffeine and Huperzine A (derived from the moss Huperzia serrata). Such a study may have found a benefit, which could help marketing of the finished supplement, but it does nothing to pinpoint which ingredient(s) are responsible for the benefits.

Many of the ingredients in Assault are increasingly popular in sports nutrition formulas. Some have been researched individually for specific strength, performance, energy or recovery benefits.

**Creatine: Energy and Power**

Energy for exercise is produced by breaking the bonds of a specific molecule called adenosine triphosphate (ATP), a process that takes place inside body cells. There are numerous ways the body makes ATP, mostly from carbohydrates and fats.

Some methods of producing ATP are quicker than others. Phosphocreatine stored in the muscles can rapidly restore ATP. It requires no oxygen. However, the stored phosphocreatine only lasts so long, about 8 to 12 seconds. Supplementing with the amino acid creatine has become a popular way of increasing muscle stores to get a few more seconds of energy from the phosphocreatine method.

**NAD+**

Nicotinamide adenine dinucleotide (NAD+) is a crucial compound in the production of anaerobic energy. As a precursor to NAD+, nicotinamide riboside has been proposed as a dietary ingredient to increase energy and performance. Based on evidence such supplementation could increase endurance, researchers undertook a proof of concept study (J Int Soc Sports Nutr. 2016 Aug 2;13:32) “The first exercise related study to evaluate the NAD+ supplement finds surprising results,” Kalman said of the study which found the supplement group had worse endurance than the placebo group. The researchers suggested the added nicotinamide riboside appeared to decrease fatty acid oxidation during exercise, leading to early fatigue.

Creatine supplements, primarily creatine monohydrate, have been around for decades, and research is ongoing. A late 2016 publication noted creatine supplementation (5 g four times daily for six days) in “explosive” male athletes who performed an exercise regimen for four weeks increased muscle strength but not performance or body composition, compared to placebo.2
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The safety of creatine supplementation has been challenged by some mainstream physicians and media, but the current body of research on creatine shows it is fairly safe. In a December 2016 published review of the safety of various forms of creatine, German sports science researchers noted, “Creatine monohydrate has already been evaluated by different competent authorities, and several have come to the conclusion that a daily intake of 3 g of creatine per person is unlikely to pose safety concerns, focusing on healthy adults with exclusion of pregnant and breastfeeding women.”

The latest trend in creatine supplements is to bond creatine to nitrate. This may slightly improve absorption and add improved blood flow and muscle “pump” (swelling) to the regular benefits of creatine monohydrate.

A recent study conducted at Texas A&M University, College Station, found supplementation with either creatine monohydrate (5 g) or creatine nitrate (3 g) significantly increased muscle creatine stores after one week, but only the creatine nitrate group saw significantly improved performance compared to placebo (6.5 g of dextrose). In this group, leg press lifting power and bench press peak power increased, compared to those taking monohydrate, placebo or a lower dose (1.5 g) of creatine nitrate.

Despite the evidence, there is still some debate on the legality of creatine nitrate as a dietary ingredient. While creatine monohydrate is “grandfathered” as having been marketed before 1994 (EAS brought creatine monohydrate to market in 1993), the nitrate form of creatine may have to undergo the new dietary ingredient (NDI) process. Thermolife International submitted an NDI notification on creatine nitrate to FDA in 2011, but the agency responded that the information submitted was not sufficient to determine the safety of the ingredient. In 2012, Thermolife declared self-affirmed GRAS (generally recognized as safe)—a designation for food ingredients—in an effort to bypass the NDI difficulties.

The argument that creatine nitrate is not an NDI requiring notification hinges on its reported separation into creatine and salt in the digestive tract; FDA’s draft guidance stated a process that makes new bonds is considered “chemically altered” and needs a notification unless the bonding is reversed in water or during ingestion. FDA has not acted against companies selling creatine nitrate or other amino acid salts, and research continues on whether taking creatine and nitrate in one ingredient provides more benefits than taking each separately, if they separate before absorption.
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Caffeine: Love-Hate

A popular pick-me-up for most people, caffeine can stave off fatigue by occupying central nervous system (CNS) receptors that would otherwise take up adenosine, a compound that increases after ATP/energy is depleted and, once seated at these receptors, signals fatigue. However, caffeine’s actions stimulate the CNS and increases adrenaline and heart rate. Chronically and in excess, this stimulating effect could be dangerous and unhealthy.

That said, caffeine is popular among athletes and is common in sports nutrition products. This stimulant is not without its researched benefits. In 2016, exercise and nutrition scientists from Fitchburg State University, Massachusetts, and University of Guelph, Ontario, published research (Appl Physiol Nutr Metab. 2016 Aug;41(8):850-5) showing low and moderate doses of caffeine, especially late in exercise, can improve performance compared to placebo. There were no adverse effects on respiratory, heart rate or glucose in the study, which involved male and female cyclists undergoing time trials.

Theacrine, a purine alkaloid found in coffee and tea, has a molecular structure (purine alkaloids) and stimulating action similar to caffeine. However, it is billed as less habit-forming. In early 2016, University of Mary Hardin-Baylor, Texas, exercise and sports science researchers published study results (J Int Soc Sports Nutr. 2016;13:2) demonstrating supplementation with theacrine (as Teacrine®, from Compound Solutions) in healthy men is safe and non-habituating. They noted across the eight-week study, baseline values for energy, focus, concentration, anxiety, motivation to exercise, and POMS (profile of mood states) were stable for up to 300 mg/d supplementation.

Subsequently, a two-part randomized trial (J Diet Suppl. 2016 May 10:1-15) showed both 200 mg/d and 400 mg/d of Teacrine supplementation in healthy subjects led to increased energy, focus and concentration, while only the low dose was associated with increased willingness to exercise, anxiety, motivation to train and libido. There were no adverse effects, including resting heart rate.

Caffeine may also be beneficial in synergistic combination with other sports ingredients, such as a unique combination of extracts from ancient peat and apples (as elevATP®, from Futureceuticals) that increases blood ATP levels and exercise benefits, according to promising new research (J Int Soc Sports Nutr. 2016 Jun 10;13:25).

Resistance-trained males took either a placebo or a supplement containing elevATP, caffeine anhydrous (extended release), B vitamins and PURE ENERGY® (from Chromadex)—a combination of caffeine and the blueberry antioxidant pterostilbene (as pTeroPure®, from Chromadex). Following a resistance exercise protocol, the subjects taking the supplement had increased muscle area and thickness, as well as decreased fat mass and fat percentage, compared to the placebo group.

The researchers said this was the first study to test the effects of an ATP-boosting ingredient with caffeine on body composition when paired with resistance exercise; they attributed the muscle development to elevATP and the fat loss to caffeine, adding there also was likely synergistic actions. There was no adverse effect on blood chemistry.
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Nitrates: Go With the Flow

Nitrates are a hot ingredient in sports nutrition. Found in many foods, especially vegetables, nitrates are lauded by athletes for increasing blood nitric oxide (NO) levels, thereby promoting vasodilation and improved blood flow. Better circulation means better delivery of nutrients that can support energy and performance. Research on this category of sports ingredients is limited but building, and several studies published in 2016 suggested positive benefits for active consumers.

The primary source of supplemental nitrates for sports formulas has been the amino acid arginine and its precursors. In the case of arginine bonded to silicon, recent evidence shows the sum may be better than the parts. Animal research reported in summer 2016 noted the combination of arginine, silicon and inositol (as Nitrosigine®, from Nutrition 21) led to greater serum and joint tissue levels of both arginine and silicon than in the control groups, including one group taking each individual ingredient at the same time.5

Around the same time, an in vitro study comparing NO effects from several sports nutrition ingredients found Nitrosigine significantly increased NO production—more than five times—compared to arginine, arginine AKG, citrulline, citrulline malate and agmatine sulfate.6

Beetroot is another common source of dietary nitrates in sports nutrition. A randomized, controlled trial (RCT) published in late 2016 found athletes taking beetroot juice for five days had improved sprint times, distance covered and reaction in a series of exercise-based tests, compared to those taking a placebo.7 Also in 2016, New Zealand researchers reported their study of trained male cyclists found six days of eight days of beetroot juice supplementation produced inconclusive results on VO2peak (oxygen capacity), two common ventilator thresholds and exercise economy, while eight days of beetroot supplementation showed beneficial impact on time trial performance time and power.8 Still, as an example of how results on nitrates and performance are mixed, another 2016 publication from the same New Zealand researchers concluded beetroot juice supplementation in trained cyclists did not improve overall performance in short-duration time trials.9

Nutrosigine

“Nutrition to augment and support complex cognitive tasks can be useful for athletes and individuals who engage in competition,” Kalman said, explaining the significance of a late-2016 study (Nutrients, 2016 Nov;8(11):736) on healthy males taking Nitrosigine. Compared to those taking placebo, the supplement group had significantly improved the ability to perform complex cognitive tests requiring mental flexibility, processing speed and executive functioning.
1. What are the top trends impacting the sports nutrition market in 2017?

Sports nutrition is becoming mainstream. Avid sports enthusiasts, as well as everyday consumers, have recognized the value of increased protein in a healthy diet. This mainstreaming of protein and sports nutrition is driving a need for more readily available applications and convenient, novel ways to deliver protein in packaged sports nutrition products.

Powder shakes and bars applications have been trending, but consumers want a variety of tastes and textures; for example, savory and crispy snacks that are low in carbs and high in protein and fiber, like our prototype new MEAT-SNX™. Consumers are now open to manufacturers putting more protein in everyday foods and in new convenient forms, such as cereals, bites and protein seasonings and gravies (low in fat and high in protein). The mainstreaming of sports nutrition presents a tremendous opportunity for food manufacturers and grocery stores to participate in the protein and sports nutrition trends.

Another trend is the ongoing focus and sophistication in the nutrition that goes into pre-workout shakes, which are adding ingredients such as L-arginine to support nitric oxide (NO) levels and help improve circulation, and L-carnitine to help support fat as energy during workouts. Some of these amino acids occur naturally in certain proteins; for example, chicken is naturally rich in L-arginine to support the boost in NO levels.

Rehydration and recovery beverages also continue to grow, providing electrolytes and carbohydrates that better utilize energy without up-and-down spikes. These more efficient carbohydrate forms allow athletes to perform without retaining sugars.

2. What should manufacturers do to help differentiate themselves in an increasingly competitive sports nutrition marketplace?

Manufacturers can differentiate themselves through their quality and by incorporating relevant and credible certification programs, as well as providing verifiable nutrition and scientifically backed results on product performance. The more a manufacturer can offer transparency and verifiable nutrition to deliver results, the greater the likelihood the manufacturer will build trust with consumers and the marketplace.

3. What unique value proposition does IDF offer?

IDF offers protein solutions that are 100 percent sourced in the USA, meet requirements for USDA minimally processed, are paleo-friendly, offer zero carbs and can claim free-from dairy, gluten and soy. IDF’s new CHiKPRO™ Chicken Protein Isolate is the most efficient protein for delivery of the Daily Requirements of essential amino acids, calculated by the Institute of Medicine (IOM).
Amaranth, or red spinach, is an emerging source of nitrates. A 2016 placebo-controlled, crossover study found a single dose of amaranth extract (as Oxystorm®, from DolCas Biotech and PLT) in healthy adults increased nitrate and nitrite levels and showed promise in improving overall performance in rigorous physical activities. Subsequent clinical research presented in June 2016 detailed how Oxystorm supplementation in male and female recreationally trained adults improved ventilator threshold (point during intense prolonged exercise when breathing surpasses normal ventilation rate).

The non-essential amino acid citrulline is a precursor to arginine. Dietary citrulline has an easier path to absorption than arginine does, which has helped drive popularity for citrulline as an alternative to arginine supplementation. Citrulline also helps remove ammonia that builds up during exercise and inhibits the restoration of ATP/energy.

In 2016, scientists from Kyowa Hakko, a Japanese supplier of L-citrulline, reported results from its RCT showing trained male cyclists who took 2.4 g/d L-citrulline for one week had significantly increased plasma arginine levels and decreased time to finish a time trial, compared to placebo. Riders taking citrulline also reported feeling less fatigue and improved concentration post-exercise, than did those taking placebo.

A popular method of boosting citrulline intake is bonding it with malic acid, which is a necessary compound for making ATP/energy.

Citrulline malate research is picking up pace, with several published studies contributing to the scientific support for the use of this ingredient in sports nutrition formulas. There were at least five different studies on citrulline malate presented at the American College of Sports medicine (ACSM) annual conference in Boston in early June 2016.

Among the highlights, consuming citrulline malate a half hour before anaerobic challenge resulted in increased mean power throughout the performance and decreased...
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lactic acid accumulation, compared to placebo;\textsuperscript{13} and, taking the supplement one hour before exercise led to increased power and total work, as well as reduced fatigue in recreationally trained females.\textsuperscript{14} Also, female masters level (42 to 60 years of age) tennis players taking citrulline malate an hour before isokinetic exercise promoted increased performance, including total work, relative peak torque, average power and average peak torque, compared to those taking placebo.\textsuperscript{15}

On the recovery side of exercise, one study found citrulline malate supplementation two hours before exercise modulated the magnitude and duration of post-exercise hypotension;\textsuperscript{16} and, the supplement might promote recovery of muscle contractile function following the onset of mild DOMS (delayed onset of muscle soreness).\textsuperscript{17}

Additional research published in the past year noted resistance-trained college males taking 8 g of citrulline malate experienced enhanced upper body performance in resistance tests.\textsuperscript{18}

Citrulline and arginine can counterbalance the downside of BCAA supplementation—increased ammonia during exercise. Citrulline and arginine can reduce ammonia and stave off fatigue. A 2016 Chinese RCT found male taekwondo athletes taking a combination of citrulline, arginine and BCAAs maintained their reaction time during match simulation, whereas those taking placebo experienced impaired reaction time.\textsuperscript{19} The supplementation group also had lower tryptophan-to-BCAA ratios and increased NO production.

**Protein and BCAAs: Muscle Nutrition**

Muscle protein synthesis (MPS) is the process that builds lean body mass via a process that is basically muscle repair following exercise. Proteins are the building blocks of muscle, and amino acids are the building blocks of protein.

Whey has long been the choice protein in the sports nutrition market, but the research on whey supplementation is still revealing insights. According to one 2016 study of NCAA division II female basketball players, eight weeks of whey protein supplementation both before and after anaerobic and resistance training resulted in increased gains and improved agility, compared to placebo.\textsuperscript{20}

**Whey Plus Aminos**

Italian researchers published study results in 2016 (\textit{Am J Clin Nutr}, 2016 Mar;103(3):830-40) detailing how supplementation with whey, essential amino acids (EAAs) and vitamins can boost lean body mass and strength, when taken in conjunction with an exercise program. “This study demonstrated the utility of sports nutrition ingredients to have a far reaching positive effect on lean mass (and health) of older subjects,” Kalman noted.
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Motivation is considered by many to be the single most important element of any training program. If you’re not out there, it’s not getting better. At the same time, loving every minute of training, every day is almost impossible. Training requires focus and freedom from the stresses of everyday life. That’s where adding Zembrin® to your sports formulation may help.

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Probiotics may enhance protein utilization for improved performance and recovery. In research conducted at the University of Tampa Human Performance Research Lab, a combination of casein and Bacillus coagulans GBI-30, 6086 (as Ganeden BC30®, from Ganeden) increased perceived recovery and reduced soreness, compared to placebo, in recreationally trained men. Specifically, the probiotic combination decreased exercise-induced muscle damage as indicated by the marker creatine kinase (CK). The researchers noted B. coagulans produces digestive enzymes that speed up digestion of proteins in the gut even more than do endogenous enzymes.

Whey, casein and other proteins contain BCAAs (leucine, isoleucine and valine). Supplementing directly with free-form BCAAs has become a popular way to skip the extra digestion needed to draw BCAAs from whey during digestion. In mid-2016, Australian researchers published clinical results suggesting BCAA supplementation in recreationally active males improved cycling performance, including completion time, compared to placebo, but there was no significant difference between the groups on central or peripheral fatigue. Auburn University researchers recently added their study results to the body of evidence, as chronic BCAA supplementation improved cycling sprint performance in endurance cyclists and inhibited immune suppression typically associated with intense exercise.

BCAAs can be beneficial when ingested at various times in the workout cycle. A late 2016 study found acute BCAA supplementation before and after intense strength training limits the reductions in power production often experienced by weight-lifters.

The mammalian target of rapamycin (mTOR) signaling pathway regulates protein synthesis and connects amino acids to energy production. Leucine is the primary BCAA involved in regulating mTOR.

Produced naturally in the body from leucine metabolism, HMB (beta-hydroxy-beta-methylbutyrate) is touted for helping regenerate muscle capacity following intense and prolonged exercise. Twelve weeks of supplementation with HMB (as BetaTOR®, from MTI Biotech) and disodium ATP (as Peak ATP, from TSI Inc.) in weightlifters increased muscle strength and power, vertical jump performance and lean body mass, compared to placebo. The researchers explained that strength and power declined in the placebo group during overreaching training phase, but did not decline in the supplement group.
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- MCT Oil Powder
- Sunflower Oil Powder
- Flax Seed Oil Powder
- Safflower Oil Powder
- Borage Oil Powder
- Evening Primrose Oil Powder
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Similarly, in research conducted by California State University and Max Muscle Sports Nutrition scientists, a dietary supplement (MaxxTOR™, from Max Muscle) containing HMB, leucine, vitamin D3 and phosphatidic acid (as Mediator®, from Chemi Nutra) increased lean body mass and muscle strength in bodybuilders, compared with exercise alone.26

**Phytochemical Testosterone Boost**

In addition to amino acids, testosterone can help increase MPS for muscle development. While the body makes its own testosterone, diehard athletes have long chased testosterone boosters for bigger gains. Seeds from fenugreek (*Trigonella foenum-graecum* L.) are rich in steroidal phytochemicals including glycosides and diosgenin. While disogenin is known to improve glucose metabolism, which benefits fat and weight management, the glycosides are known to increase testosterone, at least in rats.

Twelve weeks of supplementation with Testofen® (from Gencor Pacific) increased both total serum testosterone and free testosterone in healthy men (43 years and older), compared to placebo (*Aging Male*. 2016 Jun;19(2):134-42). A pilot study showed eight weeks of fenugreek supplementation (as Testofen®, from Gencor Pacific) in healthy men undertaking resistance training improve muscle strength and repetitions-to-failure, compared to placebo (*J Sport and Health Sci*. 2016; 5(2):176-82). The researchers noted the supplement increased free testosterone levels, promoting anabolic and androgenic activity.

**Botanicals: Protection**

Strenuous exercise creates oxidative stress and inflammation that can affect muscle health. Botanicals are great sources of phytochemicals with antioxidant and anti-inflammatory properties sought after for exercise recovery. One botanical ingredient increasingly drawing attention from researchers is tart cherry.

Texas A&M University research on tart cherry has revealed not only can tart cherry address oxidative and inflammatory concerns, but it could also impact aerobic performance. One study published in 2016 found supplementation with Montmorency tart cherry (as CherryPURE™, from Shoreline Fruit) taken by endurance runners before, during and after a half marathon led to faster race times (13 percent), more consistent pacing, increased antioxidant activity and lower inflammation, compared to those taking placebo.27 They explained tart’s cherry’s effect on aerobic performance, serum markers of muscle catabolism, physiological stress and inflammatory mechanisms, together with a more stable post-race redox balance, suggested a reduction in secondary muscle damage.
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Similarly, researchers from Northumbria University, England, published results in mid-2016 showing eight days of Montmorency tart cherry supplementation among semi-professional male soccer players correlated to improved recovery—maximal voluntary isometric contraction (MVIC), counter movement jump (CMJ) and agility more quickly returned to baseline—compared to placebo. Further, DOMS was lower and acute inflammation was better managed in the supplement group.

**MSM: Cooling the Flames of Exercise**
Methlysulfonylmethane (MSM) is an organosulfur dietary ingredient touted for anti-inflammatory properties beneficial to joint health. Following a busy year in 2015, during which MSM supplementation in athletes (as OptiMSM®, from Bergstrom Nutrition) showed promising improvements on muscle force recovery and DOMS, University of Memphis researchers published research in 2016 demonstrating how OptiMSM taken by physically active men reduced post-exercise immunosuppression. They explained strenuous exercise causes muscle damage that triggers a release of cytokines responsible for signaling for inflammatory response, but MSM reduced muscle damage and inhibited the inflammatory response (cytokine release) from strenuous exercise.

**Outlook**
As 2017 unfolds, new discoveries will spring from ongoing research into the many ingredients and formulas being studied by nutrition and exercise science researchers. The sports market craves and thrives on cutting edge ingredient innovation, and scientific validation and substantiation boosts marketing efforts and speaks to a consumer base that is typically well-educated on the science of sports nutrition.
References


2017: Year of the OWL

The Supplement OWL is now accepting labels.

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We consistently consume energy. Carbohydrates are one of the most important energy sources in our bodies. Most of the carbohydrates are decomposed in the digestive system, and used as glucose in cells throughout the body. Although lipids and protein are also known as sources of energy, the first to be decomposed is glucose. Glucose is necessary to maintain life, and red blood cells, which deliver oxygen to cells all over the body, are highly dependent upon glucose as an energy source due to lack of mitochondria.

For athletes, carbohydrates are one of the most important nutrients. Carbohydrates maintain blood glucose levels and maximize glycogen synthesis in muscle tissue. However, carbohydrates can only be stored in the body at 1 percent of total body weight. Thus, carbohydrates must be replenished constantly by ingesting foods, drinks and supplements. Carbohydrate loading is a common strategy for endurance athletes such as marathon runners, bicycle racers and swimmers. Athletes ingest carbohydrates before workouts to maximize the storage of glycogen in the muscle and liver. After a workout, sufficient recovery of glycogen in muscle takes more than half a day. By ingesting carbohydrates immediately after a workout, recovery of the glycogen in the muscle will be faster. Endurance performance and muscle recovery are significantly improved by intake adequate amounts of carbohydrate.1

In general, carbohydrates used as an energy source are sugars with a low molecular weight (such as fructose or glucose), and in a solution that tends to have very high osmolality. This can be a problem because high osmolality solutions can cause abdominal discomfort due to delayed gastric emptying. Moreover, the tastes of these carbohydrates are sweet and, therefore, can be undesirable to consume in large amounts. For this reason, high molecular weight (HMW) carbohydrates are starting to attract attention.

HMW carbohydrates have several properties that are suitable for pre-, intra- and post-workout, and offer a neutral taste. The molecular weight of the typical HMW carbohydrate is approximately 400,000 Daltons (Da) whereas low molecular weight carbohydrates such as glucose and fructose are approximately 180 Da. In the case of glucose, the osmolality of its 10 percent solution is approximately 640 milliosmole (mOsm)/kg. On the other hand, the osmolality of 10 percent HMW carbohydrate is...
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under 10 mOsm/kg.\textsuperscript{2} This value is quite lower than plasma osmolality of humans (approximately 300 mOsm). Therefore, a HMW carbohydrate drink does not impose a strain to the stomach owing to rapid gastric emptying, and maintains it, even adding extra components such as vitamins, minerals, organic acids and amino acids such as branched chain amino acids (BCAAs).

One study showed the muscle glycogen resynthesis rate after intake of a HMW carbohydrate drink is significantly improved compared with glucose.\textsuperscript{3} However, non-treated HMW carbohydrates such as amylopectin are difficult to dissolve in water, and are difficult to digest in the small intestine. In addition, viscosity of its solution tends to be high, resulting in a beverage that is hard to drink.

Highly branched cyclic dextrin (HBCD, as CLUSTER DEXTRIN\textsuperscript{®} from Glico Nutrition Co. Ltd.) is known as one of the functional HMW carbohydrates. It is manufactured cornstarch amylopectin through a process utilizing enzymatic reaction.\textsuperscript{4} The enzyme acts on the joints of the cluster structure of amylopectin and separates them by cyclization. Thus, HBCD has very narrow molecular weight distribution and dissolves well in water. Recently, effects such as enhancement of stamina,\textsuperscript{5} reduction of fatigue\textsuperscript{6} and abdominal discomfort,\textsuperscript{7} and suppression of inflammatory stress\textsuperscript{8} were associated with intake of an HBCD beverage.

Hiroki Himeno received his doctorate degree in materials science from the Japan Advanced Institute of Science and Technology. He had worked at National Institute of Advanced Industrial Science and Technology (AIST) during 2015 to 2016. He currently works at Glico Nutrition Co. Ltd in the fine chemicals sales department.

References

Learn From the Best During the Sports Nutrition Marketplace

April 18  9am-5:30pm    April 19  9-11am

Consumers are increasingly looking to get fit and live a healthy, active lifestyle. This presents opportunities beyond the traditional sports nutrition market, expanding into broader fitness positioning with product opportunities. Don’t miss this day-and-a-half event to explore:

- The science behind new and novel ingredients
- Case studies around performance-based research
- Formulation as a science and application of unique delivery systems
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Logic and science are critical drivers in the formulation of successful sports nutrition products, if not all dietary supplements.

The practice of additive or synergistic ingredient selection in formulation has become ubiquitous in the industry over the last half decade. There are many valid reasons for this, such as:

Balancing bioavailability—Combining of a useful ergogenic agent that may have poor oral bioavailability with additional ingredients that improve the bioavailability of the agent and, thus, increase efficacy or lower dosage needed as well as cost-of-goods to see the desired results.

Digestibility issues—For instance, the addition of certain enzymes to milk-derived proteins is well known and important; the enzymes can often mitigate or even eliminate gastrointestinal (GI) distress in consumers who cannot tolerate lactose (milk sugar), allowing for the consumer to use and benefit from the milk-derived protein.

Amplified benefits—The inclusion of ingredients that have different mechanisms of action yet work in concert to produce an enhanced and desirous effect (e.g., combining of various vasodilating dietary ingredients with others that increase blood plasma volume in order to deliver a more pronounced “pump” effect in a pre- or intra-workout sports nutrition product).

Processing aids—The addition of other “non-active” ingredients such as flow agents or drying agents to improve the organoleptic profile of a product that includes ingredients that may be problematic due to their hygroscopic nature or tendency to “stick” or not solvate well into water.

Regardless of the reasons behind specific ingredient selection, the more a formulator knows about an ingredient, the higher degree of confidence the formulator will have when making the decision to use/not use the ingredient. Knowledge is power.
During an early phase in the product design process, more successful formulators gravitate toward peer-reviewed, published papers on an ingredient’s effect, safety and organoleptic properties. Otherwise, a lack of published data may end up coming back to haunt a formulator when a hitherto unknown characteristic of the ingredient causes a deleterious or undesirable effect(s). As the regulations and enforcement governing the formulation and sale of dietary supplements (at least in the United States) become more robust, the ability to “make more with less” may mean the difference between a company remaining viable or going out of business. Thus, the clever, logical and science-driven approach to additive/synergistic effects of the combination of dietary ingredients with regard to safety and efficacy should only increase in scope.

Over the last two decades, Bruce Kneller is a formulator and ingredient inventor in the sports nutrition industry. His inventions, intellectual property and formulations can be traced directly and indirectly to more than $2.5 billion in sales globally in the sport nutrition industry.

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**Sports Nutrition Marketplace**

Bruce Kneller will be presenting a session on sports nutrition formulation at this year’s Ingredient Marketplace, held April 18-20 in Orlando, Florida. The Sports Nutrition marketplace program is sponsored by IDF and CHiKPRO, and produced in conjunction with the International Society of Sports Nutrition (ISSN). For more information, visit [marketplace.supplysideshow.com](http://marketplace.supplysideshow.com).
The new U.S. President campaigned on promises of an America that would “embrace the truth that people flourish under a minimum government burden” and where lowered regulations would boost economic growth. He mocked the “FDA Food Police” in a campaign fact sheet, saying they micromanage farmers, perform excessive inspections of food facilities and levy “new taxes to pay for this inspection overkill.”

Indeed, FDA seemed like an out-of-touch bureaucracy when it recently tussled with KIND LLC over whether the nut content of their bars should prevent them from using the word “healthy” (under FDA’s outdated definition, fresh eggs, grilled salmon and avocado are not “healthy” foods due to their fat content). Many feel it’s time for regulatory agencies to back off and let people do business.

How will the new Administration impact the direction and policies of federal agencies such as FTC, FDA and DEA? How will ingredients like prohormones and 1, 3 dimethylamylamine (DMAA) be seen by new leaders within these agencies? For example, will the long-awaited final guidance on new dietary ingredients (NDIs) shift focus under the new command? Will substantiation requirements loosen to help business flourish?

The President has promised “less regulation” to stimulate business, but he has also promised a return to stricter “law and order.” To the extent they conflict, how will these promises be reconciled? If the dietary supplement market continues to be viewed as under-regulated, will less onerous regulations favor the pharmaceutical and food sectors, and not the pharmaceutical and food sectors, and not...
supplement market? If FDA expands guidance definitions to allow more new dietary ingredients to be marketed as supplements, will it also be more aggressive in targeting companies that market illegal products?

The sports nutrition category has found itself under particular regulatory scrutiny, with muscle-building and weight loss ingredients the subject of civil or criminal enforcement actions during the previous Administration. What lies ahead in terms of government priorities? And what about threats from the private sector, spurred by regulatory actions? We’ve seen private actions significantly change the landscape of the dietary supplement industry. Will class action lawsuits and Lanham Act suits for unfair competition continue in the years to come? Will they have as great of an impact? Lanham Act suits effectively removed from the market a large portion of companies that were selling selective androgen receptor modulators (SARMs) when FDA did not act. Will private action fill any gaps left by less vigorous federal enforcement?

Knowledge is power. The time to begin forecasting the conditions of the next four years is now. What sports nutrition brands know about doing business under the new Administration can be the key to success. And what they don’t know can hurt them!

Rick Collins, JD, CSCS is a lawyer whose firm concentrates in the representation of members of the nutritional supplement and sports nutrition industries. For informational purposes only, not to be construed as legal or medical advice.

Rick Collins will be presenting a session on sports nutrition legal and regulatory issues during this year’s Ingredient Marketplace, held April 18-20 in Orlando, Florida. The Sports Nutrition marketplace program is sponsored by IDF and CHiKPRO, and produced in conjunction with the International Society of Sports Nutrition (ISSN). For more information, visit marketplace.supplysideshow.com.
It’s for Sale, but Is It Legal?

by Jim Lassiter

INSIDER's Take

- Desire for intense effect and immediate results has led to sports nutrition adulteration with ingredients that are illegal and have unproven safety.
- The new dietary ingredient (NDI) draft guidance could render a dietary ingredient an adulterant, even if it's “natural.”
- Brands need to be aware of the legal status of all their supplements, and should participate in political matters to better the industry.

“Nothing is illegal if 100 businessmen decide to do it.”
- Andrew Young, former United Nations Ambassador

Unfortunately, or fortunately, Mr. Young would be incorrect when it comes to dietary ingredients used in supplements. Sports Nutrition products contain a wide range of dietary ingredients from a segment of the industry that is innovative and seeks beneficial nutrients to achieve specific goals or performance.

These efforts have resulted in specific challenges. The most obvious one is the inclusion of drug entities, which is clearly illegal, yet to this day, still occurs. The simple solution here is two words: STOP IT.

Previous resistance resulted whole categories of ingredients rendered illegal with the passage of the Designer Anabolic Steroid Control Act of 2014 (DASCA). So, the simple solution is for brands to know precisely what is going into their products and to have those ingredients evaluated upfront and routinely, especially if there is any doubt as to their legality. This seems obvious, but it is far from the end game.

The sports nutrition segment of the marketplace is filled with consumers and companies that have researched and identified specific ingredients, whether synthesized or extracted from natural sources, that provide specific benefits. While this makes this segment of the industry incredibly subject-matter knowledgeable, it does not automatically render these dietary ingredients “legal.” There is also the occasional misconception that just because something is “natural” or “naturally derived” that it is acceptable (i.e., legal) for inclusion in dietary supplements.

The identical requirements for new dietary ingredients (NDIs) apply to the ingredients included in sports nutrition products. This challenge is further exacerbated by the most recent NDI notification draft guidance. The ultimate resolution and implementation of this draft guidance will have an enormous effect on the sports nutrition world. This draft guidance contains information concerning what constitutes a NDI and requires that...
every use of these new ingredients be notified each time it is used in a dietary supplement. It is the determination of an NDI that renders it “legal” or not. Inclusion of an unnotified new ingredient in a dietary supplement renders that product adulterated (equivalent to being illegal).

An additional challenge within this draft guidance concerns the manufacture of an ingredient that is chemically identical to that found in nature. Implementation of this draft guidance would render a wide range of ingredients suddenly illegal. To make matters worse, alteration of the manufacturing process used to produce these dietary ingredients also requires a new notification, without which any product using it is considered illegal (adulterated).

While it is relatively easy to identify drug entities, determining the status of a dietary ingredient as “new” is not as simple, yet, is equally critical to the assessment of whether it is legal. There is no hiding behind an obscure chemical name for an ingredient and no safe harbor from its being considered “natural.” Each ingredient must be evaluated thoroughly before it is included in a dietary supplement product. Any lack of enforcement effort is not a determination of the legality of a dietary ingredient. Each ingredient must be carefully assessed to determine if its use is legal before being used.

A speculative challenge lies lurking in the weeds that deserves consideration. Specifically, FDA’s change to the defined dietary fiber in regulations issued last year, rather suddenly resulted in a very short list of what ingredients are now considered “dietary fiber.” In the past, any ingredient that analyzed as fiber could be included as dietary fiber on the label. But now, FDA says the ingredient needs to show a physiological benefit to be listed as fiber on the label.

While there is a process for petitioning for substances to be included in that list of claimable fibers, imagine what that process is and how long it will take to amend. Now, imagine what would happen if FDA suddenly decided to define the term “amino acids,” which are present in virtually all sports nutrition products, and determined that only select amino acids are exclusively deemed to meet the new definition. All other compounds no matter how similar, even from the same chemical family, are now illegal. As with dietary
fiber, FDA would allow for petitioning other substances for possible recognition under the new definition, but that process alone would be time-consuming and burdensome, thus a broad range of ingredients would suddenly be illegal.

The problem then is what to do. There are three actions that should be taken particularly by this segment of the industry.

1. Know with absolute clarity what is in your products and your supply chain. Do not assume that a “natural substance” is going to be acceptable. Do not assume that the use of a lengthy chemical name as a substitute for the required common or usual name of the ingredient is going to give safe harbor or delay the identification of the substance as illegal. In other words, understand what is going into the product to the same degree of clarity that is often applied in the research behind what is beneficial. If there is any doubt, seek professional help to avoid the consequences of suddenly discovering a product contains an illegal dietary ingredient, even as the regulations exist today.

2. Get involved in creating a solution for the industry. Don’t just complain! This solution is about the NDI issue overall. Rather than learning about the challenges and simply objecting, even with specificity, then threatening to move on legislative change or simply ignore the matter, find efforts that offer a real solution to the problem, step up and support it fully. The solution is out there, and it needs to be implemented.

3. Be continually aware and vigilant regarding regulatory activities. Accomplishing this either directly or with the assistance of outside parties whose job it is to know such things and keep their clients apprised as to the challenges ahead. And if you see something that is not right, raise your hand!

The Sports Nutrition segment of the industry includes a wide range of products and NDIs. The current regulatory situation is one that presents obvious and relatively easy identification of substances that are considered “illegal,” but subtleties also exist and these must be considered. The near-term and longer-term views of the industry are likely to identify a much broader range of dietary ingredients as “illegal” so companies need to be prepared for big changes when it comes to product development practices and operating in full compliance.

As chief operating officer, Jim Lassiter oversees all consulting operations at Ingredient Identity. He has more than four decades of experience in quality control (QC), and government and regulatory affairs throughout the pharmaceutical, dietary supplement and natural product industries with organizations such as Nutrilite, Robinson Pharma, Irwin Naturals, Chromadex, the American Herbal Products Association (AHPA) and the Council for Responsible Nutrition (CRN). A respected author and speaker, Lassiter has served on numerous industry and trade boards.
When it comes to the sports nutrition industry, there's certainly no shortage of products promising to do amazing things for the body, whether they “restore energy levels,” “help with gaining muscle mass” or “increase metabolism.” Unfortunately, many products simply don’t live up to their claims and, consequently, end up getting pulled from the market. And many products that do work don’t sell simply because their claims aren’t compelling enough.

Why does this happen?

This industry exists to address specific issues that arise when playing sports or exercising. In many instances, sports nutrition products are born out of necessity. This is certainly true of brands such as Gatorade, a hydrating sports beverage created by the lab at the University of Florida for its players to combat the effects of heat exhaustion. However, it can be difficult to market a brand as the answer to a specific issue while also hoping for widespread success.

The way brands position sports nutrition products is as important as how effective the product is. Brands need to find ways to broaden the scope of a claim without diluting the message too much or making false claims. Failure to live up to the hype is a major concern.

A new sports nutrition brand should consider these five marketing claim tips.

1. **Stay focused on the core market.** The art of being a marketer is in finding the strongest set of users that a product applies to. While this is a basic marketing concept, it’s particularly critical when it comes to sports nutrition. Without a target demographic, a sports nutrition product becomes a general “well-being” product that doesn’t resonate specifically with anyone.

2. **Apply for certifications that make sense.** Many sports nutrition certifications are available. Will the product be used by amateur or professional athletes? Are the ingredients FDA-compliant? Can you get support from nutritional groups? There isn’t just one gold standard, so consider the different certifications. Staying focused on the core
Marketing Claims

demographic will help determine which certification is appropriate for the product as well as which organizations to target for support.

**Test the claim for complexity.** While products may have wonderful benefits, can these be easily relayed to your intended audience? When Dannon launched Activia in 2005, it was the first to launch a commercial yogurt touting the benefits of probiotics. While the benefits of probiotics are widely known, the Activia claim was so complicated that their message wound up being watered down to the generic, “great for tummy troubles” spiel seen on TV. Although Dannon’s messaging ultimately worked—Activia is now a multi-million dollar brand—it serves as the perfect example of what can happen when a claim becomes too complex for the general public. It also serves as a great reminder to test the message for commerciality.

**Once a brand knows its core demographic, it should focus on reaching out to influencers within this group who can market the product.**

**Make sure you have science to back your claims.** This should go without saying, but brands have withdrawn their claims because they couldn’t back them up with science. In the same example with Activia, Dannon withdrew several of its health claims because the science behind them was too ambiguous.

**Build a community of like-minded influencers.** Many sports consumers love when a product is endorsed by like-minded ambassadors or athletes. Once a brand knows its core demographic, it should focus on reaching out to influencers within this group who can market the product. Biosteel has been quietly targeting influencers for some time now, empowering them to spread the brand’s message on its behalf. This, in turn, has resulted in athletes seeking out Biosteel themselves without requiring Biosteel to try to outbid their competitors (like Gatorade) for endorsement deals in the NHL or NFL.

Product positioning is critical in sports nutrition. Brand managers are required to be visionaries when it comes to knowing the best way to harness “this is good for you” into a message that allows for a brand to be commercially viable without losing its identity. Following the above steps will allow them to do just that.

Phil Chang is head of retail at Hubba, a Toronto-based network that brings together retailers, brands and influencers. He previously worked at companies such as Johnson & Johnson, Unilever, Pfizer and Target. He’s held positions from sales to purchasing to global franchising. You can find him on Twitter @RetailPhil.
Leaders and Trends in Intellectual Property: Sports Ingredient Science

by Andreas Baltatzis and Gideon Eckhouse

INSIDER’s Take

- Sports nutrition trademarks are popular; more than 7,000 that include the term “sport,” and variations thereof made the list of goods and services.
- The wide diversity of trademarks among sports nutrition products shows there’s still opportunity for branding in popular subcategories.
- More than 300 original patent applications were published over the past 20 years that are directed to sports ingredients, most of which are for formulations.

Sports nutrition ingredients help consumers maximize the benefits of exercise through improved energy, endurance, recovery and muscle building. The need for safe and proven ingredients continues to rise with the interest in high intensity and high performance exercise. Patents protect inventions and trademarks protect brands.

New Brands: Trademark Applications in Sports Nutrition

Generally, a term that describes a quality or ingredient of a product cannot be exclusively owned by one party. However, many of the most marketable trademarks may include a descriptive or common term due to the public’s familiarity with the term. A review of nutritional supplement trademark applications and registrations found more than 7,000 that included the term “sport,” and variations thereof, in the list of goods and services.

Of the 15 most common terms in these trademarks, only six terms (nutrition, life/live, pro/protein, energy, sport, natural/nature) and variations thereof appeared more than 100 times. The most common term—nutrition—appeared 210 times. Terms such as super, max, supplement, strength/strong, vitamin, active and extreme appeared fewer than 50 times. These results may indicate that there is a wide diversity of marks in the sports supplement field. The diversity of trademark names in such an established area of nutritional supplements shows there is a significant opportunity for branding new products.

15 Most Common Terms in Sports Nutrition Trademarks

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Sports ingredient inventions generally relate to new ingredients or new combinations of known ingredients for improving exercise-related energy, endurance and recovery. The inventions also provide compositions and methods for improving delivery and taste.

More than 300 original patent applications were published over the past 20 years that are directed to sports ingredients.

More than 300 original patent applications were published over the past 20 years that are directed to sports ingredients, including new ingredients and combinations, and inventions for improving energy, reducing fatigue and assisting recovery. These do not include continuation and divisional patent applications, which can lead to several granted patents from one original application. The results do not include filings from 2015 and 2016, as patent applications are published 18 months from the filing of the first application, thereby excluding the most recently filed applications.

The majority of patents filed for sports nutrition products were formulations, followed by new methods of use, novel compounds/extracts and extractions, and finally new delivery vehicles and dosage forms.

Patent Application Invention Types
Patent Filing Trends

The number of sports ingredient applications filed per year has seen substantial variance over the past 20 years. The peak number of filings was in 2005 followed by a second peak in 2009. A recent drop in filings may be related to the United States Patent and Trademark Office’s (USPTO) implementation of more stringent requirements for patenting inventions derived from naturally based sources.

Attorney Andreas Baltatzis is a director at KramerAmado PC, a boutique law firm specializing in intellectual property (IP). He represents numerous innovative nutritional supplement and nutraceutical companies that improve people’s lives every day. Baltatzis also helps companies prepare and implement IP strategies by obtaining patents and trademarks that protect their innovations and cash flow, as well as advising clients on successfully launching new products and brands.

Gideon Eckhouse is a senior associate at KramerAmado, with more than 10 years of experience in patents and trademarks. He assists innovative nutritional supplement and nutraceutical companies protect their IP throughout the world. Eckhouse counsels and implements global trademark strategies for new brand launches. Additionally, he prepares and prosecutes patent portfolios protecting new products coming to market.
Takeaways for Your Business

• Amino acids, nitrates and botanicals (anti-inflammatory/oxidant) led the way in sports nutrition research in 2016.
• While strength and performance are still the end goals for athletes, more attention to pre- and post-workout nutrition is being paid on the playing field and in the research labs.
• On muscle development, recent research targets have included amino acids such as leucine and specialty compounds like HMB (beta-hydroxy-beta-methylbutyrate) and phosphatidic acid that impact the mTOR, an important cell signaling complex for muscle growth.
• More sports nutrition ingredients are being studied for cognitive or mental benefits for athletes and active consumers. This includes a branded arginine silicate (Nitrosigine®, from Nutrition 21) and green coffee extract (as NeuroFactor, from Futureceuticals).
• With the variety of novel ingredients available for sports products, formulators have additional scientific concerns related to bioavailability, digestibility and processing to get the flavor, texture and delivery form just right.
• In beverages containing carbohydrates, it’s important to consider high osmolality, which may cause gastric discomfort. Sugars with a low molecular weight such as fructose and glucose tend to yield a solution with a very high osmolality, so high molecular weight (HMW) carbohydrates are starting to attract attention.
• Regulatory status is another concern for formulators of sports nutrition products, as ingredients in this segment often walk a fine legal line. FDA has indicated sports nutrition is a key category of focus, and the agency’s latest new dietary ingredient (NDI) guidance is likely to have a significant effect on the sports segment due, in part, to rules requiring ingredients be found in nature and notifications filed for many alterations to existing dietary ingredients.
• The sports nutrition market relies heavily on claims to market supplements and other products. In addition to needing research to back up benefit claims, companies will need to consider the complexity of the claims being made and the likelihood consumers can easily and quickly relate to the claim(s).
• Overall, the regulatory outlook for the sports nutrition industry is difficult to predict—the Donald Trump Administration is pro-business, but promises stricter enforcement of laws. Still, other legal disturbances in the market include class action lawsuits and competitor lawsuits, including Lanham Act cases.
• Intellectual property (IP) protection remains a goal in this segment. A review of nutritional supplement trademark applications and registrations found more than 7,000 included the term “sport,” and variations thereof.
Looking for ingredients, suppliers and solutions in the sports nutrition space?

Check out these SupplySide and Vitafoods Global Storefronts to get more information such as whitepapers, presentations, contacts and other content from suppliers offering results for sports nutrition manufacturers and marketers.

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<td>Agropur Ingredients</td>
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Vetting potential partners can be time-consuming and cumbersome—but it’s also vital. SupplySide & Vitafoods Global Storefronts simplifies the process.

Select the Sports Nutrition category from the Health Focus area and then simply select a company you’re interested in.

Each Storefront contains a wealth of information.

Choose from the tabs to access resources such as whitepapers, ingredient information, research and videos.

When you’re ready, click the “Request for Proposal” button to receive more information directly from the company.

Visit supplysidestorefronts.com to begin simplifying your supplier selection process.
Natural Products INSIDER is the leading information source for marketers, manufacturers and formulators of dietary supplements, healthy foods and cosmeceuticals. Since 1997, INSIDER has been serving the needs of the global nutrition industry. INSIDER boasts the largest magazine and web audience in the industry delivering news, analysis and features to executives involved in the expanding market of global nutrition. The Natural Products INSIDER brand includes a print magazine, a website, e-newsletters, reports, digital summits, whitepapers, digital magazines and image galleries.