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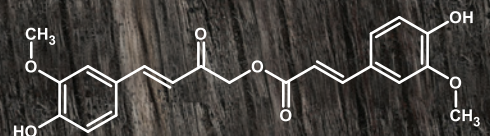
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The **TOUGH** Get *Innovating*

As customers rededicate themselves to sports and active nutrition, supplement companies are looking beyond challenges at long-term opportunities.

BY JUDY BLATMAN

Of all the challenges the sports nutrition market is facing in 2022, perhaps one of the most daunting would be to start your own company during the roller coaster ride of an on-again, off-again, on-again pandemic.

But longtime expert in the field, Robert Wildman, PhD, RD, CISSN, chair, Sports Nutrition Committee, American Herbal Products Association (AHPA; Silver Spring, MD), is trusting his gut—and the consumer. With more than 15 years in the industry, most recently with Dymatize, Wildman is also the author of four books on nutrition (including one specifically on sports and fitness nutrition) and the creator of a website where consumers can seek nutrition advice.¹

With the launch of TYM Athletic Performance earlier this year, Wildman can add company founder to his list of credentials. With four finished products for sports nutrition available, Wildman sees his company as “part of a greater lifestyle performance for athletes and people who exercise seriously for better fitness and appearance.” His longtime expertise and relationships in the market enabled him to partner with companies focused on training—including American Barbell, NFL Alumni Academy, XPE Sports—for, as he puts it, “a more comprehensive offering for training, coaching, equipment, and nutrition.”

When asked if he has concerns about introducing a new sports nutrition company in this category at this time, he answers “Yes and *Know*.” Wildman explains that he understood the constraints on the supply side. But he also “*knew* the consumer wasn’t going anywhere.”

And if the category sales statistics are to be believed, he’s right. The consumer wasn’t—and isn’t—going anywhere.

There are a number of reports that point to estimated growth for the sports nutrition market, which has blossomed into a broader-reaching category known as active nutrition. For instance, ResearchAndMarkets estimated the global sports nutrition and supplements market at a value of \$47.5 billion in 2021, with expectations that the market will achieve a CAGR of 7.9% from 2022-2027, reaching \$74.2 billion by 2027.² Grand View Research, meanwhile, reported that the global sports nutrition market size valued at \$40.0 billion in 2021 and is expected to expand at a CAGR of 8.5% from 2022 to 2030³, while Mordor Intelligence projected a CAGR of 12.5% during the forecast period 2022-2027⁴.

Rocky Roads Ahead, or Will the Future Be Sweet?

But even with strong projections, there are still issues that the pandemic highlighted for this category—and immediate, and potentially long-term, challenges that need to be addressed.

The most often mentioned of these challenges is the supply chain and what potential shortages will mean for the industry’s resilience and for consumers’ trust and wallets.

John Travis, principal technical manager, Certified for Sport, NSF International (Ann Arbor, MI), explains that “One of the biggest challenges the industry will face in 2022 is addressing the risk of the supply chain potentially limiting the availability of ingredients.”

To put it more bluntly, one company’s challenge is another company’s opportunity. Travis advises that supply chain issues could open the door for unscrupulous suppliers to sell sub-standard ingredients to unaware brands or manufacturers. “Those ingredients,” he says, “could be adulterated with cheap, innocuous substances or even

substances that present doping risk or a risk to human health.” This highlights the need for thorough scrutiny when qualifying new suppliers and appropriate evaluation of incoming ingredients as a way to drastically reduce, if not eliminate, adulteration issues, he adds.

Mark LeDoux, chairman and CEO, Natural Alternatives International Inc. (Carlsbad, CA), says that “Working with primary suppliers and reputable producers of finished products has never been more necessary. The opportunity for product adulteration resulting in economic advantages to unscrupulous suppliers has never been higher, and producers and marketers of finished products need to redouble their quality-control assessments.”

LeDoux, who also serves as the chairman, board of directors, Natural Products Association (Washington, DC), urges companies to remain vigilant in testing both raw materials and finished products to avoid falling victim to product adulteration. He advises that partnering with legitimate companies that have done the science, follow the regulations (including for new dietary ingredients), and “have capacity along with a demonstrated track record to deliver when the finished products were promised” are important components for the health of the industry.

Supply chain issues may also potentially lead to price increases—and decreases in consumer trust.

Says Wildman, “The biggest challenges remain in [the] supply side of the business, and this is going to keep prices higher for consumers, at least for 2022.”

Larry Kolb, president of TSI Group Ltd. (Missoula, MT), agrees that pricing will continue to be an important factor—one which could result in additional challenges. “As many companies are striving to reduce costs while still providing quality products, [this] could also lead to the reduction of some functional benefits for some product formulations,” he says.

And Kolb addresses the potential concerns supply chain issues may have on quality and transparency. “Companies that are already vertically integrated could have an advantage here, as increasingly customers are looking for products that show origins that encourage trust.” He adds, “Products where the ingredients are sourced, formulated, and manufactured within a vertically integrated company help to provide trust and transparency, as well as cut down on some costs.”

Dan Force, vice president, marketing and innovation, Prinova USA (Carol Stream, IL), sums it up this way: “We’re perhaps in for a little bit of whiplash at some point in 2022. Everyone has aggressively been trying to push through supply chain challenges amongst growing demand. As lead times start to contract towards normal levels, stock levels are bound to rise. This could create a lull in ingredient demand mid-2022 that I believe will be isolated to the B2B side of the business, with consumer sales remaining strong.”

Marketing Challenges Create Opportunity

But supply chain and price issues aren’t the only challenges for this category. There’s talk about how the industry has morphed from a clientele of body builders and elite athletes to those who just want to enjoy a good morning jog or a yoga class but who can still be supported by products that, as Annie Eng, CEO, HP Ingredients (Bradenton, FL), puts it, will satisfy their need to meet their own endurance and strength gains as well as recovery benefits.

Kolb, too, recognizes that the category evolution with its broadened demographics has changed the market completely. “It has not only changed who is buying these products and how the consumers would like to be addressed, it also changed the kind of ingredients that are being used,” he says.

The continued expansion in the category from body builders and elite athletes to sports and active nutrition certainly allows for marketing to a broader range of customers. The challenge is in how to reach and envelope those consumers into a now-larger playing field.

“A challenge that is an opportunity is to create products that resonate with active consumers who work out at home, outdoors, or at gyms/fitness centers,” says Eng. “The landscape of how we are working out is impacted dramatically by the pandemic.”

Eng views what she calls “this fluctuating, flexible fitness landscape” as one challenge that involves “formulating and marketing in a way that speaks to the more active-nutrition mindset” rather than only sports and athletic performance.

“The biggest challenges remain in [the] supply side of the business, and this is going to keep prices high for consumers, at least for 2022,” says sports nutrition expert Robert Wildman, PhD, RD, CISSN.

She explains the difference in psychographics, if not demographics, with these examples: “A middle-aged woman who is a competitive athlete will have different needs and goals than a middle-aged woman who enjoys being fit and healthy. Amateur male cyclists will have different needs and goals than their age counterparts who are more into defining their physique.”

And although fitness centers and gyms may be currently struggling, Eng does not believe a broadened approach of focusing on consumers with different needs, nor an emphasis on at-home fitness, will drive fitness centers and gyms out of business.

Quite the opposite. She is suggesting there is room for the market to grow with the right marketing strategies.

Kolb speaks to another audience consideration that presents a challenge: where consumers are purchasing their products. “Brick-and-mortar versus online sales is not a new challenge,” he says, “but

continues to be an important part of the decision-making process for most companies. Getting in front of the right audience and having a strong differentiation strategy is now more important than ever.”

Innovate, Imagine, Perspire

Elyse Lovett, MBA, vice president, marketing, Nutrition21 (Harrison, NY), says that “One of the biggest challenges we see with sports nutrition products is formulation flexibility. Sports nutrition today, more than any other category, caters to a broad range of consumers that have varying product preferences, from supplements to foods

to beverages. The ultimate win for any ingredient is the ability to flex its muscle in a variety of applications while still meeting consumer demands for vegan, non-GMO, and clean label.”

But there’s one more challenge—this one a lofty one—raised by Steve Fink, vice president, marketing, PLT Health Solutions (Morristown, NJ), for this category, if not the whole industry. He says that “probably the biggest challenge is continuing innovation and the commercialization of truly groundbreaking ideas. They both take imagination and a lot of perspiration.”

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GAME ON! TRENDS APLENTY

A lot of energy is driving the sports nutrition market, and there are likely as many trends to watch as challenges to overcome. PLT Health Solutions’ Steve Fink says, “This is one of the most exciting times I can remember in my nearly 20 years of working in the sports/active nutrition field.”

Synergy and Functionality

For starters, TSI Group’s Larry Kolb goes right to the sweet spot for the supplement industry: immune health. He notes that the strong link between muscle health and the immune system “will provide further growth for this category.”

For TSI’s own branded ingredients—myHMB, PeakATP, and Hobamine—says Kolb, the company is focused on “researching effective synergistic combinations of our ingredients.” For instance, he reports that “co-administering myHMB and vitamin D resulted in clinically validated greater increases in strength.”

For PLT’s Fink, it’s the trend “toward more complex, multi-benefit sports/active formulations that is bringing benefit packages to products that are better targeted to use occasion and consumer wants.” Specifically, he’s pumped about benefits like cognitive and focus support, joint and muscle recovery, weight management, and original approaches to energy profiles being built into formulations for the category.

According to Fink, some of these are new trends that didn’t exist five years ago. PLT is relying on the category’s expansion to active-lifestyle consumers to further popularize its branded ingredients, such as Dynagenix Muscle & Joint Formula and RipFactor Muscle Accelerator, both launched in 2020.

In development discussions that PLT is having with sport- and active-product companies, Fink says, “We’re seeing both reformulations and totally new concepts being developed. These discussions cover traditional types of sports products, like preworkouts, but we’re also seeing products targeting everyday active people.”

Perhaps one of the most buzzed-about trends is how adding cognitive-function ingredients will impact the category. Kolb, for one, believes that esports is a category in sports nutrition that will provide substantial growth for the overall market.

Nutrition21’s Elyse Lovett is here for it. “We believe there will always be a strong focus on the physical component of sports nutrition. We also see mental fitness starting to emerge as an attractive benefit in products, hence the launch of nootropic ingredients in the last few years. The latter

has risen to prominence during the rapid growth in esports, but it will likely transcend to other professional sports where focus, reaction time, and memory are crucial for performance benefits like they are in the gamer space.”

With its nootropic ingredient, nooLVL, Nutrition21 has good reason to view this as a positive trend. According to Lovett, this branded ingredient has resonated with gamers due to its ancillary benefits for both gaming performance and cognitive health.

PLT, too, is on board with this movement. Its branded ingredient Zembrin (*Sceletium tortuosum*) is clinically demonstrated for supporting calm focus and alert serenity, says Fink. Whether the trend is or isn’t related to the pandemic, Fink’s not sure. But he claims that “across the industry, ingredients that promote focus, reduce stress, and improve mood are finding their way into formulations” for the sports and active nutrition category.

Maria Stanieich says Kyowa Hakko’s Cognizin is backed by clinical trial data to support mental focus, recall, and overall cognitive health, which she says are areas of innovation that consumers will seek in 2022. “As many individuals are dealing with ongoing post-pandemic stress, brain fog, and simply burnout, addressing cognitive health is a real opportunity for new product formulations,” she adds.

For SRCarnoSyn beta-alanine, the advanced delivery form of Natural Alternatives International’s signature, well-established and -researched, patented ingredient CarnoSyn, Mark LeDoux says, “We have identified several healthy aging and wellness functions that are beyond sports nutrition...[however] we are working on more applications that are suitable for the elite or specific market of sports nutrition as well.”

Transparency and Trust

As consumers’ expectations for transparency rise, says PLT’s Fink, there is a greater interest in the use of proprietary, branded ingredients in formulations. “This trend is a response to some pretty interesting shifts in consumer attitudes,” he says.

According to Fink, “Origin stories are incredibly important. Consumers want to know where the ingredient is coming from, how it’s made, what the science says, and whether it is sustainable and socially responsible.” You often can’t offer this type of information for non-branded ingredients, but branded ingredients can help build trust and overall brand loyalty, he adds.

Stanieich agrees. She says that companies that are thinking ahead in innovation will have an advantage working with branded ingredients,

such as those from her company. She references 2021 survey results from two organizations, the Council for Responsible Nutrition and Ingredient Transparency Center, which, she says, “revealed supplement users prefer branded ingredients two times more than the generic ingredients.”

Sustainability and Protein

“Many of our customers are starting to tackle sustainability,” says Prinova USA’s Dan Force. In response to those requests, he advises that Prinova is leveraging ingredient technology and sourcing. For example, Force shares, “Our plant-based protein portfolio, which is suitable for sports nutrition formulations, offers options for brands looking to meet needs for healthier eating, flexitarian diets, and reduced environmental impact. We now offer a barley protein isolate that is produced from the ‘spent grain’ from beer production.” He adds that this product can be marketed to consumers as “‘upcycled’ and carries a substantially lower carbon footprint than even pea protein.”

Maggie McNamara, marketing director, Gencor, says, “The idea of sustainable nutrition is not lost on consumers today and is more important than ever.” She believes that the sports nutrition sector “is going to have to quickly embrace this megatrend, as there is just no getting around it.”

“As consumers are becoming more ethically and environmentally aware, brands need to take into account these consumers’ needs and demands when producing and delivering sports nutrition products,” states McNamara. She adds that Gencor believes that “quality begins on the farm.”

Kolb says that “protein is by far the largest individual ingredient in sports nutrition, and the rise of renewable plant proteins, which have compositional shortcomings in comparison to animal proteins, created an opportunity for TSI’s branded ingredient myHMB. Adding myHMB to soy protein, for example, has been shown to significantly increase the muscle-health benefits of this specific plant protein.”

Lovett believes 2022 will reveal some interesting protein trends. “While using high payloads of protein in sports nutrition formulations has been the standard for years, particularly in nutrition bars,” she says, “this can cause sensory issues for finished products. Fortunately, there is a way to support the power of protein in products by using ingredients that can optimize their function while using less protein. This helps formulators preserve an ideal taste and texture profile that is more appealing to a broader range of consumers.”

Robert Wildman advises that great strides have already been made to improve sensory and functional aspects in plant-derived proteins, and he expects to see more plant-based recipe alternatives to animal-derived ingredients. “Also, I think we will continue to see more innovation in synergies like protein and probiotics, as well as subfractions of proteins such as alpha-lactalbumin from whey,” he notes. TYM Athletic Performance’s finished products include ProTym, a hydrolyzed whey protein isolate powder.

Convenience

HP Ingredients is bucking a trend in expecting movement back to pill popularity, based on one word: convenience. Says Annie Eng, “We think that a ‘return to’ capsules and tablets will become more prominent”—

not necessarily for the dedicated sports nutrition enthusiast but rather for the new psychographic encompassing the active-lifestyle consumer.

She explains that “powders and stick packs need to be mixed and shaken up. But with pills, [you] just swallow in a second.” Eng suggests this appeals to a target market that “doesn’t isolate his or her workout goals from the rest of his or her life.” Instead, she says, it’s a 24/7 mindset, and quick convenience is prized. The company’s branded ingredient LJ100 is an excellent fit not only for powders but conveniently also for capsules and tablets, she adds.

Transparency

One trend is moving in a downward direction—and in this case, that’s truly a good thing: doping.

There may have been a collective sigh of relief from the supplement industry with the closing of the 2022 Winter Olympics, because while there was a doping scandal—and it was a doozy—this time there were no dietary supplements either implicated or scapegoated (at least not when this article went to press).

For the supplement industry, the change in the conversation around doping revolves around a number of things: education, partnerships with athletes, and, to the extent possible, with organizations like USADA, WADA, and other sports-governing bodies, third-party certifiers, and companies that embraced those sports certifications. NSF is one of those companies who made a difference.

NSF’s John Travis says, “There is definitely more awareness now around anti-doping and the risks athletes face daily when using supplements. Ten years ago, an athlete found guilty of doping was often considered a victim of the system. Now, it’s widespread for such an athlete to be ostracized by their peers.”

Travis credits the industry, in part, advising that “most reputable brands are now aware of the role supplements have played in some anti-doping offenses and are more sensitive to athletes’ needs for products that won’t cause them to run afoul of any anti-doping rules.”

Gencor announced early last year that Levagen, its branded version of palmitoylethanolamide (PEA), received the Informed Ingredient certification for absence of WADA-prohibited substances from LGC, the UK’s designated National Measurement Institute for chemical and biomeasurement.¹⁹

TSI Group’s myHMB also had news on the verification front, announcing last December that its β -hydroxy β -methylbutyrate monohydrate ingredient (myHMB) is now USP-verified, making it the only USP-verified HMB ingredient on the market. “This is a significant way for TSI to differentiate the quality of myHMB from other HMB products. It’s one thing to say that the ingredient you’re producing is better than any other manufacturer’s; it’s another to have such a highly respected third party verify that what you are doing meets their strict standards,” commented Kolb in a press release.²⁰

Despite the progress in this area, the industry needs to remain vigilant. Says Travis, “Third-party certifications such as NSF Certified for Sport meet the growing need from athletes for clean products and the desire from brands to deliver them. We benefit everyone involved by serving the trusted role of conducting certifications as an independent third party.” **N**

► Continued from page 6

Fink, a former law firm intellectual property attorney before becoming an executive in the dietary supplement industry—or, as he characterizes it, “before he saw the light”—believes that “One of the things that has made this industry so great was that up-and-coming brands with great ideas could emerge out of nowhere and take the industry by storm. If they were clever and resourceful, these brands could become giants in the industry. A lot of the biggest brands today were little up-and-comers yesterday. The pandemic has made it harder on the innovative, emerging companies. Without the ability to meet in person, these smaller companies might not have the resources to get their message out there. Little emerging brands that can bring evolution and revolution have a harder time.”

His solution? Create a big tent. Fink claims that, at PLT, “We love working with the industry leaders—but we also love working with startups and emerging brands.” And, he says, PLT has the internal resources to function as an innovation partner with established companies and the go-to-market capabilities and know-how to collaborate with emerging companies.

Science for Addressing Challenges

If there's one thing that can go a long way in helping overcome the challenges of consumer trust in ingredients and finished products, it's science.

In fact, a new report from ADM (Chicago) reporting on nutritional supplements found this: “When considering nutritional supplements, 59% of global consumers want to see scientific evidence supporting supplement efficacy.”⁵

Here are some of the recent studies that suppliers have shared.

“Last year was a very productive research year for Nutrition21,” says Lovett. Among the published studies in 2021 were three on its sports nutrition ingredients. “This research helped us add another layer of substantiation, which strengthened our communications and product development opportunities, particularly for gamers and active nutrition consumers, both of which are looking for impactful muscle, energy, performance, recovery, and cognitive health benefits,” she says.

The new research on the cognitive benefits of nooLVL, a patented complex of bonded arginine silicate with an additional optimized dose of inositol, demonstrated that nooLVL significantly increases cognitive performance in gamers after a single dose and within 15 minutes, according to a company press release.⁶ The research was conducted at Texas A&M University and published in *Nutrients*. The double-blind, randomized, placebo-controlled crossover trial was conducted in 26 male and female experienced gamers who were randomly assigned to consume 1,600 mg of nooLVL or 1,600 mg of a placebo (PLA).⁷

The new study on Nitrosigine, Nutrition21's patented complex of bonded arginine silicate, published in *Nutrients*, showed results that support its ability to enhance memory and cognitive function in healthy adults, according to a company press release.^{8,9}

The double-blind, crossover, placebo-controlled study observed 16 participants, ages 18-28 years old, during two separate trials, each of which were approximately three hours in length. The results of the trials showed that immediate memory performance in the ingredient group significantly improved compared to the placebo group between trials.^{8,9}

During the study, the introduction of Nitrosigine also maintained delayed memory scores in comparison to the placebo group (for which delayed memory scores decreased); significantly increased the total RBANS scores, showing an 11% increase; and showed a 27% increase in memory scores.^{8,9}

The third published study last year from Nutrition21 was published in the *Journal of Exercise and Nutrition* and, according to a company news release, demonstrated the benefits of Velositol, a patented amylopectin-chromium complex, when combined with 15 g of protein for those who engaged in resistance training.^{10,11}

The double-blind, active-controlled study included 35 recreationally active men who were randomized to one of three groups: 1) 2 g of Velositol plus 15 g of whey protein isolate, 2) 15 g of whey protein isolate alone, or 3) 30 g of whey protein isolate alone. The study concluded that the addition of Velositol to a 15-g dose of whey protein increased total squat reps, vertical jump power, and vertical jump height to a greater extent than when 15 and 30 g of whey protein were consumed alone.^{10,11}

In February of this year, Gencor (Irvine, CA) issued results from a study published in *The Journal of Dietary Supplements* that supported “the safety and efficacy of supplementation with Tesnor in boosting testosterone levels in healthy young males.”¹² Tesnor is Gencor's proprietary blend of two herbal extracts, cocoa bean (*Theobroma cacao*) and pomegranate peel (*Punica granatum*).^{12,13}

The randomized, double-blind, placebo-controlled study divided the 120 male participants ages 21-35 into three randomized groups over the span of 56 days: 1) placebo, 2) Tesnor (200 mg), and 3) Tesnor (400 mg). As part of the trial, subjects were directed to engage in 40 minutes of aerobic exercise four days per week, maintain their regular diet, and refrain from consuming any nutritional supplements or energy drinks with ergogenic benefits.^{12,13}

Results showed that the high-dose group saw significant increases in total testosterone and luteinizing hormone, compared to baseline. Post-trial, this same group demonstrated significant improvements in hand grip strength and mid-upper-arm circumference.¹²

PLT is expected to soon announce results of a 2021 unpublished clinical trial on its proprietary ingredient Slendacor Weight Management Complex. Following a previous published clinical trial¹⁴ on the ingredient, which launched in 2017, the combination of clinical work on Slendacor will allow for claims and messaging related to non-stimulant calorie burning that make the ingredient “ideal for sports/active nutrition formulations,” Fink says.

He advises that the new study measured resting metabolic rate in 60 healthy, but overweight, women and men who were supplemented with a single, daily 900-mg dose for seven days of the ingredient or a placebo. The study also measured heart rate, blood pressure, and mood. According to Fink, Resting Energy Expenditure (REE) and calorie burning increased significantly from baseline on day 1 and on day 7; the ingredient group showed an increase in REE of up to 15.2% compared to placebo. Fink reports that the ingredient group did not experience heart rate or blood pressure increases during the study, indicating that the ingredient did not show stimulant activity.

In 2021, TSI Group shared results of an unpublished, randomized, placebo-controlled, dose-ranging crossover study on Peak ATP, its

patented form of adenosine 5'-triphosphate (ATP) disodium. Conducted by researchers at Brazil's Federal University of Piauí, the study included 20 recreationally trained men in their late 20s. The benefits of 100 mg, 200 mg, and 400 mg of orally administered Peak ATP as a premix powder were evaluated.¹⁵

Results showed that a single 400-mg dose of Peak ATP improved lower-body resistance training performance and energy expenditure, increasing the number of set 1 repetitions by 13%, numerical increases in total repetitions by 7%, and total weight lifted by 6%. A dose of 200 mg numerically increased set 1 repetitions by 6%. The 100-mg ATP group saw no improvements over placebo. However, subjects taking 100 mg and 400 mg of ATP saw the lowest perceived exertion, while those taking 200 mg experienced the highest perceived exertion.¹⁵

"These results confirm the immediate benefits of Peak ATP for athletes, weekend warriors, and everyday exercisers," said Kolb in a press release. "This [ingredient] is crucial to helping everyday people exercise harder and more frequently as they pursue their long-term wellness goals," he added.¹⁵

HP Ingredients reported on results from a trial on LJ100 tongkat ali, published in *Andrologia* last year, that showed the ingredient "was able to increase testosterone even in healthy young men when consumed in high doses," says Eng. "[The results showed] significant increases in testosterone (14%) and free testosterone (34%) were recorded after two weeks," she adds. The placebo-controlled, double-blind study had 32 healthy young men (average age 24.4) consume either 600 mg LJ100 or a placebo daily for two weeks.¹⁶

New research published last year in *The Journal of Nutrition* showed that 500 mg/day, for a 12-week period, of Cognizin, Kyowa Hakko's (New York) branded form of citicoline, improved overall memory performance, especially episodic memory, in healthy older males and females with age-associated memory impairment (AAMI). The findings suggest that regular consumption of citicoline may be safe and potentially beneficial against memory loss due to aging, according to a company press release.^{17,18}

A total of 100 healthy men and women between ages 50 and 85 were evaluated as a part of the randomized, double-blind, placebo-controlled trial. Participants were randomized to receive either a 500 mg/day dosage of citicoline or a placebo, with memory functions assessed at baseline and at the end of the intervention using standardized computerized tests.^{17,18}

Maria Stanieich, marketing manager, Kyowa Hakko, adds that "There's considerable demand for memory-focused ingredients for all ages, encompassing the aging population and e-gamers—and as stress and mood are the top health concerns among Gen Z and millennials, Cognizin is not just a performance ingredient but a nutrient for the brain that improves cognitive decline over time." ■

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In on the Action

Esports supplements hit the mainstream.

BY KIMBERLY J. DECKER

As is the case with esports enthusiasts themselves, demand for esports supplements just keeps on maturing. And why shouldn't it? Digital gaming—whether professional or armchair—is more than just a serious business; it's a bona fide cultural phenomenon.

This is in stark contrast to gaming's early days, when the market “comprised mainly ‘hardcore’ gamers,” recalls Euan Costello O'Reilly, business development manager for Play Beyond Nutrition (Bristol, UK). “But in the last five years, the explosion in gaming uptake among previously casual gamers has injected huge financial growth into the market.”

How huge? Newzoo research¹ pegged total global esports revenues at \$1.084 billion in 2021, with year-on-year growth of 14.5%, driven largely by media rights and sponsorship. So as the sector scales new heights—and embraces new competitor-consumers—supplement brands will have to up their own games vis-à-vis product innovation, ingredient science, and delivering the formulations that give these 21st-century athletes an edge.

Gaming's Gains

Again, citing Newzoo research, O'Reilly notes that gaming's value looks set to grow impressively by 2025, “reflecting the booming economy with esports, as well as acceleration from the pandemic,” O'Reilly says.

But the sector's strength is measured in more than mere dollars. “The gaming world keeps growing from mobile, PC, and console users to those participating in streamed content via a range of digital devices,” observes Maria Stanieich, marketing manager, Kyowa Hakko USA (New York). “The ecosystem of gamers makes up a sizeable audience, and they're looking for a competitive edge that fits their lifestyles.”

Into the Mainstream

Increasingly, that edge comes from nutritional supplements, which are gaining fans across the esports skill spectrum—and not just among players competing at the highest levels.

We witnessed a similar evolution in traditional sports nutrition. Initially popular mainly with competitive athletes and confirmed gym-goers, sports nutrition supplements are “now seen as crucial elements in any sportsperson's diet, from weekend warriors to professional footballers,” O'Reilly says. By that same token, “Esports supplements have seen their own explosion in mainstream use over the past few years.”

Elite Influence

Credit for their spread goes, in part, to the advocacy of professional esports athletes.

“Aspiring gamers realize that they can make careers out of doing what they love,” O'Reilly points out—“which is something



that wasn't possible a decade ago." High-profile performances are netting these elite gamers the same flurry of influential product sponsorships and endorsements that their pro-sports counterparts enjoy.

That being the case, amateur gamers and even spectators can't help but notice which products their idols support. And more often than not, they want in on the action, too.

As O'Reilly says, "Consumers do seem to respond to influencers' endorsements. Trusted voices can alleviate concerns around efficacy. But ultimately, branding is essential."

Fueling the Fun

The power for sponsorship isn't lost on Elyse Lovett, MS, MBA, vice president, marketing, Nutrition21 (Harrison, NY).

"Corporate involvement and big purses for competitions have grown significantly in just a handful of years," she points out. And with serious prize money driving viewership, she adds, "Companies of all kinds have become interested in esports sponsorships"—including food, beverage, and nutrition brands.

That interest wouldn't have materialized if digital athletes weren't increasingly mindful of the relationship between their diet and performance—and for good reason: Digital gaming is taxing.

"By most accounts, today's professional gamers train on a high level that includes maintaining peak physical and mental fitness,

just like their professional-sports counterparts," Lovett says. "This often entails a hardcore training regimen and a tight focus on nutrition and diet—including supplementation."

These aren't your stereotypical snack-scarfing couch potatoes of yesteryear. On the contrary, results of a 2020 University of Queensland survey² involving 1,400 participants from 65 countries show that esports players are as much as 21% healthier than the general population, drink less, and smoke minimally. Moreover, the fact that the top 10% of gamers indexed as more physically active than lower-level competitors suggests that physical activity genuinely influences esports performance—and for the better.

Tough Customers

If gamers are increasingly cognizant of nutrition's performance-enhancing power, they're also increasingly exacting in which nutritional products they choose.

Yes, convenience still counts to these consumers. "Formats like ready-to-drink beverages, powdered drink mixes, bars, and energy crystals typically work best for gamers," Lovett says.

Adds Stanieich, "There's been notable demand for RTDs and quick-to-consume forms like gummies, jelly beans, fast chews, and easy melts. We're also seeing new demands for focus and non-caffeine energy."

TIPS FOR SUCCESS IN THE ESPORTS SPACE

We asked esports experts for their tips on how to build and market a supplement that's sure to rise up the rankings.

TIP 1 “First, make safe products in a quality environment, and don’t make promises for them that they can’t deliver. Understand your supply chain, especially around raw materials going into energy products—it’s easy for adulteration to occur in this category, and a brand is only as strong as the weakest link in its supply chain. And understanding your risks is essential: Do the research to formulate efficacious products, and then test them to ensure they’re safe from adulterants and delivering on their promises.”

David Trosin, managing director, NSF Health Sciences Certification, NSF International (Ann Arbor, MI)

TIP 2 “Esports athletes need solutions that work quickly and provide tangible benefits that they can feel and that persist over time. These solutions also need to fit seamlessly into gamers’ lifestyles in products they already consume, such as snacks and drinks. Companies need to be mindful of these athletes’ dietary requirements, given their high levels of physical and mental training. And ingredients that can be formulated without caffeine will also be key, as many gamers demand products without caffeine to avoid jitters and crashes after long play. But probably most importantly, these products should be studied in actual gamers.”

Elyse Lovett, MS, MBA, vice president, marketing, Nutrition21 (Harrison, NY)

TIP 3 “Be transparent: Consumers want to know what they’re getting. Understand gamers’ evolving needs, and marry them with the leading nutritional insights and expertise. Stay true to your core purpose.”

Euan Costello O’Reilly, business development manager, Play Beyond Nutrition (Bristol, UK)

TIP 4 “As esports matures, we’re starting to understand how the marketing approach for a gaming consumer should differ from that for a traditional fitness or nutritional-supplement buyer. For gamers, you need a clear, unique, and authentic approach as a brand. You need to understand whether you’re targeting a passionate esports athlete, or more casual fans of a player or team. And you need to know and excel at platforms like Twitch, Discord, and Twitter, whereas most non-gaming brands are dedicating resources to Instagram and TikTok. With the cost of digital advertising and sponsorship with top gamers skyrocketing, the barrier to entry is so much more challenging than it was just a few years ago. There’s still a great deal of opportunity, but the maturation of esports over the last two to three years means that outsiders can’t organically enter the space and thrive like they once could.”

Jarrod Jordan, chief marketing officer, Iovate Health Sciences (Oakville, Ontario)

TIP 5 “We see several conditions driving growth in 2021 and beyond. Key interest areas like focus, attention, memory, and eye fatigue have already attracted a large user base, but now is also the time to incorporate mood, stress, and overall health into formulations as the esports community starts to face stress and burnout.”

Maria Stanieich, marketing manager, Kyowa Hakko USA (New York)

But just like the rest of the population, gamers are reading labels and leveling more scrutiny at what they find. “As such,” O’Reilly says, “they’re looking for healthy alternatives to the sugar- and caffeine-filled products they’ve relied on for so long.”

Even so, O’Reilly continues, “There’s a vast range of personalities in the consumer base. Many are very conscious of ingredients, but their main concern remains efficacy. With most aspiring e-athletes coming from a skeptical position, they’re looking for instant results to help them improve.”

But “instant” shouldn’t equal crashes or jitters—which is why “an energy claim alone is no longer sufficient to meet gamers’ needs,” Lovett says. Instead, the name of the game today is *sustained* energy, paired with ingredients for mental focus, optimized visual processing, and nerve and muscle support.

Beyond Cognition

If these look like the same benefits consumers look for in cognitive-support products, they are. But the demands of esports consumers go well beyond cognition alone.

As Stanieich explains, “Where esports consumers differ is in seeking to train the mind—supporting mental and eye health to improve their gaming performance and unlock the maximum potential between the mind and body.”

Gamers have to react to constantly shifting onscreen stimuli within milliseconds, for example—“or else face defeat,” she says. And they have to do so for hours on end, often with little break.

“So while there may be similarities between the general population and esports enthusiasts in the types of benefits they look for,” Stanieich concludes, “the scope is different.”

And studies show that esports athletes experience the same degree of stress as do traditional athletes, O’Reilly adds. “This comes as physiological and psychological pressure, including performance anxiety, fear of failure, and tensions resulting from miscommunication, particularly in team sports,” O’Reilly notes. “The ability to stay calm and composed in these situations is crucial and has been something

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that sports scientists and nutritionists work closely with athletes to achieve.”

Prove It

Gamers are paying attention to how brands help them achieve it, too, doing their due diligence and choosing products that strike them as safe for their sport.

“Consumers in general are becoming more sophisticated and discerning about their supplements,” says David Trosin, managing director, NSF Health Sciences Certification, NSF International (Ann Arbor, MI), “and that trend will only continue. Brands that provide better scientific support, greater transparency, and clarity on the quality of their products will win the day.”

Lovett agrees. Ingredients that have been studied in actual gamers and that provide the benefits they value—energy, focus, accuracy, reaction time, et al—“will differentiate an esports product from a cognitive-support one,” she says.

For example, Nutrition21’s nooLVL—a patented, caffeine-free complex of bonded arginine silicate plus inositol—is the first cognitive-performance ingredient studied in gamers, Lovett claims, with a 2019 double-blind placebo-controlled trial³ demonstrating increased perceived energy within 15 minutes of a single dose, and improved reaction time and decision accuracy after 60 minutes of gaming.

“A more recent study⁴ that examined whether nooLVL had effects on cognitive function prior to and following a one-hour gaming challenge found evidence of enhanced short-term memory, reaction time, reasoning, and concentration among gamers following a single dose,” Lovett adds.

Stanieich notes that the eye is “a direct extension of the brain” and that prolonged screen time can lead to dryness and fatigue. Kyowa Hakko’s Eyemuse is the first postbiotic positioned to help gamers support eyes and improve their healthy function, she says, with evidence indicating that it reduces eye fatigue⁵ as well as the stiffness in the waist and shoulders such fatigue can cause⁶.

Stanieich also calls attention to Kyowa Hakko’s clinically studied nootropic Cognizin citicoline. It supports mental energy, memory, focus, and attention by facilitating membrane fluidity and plasticity; fortifying cell-membrane structures; and enhancing neuronal communication, she says, adding that a motor-speed finger-tap test⁷ among adolescent males taking 250 mg or 500 mg exhibited improved attention and significantly increased psychomotor speed compared to placebo.

Her conclusion: “Combining Cognizin and Eyemuse for a comprehensive formulation that supports brain and eye health will provide future esports formulations a competitive edge.”

Performance for All

And consumers needn’t be actual esports competitors to benefit from it.

“There’s an argument to be made that not just competitive gamers but the work-from-home crowd and those who just spend a lot of time on screens can all benefit from the same key ingredients found in something like an XP Sports product,” observes

“As esports matures, we’re starting to understand how the marketing approach for a gaming consumer should differ from that for a traditional fitness or nutritional-supplement buyer,” says Iovate’s Jarrod Jordan.

Jarrod Jordan, chief marketing officer, Iovate Health Sciences (Oakville, Ontario), maker of the XP Sports brand. “Being able to successfully develop a product with all those types in mind, not to mention a marketing and distribution strategy that makes sense to them, is how you become successful in this space.”

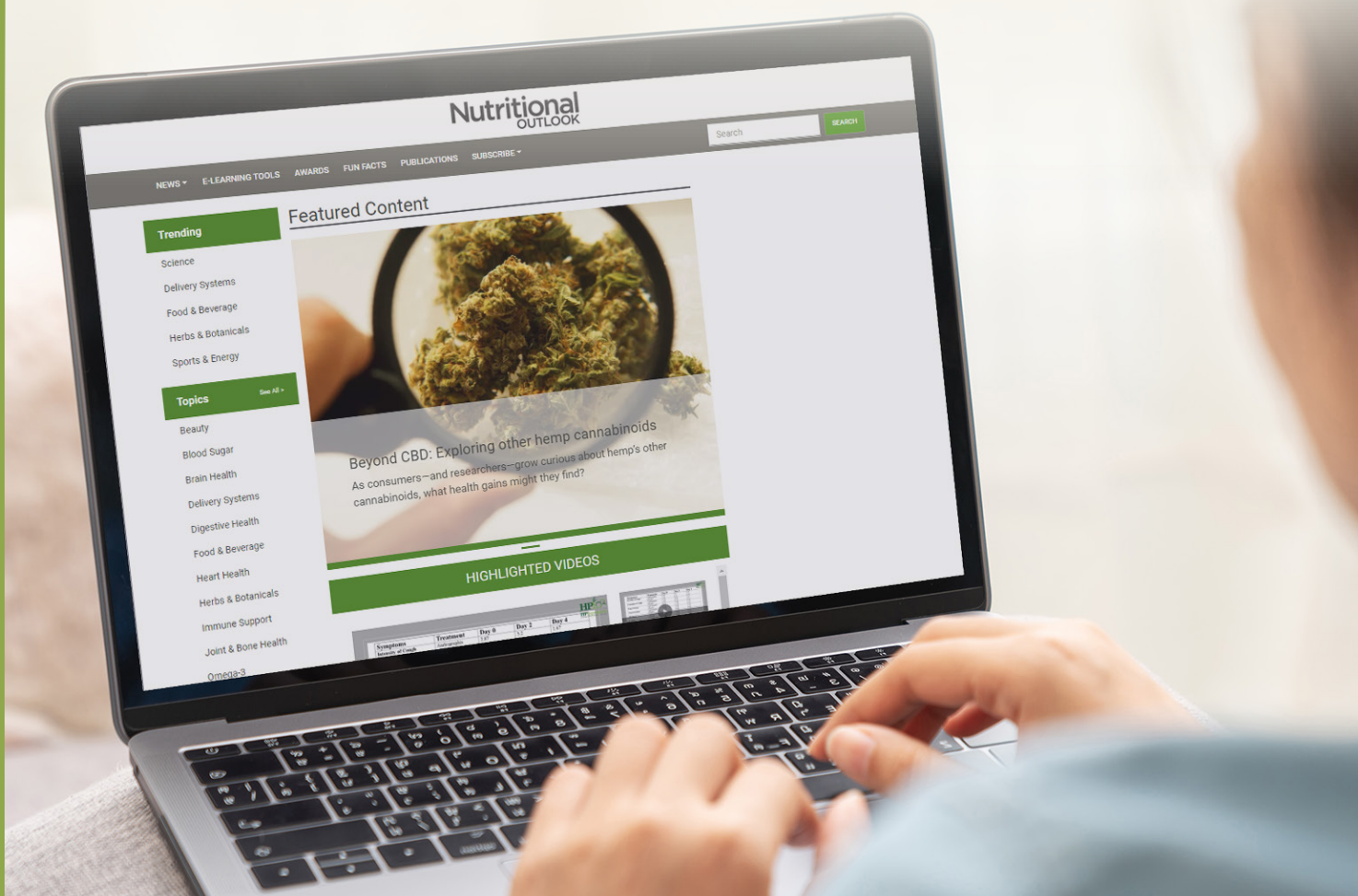
So is following the same principles that drive successful supplement formulation in general. In other words, says Jordan, “We’ve learned that esports consumers want products that genuinely work, taste really good, and give them a plethora of flavors to choose from.” ■

Kimberly J. Decker writes for the food and nutrition industries from her base in the San Francisco area where she enjoys eating food as much as she does writing about it.

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Flavor Champions

Popular and emerging flavors in sports products

BY MIKE STRAUS

Sports product flavors are always evolving to appeal to changing consumer demographics and desires. While classic flavors like chocolate and citrus are still dominant, there's been an expansion of niche flavors, too.

The flavor choice ultimately depends on the product's format, whether it's a sports nutrition bar, a ready-to-drink beverage, or a powder. As consumer palates grow more sophisticated, brands will find an audience more willing to experiment with both classic and emerging flavor profiles. Here are some of the popular and emerging flavors trending in sports products this year.

Healthy Flavors Dominate

Sports nutrition flavors in 2022 will largely follow the growing health and wellness movement, says Philip Caputo, marketing and consumer insights manager at Virginia Dare (Brooklyn, NY).

"Wellness flavors are the most influential taste trend going forward into 2022," Caputo says.

He says wellness flavors tend to be either 1) "mood-fluencing" flavors (such as passion fruit chamomile or mango turmeric) for products that contain adaptogens and other emotional health-supporting botanicals, 2) "body-boosting" flavors (like blueberry matcha or apricot mango) for products that have targeted nutritional properties, and 3) "beautifying" flavors (like watermelon cucumber or goji aronia berry) to serve the beauty-from-within market.

Some of the emerging flavors Virginia Dare is watching are specific to a particular consumer type. Caputo says foraging-themed flavors are likely to appeal to outdoorsy consumers, while gamers and esports enthusiasts will flock to e-centric flavors. "We also expect greater interest in sweet spice flavors like cardamom, nutmeg, and fenugreek," he adds. "Sweet spices offer comfort through happy memories of holiday desserts, pumpkin spice lattes, warm cinnamon buns, or hot chai."



Indulgence in Bars, Beverages

In fact, health-and-wellness flavors are trending in bars and beverages, but so are the indulgent dessert flavors consumers know and love. For instance, Megan Byrnes, marketing manager at Gold Coast Ingredients (Commerce, CA), says that while healthy flavors like berry, dark chocolate, cinnamon, and other botanicals are gaining popularity, so are flavors like peanut butter cup, birthday cake, caramel macchiato, and S'mores.

"Healthy flavors are popular in sports products that are marketed as all natural, organic, clean label, or made with simple ingredients," Byrnes explains. "Companies use indulgent flavors to transform the taste experience of an entire dessert into a protein beverage or bar." Other examples of currently popular indulgent flavors are caramel brownie, lemon cheesecake, and blueberry cobbler.

Pineapple Fusion Flavors on the Rise

Another rising star is pineapple fusion flavors, a creative new option for sports product formulators. Byrnes says the tendency is to pair pineapple with another flavor.

"Pineapple coconut has been a popular blend," Byrnes says. "Now, we're seeing pineapple passion fruit, pineapple guava, pineapple orange, and whipped cream pineapple. Companies have turned to pineapple to spark innovation in their product line."

Lemonade blends are another flavor Byrnes is watching. Brands have already experienced success with pink lemonade, strawberry lemonade, and raspberry lemonade flavors; now, mango lemonade is coming up in the lemonade line of succession.

Creative and Nostalgic Flavors for Young and Old

Some of the most popular sports product flavors involve new and old flavors that remind consumers of the past—or that cater to their generation's preferences.

For instance, Will McCormack, PhD, senior business development manager for nutrition at Synergy Flavors (Wauconda, IL), says nostalgic flavors succeeded in 2021. "Cereal flavors, in particular, have stood out within sports products," McCormack says. "In troubling times, such as the COVID-19 pandemic, consumers look for the joy and comfort of nostalgia in the products they buy."

Meanwhile, younger consumers' existing taste preferences are influencing the way sports product formulators flavor their products, too. Generation Z, McCormack says, responds quite well to iced coffee flavors.

"Pineapple coconut has been a popular blend. Now, we're seeing pineapple passion fruit, pineapple guava, pineapple orange, and whipped cream pineapple," says Gold Coast Ingredients' Megan Byrnes.

"Iced coffee is a great example of a product that resonates with younger consumers. It combines three things this generation is obsessed with: coffee, cold beverages, and indulgence. Sports brands are now partnering with well-known coffee brands to bring iced coffee recipes to life in flavor form, and we can expect this trend to grow in 2022."

Exotic Flavors Take the Market by Surprise

Some of the unexpected emerging flavors in sports products capitalize on consumers' desire to experience the world, even if from their home base. McCormack says the pandemic has given consumers the time to explore how they can recreate their favorite foods and drinks at home, and given them a newfound appreciation for world cuisines and premium beverages. This will drive consumers to seek out exotic flavors in sports products as well.

"We've seen flavors like yuzu, hibiscus, tiramisu, and speculoos growing in popularity," McCormack says. "New and emerging exotic flavors like bergamot, ume plum, banoffee, cherry blossom, blood orange, and Vietnamese coffee are expected to rise in popularity this year, inspired by Japan, Korea, the Mediterranean, and Latin American regions."

Limitless Creativity

Sports product formulators, ingredient suppliers, and flavor companies have upped their game in recent years, introducing a variety of exotic new flavors and outside-the-box takes on old classics. These flavors leverage consumer desires for novel experiences, nostalgia, indulgent dessert foods, and healthy ingredients in a paradoxical yet effective way. As the sports nutrition market becomes more sophisticated, brands will have even more freedom to experiment with flavors new and reinvented. ■

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Star Players

Big trends in sports drinks

BY MIKE STRAUS

As more consumers adopt sports nutrition beverages as part of an active lifestyle, consumer preferences are diversifying. Today, the term *sports drink* has come to mean many things.

As this umbrella category broadens, it will be essential for brands to tailor products to better appeal to specific consumer segments. Here are some of the consumer trends shaping the sports drinks market.

Esports: Cognitive Drinks Grow

The rise of esports opened up several new avenues for sports drinks. While traditional sports drinks typically focused on hydration as a key benefit, esports beverages heavily center on cognitive health benefits.

Today's esports drinks can target specific aspects of brain health or induce certain brain-states, says Erin Costello, communications and events associate for drink developer Imbibe (Niles, IL).

"Cognitive support, focus, and digital performance are all market opportunities" in this category, Costello says. "G Fuel has seen success with multiple product lines, including powders and ready-to drink [RTDs] that enhance gamers' performance." The company's marketing is on point, too. "They've taken influencer marketing by storm; they've created partnerships with movie franchises and professional gamers," she says.

Label Claims Matter

As consumers seek more functional benefits from their sports drinks—benefits like focus, eye health, and satiety—they are also

moving away from old-school fillers like sugar. There is continued demand for reduced-sugar and low-calorie sports drinks, with consumers both inside and outside the gym reaching for sports drinks, Costello says.

"According to the International Food Information Council, 25% of consumers say the total sugars information on the Nutrition Facts label has the most influence on their purchases," Costello explains.

Shoppers are also searching for key benefits and ingredients on labels. For instance, "Sports drinks are relied upon for enhanced performance and hydration through added electrolytes, B vitamins, and caffeine," she notes.

Formulating with alternative ingredients may create challenges with solubility, mouthfeel, or off-notes, but flavor-balancing additives like maskers can help ensure palatability, Costello advises. Imbibe's branded NonSense masking agent, for instance, is designed to mask off-notes like bitter, sulfuric, and astringent tastes.

"Benefit Stacking" in Demand

While traditional sports drinks still appeal to certain consumers, the healthy active-lifestyle market is increasingly trending toward combination products containing botanicals, vitamins, and other natural ingredients delivered in synergistic blends with additional benefits.

As brands innovate, their product offerings are becoming more advanced, says Natalie Bujak, marketing and innovation manager for Armada Nutrition (Spring Hill, TN), a Prinova Group (Hanover



Park, IL) business. “It’s not just about pre- and post-workout consumption,” Bujak says. “It’s now about consuming functional drinks throughout the day to provide multiple benefits. For example, sports drinks—especially energy drinks—are being launched with multiple functional ingredients such as botanicals and vitamins.”

Bujak says that while protein-based drinks are still popular, consumers are also on the hunt for holistic drinks that offer a range of benefits. Popular applications include immune health, energy, and mental health support.

Personalized Performance

As the functional drinks market expands beyond sports, its new audience will look for personalized nutrition products that support particular lifestyles. And as the stress of the COVID-19 pandemic continues to take its toll, consumers are looking for products in general that can support their health long-term, says Maria Stanieich, marketing manager for Kyowa Hakko USA (New York, NY).

Multiple consumer segments are now looking for healthy beverages to support their lifestyles. Some more athletic consumers, for instance, might be looking for performance or endurance beverages, Stanieich says; other consumers may want longer-term physical or mental health support. Stanieich says there is ample opportunity for innovation and growth within these segments. Brands that invest in tailored product applications will be able to capitalize on these niche opportunities.

In addition, “Clean-label and improved wellness is top of mind,” Stanieich says. “Today’s consumers are learning more about self-care. Clinically tested and studied ingredients are on the rise overall; consumers are looking for science-backed ingredients.”

Adapting to the Mainstream

Sports brands are aware that in order to grow, they need to reach more mainstream consumers. Rather than repositioning an existing product, Bujak says sports brands should launch new products to meet the needs of new consumer segments.

Breaking into a broader market will require functional sports drink brands to run plays from a new playbook. Active-nutrition consumers are less invested in technical details and care more about a brand’s story. They also value clean-label products. Greater transparency, better brand storytelling, and a focus on less technical communications can help brands appeal to a broader demographic.

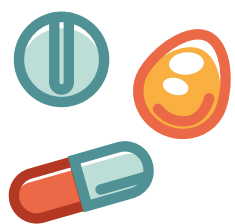
However, Bujak cautions that breaking into a new market will also require brands to invest in proactive regulatory compliance steps. Product safety monitoring and ensuring defensible health claims are just two of the ways that brands can put their functional beverages on solid footing. **N**

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5 TO WATCH FOR SPORTS

5 Must-have ingredients for your sports supplement product line

BY GENE BRUNO, MS, MHS, RH (AHG)



The global sports nutrition market was valued at \$15.6 billion in 2019 and is expected to grow at a compound annual growth rate (CAGR) of 8.9% from 2020 to 2027.¹ At the same time, the global sports medicine market is projected to reach \$15.2 billion by 2027, expanding at a CAGR of 8.2%.² The increasing demand for sports medicine, owing to the shift towards a healthy lifestyle adopted by the young population, and rising incidences of injuries among athletes and fitness enthusiasts, are some of the major factors driving the market.² Consequently, the ingredient recommendations provided in this article will heavily skew toward recovery-related ingredients for sports supplements.

Ashwagandha Extract

My first and foremost recommendation is ashwagandha (*Withania somnifera*), an adaptogenic herb that has been used in Ayurvedic medicine³ for over 3000 years. It was described by Dioscorides (78 AD) in his book *Kitab-ul-Hashaish* as a “Rasayana”—a rejuvenator “that promotes a youthful state of physical and mental health and expands happiness.”⁴

Various studies have demonstrated that ashwagandha extract is capable of increasing testosterone levels in men by about 15%-17%^{5,6,7}—and testosterone’s importance to building and maintaining muscle is well established. Furthermore, in other research, ashwagandha extract was found to increase muscle size and strength more than exercise alone⁷ and helped double the reduction in body fat percentage compared to exercise

alone.⁷ In addition, ashwagandha extract has been shown to enhance cardiorespiratory endurance (measured as VO_2max) and improved self-assessed quality of life in healthy athletic adults⁸. These clinically validated benefits make a powerful argument for including a quality ashwagandha extract in your sports supplement product line.

Besides, you don’t want to be left out. According to Data Bridge Market Research⁹, the global ashwagandha extract market is expected to reach \$102.72 million by 2029, growing at CAGR of 11.4%.

Quercetin Phytosome

Quercetin, which naturally occurs in a variety of plant-based foods and herbs, including onions, apples, berries, teas, tomatoes, broccoli, lettuce, and red wine^{10,11}, is a particularly good recovery ingredient.

Clinical research has shown that supplementation with quercetin significantly reduced muscle weakness associated with eccentric exercise-induced severe muscle damage when compared with placebo and also increased performance, measured as isometric strength, compared to baseline.¹²

More impressive, though, is research on quercetin phytosome, a form believed to be better absorbed.¹³ A study on triathlon athletes demonstrated that quercetin phytosome significantly improved time to complete the run. In addition, post-run muscular pain, cramps, localized pain, and post-exercise recovery time were all considered better with the supplementation.

According to SpendEdge¹⁴, the global quercetin extract market is expected to reach \$110.08 million by 2024, growing at CAGR of 6.53%.

Tart Cherry Extract

Another good recovery ingredient is tart cherry extract. According to the journal *Current Sports Medicine Reports*, tart cherry extract (TC) “has many antioxidant and anti-inflammatory polyphenol compounds. TC lessens pain and accelerates strength recovery after exercise, and decreases blood markers of inflammation/oxidative stress. These improvements occur in both strength and endurance exercise.”¹⁵

Clinical research¹⁶ has demonstrated that supplementation with tart cherry extract improved recovery of muscle strength, reduced muscle damage, enhanced exercise recovery, promoted faster recovery from workouts, and provided powerful antioxidant support against oxidative stress in subjects performing upper- and lower-body resistance training.

While specific market data on the tart cherry extract market isn't available, ReportLinker¹⁷ reports that the global dried tart cherry market is expected to reach \$313 million by 2027, growing at CAGR of 4.5%.

Beta-caryophyllene

Beta-caryophyllene (β -caryophyllene) is a phytocannabinoid terpene derived from pepper oil. It has been shown to be particularly effective in relieving pain and inflammation. Unlike its CBD cousin, β -caryophyllene may lawfully be used in dietary supplements, and there is no regulatory challenge in doing so as there is with CBD.

Published research¹⁸ on β -caryophyllene supplementation examined its effects on delayed onset muscle soreness (DOMS), which relates to swelling of muscles, tenderness, rigidity, pain, disruption of muscle fiber, alteration in the kinematics of joint, acute tissue damage, and reduction in power and strength. β -caryophyllene was shown to significantly reduce pain and effectively reduce DOMS, with improved recovery and without any side effects.

Currently, market data on β -caryophyllene is not readily available.

Bacillus subtilis

Anyone reading this article is no doubt aware of the popularity and trending of probiotics as a category in the natural products industry. While sports nutrition isn't typically the first application that comes to mind for probiotics, it is indeed an important application.

This is true, at least, for *Bacillus subtilis*, a spore-forming probiotic that provides its own protection against destruction by stomach acids and that survives transit through the stomach intact.^{19,20} Besides the usual benefits for immunity, digestion, and gut health,^{21,22,23} in combination with strength training *Bacillus subtilis* has also been shown to help optimize body composition, improve physical performance, decrease inflammation associated with exercise, and promote a leaner body and improved strength with strength training.^{24,25}

According to Kingpin Market Research²⁶, the global *Bacillus subtilis* market is expected to reach \$104.8 million by 2026, growing at CAGR of 8.7%.

Conclusion

While there are many good ingredients I can recommend for your sports supplement line, ashwagandha extract, quercetin phytosome, tart cherry extract, beta-caryophyllene, and *Bacillus subtilis* are five of the very best. Include these among the trending, must-have ingredients for your sports supplement products. ■

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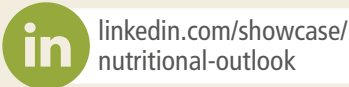
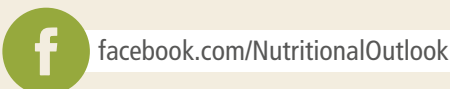


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