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January/February 2016
Vol. 19, No. 1
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Innova Market Insights

UBM Life Sciences
310/445-4200 • Fax: 310/445-4299

Group Publisher .................................................... Michael Tessalone
732/346-3016 • mtessalone@advanstar.com

Publisher/Brand Director ................................. Tim Baudler
310/445-3757 • tim baudler@ubm.com

Editor-in-Chief .................................................... Jennifer Grebow
310/445-3763 • jennifer.grebow@ubm.com

Associate Editor .................................................. Michael Crane
310/445-3792 • michael.crane@ubm.com

Account Executive ............................................... Adrienne Davis
206/934-0262 • adrienne.davis@ubm.com

Art Director ....................................................... Quinn Williams
Production Manager .......................................... Anbarasan Mannar
Production Coordinator .................................... Santhosh Kuman Dorairaj
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Circulation Management: Rochelle Ballou, rballou@advanstar.com
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<th>Solvent Residues</th>
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<th>Vidya’s Product</th>
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Vidya Herbs Inc
1412 E. Valencia DR, Fullerton, CA 92831. Tel: 714 992 1288, Fax: 714 992 1289
Email : sales@vidyaherbs.com
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Green Light to Organic-Labeling Lawsuits?

Back in December, something pretty big happened in the organic-labeling world. In California, a private plaintiff had brought a class action lawsuit against HerbThyme Farms Inc., a U.S. grower of certified-organic and non-organic herbs. The lawsuit alleged that HerbThyme falsely advertised its products as organic when in fact they contained a mix of organic and non-organic herbs.

False-advertising lawsuits are by no means uncommon, but what is unusual in the HerbThyme case is that this case was brought at the state level, whereas regulations for organic claims are promulgated at the federal level by the U.S. Department of Agriculture. The issue in the HerbThyme case became: Does federal jurisdiction over organic-labeling rules preempt the right of states to sue under their own consumer-protection laws?

According to the California Supreme Court, they don’t. HerbThyme had argued that the plaintiff should have filed her grievance at the federal level since USDA’s National Organic Program (NOP) is a federal program. But on December 3, 2015, the California Supreme Court overruled an appeals court victory previously handed to HerbThyme, instead giving the plaintiff’s case the green light and—for good or for bad—opening the door to similar consumer lawsuits in the state (and perhaps setting a model for other states to follow, too).

What does this ruling mean for consumers and for the organic industry at large? Maybe not much, according to the Organic Consumers Association (OCA; Finland, MN). In a January 5, 2016, news story for KCET, OCA’s political director Alexis Baden-Mayer commented, “I don’t predict a surge of lawsuits. There are very few areas where the organic rules aren’t being followed.”

If there is a worst-case scenario, it would be if this ruling inspires a wave of frivolous class action lawsuits, the type brought by profiteering bounty hunters. One need only point to Proposition 65 regulations in California, bent under the never-ending weight of bounty hunter lawsuits that have pretty much made the law a nationwide laughingstock.

At the time of the ruling, the Organic Trade Association (OTA; Washington, D.C.) issued a statement saying it was “very concerned about the precedent this ruling could create, since it misunderstands the extent of the Organic Food Production Act’s preemption over state laws by allowing consumer complaints outside of the enforcement process established by the OFPA and its regulations. There is a clear enforcement process at the U.S. Department of Agriculture that must be the first step in verifying and enforcing organic claims. We are hopeful that other state courts will not similarly misunderstand the clear congressional language and intent.”

If there is a best-case scenario, it is this: Giving consumers the right to bring lawsuits against those breaking organic-labeling laws may help shore up faith in the organic system. “By all appearances, permitting state consumer fraud actions would advance, not impair, these goals,” wrote Associate Justice Kathryn M. Werdegar, author of the Supreme Court’s opinion, referring to the goals of the NOP, which include bolstering consumer confidence in the validity of organic claims overall.

“Substitution fraud, intentionally marketing products as organic that have been grown conventionally, undermines the assurances the USDA Organic label is intended to provide,” Werdegar said. “Conversely, the prosecution of such fraud, whether by public prosecutors where resources and state laws permit, or through civil suits by individuals or groups of consumers, can only serve to deter mislabeling and enhance consumer confidence.”

Will we end up with the best case, or the worst case? The results will probably be somewhere in the middle. One thing is for certain, however; we haven’t heard the last on this issue.

Jennifer Grebow
Editor-in-Chief
Leading dietary supplement association the Council for Responsible Nutrition (CRN; Washington, D.C.) announced in January that all CRN members will be required to submit their supplement product labels to the Dietary Supplement Label Database (DSLD), a joint project of the National Institutes of Health (NIH) Office of Dietary Supplements (ODS) and National Library of Medicine (NLM). The mandatory database requirement is designed to improve transparency in the supplement industry, says CRN, and applies to “those CRN member companies listed as the responsible party on the product label for all dietary supplement products marketed in the U.S.”

CRN advises its members provide their product labels to the database by December 31, 2016. Beginning in 2017, participation in the DSLD will be a requirement for CRN membership renewal or acceptance for new membership.

“This marks the start of a new era for our industry,” said Steve Mister, president and CEO, CRN, in the January announcement. “Our members can no longer allow those companies skirting the laws to tarnish our reputation. This first step toward greater transparency for regulators and researchers is long overdue, and we strongly urge others in the industry to work with us on this and future initiatives that will ultimately build a stronger industry.”

Mister tells Nutritional Outlook that the decision to mandate participation in the database was made with overwhelming support from the CRN board. “Since we sent the notice out alerting our members to it, I have gotten only positive feedback,” says Mister.

Why Use DSLD?

There was discussion within CRN as to whether industry would be best served with a more inclusive database or one that has certain requirements for participation, such as outside certifications or inspections. But the CRN board ultimately chose to take the more inclusive approach with ODS, says Mister.

“We think that the database serves its purpose by being a reflection of what the industry really looks like,” says Mister. “Good, bad, ugly—all of that. We hope that everybody else in the industry will agree to put their labels in as well, so that the database really can be a mirror of what’s in the marketplace.”

Based on the research of a Product Transparency Working Group formed by CRN’s members last year, the CRN Board selected the ODS DSLD as the most appropriate place to establish a registry of dietary supplements. The database was first launched in 2013 and currently contains full label contents for more than 50,000 dietary supplement products marketed in the United States.

“The bottom line is we need a central repository for all dietary supplement labels sold in this country, and the ODS label registry is already well-established, and with a few tweaks, could provide the kind of information that would be helpful for FDA,” said Mister, in the announcement. “Given that ODS is currently reevaluating its current contracted database administrator, it was also the right opportunity for us to make suggestions as to how to make the DSLD a more useful and comprehensive tool for regulators.”

On December 31, 2015, CRN submitted a list of comments to ODS suggesting potential improvements to the database. Here are a few of CRN’s recommendations:

- Increase allocated resources to allow for expanded capacity and quicker processing
- Establish a process to update labels, denote products no longer on the market, and respond to manufacturer-requested corrections to errors
- Develop a unique product identifier system that could better serve a variety of stakeholders, including consumers down the road
- Provide FDA with confidential information that would allow it to more efficiently contact manufacturers and packagers

The American Herbal Products Association (AHPA; Silver Spring, MD) recently encouraged its own members submit dietary supplement labels for inclusion in the DSLD. Additionally, AHPA recommended several changes to the database, such as archiving labels for products no longer available for purchase, providing a readily accessible mechanism to indicate product forms when conducting a search of labels, and ensuring the language of DSLD website’s disclaimer is consistent with FDA’s Online Label Repository.

Not Ready for Consumers Yet

Although the ODS database is public and can be accessed by consumers, Mister says at this stage, researchers and regulators are the intended audience for the database, rather than consumers. However, if ODS is able to incorporate enough of CRN’s recommendations into the database, it may then be able to evolve into a place that FDA, the media, and consumers can all use, says Mister.

“For instance, we really believe that there ought to be a confidential part of the database that includes information that might not be accessible to consumers, but that would be accessible to regulators,” Mister says. The function might be especially valuable in the case of contract manufacturing, he explains, where consumers may only be familiar with the distributor of a product, but regulators need to know which contract manufacturer actually made the product.

CRN is the first association to mandate its members submit product labels to a central database, but Mister said he believes other associations will join CRN in taking this step.
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Food manufacturers are revamping snack foods with healthier ingredients and intriguing culinary trends. As a follow-up to our November 2015 Nutritional Outlook column on the snacks market, here are some notable newcomers freshening up the snacking category.

**Chip Trends**

Bean chips are popular, including launches like General Mills’ Pinto Bean and Black Bean Multigrain Bean Chips, part of its Food Should Taste Good brand. These chips also feature flax, sesame, and sunflower seeds, as well as quinoa. The Good Bean brand also launched tortilla-shaped Bean Chips with Sweet Potato & Quinoa, incorporating chickpeas, navy beans, red lentils, and pea protein.

Ancient grains like quinoa are increasingly popular, creating a nutritious—and often gluten-free—option. Joining the trendy popped-snacks category, KIND Healthy Snacks’ latest Popped Salted Caramel bar features six grains: amaranth, buckwheat, millet, oats, quinoa, and sorghum. The company markets the bar as delivering “the popcorn taste you love.” The brand hits on another trend, too, with its other popped-bar flavor, Dark Chocolate with Sea Salt and Salted Caramel.

Blends and crossovers are more common, such as a mix of popcorn and corn chips in Popcorn Indiana’s Fit Popcorn Chips; Toufayan’s Gluten-Free Scoop-able Pita Chips, snack chips based on pita bread; or Flamous Brands’ Falafel Chips, designed to accompany hummus dips.

Other interesting ingredients include seaweed, such as in the Chomperz Crunchy Seaweed Chips range from SeaSnax and the Oceans Halo snacks range from New Frontier Foods. Veggies highlight several other snacks, such as Pirate’s Booty’s new Carrot Snacks baked puffs made with carrots, corn, and sea salt, or the new Sensible Portions General Mills describes its Food Should Taste Good Pinto Bean Multigrain chips, launched in June 2015, as combining “wholesome ingredients with inherent bean flavors for a balanced and hardworking snack.”
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Bar None

Cereal and granola bars are growing strong with very high levels of new product activity in recent years. According to Innova Market Insights data, the number of global cereal bar launches doubled between 2010 and 2015 and continues double-digit growth. The United States dominates the market overall and tends to lead in product development in a relatively mature and complex market. The U.S. market includes a wide range of products: granola or muesli bars, energy and performance bars, nutrition bars, and breakfast bars.

Bars answer a lot of consumer concerns. First and foremost, the “healthy” halo surrounding bars continues—despite concerns over just how healthy some of the products actually are. More than 80% of the cereal bar launches recorded by Innova Market Insights in the 12 months ending June 2015 had a health positioning of some kind—and as much as 90% in the United States. Clean-label concerns are also key, with over 50% of U.S. cereal bar launches positioned on a natural, additive-free/preservative-free, and/or organic platform.

Strong interest in “free from” options has served the gluten-free trend well; in fact, in the United States, gluten-free marketing has moved ahead of natural, additive-free/preservative-free, and organic marketing. Gluten-free claims are now used on over 60% of launches in the United States (compared to the smaller 37% of launches globally).

Protein is rising strongly, with “high in protein” and “source of protein” claims used on 22% of global cereal bar launches and up to 40% in the United States. The performance bar market, where products traditionally include protein, is also strong, with one-fifth of U.S. launches featuring a sports/recovery or energy/alertness positioning.
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The most notable development in protein bars is their move from a specialized product for endurance and performance athletes to the mainstream, where consumers look to potential benefits of satiety, weight management, improved muscle mass, and increased energy. U.S. additions in 2015 include Campbell’s Soup’s V8 Protein bar, leveraging the well-known vegetable juice brand and adding soy protein as well as sweet potato and carrot. The bars are offered in three flavors: Chocolate Peanut Butter, Oatmeal Raisin, and Chocolate Pomegranate with Cranberries.

Other health claims featuring strongly in the U.S. cereal bars market include fiber claims (“high in” or “source of fiber”), used on 33% of U.S. launches and over 40% if whole-grain claims are included. “Low” and “light” claims are also popular, used on over 17% of launches, particularly relating to reduced sugar content, with nearly 12% of launches featuring a “no added sugar,” “low sugar,” or “sugar free” positioning.

“Bites” are another trend, embraced by some of the biggest names in the market. Balance Bar launched Balance Bites in 2015—crunchy snack bites sold in single-serve pouches. In 2015, the Gluten Free Bar brand launched Gluten Free Bites, bite-size versions of the original nut, protein, and dried fruit bar.

In the functional category, launches include GoMacro’s Thrive Bar line targeting neurological, digestive, and cardiovascular health. Mars extended its CocoaVia cocoa flavanols brand with the launch of three Goodnessknows bars, each delivering 100 mg of naturally occurring cocoa flavanols claimed to support the healthy flow of nutrients and oxygen. The bars are ready-cut into four snack squares, each at less than 40 calories.

Clean Label

Clean-label trends such as minimal processing and limited ingredients are apparent in recent launches such as Boulder Canyon’s Coconut Oil Sea Salt Crisps, made with just three ingredients—potatoes, coconut oil, and sea salt—and marketed as natural, gluten-free, Kosher, non-GMO, and free of trans-fat, MSG, and cholesterol. Navitas Naturals also launched organic, gluten-free, non-GMO Coconut Chips made by toasting coconut slices and offered in both sweet and savory flavors.

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Brain-Health Ingredients
If there’s one health concern to keep your radar on, it’s brain health. With numerous ingredient developments in the last year alone and emerging launches in related markets, many are pegging 2016 as the year of the brain.

Lisa Buono, client insights principal, healthcare vertical, for market researcher IRI, says, "IRI believes that supplements to improve and maintain brain health will grow rapidly because consumers of all ages increasingly have optimal brain health and performance as a desired goal and because supplements may be the only category, at least in the short term, that can provide products to that end."

IRI, which tracks retail sales in U.S. brick-and-mortar food/drug/mass, club, dollar, and military stores, says sales of supplements specifically marketed for brain health (excluding omega-3) grew nearly threefold last year to $40 million. Notably, this figure does not count sales in specialty stores like GNC or Vitamin Shoppe, nor Internet/direct-mail or sales of omega-3 products, so sales “are quite likely much higher in total," Buono says. (If omega-3 products that also make heart-health claims are included, the total could be as high as $400 million, she adds.)

Regardless, "the staggeringly high growth rate of the brain-health items that we are tracking is quite telling,” she continues. “Consumers want these products, that’s for sure.”

Brain-health supplementation is all about prevention as people watch elderly loved ones deal with conditions like dementia or Alzheimer’s disease. Latest U.S. Census Bureau data estimate that by 2050, the 65-and-older population will be double today’s size. The time to think about brain health is now, no matter how young the consumer. That is why baby formula, as well as related baby cereal and biscuit products, is still the largest brain-health audience currently, according to Innova Market Insights data.

But other consumer types are wrapping their minds around brain health now. Innova says sports-nutrition powders showed the highest global increase in brain health–related launches in 2015.
“The staggeringly high growth rate of the brain-health items that we are tracking is quite telling. Consumers want these products, that’s for sure,” says IRI’s Lisa Buono.
Ingredients to Watch

There is lots of opportunity here for dietary supplements. “Currently, in the nonprescription spectrum of the market, there are a handful of nutritional supplement brands aimed at brain health, but this area remains largely underserved by the OTC industry,” says IRI in a white paper recently released together with research firm Kline, called “Brain Health: Unlocking White Space Potential for the OTC Industry.”

The paper notes that brain-health supplements are still just a fraction of the total vitamin and mineral supplements market. Some of the supplements already on the market include Cebria by Ever-Neuro Pharma, Prevagen by Quincy Bioscience, Alpha Brain by Onnit Labs, Focus Factor by Factor Nutrition Labs, Procera AVH by Procera Health, and Neuro Sonic (a beverage) by Neuro Drinks. IRI says sales of Prevagen and Procera AVH alone grew nearly 500% and 300%, respectively, in 2015.

Of the many cognitive-supplement ingredients available—including ginseng, Ginkgo biloba, omega-3, huperzine A, amino acids, B vitamins, choline, vitamins A, C, D, and E...the list goes on—market researcher Euromonitor International is keeping an eye on several specifically, says Chris Schmidt, senior analyst, consumer health. These include B vitamin nicotinamide, as well as huperzine A and ashwagandha, both of which are in dietary supplements but also expanding into sports. In related news, late last year, Israeli supplier Enzymotec said it is expanding into sports. In related news, late last year, Israeli supplier Enzymotec said it is now positioning its phosphatidylserine (PS) ingredient for sports nutrition with a new ingredient, EnzySport. Innova Market Insights points to vitamin B6 as the top-selling brain-health ingredient, followed by vitamin B12, taurine, choline, and omega-3 fatty acid DHA, respectively.

In fact, it seems like all ingredient suppliers are focusing on brain health these days. In the last year alone, Sabinsa (East Windsor, NJ) introduced a new ingredient, Sabroxy, from the Oroxylum indicum plant, supporting neuronal health. HP Ingredients (Bradenton, FL) launched NeuroActin, an Andrographis paniculata extract with studies supporting cognition. Nutrition 21 (Purchase, NY) presented new clinical results for improved focus and mental clarity for its Nitrosigine bonded arginine silicate. And Frutarom (Switzerland) confirmed new cognitive-function benefit data for its Neuravena green oat ingredient.

As expected, the elderly are a huge focus. Horphag Research has a brand-new study out showing that its Pycnogenol pine bark ingredient may improve cognitive performance in older adults. Kemin (Des Moines, IA) announced results from a study on its Neumentix spearmint extract indicating the ingredient improves elderly cognition. Natreon (New Brunswick, NJ) has a new patent for its Sensoril ashwagandha for dementia-related disorders such as Alzheimer’s Disease, anxiety, and depression. Andrew Wheeler, director of marketing for FutureCeuticals (Momence, IL), says interest is also growing in the company’s NeuroFactor...
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ingredient—a brain-derived neurotrophic factor (BDNF) ingredient from the coffee plant Coffea arabica—following the Framingham Heart Study, which showed higher levels of BDNF may protect against dementia and Alzheimer’s disease.

Elsewhere, Israeli supplier Lipogen (Haifa, Israel) unveiled a new stress-management ingredient last year called Lipogen PSPA, a combination of PS and phosphatidic acid (PA). (For more on relaxation ingredients, turn to page 50.) Kyowa Hakko (New York City) announced an interesting study last year showing benefits of its Cognizin-brand citicoline for improving attention and motor function in young men. Not to be outdone, omega-3 association the Global Organization for EPA and DHA Omega-3s (Salt Lake City, UT) has a new infographic out explaining the cognitive benefits of omega-3.

### SPECIALTY GOURMET CHANNEL (UNITED STATES)
#### 25 BESTSELLING INGREDIENTS ACROSS ALL HEALTH CONDITIONS

<table>
<thead>
<tr>
<th>Ingredient</th>
<th>Current Dollars</th>
<th>Year-Ago Dollars</th>
<th>% Change</th>
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<tbody>
<tr>
<td>Protein - Animal &amp; Plant Combo</td>
<td>$6,288,390</td>
<td>$5,920,215</td>
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<td>Protein - Plant (Multi)</td>
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<td>$1,409,728</td>
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Source: SPINSscan Specialty Gourmet

Time period: 52 weeks ending 12/27/15 versus the 52 weeks ending 12/28/14
Channel: Specialty gourmet supermarkets

The list goes on. Even grape juice brand Welch’s, which last year embarked on a new path as a supplier of grape ingredients, is getting in on the action. In December, the company announced a new study indicating its Concord grape juice benefits the brain health of working mothers. (See page 84.)

Will marketers take advantage of all this innovation? If they aren’t, they should be.

“There is significant upside market potential in the area of brain health, which remains a largely untapped OTC market with meaningful treatment gaps even in the prescription market as well,” the IRI/Kline white paper states. “White-space opportunity exists that OTC marketers can fill in brain health because demand is critical, with a high number of consumers seeking solutions which are not adequately addressed by currently available OTC or prescription drugs. OTCs/nutritional supplements can bridge the gap with products aimed at prevention of dementia/memory loss and that help maintain brain health.”

“There is ample evidence such products will be increasingly demanded by consumers across multiple generations,” it concludes.

### PHO Replacers

As the 2018 deadline nears for U.S. food manufacturers to remove partially hydrogenated oils (PHOs) from their products, PHO-replacement ingredients will be at the center of the conversation.

Many companies have already made the switch to non-PHO alternatives to meet specific health claims, but there are still plenty of food applications relying on PHOs, says Tom Tiffany, senior technical sales manager, ADM Oils, Archer Daniels Midland (Chicago).

Tiffany says soybean oil and canola oil are some of the most popular commodity PHO-replacer oils used in foods, but there are plenty of other ingredients ideal for specific formulation needs.

“We also see interest in the utilization of high-oleic soybean oil, high-oleic canola oil, and mid-oleic sunflower oil as alternatives for PHOs where solid fats are not needed and there is a need for improved oxidative stability to maintain shelf life,” says Tiffany. “In applications where shortening or solid fats are needed, palm oil, palm oil blends with liquid oils, and interesterified soybean oil-based...
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Soybean oil is a popular PHO-replacer oil in many foods, says ADM’s Tom Tiffany. Shortenings are being utilized to deliver functional attributes. In September, Nutritional Outlook reported on the appeal of palm oil as one of the most attractive non-PHO oils. Palm oil’s formulation flexibility, abundant supply, and cost efficiency have many companies hailing it as a top PHO replacer, but ensuring it is produced sustainably can be a challenge.

Non-PHO solutions are also seeing activity in the area of ingredient encapsulation. PHOs have been used for years to enhance the flexibility of certain food applications, such as frozen meat or bakery dough, where cold temperatures can increase the fracture rate of brittle coating oils, says Walt Zackowitz, marketing director of specialty ingredients, Innovative Food Processors (IFP; Faribault, MN).

Last year, IFP launched a new line of non-PHO encapsulated food ingredients that rely on encapsulation technology improvements and, if needed, non-PHO modifiers such as non-hydrogenated vegetable oils. IFP says its non-PHO encapsulated food ingredients allow for “longer and thinner microscopic coating layers, which are naturally more flexible.”

The days of PHO-based emulsifiers are also numbered. With that in mind, Corbion (Lenexa, KS) recently added two non-PHO emulsifiers to its Ensemble line that are intended for use as drop-in PHO replacements to “minimize reformulation hurdles and operational disruption,” according to Jim Robertson, global product manager, emulsifiers.

Yet, even if certain PHO alternatives become popular in the immediate rush to replace PHOs in food, the question remains whether these are permanent solutions, or just an interim fix while the world of non-PHO formulations continues to develop. Only time will tell.

Hemp, pea, and rice burst onto the plant protein scene as hot new alternatives to soy, but that hasn’t stopped formulators from asking, “What’s next?”

Plant Protein
Hemp, pea, and rice burst onto the plant protein scene as hot new alternatives to soy, but that hasn’t stopped formulators from asking, “What’s next?” Faba bean, lentil, pumpkin seed, duckweed, garbanzo bean, and more are now hoping to nab a spot on the list of next-generation plant proteins. “Pea, rice, and soy proteins have been the dominating plant-based proteins in the market, but as those ingredients reach saturation, we will see the rise of lesser known plant-based proteins as finished-product manufacturers look to differentiate their products,” says Rikka Cornelia, product manager, BI Nutraceuticals (Long Beach, CA).

Beyond their novelty, these up-and-coming proteins may be a better fit for specific formulation needs. For instance, BI’s pumpkin seed protein has a “favorable roasted aroma,” says Cornelia, which may work especially well in chocolate applications.

Keep an eye out for pulse proteins as well, such as garbanzo bean, faba bean, and lentil. Thanks to their nutritious properties and eco-friendly cultivation, the Food and Agriculture Organization of the United Nations (FAO) has declared 2016 the International Year of Pulses.

Many of these up-and-coming plant proteins also have an appealing story to tell in terms of sustainability. Take Lentein lentil protein, manufactured by Abu Dhabi-based supplier Parabel. The ingredient earned an
Innovation Award last year for its low environmental impact at the Institute of Food Technologists’ Annual Meeting & Food Expo (IFT). Thanks to Lentein’s aquafarming process, 98% of water used for its production can be recycled, says Parabel.

Mankai, a high-protein strain of duckweed (*Lemnaceae*) from Hinoman (Tel Aviv, Israel), is also tapping into eco-friendliness with a year-round, semi-closed-system cultivation process that allows for cultivation in a wide range of locales using 10 times less water to produce than soy, kale, or spinach.

Blending different plant proteins is another growing trend, likely driven by consumer interest in multi-source formulations, suggests Chris Schmidt, senior consumer health analyst, Euromonitor. Demand for well-rounded nutrition could lead away from a focus on products marketed strictly for protein content and toward a more inclusive and holistic approach, he adds.

“We expect to see the shift in marketing from ‘protein product’ to ‘total nutrition products,’ with added vitamins and minerals and other nutrients like fiber or omega fatty acids,” Schmidt says. “Especially as more average consumers, or non-athletes, flock to the category, the products will need to become more multifunctional.”

**Stevia**

If it seems like you’ve been listening to talk about next-generation stevia for years now, you’re not alone. After tantalizing us with promises of less bitter or more scalable steviol glycosides, key stevia suppliers are now taking those glycosides commercial.

Some of the biggest news came out of Cargill (Minneapolis) late last year. At the SupplySide West trade show in October, the company finally gave us a taste of its first-ever fermentation-derived stevia sweetener, EverSweet. In 2016, Cargill is taking EverSweet to potential buyers whom will, one can imagine, include certain key beverage brands.

Cargill is not alone. Many stevia firms are now exploring fermentation as a less-expensive, resource-efficient way to obtain glycosides like Reb M and Reb D that are sweeter than Reb A yet present in much smaller quantities in the stevia leaf. With fermentation, these rarer glycosides can be cultivated in larger scale. Biotech firm Stevia First (Yuba City, CA) has been honing its own fermentation process. Last year, the company announced a new milestone: it can produce stevia without requiring glucose as an input for fermentation.
The diet soda market is the one to watch. With U.S. soft drink sales diving, can stevia help the market recoup with healthier options?

EverSweet success would also broaden the market for Reb M and Reb D as a whole, says Scott Fabro, global product development director, high-intensity sweeteners, Cargill. A stevia sweetener that is cost-efficient and more sugarlike than Reb A—Fabro describes EverSweet’s taste as a “more rounded” sweetness that avoids the “spikey” sweetness common of other stevia sweeteners—helps formulators more ably replace more sugar with stevia and cut more calories. Cargill says EverSweet can get to 100% sugar replacement in a carbonated soft drink, for instance—a level not previously possible for the company. These capabilities “should allow a dramatic expansion in the use of Reb M and D, allowing food and beverage producers to create new classes of lower-calorie products that taste great and are affordable to all,” Fabro says.

Another leader, PureCircle (Oak Brook, IL), is producing Reb M commercially, but is still very much focused on stevia’s “natural” story of traditional leaf extraction. Last October, the company announced the next milestone in its business plan: a U.S. patent locking down leaf-derived Reb M for beverages. The market will be watching for products down the line, including any from PureCircle’s Reb M co-developer, Coca-Cola, which shares the new patent.

PureCircle is set to produce Zeta Reb M in high quantities. The Reb M is part of the company’s new Zeta line of stevia sweeteners for low- to no-calorie applications. In the December Zeta announcement, COO Jordi Ferre said that thanks to PureCircle’s stevia agronomy program, the company is able to yield “over 20 times the amount of rare steviol glycosides versus other leaf available on the market.” Zeta sweeteners, which also include other glycosides, “provide the most sugarlike taste profile on the market for low-to-zero-calorie sweeteners,” the firm claims. “Sweetening low-to-no-calorie applications like diet soft drinks has been especially challenging, so we are very excited by the impressive taste performance of our new Zeta family of ingredients,” adds Faith Son, vice president, global marketing and innovation, PureCircle. In 2016, the company will continue scaling up and adding to both its Zeta line and its Sigma line, also introduced last year and focusing on application-specific stevia solutions, such as for tea or dairy products.

With the table set for new glycosides, what can we expect in terms of launch activity in 2016? As always, the diet soda market is the one to watch. With U.S. soft drink sales diving, can stevia help the market recoup with healthier options?

Market researcher Innova Market Insights points to other categories where new stevia launches are high. Sports bars are “booming,” Innova says, with 16% growth in new global launches last year alone. In the United States, there is growth—albeit more modestly—in sports powders, iced tea, carbonated drinks, energy drinks, and chocolate bars.

Zinc

Magnesium may be the mineral du jour, but another is making headlines now. “We believe zinc is about to become the next star in the minerals category,” says Rocio Aramburo, market development manager, health and nutrition, Jungbunzlauer (Newton Center, MA). “Profiting from its various health benefits and its relatively low cost in use, zinc sales in supplements have shown increased growth since 2012 and are starting to catch up with calcium, magnesium, and iron, the category leaders,” Aramburo adds. She points out that in the European Union, zinc has already received more positive opinions (18 total) from the European Food Safety Authority than any other mineral.

Market researchers also confirm healthy growth for zinc. According to SPINS natural products specialist Kimberly Kawa, U.S. zinc
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sales in U.S. specialty men’s supplements shot up last year, up 31.6% compared to 2014, says Innova Market Insights. In the U.S. supplements aisle, zinc also grew in meal replacements, oral feeding, specialty women’s supplements, children’s health, beauty products, and vitamins and minerals. In the global market, zinc is steadily strong in baby formula and milk products, and its presence is also growing in tube-feeding formulas, meal replacements, beauty products, and children’s supplements.

For Albion, this means zinc sales are up and outpacing market growth and now close behind the company’s leading performer, magnesium. Alice Chin, director of quality control for Ingredientsonline.com (La Mirada, CA), says the company expects zinc prices to remain stable this year.

Developed nations aren’t necessarily zinc deficient, but there is still a need for zinc all around. Western diets are often replete in dietary sources of zinc—primarily foods of animal origin, including meat, liver, fish, milk, and cheese—says Aramburo. But for those on specialty diets, such as vegetarians, zinc deficiency is higher because plant-derived zinc is generally less bioavailable. There are also communities suffering from health conditions that put them at risk of zinc deficiency. “Conditional causes of zinc deficiency are often disease-related, stemming from problems like Crohn’s disease or cystic fibrosis,” Motyka says. There is also increased need for zinc in pregnancy. And then there are the elderly, who are often zinc deficient.

The opportunities for zinc are there, says Motyka. “It is not a problem for the zinc market to grow in the United States due to the increased incidence of conditional-induced zinc deficiencies and the finding that 40% of Americans over 55 years of age have diets that are zinc deficient. People over the age of 55 are the fastest-growing segment of the U.S. population. In this segment, the need for zinc is especially important for cognition and immune-system function.”

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Jungbunzlauer’s Gerhart agrees that the future for zinc is bright: “Awareness of zinc and its various beneficial effects on human health has grown steadily in recent years. Its physiological versatility, which offers various options for new product concepts, combined with its relative low cost in use, demonstrates why zinc is forecasted to continue its growth within fortified foods and supplements.”

**Move over, magnesium! Is 2016 the year for zinc?**

**Probiotics**

North America and Europe are home to some of the most established probiotic markets in the world, but the real potential for dramatic growth may lie elsewhere. Which emerging markets should we keep an eye on? Latin America and Asia are among the...
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Joint health & Skin moisturizing

Gabarelax™
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most promising, says George Paraskevakos, executive director, International Probiotics Association (IPA).

Because of the large and still-untapped consumer base in these younger markets, “the growth curve of opportunity is way higher than what you’ll see in a more mature market,” says Paraskevakos. Specifically, he points to Brazil, Mexico, Colombia, China, Japan, South Korea, and possibly Southeast Asia as some of the most interesting hot spots on the radar.

Euromonitor sees promise in many of the same countries. For probiotic yogurt specifically, global growth is being driven by countries like China, which added $1.4 billion in new sales between 2012 and 2014, reported Ewa Hudson, head of health and wellness, Euromonitor International, during her October 2015 SupplySide West presentation “Changing World of Probiotics—Global Market Snapshot.” Probiotic yogurts are also growing big in China, probiotic sticks, sachets, and powders perform better in South Korea, Paraskevakos says. And probiotic foods are the predominant choice in South America, although demand for supplements is on the up.

“It’s a very varied industry in terms of how people get their probiotics,” Paraskevakos confirms. “It’s so region- and even country-specific.”

In emerging markets, digestive health is usually the first probiotic health area that proves successful in reaching consumers, says Paraskevakos. “It all begins in gut health, and then as the thirst of consumers grows and they start to get used to the consumption of the probiotic and getting past that initial stage of knowing it’s good for your gut, then other [health] areas start to come through,” he explains.

Despite this entry-point similarity, preferences for product type tend to vary wildly. For instance, while probiotic yogurts are growing big in China, probiotic sticks, sachets, and powders perform better in South Korea, Paraskevakos says. And probiotic foods are the predominant choice in South America, although demand for supplements is on the up.

“It’s a very varied industry in terms of how people get their probiotics,” Paraskevakos confirms. “It’s so region- and even country-specific.”

In emerging markets, 2016 may also be big for regulatory issues, primarily because of developments in Europe and the United States that could set the tone around the world. Paraskevakos points to FDAs impending release of New Dietary Ingredient (NDI) guidance that, when finally released, could change the way regulators treat probiotics in the United States. And in Europe, regulators are expected to offer additional comments on permissible probiotic health claims in the first months of 2016, he says.

“If Europe turns around and makes probiotics pharmaceutical drugs, that’s going to raise flags for other regulators across the world,” Paraskevakos adds.

Yet, as concerning as the regulatory drama in Europe is, it may also be contributing to the rise of new probiotic markets around the globe. Frustrated by limiting regulations in Europe, many probiotic companies are shifting their resources to other parts of the world where they are able to more freely commercialize their products, explains Paraskevakos.

Algae

With partnerships building around algae ingredients for food purposes, will we see more use of these ingredients in the near term?

The need is certainly growing, according to Mark Brooks, senior vice president, food ingredients, Solazyme (San Francisco). “We expect to see great success given that these oils have been shown to allow food manufacturers to remove added preservatives in foods such as dressings and mayonnaise and to remove partially hydrogenated vegetable oils completely.”
REMPRO: Instant Egg White Protein

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Brooks is referring to Solazyme’s AlgaWise oil line, now marketed in partnership with oils specialist Bunge Ltd. (White Plains, NY). Announced late in 2015, the two are teaming up to commercialize food and animal nutrition algal oils and have rolled out three ingredients to start: an oil to replace saturated fat, a high-stability trans fat–free oil to replace partially hydrogenated oils in frying and other applications, and an oil specifically geared to confectionery, bakery, and spreads. “The Bunge partnership will help grow the demand for algae food products, given Bunge’s global leadership and expertise in food and ingredients and their deep understanding of the value of algae as an ingredient,” Brooks says. AlgaWise saw its first launches. (At the Vitafoods Europe show last May, Por-
tugal-based chlorella supplier Allmicroalgaes boosted its chlorella powder line for food, introducing a new liquid chlorella extract specifically made friendlier for certain food and beverage applications. (The company was formerly known as Alma until it became part of the company Allmicroalgae in November 2015.)

Allmicroalgae’s business development manager Sofia Hoffman de Mendonça says

### Ingredients to Watch

Chlorella algae like Solazyme’s have successfully made inroads in the food market. Spirulina is also found in numerous launches.

Solazyme also partnered with Glanbia Nutritional (Carlsbad, CA) last year on another algae food interest, algal protein, with Glanbia distributing Solazyme’s AlgaVia Whole Algal Protein to grow this still-emerging protein source. “While algal protein does occupy a relatively small portion of the protein market, we are confident in the significance of its role,” says Elaine Drummond, clinical and technology development officer, Glanbia. She points out that AlgaVia feeds in perfectly to demands for vegetarian/vegan and non-GMO products, while providing whole-food complex carbohydrates, polyunsaturated fatty acids, tocopherols, vitamins, and minerals. In 2016, she expects upward movement for vegan proteins like AlgaVia.

Chlorella algae like Solazyme’s have successfully made inroads in the food market. Spirulina is also found in numerous launches.

### CONVENTIONAL CHANNEL (UNITED STATES)

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<td>$232,203,377</td>
<td>3.6%</td>
</tr>
<tr>
<td>Multivitamin (Senior)</td>
<td>$234,247,371</td>
<td>$242,812,587</td>
<td>(3.5%)</td>
</tr>
<tr>
<td>Multivitamin (Children)</td>
<td>$208,235,891</td>
<td>$213,564,686</td>
<td>(2.5%)</td>
</tr>
<tr>
<td>Calcium</td>
<td>$196,603,866</td>
<td>$198,129,592</td>
<td>(0.8%)</td>
</tr>
<tr>
<td>Melatonin</td>
<td>$193,612,346</td>
<td>$157,890,090</td>
<td>22.6%</td>
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<tr>
<td>Psyllium</td>
<td>$181,030,374</td>
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<td>Glucosamine/Chondroitin Combo</td>
<td>$170,240,394</td>
<td>$198,742,681</td>
<td>(14.3%)</td>
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<tr>
<td>Fiber - Other</td>
<td>$161,545,786</td>
<td>$151,443,145</td>
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<tr>
<td>Co-Enzyme Q10</td>
<td>$144,689,466</td>
<td>$137,425,412</td>
<td>5.3%</td>
</tr>
<tr>
<td>Vitamin B12</td>
<td>$143,870,412</td>
<td>$128,715,358</td>
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<tr>
<td>Multivitamin (Men)</td>
<td>$131,762,534</td>
<td>$114,737,127</td>
<td>14.8%</td>
</tr>
<tr>
<td>Eye-Health Formulas</td>
<td>$126,948,020</td>
<td>$134,105,419</td>
<td>(5.3%)</td>
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<td>Biotin</td>
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<td>$92,148,582</td>
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<tr>
<td>Horehound</td>
<td>$114,850,413</td>
<td>$105,886,754</td>
<td>8.5%</td>
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Source: SPINSscan Conventional, powered by IRI

Time period: 52 weeks ending 12/27/15 versus the 52 weeks ending 12/28/14

Channel: Conventional multi-outlet, comprising 101,000 retail locations spanning grocery, drug, Wal-Mart, mass, dollar, military, and club stores
my curcumin should be adulterated
my curcumin should be synthetic
my curcumin should infringe patents
my curcumin should be unnecessarily bioavailable

my curcumin should only be Curcumin C3 Complex® by Sabinsa
my black pepper extract should be toxic
my black pepper extract should be clinically unsubstantiated
my black pepper extract should infringe patents
my black pepper extract should be confused with table side pepper

my black pepper extract should only be BioPerine® by Sabinsa
One niche to keep an eye on is the market for omega-3 ultra-high concentrates.

the new Chlorella Water Extract has a higher solubility (removing some of the omega-3 and omega-6 oils present in the powder version of the ingredient) and a “less intense” color and flavor. The year before, the company also introduced chlorella pieces to the food market. A Swedish company is now using Chlorella Crunches to make health food. “We also have other companies exploring the possibility to include the crunches within cereal bars and to use the flavored versions as healthy snacks,” de Mendonça says. All microalgae’s ingredients are also in chlorella pastes for foods like cream cheese, as well as in “bubbles” for bubble tea (“green pearls containing a sweet solution with chlorella powder inside”), both developed by Portuguese food company Frulact.

What kinds of products can benefit from algae? Suppliers name endless applications. “Algae are very versatile and can also play a role in the switch from artificial and/or synthetic ingredients towards natural ingredients such as whole algae or extracts derived from algae,” says Anneke Roes, marketing and sales manager for Dutch algae firm Nutress.

Market researcher Innova Market Insights pegs some specific product types as promising. Given algae’s protein potential, meat substitutes are growing, such as vegetarian algae sausage Brat-Algenwurst by German company Remis Algen or soy cakes with algae by Natursoy in Spain, both launched last September. Algae drinks like those introduced by Helga and Natufood last year saw the highest global growth in terms of algae food launches in 2015, Innova says.

Last year, algae drinks also grew in the United States. New to market were Spiru-Tein’s whey protein powder (spirulina) and Goodbelly’s Tropical Green Flavor probiotic juice (spirulina and chlorella). Sports-nutrition powders like Spiru-Tein are “fertile ground” for algae in the U.S., with market-penetration growth of 3.6% last year, Innova says.

Also in the United States, algae ingredients are picking up in cereal and energy bars, as well as other traditional foods like ice cream and chocolate bars such as those from Doisy & Dam in the UK (spirulina) and Conscious in Belgium (blue-green algae), both launched last year.

Nutress believes there is plenty of potential globally, and the company has its eye on the Benelux region for its food-grade chlorella. In December, the company partnered with Belgian distributor Azelis to bring the ingredients to Belgium, the Netherlands, and Luxembourg. The line includes frozen (IQF) ingredients, dried flakes, and powders, which can be used to reduce sugar, salt, and “bad” fatty acids, while serving as a clean-label natural colorant and shelf-life extender, Roes says. Chlorella’s subtly salty umami flavor “stimulates the salivary glands and therefore enhances sweet and salty flavors,” she adds, all while improving nutritional value with chlorella’s macro- and micronutrients. Algae can enhance the color of smoothies or be added to dough to reduce salt. It can also mix in with icings, coatings, mousses, and creams or be applied as a garnish (flakes or powders).

The options, it seems, are endless, and along with it, business for suppliers. “Our algae-based ingredients can be found in food products in more than 10 aisles of the grocery store here in the United States,” says Solazyme’s Brooks. “Our customers are using us in a range of applications. We expect to see an increased interest in algae as a food ingredient in 2016, given the consumer interest in healthier and wholesome food ingredients.”

Omega-3
The value of omega-3 ingredients may be declining in leading markets, but elsewhere around the globe, the story is different. While the value of U.S. and European omega-3 markets fell, value increased in emerging markets like Asia-Pacific and South America, according to the 2013—2014 EPA & DHA Ingredient Market Report just out from the Global Organization for EPA and DHA Omega-3s (GOED; Salt Lake City, UT).

The value of omega-3 ingredients increased in emerging markets like Asia-Pacific and South America, according to GOED’s new 2013–2014 EPA & DHA Ingredient Market Report.
Ingredients to Watch

SupplySide West, including the market’s first high-concentrate algal oil from DSM with up to 85% omega-3 DHA concentration.

Will consumers have an appetite for higher concentrates for higher prices? Time will tell, and category growth also depends on dynamics in other sectors of the omega-3 market. GOED’s communications director, Ellen Schutt, points out that while the total volume of omega-3 concentrate oils was up 3.4% in 2014 over 2013, their value decreased 6.6% at the same time to $667 million due to lower omega-3 supplement usage overall in established markets such as the United States. The silver lining? Consumers in China and emerging markets are starting to demand more concentrates, Schutt adds, beyond the category leaders, the United States and Europe.

Nordic Naturals is one omega-3 brand placing faith in concentrates. Last November, the company launched Omega ONE, an ultra-high concentrate with 80% EPA+DHA (with 90% or more of that in the absorbable triglyceride form).

“Nordic Naturals is seeing consumers who understand what this higher concentration means to them, like less pill fatigue and the opportunity to reach a higher dose of EPA and DHA in fewer soft gels. This can potentially translate to improved compliance and results, provided that the quality, freshness, and purity factors are intact,” says Tone Larson, product development manager, Nordic Naturals. Another plus? High concentrates can reach new audiences, such as practitioners who only want to prescribe higher levels of EPA and DHA in a clinical setting, Larson adds.

Harry Rice, PhD, GOED’s vice president of regulatory and scientific affairs, says there are two more reasons to keep an eye on the omega-3 market overall, especially in the United States. GOED is still waiting to hear back from FDA on whether or not DHA/EPA will be granted a qualified health claim for reduction of blood pressure. Although FDA has postponed its decision three times and could postpone again, Rice says it would be surprising if the agency does not come back with a final decision in 2016.

GOED also continues to hope that EPA/DHA will be selected to undergo an Institute of Medicine (IOM) Dietary Reference Intake (DRI) review. A report from a 2015 DRI workshop held by a U.S. and Canadian assessment group is due this March and could get the ball rolling for what many hope will one day be a DRI value for omega-3s.

Egg Replacers

The avian influenza outbreak made headlines in 2015 for prompting a U.S. egg shortage, but it could continue to have a big impact on egg-replacement ingredients in the year ahead. Although the worst days of the egg crisis may have passed, many of the innovations it inspired will soon be making their debut.

“Projects started in summer 2015 during the height of the crisis might not be completed and launched until sometime in 2016,” says Jon Stratford, sales and marketing manager, Natural Products Inc. (Grinnell, IA). “Food makers who made a strategic commitment to reducing their reliance upon eggs may continue their R&D and launch (or re-launch) their reduced-egg products well into 2016,” says Jon Stratford, sales and marketing manager, Natural Products Inc.

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the price of eggs and prompt formulators to look toward egg alternatives this year, suggests Mike Buttshaw, vice president of ingredients sales and marketing, MGP Ingredients (Atchison, KS). He says MGP’s Arise line of wheat protein isolates offers especially dependable replacements for egg whites in many applications.

“The majority of egg-containing food products are flour-based foods (bakery, pasta, and noodles), which makes Arise wheat protein isolates compatible in those food systems in terms of functionality, labeling, and applicability for vegetarian/vegan diets,” says Buttshaw.

Then again, the avian flu epidemic has largely been managed, so 2016 may not be as big of a year for egg replacers as 2015, suggests Ricardo Rodriguez, marketing manager of confectionery & bakery at Ingredion (Westchester, IL). However, Rodriguez believes consumer awareness of egg replacers has increased and the “free from” movement will continue to drive demand for allergen-free ingredients like egg replacers.

“Tone believe that some companies that were forced to look at [egg] alternatives will in fact stay with them, because they worked well,” says Rodriguez.

Rodriguez sees pulse-based ingredients among the next generation of egg-replacer ingredients, such as Ingredion’s Vitesse pulse proteins and Homecraft pulse flours. He says the pulse-based ingredients work well on their own as egg replacers or in combination with other products, such as Ingredion’s Precisa Bake 100 texturizing system, which further extends the egg-replacement capabilities while preserving texture and taste.

Algae may be another simple and cost-effective egg substitute in certain applications. Microalgae firm Solazyme says its AlgaVia whole algal flour is ideal for maintaining the indulgent mouthfeel provided by eggs and dairy fats in products like ice cream and alfredo sauce.

But there may still be applications when only real eggs will do the job.

“Eggs provide better flavoring, better functionality, consistent performance, consumer familiarity, and a clean label,” says egg supplier Rembrandt Foods (Spirit Lake, IA). “Replacers often function on a basic level, but fall short when compared to the expectations of using real eggs.”

During the egg crisis, Rembrandt created “egg extenders” that blended real eggs with other functional ingredients to stretch the diminished egg supply a little further. The egg extenders were meant to be used as a 1-to-1 substitute for standard eggs, while providing the taste, aroma, and coloring typical of standard dried egg products, according to Rembrandt.

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Flavor Forecast

A new year is here, and with it, flavor firms’ predictions for 2016’s trendiest tastes.

BY JENNIFER GREBOW, EDITOR-IN-CHIEF

Flavor preferences may come and go, but if we’ve learned anything in recent years, it’s that topline trends are here to stay. In 2016, shoppers will continue seeking flavors deemed natural, healthy, and “clean,” as well as twists on oldies but goodies. But they will also retain a sense of adventure and a willingness to explore new regional notes.

“Mega trends” like natural and clean-label reflect the new way in which companies approach flavor selection, points out Anton Angelich, group vice president, marketing, Virginia Dare (Brooklyn, NY). Food and beverage firms aren’t primarily looking for vastly unexpected flavors anymore, he says; rather, they are more focused on identifying consumers’ primary concerns—natural, clean-label, “free from,” non-GMO—and building flavor palettes around those key drivers.

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Natural, Organic, “Free From,” and Clean-Label

Demand for ingredients that are clean-label, natural/organic, and free of artificial additives, high sugar, and preservatives extends to all aspects of the food and beverage chain. Flavors are no exception.

One example of a trending natural source? "Barks, roots, and leaves will all come back on the scene in a big way," predicts Lauren Williams, marketing manager, beverage flavors, North America, Sensient Flavors (Hoffman Estates, IL).

Specific examples include honeyed evergreen, a pine flavor the company describes as “crisp” and “softened by honey instead of sap.” (“Tree’ is the new ‘seed,” Williams adds.) Another example is sassafras root. “This herbal plant’s flavor falls somewhere between a medicinal tonic and root beer,” Williams says. "With consumers’ interest in bitters, roots, and craft sodas, this flavor is sure to get them talking.”

Wild Flavors and Specialty Ingredients’ (Decatur, IL) American Oak distillate is a good example of an ingredient the company says is now drawing formulator attention, not only for its “leathery notes, vanilla, dried fruit, and a hint of floral rose aromatics” but also for its clean-label appeal. It can be labeled simply as a distillate, “making [it] much friendlier for clean- and clear-label needs,” says Mark Rainey, vice president, marketing, Wild Flavors (now a division of ADM).

Demand will also be up for non-GMO flavors in 2016, according to Ed McIntosh, marketing manager for Flavorchem Corp. (Downers Grove, IL). “As FDA has not defined and probably will not define anytime in the near future what constitutes natural, consumers will look at flavors and ingredients that are..."
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non-GMO, such as cocoa, coffee, orange, and peppermint,” he says. As it happens, the company just released a line of Non-GMO Project Verified flavors, including those mentioned above.

**What’s Old Is New**

Artisan flavors with homemade appeal “will be popular because artisanal is synonymous with quality and health,” says McIntosh. According to Virginia Dare, “retro” flavors with all-American appeal include strawberry rhubarb pie, peach cobbler, blueberry pie/blueberry crumble, carrot cake, bananas foster, and bourbon bread pudding. Many of the company’s 2016 predictions draw from the comfort of the bakery and dessert isle, including cinnamon bun, cherry cheesecake, strawberry cheesecake, black walnut cookie, chocolate hazelnut, pumpkin pie, sweet potato pie, tiramisu, caramel apple swirl, and the trending “birthday cake.” And, like last year, the company cites these flavors as continuing to rise across categories: maple (or even maple cinnamon), ginger (or ginger peach), salted caramel, and salted vanilla.

New twists on classics build a bridge between the unfamiliar and the known. Take coconut, says Sensient’s Williams. The company is now promoting charred coconut. “The coconut has become as ubiquitous as the apple,” she says. “We have combined that with another flavor that is becoming a pillar of American cuisine—smoke. Not just smoke, in fact. We’ve put the coconut much closer to the flame and let it roast there.” Flavor firm Fona International (Geneva, IL) also confirms the popularity of smoky flavors, which it now classifies as “everyday.”

**Woody notes** are adding complexity to existing flavors for alcoholic drinks and even floral-flavored teas, says Synergy Flavors (Wauconda, IL). These woody notes are even taking a turn in confectionery products, soups, sauces, protein products, and even fruits like avocado and tomatoes, adds Synergy’s technical director, Paulette Lanzoff.

How about a new take onmelon? Sensient now offers overripe melon, a flavor that also addresses today’s sustainability initiatives. “As focus on food waste comes front and center, we are bringing that to the flavor world by appreciating the melon, which is so often served under-ripe and tossed when it is truly ripe. The green notes mixed with fermentation—and, therefore, a bit of alcohol—is a biologically attractive scent and taste to humans,” Williams says.

Finally, by applying traditional preservation to cherry blossom, Sensient is proposing what it calls preserved cherry blossom. “Americans are into pickling, preserving, curing, brining, and other ways to make seasonal ingredients last all year,” Williams explains. “The notoriously short cherry blossom season is a global sensation, making the floral, fruity cherry blossom the perfect candidate for this treatment.”

As consumers gravitate toward food “interaction”—paying attention to how food is made—“how food and beverages are prepared, such as fermenting, pickling, and smoking, is becoming significant,” adds Catherine Armstrong, vice president, corporate communications, Comax Flavors (Melville, NY). “We created an array of flavors based on specific preparations to appeal to a wide audience.” These include coconut vinegar, pickled artichoke, roasted strawberry, and smoked avocado.

**Tea Inspiration**

Many flavor firms point to growing interest in tea flavors. Drink companies have already watched matcha green tea take off. “According to the Sage Group [marketing consultant], U.S. retail sales of matcha green tea powder reached about 55% in 2014,” Comax Flavors points out. (Today, Fona International categorizes matcha as a mainstream flavor.)

“Tea’s healthy antioxidant properties catalyzed it into one of America’s favorite beverages,” explains Synergy Flavors’ Lanzoff. She says tea flavors are now infiltrating foods such as cakes, ice creams, and sorbets, and that green tea is even appearing in breakfast foods and baked goods.

Comax Flavors is introducing its Cup of Tea collection for 2016. “According to Mintel, U.S. retail sales of tea and ready-to-drink tea grew 19.8% to $7.3 billion between 2009 and 2014,” the company says. “The Tea Association of the USA cited that 85% of tea consumed in America is iced tea, and loose-leaf tea is growing in popularity.” The Cup of Tea flavor collection includes cascara tea, dandelion tea, matcha rose, and turmeric orange ginger.

Rainey says Wild Flavors is also seeing “strong interest in a wide range of our proprietary and market-differentiating tea essences.” He adds, “We’re seeing tremendous demand for our white tea extracts, as well as a wide variety of others, too. These are being used for a wide range of applications, including beverages, food, and snacks.” Plus, these flavors can be clean-labeled as “tea essences.”

Virginia Dare, which suggests green tea in 2016, has another twist: lime green tea.

Alongside demand for tea flavors comes demand for coffee flavors, Lanzoff adds. “The versatility of coffee flavor is exploding in a variety of food and beverage products such as sauces, beer, candy, desserts, and sports nutrition products such as RTDs and bars,” she says.

**Regional Is Hot**

For consumers feeling more adventurous, there are a host of flavor suggestions from all corners of the world.

Ethnic spices are finding broader appeal, says market researcher SPINS (Schaumburg, IL). “Some spices to keep tabs on are dukka, harissa, and sumac (North Africa), sambal (Southeast Asia), gochujang (Korea), and ghost pepper (India). Of particular interest to the spicy-loving crowd, ghost pepper has emerged as a specialty flavor in sauces, salsas, infused honey, chips, jerky, and nuts,” says SPINS in its 2016 Trend Predictions report.

Some of the “hottest” spicy flavors are regional specialties. The Turkish Urfa Biber chili pepper is one of them. Sensient’s Williams describes the flavor almost poetically: “From time to time, you come across something that is so luxe, it makes you feel special when you use it. This is one of those things. The rich, raisin-y, chocolate taste of this chile has notes of tobacco and wine. This is standout in a chili category that is saturated.”

The lifting of the U.S. economic embargo on Cuba could result in renewed interest in Cuban cuisine, points out Comax Flavors. As such, it is recommending these flavors: Café Cubano, Cuban sofrito, Mamey mojito, and toasted coconut flan. “We see Cuba as a natural extension for the next ethnic food inspiration,” Comax’s Armstrong adds.

Classic flavors from Mexico are getting a new twist from Sensient Flavors. Chamoy is one of them. “This fun mash-up of flavors combines the smoky heat of ancho chilies
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Flavors to Watch

“Consumers’ renewed interest in revisiting classics updated with an artisanal emphasis can take this flavor to a new level,” she adds.

Virginia Dare recommends a range of Hispanic-inspired flavors in 2016, including tres leches cake, strawberry horchata, pineapple cream, and mango/guava.

McCormick & Company (Sparks, MD) includes Southeast Asia flavors in its 2016 flavor forecast, particularly flavors from Malaysia and the Philippines. And Sensient is recommending pandan, described as a “green, nutty, and almost bready Southeast Asian staple.”

Fruits, Veggies, and Other Botanicals

Fruit and vegetable flavors continue trending, feeding nicely into demands for natural, less processed, “better for you,” and sustainable ingredients, Comax Flavors points out.

“There’s been a gradual increase in green-themed products, and to tap into this trend and meet the demand for green vegetables and fruits, we created a unique green range,” says Comax’s Armstrong. The company’s new Green Goodness collection includes avocado pear, broccoflower, green jackfruit, and jalepeño honey.

Gold Coast Ingredients (Commerce, CA) has a recommendation that offers both regional and fruit-based appeal: lucuma.

“Driven by our society’s ongoing quest to find the next superfruit, we think lucuma, the commonly eaten fruit in Peru with a subtly creamy and caramel-like flavor profile, will gain popularity in the nutraceutical industry during 2016,” says Megan Trent, marketing. Lucuma is already in ice cream and chocolate bars, but as consumers become more familiar with the fruit, Trent says, applications can branch out. The flavor complements everything from smoothies and shakes to protein-enriched ice cream and nutrition bars.

Speaking of superfruits, Synergy Flavors pegs blackcurrant (cassis) as a flavor to watch.

“Popular in Europe for its antioxidant effects,” says Lanzoff. Cassis is already in jams, sodas, teas, alcoholic drinks, and baked goods, but its use can extend to nutritional products like nutrition bars, branched-chain amino acids, and flavored protein water, she says.

If this list isn’t enough for you, take a look at some other plant-based flavors that Fona International pegs as “up and coming”: bergamot, elderflower, lavender, rooibos, and juniper. Mainstreaming flavors are lemongrass, fig, saffron, rhubarb, cardamom, and cashew. And for the truly novel? Fona points to harissa, lulo, ube/purple yam, sea buckthorn, golden berry, peri-peri/piri-piri, feijoa, and cupuaçu.

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Supplements Under Study

A sneak peek at upcoming dietary supplement research projects at the National Institutes of Health

By Maureen Kingsley

Industry, take note! Dietary supplements of all stripes (herbal, botanical, vitamins, minerals, marine-based, and more) are the subjects of numerous research studies and clinical trials this year. The National Institutes of Health (NIH) and its various branches are sponsoring studies of niacin, tart cherry and aronia berry, resveratrol, and vitamin E, among many, many others. The Global Organization for EPA and DHA Omega-3s (GOED; Salt Lake City) has on its radar three omega-3 fish-oil studies in particular whose results could have a major impact on the fortunes of its members.

Ahead, we outline some of the more interesting NIH dietary-supplement studies—most of which target cardiovascular health—and briefly summarize the omega-3 research noted by GOED’s leadership.

Niacin
The NIH’s National Heart, Lung and Blood Institute (NHLBI) is sponsoring a clinical research study of niacin’s positive effects on human cardiovascular health. (Niacin is found naturally in such foods as fish, meat, fruits, and vegetables. It is, of course, also available as a supplement.)

The researchers are hoping to better understand how niacin supplementation benefits cholesterol levels, fat metabolism, and vascular health in adults aged 18–99 with fasting good cholesterol (HDL-C) below 60 mg/dL.

Eligible participants will receive a two-week supply of niacin. They will take two tablets daily for one week, then four daily thereafter.

Tart Cherry and Aronia Berry
In a study sponsored by the National Institute of Nursing Research (NINR), researchers will observe the effects of tart cherry and aronia berry supplementation on endothelial function and cardiovascular measures in healthy older adults (ages 55–75). Specific heart-health markers under examination include inflammation, oxidation, and cholesterol.

Study subjects will include men and women. For three weeks each, participants will take aronia berry extract capsules, tart cherry extract capsules, placebo capsules, and no capsules. They will report for a study visit every three weeks.
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Opinions are mixed on the power of resveratrol supplements, with the National Institute on Aging the latest to investigate benefits for heart health.

**Resveratrol**

The National Institute on Aging (NIA) is studying the hotly contested red-grape compound, resveratrol, in a study whose objective is to determine resveratrol’s effects on heart and blood-vessel health in older, overweight persons, and at what dosage.

Healthy overweight, nonsmoking older adults (aged 50–100 years) will participate in a screening visit and four study visits. Some of the study visits will involve overnight in-patient stays. Participants will be separated into three groups, two of which will take different dose levels of resveratrol. The third group will take a placebo.

**Vitamin E**

A complex, three-armed study will look at vitamin E pharmacokinetics and biomarkers in women, a population for whom vitamin E has been historically understudied.

The goal of this study, which is sponsored by the National Institute of Diabetes and Digestive and Kidney Diseases (NIDDK), is threefold: 1) to determine the amount of fat required to obtain the best vitamin E absorption from a meal, 2) to determine the amount (i.e., best dose) of vitamin E that must be consumed before it can be measured in the blood, and 3) to examine how vitamin E and vitamin C work together in the body, in conjunction with diet and vitamin supplements.

This study is recruiting women only, ages 18–40. It will consist of five one-month-long studies.

**Omega-3 Fatty Acids**

GOED is “eagerly anticipating” three large, ongoing omega-3 clinical studies with cardiovascular outcomes, says Harry Rice, vice president of scientific and regulatory affairs. None is due to be published this year, but it is “possible, albeit unlikely, that preliminary results could be presented at a scientific meeting,” Rice shares.

The first is VITAL-Bone Health, which involves two ancillary studies evaluating the effects of vitamin D and/or omega-3 fatty acid supplements on incident fractures and bone-health outcomes in the Vitamin D and Omega-3 Trial (VITAL). Results from these studies, sponsored by Brigham and Women’s Hospital (Boston) will, ideally, clarify the relationship between supplemental vitamin D and/or omega-3 fatty acids on bone health, and inform clinical care and public-health guidelines on supplementing with vitamin D for the prevention of fractures in women and men.

The second study is titled “Outcomes Study to Assess Statin Residual Risk Reduction with Epanova in High CV Risk Patients with Hypertriglyceridemia (STRENGTH).” Sponsored by pharmaceutical firm AstraZeneca (which sells omega-3 drug Epanova), the study will include eligible men or women considered to be at high risk for atherosclerotic cardiovascular disease.

Amarin Pharma’s REDUCE-IT study is the third that is eagerly anticipated by GOED, with the sponsoring company expecting to publish results in 2018. The purpose of this large study, according to information on ClinicalTrial.gov, is to evaluate whether the high-concentrate EPA drug AMR101, combined with a statin therapy, “will be superior to the statin therapy alone when used as a prevention in reducing long-term cardiovascular events in high-risk patients with mixed dyslipidemia.”

Maureen Kingsley is a freelance writer, editor, and proofreader based in Los Angeles. She covers a variety of industries, including medical technology, food-ingredient manufacturing, and cinematography.
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IT'S IN THE DETAILS.
Try as we might to keep cool, calm, and collected, stress is an unavoidable aspect of modern life. Between long working hours, excess caffeine consumption, and addictive digital devices disrupting sleep, it’s no surprise that many of the top ingredients for sleep and mood support have seen sales climb in the past year.

During the 12 months ending in October 2015, sales of U.S. mood-support supplements containing magnesium were up 26.3% over the previous year, mood-support gamma-aminobutyric acid (GABA) sales were up 16.7%, and mood-support ashwagandha sales were up 57.3%, according to SPINS.1 During the same period, sales of sleep supplements containing melatonin were up 19.6%, and sleep supplements containing valerian were up 6.9%.

But strong supplement sales isn’t the only exciting news for the relaxation market. New ingredient combinations and an increasingly varied range of product types are also changing the way consumers approach relaxation ingredients.

“Innovation has been very prevalent in the sleep aid industry,” says Ayako Homma, U.S. analyst, Euromonitor International. “Formulations are moving towards complex blends of botanicals, and delivery formats are increasingly creative, ranging from liquid concentrates and drops to oral film strips.”

A similar movement seems to be taking place within the mood-support sector of the relaxation market. Combine this shift in formulation trends with promising new ingredients and research, and the relaxation market actually looks pumped.

**Beverages, Shots, Melts, and More**

With so many new products launched in just the past few years, the range of product types marketed for relaxation is now impressively broad. Let’s start with stress relief.

Ashwagandha supplier Ixoreal Biomed (Hyderabad, India) says formulators have increasingly become aware of the stress-relieving potential of its KSM-66 brand ashwagandha, driving its presence in both new products and updated products.
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Relaxation

Allysian’s Sinless functional dark chocolate includes KSM-66 ashwagandha.

“A major trend is that formulators incorporating ashwagandha have moved beyond capsules and tablets to using foods and beverages as delivery mechanisms,” says Kartikeya Baldwa, director, Ixoreal Biomed. “KSM-66 ashwagandha is now used in teas, energy drinks, bars, chewing gums, chocolates, and beverage add-on powders. This makes KSM-66 more accessible and easy to incorporate into one’s daily intake.”

Recently launched relaxation products featuring KSM-66 include 8-12Hz Neural Gum from Effective, Sinless functional dark chocolate from Allysian, Food of the Gods chocolate turmeric elixir from Spice Pharm, and the Rebbl Ashwagandha Chai Super Herb Elixir beverage, winner of BevNET’s 2015 Best Functional Beverage award.

Baldwa adds that a recently completed study may add further support for ashwagandha’s role in relaxation products. The yet-to-be-published study found ashwagandha may help reduce stress and stress-induced food cravings in moderately overweight adults, Baldwa claims.

L-theanine, another popular ingredient for mood support, is also appearing in some new product types. Ingredients complementary with other ingredients. “As formulators’ understanding of ashwagandha grows, they recognize synergies and complementarities with other ingredients.”

Ingredients Come Together

Combining multiple relaxation ingredients in a single product is another growing trend, suggests Euromonitor. Along those lines, ENI’s Bewicke says he has seen a rise in sales of ENI’s Calming Blend, which marries AlphaWave L-theanine with extracts of chamomile, valerian, lemon balm, passionflower, and hops.

“Also, some companies are interested in customized blends,” says Bewicke. “It makes sense to use other ingredients that have long histories of use for relaxation.”

Chris Schmidt, senior health analyst, Euromonitor, has also seen L-theanine gain traction recently in combination with other herbal ingredients, such as Rhodiola rosea and ashwagandha.

Ixoreal Biomed is seeing similar combo trends developing around ashwagandha. Baldwa mentions Zembrin (Sceletium tortuosum) from PLT Health Solutions and magnesium as two ingredients that are being paired with ashwagandha to create promising “complementary bundles” for relaxation.

“We do see more interest in combining ashwagandha with other ingredients,” says Baldwa. “As formulators’ understanding of ashwagandha grows, they recognize synergies and complementarities with other ingredients.”

PSPA for Stress Relief

Beyond new applications for established ingredients, what are some of the up-and-coming relaxation ingredients to keep an eye on?

A new phosphatidylserine (PS) and phosphatidic acid (PA) complex from Lipogen (Haifa, Israel) is aimed at alleviating the stress response and improving cognitive health. Called Lipogen PSPA, the ingredient is the only PSPA solution available on the market for stress relief, Lipogen says.
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The success of phosphatidylserine as a cognitive-health ingredient led Lipogen to research the ingredient’s stress-relieving potential, including two human clinical trials suggesting it may normalize the body’s internal cortisol secretion and support a healthy response to psychological and social stress.

In the most recent study, published in Lipids in Health and Disease in 2014, 75 healthy men aged 20–45 were randomly allocated to consume either 400 mg PS and 400 mg PA, 200 mg PS and 200 mg PA, or a placebo. The supplementation period lasted 42 days, with endocrine stress response measured at the conclusion of the study based on adrenocorticotropic hormone (ACTH), salivary cortisol, and blood serum cortisol responses to the Trier Social Stress Test (TSST).

Compared to the placebo group, the 400-mg PSPA group demonstrated a normalized ACTH, salivary cortisol, and blood serum cortisol response to the acute stress test. But supplementation with 200 mg of PSPA did not result in a significant difference in these measures from the placebo. What’s more, the 400-mg PSPA effects were only observed in chronically stressed subjects, but not in subjects with low levels of stress.

Researchers concluded that in chronically stressed subjects, supplementation with 400 mg of PSPA may be able to “normalize the hyper-responsivity of the HPAA [hypothalamus-pituitary-adrenal axis] to an acute stressor.”

Lipogen PSPA made its U.S. debut in 2015 in the stress-management supplement PS-PA Synergy from Jarrow Formulas (Los Angeles). Lipogen says its PSPA ingredient is mainly focused on the dietary supplements industry, but it is Generally Recognized as Safe (GRAS) by FDA and is an appropriate ingredient for cereals, bars, gummies, and other product types, too.

Vitamin D for Sleep?
Recent research also suggests a potential role for vitamin D in maintaining healthy sleep.

A 2015 cross-sectional study of 2966 men aged 68 and older investigated the connection between total serum vitamin D and sleep. Researchers found that lower serum vitamin D levels were associated with shorter sleep duration and lower sleep efficiency. Although they conceded that the reasons for the finding were unclear, researchers hypothesized it may be due to “the presence of vitamin D target neurons in these regions of the brainstem that affect sleep.”

A separate study published in 2014 found a similar correlation between vitamin D levels and sleep. Researchers reviewed cross-sectional data from the National Health and Nutrition Examination Survey to investigate the sleep measures and nutrient serum concentrations of 2459 adults aged 20–85.

Higher vitamin D levels were associated with lower incidence of sleepiness and insomnia, suggesting a potential protective effect of vitamin D on sleep quality, said researchers. They also found that higher folate serum levels were associated with reduced incidence of sleep disturbance, while higher serum levels of vitamin B12, a popular energy ingredient, were associated with shorter sleep duration.

Magnesium Holding Strong
Amidst these novel developments, let’s not forget about one of the mood-support heavyweights: magnesium.

SPINS reports U.S. magnesium sales in mood-support dietary supplements have climbed to a total of approximately $10.4 million in the 12 months ending in October 2015, up more than $2 million over the previous year. Magnesium supplier Albion Minerals (Clearfield, UT) agrees that even though magnesium has appeared in relaxation products for years, its usage in products for cognition is absolutely increasing.

“Magnesium products aimed at cognition and metabolic syndrome will continue to grow, and magnesium will continue to be a major performing ingredient in relaxant and cognition products,” says Max Motyka, consultant to Albion Minerals.

Even if up-and-coming ingredients are looking to shake up the relaxation market, strong sales and product innovations suggest established ingredients like magnesium, L-theanine, melatonin, and ashwagandha don’t need to be stressed yet.

References
1. Data includes natural supermarkets (excluding Whole Foods Market) and conventional multi-outlet channels. Comparison of 52 weeks ending 11/1/15 with 52 weeks ending 11/2/14. Based on primary ingredients in supplements. Ashwagandha figures for natural channel only.
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In a ready-to-drink (RTD) market where soft drinks are struggling, why are energy drinks doing so well? After all, soda is demonized for being sugar-high and unhealthy—but consumers don’t necessarily consider energy drinks that much better for them.

Based on a recent survey, market researcher Mintel reported that fully two-thirds of energy drink buyers “are concerned about the negative effects of energy drinks and shots.” Even so, Mintel notes, “that doesn’t deter them from consuming energy drinks.” Sales are resilient, even amidst negative energy drink headlines like those in 2012–2013 when U.S. lawmakers began looking into safety concerns, such as marketing to children.

“Energy drinks have a very loyal consumer base,” explains Elizabeth Sisel, Mintel beverage analyst. “Even energy drinkers likely became wary of the category while there was negative media attention surrounding its safety, which is why we see the category’s sales growth was the smallest in the time when that negative scrutiny was present. However, once the spotlight was off, consumers likely returned to their normal drinking habits.”

So, why the soft spot for energy drinks? “Energy itself is the reason,” says beverage expert James Tonkin, founder and president of consultant HealthyBrandBuilders. “We live in a stressed-out, get-it-done-now, go-go-go environment today.”

And it’s really as simple as that. We’re tired, we need energy support, and that is why drink giants are thriving. Leaders like Red Bull (whose value last year eclipsed $7 billion) and Monster (now partially owned by Coca-Cola) report that sales are soaring. In its most recent financials, Monster cited 19% net sales growth in Q3 2015 alone—that’s $757 million. With numbers like these, Mintel expects the U.S. energy drink market to grow 52% by 2019. Energy drinks are now growing at a faster clip than sports drinks and ready-to-drink tea (but slower than bottled water and ready-to-drink coffee). By contrast, growth in fruit drinks, carbonated soft drinks, and “value-added water” is on the decline, the market researcher reports.

Are there any chinks in the armor? Worries over what’s actually in these drinks are telling. Driven by concerns about popular drink ingredients like synthetic caffeine, there is a segment of shoppers looking for natural ingredients they perceive as healthier, such as natural—plant-based—sources of caffeine. Mintel estimates that 30% of energy drink users now consume “natural” energy drinks and shots.

“This is a potential growth area that we are watching, and many well-known brands, from juice to coffee to tea (V8, Starbucks, Arizona) have natural energy drink products,” Sisel says.

In a recent article for Nutritional Outlook, market researcher Innova Market Insights pointed out that Red Bull and Monster released their versions of “healthier” options, such as Red Bull’s Total Zero or Monster’s Energy Zero, both with zero calories and zero sugar. Mintel mentions Monster Energy Unleaded, which contains no caffeine. Monster is also targeting the sports nutrition market with Monster Energy Shakes with protein, Innova said.
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Tonkin mentions some common energy drink ingredients that are good candidates for natural replacements. “Taurine is very overused and if folks knew more about it, they perhaps would stop drinking traditional market-leading drinks. Guarana and glucuronolactone are two other ingredients that have been in traditional energy drinks and can and should be replaced by healthier alternatives,” he contends.

Other ingredients mainstream in energy drinks are B vitamins, ginseng, Ginkgo biloba, L-carnitine, sugars, and antioxidants. Innova Market Insights says that as of October 2015, guarana is still the top-selling natural alternative for energy drinks and now in one out of every four new products launches. Ginseng is next in line. Innova says the ingredient increased market penetration nearly 10% last year. Selling farther behind for now are green tea and other tea extracts, natural caffeine, and yerba mate.

Whether natural sources of caffeine are more beneficial than synthetic caffeine (such as providing a more-steady supply of energy minus the energy “crash”) is up for debate, but another undeniable advantage of a holistic, plant-derived energy source is the benefit of other phytochemicals intrinsic to the plant.

Let’s look at some of the botanical-based energy options on the market today.

Natural Caffeine Sources

Unwittingly or not, even as consumers look for natural energy sources, they still are drawn to those containing caffeine, and for good reason. “Caffeine works!” says Jackson Zapp, vice president, innovation, Applied Food Sciences (Austin, TX). “No other botanical remedy has the same efficacious result that caffeine has on consumers.” This is the primary reason energy drinks are so resilient, he says. Unlike with other products with long-term benefits (think immune health, or antioxidants), consumers can feel the boost from caffeine now.

“Caffeine is and will be an excellent source of energy because consumers can really feel it physically,” says Leslie Lannebere, business manager, Naturex (Avignon, France).

Guarana berry, green tea, and yerba mate are still the top natural-energy sellers that do contain caffeine. “Having a natural source of caffeine from guarana, yerba mate, or kola nut is definitely the best alternative to avoid caffeine media scrutiny because these botanicals are familiar in some extent to consumers, they provide a good image playing with ‘intuitive functionality,’ and they also provide a large spectrum of other components, such as polyphenols that—combined with caffeine—are responsible for enhanced benefits demonstrated in some clinical studies,” Lannebere adds.

Take green tea. Green tea offers numerous health boons beyond caffeineic stimulation. “Green tea–derived caffeine is probably the best source because it naturally contains some L-theanine, which can take the edge off the caffeine ‘jitteriness,’” says Brien Quirk, director of R&D, Draco Natural Products (San Jose, CA). “Green tea also contains a small amount of caffeine-related xanthine alkaloids with energy effects, such as theophylline and theobromine. [Tea catechin] EGCG might also increase some brain-stimulatory neurotransmitters through the COMT [catechol-O-methyltransferase] pathway.”

Green tea extracts are not just reserved for tea-flavored products anymore, Zapp points out. Given the “oversaturation” of tea-flavored beverages like iced and cold-brewed teas, “this may be why brand makers are reaching out to us seeking the same familiar benefits from green tea, only in the form of extracts that can be formulated into any flavor of shot or style of energy drink,” he says. “In other words, by using an extract, beverage makers are no longer limited to the scope of flavor that would otherwise be associated with the individual type of botanical.”

Unwittingly or not, even as consumers look for natural energy sources, they are still drawn to those containing caffeine, and for good reason.

“Caffeine works!” says Jackson Zapp, Applied Food Sciences.

Rikka Cornelia, product manager, BI Nutraceuticals (Long Beach, CA), which supplies both whole powders and water-soluble extracts, adds, “Some green tea extracts provide very little flavor or color, which is ideal for flavored waters or lighter beverages, while in other cases, the flavor and color added from a green tea powder enhances the overall beverage.”

HealthyBrandBuilders’ Tonkin says green tea is a very promising natural-caffeine option. “Green tea extract is a great and natural source of energy that has lots of runway if marketed correctly and against the synthetic and otherwise less-healthy alternatives in energy drinks.”
The benefit of guayusa over coffee is the amino acid L-theanine. L-theanine has a soothing effect, which, when combined with the caffeine of guayusa, gives off a sustainable rush of energy that won’t leave you with jitters in the end like coffee,” he says. (Yerba mate, too, provides this “gentle energy boost,” while supporting memory and alertness, he adds.)

“Guayusa has a unique blend of caffeine and other polyphenol content that presents a novel footprint in the energy market,” says Applied Food Sciences’ Zapp. “Guayusa has been dubbed a ‘focused energy’ based on anecdotal experiences of those synergistic benefits.”

Guayusa’s “subtle, earthy aroma” may also blend in better with an energy drink because it doesn’t contain the bitter-tasting tannins that are part of green tea and teas in general, says BI Nutraceuticals’ Cornelia.

In addition, last year, Nutritional Outlook reported on another promising botanical, yaupon holly. As the only caffeine-containing plant to hail from the United States, this botanical is still obscure in the energy space but is one that Mark Blumenthal, founder and executive director of the American Botanical Council (Austin, TX), dubbed “the most interesting right now.”

Natural sources of caffeine hold a lot of promise for energy drink formulators. If you’re going to use a caffeinated source, it’s best to do so transparently. Zapp says, “By making it healthier, more natural, and more transparent, beverage makers understand this is how to create growth in the energy market of today.”

And if these sources don’t provide enough of a boost, drink makers can always kick it up a notch. “If desired, manufacturers have the option to add either synthetic caffeine or natural caffeine extracted from coffee to boost the overall caffeine level,” says Cornelia.

Non-Caffeinated Sources
If your aim is a non-caffeinated formula, there are options there, too.

“Borojo is an ingredient from Ecuador that is perfect for a quick energy boost,” says Ecuadorian Rainforest’s Luna. “Borojo was traditionally used by Embera Indians in Colombia to increase their stamina. Borojo is a great source of many B vitamins as well as phosphorus, making it a great ingredient for energy.”

FutureCeuticals (Momence, IL) points to increased interest in its patented, organic Coffeeberry extract. Andrew Wheeler, director of marketing, says the company produces Coffeeberry from the whole coffee fruit in order to capture a spectrum of nutrients. “We intentionally manufacture this product from the whole coffee fruit, rather than utilize a waste stream of the decaffeination process or from green coffee beans, because of the beneficial nutrients contained outside of the bean in the fruit,” he says. “All other sources of coffee caffeine will not have the higher levels of chlorogenic acids and trigonelline from the whole coffee berry. The difference between bean-derived caffeine and whole coffee fruit–derived caffeine are vast in terms of nutrition.”

“The benefits of whole food definitely apply to caffeine, as well,” he adds.

In line with whole food, more than one supplier points to the promise of guayusa. Years ago, Nutritional Outlook reported on this close relative of yerba mate, which yields less caffeine than coffee but more than green tea. In addition, it contains beneficial polyphenols, fiber, and amino acids. Tonkin says that guayusa, along with yerba mate, is “gaining traction, albeit slowly.”

“Guayusa has been the most talked about ingredient for energy,” says Ramon Luna, marketing, Ecuadorian Rainforest (Belleville, NJ). “The benefit of guayusa over coffee is the amino acid L-theanine. L-theanine has a soothing effect, which, when combined with the caffeine of guayusa, gives off a sustainable rush of energy that won’t leave you with jitters in the end like coffee,” he says. (Yerba mate, too, provides this “gentle energy boost,” while supporting memory and alertness, he adds.)

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Toni Johnson Nutrition, Valhalla, NY, points to the promise of yaupon holly. “Yaupon is one of the most interesting new sources of caffeine,” she says. “It’s been used for centuries by the Cherokee to increase energy and to reduce fatigue.”

In addition, the caffeine level of yaupon holly is lower than that of coffee. “This is a great advantage because it reduces the jitters and stomach upset that can come with high levels of caffeine,” Johnson says. “Another advantage is that it has a natural, earthy flavor that is very different from coffee.”
WHICH FLAVORS ARE TRENDING IN ENERGY DRINKS?

Today’s energy drink makers are inspired not only by botanical ingredients but also botanical flavors.

Fruity and citrus flavors are most popular among leading energy drink brands. Anton Angelich, group vice president, marketing, for flavor house Virginia Dare (Brooklyn, NY), says, “The characteristic and iconic tutti-frutti–type flavor of Red Bull leads the category’s flavors.” Still, today’s energy drink makers are also inspired by other botanical flavors, says Tina Rzeha, marketing associate, beverage flavors, North America, Sensient Flavors (Hoffman Estates, IL).

“Some of the up-and-coming flavors in the energy drink market are botanicals. With their natural image,” these flavors “cater to consumers’ desire for more natural energy drinks,” she says.

Innova Market Insights also tracks energy drink flavor trends. Here’s what the market researcher is seeing.

Orange is currently the most popular flavor for energy drinks, followed pretty evenly behind by strawberry, other “unspecified” berry flavors, lemonade, blueberry, pomegranate, citrus, raspberry, lime, and green tea. Red Bull has also been focusing on tropical flavors, Angelich points out.

Botanical flavors offer some appealing advantages, Rzeha says, including less sweetness, less artificial-tasting flavor, and more unique combinations that still have “everyday appeal.” Interesting botanical flavor profiles will also appeal to those consumers looking beyond “gas station–type” energy drinks to “more of a grown-up appeal,” she adds.

“Botanicals are a great way to attract this kind of consumer.”

Of note, Rzeha says she sees “category blurring” in sports and energy drinks. Part of this blurring is happening because consumers are interested in many types of beverages now: fusion-style teas, functional waters, and dairy products with added energy and protein ingredients, for instance. Low-calorie “energy waters,” like those infused with vitamins, minerals, and energy extracts like guarana and coffee bean, are trending among older millennials for their “wholesome appeal,” she says, and dairy-based energy drinks appeal to younger shoppers. Given these diverse tastes, marketers are interested in trying out “mash-up beverages,” as she calls them, to capture new consumers—a trend that could affect the entire category, including drink flavors.
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Adaptogenic herbs also support energy, while combatting stress. “We have seen a huge increase in sales for astragalus extract, rhodiola, eleuthero, goji berries, and green tea,” says Draco’s Quirk, checking off a list of some of the most common adaptogens. “In traditional Chinese herbal medicine, these are all vital energy (Chi) tonic herbs, which have stood the test of time.”

The company supplies numerous extracts that align with the goals of Chinese traditional medicine, such as “yang” and “qi” tonics. “Yang tonics are the energizing side of the yin and yang foundation of a person’s constitution and do not contain caffeine,” Quirk explains. “They are believed to increase attentiveness and are known to stimulate brain activity, according to modern science. Some examples include cynomorium, eucommia, cridium, dodder seed, and epimedium. Most people think of epimedium as being just a libido tonic, but it has proven benefits to work like ginkgo and increase blood flow to the brain.”

HP Ingredients (Bradenton, FL) promotes the energy-boosting benefits of another known libido-boosting adaptogen, tongkat ali. CEO Annie Eng explains that by increasing testosterone levels, tongkat ali can also increase overall energy levels.

Of course, if using a more obscure ingredient in an energy drink, it is important to ensure the ingredient is approved for beverage use, such as Generally Recognized as Safe in the United States, Quirk adds.

**Organic Ingredients**

Along the lines of “more natural,” organic ingredients are seeing more demand in energy drinks. Even Rockstar is getting into the action, recently launching its Organic Island Fruits energy drink with organic sugar and caffeine from organic green coffee beans, says Innova Market Insights.

“The consumer will undoubtedly start questioning the long ingredients list in their energy drinks and start to question whether those ingredients are organic or even natural (i.e., not from synthetic sources),” says Saumil Maheshvari, market analyst for Orgenetics (Brea, CA), which supplies USDA certified-organic vitamins, minerals, and antioxidants.

“I think this year we’ve started to hit that critical juncture where the consumer is starting to question and is looking for a healthy and more natural and organic alternative to their beverage choices.”

Orgenetics offers several ingredients keen for this space, including organic green tea extract. Orgen-B—organic B vitamins from organic mango, lemon, and guava—is appealing “since it’s nothing more than a standardized fruit extract,” Maheshvari says. And...
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Orgen-C, organic vitamin C from organic amla fruit, is also a good candidate, as are organic antioxidants.

Applied Food Sciences’ Zapp says his company’s organic ingredients are “doing the best business” in this market. Customers are looking for certified organic, due to fuzziness over the definition of natural, he confirms. “Ultimately, there is an uncomfortable truth that, under its current definition, one could extract caffeine from a botanical source with harsh chemicals, yet still net a ‘naturally derived’ caffeine,” he says. “But at what cost?” He says the company’s organic extraction technique ensures these harmful chemicals are excluded, for the utmost in clean labeling.

Broadening Consumers’ Minds

Natural sources of botanical-derived energy hold lots of promise, if not for today’s consumer then for tomorrow’s, who will one day come knocking for healthier options.

It’s happening already, says Draco’s Quirk, and not just in the United States. “We have seen huge sales growth of energy drink requests using botanical extracts in flavored, ready-to-use formulations, and in particular a large number of requests coming from Asian countries such as China, South Korea, and Japan. This does show growth in using natural energy-boosting ingredients instead of relying on caffeine from conventional, single-ingredient energy boosters such as high-caffeine beverages like coffee, tea, or colas.”

Ensuring those ingredients work is the key to success, reminds HealthyBrandBuilders’ Tonkin. “Consumers do want great taste and efficacious dosages of their ingredients so they feel the effect. If that doesn’t happen with things other than artificial stimulants, the new-ingredient profiles lag.”

“On the other hand,” he says, “if they work and are healthier alternatives, it’s a natural win-win. My vote is in that direction, for sure.”

Also keep in mind that many of these botanicals may be new to consumers, so some education may be needed. “Botanicals are wonderful but unfortunately very new and relatively unknown to the majority of ‘blue collar’ consumers, the crux of the purchaser of energy drinks today,” Tonkin says. “Therefore, products that include green tea extract, coffee extract, ginseng, baobab, maca root, ashwagandha, and other botanicals and herbs will have to put gobs of money and marketing horsepower behind them.”

On the plus side, don’t forget that these botanicals often have a sexier story to tell (versus being synthesized in a lab) and marketers can use tales of traditional use and exotic origins to their advantage. Carol Cheow, general manager, sales and marketing, Cactus Botanics (Shanghai), says the company’s herbal formulas for energy drinks are backed by a thousand years of traditional use. “Countless people over the years have confirmed the efficacy and safety of these formulas,” she says. “They have been recorded in the classic of Chinese traditional medicine. We only need to walk along these roads.”

Finding new ingredients for energy drinks beyond the tried and true can be a challenge, but it’s definitely worth trying, says Margaret Gomes, marketing director for NP Nutra (Gardena, CA), which offers freeze-derived fruits and vegetables for energy drinks.

“Yes, it is difficult to find new ingredients for energy drinks or any functional beverages,” she says. “The texture, flavor, and color need to combine together, taste good, and look good, too. Some ingredients don’t blend well with others, or the colors don’t mix. All these factors are very important to the end product and to the consumer.”

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The sale of energy supplements can be challenging. While a majority of manufacturers promote products made with approved ingredients, an unfortunate few make headlines every year because their products contain unapproved stimulants—stimulants that often really work.

Energy supplements made the legal way won’t provide dramatic results like certain unapproved stimulants, but manufacturers do have a great variety of ingredients to work with. These ingredients are safe and researched, and they are more closely related to plant life (if not plants themselves). What they lack in dramatic energy effects they make up for with extra nutrients and factors to benefit overall health and wellness.

Some of these ingredients are widely available, and others are more difficult to source in large quantities, which makes premium pricing possible. A number of energy ingredients are not based in Western science; rather, they developed their reputations from traditional healing practices, as is the case with adaptogens.

“Adaptogens are natural substances that are very safe,” says Mark Blumenthal, founder and executive director of the American Botanical Council (Austin, TX). “One can consume relatively large amounts of these without adverse reaction, and they help the body respond to types of non-specific stress, such as fatigue, heat, cold, or exhaustion.”

The following are several ingredients that should be of particular interest to energy supplement manufacturers.

### Schisandra

Schisandra (*Schisandra chinensis*) is a woody vine from northeastern Asia, and its bright red berries have had a place in Asian pharmacopeia for several decades. Although much of the available research on schisandra is old and/or requires translation, studies on humans and other animals suggest potential benefits of consuming the fruit, including increased stamina, reduced fatigue, and protection against environmental stress. Anti-inflammatory lignans, which are concentrated in schisandra berry seeds, are of particular interest to many scientists.

Schisandra is considered an adaptogen. Its Chinese name, *wu wei zi*, means “five tastes berry” and refers to the fruit’s sweet, sour, bitter, salty, and pungent qualities. In traditional Chinese medicine, these various flavors correlate with different energy paths in the body.

There’s quite a bit of schisandra available in the ingredient marketplace, and it’s usually sold as encapsulated powder or dried, chewable fruits.

### Cordyceps

Although it’s much more difficult to obtain per kilo than schisandra, *cordyceps* (*Cordyceps sinensis*) is another intriguing option for energy supplements. Born out of butterfly and moth larvae in Asia, this parasitic fungus is sold at a premium because of its very narrow distribution in nature. It grows wild and can only be harvested at elevations of 3000 meters and higher.
A limited number of studies suggest improvements in exercise capacity, exercise metabolism, and sexual vigor with cordyceps supplementation. Much of the ingredient’s reputation for increasing energy actually comes from hundreds of years of cultural use and traditional healing practices in parts of Asia.

While hundreds of cordyceps species exist throughout the world, *Cordyceps sinensis* is the most widely used and studied among them. Because it is expensive, there is potential for economically motivated adulteration in the ingredient marketplace.

**CoQ10**

Unlike cordyceps and schisandra, coenzyme Q10 (CoQ10) is an ingredient that’s already endogenous to the human body. It’s found in all human tissues, especially the heart, where it’s required for the production of ATP.

When humans aren’t producing enough CoQ10, supplemental CoQ10 can improve cellular function and thereby reduce weakness or fatigue. Such benefits can be had for at least a few populations, including those with a rare inability to properly synthesize CoQ10 and patients with congestive heart failure. For normal populations, however, CoQ10 studies have, according to some researchers, yielded inconsistent results in the energy department.

Commercial CoQ10 ingredients are available as fermentation-based products.
Theacrine
Like the somewhat related caffeine, theacrine is an alkaloid that can stimulate humans into action. But it might be able to do so without caffeine’s commonly reported side effects.

Early research on theacrine suggests that while theacrine can enhance locomotor activity in animals, it also has a sedative effect (what manufacturers may describe as “no jitters”). Add to that reports that theacrine is non-habituating, and the ingredient sounds like a suitable alternative to caffeine.

Theacrine is found in various plants, including cupuaçu (Theobroma grandiflorum) and a wild Chinese tea known as kucha (Camellia assamica var. kucha), the latter containing both theacrine and caffeine. Kucha is already popularly consumed as a healthy beverage in China. Natural sources of theacrine may be suitable for creating whole-food health products and extractions, but for manufacturers seeking an especially purified ingredient, a nature-identical form of theacrine is now available under the trade name Teacrine.

Beets
For manufacturers seeking non-stimulant approaches to energy-health products, a whole-food approach to energy may be possible with beets. These edible roots are naturally rich in nitrates that convert into nitrites in the body. These nitrites ultimately support healthy blood flow, and improvement in exercise may occur as a result.

Beets continue to be the focus of exercise studies and diet conversations. Some clinical outcomes with beet powder or juice consumption have been positive, although others have been inconclusive. Regardless, beets still offer a variety of other nutrients, such as vitamins and minerals, and the availability of powders and juices can serve multiple product lines.

Robby Gardner is the former associate editor for Nutritional Outlook.

Interest is growing in beets, whose rich supply of nitrates promotes healthy blood flow.
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The best performance demands the right protection.
Echinacea leads the immune-health pack with strong clinical and consumer support.

BY IRFAN QURESHI, ND

While certainly unpleasant, symptoms of the common cold or flu are generally short-lived. But that doesn’t mean consumers should take getting sick lying down. Many natural remedies on the market can help shore up good health to guard against the times when, inevitably, we get sick. Among them, the botanical echinacea is perhaps the most well known, and for good reason.

The echinacea plant is indigenous to North America and was traditionally used by Native Americans for its health benefits. Often referred to by the common name of purple coneflower, there are three major species used medicinally: *Echinacea purpurea*, *Echinacea angustifolia*, and *Echinacea pallida*.1 Current studies indicate the plant’s benefits for the prevention and treatment of colds and flu, as well as for preventing complications arising from these viral infections.

Echinacea is also one of the top-selling botanicals in the United States, according to a recent report published last year in the American Botanical Council’s journal *HerbalGram.*2 Sales of echinacea in the mainstream retail channel (includes supermarkets, drugstores, mass-market retailers, and buyer’s clubs) surpassed $50 million in 2014—a 79% increase from 2013—making it the third top-selling medicinal herb behind horehound and cranberry. Echinacea also made the top-10 list in the natural channel, totaling over $7 million in retail sales.

These numbers are a tribute to echinacea’s popularity with consumers, who strongly believe in the plant’s ability to support immune health. It is also a testament to the research that has been performed on the botanical for prevention of colds and flu as well as related complications. While a recent review concluded that overall evidence of echinacea’s ability to prevent the common cold is weak (although there was evidence that echinacea reduces the incidence of cold episodes*3*), additional recent studies point to substantial positive effects from echinacea supplementation as a potent immune-system enhancer.

Clinical Evidence for Echinacea

A recent trial conducted in the Czech Republic by Karel Raus and colleagues aimed to evaluate the effectiveness of a hot drink (*Echinaforce* by A. Vogel Bioforce AG, Roggwil, Switzerland) containing echinacea (*Echinacea purpurea*) compared to the drug oseltamivir (the generic name for Tamiflu) against the influenza virus.3 In a double-blind, multicenter study, 473 patients with early influenza symptoms (onset of 48 hours or less) were randomized to treatment with oseltamivir (5 days) followed by placebo (5 days), or the echinacea-based hot drink for 10 days. After five days of treatment, the rate of recovery from illness for the echinacea group was 50.2%, while 48.8% of patients in the oseltamivir group recovered. The reduced rate of complications and side effects attributed to echinacea make it a favorable option for the early treatment of influenza.

An earlier study evaluated the ability of *Echinacea purpurea* to prevent the common cold. In this large European study led by Martez Jawad of the Common Cold Centre at Cardiff University (Wales, United Kingdom), 755 healthy individuals received an alcoholic extract of *Echinacea purpurea* (*Echinaforce*; 0.9 ml of extract three times per day) or a placebo for four months.4 Over the four-month period, there were a total of 149 episodes (672 episode days) of the common cold in the echinacea-treated group versus 188 episodes (850 episode days) in the placebo group. The difference in episode days between groups was statistically significant. Furthermore, the difference in rate of recurrent infection

Strong evidence continues to build behind echinacea’s human benefits.

Further, influenza sufferers often develop additional complications frequently associated with the lower respiratory tract, a major cause for hospitalization. In the current study, the rate of complications in the oseltamivir group was 6.5%, but it was lower in the echinacea group, at 2.5%. Overall reported side effects were also lower with echinacea treatment, particularly indicated by a five-fold lower incidence of nausea and vomiting compared to oseltamivir. The reduced rate of complications and side effects attributed to echinacea make it a favorable option for the early treatment of influenza.
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Researchers are interested in all three major echinacea species: *Echinacea purpurea*, *Echinacea angustifolia*, and *Echinacea pallida*.

was significantly lower with echinacea treatment than with placebo. In addition, the use of pain medication to treat cold-related symptoms was substantially higher in the placebo group than with echinacea therapy. The echinacea preparation also had an excellent safety profile comparable to the placebo treatment.

Francisco Di Pierro and colleagues from Velleja Research in Italy evaluated the ability of a standardized extract from the roots of *Echinacea angustifolia* (the branded ingredient Polinacea from supplier Indena in Milan, Italy) to prevent respiratory tract infections.6 The researchers conducted two pilot studies; one in adults with chronic respiratory issues (including asthma, chronic bronchitis, and respiratory insufficiency) and another in healthy children.

The first study looked at the ability of the echinacea preparation to reduce respiratory complications associated with ailments diagnosed as the common cold (secondary to the influenza and parainfluenza viruses) in adults with existing respiratory issues who received the flu vaccine. In other words, the researchers wanted to evaluate the ability of echinacea to enhance the immune response to the flu vaccine. The second study in children assessed the ability of the echinacea product to prevent or decrease the number of episodes of influenza or parainfluenza over a four-month period.

In the first study, adults aged 38–79 with diagnosed chronic respiratory issues were divided into one of three groups: group 1 received the flu vaccine only, group 2 received the echinacea product, while group 3 received both. Echinacea was administered for 90 days: 2 tablets per day (with 100 mg of extract per tablet) for 15 days, followed by 1 tablet per day for the next 15 days and 1 tablet every other day for 60 days. Participants were monitored over a four-month period.

In the group receiving the vaccine only, 5 of 14 individuals developed cold-like symptoms, while three individuals experienced respiratory complications. In the echinacea group, 2 of 12 suffered from cold-like symptoms, and one individual developed respiratory complications. In the combination therapy group, only 1 of 12 participants developed cold-like symptoms, and none of the individuals developed complications. This indicated a protective effect of echinacea against influenza and parainfluenza and further suggests that echinacea may bolster the immune response associated with the flu vaccine.

The second study enrolled 34 healthy children between the ages of 9 and 15. Participants received the echinacea product (one tablet daily for 30 days followed by one tablet every other day for the next 60 days) or a B-complex vitamin on the same dosing regimen. Evaluation included the development of cold symptoms and the onset of respiratory complications over a four-month period.

Two of the 14 children in the echinacea group developed cold or flu symptoms, while in the group receiving B vitamins, 8 of 20 children developed cold or flu symptoms. None of the individuals in either group developed respiratory complications associated with their infections.

While larger trials are needed, these preliminary studies support a potential clinical benefit of echinacea for the prevention of cold and flu and indicate the plant’s ability to enhance the immune response associated with flu vaccination.

A new meta-analysis of randomized controlled studies confirms the benefit of echinacea in reducing the risk of recurrent respiratory tract infections and associated complications. Led by Andreas Schapowal from the Allergy Clinic in Landquart, Switzerland, the group of researchers identified studies with a primary endpoint of recurrent infection risk.7 After narrowing down their focus to 12 clinical studies on echinacea addressing this endpoint, six trials with a total of 2,458 participants met final inclusion criteria and were included in the analysis.

The results of the meta-analysis showed that echinacea extracts were significantly associated with reduced risk of recurrent respiratory tract infections. Furthermore, in individuals more susceptible to infections or with increased stress and immunological weakness, echinacea administration cut the risk of recurrent infections in half. Common complications such as pneumonia, ear infections, tonsillitis, and pharyngitis were also less frequent in those taking echinacea. The authors concluded that the use of echinacea potently lowers the risk of recurrent infections and complications, and these benefits appear to be strongest in those most susceptible.

**Immune-Stimulating, Anti-Inflammatory, and Antiviral**

Echinacea species confer their preventive benefits on colds and flu through several mechanisms. These include direct antiviral effects, immune-modulating benefits, and anti-inflammatory activity.

A study led by Margaret Ritchie of Napier University in Edinburgh, United Kingdom, aimed to examine the effects of supplementation with an ethanol extract of *Echinacea purpurea* for eight days in 30 volunteers by examining blood samples for changes in cytokine profiles.8 The research team drew blood on a daily basis and stimulated it with various inflammatory agents. Echinacea
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supplementation was found to reduce the levels of pro-inflammatory cytokines tumor necrosis factor-α (TNF-α) and interleukin-1β (IL-1β) by up to 24% while increasing the levels of the anti-inflammatory cytokine interleukin-10 (IL-10) by 13% when compared to baseline values.

Further subgroup analyses performed by the authors also found differential effects in individuals with higher stress or greater susceptibilities to infection. For example, in those individuals treated with the echinacea extract during a stressful period or those individuals reporting greater than two colds per year, the echinacea extract caused a significant transient increase in interferon-γ (IFN-γ) levels of over 25%. As IFN-γ is a powerful activator of natural killer cell and macrophage activity, this is a highly beneficial effect in fighting off viral infections. These results together demonstrate that echinacea supports anti-inflammatory effects and further modulates the immune system to achieve higher levels of immune activity in individuals requiring additional protection.

Similar benefits in cytokine profiles have been shown for Echinacea angustifolia. Barbara Dapas and colleagues from the University of Trieste in Trieste, Italy, assessed the effects of an echinacea-based syrup given daily for four weeks in 10 healthy subjects aged 26–53 years.9 The investigators evaluated changes in cytokine expression in lymphocytes and monocytes (immunologically active white blood cells) in plasma samples by measuring levels in cellular messenger RNA. A fasting baseline blood sample was drawn each week for five weeks prior to commencement of the echinacea syrup. A further weekly blood sample was taken for the four-week trial period. Results indicated that levels of IL-2 and IL-8 increased, suggesting improved lymphocyte proliferation and neutrophil activation and thus enhanced immunological activity; in addition, levels of the pro-inflammatory cytokines TNF-α and IL-6 decreased.

A recently published review of the pharmacology of echinacea by...
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An Echinacea purpurea hot drink proved as effective as the generic version of the drug Tamiflu for early treatment of the flu.

Azadeh Manayi and colleagues from Tehran University of Medical Sciences (Iran) and the University of Saskatchewan (Saskatoon, Canada) affirms the herb’s immune-modulating and anti-inflammatory benefits. The authors also reviewed cell studies demonstrating direct antiviral activities of echinacea against various viral agents, including human, avian, and swine-origin strains of influenza, while additional assays indicated that the extract tested had the ability to block viral entry into treated cells. Together, the multiple mechanisms of action of echinacea species make echinacea an attractive botanical choice for immune support.

In addition to this trifecta of benefits supporting immune defenses, echinacea appears to have a very positive safety profile. In a recently published paper, Karin Ardjomand-Woelkart and Rudolf Bauer from the Institute of Pharmaceutical Sciences at the University of Graz (Austria) conducted a systematic review of literature on echinacea preparations for evidence of drug interactions, contraindications, adverse events, and duration of safe use. Based on their findings, the authors concluded that echinacea preparations are well tolerated and safe for children and adults alike.

An Ounce of Prevention

Echinacea is a botanical that continues to show promise in preventing colds, flu, and related complications. The clinical results described here are extremely positive in that the difficulty associated with developing preventive treatments for the common cold and flu viruses stems from the fact that multiple viruses are implicated in symptoms. Vaccines can often miss their marks, as well, by not including active seasonal strains. The fact that echinacea supports immune health through multiple mechanisms makes it an effective primary or adjunct preventive measure with a high level of safety.

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iven the events of the past year, dietary supplement contract manufacturers could be forgiven for asking if theirs is a glass half full or half empty. On one hand, they’ve never been more vital to the category as a growing class of health-conscious consumers sent global supplement sales skyrocketing up at a 50% faster rate compared to over-the-counter drugs during the 2009–2014 period, per market research firm Euromonitor.

On the other hand—and in no small part thanks to that very vitality—contract manufacturers (CMs) are feeling much the same heat as their more-visible marketer partners when lapses in product quality, identity, or safety arise. And arise they have, prompting everyone from regulators at FDA and the FTC to attorneys general and even the Department of Justice to intensify their scrutiny of supplement brands—and, by extension, the manufacturers behind them.

Which got us thinking: What do CMs have to say about the state of the industry’s reputation, their contribution to it, and the rules that tie it all together—FDA’s dietary supplement current good manufacturing practices (cGMPs)? As Shaheen Majeed, marketing director, Sabinsa Corp. (East Windsor, NJ), puts it, “There are some very good companies making quality products and adhering to the GMPs, and there are others making abysmally bad ones that do nothing to comply.” Whether that signals a glass is half full or half empty, “It certainly has been an eventful year,” he says.

Current Events
Among the more notorious events in the U.S. was the sting operation led by New York State Attorney General Eric T. Schneiderman, which called into question the compositional authenticity of major supplement brands and led him and chief law-enforcement officers from 13 other states to demand a congressional investigation into industry practices. Then there were the multiple warnings FDA issued to companies marketing pure powdered caffeine, for example, or products containing beta-methylphenethylamine (BMPEA), an amphetamine-like stimulant the agency doesn’t recognize as a dietary ingredient.

And don’t forget the steady drumbeat of news casting doubt upon the very wisdom of supplementation. While Eugene Ung, executive vice president, Best Formulations, (City of Industry, CA), thinks “it’s too early to tell if there will be a negative impact from this press,” industry members—even those who’ve heard the allegations before—remain on guard. Notes Marc Ullman, counsel, Rivkin Radler (Uniondale, NY), “The constant negative press remains concerning. To date, the supplement industry has been pretty ‘Teflon,’ but at some point, odds are something’s going to stick.”

Continued on page 82
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** Bohbot J The Gynaecologist’s and Obstetrician’s Journal 2007  Special Issue from the CCD Laboratory.
THE PRICE OF CONTRACT MANUFACTURING

Contract manufacturers (CMs) are well-nigh indispensable in today’s supplement industry. But as regulations and expectations change, cost equations change with them. That puts CMs in the tricky position of mitigating what costs they can while passing on those they can’t to brand-owner customers who don’t always appreciate the underlying arithmetic.

Yet CMs, says Eugene Ung, executive vice president, Best Formulations (City of Industry, CA), “work on very thin margins.” Without sharing some of the cost burden, he says, “we could be in the red on certain products we manufacture.” Market partners who see the longer term understand and accept that all nodes on the production chain must grow to survive. “Otherwise,” Ung says, “they’re killing their own goose.”

But still, the case for cost sharing can be hard to make.

No wonder, then, that CMs first try to cap costs all around. Says Ephi Eyal, president and CEO, Innovative Food Processors Inc. (Commerce, CA), “We work closely with our customers to mitigate inflationary pressure, whether as a result of material input cost hikes or increased regulatory requirements. Yet when systems are in place and rigorous processes are documented and implemented well, the outcome is worth the increased effort on both sides.”

And that’s why CMs are in no danger of cost-sharing their way into obsolescence. “Contract manufacturers have so much information about the supply chain,” contends Michael Schaeffer, president, Pacific Nutritional Inc. (Vancouver, WA). “They’re useful in managing costs by spreading the burden over all of the products being manufactured in a single facility.” In so doing, they ultimately save their customers money and more than earn their keep.

We asked contract manufacturers where their costs are shifting up or down. Read on for a full accounting.

Labor Pains

A sure sign that the recession is over is upward pressure on wages—and that’s as true within the supplement-manufacturing sector as it is in any other industry. Indeed, labor, insurance, and associated operating costs “are always a challenge, as they continually go up,” says Ung.

Steve Holtby, president and CEO, Soft Gel Technologies Inc. (Commerce, CA), agrees, noting that “highly trained, competent machine operators” add to his cost as a maker of softgel capsules. The rotary die process “involves high precision and requires constant oversight.” That said, “Inaccuracies make production even costlier,” he points out.

Machine Learning

One benefit of automated over human capital: machines don’t ask for pay raises or vacation. They don’t mind if management cancels the holiday party, either. But, they don’t come cheap.

Even so, CMs are investing in automation to streamline their operations. Several years ago, Soft Gel shifted to an optical inspection system to sidestep the operator fatigue that’s inevitable when visually evaluating thousands of softgels per day. The new system, Holtby explains, “digitally photographs each softgel with up to four cameras and compares the images to an approved reference standard.” It can process up to one million doses per hour and check for irregularities and foreign objects as well as flaws, rejecting inferior product with an air jet. What’s more, “it’s designed to FDA 21 CFR Part 111 requirements and helps increase throughput while reducing labor costs,” he says.

Teach to the Test

You just can’t put a supplement or its constituent ingredients through too many tests these days. As a result, “In the past several years, testing was the big cost for everyone in the supply chain,” Ung says. Making matters worse is the lack of international testing standards for many of the raw materials used in dietary supplements. “Therefore,” he continues, “there could be a handful of assay methods out there, which is a source of inefficiency and additional costs.”

His company’s in-house laboratory helps the firm contain test-related expenses. Nevertheless, “accurate test methods pose a challenge at the moment,” he notes. “As the industry evolves, we hope that testing will become more streamlined and efficient, as well.”

Stake Your Claims

Supplement shelves are more crowded than ever; meantime, supplement shoppers are increasingly discriminating. The upshot: a product’s really got to stand out to get noticed.

One way to do just that is to bear a catchy product claim or certification. But, says Pacific Nutritional’s Schaeffer, “With marketing companies wanting to add more claims, such as gluten-free, allergen-free, and non-GMO, there’s been an added burden on changing ingredient specifications and additional testing.” Indeed, certification and claim substantiation “has the highest cost,” he says.

No Such Thing as a Minor Detail

When it comes to increasing costs in supplement manufacturing, it’s the little things that really add up. As Holtby notes, customers rightly focus on testing and certifications to ensure product integrity and “effective quantities of safe, clinically proven, and ethically obtained ingredients.” But less-flashy features, including product price, delivery logistics, and batch sizes, “are sometimes more critical,” he says. “We spend a great deal of time advising customers on what is and isn’t realistic, and we strive to understand what issues are most important to them, building our business proposals to encompass these key factors.”
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Shared Responsibility?
When it does, it’ll splatter on everyone’s pan, as adherence to GMPs is the responsibility of all links in the production chain. “The supplement cGMPs don’t differentiate between a contract manufacturer and a marketer/brand owner,” says Scott Langston, quality systems manager, Innovative Food Processors Inc. (IFP; Faribault, MN). As 21 CFR 111.1(a)—the section of the Code of Federal Regulations that spells out the guidelines in the U.S.—makes clear, “anyone who manufactures, packages, labels, or holds dietary supplements must follow the cGMPs,” he says.

But though all parties bear responsibility, they don’t all bear it equally. Just ask a CM. “They rarely have their names on labels,” says Steve Mister, president and CEO, Council for Responsible Nutrition (CRN; Washington, DC), yet CMs “have a great deal of accountability for how quality supplements are produced.”

Some argue they have the lion’s share. As for why, credit—or blame—the outsized role that CMs now play in supplement production, as well as the fundamentals of contract manufacturing itself.

“As GMPs were phased in,” Mister explains, “we saw their position in the supply chain strengthen as many smaller firms recognized that their expertise lay in marketing products, not in manufacturing, leaving that task to sophisticated contract manufacturers who could aggressively implement the GMPs.”

Thus, responsibility for everything from raw-materials testing and supplier qualification to process documentation and records maintenance now often falls to the CM.

Leveling the Playing Field
This frustrates some in industry. “The CM is the natural link between the ingredient suppliers and the brand owners,” Ung says. “But suppliers and brands have their own GMP responsibilities.” He believes that as the GMPs began rolling out in 2007, “the burden sat squarely on the shoulders of the manufacturers.” Meanwhile, brand owners and ingredient suppliers “weren’t taking the GMPs as seriously, pointing to the CM as the one with the GMP responsibility,” he says.

“It’s no surprise that “we didn’t think this was fair at all,” Ung continues. Neither did other CMs. As Majeed notes, “FDA’s final guidance for GMPs left ingredient quality and vetting of suppliers to the manufacturers, and we’ve seen the inevitable outcome in the form of a wide range of quality.” Not only does this redound to the detriment of the entire industry, he says, “it’s just not fair. It works against having a level playing field when the supply end has such an incredibly wide range of quality.”

Test Early and Often
Until that field levels, CMs say to test early—and often. Steve Holty, president and CEO, Soft Gel Technologies Inc. (Commerce, CA), has also witnessed the disinclination of some ingredient distributors to conduct even minimal baseline testing—“in which case, we’d perform or arrange for the testing ourselves.” That increases the challenge of supplier qualification “because raw-ingredient suppliers aren’t held to the same regulations as supplement manufacturers,” he says.

The question he believes industry must ask is how much responsibility the CM should assume for testing. “Some contract manufacturers still rely almost solely on the supplier’s stated results on a certificate of analysis,” he says. “However, it’s vital that contract manufacturers develop their own protocol for testing and qualifying individual batches of raw materials, as they carry a good chunk of end-product responsibility.”

As for the brand marketer’s burden, “Ultimately, the one with the name on the bottle—the seller—bears the responsibility to ensure that the product being sold meets label claims and is safe,” Ung says. “The seller is responsible to have their own quality systems in place to verify that the manufacturer is compliant. Gone are the days when sellers would simply say, ‘Ask the manufacturer. They made it.’

Exercising Accountability
Ung contends that this is a sign of industry’s evolution. As FDA continues to bring more guidance actions against branded companies, “it’s become clear to brand owners that they indeed have accountability in the GMP regulatory process,” he says. So what further advice would he and other CMs share with their brand-owner partners?

Ung suggests that marketers “develop product specifications, take quality agreements seriously, and understand that CMs aren’t trying to shift responsibility, but are trying to be clear on the expectations so that everyone’s on the same page.”

Majeed beseeches brands “to understand that a quality product requires investment”—an easy point to forget when focusing on the bottom line.

“Talk to your CM about the claims you’re looking to make, labeling issues, what ingredients you’d like, and why they’re important to you. Get a competent legal opinion about marketing claims that can be made, and be wary of saving a few dollars by using generic,” he says, adding that doing so can weaken product quality and infringe upon patents. Holty stresses transparency and frequent auditing of CMs—at least annually, if not more often. Some of our customers require us to undergo periodic internal and third-party audits to confirm GMP compliance.” Far from bristling at this, CMs should welcome their customers’ engagement. “Not only can you learn from audits, but...
they allow customers to see directly what is and isn’t being done properly.”

He also encourages brand partners to inspect batch records and ingredient certificates of analysis, and he doesn’t mind when they inquire about testing procedures. “More marketers are now documenting their own requirements for testing protocols,” he says. “A contract manufacturer that communicates with the marketer and is open about procedures has a huge advantage, as doing so takes guesswork and liability out of the GMP-responsibility equation.”

Nevertheless, Ung reminds brand owners that testing and quality assurance aren’t free. “These are costs that are important for building trust with the consumer,” he says. And notwithstanding the inevitable inefficiencies that come with any regulated production process, “We work with our vendors and customers on a continual basis to open the lines of communication to try to work out these inefficiencies.” (See sidebar on page 80.)

**Cleaning Their Own House**

To Holtby, the keyword is proactive. CMs should clue their partners in to the importance of the GMPs’ stipulations. What’s more, “It’s important to have formal training programs in place to ensure that your own personnel have a thorough knowledge of GMPs and SOPs and follow them.” As for recordkeeping, documentation, certifications: it’s a given that they all “need to be maintained for traceability,” he says.

Langston says IFP “has had a robust supplier-qualification and assurance program in place for some time” and “walks our brand-owner customers through a standard quality agreement to ensure alignment of expectations on the quality standards that apply to the product at hand.” The earlier they start that alignment, “the easier it is for both parties to qualify the product and share in their commitment to regulatory requirements.”

And if either party has any questions, industry organizations are there to help. “Initiatives such as the SIDI Work Group are important in creating voluntary guidelines for industry to support standards across the entire supply chain,” Langston says. “As members of CRN, we’re actively engaged in setting these guidelines and are looking forward to wide adaptation, which will significantly streamline the ingredient-qualification process.”

So maybe the glass is more than half full. Ung seems to think so. “It’s certainly fairer today than in 2007,” he says of the balance of GMP responsibility. “Companies in this industry for the long term have a reputation to protect and consumers to grow, so there’s a vested interest in doing the right thing and working together.”

That’s a full glass we’ll take.

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

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Polysaccharide Gums May Promote Probiotic Growth in Milk


Researchers at North Carolina Agricultural and Technical State University (Greensboro, NC) recently found that different polysaccharide gums may promote the growth of several probiotic strains in milk. The scientists investigated how nine different polysaccharide gums influenced growth of Lactobacillus reuteri and Lactobacillus rhamnosus bacterial strains in either fluid milk or a modified basal medium.

Researchers combined each of the probiotic strains with different polysaccharide gums in milk or basal media and then allowed the samples to incubate for 12 hours at 37°C. The tested gums and combinations included inulin, locust bean, xanthan, guar, pectin, carrageenan, guar/locust bean/carrageenan, pectin/carrageenan, and carrageenan/maltodextrin.

Growth of the L. rhamnosus GG B101 strain in milk was most enhanced by the addition of xanthan, carrageenan, and carrageenan/maltodextrin, while growth of the L. rhamnosus GG B103 strain in milk was most enhanced by xanthan and carrageenan/maltodextrin. Many of the other polysaccharide gums were also found to enhance the growth of the L. rhamnosus strains, but to lesser extent. Similarly, carrageenan and carrageenan/maltodextrin were also found to be among the most effective gums at enhancing the growth of the L. reuteri DSM20016 strain in milk, but locust bean also appeared to be effective at promoting L. reuteri growth in milk.

“These results support previous findings that showed carrageenan/maltodextrin could promote growth and viability of Lactobacillus strains,” the researchers wrote. They also commented on xanthan, which stimulated “the highest growth of L. rhamnosus GG strains, but led to a slight inhibition in the growth of L. reuteri strains in both milk and media.”

Welch’s Concord Grape Juice May Improve Cognitive Performance

Researchers at the University of Leeds (United Kingdom) say that working mothers who drink Welch’s (Concord, MA) brand Concord grape juice may experience improvements in cognitive performance, including memory.

Although cognitive benefits have been found in past research on older adults who drink Concord grape juice, Welch’s says this is the first time a similar finding has been made in a different demographic subset.

The randomized, double-blind, crossover study included 25 healthy working women aged 40–50 years with pre-teen children. For 12 weeks, the women drank 355 ml per day of Concord grape juice or a placebo comprising a grape-flavored, sugar-sweetened drink.

Participants performed several tests meant to assess cognitive performance over the course of the study, including a 25-minute driving simulator that asked participants to match the speed and direction of a lead vehicle. Researchers observed statistically significant improvements in immediate spatial memory and driving performance in the Concord grape juice group compared to the placebo group.

“This is the first time it has been found that the cognitive benefits associated with drinking Concord grape juice extend beyond older adults,” according to a Welch’s press release. The study results were presented at the 2015 International Conference on Polyphenols & Health in Tours, France.

New Sports Ingredient Velositol plus Whey Boosts Muscle Protein Synthesis

A new, patented sports-nutrition ingredient, Velositol, increased muscle protein synthesis (MPS) by a significant 34% when combined with whey protein, according to the ingredient’s supplier, Nutrition 21 (Purchase, NY). The company presented the latest study results during December’s International Sports & Exercise Nutrition Conference.

Without making public more details about the recent study, the company claims the 34% increase in muscle protein synthesis is a greater increase than when whey protein was administered alone. Velositol achieved these results when given in a single dose, the firm says. Increasing MPS boosts the body’s ability to build lean muscle and repair muscles damaged during exercise.

Velositol is an amylopectin/chromium complex. Researchers from The Center for Applied Health Sciences and the University of Arkansas for Medical Sciences conducted the study.

“Nutrition 21 is excited to add our new, innovative ingredient, Velositol amylopectin/chromium complex, to our sports-nutrition portfolio,” said Bill Levi, vice president of strategy and business development, Nutrition 21, in a press release. “Velositol has been shown to ‘amplify’ the effects of protein for enhanced muscle protein synthesis (MPS). Consumers can accelerate and increase MPS when they choose a workout product containing Velositol, and they should look for the Velositol logo on workout products to get more out of their fitness training.”
Ingredient Showcase

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KSM-66 Ashwagandha Improves Muscle Strength, Size, and Recovery, Study Finds


A randomized, double-blind study published in the Journal of the International Society of Sports Nutrition suggests that KSM-66 brand ashwagandha (Withania somnifera) may improve muscle strength, size, and recovery in adult males engaged in resistance training.

Researchers found that healthy men aged 18–50 who consumed 300 mg of the ashwagandha root extract in addition to resistance training for eight weeks experienced significantly greater increases in muscle strength and size than a placebo group. The KSM-66 group also showed significantly greater reduction in markers of exercise-induced muscle damage. Additionally, KSM-66 supplementation led to a significantly greater increase in testosterone levels and a significantly greater decrease in body fat percentage.

According to KSM-66 supplier Iooreal Biomed (Los Angeles), the findings are noteworthy, indicating that KSM-66 ashwagandha may “increase the body’s adaptation in response to strength training and serve as a useful adjuvant.”

“While there are other published studies demonstrating the effectiveness of ashwagandha in increasing strength and stamina, this is the first study using a standardized, branded ashwagandha extract and demonstrating significant effects on muscle strength, size, and recovery,” says director Kartikeya Baldwa. “This study also corroborates the findings from a previously published clinical study showing KSM-66 to be effective in increasing natural testosterone production in men.”

Is Pasta an Effective Delivery System for Probiotic Ganeden BC30?


Pasta has historically been a challenging delivery system for probiotics, but a study published in the Journal of Cereal Science suggests probiotic strain Ganeden BC30 (Bacillus coagulans GBI-30, 6086) is able to survive the manufacture and preparation of pasta and still be present in efficacious amounts.

To study Ganeden BC30’s behavior, researchers created a new functional pasta made of a durum wheat flour, barley beta-glucan, and Ganeden BC30. Researchers at the University of Verona (Italy) conducted the study—the 22nd study on Ganeden Biotech’s (Cleveland, OH) patented probiotic strain.

Using chemical, nutritional, and microbiological analyses, the researchers found that “the probiotic strain remained viable during the pasta-making and cooking processes, and its amount in cooked pasta (about 9.0 log CFU/100 g) would be considered sufficient to exert beneficial effects on [the] consumer,” they wrote.

In addition to Ganeden BC30 surviving in efficacious levels at both five- and seven-minute cook times, the probiotic also appeared not to affect the characteristics of the pasta, according to Ganeden. Researchers reported that the addition of the probiotic strain to the pasta “did not affect the postprandial glycemic response of pasta in healthy volunteers.”

“This study is exciting, as it shows the distinct formulation capabilities of Ganeden BC30 in an additional product category that would be impossible for traditional probiotics,” says Mike Bush, senior vice president, Ganeden.

Arthrem May Alleviate Osteoarthritis Symptoms

Stebbings S et al., “A pilot randomized, placebo-controlled clinical trial to investigate the efficacy and safety of an extract of Artemisia annua,” published in the Western Ontario and McMaster Universities Osteoarthritis Index (WOMAC) to assess osteoarthritis symptoms, and a visual analogue scale (VAS) to assess joint pain.

Participants in the Arthrem group showed a significant improvement in WOMAC total scores, as well as a statistically significant reduction in the WOMAC measures for stiffness and physical function, compared to the placebo group. Additionally, the VAS pain scores were statistically reduced in the Arthrem group, but not in the placebo group.

“The published results show that the natural product, Arthrem, has potential as an anti-inflammatory/analgesic in osteoarthritis,” says Sheena Hunt, PhD, coauthor of the study and principal scientist for Promisia. “In patients taking one Arthrem capsule twice a day, pain and stiffness were significantly reduced and physical function significantly improved.”

Hunt also noted that the effects of Arthrem supplementation were especially positive in the subset of participants suffering from mild or moderate osteoarthritis, rather than more severe osteoarthritis. Within that subgroup, the average magnitude of pain at the end of the 12-week period was less than half what it was baseline, says Hunt.
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The global probiotics market is booming, but expanding probiotics into different health areas is key to further growth. Allergies are a big interest area for suppliers, and for good reason; new research is propelling probiotics forward.

“We expect the probiotic market to increasingly target allergy,” says Maj Britt Larsen, PhD, scientific advisor for probiotic supplier Chr. Hansen (Hørsholm, Denmark).

Probiotic benefits for allergic conditions like eczema are relatively well researched, but newer studies on food, pollen, and pet allergies promise fresh opportunities, with focus ranging from proactive protection in infants to tackling hay fever in adults.

Infant immune health remains one of the most promising areas so far for probiotics aimed at allergies. The theory goes that allergies are most easily thwarted at an early stage of life, before obvious symptoms arise.

“For the development of an infant’s immune system, time in utero and two years after birth are of crucial importance,” says Peggy Steele, global product manager of probiotics, DuPont Nutrition & Health (Madison, WI). “Balanced development of the immune system is associated with protection from allergic diseases and atopic eczema.”

Last October, DuPont added the new probiotic product Protect EarlyLife to its Howaru line. It contains the *Lactobacillus rhamnosus* HN001 strain and is meant for pregnant women and children aged 0–2 years.

A 2013 study explored the allergic response of children who supplemented with DuPont’s HN001 daily *in utero* and from birth until two years of age. Researchers found that at six years of age, children who had taken the probiotic as infants showed a significant reduction of allergic skin-prick test sensitization when compared to a placebo group. The skin-prick test measured reactions to egg white, peanut, cow’s milk, cat pelt, dust mite, and mixed grass pollen.

Adults with existing allergies may also stand to benefit from probiotic supplementation. A recent study of Chr. Hansen’s LP-33 (*Lactobacillus paracasei*-33) suggested that adults who reported persistent allergic rhinitis (AR) symptoms during grass pollen season experienced significant improvements to quality of life after supplementing with LP-33.

After five weeks of supplementation, the LP-33 group posted significantly lower scores on the Rhinitis Quality of Life analysis compared to a placebo group. Researchers also observed a consistent improvement of ocular symptoms in the experimental group, but no difference in nasal symptoms.

Additionally, Chr. Hansen’s LP-33 has also been found to reduce allergic rhinitis symptoms in children and adolescents.

With such solid studies as these, the power of probiotics is nothing to sneeze at.

References

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