

Natural Products **Insider**[®]

Vol. 10, No. 9 July 2020

naturalproductsinsider.com US\$20.75

Sports nutrition: Protein

Forward focus

**SupplySide[®]
WEST**

PRESENTED BY



**KSM-66
Ashwagandha[®]**

WORLD'S BEST ASHWAGANDHA



Food ingredients
North America

OCTOBER 27-30, 2020
Expo Hall October 29 & 30
Mandalay Bay, Las Vegas, NV

supplysidewest.com

Discover
what's new with
Sports Nutrition
at **SupplySide West**
& Food ingredients
North America 2020.

SupplySide
WEST

PRESENTED BY



OCTOBER 27-30, 2020

Expo Hall October 29 & 30
Mandalay Bay, Las Vegas, NV

supplysidewest.com

REGISTER



4

Viewpoint: Macro darling

Protein remains the talk of the aisles, as a wider array of food and beverage products incorporate or call out high protein content.



6

Picking the correct protein: From human metabolism to preference

A proper combination of highly digestible forms of proteins may be the ultimate choice for consumers, writes **Mark LeDoux** of Natural Alternatives International Inc., with considerations of an individual's genotype, age and specific needs.



11

Top of the chain when it comes to protein

The protein market is abuzz with plant-based options, but milk-derived animal protein is tops in amino acid composition, with whey protein, milk protein and casein isolates that are ideal for muscle building and repair, as detailed by **Duffy Hayes**.



16

Plant protein revolution

Marie Spano explores the plant-based protein options gaining in popularity with consumers, including standbys like pea, rice, hemp and soy, as well as newer unique proteins including sacha inchi, quinoa and water lentils.



24

Uncertainty ahead for the sports protein market

Sports nutrition products were surging in early 2020, but changes forced on active consumers by COVID-19 will likely hinder market progression, according to Euromonitor's **Andrew Stablein**.



28

Protein trends within sports nutrition

While consumers show little preference whether protein is sourced from dairy, meat or plants, writes **Will Cowling** of FMCG Gurus, everyday sports nutrition buyers are interested in products with high-protein claims.



30

Helping sports nutrition brands put protein back in the driver's seat

Today's protein products must meet consumers' performance needs while also nailing palatability, which has led to numerous beneficial protein blends, writes **Charles DeVos** of Leif Labs.



33

Protein maintains versatility, broad consumer appeal

While the fitness and sports nutrition segments have proven to be extremely susceptible to fads, explains **Rikka Cornelia** with Martin Bauer, protein's dominance in the marketplace hasn't wavered.



35

Green eggs and ham: The push for new protein directions

Editor **Steve Myers** condenses the protein market as having strong but potentially flat traditional spaces like whey, pills and bars, and hot emerging areas like plant-based and convenience format protein products.



Copyright © 2020 Informa Markets. All rights reserved. The publisher reserves the right to accept or reject any advertising or editorial material. Advertisers, and/or their agents, assume the responsibility for all content of published advertisements and assume responsibility for any claims against the publisher based on the advertisement. Editorial contributors assume responsibility for their published works and assume responsibility for any claims against the publisher based on the published work. Editorial content may not necessarily reflect the views of the publisher. Materials contained on this site may not be reproduced, modified, distributed, republished or hosted (either directly or by linking) without our prior written permission. You may not alter or remove any trademark, copyright or other notice from copies of content. You may, however, download material from the site (one machine readable copy and one print copy per page) for your personal, noncommercial use only. We reserve all rights in and title to all material downloaded. All items submitted to NATURAL PRODUCTS INSIDER become the sole property of Informa Markets.

Macro darling

Carbs and fats have had their ups and downs with consumers, but protein steadily has remained in their good graces. For athletes, protein equals muscle; for the wider audience, including active consumers, protein also means less fat. Regardless of perspective, this macronutrient is the talk of the aisles, as a wider array of food and beverage products incorporate or call out high protein content.



In lieu of taking a protein syringe to every ingestible product, brands face many protein formulation decisions on source, dose, delivery form, quality and any number of designations such as clean label and responsibly sourced. We designed this digital issue to help inform these decisions.

Starting with the science behind protein and amino acids ([page 6](#)), this issue breaks down protein metabolism and details methods to determine the most efficient and/or best quality protein ingredients. These days, protein ingredients run the gamut from animal- (meat, dairy) and plant-based sources. Fast whey and slower casein star in the animal protein article ([page 11](#)), which looks at ingredient characteristics and trends. On the plant side ([page 16](#)), you may be familiar with soy, rice, pea and hemp protein, but we go further into the canopy to highlight sacha inchi and coffee protein, as well as quinoa, water lentils and other emerging sources—it's like a journey to Peru with a layover in Florida.

The focus here is forward. Protein is booming, but what's next? How do brands stand out? Two current major influences on the sports nutrition market are demographics and COVID. The influx of active consumers from outside the traditional sports nutrition core has brought along fanny packs full of new sensibilities and demands, especially relative to product sizes and formats. Meanwhile, the pandemic saw hoarding shoppers and increased nutrition sales, but also shuttered gyms and restricted ability to exercise, which also meant fewer places to buy convenience sports nutrition items. All of this has created uncertainty in this segment, which the experts at Euromonitor address starting on [page 24](#). The upside is consumers still want protein, according to FMCG Gurus research ([page 28](#)), and they are leaning into plant options.

While each article offers nuggets on how brands can differentiate protein products, this edition offers two perspectives on bringing all the pieces together to make finished goods that rise above the crowd. This could be working with manufacturing and supply partners on formats and ingredient blends ([page 30](#)), as well as flavor and texture solutions for non-supplement formats, such as RTD beverages ([page 33](#)).

¡Viva la protein!

A stylized, handwritten signature in blue ink that reads "Steve Myers".

Steve Myers
Editor

(480)281-6725

steve.myers@informa.com

[linkedin.com/in/stevenvmyers/](https://www.linkedin.com/in/stevenvmyers/)



**Cargill
Label-friendly
Ingredients**

Because consumers care what's inside.

Increasingly, buying decisions are influenced by perceptions of wholesomeness, sustainability and simplicity.

As a global ingredient leader, Cargill offers an extensive portfolio of label-friendly ingredient solutions to help meet your formulation goals for sugar reduction, non-GMO, organic and beyond!

Some of the products in our growing label-friendly portfolio include:

- ViaTech® stevia sweeteners
- Oliggo-Fiber® chicory root fiber
- Label-friendly starches
- Lecithin
- Plant proteins
- Pectin & gums
- Custom Texturizing Systems

Partner with Cargill to benefit from proven application expertise and a reliable global supply chain.

Learn more and request samples at www.cargill.com/labelfriendly.

Cargill is committed to helping people and organizations *thrive*.
www.cargill.com

©2020 Cargill, Incorporated





Protein selection: From human metabolism to preference

by Mark A. LeDoux

INSIDER's take

- ◆ Animal and vegetable proteins offer unique advantages, as well as areas of concern.
- ◆ Nine of protein's 20 amino acids must be consumed, as the body cannot produce them.
- ◆ A proper combination of highly digestible forms of proteins may be the ultimate choice.

Considering an individual's genotype, age and specific needs, the selection of appropriate protein sources is important. Animal proteins are the “gold standard,” as they contain all the essential amino acids (EAAs) required for human metabolism and growth of human tissue, and they are highly digestible. The challenge comes for those that prefer vegan sourcing, as most vegetarian forms of plant proteins are deficient in one or more of the EAAs requisite for maximum efficiency.

Some health professionals are concerned that despite the benefits of animal protein, excessive levels of accompanying dietary fat may prove problematic. With the introduction of more advanced processing technologies, derivative products such as casein, soy and whey have gained widespread acceptance. Of course, there is also the need to balance protein intake from any source, as elevated intake may have a demonstrable impact on bone health¹ or renal function and capacity.²

Some postulates that lead consumers to selections of protein supplements as part of their training regimen include:

- Higher protein intake needs are common in athletic populations.
- Animal proteins remain an important source of protein; however, potential health concerns exist from a diet rich in only protein derived from animal sources.
- With a proper combination of sources, vegetable proteins may provide similar benefits as do proteins derived from animal sources.
- Casein (milk protein solids) protein supplements may provide the greatest benefit to protein synthesis in the human body for a prolonged duration.³

Not only is protein considered an essential component of athletic training, it has gained popularity in the general population for weight reduction programs.^{4,5}

In addition, adequate protein intake for older adults has been evaluated and recommended by different nutrition boards to help support physical mobility.⁶ This age group needs education that an imbalance between protein supply and protein need can result in loss of skeletal muscle mass and function, and that a chronic disruption in the balance between muscle protein synthesis (MPS) and degradation are commonly seen in the aging process.^{7,8}

What is protein exactly and how does it work? First, proteins are nitrogen-containing chemical substances formed in the human body by amino acids. The fundamental structural components of muscles and other bodily tissues, they are used also to produce enzymes, hemoglobin and hormones.

To be appropriately used in the human body, proteins must be metabolized into their simplest components, namely amino acids.

Twenty amino acids have been identified as essential for human metabolism and resultant growth. Of these, 11 are considered nonessential in adults—meaning they can be synthesized within the body so do not need to be consumed as part of the diet. The remaining nine amino acids are deemed essential because they cannot be synthesized by the body and, therefore, must be consumed as part of the diet. A lack of EAAs in a dietary protein source potentially compromises the ability of the body to grow, maintain or repair damage to tissue.

The primary role of dietary proteins is for use in the various anabolic processes of the body is well-established. The theory is that if more amino acids and protein were available to the muscle being exercised, it would enhance muscle protein synthesis (MPS), the keystone of building new muscle. Within four weeks of protein supplementation (3.3 versus 1.3 g/kg/d) in subjects' resistance training, significantly greater gains were seen in MPS and overall body mass in the group of subjects with the greater protein intake.⁹

In studies examining individuals undergoing strength training, higher protein ingestion has generally demonstrated a positive effect on protein synthesis.^{10,11}

Assessing protein quality

Based on the work conducted by the FAO/WHO cited above and reported in 1990, the quality of a protein is determined by assessing its EAA composition, digestibility and bioavailability. The various methods of determining the quality of protein can be expressed as protein efficiency ratio (PER), net protein utilization, biological value and protein digestibility corrected amino acid score (PDCAAS).

The primary standard by which all proteins are measured is the set PER value for casein, which is 2.7. Any protein value that is equal to or greater than 2.7 is considered an excellent protein source.

When assessing biological value, protein quality is calculated by identifying the amount of nitrogen used for tissue formation divided by the nitrogen absorbed from food. This product is then multiplied by 100 and expressed as a percentage of nitrogen utilized. Foods with a high biological value correlates to a high supply of the essential amino acids. Here is where the animal sources seem to possess higher values than vegetarian sources, due to the lack of one or more of the “essential” amino acids not found in the vegetable supply.

Probably the best measurement of efficiency, however, lies with the net protein utilization calculation, which relies on a direct measurement of retention of absorbed nitrogen. While the biological value is instructive, it is of diminished value if the nitrogen is not thoroughly digested and absorbed.¹²

In 1991, the World Health Organization (WHO) and Food and Agriculture Organization (FAO) adopted PDCAAS as the preferred method of assessing dietary protein value. PDCAAS is calculated by taking the limiting amino acid score (i.e. the ratio of the first-limiting amino acid in a gram of target food protein to that in a reference protein or requirement value) and “correcting” it for true fecal protein digestibility.¹³



Essential or no?

In an era when being designated as “essential” is paramount, figuring out which amino acids are essential can be confusing. Consumers often hear there are eight or nine essential amino acids (EAAs), so what gives?

The difference may be histidine, which is considered essential in children but not in adults, except for in cases of specific kidney dysfunction that result in dangerously high blood levels of nitrogen waste products.

Other aminos, like arginine and proline, can be considered conditionally essential, creating even more confusion over which aminos are included with and considered as EAAs.

However, in 2011 these two United Nations (UN) groups reported on a reassessment of the value of PDCAAS and suggested PDCAAS falls short on assessing the digestibility of individual amino acids; instead of the fecal method, they recommended a newer approach called digestible indispensable amino acid score (DIAAS), which is based in the ileum, the final part of the small intestine.] In their consultation report, WHO/FAO noted, “DIAAS % = 100 x [(mg of digestible dietary indispensable amino acid in 1 g of the dietary protein) / (mg of the same dietary indispensable amino acid in 1 g of the reference protein)].” WHO and FAO noted both methods have limitations.

However, PDCAAS is still used in the nutrition industry, and adoption of DIAAS has been slow or merely complementary.

Relative scoring values of protein sources

The following chart was compiled from the W.S. Dairy Export Council, Reference Manual for United States Whey Products 2nd Edition, 1999, in addition to work performed by Sarwar in 1997 and reported in the Journal of Nutrition.¹⁴ The data reflect protein efficiency rating (PER), biological value (BV), net protein utilization (NPU) and PDCAAS, as determined using the four methods of calculating protein quality.

Protein source	PER	BV	NPU	PDCAAS
 Beef	2.9	89	73	.92
 Casein	2.5	77	76	1.00
 Eggs	3.9	100	94	1.00
 Cow's milk	2.5	91	82	1.00
 Soy	2.2	74	61	1.00
 Whey	3.2	104	92	1.00
 Peanuts	1.8	(not listed)	(not listed)	0.52

As evident from these various analyses, whey protein is a suitable alternative to those who wish to consume less animal protein and corresponding fat from meat sources. Whey is generally the liquid part of bovine milk that remains after the coagulation with enzymes leading to the precipitation of cheese curds. Whey is one of two primary protein groups in bovine milk accounting for roughly 20% of the milk, while casein accounts for the remainder. All of the constituents of whey protein provide high levels of the essential acids and branched-chain amino acids (BCAAs). Vitamins and minerals are also present in bovine whey, which is a reason why sports nutrition focuses on whey protein sourcing. Whey and whey protein are also present in other consumer staples such as salad dressings, infant formulations, baked goods, snacks and medical nutritional formulae.

While soy was never considered a significant part of the American diet, versus cultures in Asia, the PDCAAS number for soy protein shows it to be equivalent to animal protein with a score of 1.0—the highest possible rating.¹⁵ Considering digestibility and diet habits, combinations of various plant-based proteins or synthetic amino acids can also provide the needed nutrient profile and characteristics. In addition to the alpha amino acids, some of the beta amino acids are also important nutrients and may derive mainly from animal protein. For instance, beta-alanine is recommended to supplement with the synthetic amino acid form.

Selecting from the vegetarian world of soy products, one would be well advised to focus on soy concentrates or soy isolates. The latter is the most refined soy protein product containing the greatest concentration of protein. These are very digestible and easily introduced into foods such as sports drinks or infant formulas. Soy isolates have been recognized as beneficial for those concerned with low saturated fat and cholesterol ingestion,¹⁶ and the American Heart Association (AHA) has endorsed their use.¹⁷

In particular, women should consider using soy isolates in their protein selection. It has been hypothesized that considering that isoflavones are considered phytoestrogens (exhibiting estrogen-like effects and binding to estrogen receptors), they compete for estrogen receptor sites in breast tissue with endogenous estrogen, possibly reducing breast cancer risk—although the research is inconclusive.¹⁸

In summary, consumers have legitimate choices when securing protein supplements. With the advent of casein, soy protein isolates, whey proteins and colostrum, legitimate alternatives exist to animal-sourced meat proteins. A proper combination of highly digestible forms of proteins may be the ultimate choice, but health and performance benefits still depend on absorption and utilization of the essential amino acids required for tissue repair, growth and maintenance.

In general, the rate-limiting sulfur-containing amino acid that one needs to assure full protein utilization is methionine. The body cannot make this material. Likewise, cysteine can be made in limited quantities, as it is also a sulfur-containing amino acid—it requires a substantial “pool” of sulfur in the body.

When seeking to boost the presence of sulfur-containing amino acids, it appears the best food choices are oatmeal, walnuts, whole wheat, rice and barley (vegan sources), as well as pork, tuna, chicken and beef (animal sources).

A well-informed consumer is a force to be reckoned with, so manufacturers should select the best protein sources for their formulation and target audience, empowering the users to best meet their specific needs. ♦



Mark A. LeDoux is founder, chairman and chief executive officer of [Natural Alternatives International Inc.](#) Established in 1980, the organization has facilities in the U.S. and Switzerland engaged in the research, design and manufacture of nutritional supplement programs and products for multinational clients. LeDoux is a proud member and leader of many industry organizations.

References

1. Dawson-Hughes B. "Calcium and protein in bone health." *Proclamations of the Nutrition Society*. 2003;62:505-509.
2. Brenner BM, Lawler EV, Mackenzie HS. "The hyperfiltration theory: A paradigm shift in nephrology." *Kidney International*. 1996;49:1774-1777.
3. Boirie Y et al. "Slow and fast dietary proteins differently modulate postprandial protein accretion." *Proclamations of National Academy of Sciences*. 1997;94:14930-14935.
4. Eisenstein J et al. "High-protein weight-loss diets: Are they safe and do they work? A review of the experimental and epidemiologic data." *Nutrition reviews*. 2002;60:189-200.
5. Demling RH, De Santi L. "Effect of a hypocaloric diet, increased protein intake and resistance training on lean mass gains and fat mass loss in overweight police officers." *Annals of Nutrition Metabolism*. 2000;44:21-29.
6. Deutz NE et al. "Protein intake and exercise for optimal muscle function with aging: Recommendations from the ESPEN Expert Group." *Clinical Nutrition (Edinburgh, Scotland)*. 2014;33(6):929-936.
7. Koopman R. "Dietary protein and exercise training in ageing." *The Proceedings of the Nutrition Society*. 2011;70(1):104-113.
8. Houston DK et al. "Dietary protein intake is associated with lean mass change in older, community-dwelling adults: The Health, Aging, and Body Composition (Health ABC) Study." *The American Journal of Clinical Nutrition*. 2008;87(1):150-155.
9. Fern EB, Bielinski RN, Schutz Y. "Effects of exaggerated amino acid and protein supply in man." *Experientia*. 1991;47:168-271.
10. Lemon PWR. "Do athletes need more dietary protein and amino acids?" *International Journal of Sports Nutrition*. 1995;5:S39-S61.
11. Jäger R et al. "International Society of Sports Nutrition Position Stand: Protein and exercise." *J Int Soc Sports Nutr*. 2017;14:20.
12. Hoffman JR, Falvo MJ. "Protein – Which is Best?" *Journal of Sports Science and Medicine*. 2004;3(3):118-130.
13. Schaafsma G. "The protein digestibility-corrected amino acid score." *Journal of Nutrition*. 2000;130:1865S-1867S.
14. Sarwar G. "The protein digestibility-corrected amino acid score method overestimates quality of proteins containing antinutritional factors and of poorly digestible proteins supplements with limiting amino acids in rats." *Journal of Nutrition*. 1997;127:758-764.
15. Gorissen S et al. "Protein content and amino acid composition of commercially available plant-based protein isolates." *Amino acids*. 2018;50(12):1685-1695.
16. Hasler CM. "The cardiovascular effects of soy products." *Journal of Cardiovascular Nursing*. 2002;16:50-63.
17. Erdman JW. "Soy protein and cardiovascular disease. A statement for healthcare professions from the Nutrition Committee of the AHA." *Circulation*. 2000;102:2555-2559.
18. Wu AH et al. "Soy intake and risk of breast cancer in Asians and Asian Americans." *American Journal of Clinical Nutrition*. 1998;68:1437S-1443S.





ASK
ABOUT OUR
NEW CLINICAL DATA
sales@nutrition21.com

PROTEIN'S PERFECT PARTNER

UNLEASH YOUR POTENTIAL — VELOSITOL DOUBLES THE IMPACT OF PROTEIN ON MUSCLE PROTEIN SYNTHESIS BEYOND PROTEIN ALONE.*

Velositol® is a powerful ingredient, that when used with protein is designed to accelerate and boost muscle protein synthesis (MPS), a key to enhanced muscle growth, lean body mass, and quicker muscle recovery.

The power of Velositol has been shown effective when added to:

- **WHEY PROTEIN**
- **PLANT PROTEINS**
- **BCAAs**

Nutrition21
INNOVATIVE INGREDIENTS. REAL RESULTS.



Nitrosigine®

VELOSITOL

ChromaX

NEOLVL

LEPIDAMX

GET IN TOUCH WITH US: info@Nutrition21.com www.Nutrition21.com

*In a study using 6g of whey protein.

THESE STATEMENTS HAVE NOT BEEN EVALUATED BY THE FOOD AND DRUG ADMINISTRATION.
THIS PRODUCT IS NOT INTENDED TO DIAGNOSE, TREAT, CURE, OR PREVENT ANY DISEASE.

Nutrition21 LLC – 2020 Data on File.

DRA2692071520

Top of the chain when it comes to protein

by Duffy Hayes

INSIDER's take

- ◆ The protein market is quickly expanding with plant-based options, but milk-derived animal protein is tops in amino acid composition.
- ◆ Isolates of whey protein, milk protein and casein are ideal for muscle building and repair, albeit on different timelines.
- ◆ Formulators are being challenged to come up with RTD beverages that contain notable levels of protein.

All the buzz lately in the world of consumer protein products has centered on trendy plant-based options, from soy to hemp to pea to rice, mixed and matched in lots of unique new formats and applications.

But when it comes to muscle building and protein quality in the sports nutrition market, sector-leading animal protein—primarily derived from dairy milk—still stands above the crowd when measuring amino acid composition and how well those amino acids are taken up by the body.

It's a question of complete versus incomplete, and essential compared to nonessential amino acid content.

There are 20 amino acids that the body utilizes to build proteins, some deemed essential and others nonessential, but only animal proteins are considered complete in that they contain sufficient levels of all of the essential amino acids the body needs to function effectively. Most plant protein sources, which lack and/or are low in one or more of those essential amino acids, are therefore considered incomplete, though combinations of plant-based proteins can yield a complete amino acid profile.

Ingredients for inclusion in protein powders—and increasingly new and novel delivery formats extending into foods and beverages—have evolved from protein concentrates, to the more-concentrated isolates, to hydrolysates (proteins in which the bonds between amino acids are broken during the extraction process, allowing them to be absorbed more quickly by the body).

The animal-based protein conversation starts with whey protein, omnipresent in the powder protein tubs found on the shelves of high-performance athletes from weekend warriors to soccer moms. Whey has become the mainstream protein of choice over the past two decades and with good reason: it's a scientifically proven winner for athletes.

“Whey protein, in particular whey protein hydrolysate (WPH), has long been recognized as a superior form of protein for athletes because of its proven benefits for recovery, endurance and muscle building,” explained Mathias Toft Vangsoe, business development manager Americas, Arla Foods Ingredients.

He said whey protein offers better amino acid composition than other forms of dietary protein, such as soy, and is more rapidly absorbed, citing a 2010 study published in the *Journal of Agricultural Food Chemistry*.¹



“Whey protein, in particular whey protein hydrolysate (WPH), has long been recognized as a superior form of protein for athletes because of its proven benefits for recovery, endurance and muscle building.”

Mathias Toft Vangsoe, business development manager Americas, Arla Foods Ingredients

Another study, from 2015, focused on endurance performance and recovery in elite orienteers taking part in a strenuous training camp.² It found that ingestion of WPH before and after each exercise session improved performance and reduced markers of muscle damage.

The findings of another study suggested that supplementation with WPH is beneficial for reducing the symptoms of exercise-induced muscle damage and improving recovery of muscle function in physically active females, Toft Vangsoe noted.³

Lindsey Ormond, director of nutrition and research with Milk Specialties Global, described the specific benefits of hydrolysates:

“Hydrolyzed dairy proteins, such as whey protein hydrolysates ... provide the same high-quality protein dairy is renowned for, but in smaller peptide units. This can lead to faster absorption of the protein and improved recovery versus even a standard, intact whey protein,” she explained.

The science backing whey protein for athletes is remarkably deep, and further includes studies showing whey supplementation increasing lean body mass and improving the performance of Division III collegiate female basketball players,⁴ and reducing the amount of musculoskeletal injuries in male Army combat trainees,⁵ among scores of related studies.

Not all milk-derived proteins operate on the same timeline, though. While whey protein is optimal for post-workout consumption due to its high leucine and branched-chain amino acid (BCAA) levels, and fast absorption rate, Ormond noted casein and milk protein form the staple of overnight recovery products, as they are absorbed more slowly. Leucine is known to trigger muscle protein synthesis (MPS).

Casein affects stomach acid and delays the uptake of amino acids into the bloodstream. That means a slower, steadier exposure of the muscles to amino acids, which has been shown to reduce the rate of muscle protein breakdown (MPB).⁶

Glanbia Nutritionals is one company offering a wide range of dairy-based proteins for varying purposes—whey protein concentrate (WPC), whey protein isolate (WPI), milk protein concentrate (MPC), milk protein isolate (MPI), as examples—but the technology is such that specialty proteins can “flip the script” when it comes to time release and muscle exposure, according to Robert Peterson, application scientist at Glanbia.

“[Glanbia’s] WheyXR uses proprietary technology to slow the digestion of whey proteins, similar to a milk protein. This allows to have increased levels of branched-chain amino acids present with whey protein but with a slower release, similar to milk proteins,” Peterson explained, adding that Glanbia also offers the milk protein SatieTein, which is touted as digesting even more slowly than regular casein.



While whey and other milk-derived protein sources are staples in the animal-based sector, collagen is also an evolving contributor. It's the structural connective tissue naturally found in humans and animals, and while collagen is more associated with supplements, collagen peptides lend themselves advantageously to foods and beverages, many targeted at the sports nutrition crowd.

"Collagen is easy to formulate with. Not only is it non-allergenic but it has a very neutral sensorial profile and dissolves or blends easily, and has the added benefit of being no fat, no carbohydrates, pure, allergen-free, and easy to digest," explained Angie Rimel, marketing coordinator with GELITA. "It is versatile, and the most promising ingredients are bioactive collagen peptides, which can target the specific health benefits that we are seeing a growing consumer interest in."

Ingredient companies are also coming up with ways to maximize protein's impact on MPS, and Velositol from Nutrition 21 is a good example.

"Velositol is a patented combination of amylopectin and chromium that is designed to work as a perfect partner to protein," explained Aimee Masterson, marketing director at Nutrition 21. "Velositol's highly soluble amylopectin stimulates insulin's safe and controlled release, while chromium enhances insulin function and increases muscle cells' sensitivity to it.⁷ Together, these nutrients enhance insulin's ability to transport amino acids into muscle cells where they supply the nutrients needed for MPS."

Formulation, and new food and beverage formats

Consumers have keyed in on the potential of protein, as evidenced by the sales growth of ready-to-mix (RTM) protein powders. The sports powder category rang up US\$6 billion in sales in 2019, according to *Nutrition Business Journal (NBJ)*, and has seen annual sales growth between 6% and 7% since 2013. Sales growth in the category peaked in 2013, according to *NBJ*.

But *NBJ* says grab-and-go, ready-to-drink (RTD) functional sports beverages, as well as snack bars and gels, are gaining more consumer attention as the protein product space evolves. That has meant new ingredient technology development to overcome formulation issues common to milk protein sources.

With bars, a growing market segment when it comes to deliverable protein, the on-the-go snack choice often suffers from issues of hardening—so although a fresh bar has a soft consistency, the same six-month-old bar could be hard enough to damage dental work. Meeting that need, Glanbia offers BarPro and BarFlex lines, milk proteins and whey proteins optimized for use in bars and snacks.

“Protein bars are notorious for getting hard as they age. These lines of protein allow customers to minimize bar hardening while also achieving a wide range of textures,” Peterson said.

Bitter peptides commonly associated with WPH also challenge formulators, but protein providers have worked to overcome potential issues via new technology and application knowledge. One example is Arla’s Lacprodan HYDRO.PowerPro, a WPH the company touts is 50% less bitter than comparable products.

Additionally, formulators are being challenged to come up with RTD beverages that contain notable levels of protein, as consumers clamor for more nutrition out of their cold brew coffees, fruit drinks, teas and fermented beverages like kombucha and kefir. The issue from an ingredient perspective is the pH level of many of these types of beverages, and the turbidity that often results with the addition of protein to beverages that register a low pH level.

Glanbia’s recently developed OptiSol 1007 was created to offer better performance in neutral pH protein beverages, Peterson said. It’s a heat-stable concentrated whey protein that functions optimally in beverages with a pH between 6.9 and 7.1.

With milk proteins dominating the current low-acid beverage market, Peterson explained, Glanbia sees “significant market opportunity for complete or partial whey-based neutral pH beverages to break through the milk-protein laced landscape.”

Protein waters are another group of RTD beverages consumers are seeking and formulators are trying to home in on.

“[Clear protein water] is a growing sports nutrition category, but one in which some brands have been reluctant to launch new products because of challenges with taste and dry mouthfeel,” said Arla’s Toft Vangsoe, offering that the company’s Lacprodan ISO.Water ingredient overcomes these issues, allowing manufacturers to offer clear protein waters without the taste of protein. He added Arla’s whey protein hydrolysate products are pH-flexible, “creating possibilities in a wide range of applications.”

Milk Specialties Global met protein water formulation and product challenges—including stability and astringency—with its PRObev ingredient, according to Ormond. She noted PRObev allows “manufacturers to produce great-tasting, shelf-stable clear RTDs with low astringency and a significantly better flavor profile.”

She continued, “PRObev also opened up a new RTM market with clear whey protein shakes, unlocking a vast range of potential new flavors and attracting new consumers who prefer lighter options.” ♦

References

- 1 Morifuji M et al. “Comparison of different sources and degrees of hydrolysis of dietary protein.” *J Agric Food Chem*. 2010;58(15):8788-8797.
- 2 Hansen M et al. “Effect of whey protein hydrolysate on performance and recovery of top-class orienteering runners.” *Int J Sport Nutr Exerc Metab*. 2015;25(2):97-109.
- 3 Brown MA, Stevenson EJ, Howatson G. “Whey Protein Hydrolysate Supplementation Accelerates Recovery From Exercise-Induced Muscle Damage in Females.” *Appl Physiol Nutr Metab*. 2018;43(4):324-330.
- 4 Taylor LW et al. “Eight weeks of pre- and postexercise whey protein supplementation increases lean body mass and improves performance in Division III collegiate female basketball players.” *Appl Physiol Nutr Metab*. 2016;41(3):249-254.
- 5 McAdam J et al. “Impact of whey protein supplementation on fitness performance, body composition and injury rates in Army initial entry soldiers.” *J Sci Med Sport*. 2017;20(Suppl. 2):S49.
- 6 Boirie Y et al. “Slow and fast dietary proteins differently modulate postprandial protein accretion.” *PNAS*. 1997;94(26):14930-14935.
- 7 Ziegenfuss TN et al. “Effects of an amylopectin and chromium complex on the anabolic response to a suboptimal dose of whey protein.” *J Int Soc Sports Nutr*. 2017;14:6.

PLTSPORTS

DYNALeve™

GET THEM BACK IN THE GAME FASTER

ACTIVE/SPORTS NUTRITION

Reduced Muscle & Joint Soreness. Faster Recovery. Easier Workouts.

Dynaleve™ Fast Facts

- 2 clinical studies
- Reduced post-exercise muscle & joint soreness
- Supports faster, better recovery
- Reduces perceived exertion
- Helps reduce stiffness
- Fast-acting
- Patent-pending
- Clean label
- Safe, side-effect free

Dynaleve™ is a breakthrough new, water-soluble, neutral tasting *Boswellia*-based ingredient that will change the landscape of the active/sports nutrition market by offering a comprehensive solution to post-exercise recovery, while promoting the ability to perform at a higher level, sooner. Results point to a nearly 50% reduction in muscle soreness versus placebo with dramatic improvements in joint soreness and ease of exercising. The combination of clinically-demonstrated muscle and joint benefits is unique in the active/sports nutrition market.

Dynaleve can be formulated into a remarkably broad range of consumer products for active/sports nutrition consumers. Clinical data supports its use as both a post-workout/recovery and a daily use product - for people who are engaged in regular exercise. Dynaleve can be used in liquid and solid taste-sensitive formulations like powders, chews, gummies, stick-packs, shots, shakes and more.

Cutting-edge solutions for sports. Let us show you the data.

Contact PLT Health Solutions for samples and more information.
+1.973.984.0900 ext. 214 • www.PLTHealth.com



PLT
HEALTH SOLUTIONS

Plant protein revolution

by Marie Spano

INSIDER's take

- ◆ Though they contain less protein per serving than their animal-based counterparts, processing can improve plant-based protein percentages.
- ◆ New options like sacha inchi, quinoa, water lentil, coffee, corn and potato join standbys like pea, rice, hemp, wheat and soy.
- ◆ Novel and unique combinations of plant proteins are popping up in a variety of products, many of the snack variety.

Plant-based proteins have grown strong, stable roots on grocery store shelves. While athletes and active consumers load up on products made from old standbys including pea, rice, hemp and soy, newer unique proteins including sacha inchi, quinoa and water lentil are appearing with greater frequency in protein blends. Yet their efficacy for supporting muscle building isn't clear.

Plant proteins are giving animal-based proteins a run for their money. However, plant foods typically contain less protein per serving and the protein is often of lower quality.¹ Yet processing can improve both the protein content and quality of plant protein powders. Protein quality is a measure of both the amino acid content and bioavailability of those amino acids, according to a paper from the Food and Agriculture Organization (FAO) of the United Nations(UN)/World Health Organization (WHO). Most plant proteins fall short in one or more of the nine essential amino acids,¹ which are necessary for protein synthesis in muscle. When one or more essential amino acids is in short supply, muscle protein synthesis (MPS) will not be sustained at the same rate.² Also, plants naturally contain antinutrients, nutrients that bind other nutrients, including amino acids, rendering them less bioavailable. When protein is separated from the plant, it is also separated from many, if not all, of these antinutrients. Processing also increases the amount of protein, and therefore amino acids, per serving compared to the whole food form.

Old standbys: Pea, rice, hemp, wheat and soy

A handful of plant-based proteins have penetrated the mainstream market, gaining consumer acceptance and increasing the opportunities for less-familiar protein sources to follow.

Pea

Pea protein comes in several forms, including isolates, concentrates, and wet or dry textured. Pea protein can be used in a number of applications, including cheeses, dairy-free milk and ice cream, processed fish, meat alternatives, hot and cold cereal, pasta snack bars and baked goods.

Although pea protein is low in methionine and cysteine, consuming two to four times the amount of pea protein can make up for this shortfall. Also, a 50/50 blend of pea with rice, corn or hemp can be used along with increasing the total protein content by 10 to 90% to ensure all essential amino acid needs are met.¹ According to Jon Getzinger, chief marketing officer, PURIS, the antinutrients found in raw peas are also removed when processing peas into protein powder.



Melissa Machen, senior technical services specialist, plant protein, Cargill, noted pea protein “hits all the big consumer trends—non-GMO, high protein, vegan, plant-based, organic—yet still delivers the sensory characteristics and functionality that product developers must have to create great-tasting products.”

Rice

Rice protein stands out for being naturally gluten free, non-GMO and allergen friendly. The protein content of brown rice protein is approximately 79% of raw material, though this may vary based on the manufacturer. The protein digestibility-corrected amino acid score (PDCAAS)—a measure of a protein’s quality based on its amino acid profile and the ability of humans to digest the protein—of rice protein is between 0.52 and 0.67, according to Axiom Foods. Whey, egg and soy all have a PDCAAS of about 1.0.

Rice protein falls short on lysine and methionine but contains plenty of leucine, the trigger initiating MPS.^{1,3} Consuming two to four times the dose of rice protein can make up for its low lysine and methionine content. Or, rice protein can be blended 50/50 with soy, microalgae or pea protein, while also increasing the total dose of the protein by 10 to 90%.¹ Rice protein can be formulated into bars, beverages, breakfast foods, baked goods, protein powders, pet foods and more.

One study compared how high doses of brown rice protein and whey protein consumed soon after exercise influenced skeletal muscle hypertrophy in college-aged resistance trained males over an 8-week resistance training program. No differences between groups were measured in strength, body composition or muscle hypertrophy at the end of the study.⁴ Though the study authors suggested rice is comparable to whey based on these results, the study participants consumed an astounding 25% of their calories from protein (the average based on National Health and Nutrition Examination Survey [NHANES] surveys is 15%). Plus, the type of post-workout protein might not matter much once the leucine threshold is reached, sufficient amounts of other essential amino acids are provided and total protein intake each day surpasses what is required for muscle growth and strength gains.⁴

Hemp

Hemp protein meal contains 30 to 50% protein. Hemp protein concentrate, the dehulled and defatted hempseed or hemp protein meal, contains at least 65% protein. Hemp protein isolate contains over 90% protein. The method of extraction used to produce hemp protein isolate influences the protein content, composition, solubility and reactivity with food additives.⁵ Though hemp in its various forms boasts a high digestibility, 90.8 to 97.5%, the PDCAAS for hemp meal and dehulled hemp seed is 0.49 to 0.52 and 0.63 to 0.66, respectively.⁶ Lysine is the first limiting amino acid in hemp, followed by leucine and tryptophan. In fact, one would have to consume 54 total grams of hemp seed protein to get the same amount of leucine in 25 g of whey. To make up for its

Pea protein “hits all the big consumer trends—non-GMO, high protein, vegan, plant-based, organic—yet still delivers the sensory characteristics and functionality that product developers must have to create great-tasting products.”

Melissa Machen, senior technical services specialist, plant protein, Cargill

lysine shortfall, one would need to consume two to four times the amount of hemp protein or mix hemp with soy, microalgae or pea, and ramp up the total protein content by 10 to 90%. Hemp seed protein can be used in bars, biscuits, snacks, beverages, and processed meat products.⁵

Wheat

“Cereal proteins, like wheat, are known to be low in lysine, but high in other amino acids, like methionine and isoleucine, meaning they work well in combination with other plant proteins that are low in these amino acids,” said Ronny Velicogna, technical director, wheat, ADM.

The protein content of wheat protein is 74 to 88%. And, according to Velicogna, “The bioavailability of amino acids in milled wheat is excellent and antinutrients in wheat, especially refined flour, are not as much of an issue as with other plant proteins. When wheat protein is isolated, the solubles are often removed, including the majority of the protease inhibitors and alpha amylase inhibitors (both antinutrients).”

However, the essential amino acid content of wheat protein, at 22%, is low compared to animal-based proteins and muscle protein (38%). Also, wheat falls short in methionine and lysine. Plus, wheat is relatively low in leucine, containing just 1.7 g of leucine per 25 g of protein.⁷ For reference, whey contains 2.7 grams per 25 grams of protein.¹

Wheat does increase the process underlying muscle building at rest, as evidenced by a study in elderly men.⁸ But, a 35 g serving of whey and 35 g serving of casein both yielded better results compared to an equal serving of wheat protein.

Soy

Soy is highly digestible and boosts a high PDCAAS of 0.95 to 1.0.⁹ However, more soy is needed, approximately 40 grams of soy protein, to match the leucine content in 25 grams of whey protein.¹ Soy has always been considered a complete protein, providing the nine essential amino acids in adequate amounts. However, one review suggested soy falls short on the WHO/FAO/United Nations University (UNU) requirements for methionine. Soy can be combined with corn, hemp or brown rice for a more robust and complete amino acid profile.

When equal quantities of whey and soy are compared with one another, whey leads to a more robust MPS response.¹⁰ However, ramping up the total amount of soy to provide equal amounts of leucine compared to a smaller dose of whey would likely even out any discrepancies between soy and whey when considered in the context of a strength-training program over time. Despite lingering warnings suggesting soy has a negative impact on testosterone, research to date has not been conclusive.¹¹

New additions: Sacha inchi, quinoa, water lentil, coffee, corn, potato

Although some of the foods behind newer protein sources may have been around for countless centuries, the applications drawing on their strengths as protein ingredients have not.

Sacha inchi

Sacha inchi is an allergen-friendly nutrient-dense and high-protein seed with a slightly nutty taste. Food manufacturers can use the whole seeds, butter, powder or a texturized protein to ramp up the protein content of their products. Sacha inchi protein powder can be combined with other plant-based proteins and formulated into cookies, crackers, brownies, bars and more. Sacha inchi protein is 60% protein and can be mixed with pulses such as pea protein to get a complete protein.

Quinoa

Quinoa, in its natural form, contains about 35% protein. Unlike many plant proteins, it is high in lysine.¹² Quinoa protein isolate is a complete protein by FAO/WHO standards and has an essential amino acid content similar to soy protein isolate. However, quinoa is pretty low in leucine, containing just 1.5 grams per 25 grams of protein (compared to 2.7 grams per 25 grams of whey protein). This is less than both wheat and rice.^{1,7}

Water lentil

Water lentils are an indigenous, non-GMO plant. Water lentil concentrate is a minimally processed protein ingredient. According to Cecilia Wittbje, vice president marketing, Parabel, water lentil concentrate contains 70% protein. “Water lentil concentrate has more [essential amino acids] than soy or pea. It also boosts high digestibility, making it especially good for sports nutrition as it’s so high in BCAAs [branched-chain amino acids] and unlike many plant proteins, lysine.” The PDCAAS of water lentil concentrate is truncated at 1.0.

Water lentil concentrate is also a good source of magnesium and iron. It can be formulated in bars, drinks, meal replacers, soup and tofu.



Plant-based is sprouting growth in sports nutrition

by Geri Berdak

Plant protein-based snacks might be one of the biggest opportunities in the sports nutrition market. Snacking itself has been a growing trend, yet the market for plant-based protein snacks is far from saturated. Protein snacks offer a healthy snacking option that provides satiety. Consuming protein throughout the day is a good strategy to address degenerative loss of skeletal muscle mass, quality and strength that happens with age (*J Nutr.* 2014;144(6):876-880).

Protein bars are a popular snack option because they are convenient and the format is flexible, making protein fortification easy. While the bar market may be somewhat saturated, many brands are finding a way to stand out—developing great-tasting protein bars that are plant-based and have a story behind them. Most use whole food ingredients and claim no added sugar or artificial ingredients. They use sports positioning and a permission-to-indulge approach incorporating decadent flavors and ingredients.

[KIND](#) protein bar illustrates this well with its “made from real food” tag line. However, Several other brands are also building a solid reputation in the plant-based protein bar category.

[Vega](#) is becoming a celebrated brand, launching some great-tasting plant-based protein bars featuring flavors like Salted Caramel. The

Coffee protein

Coffee protein is a whole food protein and therefore contains a lower percent of protein, 30%, but provides additional benefits, including phytonutrients and fiber. Coffee protein comes from green coffee beans, and is non-GMO and caffeine free. There is no information on the digestibility and amino acid composition of coffee protein at this time.

Corn

The protein content of corn protein ranges from 58 to 75%. Corn is very high in leucine, which makes up 13.5% of its total protein, but is limited by its lysine content at only 1.5% of its total protein. Consuming two to four times more corn protein or mixing corn as part of a 50/50 blend with soy, microalgae or pea and ramping up the serving by 10 to 90% more protein results in a more complete protein.¹

Potato

Potato protein provides all the essential amino acids in sufficient quantities and offers a high leucine content, containing 2.7 grams of leucine per 33 grams of protein.¹ Potato protein also boasts a PDCAAS of 0.93.¹³

Only one study has been published on potato protein. It found potato protein stimulates the process underlying muscle growth in recreationally active women at rest; however, the group receiving the potato protein also consumed more total protein for the day compared to those getting a placebo (1.6 versus 0.8 grams of protein per kg per day). So it isn't clear if the potato protein was particularly useful or if simply ramping up total protein intake made the difference. Also, rates of myofibrillar protein synthesis—including all periods of feeding, fasting, exercise and rest—after the 14-day test period were similar between the control group with exercise and the potato protein supplemented group with exercise.¹⁴

Chickpea

Chickpea protein isolates range from 84.8 to 87.8% protein.¹⁵ According to Steve Fink, PLT health, chickpea protein has a PDCAAS of 0.84

company's protein bars are made with brown rice and pea protein and contain around 290 calories, 20 g of protein, 26 g of carbohydrates, 10 g of fat and 3 g of fiber, with no added sugar.

[Tribe Vegan](#) sports nutrition brand is seeing fast growth with a range of bars containing protein from seeds, nuts and rice. Its recovery bars are formulated with 2:1 ratio of carbohydrate to protein for optimal recovery. Each bar contains around 215 calories, 10 g of protein, 23 g of carbohydrates and 12 g of fat. All the performance benefits in Tribe's bars are delivered from natural whole foods—no preservatives or emulsifiers.

Using proteins that come from a variety of plant sources can add excitement too, as well as contribute unique health benefits. Among the newer plant-based protein ingredients hitting the market today are chickpea, mushroom, sacha inchi, hemp, flax, chia, pumpkin and sunflower seed proteins. And exciting new technologies are also being perfected—like [mushroom fermentation](#), which promises to tidy up the taste profile of plant-based proteins, resulting in a cleaner-tasting product that contains all the essential amino acids.

Choosing the right protein ingredient is key. The best first step is to determine the desired benefits the product should achieve—or the “job” the customer is hiring the product to do—then review the protein ingredient options, considering differences in nutrient quality, functionality, flavor, cost, health benefits and consumer perception. ♦



Geri Berdak is president of [CloverQuest Group](#), whose focus is to help companies navigate the dynamic, changing food/wellness landscape and become leading brands in the space.





with tryptophan the first limiting amino acid. Chickpea protein can be combined with seed proteins, which tend to have an amino acid profile complementary to chickpeas, Fink said.

Canola protein

Canola oilseed protein content is 36%, while the protein content of defatted oilseed meal, milled pulses and flours is 45 to 55%. The type of processing determines the amount of antinutrients removed. For instance, dry processing has limited success with antinutrient removal.

A canola protein isolate with cruciferin, napin and lipid transfer proteins has a digestibility of 84% and PDCAAS of 0.86. However, the calculated PDCAAS of a napin-rich canola protein isolate was 0.61 and a cruciferin-rich canola protein isolate 0.64. The types of protein in the final product also determine which proteins are limiting, with phenylalanine and tyrosine limiting for the napin-rich canola protein isolate, and lysine the limiting amino acid for the cruciferin-rich canola protein isolate.¹⁶

Flaxseed

Flaxseeds have an in vitro protein digestibility (IVPD)—a measure of protein stability and how it can withstand digestive processes (therefore taking into account biologically unavailable amino acids)—of 64.1 to 72.7. By comparison, soybeans are between 75.3 and 90. Flaxseed protein isolate has an IVPD of 0.68.¹⁷ Flaxseeds contain only about 18% protein and do not contain sufficient amounts of lysine. However, flaxseed protein isolate contains approximately 69% protein.¹⁸

Novel products made with plant proteins

Unique combinations of plant proteins are popping up in a variety of products.

[Plant Fusion](#)'s line of protein powders combines a naturally processed pea protein isolate with whole algae protein, amaranth powder, artichoke powder, sprouted quinoa powder and added BCAAs to ensure delivery of a complete protein with sufficient amounts of leucine. While some companies add amino acids to inflate their protein content through nitrogen spiking, Plant Fusion is fully transparent. It accurately displays the protein content, while also adding a separate line to clearly cover total protein content from proteins plus BCAAs.

The company also chose this mix of proteins to avoid heavy metals, gluten, soy and pesticides, while sticking to non-GMO, organic sources of protein. "This is a great protein for athletes choosing a plant-based approach. For athletes who really tax themselves, or struggle with weight gain, repair or digestion, we would suggest our Elite Activated Peptide Protein," said Laura Paster, marketing coordinator, Plant Fusion.

[NOW Foods](#) chose non-GMO proteins, pea, hemp and quinoa to create the Sports Plant Protein Complex, with all nine essential amino acids needed to effectively build muscle.

The combination of three plant proteins provides an essential amino acid profile closer to whey compared to using only one of the proteins on its own. According to Bryan Morin, NOW sports brand manager, “Although plant protein will not give you the same amount of BCAAs that a whey protein would, there are some other amino acid benefits to using plant protein. One is the amount of arginine you’re getting is almost three times as much as what you get from whey. Sports Plant Protein Complex contains 1,800 mg arginine.” Arginine helps expand blood vessels for greater blood flow. Like its other products, NOW Sports Plant Protein Complex contains only natural ingredients and no artificial colors, flavors or sweeteners.

[Starseed](#) created a line of sachet inchi organic, wholesome, nutrient-dense snacks, butters, shakes and powders. The company’s sachet inchi seed snacks come in roasted unsalted, roasted salted, dark chocolate and caramelized, and are a good source of protein and rich in healthy fats. Starseed’s to-go butter pouches contain healthy fats and are an excellent source of protein, while its protein shake boasts few ingredients and a clean label.

Though the research on plant proteins and their impact on muscle both at rest and after exercise is far behind the research on animal-based proteins, particularly whey, casein and egg, protein blends show promise for sports nutrition products. While vast differences exist in the digestibility and essential amino acid content of plant proteins, blending plant proteins together and ramping up the total protein per serving can lead to product with a complete array of essential amino acids including sufficient leucine. ✨



Marie Spano, M.S., R.D., CSCS, is a nutrition communications expert whose work has appeared in popular press magazines, e-zines and nutrition-industry trade publications. She has been an expert guest on NBC, ABC and CBS affiliates on the East Coast. For more information, visit mariespano.com.

References

- Gorissen SHM et al. “Protein content and amino acid composition of commercially available plant-based protein isolates.” *Amino Acids*. 2018;50:1685-1695.
- Atherton PJ et al. “Distinct anabolic signalling responses to amino acids in C2C12 skeletal muscle cells.” *Amino Acids*. 2010;38(5):1533-1539.
- “WHO/FAO/UNU Expert Consultation Protein and amino acid requirements in human nutrition.” *World Health Organ Tech Rep Ser*. 2007;935:1-265.
- Joy JM et al. “The effects of 8 weeks of whey or rice protein supplementation on body composition and exercise performance.” *Nutr J*. 2013;12:86.
- Wang Q, Xiong YL. “Processing, Nutrition, and Functionality of Hempseed Protein: A Review.” *Comp Reviews Food Sci Food Safety*. 2019;18(4):936-952.
- House JD, Neurefeld J, Leson G. “Evaluating the Quality of Protein From Hemp Seed (*Cannabis Sativa* L.) Products Through the Use of the Protein Digestibility-Corrected Amino Acid Score Method.” *J Agric Food Chem*. 2010;58(22):11801-11807.
- Dakhili S et al. “Quinoa protein, composition, structure and functional properties.” *Food Chem*. 2019;299:125161.
- Gorissen SH et al. “Ingestion of Wheat Protein Increases In Vivo Muscle Protein Synthesis Rates in Healthy Older Men in a Randomized Trial.” *J Nutr*. 2016;146(9):1651-1659.
- Hughes GJ et al. “Protein Digestibility-Corrected Amino Acid Scores (PDCAAS) for Soy Protein Isolates and Concentrate: Criteria for Evaluation.” *J Agric Food Chem*. 2011;59(23):12707-12712.
- Phillips S, Moore DR. “The role of milk- and soy-based protein in support of muscle protein synthesis and muscle protein accretion in young and elderly persons.” *J Am Coll Nutr*. 2009;28(4):343-354.
- Hamilton-Reeves JM et al. “Clinical studies show no effects of soy protein or isoflavones on reproductive hormones in men: results of a meta-analysis.” *Fertil Steril*. 2010;94(3):997-1007.
- Dakhili S et al. “Quinoa protein: Composition, structure and functional properties.” 2020;310:1-45.
- Waglay A, Karboune S, Allil I. “Potato protein isolates: recovery and characterization of their properties.” *Food Chem*. 2013;142:373-382.
- Oikawa SY et al. “Potato Protein Isolate Stimulates Muscle Protein Synthesis at Rest and With Resistance Exercise in Young Women.” *Nutrients*. 2020;12(5):1235.
- Paredes-Lopez O, Ordovica-Falomir C, Olivares-Vazquez MR. “Chickpea protein isolates: physicochemical, functional and nutritional characterization.” *J Food Sci*. 1991;56(3):726-729.
- Campbell L, Rempel CB, Wanasundara JPD. “Canola/Rapeseed Protein: Future Opportunities and Directions—Workshop Proceedings of IRC 2015.” *Plants (Basel)*. 2016;5(2):17.
- Sa AGA, Moreno YMF, Carciofi BAM. “Food processing for the improvement of plant proteins digestibility.” *Critical Reviews Food Sci Nutr* 2019;1-20.
- Khun KR et al. “Assessing the potential of flaxseed protein as an emulsifier combined with whey protein isolate.” *Food Res Int*. 2014;58:89-97.

The best plant protein comes from the heart.



V-70™

hemp heart protein

70% Protein sourced from hemp hearts.

Inside every hemp seed is a valuable inner core, called the hemp heart. The nutrients within are the proprietary source for our new protein ingredient, V-70™ Hemp Heart Protein. You might appreciate the 70% protein complete with all nine essential amino acids and omega-3s, but it is the neutral flavor and near white color that provides you with a significant formulation advantage over other plant proteins. Additionally, V-70™ emulsifies with exceptional performance overcoming notable challenges from many plant proteins.

Smooth Texture

Neutral Taste

70% Protein



AppliedFoods.com/V-70
1-800-345-9666
sales@appliedfoods.com

an exciting collaboration with



Uncertainty ahead for the sports protein market

by Andrew Stablein

INSIDER's take

- ◆ Before COVID-19, an influx of active consumers was fueling growth in protein bar and RTD sports products.
- ◆ Gym closures and a shift to staying at home translated to less occasions for sports nutrition consumption.
- ◆ As consumer priorities and behaviors shift, sports protein players must determine how to become/stay relevant.

Coming into 2020, sports nutrition was continuing to ride the strong performance of protein across bars, ready-to-drink (RTD) products and powders. The emergence of plant-based and other alternatives has stalled whey protein's leading growth over the past few years. However, the overall market for sports protein products has flourished, registering strong growth in 2019.

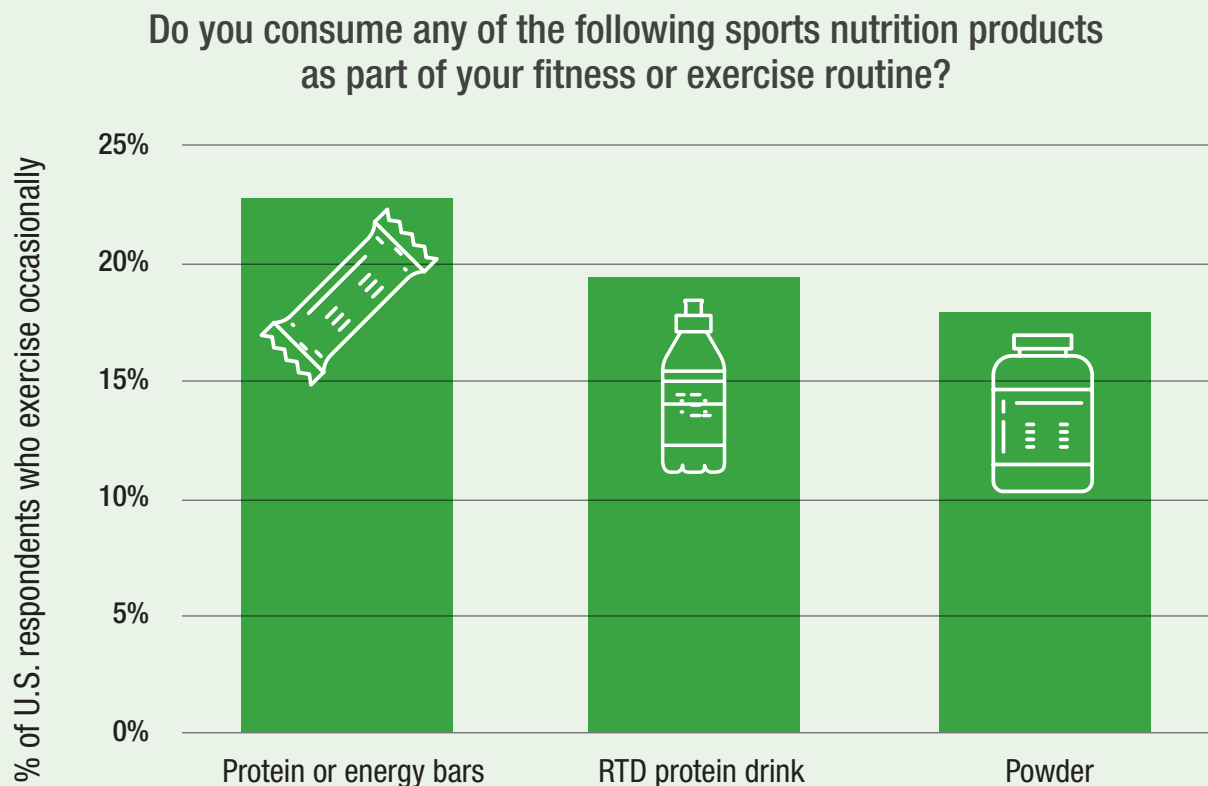
The category's success can be attributed to the active consumer phenomenon. Among the types of demographics, "core" sports protein consumers—or frequent gymgoers—have not significantly changed their routines over the past decade or so. These individuals consistently find a way to go to the gym and spend on sports nutrition products that help achieve their goals.

The opportunity that has elevated the sports nutrition market and brought significant change to the industry has been the average consumer looking to become active. These individuals are interested in living healthier lifestyles, going to the gym a couple of times per week and learning to integrate sports nutrition products into their diets to match their goals. With better access to tutorials through videos and social media, as well as a plethora of information on the internet, the average consumer is more equipped to pursue a healthier lifestyle on his or her own. This desire from average consumers to be active has driven sports nutrition consumption in recent years.

These new active consumers represent an increasing portion of the target market for sports nutrition but have different format preferences compared to "core" sports nutrition consumers. Newer consumers of sports nutrition are more inclined to try smaller-sized products rather than make more costly, bulkier purchases given their unfamiliarity with the category. This phenomenon has benefitted bar and RTD formats, where singular SKUs are more affordable. According to [Euromonitor International's 2020 Health and Nutrition Survey](#), U.S. respondents showed a higher rate of preference to protein/energy bars and RTD protein drinks than to powders as a sports nutrition product used as part of fitness routines. This is indicative of an average consumer being more familiar with bars and RTDs rather than powders.

At the onset of 2020, the RTD space was continuing to lead growth, demonstrating a change in modern lifestyles. The on-the-go format of RTDs and increased availability of protein-focused SKU counts in-store has bolstered the sports protein market. RTDs have benefitted from the active consumer phenomenon,





Source: Euromonitor International Health and Nutrition Survey 2020

especially since these products are now accessible at traditional food, drug and mass retailers where foot traffic is greater. Bar and powder protein formats also performed well coming into 2019, but not to the same degree of success.

The severe effects of COVID-19

As [COVID-19](#) cases increased across the U.S., spikes in demand for CPGs, including sports nutrition products, were evident. Consumers stockpiled their pantries with shelf-stable products as the time span of social distancing measures and the future availability of food products were in question. Since the initial spike, declines in year-on-year growth for sports nutrition products have been evident due to reduced store visits as well as purchase shifts to essential goods.

Gym closures due to the COVID-19 pandemic created drastic short-term changes to the sports protein market. The majority of gyms across the U.S. were closed in a matter of weeks, leaving gymgoers displaced as far as where and how to maintain previous exercise routines. Without access to gyms, many consumers' routine use of sports nutrition products, namely protein, to supplement their workout was eliminated. The result was strong year-on-year sales declines for April and May, in particular.

Another phenomenon in the COVID-19 environment has been the reorientation of sports protein formats across bars, RTDs and powders. Restrictions keeping consumers home resulted in fewer on-the-go occasions, leading to changes in consumer purchasing patterns. A notable shift has been away from convenience stores, which are a key channel for sports protein bar and RTD formats. With consumers traveling less, demand for on-the-go protein formats has suffered. Sports protein RTD and powder

In 2008, sports protein products registered 5.2% growth, implying the fitness industry was seemingly recession-proof. However, in 2008, sports nutrition was not as large of a category, and gyms were not mandated to close.

Source: Euromonitor International

formats both sustained moderate performances in Q1 2020 largely due to the buying spike in early March; however, both have since declined due to the combination of gym closures and channel shifts toward essential retailers and e-commerce.

What does the new normal look like?

At this point, sports protein brands and retailers are still faced with several questions as far as how long these difficult times will last. As of early June, most of the U.S. has reopened, albeit with reduced capacities in public places. Gyms have started to reopen in certain states, but much of the nation still lags as hygiene concerns remain high in facilities. Consumer behavior has been significantly altered due to the pandemic, with greater priority being given to immunity products, hygiene products and other essential goods.

The sports protein industry is still trying to determine how active consumers will pursue their fitness and health goals. Without gyms, will consumers opt for cardiovascular exercises, such as walking and running, due to lack of access to weights? If so, will sports protein intake remain the same as pre-COVID-19 pandemic? How will sports product consumption be impacted by people implementing weight training in their homes? Brands need to consider these developments in order to best reach fitness consumers as they engage in new practices.

Another variable to consider as a result of the COVID-19 pandemic is disposable income during a time when more than 30 million Americans are unemployed. Are sports protein products considered a luxury purchase when there are constraints to disposable income? According to Euromonitor International, in 2008, sports protein products registered 5.2% growth, implying the fitness industry was seemingly recession-proof. However, in 2008, sports nutrition was not as large of a category, and gyms were not mandated to close.

The sports protein market's performance will largely rely on how the economy reopens for the remainder of 2020 and into 2021 in the aftermath of the COVID-19 pandemic. High levels of unemployment and impediments to gym access and exercise routines will force sports protein players to reassess how to appeal to a new type of consumer with altered priorities and behavior. ♦



Andrew Stablein is a beauty and health analyst based in [Euromonitor International's](#) Chicago office. He provides insights on competitive analysis, consumer trends and growth opportunities in the U.S. personal care and consumer health industries. Stablein is particularly interested in the disruption of these fast-paced industries through the likes of e-commerce and changing consumer attitudes.



100% USDA Certified Organic & All Natural Vitamins | Minerals | Antioxidants

Ideal for brands that need:



Vegan & Plant based



Naturally occurring
co-factors & co-nutrients



High potency



Water soluble



Water extracted, so no synthetic
solvents/carriers used



Standardized actives:
Lot to lot analysis



Clean label



Yeast free/
No fermentation

From a vertically integrated, transparent, and sustainable supply chain

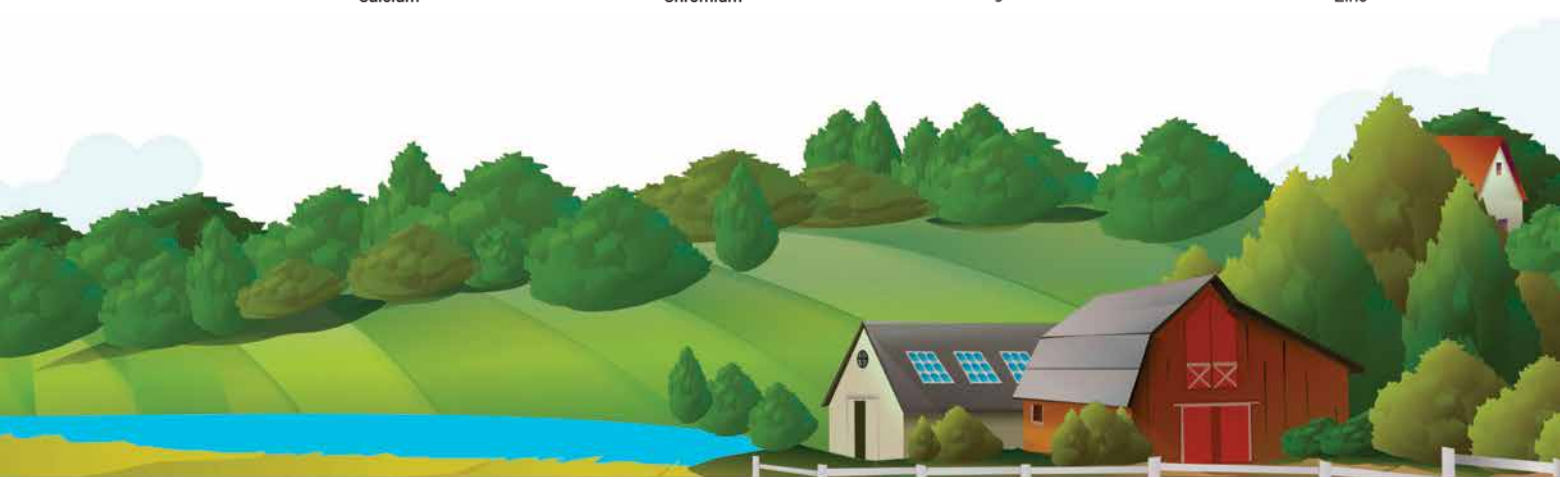
www.organicvitamins.science | www.orgenfamily.com

 **Orgen-Cal®**
Calcium

 **Orgen-Cm®**
Chromium

 **Orgen-MG®**
Magnesium

 **Orgen-Zn®**
Zinc



Protein trends within sports nutrition

by Will Cowling

INSIDER's take

- ◆ Fifty-three percent of everyday consumers surveyed were interested in products with high-protein claims.
- ◆ Protein gel intake increased 59% among sports consumers; more than other delivery formats.
- ◆ Overall, consumers have little preference whether protein is sourced from dairy, meat or plants.

The core sports nutrition user is someone who is considered fit and healthy who engages in strenuous and regular physical activity. These consumers actively seek out products with functional benefits, which offer high protein to help them build muscle and recover faster. However, due to the health halo that surrounds protein as an ingredient, the everyday consumer now recognizes the benefits and is opting for healthier alternatives offering high-protein claims.

When it comes to sports nutrition products, consumers find a wide range of claims attractive. The fact that many consumers do not differentiate between the appeal of these claims shows a market for products that consumers may generally deem as “healthy.” This bodes well for sports nutrition products, with more than half (53%) of consumers [stating](#) that high-protein claims are appealing.

FMCG Gurus consumer insights show that a number of consumers within the sports nutrition market have increased their intake of protein-based products. This is highlighted as over half of consumers [stated](#) they have increased consumption of products such as milk protein drinks, protein water and protein snack bars. Protein gels have had the biggest increase with 59% of global consumers having increased their intake.

High-protein products are not just used by consumers in conjunction with physical activity, but as an everyday product being driven by health-conscious consumers. This shows the opportunity for brands to position sports nutrition products not just to athletes, but also at everyday consumers who are time-scarce and seeking healthier alternatives to traditional products.

Protein sources

FMCG Gurus global research [indicated](#) 4 in 10 consumers would like to increase the amount of protein in their diet. As protein continues to be used as a common ingredient in a wide variety of everyday food and drink products, this trend will likely increase. When it comes to sports nutrition consumers, 60% of global consumers found whey protein isolates the most appealing source. However, the everyday active consumer stated that plant protein was the most appealing (57%). When analyzing a handful of these protein sources, which align with the meat versus dairy versus plant protein debate, the research shows that overall, consumers have very little preference in terms of sources.



FMCG Gurus global research indicated 4 in 10 consumers would like to increase the amount of protein in their diet. As protein continues to be used as a common ingredient in a wide variety of everyday food and drink products, this trend will likely increase.

Plant protein is becoming a popular source as consumers seek better-for-you options. This is highlighted as 54% of consumers who eat plant protein [stated](#) it is a healthier alternative to dairy-based products. This popularity can also be linked to 6 in 10 consumers stating they have considered reducing meat intake over the last 12 months as they associated a meat-reduced diet as more sustainable and healthier for them.

Brands can also position plant-based protein products around being stylish and elite, and not just as a healthier alternative. While veganism and vegetarianism are not new trends, the rise in these diets—combined with the emergence of the flexitarian—can be attributed to more consumers wanting to adjust their dietary habits to lead a more sustainable lifestyle. Self-expression is a key reason consumers adopt these diets, as free-from diets are associated with a form of elitism. This is something that needs to be factored in when it comes to product positioning, ensuring that vegan and vegetarian products are seen as stylish and cool. ✨



Will Cowling is the marketing manager at [FMCG Gurus](#) a leader in market research helping companies in areas such as consumer research, product development and idea generation. He worked previously with The Bradfords Group and Marketing Matters. He is a graduate of Bournemouth University.



Helping sports nutrition brands put protein back in the driver's seat

by Charles DeVos

INSIDER's take

- ◆ Brands need to focus on ways to better distinguish themselves in the continually growing space.
- ◆ Today's protein products must meet consumers' performance needs while also nailing palatability.
- ◆ Protein blends may provide benefits in how they work, who they appeal to and when they're used.

In the early '80s, when I first started working out at a young age, wrestling and practicing martial arts, it was a pre-creatine world where protein was the primary supplement source for consumers. Memories of that time were having to choke down terrible-tasting protein powders and bars. The products available to consumers all just tasted mediocre, at best.

Fortunately, an expansion of the protein product space with greater consumer choices was on the horizon.

Protein market turning point

By the early 2000s, the industry began to see a significant turning point. Finally, brands were bringing protein products to market that not only offered strong nutritional and workout benefits, but also tasted good.

Great examples of this were the introduction of products like Muscle Milk and Detour Bars, offering consumers a previously unavailable range of great-tasting protein shakes and bars. This was definitely an inflection point, when brands and their approach to manufacturing and product development began placing a greater emphasis on balancing the consumer's overall needs of performance and palatability.

Brands also began a more careful consideration of other key product-development factors, including formulation. Protein products offering ranges of benefits—such as instant absorption, slow absorption, and immediate and sustained release—became available and offered new choices to better fit the consumer's individual nutritional and performance needs.

Mindful manufacturing to invigorate today's protein brands

Today, with an abundance of well-rounded and great-tasting protein products available, brands now need to focus on ways to better distinguish themselves in the continually growing space.

Additionally, as pre-workout energy-focused products have become a focal point over the past decade, the benefit of protein as post-workout supplementation to rebuild the body's cells that have been broken down during rigorous workouts has taken somewhat of a back seat.

Manufacturers can play an important role in supporting brand partners in their efforts to make their protein products stand out and get back in the driver's seat. Instead of solely focusing on manufacturing production and what I refer to as “mindless manufacturing,” proactive manufacturers can provide more mindful guidance to their partners to help them formulate and invigorate successful protein product lines.

Protein formulation strategies

Various ingredients and formulation strategies are available when a brand is looking to create standout protein products. When developing products designed to support activities ranging from bodybuilding to marathon running, it's beneficial to further educate target consumers of the value and powerful recovery benefits of protein—particularly in the immediate post-workout period.

It's important to clearly identify a product's mission by gaining a better understanding of the target customer's background and goals. If a brand is targeting hardcore athletes who exert significant amounts of energy, for example, brands should consider the value of including a protein that will enable those athletes to better recover, maintain muscle and prepare their bodies to go out and do it again.

Once a brand has a foundational understanding of its product's mission and objectives, some of the key protein sources and their respective benefits to consider in the formulation process, include:

Whey proteins: Whey protein and whey protein isolate (filtered to remove carbs and fat and provide higher protein content) absorb instantly and are an excellent protein to include in a formula designed for post-workout after any level of activity.

Taking whey protein up to 30 minutes following a workout enables the body to start rebuilding and recovering more immediately, as this is the point when muscle has been broken down.

Protein blends: Some of the best protein formulas on the market incorporate a variety of protein ingredients that offer multiple benefits.

For example, nutritional supplement and workout innovator Jim Stoppani has developed some excellent blend formulas, which include a mix of ingredients like whey protein isolate (immediate absorption), milk protein isolate (immediate absorption), casein protein (slower digestion and sustained release) and egg protein (medium range absorption).

Protein blends provide fast-, medium- and slow-release to help muscle repair immediately, as well as over a sustained period of time. Blends can be beneficial following any type of workout and they're also good to take before bed or right after waking up.

Plant-based and pea proteins: For plant-based formulas, pea protein products (derived from split peas and typically containing several proteins like quinoa or brown rice) are all very slowly digested proteins.

Although the texture of pea protein products can be considered chalky, this protein's slow digestive process provides its own unique set of benefits. The slow release mechanism makes this an excellent supplement form to take at night, rather than as an immediate post-workout addition.

Taking pea proteins as a pre-sleep supplement can help an athlete's body better repair and be less catabolic, which is the state during sleep when the body is feeding off of its own muscle. Similarly, the slow digestion of casein makes it a great nighttime supplement.

Stay mission-focused

No matter what protein formulation and direction a brand decides to take, it's important to stay mindful of the original product mission and objectives it first sets out to help its customers achieve.

As brands grow, if they can continue to bring the original passion that first inspired them, it will go a long way in helping them to continue to be successful and set their products apart in the marketplace.



Charles DeVos is a sales executive for [Lief Labs](#), an innovator in product ideation and formulation for the dietary supplement market. DeVos has been in the health and fitness industry for the past 20 years and has trained in multiple physical disciplines.

#AmazingCollagen

Bioactive Collagen Peptides®

From Pre-Season Training to Game-Day Performance

Body Toning

- Increases lean mass and decreases fat mass

BODYBALANCE®
Always in Shape

Joint Health

- Recovers joint cartilage and reduces joint pain

FORTIGEL®
The Joint Health Revolution

Connective Tissue Improvement

- Strengthens ligaments and tendons

TENDOFORTE®
For Connective Strength

Bone Health

- Increases bone mineral density

FORTIBONE®
Collagen Matrix Stimulation



GELITA
Improving Quality of Life

Protein maintains versatility, broad consumer appeal

by Rikka Cornelia



INSIDER's take

- ◆ Although sports nutrition fads constantly fluctuate, protein's dominance hasn't wavered.
- ◆ Product developers must navigate the organoleptic properties of protein concentrates.
- ◆ Texture is especially challenging when it comes to baked protein goods and snacks.

The fitness and sports nutrition segments are extremely susceptible to fads. Five years ago, it was all about CrossFit and paleo. These days, it is all about Peloton and keto. The years in between saw too many crazes to list. Today, the most significant factor driving this rapid evolution is the outstanding growth in demographics, as fitness and sports nutrition are increasingly valued by average consumers, not just athletes. However, in the sports nutrition segment, one constant has stayed strong throughout the decades: protein concentrates. Claims surrounding protein became incredibly important to athletes in the 1990s, and now, they are resonating with average consumers, giving brands plenty of new opportunities.

Brands entering the marketplace need to first determine the type of product application that fits their audience's needs. The easiest and traditional applications for the organoleptic properties of protein concentrates are bars and shake mixes. If a brand goes the route of a shake mix, it is imperative they utilize a protein concentrate that is ready to drink (RTD) because the manufacturing process of shake mixes does not have a kill step, such as baking. When inquiring about the RTD status of a supplier's protein concentrate, brands not only need to confirm that they have a kill step, but also that their kill step is validated. The presence of a sterilization method does not guarantee effectiveness and quality, but the validation of the sterilization method does. A process may be applicable in one situation but not another; validation determines its usefulness and gives meaning to its results. Several means allow a supplier to validate its processes; one example is third-party certification. For instance, certification from Safe Quality Food (SQF), a hazard analysis critical control point (HACCP)-based safety and quality management system, supports food safety and process validation.

For brands looking beyond traditional applications, the organoleptic properties of protein concentrates—especially flavor and texture—must be taken into extra consideration during product development. Bars and shakes cater to these challenges of protein concentrates, but other applications do not. For flavor, formulators can sometimes work with the flavor profile of the protein concentrate to their advantage. For instance, pumpkin seed protein has a nutty roasted flavor and pairs well with a cold brew coffee. When the flavor profile of a protein concentrate works against them, formulators can use deflavored proteins, as well as flavoring and masking agents. Once the flavor is perfected, shelf-life studies are needed. Brands should always evaluate at the end of shelf life to see how the finished



product is affected by processing and aging. The best time to do this is after a pilot plant run because it is usually smaller than a full production run but still made on production equipment, giving a better approximate than a lab batch product. This gives product developers enough time to adjust the formula if needed since trial batches are usually done before the product needs to ship to stores. Brands can also complete accelerated shelf-life studies using heat to approximate full shelf life, but in less time. This gives some idea as to how the product will perform over time.

As for texture, protein concentrates often absorb moisture very easily, making the finished product thick, chalky or powdery in texture. Ultimately, the type of application and protein concentrate determines the impact. For instance, texture is especially challenging when it comes to baked goods and snacks in both formulation and production. Since protein concentrates can absorb water as well as other liquids in the formula, changes in baking time, frying time or temperature may be required to offset its absorption properties. Other solutions to these challenges are adding more water, increasing mix time and/or changing baking conditions. Ultimately, it depends on the protein source and its water absorption rate. This moisture retention not only presents a challenge on the backend but also during shelf life. High-protein applications are more susceptible to drying out and/or hardening so once again, it is very important for brands to do shelf-life studies.

The sports nutrition segment has been and will continue to be ever-changing, but protein is still king and its reign will not end anytime soon. This opens up a lot of new opportunities for brands, but they need to remember that a successful high-protein offering still prioritizes the organoleptic properties of the product. Healthfulness can attract customers, but the sensory experience keeps them. ♦



Rikka Cornelia is the product manager for [Martin Bauer](#). She has a bachelor's degree in economics from the University of California, Irvine.

Green eggs and ham: The push for new protein directions

by Steve Myers

Sports nutrition revolves around protein. Muscle development, performance and recovery require adequate amino acids, the building blocks of protein. The right amount of amino acids—specifically leucine, it seems—triggers muscle protein synthesis (MPS), the process of making new lean body mass.

There is no question of protein's importance and dominance in sports nutrition, but the recent spread of the protein obsession from sports to the mainstream base, especially so-called active consumers, makes it challenging to define and analyze the parameters of sports nutrition protein growth and potential. It is the unscathed macronutrient, compared to beleaguered fats and carbs, and many dieters have turned to increased protein intake for improved body composition. Even “keto” dieters think they need higher protein! (Tip: Protein should be low to moderate in keto to limit gluconeogenesis.)

An FMCG Gurus global consumer survey revealed 4 in 10 people are interested in increasing their dietary protein intake ([page 28](#)). In its annual sports nutrition and weight management report for 2019, *Nutrition Business Journal (NBJ)* called protein “a crossover hit” and said protein powders are “the one sports nutrition supplement mainstream consumers may know and trust.”

Starting with a wide view, the global supplemental protein market was estimated at US\$17.6 billion in 2019 by Grand View Research. The market data firm's most recent [report](#) on the subject predicted an 8% compound annual growth rate (CAGR) to reach a market size of \$32.6 billion by 2027. Generally, Grand View analysts credited increases in health and fitness centers and consumer health consciousness, but they also highlighted the positive impacts of Millennials and protein innovations on growth and popularity. The broader influence is protein's attractiveness to active consumers, nontraditional sports nutrition users who are adopting more active lifestyles.

Euromonitor attributed the sports nutrition segment's success to active consumers ([page 24](#)), while the core users' patterns and attitudes haven't changed much. Active consumers are increasing their gym and fitness participation and seeking out more sports nutrition products, trends buoyed by better access to video and social media tutorials and influencers online. The firm said these users are a growing part of the sports nutrition market, but they have different demands from core users, including protein source and product formats.

The dividing line is clear, according to FMCG Gurus research, which showed most (60%) traditional sports nutrition users prefer whey protein, while most (54%) active lifestyle consumers are more attracted to plant protein.

Convenience and functional foods and beverages are among the preferred delivery types. *NBJ* said the “protein fascination is the driving force behind the still stellar growth of functional sports beverages—think RTD [ready-to-drink] shakes, for instance—across all channels.” It reported such RTD beverages grew 14.3% from 2018 to 2019, while



There is no question of protein's dominance in sports nutrition, but the recent spread of the protein obsession from sports to the mainstream base, especially so-called active consumers, makes it challenging to define and analyze the parameters of sports nutrition protein growth and potential.

nutrition bars and gels appear to have matured as a category and face saturation concerns. Protein figures in all of these product types, and protein content is being beefed up or highlighted for many of these products.

Meanwhile, *NBJ* predicted powders will hold a steady mid-7% growth line from 2020 through 2022: solid but not explosive. Grand View reported protein powders represent about 64% of the protein supplement market. "Factors such as the strong online sales, mass distribution channels, and increasing number of standalone mass-facing brands by various companies, such as Glanbia, NBTY and IOVATE are expected to drive the growth," the firm stated. Still, they noted increasing snack-based meal replacements consumption and demand for greater ingredient traceability and authenticity are likely to wield expanded influence on protein supplement growth.

The rise of convenience and foodie formats may be limited not just by the pace of technology enabling sports nutrition ingredients to play and taste well in such matrices—the market is now seeing clear protein RTDs—but also by the elephant in the room called COVID-19. Many such products are purchased at or near the point of activity, such as in gyms and fitness centers. However, most of these facilities shuttered during the lockdowns or have been slow and limited in opening during the continued pandemic.

Aside from strategic trips to grocery stores and other retailers in the multi-outlet (MULO) channel (e.g., mass merchandisers, club stores and dollar stores), most consumers turned to online shopping.

In a June 2020 *Insider* and Council for Responsible Nutrition (CRN) webinar, Kristin Hornberger, Information Resources Inc. (IRI), noted 59% of respondents in an April 2020 survey ([Coresight Research Survey On The Impact of the Coronavirus on Consumer Behaviors](#)) said they are buying more online than they used to, with 41.4% overall saying they expect to buy more health products (supplements, etc.) online. The e-commerce trend, as well as the overall swarm to health products, may be the new normal, even after the pandemic resolves, she added. Survey results show 66% of respondents expect to change their behaviors for the long term.

As expected, immunity products lead the way, but sports and energy beverages (18% change in buyers, 14.1% change in spend, according to IRI) are among the top gainers during the pandemic, suggesting convenience may still reign—even if active nutrition consumers are buying these items more often from grocery and other major retailers and less so from gyms, fitness centers and sports- and supplement-specific retailers.



According to the *NBJ* report, sports RTD beverages saw a 23.5% bump in e-commerce share (2018-2019), although internet sales are just 21.4% of the overall market for these products; natural and specialty retail is the top channel with 47.7% share. For nutrition bars and gels, e-commerce rocketed a whopping 191% but is still only 2.6% of the overall market for these goods, with mass market ruling 53.4% of the roost.

Another COVID-era trend affecting sports nutrition protein is the rush to self-treat, as fear and office restrictions limited consumers' ability to seek professional health care treatment. In the Insider/CRN webinar, Kathryn Peters, executive vice president of SPINS, charted an uptick in sales of self-care foods, including protein-rich products. She said all forms of protein are in demand as consumers continue to seek nutritious proteins during sheltering at home. According to SPINS data, percentage change in units sold (year-over-year, ending March 22, 2020) increased comparably across the protein grocery spectrum, including meat and plant-based alternatives. However, while most of these categories saw high double-digit growth, refrigerated plant-based protein products saw triple-digit growth in units sold with the biggest increase (~160%) in the MULO channel.

Another area seeing a bump due to the pandemic is weight management. Grand View noted the functional advantages of protein intake—including muscle repair, energy boost and weight loss—will further fuel the demand for these products. During the height of quarantines, many idle and stressed consumers shared memes about weight gain from snacking and lack of exercise, rendering COVID-19 much like the infamous “freshman 15” for college students who gain weight.

Where's the beef?

The protein market overall is booming, and all manner of consumers, inside and outside of the sports nutrition market, seem to love and flock to anything with promises of elevated protein content. But where are the best opportunities for sports nutrition brands?

The sports nutrition and weight management market was around \$42.5 billion in 2019 (*NBJ*), and protein supplements were around \$17.6 billion (Grand View). Sports nutrition accounted for around 66.8% of the global protein supplement market's revenues in the same year (Grand View). RTD and functional foods are fast growers, as are plant-based protein products.

New Hope's NEXT Concept Lab, which analyzes new product ideas regularly, looked at 1,500 protein



concepts in its database to see which rose in a conceptual marketplace. Endpoints are purchase intent (customer will buy it) and market prediction (customers think others will buy it). The product types scoring high in both intent areas include grass-fed protein, grain-based protein and plant-based protein. Nut and seed protein concepts had slightly high market prediction but low purchase intent. The average protein product had slightly high purchase intent but low market prediction. Traditional whey protein concepts were low in both endpoints. Proving most consumers outside of specific cultural groups and regional areas are not ready to eat bugs, insect protein concepts showed very low purchase intent and off-the-charts low market prediction.

In a 2019 SupplySide East sports nutrition presentation, *NBJ's* Claire Morton Reynolds and Next's Eric Pierce noted the egregious side effects of the meat, seafood and dairy industry are wreaking havoc on our social and environmental conscience, prompting consumers to seek brands that can prove their commitment to producing responsible animal-based proteins. They reported innovation activity among products using a protein claim at Natural Products Expo (between 2016 and 2018) was a low 5% for animal protein products and a soaring 38% for plant protein goods. Based on such products exhibited at these shows, egg protein claims were the lone positive mover in this supplement category, as whey, milk protein and casein fell dramatically. Things were looking up on the food and beverage side, as whey posted 26% growth and egg saw an 87% jump, but milk protein and casein experienced huge gains, 182% and 196% respectively.

On the veggie side, pea protein was the strongest in both innovation activity for supplements and food/beverages, as well as in overall number of products exhibited. Rice was second in volume and also positive in innovation activity, slightly so in supplements and majorly so in food and beverages. Hemp protein was a downer in both supplements and food/beverages, while equally dismal in supplements, yet posted low double-digit positive growth in food/beverages.

Don't get it too twisted. Whey products far outnumbered any other protein, animal or plant, but the data is painting a picture of a protein market that has strong but flat/saturated traditional segments (whey, pills, bars) and emerging hot areas like plant-based, responsible/sustainable/clean and convenience format protein products. ♦

Healthy Insider Podcast

Discuss. Debate. Define.

GET YOUR
INDUSTRY NEWS
HERE FIRST.

Natural Products Insider is home to the latest news updates, research and analysis for manufacturers and marketers of dietary supplements. Get your industry news here first.



LISTEN NOW





What types of protein sources do you incorporate into your diet?

A. I incorporate a variety of protein from both plant and animal sources. I like using plant-based protein powders made from organic protein blends like pea protein, brown rice protein and chia seeds to fuel post-workout nutrition.

Madison Dorn
Content producer



A. I feel like simple is always better. Eggs or half an avocado or toast, almonds, beef jerky or even just peanut butter and a banana are my go-to's when I want to be set for a run or a bike ride.

Sky Dailey
Senior marketing manager



Natural Products Insider®

leads CPG brands from ideation through manufacturing, supporting the development of innovative, healthy and compliant products in the dietary supplement, functional food and beverage, and sports nutrition industries. As an official content provider for SupplySide, Natural Products Insider connects ingredient buyers and suppliers with executives across the health and nutrition marketplace.

Content

Content Director

Sandy Almendarez sandy.almendarez@informa.com

Editors

Steve Myers steve.myers@informa.com

Senior Editors

Judie Bizzozero judie.bizzozero@informa.com

Karen Butler karen.butler@informa.com

Todd Runestad todd.runestad@informa.com

Legal and Regulatory Editor

Josh Long josh.long@informa.com

Assistant Editors

Duffy Hayes duffy.hayes@informa.com

Alex Smolokoff alex.smolokoff@informa.com

Contributing Editors

Rikka Cornelia, Will Cowling, Charles DeVos, Mark LeDoux, Marie Spano, Andrew Stablein

Content Producer

Madison Dorn madison.dorn@informa.com

Content Marketing Manager

Corrin Salamatian corrin.salamatian@informa.com

Sales

Senior Account Director

Ioana Neacsu ioana.neacsu@informa.com

Account Managers

Anthony Arteca anthony.arteca@informa.com

Todd Berger todd.berger@informa.com

Lauren Hand lauren.hand@informa.com

Laurel Rivers laurel.rivers@informa.com

Todd Willis todd.willis.us@informa.com

Business Development Specialist – Asia

Jiani Lai jiani.lai@informa.com

Sales Support Coordinators

Susan Ginn susan.ginn@informa.com

Claire Webb claire.webb@informa.com

Creative

Senior Content Design Manager

Katie Dove

Art Director, Health & Nutrition

Andrew Rosseau

Marketing services

Program Manager

Kristin LaBarbera kristin.labarbera@informa.com

Program Marketing Coordinator

Leez May leez.may@informa.com



informa markets

President

Vice President & Market Leader, H&N SupplySide Portfolio

Vice President, Content, Health & Nutrition

Brand Director and Vice President of Sales, H&N SupplySide Portfolio

Vice President, Marketing Services

Fred Linder

Jon Benninger

Heather Granato

Danica Cullins

Danielle Dunlap

Published by Informa markets

2020 N. Central Ave, Suite 400, Phoenix, AZ 85004

Tel. (480)990-1101 • Fax (480)990-0819

Website: naturalproductsinsider.com