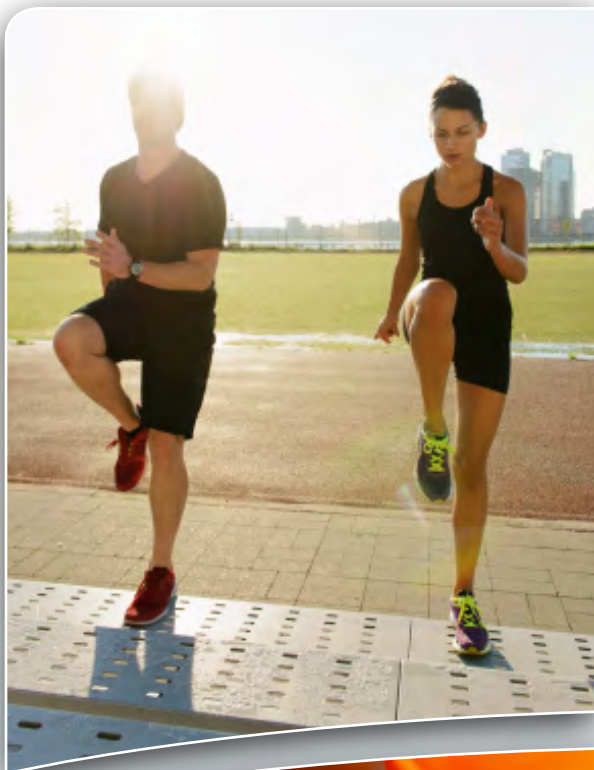




SPORTS NUTRITION & PERFORMANCE INGREDIENTS 2016



Engredea 

MINI-GUIDE



Boosts for Everyday Athletes



Sports and performance nutrition has officially moved from muscle head to mainstream. For decades, this category catered mainly to Mr. Universe wannabes and elite endurance athletes. Meanwhile, most Americans saw protein as a synonym for steak, while collagen was something to plump up lips. But now, these and other key ingredients have found favor among active everyday consumers. These next-gen users are seeking out supplements that supply clean fuel, provide a training edge, aid in recovery and help them stay in primo shape as they age. It's no wonder U.S. sports nutrition sales soared 11 percent in 2015 to hit \$6.7 billion, according to Euromonitor.

There are myriad factors propelling this category's growth, but perhaps most significant is its broadened consumer base. "Sports nutrition is expanding to more average people and to what we call lifestyle users," says Chris Schmidt, senior consumer health analyst at Euromonitor. "These consumers hadn't really experimented with the category before, but now they've gotten a taste of the high-performance lifestyle through SoulCycle or CrossFit. Supplementation makes more sense with their regimented training than when they were just going to the gym occasionally."

As these new competitors delve deeper in their activities, they tend to become more educated about



products and start seeking more targeted formulas. “There are different tiers of sophistication,” says Anthony Almada, industry expert and founder and CEO of Vitargo Global Sciences. “A first-time mud runner might grab Gatorade first, then a gel, then maybe a Honey Stinger Waffle. They’ll keep evolving until they find something that perfectly matches their needs.”

It also helps that so many more Americans—athletes and otherwise—now understand that what they put in their body greatly effects their health. “Consumers, especially millennials, are really learning about nutrition,” Schmidt says. “They’re viewing supplements as extensions of the foods they already know to be beneficial.” Companies that invest in consumer education are further fomenting this concept. “By breaking down high-level information,” says Schmidt, “they’re helping push the idea that you really can boost performance with supplements.”

Baby boomers are also spurring this market’s expansion, as many are staying active well into their golden years. “Consider creatine, which was very much anchored in performance,” Almada says. “Now older adults are using it to maintain muscle so they’ll never have to say they can’t golf anymore.” Same story with muscle and joint products. Boomers aren’t necessarily using to them so they can start running marathons, Almada says. They’re turning to turmeric and collagen so they can continue walking, biking and chasing grandkids. Of course, this is where the lines between sports nutrition and lifestyle usage blur. But

for ingredient suppliers and supplement marketers, boomers represent a whole new audience.

Sports and performance is a massive, multifaceted category, encompassing pre-workout, performance enhancement and recovery products, but also extending into general joint support, brain health and other related areas. So rather than dissect it by subcategory of finished product, let’s look closely at the latest ingredient trends in the category as a whole, since many of these are influencing multiple types of products. Hopefully, this will inspire innovative new launches and creative, effective ways to freshen up existing lines.

PROTEIN GOES GREEN

Where else to start but with protein? Long the cornerstone of sports nutrition, protein continues to be big with bodybuilders, of course, but active consumers and baby boomers are embracing it as well. Many use protein for the traditional reasons—muscle building and recovery—while others just want to make their morning smoothies more nutritious. Regardless of exact usage, whey still dominates, followed by casein. Both milk-based proteins supply ample amino acids that the body needs for metabolism and muscle maintenance, and there is plenty of research to demonstrate the bioavailability and efficacy of each.

But the protein market is quickly going green. There has been tremendous development around plant-based proteins such as rice, pea, hemp and even quinoa in

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recent years. Each has a slightly different amino acid profile, which is usually less complete than that of animal-based proteins. However, plant proteins often carry additional beneficial benefits like phytonutrients and fiber. They're not nearly as well studied as whey and casein, only because they're much newer to the scene, so it's tough to directly compare their efficacy. Even so, plant proteins have enough going for them that supplement manufacturers and consumers are rapidly buying in.

For one, the prices are steadier than those of dairy proteins, which are based on fluctuating commodity markets. "Rice and pea are both excellent proteins, but a key reason they've come to the forefront is price," says Alan Rillorta, director of branded ingredients sales at AIDP. Additionally, the sharp uptick in food allergies and intolerances is leading consumers to shun dairy proteins, as well as the other old standby, soy. "Manufacturers are now realizing they're leaving too many consumers on the table when their products include a dairy or soy protein," says Kay Abadee, marketing director at Axiom Foods. Vegans and vegetarians, of which there are far more now than a decade ago, are also propelling plant proteins' popularity.

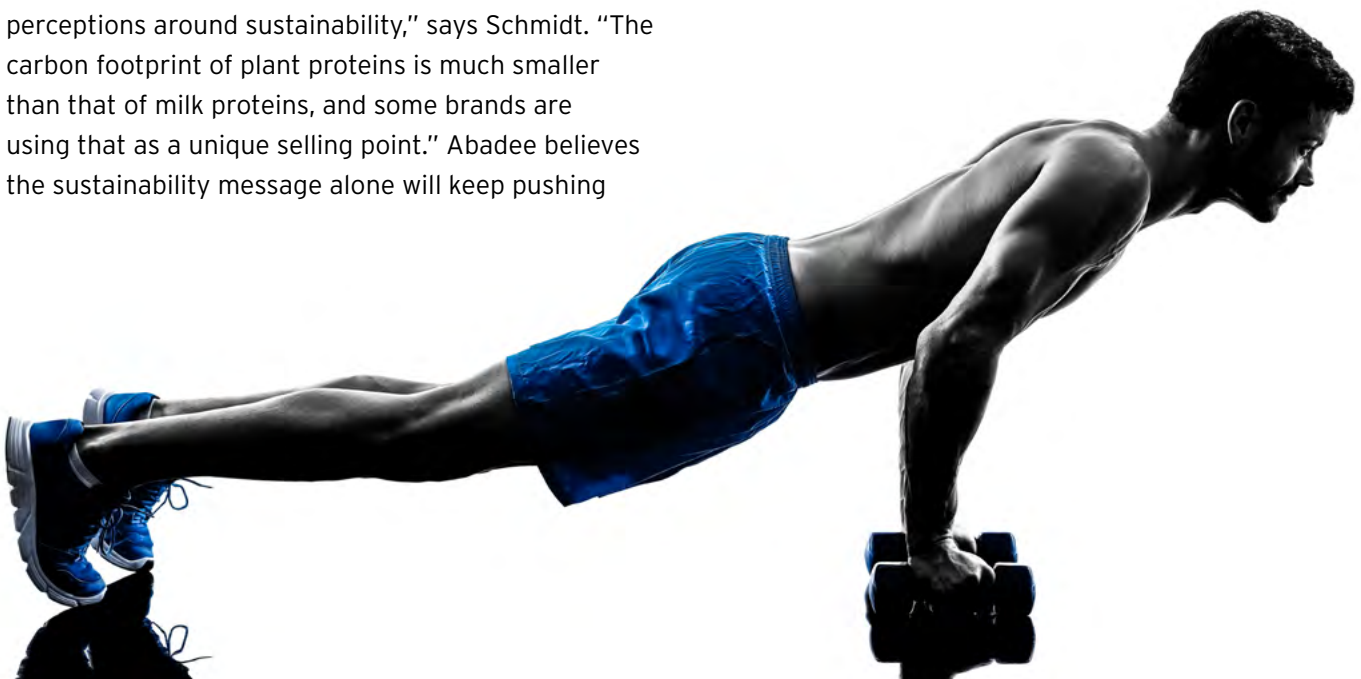
Plant proteins also have an eco-edge over their animal-based counterparts. "Demand for these ingredients is driven in part by evolving consumer perceptions around sustainability," says Schmidt. "The carbon footprint of plant proteins is much smaller than that of milk proteins, and some brands are using that as a unique selling point." Abadee believes the sustainability message alone will keep pushing

consumers toward plant proteins. "It's predicted that by 2050, we'll be largely a vegetarian population because protein production through livestock requires so much water," she says. "The Earth's water supply simply can't keep up."

Blending various proteins—plant-based with plant-based, as well as plant-based with animal-based—is becoming increasingly popular. Blending allows manufacturers to offer finished products with precise amino acid profiles, desirable nutritional packages and the ability to meet special dietary needs. "Each protein brings something different to table," says Scarlett Full, director of nutrition and research at Axiom Foods. "For instance, legumes like pea and soy are higher in lysine than grains, but grains have a lot of iron. When you combine pea with rice, you get a complete amino acid profile that can compete with whey."

Looking at specific plant proteins, rice and pea are leading the pack. On its own, neither has quite hit critical mass, but both are getting closer. "Rice protein is going over the tipping point first, but pea protein is right behind," says Abadee. "You know a protein is no longer 'alternative' when you see all the large grocery companies putting products containing it in retail locations nationwide."

Axiom has gotten tremendous traction with Oryzatein, a hexane-free brown rice protein that's





extracted from the whole grain. It is available in organic and conventional and multiple textures and concentrations, including as a true isolate. Axiom grew 770 percent between 2011 and 2015, due largely to Oryzatein, says Abadee. “Prior to us, most rice proteins weren’t from the whole grain so didn’t have the benefits of the bran,” she explains. “Or they weren’t organic or intended for human nutrition.”

Axiom’s low-heat-processed, water-extracted pea protein, Veg-O-Tein, of which the company launched an organic version last year, is also catching on, albeit a tad more slowly. This is partially because far fewer North American farmers currently grow organic peas than other grains, Abadee says, so the source material costs more. Also, pea is often sold at a lower protein concentration. Still, Veg-O-Tein is a great source of iron and other nutrients, and sports nutrition companies are quickly embracing it, oftentimes blending it with other proteins. Axiom also offers Incatein, an easily digested, amino acid-rich protein from the ancient Peruvian seed sacha inchi, which also offers a desirable balance of omega-3s, -6s and -9s.

Another top supplier, AIDP, markets more than 20 varieties of organic and nonorganic plant proteins in different grades and textures. These include PeasiPro, a lysine-rich yellow pea protein; Advantein, a rice-pea blend offering ample amino acids and a smoother taste than straight rice protein; and Sacha Inchi. AIDP’s highly soluble Hemprotein is also catching on more with manufacturers, says Rillorta.



Anderson Global Group also plays in the plant protein space, offering an organic brown rice protein called ProteoSmart as part of its AGG Sport and Body portfolio.

SAY YES TO NO

Another hot-and-getting-hotter trend in this market is formulating with ingredients that increase nitric oxide (NO) production. Found mostly in pre-workout products, these include amino acids, botanical extracts and antioxidants that, by prompting the body to release more NO, boost blood and oxygen flow to the muscles and brain. This, in turn, can benefit aerobic exercise such as running, anaerobic workouts like weightlifting and post-exercise recovery.

For a long time, L-arginine was probably the most popular NO enhancer, but “science has since come out to show L-arginine was not as effective as once thought in supplement form,” says Schmidt. This has opened the door for other ingredients that help sustain energy in this fashion. “The ever-growing popularity of endurance sports will push a lot of innovation in this area,” he adds.

One ingredient with decent science backing its efficacy is citrulline malate. Kyowa Hakko USA is launching patent-pending citrulline + arginine for NO levels in mid-year.

According to Almada, beet juice has the strongest evidence behind it for NO enhancement. Several recent university studies have underscored nitrate-rich beets’ role in helping athletes perform better. Sabinsa now offers Sabeet, a water-soluble powdered beet root extract standardized to 2 percent nitrates, as a preworkout product. “It has been clinically evaluated to increase endurance as a result of reduced oxygen consumption, and thus finds potential use in energy-support formulations, including beverages,” says Shaheen Majeed, Sabinsa’s marketing director.

EXERCISE GETS BRAINY

Muscles and physical energy are clutch for sports, but consumers are quickly embracing the mental component, too. “We’re seeing more cognitive health



ingredients being put into workout supplements,” Schmidt says. “These ingredients promote focus and the ability to lock in.”

One such ingredient is ashwagandha, a well-recognized anti-inflammatory that enhances energy levels but also has brain benefits. “Ashwagandha enables biological systems to withstand greater amounts of mental, emotional and physical stresses,” says Majeed. “Preclinical studies indicate its role in reducing serum cortisol levels, thus playing a key role in stress management.” Demand for Sabinsa’s ashwagandha standardized with anolides has increased significantly, says Majeed. It can be used as a standalone sports nutrition supplement or as part of multi-ingredient products.

Elyse Lovett, marketing manager of Kyowa Hakko USA, is also seeing a shift toward ingredients that support concentration. “You want to pump up your muscles to cycle harder and faster, but the focus aspect of sports is also important,” she explains.

For this reason, more brands are adding Cognizin, Kyowa’s patented citicoline, to their sports and performance formulas. This thoroughly studied “brain nutrient” increases synthesis of neurotransmitters such as dopamine and noradrenaline, boosts energy production in the frontal cortex and helps brain cell membranes stay healthy. “Cognizin is geared more toward players than muscle heads,” Lovett says. “Sports nutrition companies don’t usually start with it, but a lot of our Sustamine customers are realizing Cognizin would be a good addition to their products.”

Sustamine alone is worth mention. This unique dipeptide, which combines the amino acids L-alanine and L-glutamine, has found tremendous success since launching five years ago. Highly stable and water-soluble, Sustamine enhances electrolyte and water absorption in the intestines, stimulates glycogen synthesis and inhibits muscle protein breakdown. Lovett believes that Sustamine and Cognizin together provide a potent body-brain punch.





No surprise, AIDP is getting more requests for its brain health ingredient, Magtein, a patented magnesium L-threonate with sufficient evidence to show it supports neural communication. “You’ve got to be focused when golfing, playing basketball or even lifting,” says Rillorta. “And if you can recruit more neurons, you can also recruit more muscle, so Magtein has benefits throughout the body.” Magtein is very bioavailable and works synergistically with caffeine.

LESS PAIN, MORE GAIN

For seasoned athletes to stay on top and for active everyday consumers to keep moving, their muscles and joints need support. Both sets are seeking drug-free products that tame post-exercise inflammation and assist in muscle recovery.

Glucosamine and chondroitin have long dominated the joint health scene, but curcumin is now giving the old guard a serious run. This potent anti-inflammatory from turmeric root is backed by a fat file of research,

and top suppliers like Sabinsa have found ways to improve its bioavailability. In the past year alone, Majeed says the company has seen a marked uptick in interest in its patented Curcumin C3 Complex, which provides 95 percent curcuminoids and is the most clinically studied brand in the world.

Sabinsa also offers Curcumin C3 Reduct, a highly stable, well absorbed, colorless extract. And in March 2015, the company launched uC3 Clear, a 100 percent water-soluble curcumin for drinkable sports nutrition products. “These formulations can help inhibit tissue damage due to inflammation, which can arise due to extensive exercise,” Maheed says. “Boswellin PS and ginger extracts are also important anti-inflammatories that find potent application to prevent and manage sports injuries.”

Anderson Global Group offers a few solutions for supporting muscles and joints, including CherryPURE, a powder from Montmorency tart cherries. A double-blind, placebo-controlled Texas A&M study published in

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December 2015 found that resistance-trained men who took CherryPURE had a significant decrease in post-exercise muscle soreness and fewer markers of protein breakdown, suggesting recovery benefits. Anderson Global also supplies Celery3nB, a high-quality celery seed extract available as an oil or powder that targets inflammation and assists in muscle building.

For joint support, AIDP supplies KollaGen II-xs, a chicken sternum collagen that can be formulated into protein powders without depleting protein content per scoop. It contains 55 to 70 percent collagen type II, along with chondroitin, glucosamine and hyaluronic acid, the major components of joint cartilage.

BioCell Technology has built up a loyal following for its highly bioavailable matrix of hydrolyzed collagen type II, hyaluronic acid and chondroitin sulfate, BioCell Collagen, since its 1997 launch. "This patented natural matrix provides a synergy of readily absorbed and usable connective tissue components that is unparalleled on the market," says Suhail

Ishaq, BioCell's president. Another solution is BioCell EstraFlex CMO, a proprietary blend of esterified fatty acid carbons. "EstraFlex CMO is an all-natural, bovine- and vegetable-derived ingredient aimed at promoting joint health, flexibility and mobility," Ishaq says. "It can be either standalone or combined with other ingredients. Demand for both of these ingredients has grown consistently due to their remarkable efficacy. In fact, the efficacy of BioCell Collagen for skin/joint health and exercise recovery continues to be validated by an ever growing number of clinical studies."

An emerging joint health ingredient is egg membrane. Biova has seen a huge surge of interest in BiovaFlex, its water soluble egg membrane ingredient that's guaranteed to be at least 88 percent protein. Perhaps even more notable is that a recent peer-reviewed, randomized, double-blind, placebo-controlled crossover study showed just 450mg/day of BiovaFlex was associated with improved joint Range of Motion (ROM) and increased physical activity levels. Plus, a



subgroup showed reduced back pain (as one might experience from exercise and/or daily activity) after just 5 days. - significantly shorter than the six to eight weeks for glucosamine and chondroitin. It remains stable and works synergistically with MSM, turmeric, glucosamine, chondroitin and other common joint health ingredients. "This is a sustainable, very versatile ingredient that can either refresh an existing product line or anchor a new one," says Matt Stegenga, Biova president. "The joint health market is asking for new ingredients, and when formulators learn about egg membrane, they're impressed." Four Biova's customers launched new products containing BiovaFlex at Natural Products Expo West 2016, including RTD beverages.

THE BUILDING BLOCKS

As consumers learn more about nutrition in general, they understand the key role vitamins and minerals

play in whole-body health. They also realize that a healthy body performs better on the bike, in the weight room or on the race course. Therefore, athletes and other active consumers are supplementing their diets with essential vitamins and minerals in the form of RTD drinks, pills, stick packs and smoothies.

While there are countless commodity vitamins and minerals available to product formulators, Origenetics offers a step up from synthetic isolates. The company uses water extraction to pull nutrients, along with their co-nutrients and cofactors, from fruits, vegetables and botanicals. According to Saumil Maheshvari, marketing specialist at Origenetics, a complete matrix allows for more regulated absorption of these nutrients into the bloodstream, thereby thwarting stomach irritation—an important perk for athletes. "Athletes are demanding better ingredients than synthetic isolates," Maheshvari says. "As consumer preferences have shifted, the

sports nutrition market is seeing the benefits of whole-food complex vitamins and minerals and incorporating them into their products."

Of particular relevance to this market are Origen-Cm, an extract of certified-organic *Moringa oleifera* leaves standardized for 0.1 percent chromium, as well as Origen-Zn, organic guava leaf extract standardized for 4 percent zinc. Maheshvari says Origen-B is also popular among sports nutrition product formulators, since B vitamins are key for energy and metabolism. Origen-B is a blend of organic guava, mango and lemon extracts. At 600 milligrams, it offers more than the recommended daily allowance of all the water-soluble B vitamins except for B12.

All of which is to say, the sports nutrition and performance market continues to both innovate and create winning formulations for the shifting consumer landscape. You don't have to be on a Wheaties box to benefit from superior nutrition and an all-around improvement in daily activities - even if those activities are the daily decathlon of office work behind a desk. ●

