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# Nutrition

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## Supplements & Food Safety

The dietary supplement industry waits for the dust to settle on the FSMA and, maybe, thinks it's time to feel good about itself

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# Perfecting Functional Foods & Beverages

Consumer expectations for cleaner, healthier and tastier products are changing the category. **By Corinne Anderson**

“**N**atural has become the watchword across the whole food and beverage industry,” said Wayne Lutomski, vice president of International and Welch’s Global Ingredients Group, based in Massachusetts. When the functional food and beverage category first emerged it was viewed as a distinct entity. “We saw a lot of products come into the market specifically to deliver health benefits, while good taste and pleasure took a backseat. Over the years however, the category has evolved to become more integrated into the mainstream. As this happened, the emphasis has shifted to everyday concepts that deliver functional health benefits in a convenient and enjoyable way.”

In addition, the regulatory environment has become much tougher, noted Oliver Wolf, head of advertising/print media/exhibitions for Germany-based Gelita. “Certain expectations in terms of health claim

approvals have not come to fruition, which has made innovation more complex. As a consequence, many producers are looking to develop products with naturally healthy and non-allergic ingredients.”

“I think consumers’ expectations have changed the category,” Lutomski said. “Shoppers have become skeptical of the claims functional foods and beverage brands make today. So, as a product manufacturer and marketer, the question you have to ask is: am I using ingredients with benefits that are supported by sound science? But don’t forget it has to taste good, too.”

## Market and Trends

According to Mark Thurston, president of California-based AIDP, the market is still growing “above 5 percent per annum overall but the non-GMO (genetically modified organism) organic products are in double-digit growth.”

Tyler Lorenzen, president, proteins

and ingredients at World Food Processing (Minneapolis, MN), noted that the future of functional food is clean label, non-GMO and organic. “Five years ago, awareness of non-GMO was on the rise. Today, non-GMO is mainstream.”

And, five years ago, it was more about energy drinks and not much in the way of functional foods, added Suvash Kafley, senior director of process and product innovation at Minnesota-based Milk Specialties Global. “Everything was loaded with carbs and fats. Now, people are asking for reduced sugar options and higher protein. There are three trends I see: nutrition, convenience and feel good,” he said.

Kafley noted that protein-added ingredients have become popular, as well as low carbohydrates and fat. “In the convenience sector, consumers have shown a noticeable interest in products being shelf-stable, portion controlled, personalized and having a bold and interesting flavor. Third, the

most important aspects center on clean label, organic, non-GMO and whether it is naturally flavored."

Thurston agreed, adding that more vegetable and plant based ingredients, minimally processed and a move away from artificial colors, preservatives and sweetening systems have been the main trends in the category. "We have a full range of plant and vegetable powders; plant based proteins; plant and yeast based minerals as well as natural sweeteners and plant based prebiotics," he said.

### Protein is King

Many new products on the shelf are driving innovations from protein-fortified greens, to microwavable muffins, to protein bars that taste amazing. The innovation is constant and spreads across all categories, protein being the king ingredient overall, Lorenzen said.



"Everyone is high on protein," Kafley said. "It is no longer for body-builders or sports nutrition only. It's for kids, adults and the aging population. While everyone uses protein differently, or for various reasons like growing healthy, maintaining lean muscle, weight loss and healthy aging, this is one ingredient that can help everyone."

Protein is widely recognized as a necessary nutrient associated with muscle growth and maintenance. Nutrition 21's new ingredient Velositol has been shown to double the benefits of protein, supporting an increase in muscle protein synthesis. "Velositol offers our customers a new way to formulate better protein products," said Bill Levi, vice president of strategy and business development for New York-based Nutrition 21.

### Milk & Whey

Milk Specialties Global offers various ingredients to help processors and formulators achieve their goals of delivering superior nutrition with high quality products. Lactose-free whey

protein isolate and milk protein isolate are targeted toward lactose-free and low-sugar formulations. Both milk and whey protein powder have non-detectable levels of lactose, according to Kafley.

The company's ingredient, Barsoft, is produced via membrane filtration process and contains casein and whey in slightly different composition to decrease bar hardening over time. Bar texture can be further enhanced by using high protein inclusions.

"We have the ability to tailor products using combinations of the following offerings to meet customer needs: non-GMO/hormone free, organic and made with grass-fed," Kafley said. In addition, Milk Specialties Global also offers proteins for bakery and confectionary uses.

### Plant-based Proteins

"We have been experiencing an increased demand for natural gum replacements in the RTM (ready to mix) space, and we meet this with our beverage-ready TRIM family of healthy grains," said Andrew Wheeler, director of marketing at Illinois-based FutureCeuticals, Inc. The mainstream protein shift has also turned to whole food sources of plant-based protein."

Some of FutureCeuticals' formats include: Terasante Whole Food Plant Proteins, a legume and also a greens formula; Coffeeberry whole coffee fruit, baking and meal replacement; Coffeeberry energy whole coffee fruit caffeine, for healthy energy/performance; Sproutgarden in house, grown America in sprouts; organic grasses; QuinoaTrim, Nutrim beta glucans from oat; AncienTrim beverage ready ancient grains; and ModCarb Real Fuel from Real Food, with protein palatability and slow-burn energy.



PurisPea protein is a U.S.-grown and manufactured pea protein by World Food Processing. It is naturally non-GMO, offered as organic and can be found in protein shakes, bars and

crisps, ready-to-drink beverages and even dairy products. PurisPea has the ability to be cross-functional, Lorenzen said. "This is because it has proven to be important for its ease of use in a probiotic drink or a protein crisp, and is always delivering on great taste."

FutureCeuticals' Organic Terasante whole-food plant proteins have become in-demand because consumers are looking for non-isolate or concentrate sources of protein, according to Wheeler, who added, "We have seen a lot of interest in natural sources of energy, primarily our Organic Coffeeberry energy whole

### Grape Functions

Made from two American super fruits, Concord and Niagara grape juices are delicious and deliver natural nutrition—including plant nutrients called polyphenols, which act as antioxidants and can also contribute to health, Lutomski said. "It's the perfect package and totally in tune with what consumers today are looking for."

FruitWorx real fruit inclusions is Welch's new ingredient line that uses a unique URC process that concentrates the natural goodness of fruit juices and purees into delicious and versatile pieces, flakes and bites. This makes FruitWorx a good addition to snack bars and other on-the-go innovations. According to Lutomski, FruitWorx products are easy to work with, they do not clump, and there is no foreign matter, like sticks or stems, in them.

Welch's Global Ingredients Group also added Niagara grape juice, a unique golden American super fruit juice that delivers a sophisticated flavor profile and naturally nutritious polyphenols. It is available globally to companies, and offers bolder and more floral flavor notes than other white grape juice, Lutomski said.

In addition, following the success of the FruitWorx Concord grape a year ago, Welch's also added Niagara grape to its FruitWorx range of real fruit for inclusion in bakery, nutrition bar, confectionary, snack and breakfast cereal applications. FruitWorx inclusions can be made using a single type of fruit or in combination with other fruits, or blended with other ingredients including ancient grains such as chia, or covered in chocolate for a delicious and wholesome treat.

## Perfecting Functional Foods & Beverages

coffee fruit caffeine. In the natural caffeine arena formulators are intrigued by chlorogenic acids from the whole coffee fruit working in concert with natural caffeine."

### More Focus on Plant Ingredients

Minnesota-based Cargill offers CoroWise plant sterols, along with Oligo-Fiber chicory root inulin, also known as the invisible root fiber, which can be incorporated into products without affecting taste or texture. It also acts as a prebiotic ingredient that supports digestive health and enhances dietary calcium absorption.

Cargill's Regensure glucosamine is the only vegetarian glucosamine produced in North America and Trehalose, a naturally occurring disaccharide that can be found in mushrooms, desert plants and yeast, is a functional ingredient that can impact

the freshness, flavor and texture of the product. Trehalose's chemical structure remains stable under a wide range of conditions, including high heat, low pH, freeze/thaw cycles and prolonged storage, said Pam Stauffer, Cargill's global marketing programs manager.

California-based Polyphenolics is in the business of extending the beneficial aspects of grapes to the consumer in the form of grape seed and skin extracts, said James A. Kennedy, PhD, president of Polyphenolics. These polyphenolic extracts are produced from California-grown grapes that have undergone a patented extraction and purification process: Mega Natural-Gold, a general grape seed extract with antioxidant properties and MegaNatural-BP, a grape seed extract with targeted activities intended to help maintain healthy blood pressure.

These extracts have been utilized in functional beverages, such as Welch's Essence Sparkling Water, Health

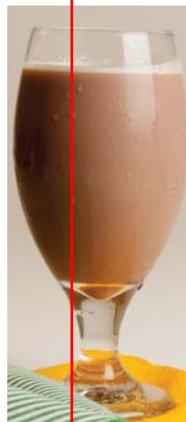
Transformance, a dietary supplement beverage; Sobe Lifewater, a vitamin enhanced water; ThinkitDrinkit Personalized Performance Nutrition supplement mix, which can be added to cold/hot beverages, sports drinks, smoothies, yogurt and baked goods; and Young Living NingXia Red.

### Less Sugar

Many consumers seek to reduce sugar in their diets, particularly in their beverages, said Stauffer. "The USDA (U.S. Department of Agriculture) 'My Plate' Guidelines significantly affect the recommended amount of daily sugar consumption for Americans. Added sugars, in particular, are under fire."

Cargill is seeking to help customers stay ahead of these guidelines with its zero-calorie sweeteners like ViaTech stevia sweetener and Zerose erythritol, which can help achieve reformulation options that taste great and reduce added sugars, Stauffer said.

"As a plant-based sugar



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## Perfecting Functional Foods & Beverages

with calories, stevia presents the perfect solution for consumers who are looking for naturally sourced low-calorie sweeteners in their search for a healthy lifestyle and weight management program," Stauffer continued. "Stevia leaf extract is appealing to the food and beverage industry because they can reformulate their products providing calorie-free alternatives from a natural source."

The pressure for lessening the amount of sugar and maintaining great taste is very real for formulators. ViaTech stevia and Zerose erythritol

### Vitamins Fuel Growth

There is a growing trend toward personalized medicines in pharmaceuticals which has developed into personalized consumer-based health treatments, supplements, diets and food, said William Ludlum, vice president of administration and special projects of Extracts & Ingredients, a division of MORRE-Tech Industries in New Jersey. Extracts & Ingredients provides water-soluble nutrients in several categories including vitamins, carotenoids, omega-3s, phytosterols and bioflavonoids. These ingredients are applicable for creating product groupings for functional foods, beverages and nutritional products. "These trends will impact day-to-day functional foods and drinks, opening up a market for manufacturers to supply personalized ingredient groupings for use at home."

The water-soluble B-vitamins and the fat-soluble vitamins, omega-3s and phytosterols have been popular ingredients for functional foods and beverages over the past five years. Another is vitamin D because of its medical importance in immune, heart, brain and muscular functions.

"Clearly, the addition of vitamins to water, juices and health drinks have been market success," Ludlum said. "Fortification of foods and beverages with vitamins and supplements normally fuel the growth of the groups. Addition of different groupings creates new products within each category."

allow beverage manufacturers to make reduced/zero-calorie beverages that taste more like sugar-sweetened products. Reducing calories from beverages without sacrificing taste is highly desirable by consumers.

### Collagen

Due to its multiple health benefits that complement trends, bioactive protein such as collagen peptides are set to be one of the biggest beneficiaries of the growing functional ingredients market, said Mai Nygaard, global director, Wisconsin-based Peptan (Rousselot Inc.).

"Collagen peptides are in the spotlight because of their multiple sports nutritional benefits. Due to the unique amino acid composition, they offer added value in terms of sports performance in regards to supporting fast recovery, promoting healthy and flexible joints and helping to reduce the risk of injury by protecting joints and connective tissues," Nygaard said.

Food ingredient offerings have become more specific, which has opened up a whole new horizon of opportunities, said Wolf. One example of this: collagen proteins.

"Traditionally used as natural stabilizers and emulsifiers for countless products, they now, owing to intensive research, enable manufacturers to add important health benefits to everyday products," he explained.

Gelita has intensified its R&D investments and offers specific bioactive collagen peptides that are individually optimized to stimulate each of the three different human cell types involved in collagen synthesis. They're all manufactured according to a very precise enzymatic hydrolysis process, resulting in unique products with high and consistent quality and stability properties, Wolf continued.

"Being GMO-free, collagen peptides are ideal for the development of clean label products and they fit well with the growing consumer interest in products that are pure, safe and naturally functional. They can be used to develop innovative solid and liquid products, such as fortified gummies, beverages and shakes, bars, gels and all kinds of instant foods," Wolf said.

### Beauty From Within Crosses Over

As consumer health concerns continue to influence the way food and

beverages are produced and positioned, previously well-established boundaries between different industries are beginning to blur, according to Wolf. "One example of crossover-innovation is the synergy between foods and cosmetics, resulting in the emerging market of nutricosmetics—beauty-from-within products that are delivered as foodstuffs. Another example is the fusion of food and pharmaceuticals. As food becomes healthier and pharmaceuticals enter the supplement and nutraceutical market, exciting new product innovation opportunities have been identified."

Beauty from within is also a growing trend within the functional products market, Nygaard noted. "This movement sees consumers tailoring their diet to promote skin health and obtain a more youthful look. Many 'inner beauty' products are based on collagen peptides, which have been proven in clinical studies to improve the moisture content of skin, to boost collagen and elasticity, providing more firm and smooth skin."

The special amino acid composition of Verisol's collagen peptides enables Verisol to stimulate the fibroblasts in the dermis. This substantially increases the synthesis of collagen, elastin and proteoglycans, all of which are essential for providing elasticity. As a result, the epidermis is supported from beneath, skin sagging is prevented and wrinkle formation is reduced. Verisol is complimentary in many different products, from liquids to solids, coating tablets to dietary drinks, and even foodstuffs like chocolate, according to the company.

Rousselot's Peptan contains a combination of 18 key amino acids and is highly bioavailable with more than 90 percent of the peptides delivered to the connective target tissues within just a few hours of consumption. It has a neutral taste and odor, with instant solubility in cold and warm liquid, as well as heat stable. It can be utilized in food, dietary and nutricosmetic solutions.

"Peptan stimulates cell activity and provides specific metabolic signals to produce more collagen and other matrix components in the local tissue," Nygaard explained. Peptan, is obtained from natural sources of native collagen type 1, a proprietary enzymatic hydrolysis process that

produces small bioactive peptides, which are optimized to provide multiple health benefits in joint, bone and skin health.

Peptan is also useful in gummies. In fact, the company's prototype, My Beauty Cherries, are functional gummies that act as an example of how collagen peptides can work synergistically with vitamin C in a delivery format that is easy to incorporate into different consumers' lifestyles.

### Bone Health

Everyone knows bones need calcium, but they also require collagen for optimum health, Oliver explained. "Bone comprises a mixture of mineral crystals held in an organic collagen matrix. On their own, these crystals would be extremely brittle and prone to breakage, so collagen plays a key role in keeping the skeletal system healthy."

The Bioactive Collagen Peptides in Fortibone by Gelita stimulate osteoblast cells to increase the production of the extracellular bone matrix, the essential framework that

supports calcium mineralization. It also regulates certain degenerative processes by reducing protease production in osteoclasts.

Fortigel has been scientifically shown to measurably stimulate the synthesis of cartilage tissue, thus counteracting the wear and tear on joint cartilage caused by factors such as aging, excessive weight bearing or extensive physical exercise.

Fortibone and Fortigel can be utilized in dairy products, functional food, food supplements and beverages, and Fortigel can also be used in gummy snacks.

Gelita developed the ingredient Bodybalance to fight sarcopenia (the progressive loss of skeletal muscle mass and strength that affects millions of aging adults). These specific collagen peptides were found to further increase the benefits of resistance training in elderly people with sarcopenia in a double-blind placebo-controlled study conducted at the Institute of Sports and Sports Science at the University of Freiburg, Germany. The ingredient is a natural

source of protein, is allergen-free, and can be used to develop clean label products such as beverages, shakes, bars, gels and instant foods such as soups.

### Future of Functional

"The consumer is becoming increasingly aware that functional foods and beverages can help to maintain a healthy state and perhaps more importantly should be taken to maintain a healthy lifestyle. This growth trend in the market for functional foods and beverages will only continue," Kennedy said.

"The challenge has been to deliver these ingredients in a format that consistently delivers that nutrition in a convenient manner, while tasting delicious," Lutomski stated.

An example of co-innovation for a new nutrient delivery concept, Nygaard explained, comes from a collaboration between Fortified Food Coatings, Rousselot and DSM, who together developed a concept which enhances the nutrient content of food by applying a layer of nutrient fortified gelatin to ready meals, targeting for example, the aged care sector.

"Ingredient suppliers," Nygaard pointed out, "who offer global expertise, and in-house technical experts than can work in close partnership with manufacturers to facilitate the use of ingredients in their applications, co-develop new products and get them to market faster, will have the most impact on future innovation." **NIE**

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