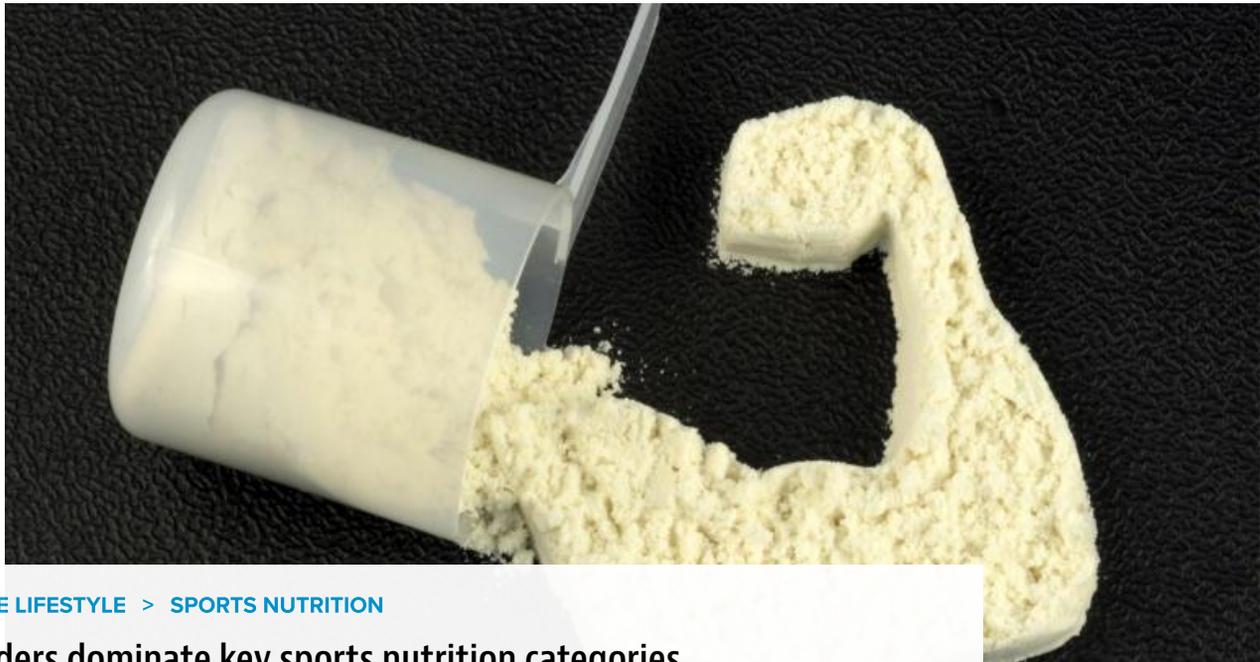




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Powders dominate key sports nutrition categories

In the sports nutrition market's love affair with powders for muscle, energy and recovery products, innovation is only limited by flavor and stability challenges.

[Steve Myers](#) | Oct 09, 2018



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INSIDER's take

- Powder formulas can deliver larger doses of ingredients and allow consumers some level of customization.
- Protein blends, creatine, stimulants and branded ingredients for muscle, energy and recovery are popular in powder formulation.
- Powder ingredient types affect taste, with proteins tied mostly to creamy dessert flavors and many energy ingredients locked into fruity and acidic flavors.

Powder-based formulas are all over the lists of best-selling sports nutrition products at top retailers including Amazon, Walmart and Bodybuilding.com. Powder products dominate certain categories more than others. For instance, Amazon's protein, pre-workout and post-workout/recovery categories are mostly owned by powder products, specifically ready-to-mix (RTM) formulas.

Mixable powders more popular in sports nutrition compared to other sports nutrition formats, including capsules, bars and ready-to-drink (RTD) products.

Capsules have the advantage of more easily hiding off flavors and not having to contend with liquid from consumer mixing before use. However, consumers increasingly seek more food- and drink-like experiences rather than a litany of pills, so RTM powders offer a way for consumers to drink their sports supplements in a range of palatable flavors. Further, RTM powders often involve "scoops," each of which delivers anywhere from 5 g to more than 30 g of ingredients. It would take many capsules to deliver an equivalent amount of product.

For ingredients such as protein, which is typically dosed at 20 to 30 g per serving, powders are the primary delivery format, followed by RTD and bar products. RTD sports nutrition products can deliver the amounts of protein sports nutrition consumers want and offer pleasurable convenience, but they cost more to ship (no water content) and have a shorter shelf life than RTM products, especially with high-protein products.

"We decided to make a pre-workout powder because we knew we could make a really delicious flavor profile," said Kaelin Tuell Poulin, founder of LadyBoss, which makes an energy and pre-workout powder for women called LadyBoss FUEL. "When you can take something that tastes like candy before you work out, it's more satisfying than pills or any other form of pre-workout. Powder products also absorb in the body much quicker because it's mixed into a liquid, like water, and liquid is easier for your body to break down and digest than pills."

Another advantage of powder products is they can be custom blended by the consumer. While many

multi-ingredient pre- and post-workout formulas contain 15 or more dietary ingredients, some popular products focus on one ingredient, such as creatine, or a group of like ingredients, such as proteins or amino acids. Branched chain amino acids (BCAAs) are a popular standalone product. Energy formulas also can run the gamut of few to many ingredients, mostly stimulants (“stims”) and vasodilators (“pumps”), as well as carbs and compounds that support mitochondrial energy production.

Longtime sports nutrition formulator Bruce Kneller, currently a partner with HiQ Financial Holdings Inc., said consumer mixing of different powder formulas is part of a cycle in sports nutrition that sees formulation go from involving few ingredients to long lists of ingredients.

“The sports nutrition industry vacillates on an 18- to 24-month cycle where consumers want inexpensive products with few ingredients, so they can mix and make their own potions in their houses via kitchen chemistry,” he noted. “Then we start to see brands and labels adding more ingredients into the formulation, usually one or two at a time, to make ‘new and improved’ pre-workout products, until the final product has 20 plus g and 18 ingredients per serving, and it looks like the formulator threw everything possible into the mix—the proverbial ‘kitchen sink’ product.” He explained that someone eventually relaunches a bare-bones, inexpensive type of product that is basically “high stim/high pump” with a good dollop of beta alanine so people can “feel it really working!” (Beta alanine supports increased energy/decreased fatigue and can cause paresthesia, a tingling or itching sensation.)

Powder trends and formulation

Whether part of the cycle Kneller mentioned or part of bigger trends migrating from the general health and nutrition market to the sports nutrition market, real ingredients and label transparency are a growing trend for powders.

“Clean label is now part of the price of admission into the sports nutrition space, just like it is in all other segments, so excipients and carriers need to be natural,” said Andrew Wheeler, corporate director of marketing for Futureceuticals, which makes low-dose, clinically researched ingredients in powder form including several offering energy, recovery and cognitive benefits.

“We feel that the key to success is low-dose powders that can be utilized in tablets, capsules, gels, gummies, RTM/RTD and any other delivery format,” he said. “A central part of our Discovery Research platform is determining the maximum response to the lowest dose, and as our research has told us, more is not always best. Sometimes, a greater response comes from a lower dose. This gives our customers the ability to take advantage of versatility and economy coupled with the strongest claims possible.”

Armada Nutrition, a contract manufacturer specializing in powder products, singled out green tea

catechin ingredient (Vaso6, from Compound Solutions) as a top powder ingredient for pre-workouts and nootropic supplements with a blood flow benefit. “It’s interesting how you can get such robust response from such a small dosage with regards to vasodilation,” said Brent Laffey, president of Armada Nutrition.

For recovery powders, Brashares said trace minerals are underutilized and have high potential. “We’ve definitely been seeing them increase in usage,” he said. “Aquamin (from Marigot Ltd.) would be a good example for this category we see growing.”

Ingredient trends in sports powders favor researched compounds for specific goals, such as protein and amino acids for muscle building. Top-selling products often feature branded ingredients, reflecting the move toward using the exact ingredients studied in research.

For protein, whey is king, and is popular in both concentrate and isolate form. Casein, namely micellar casein, is also a top choice, especially in recovery formulas, since it is a slower digesting protein ideal for recovery and overnight muscle protein synthesis (MPS).

Chicken is a favorite food protein source, and now chicken protein powder offers a non-dairy alternative source of all essential amino acids, as well as many conditionally essential amino acids including glutamine, arginine, cysteine, glycine and tyrosine.

“Many sports nutrition products are made with soy or whey, which can be good options for some, while others may be avoiding dairy, lactose or soy-based products,” explained Stephanie Lynch, vice president of sales, marketing, and technology for International Dehydrated Foods (IDF), noting dairy, wheat and soy are on the list of the eight major food allergens. “Newer specialty diets, such as keto and paleo are trending, and CHiKPRO chicken protein powder—a naturally gluten-, dairy-, and soy-free protein—is a diet-friendly alternative for sports nutrition formulators.”

Lynch further noted IDF’s chicken protein isolate powder is 100 percent real chicken available in forms compatible for use in both USDA food and FDA supplement applications. “CHiKPRO is a complete protein, and provides the same nutrition and benefits as eating a piece of chicken,” she said. “In addition to protein, it also includes the necessary nutrients (such as zinc and iron based on 100 g servings) to promote and maintain balanced nutrition. CHiKPRO is also rich in electrolytes and has a 2:1 potassium/sodium ratio, which supports recovery and rehydration.”

Common protein blends include whey, casein and milk protein forms along with BCAAs and other amino acids, as well as the growing array of plant protein sources. Chicken protein powder has a real chicken flavor; it has hit the finished products market as a scoop-able, standalone, RTM powder.

Aside from soy and the newer water lentil ingredient LENTEIN from Parabel, individual plant sources

such as pea, hemp, rice and others are low in one essential amino acid and need to be blended to deliver a “complete” protein. Plant proteins also come with different colors and flavors that need to be considered by formulators.

Manufacturer Manitoba Harvest found a winning combination of pea and hemp protein. Its Hemp Yeah! Protein powder combines these two plants to offer a complete amino acid profile in a product that is also certified organic, kosher, vegan and non-GMO (genetically modified organism).

“While hemp is low in lysine, it works really well in combination with pea protein that is high in lysine, helping to support lean mass building,” said Anne Thompson, vice president of marketing at Manitoba Harvest. “The combination of hemp and pea protein in Hemp Yeah! also results in a highly digestible protein (with more than 87 percent digestibility), allowing for maximum absorption.” She added hemp is high in arginine, a vasodilator for improved blood flow, and the hemp-pea blend delivers 20 g of protein per serving, 2 g of omega-3 and omega-6 fatty acids, and is a rare source of gamma linolenic acid (GLA).

She noted many vegan protein powders fail to deliver a smooth taste and texture, but her team specifically chose pea protein for its superior taste, texture, mixability and nutritional benefits.

“Pea protein has high solubility, excellent dispersibility and mouthfeel, and great taste,” she affirmed. “Organic coconut sugar is used to sweeten the plant protein blend, and we are using organic cocoa and natural flavors to enhance the taste.” She noted consumers looking for a vegan protein drink can blend Hemp Yeah! with any non-dairy milk for a pre- or post-workout shake.

Hemp Yeah! is available in three varieties: chocolate, vanilla or unsweetened, which is standard for protein powders, due to the mouthfeel of proteins.

“It’s really difficult to take a milk protein product, something with whey or caseinate in it, and do anything but a creamy flavor due to the mouthfeel and creaminess inherent to most proteins,” Kneller explained. “The fruit-flavored milk proteins don’t taste all that good in my opinion. You may see a strawberry cream or an orange creamsicle type of product here or there, but that’s about it for your milk proteins and fruit flavors.”

Among top-selling protein powders, flavors include chocolate, vanilla, strawberry, cookies and cream, caramel, mocha and assorted cake, ice cream, pie and other dessert flavors.

On the flip side, many pre-workout and energy formulas are fruit flavored. Masking stimulants, bitter herbals (anti-inflammatory, antioxidant, ergogenic and stimulant) and various salts (ketone, etc.) is a big endeavor in these products.

“It’s kind of funny how the most effective ingredients are often the worst tasting ones,” Tuell said.

“However, we worked with an excellent team of chemists to create the most delicious flavor profile

HOWEVER, WE WORKED WITH AN EXCELLENT TEAM OF CHEMISTS TO CREATE THE MOST DELICIOUS FLAVOR PROFILE possible, while still maintaining a light texture and effective formula that mixes well in a simple shaker bottle.”

The nitric oxide (NO) ”pump” ingredient agmatine comes with an unappealing taste, according to Kneller, who said a typical dose of a gram or more per serving means the flavor is difficult to hide.

The same goes for certain stimulants. “In general, virtually all the 2-phenylethylamine backboneed ‘stimulants’ tend to be truly vile from a taste perspective,” Kneller noted.

The flavor-masking challenges don’t end there. One of the growing trends in energy and body composition is the ketone diet, which involves very low carb intake. As the body is starved of carbs, which typically drive the bulk of early mitochondrial energy production, ketones can accumulate and drive later energy production where fat is more rapidly oxidized for fuel.

One ketone, beta hydroxybutyrate (BHB), is a popular supplement ingredient. Kneller said, BHB salts are exceedingly challenging to use in powder formulations despite their current popularity and ubiquity. “These ingredients taste really bad (sour, bitter), and they require a lot of masking agents, sweeteners and flavorants to cover them up and make them even remotely palatable to the mainstream consumer.” He said the challenge is amplified by needing multi-gram amounts per dose of BHB salts to induce and maintain ketosis. “You have to add in a lot of ‘stuff’ to cover up the bad taste, and it gets expensive fast.”

Kneller advised, BHB salts pretty much limit flavor options to citrus fruits like lemon/lemonade, orange, lime and other "acidic" flavors. “I have seen chocolate BHB salt products; but in my opinion, they are absolutely disgusting and would make a Billy goat gag,” he warned.

In general, more bitter tasting ingredients are limited to flavors that are acidic. “This is why you don't see chocolate-milk-flavored pre-workout products,” he noted. “You just can't mix a good chocolate, a rich, creamy flavor, with these nasty, bitter/acidic flavors. Ever see anything but a fruit-flavored BCAA product? Now you know why! There is no market for "chocolate-covered lime flavor.”

Plant-based ingredients can also be a big challenge. “High inclusions of botanicals can be difficult to overcome from a sensory standpoint and can be challenging to mask the herbal notes as well as limit color options,” Laffey reported.

Green tea extract is a popular ingredient in both energy/pre-workout and body composition/weight formulas. As pleasurable a flavor as green tea can be for many consumers, the extract is standardized to a catechin (i.e. epigallocatechin gallate, or EGCG), which can be really bitter when used in large amounts. “Green tea is a popular dietary ingredient, due to its myriad health-promoting benefits,” Kneller said. “The higher the catechin content, the ‘healthier’ it is, but the nastier it tends to be from a taste perspective.”

“We also try to use encapsulated forms of micronutrients when possible to help mask potential bitter notes,” Laffey said. “Ingredients such as theacrine, copper, iron, methylberine, capsinoids, etc. come to mind.”

Trending sports powder ingredients

Protein—whey, casein, milk and plant (soy, pea, rice, hemp, etc.), for amino acid muscle building.

Amino Acids—essential amino acids, including branched chain amino acid (BCAAs, leucine is required for muscle protein synthesis).

Creatine—monohydrate, nitrate, buffered, with palatinose, etc., for energy production.

Caffeine—synthetic (anhydrous) and herbal (coffee, guarana, etc.) for energy/stimulant benefits.

Beta Alanine—anti-fatigue in the muscles.

Carnitine—energy production.

Citrulline—often paired with malic acid/malate for energy benefits.

Coffee—energy and weight management (green coffee).

Betaine—strength and power benefits.

Green Tea—antioxidant and weight management.

Cognitive/Nootropics—taurine, Huperzine A and tyrosine.

Choline—cognitive and muscle performance.

Nitric Oxide “pumps” —arginine, beet and agmatine.

Sweeteners—sugar, synthetic alternatives (sucralose, acesulfame, etc.) and Stevia.

Conjugated Linoleic Acid (CLA) —body composition.

Garcinia Cambogia—weight loss.

Turmeric/Curcumin—anti-inflammatory.

Tart Cherry—anti-inflammatory.

Minerals—zinc, magnesium, iron and electrolytes (potassium, calcium, sodium).

Powder innovations

The road ahead for sports powders includes potential, technological innovations that would allow for the use of ingredients that currently are challenging or impossible to include in powder formulations. To this end, flavor masking and increased stability are other ripe areas for protein powder innovations, according to Kneller.

One example is when Glanbia adapted its vegetable protein flavor neutralizing technology, EasyFlav, to work on whey protein. EasyFlav can cut carbohydrate content by 30 percent with added protein and stable flavor, according to the company. It saves time by reducing the need for separate protein and flavor solutions.

A recent innovation in protein powder is Velositol, which has been shown to boost the MPS ability of protein supplements (*J Int Soc Sports Nutr.* 2017;14(6)). Nutrition 21 designed this patented amylopectin chromium complex to enhance insulin response to boost amino acid uptake and provide muscle fuel. Following a trend in powder innovations, Velositol is flavorless and accepts flavor easily, according to Nutrition 21.

Bill Levi, vice president of operations at Nutrition 21, noted Velositol and the company's arginine silicate Nitrosigine are easy to formulate powdered ingredients. "Neither Velositol nor Nitrosigine negatively interacts with other ingredients, and they both are simple to flavor."

Sports powders are poised to maintain and grow in popularity across consumer groups and athletic goals, especially as flavor and stability technology improve, and novel ingredients become available in flavorless or flavor-friendly forms that bear many trendy designations from organic and gluten-free to clean label and non-GMO.

Looking for insights on how to keep up with the younger generation of sports nutrition consumers and the changing retailing landscape? Join us for the [Sports Nutrition 2020: Sharpening the Vision](#) workshop on Wednesday, Nov. 7, at SupplySide West 2018. This workshop is underwritten by

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SupplySide West podcast: Regulatory women are backbone of nutrition industry

Women that advise on legal and manufacturing matters in a traditionally male role show strength of character

Sandy Almendarez | Oct 25, 2018





A regulatory consultant in the food and supplement industries must be confident and knowledgeable to navigate the murky waters of laws that are often not black and white. When a woman takes this role, she is acting outside of gender norms in a field dominated by men. In this Healthy Insider podcast, Rena Cohen-First, director of sales, Western Region, [The Wright Group](#), talks with Denise Webster, regulatory consultant, [Food Brand Protection](#), about her career as a Gen X female leader. Sandy Almendarez, editor in chief, **INSIDER**, shares a bit of the Millennial perspective.

They discuss:

- The type of personality it takes to be a regulatory consultant in the food and supplement industries, and Webster's successful career path;
- The perks and flexibility a company can provide to attract female leaders;
- Where the next generation of women in the health and nutrition industry can find mentors and solidarity.

Links and resources

- Cohen-First will be speaking at the SupplySide Workshop "[Boosting Your ROI: Secrets to Business Success](#)," Thursday, Nov. 8, 9 to 11 a.m. At the workshop, she'll provide insights she gleaned from conversations like the one on today's podcast.

Got feedback? Email Sandy at Sandy.Almendarez@informa.com, or tweet to [@NatProdINSIDER](#) using the hashtag #INSIDERPodcast

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