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FEATURES

17 Best of the Industry 2014
Recognizing eight standouts for their achievements in 2014

47 People to Watch Directory
A Who’s Who of the natural products industry

OTHER CONTENT

8 From the Editor

10 News
A snapshot of U.S. dietary supplement usage in 2014

12 Viewpoint
How DSHEA defined the dietary supplement market

14 Marketing
DHA and the omega-3 health claims market

54 Research Update

56 Advertiser Index

57 Classified

Winner of the Western Publishing Association’s 2014 Maggie Award for Best Trade Publication (Circulation under 50,000)
Celebrating the Best of 2014 and the Spirit of an Industry

Over the course of the 20th anniversary of the Dietary Supplements Health and Education Act (DSHEA) this year, many industry members reflected on the differences between life pre- and post-DSHEA.

Nutritional Outlook editorial advisory board member Duffy MacKay explains in his retrospective salute on page 12 that DSHEA not only defined and legitimized dietary supplements but also “has given our industry the ability to foster unique growth.”

For evidence of this growth, look no further than the eight companies and organizations Nutritional Outlook celebrates as the Best of 2014. Each is a pioneer. And thanks to the efforts, business savvy, and persistence of each this year, the natural products industry is advancing in ways one could not have imagined pre-DSHEA.

Our Best of 2014 winners are diverse, yet all share the same desire for excellence and innovation in what they do, whether that is helping to spur regulatory reform, pushing for a new health claim, creating ingredient solutions that meet today’s biggest health and product demands, helping companies navigate the increasingly complex global non-GMO landscape, commercializing a much-needed method of plant breeding, or introducing consumers to heretofore unseen product concepts.

These companies capture the spirit of what defines the natural products industry. For, while DSHEA laid down the category path for dietary supplements, what followed can only be attributed to the hard work of the companies involved. Members—organizations and individuals—determine whether an industry will be great, and this industry will certainly benefit from the forward-thinking achievements of these eight Best of 2014 winners.

We at Nutritional Outlook thank our readers and supporters for another great year. From all of us, best wishes for a prosperous new year!

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Gender Gap Closing among U.S. Supplement Users, 2014 Survey Shows

New data from the Council for Responsible Nutrition’s (CRN; Washington, DC) 2014 Consumer Survey on Dietary Supplements indicate that dietary supplement usage in the United States remains steady. The survey also reveals some interesting trends, especially regarding supplement usage by men versus women.

Supplement usage overall appears healthy. The percentage of U.S. adults who reported taking dietary supplements is the same in 2014 as it was in 2013—68%; moreover, more than 50% of survey respondents in 2014 said they are regular supplement users.

Gender and age-group analysis provides some interesting insights—most notably, that supplement usage between the sexes continues to equalize. According to 2014 survey results, usage by women and men differed by 6 percentage points (71% women; 65% men). Compare this to previous years, during which this gap was greater: 8 percentage points in 2013 (72% women; 64% men) and 12 percentage points in 2012 (74% women; 62% men).

Age-group analysis reveals which supplements are most popular among groups. All age groups are fans of vitamins and minerals, the most popular supplements category by far. Usage was fairly even among age groups (98% baby boomers; 97% elderly; 95% Generation X; and 95% Generation Y). But more elderly customers take specialty supplements (51%), compared with baby boomers (46%), Generation X (40%), and Generation Y (25%).

While older customers are slightly heavier users of vitamin, mineral, and specialty supplements, younger customers lead in the areas of herbal-botanical supplements and sports nutrition/weight-management supplements. Generation X was the highest user of herbal-botanical supplements (29%) in 2014, compared to baby boomers (27%), elderly customers (24%), and Generation Y (23%). Generation X was also the highest user of sports nutrition and weight-loss supplements (26%), followed by Generation Y (24%), baby boomers (18%), and the elderly (10%).

CRN says it will continue to release findings from the survey throughout next year.

The 2014 survey comprises a national sample of 2,010 U.S. adults aged 18 and older. Ipsos Public Affairs conducted the CRN-funded survey online August 25–29, 2014. Weighting was employed to ensure that the survey’s sample population accurately reflects the overall U.S. adult population according to Census data.

FDA Finds Gluten in Presumably Gluten-Free Products

It appears that celiacs have good reason to be wary of processed foods that are not specifically labeled gluten-free. In an FDA study on over 400 market-sold foods, researchers found that even when products were presumably gluten-free—that is, their ingredient lists did not include wheat, rye, and barley—many of them were, in fact, contaminated with gluten.

Of 461 products that FDA purchased for its analysis, 98.9% of products with “gluten-free” labels did meet the legal definition of “gluten-free”—that is, their ingredient lists did not include wheat, rye, and barley. About half of these offenders contained more than 100 ppm of gluten.

Depending on the circumstances of a manufacturer’s operations, foods not containing gluten may still come into contact with gluten from shared surfaces, gluten particles in the air, and other sources. For these circumstances, manufacturers can package their products with warning labels, such as “manufactured in a facility that also uses wheat” or “made on equipment shared with wheat.” In FDA’s study, half of the foods contaminated with gluten at levels above 20 ppm failed to include warning labels, so there’s wonder as to whether their manufacturers were unaware of the contamination threat or just didn’t want to use warning labels.

Interestingly enough, breakfast cereals were the most likely culprits for gluten contamination in FDA’s study. Many of these cereals contained oats, which, despite not containing gluten by nature, are often at risk of contamination.

FDA’s analysis was published in the Journal of Food Chemistry on August 5, 2014.
Consumers are increasingly searching for gluten-free foods. That’s why GPC is increasingly supplying gluten-free ingredient solutions. Our technical experts have created proven trial formulas for a wide range of gluten-free applications, from quick breads and yeast breads, to cookies and cakes, even doughnuts. Using corn-based functional starch ingredients, we’ve developed innovative, customizable solutions to many traditional problems, including those of texture, shelf life and product volume. If you have a gluten-free challenge, it’s likely we’ve already found a solution. All you have to do is ask.
How DSHEA Defined the Dietary Supplements Market

What once was an undefined space for dietary supplements is now a thriving, regulated industry.

By Duffy MacKay, ND, Council for Responsible Nutrition

In 1994, the year Congress enacted the Dietary Supplement Health and Education Act (DSHEA), I was finishing my final year of college at the University of California, Santa Cruz. Back then, DSHEA was the farthest thing from my mind, as I focused on finals and preparing to enter medical school. It wasn’t until a couple of years later when, midway through naturopathic medical school, I got my first glimpse of DSHEA’s influence.

My first industry job was at a company that had been around pre-DSHEA. It was the epitome of a mom-and-pop shop. The owner embodied the spirit of DSHEA. He very much believed that the products he sold were a means to stay healthy, and he wanted to be able to talk candidly with his customers about products’ health benefits and offer a wide variety of supplement products to his customers. I can just imagine his frustration a couple of years prior, pre-DSHEA, when FDA would have claimed his products did not have a place—no regulatory category nor definition. Pre-DSHEA, the vitamins and minerals and herbal and nutritional supplements that he believed were part of a healthy lifestyle were stuck in a gray area under federal law, and that meant FDA didn’t really know how to regulate them.

Before DSHEA, dietary supplements—sometimes referred to as “food for special dietary uses”—routinely fell somewhere in between the food, food additive, and drug categories. FDA objected to label claims made by supplement products because the agency considered structure/function claims solely the privilege of drugs. In fact, the agency wanted to call anything that exceeded the recommended daily allowance a drug, and it even tried to call blackcurrant oil a food additive because the ingredient was enclosed in a gelatin capsule. FDA was also reluctant to give consumers too much information about the burgeoning science behind supplement products unless the research was as definitive as the two randomized controlled trials (RCTs) required for new pharmaceuticals.

Indeed, pre-DSHEA was a time of confusion and uncertainty for the industry and consumers alike.

Consequently, the industry, including business owners like my former boss, as well as health-seeking consumers, was not happy. The regulation of dietary supplements as drugs would have put supplements out of
The passage of DSHEA was literally the defining point for the dietary supplements industry. The law now defines a dietary supplement as a product "intended to supplement the diet," containing a vitamin, mineral, herb or botanical, amino acid, or other dietary substance, for use by man to supplement the diet—including concentrates, extracts, and combinations of those ingredients. It gave consumers and companies a clear definition of what a dietary supplement is and provided the industry with clear requirements for how to make these products, how to label them, and what kind of educational information to include. DSHEA also met consumers' expectations by reassuring that dietary supplement companies were following a regulatory structure and that consumers could trust in what they read on the supplement label.

The gray area started clearing up.

As the industry was defined, it began to grow. What once was a modest-sized marketplace is now a significant one. And with that growth has come a level of maturity. Because of DSHEA, this industry is different than it was 20 years ago. This law has given our industry the ability to foster unique growth in product areas that can help people stay healthy. It has prompted self-regulatory and monitoring programs to help maintain consumer confidence. It has opened the door for more research, worldwide, to study the benefits of dietary supplements.

On this 20th anniversary of the passage of DSHEA, I think back to my former boss. Today’s retailers, product developers, and product line workers are just as passionate as he was about providing quality products that keep people well and improve their health.

Duffy MacKay, ND, is the senior vice president, scientific and regulatory affairs, for the Council for Responsible Nutrition (CRN), the leading trade association for the dietary supplement and functional food industry.
DHA Health Claims in the Broader Omega-3 Category

Baby food and pet food still dominate the DHA market.

BY INNOVA MARKET INSIGHTS

Consumer awareness of omega-3 fatty acids—and the omega-3 fatty acid DHA, in particular—has grown over the years. DHA has enjoyed a higher profile as result of increased research on its potential health benefits; however, recent tightening up of claims legislation in some global regions has, in some cases, caused decreased use of specific health-benefit claims for DHA and other omega-3 ingredients. Also, while claims such as “high in omega-3s,” “contains omega-3s,” and “rich in omega-3s” persist, claims linking omega-3s to specific cardiovascular, cognitive, eye-health, and joint-health benefits are much less common, with companies instead relying more on consumer knowledge about the wide range of potential benefits attributed to these nutrients.

Food and drink launches marketed on their DHA content amounted to less than 1% of the total global product launches that Innova Market Insights recorded in the 12 months up to the end of August 2014. This figure rises to nearly 2% of total launches if more-general omega-3 fatty acid claims are also included.

Product launches touting DHA and/or omega-3 fortification span most product sectors and include omega-3s from a wide range of sources, including oilseeds, vegetables, and fish, and marine products such as algae.

DHA Marketing Highest in Asia

There are some significant regional differences in DHA and omega-3 marketing, however. Asia, for instance, is the leader in terms of DHA claims. In Asia, products featuring DHA claims account for 1.8% of total food and drink launches; in fact, more DHA claims were used than general omega-3 fatty acid claims, which appear on just 1.1% of new product launches.

This could imply a greater ingredient awareness among Asian consumers, who seek out specific omega-3 ingredients. Asia in fact accounts for nearly 64% of all global DHA product-launch claims—well ahead of the United States and Western Europe, which each account for 9% of total launches featuring DHA claims.

Baby Food and Pet Food: DHA Claims Leaders

Baby food is by far the most frequent user of DHA claims, accounting for 80% of the global total and ahead of pet food, which accounts for 10.5% of product launches with DHA claims. Other types of product launches account for the remaining 10% of the DHA claims market and is led by fish and seafood (oily fish is increasingly marketed as naturally containing DHA and/or omega-3 fatty acids), dairy products (including yellow fats), sauces and seasonings, and bakery products.

General Omega-3 Claims

While DHA claims remain high in baby food and pet food, other product categories rely much more highly on general claims of omega-3 fatty acid content. Baby and pet food still account for 45% of general omega-3 claims, while the remaining 55% of general omega-3 claims is attributed to other products, again led by fish and seafood. Sauces and seasonings, cereal products (mainly cereal bars), dairy products, and bakery products are the next biggest users of general omega-3 claims.

Product Types

A wide range of fish products is now marketed on naturally high-DHA or omega-3 fatty acid content, including traditional canned lines, as well as newer pouch fish or fish meals, frozen products, and even preserved lines such as the Ahi Tuna Jerky launched in the U.S. market in 2014, marketed as containing DHA.

In the dairy sector, organic specialist Stonyfield (Dannon) is the leader in mainstream omega-3 products. Since introducing a product range in 2011, the company has built on the concept to offer whole milk, 2% reduced-fat milk, and low-fat...
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chocolate milk. All are marketed as rich in DHA and EPA to support “heart, brain, and eye health.” The company’s YoToddler and YoBaby yogurts are also advertised as containing DHA.

Rival organic dairy company Horizon (WhiteWave) makes even more overt use of DHA content for its DHA Omega-3 milks range, including whole, reduced-fat, and fat-free products, as well as two flavored chocolate and vanilla lines. The packaging prominently states “supports brain health” directly below the product name.

Meanwhile, in Canada, Saputo-owned Neilson offers its Dairy Oh microfiltered milk, obtained from cows fed a special diet high in DHA and marketed as supporting the normal physical development of the brain.

There is also some ongoing interest in DHA in the mainstream soft drinks market. Coca-Cola’s Minute Maid offers a Pomegranate Blueberry Fruit Juice Blend containing omega-3/DHA and claiming to “support brain and body.” An interesting launch early in 2014 (and since discontinued) was the Mint Melon BrainBoost Drinkable Yogurt from Skyland, claiming to support brain function and cognitive development.

Although we’ve seen less product activity in DHA and omega-3 rich/fortified products in recent years—and particularly in Europe following difficulties stemming from health claims regulations—clearly there is still interest in the sector. As promising as some of these ingredients are, marketers are still grappling with their share of challenges, including the fact that some ingredients are better researched than others, and figuring out how to market products naturally high in DHA versus products for which omega-3 has been added as an ingredient.

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Nutritional Outlook’s readers and editors highlight these eight companies for their standout achievements in 2014.
U.S.–China Health Products Association

Navigating China’s complex natural-products industry is easier, thanks to the USCHPA.

BY KIMBERLY J. DECKER

Not since the Nixon Administration has an organization done more to open China to American interests than the U.S.–China Health Products Association (Tianjin, China; and Lewes, DE). That may sound like hyperbole, but for the many American natural-products companies that have benefitted from the association’s efforts—whether on nuts-and-bolts trademark issues, cultural insights, or broader initiatives to change the way the industry works in China—it’s the plain truth.

That’s a tall order for any trade association to fill, which is why it’s all the more notable how successfully USCHPA has filled it. For when the association was incorporated in July 2010, it was virtually a one-man show, with its current executive director, Jeff Crowther, serving not only in that capacity, but as chief financial officer, communications officer, membership officer—“basically everything the association needed to function properly,” he says.

Those early years were lean, but with Jarrow Formulas (Los Angeles) and NSF International (Ann Arbor, MI) the first two companies to join as members, the association got a vital financial jumpstart. “However,” says Crowther, “two companies do not an association make, and the funding was severely lacking to tackle all the things I wanted it to accomplish.” So, forgoing his salary that first year, he set a goal of racking up at least five or six other members by its end, and with that goal accomplished in short order, USCHPA “started moving forward with our mission, hiring staff, and so on.”

As something of a startup, USCHPA was lucky to have an “old China hand” (albeit a chronologically young one) like Crowther at
welcomed by many, Crowther predicts that "formulas that contain
and mineral supplements. And, while a notification system would be
the creation of a notification or "recording-type" system for vitamin
release of two draft documents by China's FDA in November detailing
vitamin and mineral formulas—a fact somewhat confirmed by the
basis system not unlike that in the U.S., for ingredients such as simple
etary supplement regulations, hints are they'll create a notification-
though we'll have yet to learn the precise content of China's final di-
process for supplements, by way of redrafting its food safety law. Al-
risks and investments. And, true to the association's mission to bridge the
gap between industry and regulators, the event featured China's FDA
director Zhang Jinjing in an exclusive Q&A session. Also represented?
The Chinese Nutrition Society, the China Council for the Promotion of International Trade, the China Health Care Association, the China
Chamber of Commerce, and the Tianjin Free Trade Zone Investment
Bureau, not to mention representatives from Canada, the EU, Israel,
and U.S. governments.

It's all in a day's work for an organization that "isn't your typical
trade association," says Crowther. Aside from regulatory advocacy,
USCHPA helps its member companies, and the dietary supplement
industry as a whole, succeed in "one of the most difficult markets in
the world. So there's a lot of extra help needed to navigate the regula-
tions, systems, sales channels, and more." They'll be in good hands.
"What I tell new members," Crowther says, "is that if they have a prob-
lem, put it on the table and my team and I will get to work on it."
Arla Foods Ingredients

Innovation is an inherent byproduct of this dairy company’s culture.

BY KIMBERLY J. DECKER

When a handful of Danish and Swedish dairy farmers got together in the 1880s to form the cooperatives that would one day become Arla Foods Ingredients, they weren’t making things easy on themselves. But being Danish and Swedish dairy farmers, they had little choice but to base their farms in Northern Europe. As a result, says Susie Moller Hjorth, president, North America, Arla Foods Ingredients (Basking Ridge, NJ), “Our founders chose to produce milk in one of the most expensive places on Earth.”

The choice proved to be “a little bit of a challenge,” she confesses with classic Scandinavian understatement. “But with that challenge came innovation, because we had to come up with new ideas for how to add value to milk.” After all, she says, “We’re here for the purpose of giving a good return to our owners, who are our farmers. So we were committed to innovation very early on. And that’s what we’re still doing every day. It’s an innovation culture.”

The dividends were on full display in 2014 as Arla Foods Ingredients racked up a handful of awards for its novel ingredient technologies—technologies that not only reflect the resourceful spirit of its founders, but make good on its commitment to sustainability both internally and for its customers. “Sustainability is one of those words that have become ‘buzzwords’ over the years,” Hjorth notes. “But we’ve done a great deal of work internally to translate those buzzwords into real fundamentals.”

Consider, for example, Arla’s Nutrilac FastRipe milk protein, which reduces ripening times for cheese without diminishing product quality or shelf life, allowing cheesemakers to bring product to market sooner. That creates efficiencies not only in terms of capital use but also by accelerating the cheese-ripening process and thus relieving pressure on other inputs, including energy and space. “If you can get ripening time down on cheese,” Hjorth explains, “it not only reduces costs, but is also good for the environment because it cuts resource use.”

While Nutrilac FastRipe took the Best Manufacturing or Processing Innovation prize at this year’s World Dairy Innovation Awards, its cousin, the Nutrilac acid whey process solution, went home with 2014’s IFT Annual Meeting & Food Expo Innovation Award. And the innovation couldn’t be timelier, as it addresses an unintended consequence of the Greek-style yogurt phenomenon. To wit: For every 100 kg of milk that becomes Greek-style yogurt, fully 66 kg of acid whey remains—a byproduct whose disposal imposes both financial and environmental costs on yogurt manufacturers.

New Nutrilac YO-8075 enables high-protein Greek smoothies.

Thanks to the company’s process, the simple addition of a specialized Nutrilac milk protein to the Greek-yogurt acid whey stream turns that byproduct into a high-value, mild-tasting, protein- and calcium-rich foundation for further dairy development—and in the process, it turns what had been an operational liability into a potential profit source. The company is very proud of the praise the process has gotten, says Torben Jensen, an Arla application manager based in Aarhus, DK. “Because we try to think creatively: ‘Here is a waste product, and how can we transform that into value? How can we utilize every portion of the milk in another product?’”

That frugality both mirrors and informs the company’s broader sustainability efforts, which include “translating a very aggressive environmental strategy into tangible, and also very aggressive, targets,” Hjorth says. Among those targets: keeping CO₂ emissions below 25% even as the company grows; putting energy consumption...
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and environmental issues at the top of the agenda when investing in and building new facilities; adopting responsible packaging to minimize resource use without compromising integrity or product quality; and working with suppliers who themselves place a high store in sustainability.

"We want to make sure that they run a sustainable business, and we want to make sure that all the ingredients they use comply with our own high standards," Hjorth says. "So we’re challenging ourselves to find all those areas where we can contribute to running a more sustainable business."

It’s a mentality that would have been familiar to those 19th-century Scandinavian dairy farmers—although they probably wouldn’t have made as much of a fuss over Arla’s accomplishments as we in industry are. "It’s our heritage," Hjorth says humbly. "And I think that much of our innovation-oriented mindset comes from that heritage. We’re owned by farmers and by farm families, and we grew from this relatively modest co-op through merging with other co-ops and developing our business through growth. And yet this cooperative mindset has always been the driver. We take a great deal of pride in that."

And make no mistake about it—while Arla’s solutions pay tribute to 19th-century frugality, the company very much has its eye on the future. One of its latest launches this year, Nutrilac YO-8075, is a direct acknowledgement of the aforementioned Greek-yogurt trend sweeping the nation. Nutrilac YO-8075 helps manufacturers take Greek-style dairy into the next realm: high-protein smoothies, to meet the skyrocketing high-protein trend.

The company describes Nutrilac YO-8075 as a natural whey protein derived from cow’s milk. The ingredient makes possible fat-free smoothies comprising 50% Greek yogurt and 50% fruit, for a total protein content as high as 7.5%. This is higher than typical smoothie protein content, which the company says usually hits around 1%. Citing growing demand for Greek yogurt and high protein, "This means there is a significant opportunity in the marketplace to offer next-generation smoothies that are also very high in protein," said Jensen, in a press release.

And, of course, there is always that nod to sustainability. Nutrilac YO-8075 generates zero of the aforementioned acid whey byproduct of standard Greek-yogurt making. And it can achieve high yields and be processed on existing machinery. It is this very forward-thinking that makes Arla Foods Ingredients one to watch.
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The industrial-hemp champions are finally seeing decades of persistence start to pay off.

BY KIMBERLY J. DECKER

If Chris Boucher has learned anything during the decades he's spent working to legitimize—and legalize—industrial hemp in America, it's that one should never doubt the power of persistence, or of taking legal action. As the vice president of product development at US Hemp Oil, a division of CannaVest Corp. (San Diego), says, "The quickest, fastest way to get industrial-hemp laws implemented correctly in this country is to sue the DEA."

He almost makes it sound easy. But that persistence part still helps, and Boucher has it in spades, which probably came in handy during the 20 years that passed between the day in 1994 when he dropped some hemp seeds into the ground at a USDA research station in Southern California and this past May, when a field at Murray State University in Kentucky became the first planted with legal industrial hemp since the 1950s. Making that day a reality, Boucher says, only took "some maverick Kentucky politicians stepping in, refusing to back down and litigating."

Well, that plus the ongoing efforts of Boucher, US Hemp Oil, and CannaVest.

First, some context: The status of industrial hemp in the United States is complex. On one hand, coming from the same Cannabis sativa plant that brings us marijuana, industrial hemp falls into the notorious class of Schedule I controlled substances that includes heroin, Ecstasy, and mescaline. On the other, the 2014 Farm Bill grants universities and state departments of agriculture the legal right to research industrial-hemp farming, production, and marketing if the states already legalized the growth or cultivation of industrial hemp themselves.

It's a classic states'-rights issue, Boucher believes, "and according to the law of the United States of America, industrial hemp is legal as long as it's 0.3% THC and below," he says, referring to delta-9 tetrahydrocannabinol, the psychoactive compound that gives marijuana its high. However, and despite the new Farm Bill, the U.S. Drug Enforcement Agency (DEA) doesn't always distinguish between industrial hemp and old-fashioned pot, and so it's been known to confiscate seeds destined for innocent research purposes.

And that brings us back to the legal actions of states like Kentucky, and to the role that CannaVest—not to mention Boucher himself—had in shepherding them along. Boucher and colleagues founded CannaVest and its subsidiaries not just to bring hemp-based supplement, food, and consumer products to the American mainstream, but to "support, invest in, and develop America's industrial-hemp industry for producing seed oil, protein powder, grain, fiber—basically the whole nine yards," he says. "We're investing in the research, equipment, and everything we need" to revive the cultivation of a crop that our Founding Fathers tended. "That's our goal."

It's a goal that Boucher's been pursuing "nonstop" since the last century. Having started one of the country's first hemp-products companies in 1990, as well as having been a founding father himself of the Hemp Industries Association of America (HIA) in 1992, he's familiar with the industrial-hemp business. He also has experience with its legal side, having helped write "some of the first industrial-hemp legislation in the United States in 1994," he says, and, as part of HIA, having sued DEA in 1999 for threatening action against businesses that sell hemp-based products.
That experience came in handy as CannaVest guided Kentucky in taking on DEA’s resistance to industrial-hemp agriculture. And in light of everything, “It was a miracle that we were able to get the first seeds in 50 years into the ground in Kentucky,” Boucher says.

Once they were there, CannaVest’s involvement continued in its assistance with technical issues, importing and donating seed for research, and bringing in expertise “to teach the farmers and the university the best ways to grow hemp,” he says. And that’s really what industrial-hemp research is about. With the field dormant for so many years, the industry has a lot of intellectual ground to recover, and Boucher says they’re eager to learn how best to make the crop marketable.

For example, “We want to determine how many pounds of seed per acre the hemp plant will grow,” he says. “And just because a seed grows well in Canada doesn’t mean it’ll grow well in Kentucky or Southern California.” With some 100 varieties of industrial hemp out there—“some designed just to produce seeds; others designed just to produce fiber”—farmers will need to know which best suits their target product. After all, says Boucher, “That’s your bottom-line economic factor.”

And while developments in Kentucky are getting the spotlight, it’s not the only industrial-hemp hotbed that CannaVest’s efforts reach. In Colorado, the company supplied seeds and consultation services to universities for their own hemp-cultivation research. It also helped one of the largest farms in that state’s San Luis Valley embark upon planting industrial hemp—until DEA seized the seeds. “Imagine the investment and job creation we’d have if we’d gotten those seeds in the ground,” Boucher says. “How do you calculate that?”

Whatever the figure, he believes it’s only a matter of time before we arrive at a more rational approach to growing, using, and overseeing industrial hemp. And when we do, he predicts, “we’ll see tens of thousands of acres of hemp being grown in the next five years, and factories producing fiber, seed oil, protein.”

The demand is surely there. “The consumer’s informed at this point,” he says. “They know it’s a quality crop, it’s safe, it’s one of the most digestible proteins that we know of. Heck, our first flag—the Betsy Ross flag—was made from hemp! We used to salute the United States of America with a hemp flag!” And you can’t get more American than that.
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The team at DianaPlantSciences (DPS; Portland, OR) isn’t just imagining this scenario; they’re working it in their labs every day. And they’ve been doing so—using what’s known as plant cell culture technology—for the past four years. The technology “bridges the gap between agricultural products and pharmaceutical ones,” says company president Marc Philouze, and the result is an ingredient with “a high content of target phytoactives while retaining the diversity and complexity of the elements inherent to the traditional plant.”

So what is plant cell culture technology? Philouze describes it as the controlled growth and reproduction of plants, plant tissues, and/or plant cells for the purpose of zeroing in on those cells that exhibit an optimal concentration and distribution of whatever naturally occurring phytoactive you’re looking for.

And it’s a technology whose time has come, given the pressures facing not just industry, but the planet. Compared to traditional agricultural methods used to produce plant sources of bioactives, the technology leaves a vanishingly small footprint. For example, it requires minimum water use and no pesticide application. And because the plant cells produce a precisely prescribed amount of actives within each cell, there’s no need to harvest a whole plant and extract one compound, a process that’s labor, energy, and resource intensive and leaves behind wasteful byproducts.
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By proceeding in a controlled environment shielded from environmental variability, plant cell culture technology "enables the growth of plant cells without ever having to worry about how factors such as rainfall, drought, light, and pests affect yield and consistency," Philouze adds—no small matter in our changing climate. And because it renders pesticide exposure or adulteration moot, it makes the task of accounting for transparency, identity, and traceability much easier.

So if plant cell culture technology is, in a word, efficient, one thing it isn’t is genetic modification. Plant cell culture technology introduces no traits and generates no products that the plant wouldn’t possess or produce naturally. Rather, Philouze explains, "The process repeatedly selects the groups of cells that display the targeted characteristics, generation after generation." Think of it as 21st-century plant breeding, amplifying desirable attributes not through painstaking matches but through a proprietary technology that permits high-throughput screening of multiple cell lines.

Novel as it seems, the technology has actually been around for decades, Philouze says, but was held back because it "had been difficult to commercialize due to lack of reproducibility, scalability sensitivity, and selectivity." And that’s where his company makes a difference.

As Philouze tells it, DPS was founded by "a handful of scientists focused on producing ingredients from plant cell culture technology." Some had been working with the technology for close to 30 years, and their cumulative expertise not only gave the firm uncommon familiarity with cell-line selection—all the better to hone in on the best choices for targeted actives—but, says Philouze, translated into "a rare understanding of metabolic pathways and the ability to unlock them to attain active concentrations far in excess of the plant performance in the wild, without compromising its natural origin."

This mastery of key metabolic pathways allows the team to focus on secondary metabolites that protect the plant cell but don’t directly act in the plant’s growth, development, or reproduction. This point may sound recherché to layfolk, but to Philouze and colleagues, it equals access to "many powerful compounds, such as potent antioxidants," that fall into the secondary-metabolite category.

As proof of the technology’s benefits and the company’s technical savvy, DPS launched its first commercial product, Cocovanol Cocoa Actives. The health benefits of cocoa have sparked no dearth of chatter, and Cocovanol delivers high polyphenolic content without extraction issues, sustainability quandaries, bitterness, caffeine or theobromine (the bitter alkaloid of the cacao plant), or—crucially—excess calories and fat.

Also in development is ActivBerry bilberry, whose procyanidin profile is impossible to replicate via traditional extraction from the bilberry fruit, says Philouze. Moreover, the product can claim sustainable sourcing and a neutral creamy color that, unlike most berry extracts, doesn’t interfere with the appearance of colorless applications, such as skin creams.

That’ll keep the company busy in 2015, as will efforts to educate consumers and manufacturers about plant cell culture technology. "We developed the website www.plantcellculture.com to serve as an educational platform," Philouze points out, and the company prepared several white papers and backgrounderd to help the public understand the technology’s safety and utility in providing "a real solution for some of industry’s challenges."

Fortunately, the learning curve isn’t very steep. "Once people understand the technology and its benefits, the interest soars right away," Philouze says, adding that "DianaPlantSciences also offers companies partnership opportunities in developing exclusive novel ingredients for maximum differentiation in the marketplace."

Since the company’s founding, internal interest certainly hasn’t flagged. "Some of the company’s scientists have been working with their cell lines from the very beginning and think of them like their babies," Philouze says. "So it’s an exciting technology for the market and the industry, and it’s still very exciting for us."
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Flax Council of Canada

An approved flax/cholesterol health claim is just one of the council’s 2014 highlights.

BY KIMBERLY J. DECKER

In the pantheon of “superfoods,” you won’t find one with a more storied past than flax. Domesticated as early as the Neolithic Era, flax merited mention for its healing properties in Greek and Roman texts dating back to 650 BC, and the 8th-century emperor Charlemagne so valued the crop’s healthfulness that “he passed regulations related to a requirement for flax consumption,” says Kelley C. Fitzpatrick, director of health and nutrition, Flax Council of Canada (FCC; Winnipeg, MB).

But while flax’s backstory may be catnip to history buffs, it’s the superfood’s future that occupies the FCC. And 2014 saw the emergence of several exciting developments that demonstrate not only flax’s functional promise, but the FCC’s active role in helping realize it.

As Fitzpatrick says, “We know that consumers are looking toward real, whole foods for their nutritional needs.” As such, they’re setting their sights on flax—and, in particular, its seeds—as rich sources of soluble and insoluble fiber, the short-chain omega-3 fatty acid alphalinolenic acid (ALA), and lignans, which Fitzpatrick describes as “a major class of phytoestrogens and an effective antioxidant.”

Now more than ever, flaxseed’s appeal is expanding beyond its traditional audience of natural and health-food devotees and “gaining traction with consumers of mass-market and convenience foods,” she continues.

Of course, flax’s profile didn’t rise this high on its own. Credit goes to the FCC’s advocacy and to the attention the group has called to the science supporting flax’s health benefits. “We know that science is very important in the promotion of healthy ingredients,” Fitzpatrick points out. “And positive research results show that flax’s highest value position is as part of the human diet to prevent several diseases and chronic conditions.”

The best place to dive into that research is the Flax Research Database for Human Health and Nutrition, which the FCC launched in partnership with Glanbia Nutritional (Fitchburg, WI) in 2012. With their goal of making the database the most comprehensive portal for nutritional information about flax, the partners offer it free of charge to the public and update it regularly—courtesy of funding from Glanbia—to reflect the state of flax science.

The database provides an unbiased review of research on everything from omega-3s and fiber to antioxidants and proteins. As it now stands, “there are currently over 1,000 abstracts with editorial comments included,” says Fitzpatrick. Most focus on human clinical trials related to health and disease reduction, and a strict requirement that all literature be peer reviewed and available through commonly used scientific search sites helps maintain the collection’s rigor.

“We’ve also included papers highlighting analytical assessments, food formulation, and review articles,” Fitzpatrick adds, noting that the database’s audience comprises health professionals, food-industry members—even consumers. As for their response: “We’ve had very positive comments.”

As flax goes mainstream, the FCC is here to help.

DECEMBER 2014 * NUTRITIONAL OUTLOOK
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Among the lessons visitors might have learned from their review of the database:

- Flaxseed's lignans may protect against some cancers, including prostate, breast, lung, and colon, because of their antioxidant action and “ability to reduce tumor number and blood-vessel growth,” Fitzpatrick says.
- Flaxseed's lignans and ALA help reduce and prevent inflammation that can affect the immune response. “Thus,” Fitzpatrick says, “flaxseed may be useful in the treatment of such immune disorders as rheumatoid arthritis and psoriasis.”
- A prospective, double-blind, placebo-controlled, randomized trial demonstrated reductions in systolic and diastolic blood pressure in flax-consuming subjects relative to those receiving a placebo. The higher the baseline blood pressure, the greater the flax-related reductions.
- Flaxseed appears to lower fasting blood glucose and glycated hemoglobin (HbA1c) levels, suggesting potential for diabetes management. And in overweight or obese pre-diabetic subjects, flaxseed intake decreased glucose and insulin levels while improving insulin use.

From the standpoint of 2014 milestones, the research with the most significant impact is that showing flaxseed's potential to reduce the risk of heart disease by preventing the buildup of harmful deposits on artery walls. “In studies that assessed large groups of people to determine disease trends,” Fitzpatrick says, “increasing dietary ALA content corresponded to a decreased risk of stroke and heart disease. And along with fiber, lignans, and other antioxidants, ALA can reduce blood cholesterol”—a claim that this year won the support and sanction of Health Canada.

That’s because the FCC submitted a health-claim petition to Health Canada (the federal department that regulates such claims) describing the relationship between serum cholesterol reduction and flaxseed—ground, milled, or meal. The scientific substantiation for the claim totaled 1,079 references initially, which the team then shrank to 526 by eliminating duplicate studies. Finally, in accordance with Health Canada’s stringent requirements for study quality and design, the team winnowed the selection to a mere seven that they submitted to the agency.

And it worked. Health Canada’s Food Directorate announced the claim’s approval this past January. “The acceptance of the flaxseed/cholesterol-lowering relationship by a well-respected agency such as Health Canada provides support for the remarkable potential of flaxseed in health and wellness,” Fitzpatrick says. “And it’s important to note that this claim is one of only 10 allowed in Canada for foods and ingredients, which demonstrates the significant rigor that Health Canada demands of the scientific criteria.”

The claim is a tool that manufacturers can use to draw their consumers toward the benefits of flax—and the products made with it. “A health claim stated clearly on labels is a very positive step in promoting new—as well as increasing current—food use for flaxseed,” she notes. “To maintain this momentum, the FCC will be attending trade shows, providing presentations at conferences, sponsoring media events, and populating the website www.healthyflax.org”—“the backbone” of the FCC’s marketing campaign.

“We’ll also be visiting food and ingredient companies to provide information regarding the nutrition properties, as well the functional aspects, of flax for development purposes,” Fitzpatrick continues. Because the minimum amount of milled or ground flax needed to make the claim is 13 g (about 2 tablespoons) consumed three times daily for a total of 40 g, we’re working with the Food Development Centre (FDC) here in Manitoba to create delicious products with enough flax to achieve the health claim,” she says.

Beyond that, the FCC plans to continue racking up the good flax news, whether related to its hypertensive effects, antioxidant characteristics, or even its protein components. “The research will continue to focus on lowering cardiovascular disease, metabolic syndrome, diabetes, and inflammatory disorders,” Fitzpatrick says. “We would expect that through more positive research results, there will be greater market pull for flaxseed-containing foods from consumers and hence a greater number of such foods fortified and marketed domestically.”
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Global ID Group
A pioneer in the world of non-GMO testing, certification, and education—at home and abroad.

BY KIMBERLY J. DECKER

From Kenneth Ross’s perspective, the 2014 Institute of Food Technologists’ Annual Meeting & Food Expo was something of a turning point in the saga surrounding genetic modification, or GM, technology. After all, IFT is the major gathering of food-industry players—who, as a rule, tend to be fairly sanguine about GM. That being the case, a keen interest in non-GM offerings had “been pretty invisible” in years past, says Ross, CEO of the Global ID Group (Fairfield, IA).

Not so this go-round. “I was really taken by surprise by how much visibility the non-GMO issue had” at the June show, he recalls. “There were booths all over with people advertising non-GMO ingredients, and sessions on research about public perceptions. So if people still wonder whether non-GMO is going mainstream within the food industry, I’d say the answer is, ‘Yes.’”

That shift came in part thanks to the work of the Global ID Group. After all, to the extent that the food industry—to say nothing of consumers—can give credence to what “non-GMO” actually means, they have the actions of the Non-GMO Project and the Global ID Group and its family of companies to thank.

Since the group’s founding in 1996, it’s pursued a mission of “supporting the production of safe, ethical, and sustainable food,” as Ross puts it, by applying scientific rigor to the way we define, identify, and analyze the GM content of ingredients, agricultural goods, and finished products. At the beginning, that meant helping to pioneer the field of GMO testing as the first lab in North America—and among the first in the world—to use polymerase chain reaction, or PCR, technology to recognize and distinguish between GMO and non-GMO DNA. “Without the advent of PCR testing for GMOs,” Ross notes, “entire regulatory regimes that were put into place around the world would not have been possible.”

The Group also realized early on that consumers, regulators, and advocates would come to place high store in such information and expanded its services beyond testing to encompass third-party certification, introducing a workable non-GMO certification standard in 2000 under its CERT ID subsidiary.

That standard helped to streamline GMO verification—and, to hear Ross tell it, not a moment too soon. “We found that if you were shipping large volumes of GMO crops and had to test every lot, you’d go broke,” he explains. Their solution looked instead at the entire system—from field to factory; seed to storage—to address critical points where GMO contamination might occur. Having done that upfront, subsequent sampling on a statistical basis could provide as much assurance that a system and its outputs are certifiably non-GMO as could testing every shipment.

The process, Ross says, “is still the gold standard globally between sellers and buyers of non-GMO crops.” What’s more, it was incorporated into the ProTerra Standard that the Group debuted in 2006 to certify food and feed along dimensions ranging from environmental and social accountability to labor issues, worker safety, and more. On an annual basis, Ross says, the company certifies roughly four million metric tons of Brazilian soy destined for EU markets as both non-GMO and socially and environmentally responsible.

But even as certification programs were setting the pace for the industry, there were concerns that the USDA’s National Organic Program (NOP) included a loophole that permitted adventitious or accidental GMO contamination of organic crops, without any defined threshold of tolerance.

Since 2002 when the NOP went into effect, the GMO proportion of the domestic soybean crop has grown from 4% to over 90%—with similar growth rates for corn—leading the Group and others to conclude “that industry needed an extra level of assurance so we didn’t wake up one day and find that we couldn’t get sources of non-GMO in-
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gredients for organic products,” Ross says. “While, at the time, organic was the best way to avoid GMOs, organic and the Non-GMO Project seal combined would assure non-GM choices well into the future.”

Thus arose what might be the Global ID Group’s crowning achievement: a founding role in the Non-GMO Project, an independent, nonprofit initiative to design and administer a product-verification program to maintain organic’s status as the gold standard for non-GMO.

Realizing that “this was a much bigger issue than any one company could address,” Ross says, Global ID contributed its CERT ID certification standard to serve as the basis for the Non-GMO Project’s. Beyond that, he gives “tremendous credit to people who, in the early stages, jumped onboard and supported that effort,” including Whole Foods, United Natural Foods Inc., Nature’s Path, Eden Foods, Lundberg Family Farms, Strauss Creamery, and others.

The Non-GMO Project standard has evolved through a five-year, multi-stakeholder process into a “rigorous and meaningful” standard that applies to seeds, feed, multiple ingredients, and finished products, and that serves the needs of growers, suppliers, manufacturers, retailers, and “everyone’s needs in the industry,” says Ross.

And now, it’s going global. While its founders designed the Non-GMO Project for domestic consumption, so to speak, “non-GMO verification is a global issue,” Ross insists, and making sense of the world’s patchwork of regimes became the Global ID Group’s next challenge.

Its solution: the Non-GMO Global Framework, whose purpose, Ross says, “is to allow a company that’s looking at its non-GMO strategy globally to understand all the global regulatory asymmetry that’s out there and source, produce, sell, and provide products in a global non-GMO marketplace.” The framework also vets labs for ISO 17025 accreditation, walks customers through global testing requirements, and helps them evaluate results. The Framework debuted at this year’s Natural Products Expo West show and, says Ross, is already helping “match up international buyers and sellers.”

To help administer its non-GMO programs and their tens of thousands of suppliers and products, Global ID developed its SupplyTrak supply-chain compliance software, which allows users to map wherever in the supply chain their products’ constituent ingredients reside. Ross notes that a development new in 2015 will permit users to track the global supply chain not just against non-GMO standards but along dimensions of concern like gluten content, child labor, resource conservation, and more.

Other new developments this year include the company’s validation and implementation of digital PCR as a GMO-detection tool—a first in the industry, Ross says. The technology is 10 times more accurate and sensitive than traditional PCR, he says, “which will allow us to do some things that hadn’t been possible before in terms of verifying and validating non-GM products.” The company is also working with Europe’s Danube Soya Initiative to ensure that a certain portion of the non-GMO soy used in Europe comes from along the Danube River, shrinking the commodity’s carbon footprint.

But of 2014’s accomplishments, the “biggest of them all” was hitting 20,000 verified products, Ross says. “In the early days, we’d go to Natural Products Expo East or Expo West, and if we saw 10 booths with a Non-GMO Project seal, we were beaming.” How that’s changed. “Clearly, we’ve gone beyond critical mass, and the industry has accepted and adopted the Non-GMO Project as the standard.”

In the coming year, the Group will publish its Global Guide to GMO Standards and Regulatory Policy, the first comprehensive online database and publication tracking in real time the progress of the Framework in all key markets, comparing regulatory regimes, retail policies, and third-party seals. “It just gives you the entire global picture along the lines of the knowledge embodied in the Framework,” Ross says.

As non-GMO’s robust presence at IFT attests, it’s a mission whose time has come, and one whose target constituency includes what Ross calls “the new food industry.” He describes this new industry as going beyond maximizing the palatability, popularity, and profitability of its products to embracing a commitment to transparency, authenticity, sustainability, social responsibility, and safety.

That’s uncharted territory for the food biz. While it’s achievable, “that doesn’t mean it’s going to be easy,” Ross says. “But I think that in this world and this new food industry, we do have to take responsibility. A lot of companies have been doing a lot of fantastic work in that area for a long time, and now it’s becoming almost a requirement going forward.”
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Can’t we all just give the poor artichoke a break? It’s been maligned as an “acquired” taste, more trouble to prepare than it’s worth, and just-plain scary looking. And don’t even get the wine geeks started on what it does to an oaky Chardonnay. But despite all the smack talk, the spiky thistle has its devotees, and thanks to Howard Ketelson, PhD, and the crew at ARTY Water (Newport Beach, CA), artichoke fans now have yet another option—besides deep-fried hearts and dip—for enjoying this remarkable vegetable. And it’s as easy to do as taking a drink.

As perhaps the first commercially produced, ready-to-drink artichoke water on the market, ARTY takes its place alongside all those other “natural hydration” products that have become such a sensation lately—including, but not limited to, coconut water, aloe water, et al. And, admits Ketelson, CEO and founder of ARTY Water, “there is a huge battery of water products on the market. It’s been interesting to watch the significant acceleration of innovation over the past year with maple, birch, watermelon, and other products emerging to provide consumers a wide range of choices.” But while he gives props to them all, ARTY Water, he says, is different.

For starters, it transforms a notoriously imposing produce item into a beverage that’s 100% consumable. As Ketelson notes, “Artichokes are one of the most underused and misunderstood vegetables,” with roughly 30%–40% of the plant going to waste in the course of preparation. “It’s difficult to, essentially, squeeze artichokes into a bottle,” Ketelson concedes. So he and his colleagues developed a proprietary process—and a “strategic intellectual property plan to make sure our process stays unique,” he adds—that uses the whole artichoke—from stem to tip—to make ARTY Water.

The product made its mass-market debut at the 2014 Natural Products Expo West trade show, and the months since have “been an amazing experience, and the momentum keeps building,” Ketelson says. The team first tested the product in small groceries and at Equinox fitness clubs where Ketelson teaches indoor cycling, but it was really that showing at Expo West that generated what he calls a “tremendous response” and gave the team the chance to distribute more than 3,000 bottles to eager samplers. “This event was the pivotal point to invest money into the company and plan a path forward,” Ketelson says.

The subsequent buzz has been inescapable both within the industry and with consumers. Ketelson notes that the product received a “best of” new-product nomination at Expo West, and that the company was invited to participate in a Food Navigator beverage forum. Meanwhile, a Q by Equinox blog posting got picked up by Details.com and spread news about the product’s benefits to other media. “And we received a tremendous reception by the vegan community at the recent SEED Event in New York,” Ketelson adds.

Yet the question remains: Why artichokes? “We were initially driven by the artichoke’s unique nutritional value,” Ketelson explains, which comprises basic vitamins and minerals as well as key antioxidants and electrolytes. “Artichokes have one of the top ORAC values,” he notes, which is a measure of a substance’s oxygen radical absorbance capacity and, thus, its antioxidant potential. “When most people think of antioxidants, blueberries come to mind,” he notes. “Artichokes are the blueberries of the vegetable world per antioxidant levels.” Even the drink’s green/yellow color reflects its phytonutrient content.
Today more than ever, “energy” is the overwhelming consumer buzzword, and a myriad of nutritional products contain so-called “energy” ingredients.

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Among those phytonutrients are luteolin, known for its anti-inflammatory properties; silymarin and cynarin, both of which have "hundreds of papers discussing their benefits," Ketelson says; and caffeic and chlorogenic acids, with documented anticancer, antimicrobial, and antiviral properties. "Obviously, more studies are needed to see if incorporating artichokes into a water and using the product for these positive benefits has merit," Ketelson admits. "But regardless, ARTY Water contains these nutrients and brings them in a delicious, nutritional product to consumers."

The team spent "considerable amounts of money" testing for more than 50 constituent nutrients, Ketelson says. But they also spent considerable time and effort testing for consumer palatability, which is the bottom line with any beverage product. Not coincidentally, it’s the bottom line for Ketelson and his colleagues, too. "The ARTY Water team loves food," he says, and coming up with the formulation and flavor profile “was the most fun time for us.”

That doesn’t mean it was easy. He calls the product’s profile development "a huge challenge" involving many months spent "hammering away—literally—in our test kitchen to produce several variations of the current product." An earlier iteration was heavier and "meatier—similar to coconut water in consistency," he says. Aiming for something lighter, more refreshing, and amenable to frequent consumption, especially pre- and post-workout, they eventually landed at the texture on display today.

As for the hints of mint, apple, and lemon, they chose them to "catch you by surprise," Ketelson says. "It’s balanced with key flavors of subtle fruit sweetness and vegetable artichoke notes on the back end of the taste profile. It’s easy to drink daily and goes great with lunch or dinner. I love it with fresh salads or as a complement to sandwiches. It’s also great in smoothies."

That’s what you get when you gather a group of passionate foodies, scientists, and athletes to design a next-generation beverage. But Ketelson is also quick to credit their farmer partners at Ocean Mist who supply the California-grown raw material for ARTY Water. "Ocean Mist has a 90-year heritage of farming artichokes," he says. "We feel strongly about working with U.S. farms and suppliers, and Ocean Mist has a contagious passion for providing great fresh produce" that fits with ARTY’s mission.

As the team starts testing a new version of ARTY made with ginger root—not to mention two non-water concepts using artichoke matter left behind after bottling—Ketelson and crew take pride in giving consumers a water that “comes from the hands of the land to the bottle directly from fresh California artichokes in a very short period of time,” he says. "We feel very strongly about what we produce and value what ARTY brings to the table."
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Chapul
Introducing crickets to the American palate

BY KIMBERLY J. DECKER

Pat Crowley doesn’t know what all the fuss is about eating crickets. “I’ve traveled around the world and seen insects on a multitude of culinary menus,” says the founder of Chapul (Salt Lake City), the company that brought us The Original Cricket Bar. “So the concept of eating insects wasn’t new to me.”

But perhaps more pivotal in his motivation to create Chapul was the fact that, with a graduate degree in hydrology and experience as a whitewater-rafting guide, Crowley knew all too well the inimical consequences that contemporary agriculture imposes on the environment, and on water resources in particular.

So all it took was a TED Talk on the health and sustainability benefits of entomophagy—the practice of eating insects—to convince Crowley that giving bugs a place at the table is a sound strategy for feeding the planet in the not-too-distant future, when demand for finite resources will surely outstrip supply. The only trick, of course, would be convincing the rest of us of the same.

Which is where those cricket bars come in. “Knowing that our cultural perception of insects was the main barrier to entry,” Crowley says, “I started Chapul in 2012 to address this by introducing insects into our diet in a culturally friendly way.” With the Aztec Bar (dark chocolate, coffee, and cayenne), the Chaco Bar (chocolate and peanut butter), and the Thai Bar (coconut, ginger, and lime), you could argue that he was introducing them in a gastronomically friendly way, too.

And as far as timing goes, the company couldn’t have scheduled a more opportune moment for giving the cricket bars their debut. “Bugs are as ‘paleo’ as you can get,” Crowley points out. “Humans were eating insects long before the agricultural revolution 10,000 years ago. In the case of some Native American groups, there’s evidence that insects were even the primary source of protein.”

Did you know that crickets are high-quality protein?

And therein lies the appeal of crickets as food. The “flour” Chapul uses—basically, milled crickets—clocks in at 60% high-quality, easily digested, complete protein. “Of the almost 2,000 known varieties of insects eaten around the world,” Crowley notes, “crickets rank high in overall nutrition.” For example, in addition to protein, they supply iron, vitamin B12, and other micronutrients.

And they convert what they eat into this nutritive value much more efficiently than do other animals we raise for food, using about one-tenth the amount of land and water resources as other forms of livestock, Crowley says. “They can also be grown in mobile or urban environments,” he adds, “relieving the current need to clear-cut Amazonian rainforests to grow soy fields” for feed.

So despite a virtually nonexistent market for cricket cuisine when the company started, “our guess was that our target customers would be concerned not only about the health of the planet, but their personal health as well,” Crowley says, generating enough demand to get Chapul hopping.

According to the FAO, insects will meet the world’s growing need for alternative protein sources.
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And in a tribute both to their faith and to the American consumer’s gastronomic temerity, Chapul bars have taken off. The two years since their launch have “been a wild ride,” Crowley says, prompting press coverage in The New York Times, The Washington Post, Huffington Post, CNN, and NPR—and—most significantly, says Crowley—an appearance on ABC’s “Shark Tank.” The show is a family favorite, and “it was gratifying to know that we may have spurred family conversations about what was on the plate that night for dinner,” he says. It also didn’t hurt that the appearance netted an investment from Mark Cuban.

That’s not to say that selling Americans on cricket bars has been a stroll down Easy Street. Whether from the absence of any supply chain or FDA guidance to commercial kitchens “weary of our product and store owners not giving us the time of day,” Crowley says, “we were met with adversity at every corner.” Fast-forward to now, and you’ll find dedicated insect farms producing food-grade product, definitive FDA statements, and—thanks, in part, to Chapul’s NEXTY award for most innovative food product with a healthy and sustainable mission at the 2014 Natural Products Expo West trade show—“a lot of very receptive retailers eager to bring in our bars.”

To the company’s credit, it “tries to make it as easy as possible for people to take that first step,” Crowley says. By milling the crickets into a mild, slightly nutty-tasting flour matched with “delicious and familiar flavors” like fruits, nuts, and chocolate, the company lets the bars speak for themselves. And with his background in science, Crowley finds the experimentation inherent to product development “a fun process.” The biggest lesson he’s learned so far: “There is no such thing as perfect, and we just commit to constantly improving both our process and our product.”

Take, for example, the “fun flavors and new products” Chapul has in the pipeline and hopes to debut in the coming months via its website. “Our philosophy is to be a positive, solution-based option for the growing population of concerned foodies,” Crowley says. “A measure of our success will be in five years when you can purchase insect-based foods at your local farmers market—and, of course, a Chapul bar in your local grocery store.”
Nutritional Outlook’s

People to Watch Directory

A Who’s Who
of the natural products industry
Lorraine Aboughanam, Vice President of Sales & Marketing
Elite Ingredients LLC • Clifton, NJ

Since its launch in 2009, Elite Ingredients has managed to proactively facilitate essential improvements necessary in redesigning business concepts in the nutraceutical field. Lorraine Aboughanam, the vice president of sales and marketing, is the key component in the company’s successful growth. Her R&D team works tirelessly in an effort to gain exclusive distribution rights to elusive raw materials internationally. Lorraine and her team perform multiple quality-assurance checks to ensure optimal customer satisfaction. Elite Ingredients has quickly built a reputation of excellence through its attention to detail for every order. They believe that the best approach to a successful operation is to be consumer oriented while simultaneously providing quality products at the best value in the current market. Company standards and strategies used to ensure smooth and expeditious service are constantly redesigned and updated in order to keep up with current trends. In addition to being the vice president of sales and marketing, Lorraine has extended her services to a new demographic as a consultant for finished products based on her expertise and proficiency. Her vision has been recognized and quickly become a trusted brand in the nutraceutical world. Lorraine Aboughanam and Elite Ingredients have successfully raised the bar and become the industry’s trusted leader.

www.elite-ingredients.com

Lisa Thomas, General Manager, Dietary Supplements & Sports Nutrition
NSF International • Ann Arbor, MI

Lisa serves as the general manager for NSF product certifications and facility GMP registrations for dietary supplements and sports nutrition companies, as well as for the bottled-water and functional-beverages programs at NSF International. Lisa leads the NSF team of auditors, toxicologists, chemists, microbiologists, and project managers, ensuring client facilities and products pass all audits and label claim, contaminant, and banned-substance testing.

Networking with regulatory bodies, medical decision-makers, and trade and professional athletic organizations, Lisa strives to educate the public on properly choosing safer products for consumption, leading to consumer confidence and a healthier, safer lifestyle for all. Lisa plans to pursue greater product quality in the future through supply-chain control, utilizing NSF’s extensive international capabilities.

Prior to joining NSF International, Lisa was a Montessori elementary teacher, a National Team and professional soccer athlete, and an Olympic athlete coach. After her teaching experience and pursuing a career as a medical examiner, Lisa chose to step out of the lab and start a quest for public health and safety at NSF International, combining her biochemistry education and professional athletic background to help improve quality and safety in the dietary supplement, sports nutrition, and bottled-water industries.

www.nsf.org

Jamie Spell, Managing Director
Nutraceuticals International Group LLC • Bloomingdale, NJ

Jamie Spell, the managing director of Nutraceuticals International Group®, is the guiding force behind this multimillion-dollar company. Under her leadership, NIG has become a major supplier of nutritional ingredients, nationally and internationally. “NIG doubled its revenues in 2014, and we are confident that NIG will continue to grow our business for years to come,” she says.

NIG launched NIG Europe to better serve our international customers and has expanded into Mexico, too. Following our merger with Omni Flavors, we now offer the finest all-natural flavorings in the industry. NIG also offers its own line of proprietary ingredients, many of which have been awarded trademarks and patents.

Jamie always seeks to improve NIG’s service and reputation as the nutraceutical industry’s go-to source for essential and innovative products.

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Anurag Pande, PhD, Vice President – Scientific Affairs
Sabinsa Corp. • East Windsor, NJ

Anurag completed his M.Sc in organic chemistry from Lucknow University. He joined the National Botanical Research Institute, a CSIR institute, as a research fellow and completed his PhD from RML Awadh University. His research interest is related to traditional Indian medicinal plants and their antioxidant and nutraceutical potential. After completing his PhD, Anurag joined the Sami Labs’ Sabinsa group as a research scientist in 2004 and worked at a research facility at Sami Labs, Bangalore, on various nutritional and cosmeceutical projects. He later joined the technical support group at Sami Labs responsible for providing interface between R&D and various Sabinsa marketing offices located globally. After brief stint at Sabinsa Europe GmbH, where he was exposed to the European market, in 2007 he joined Sabinsa Japan Corp., Tokyo, as senior manager, technical affairs, and was responsible for handling the technical and regulatory requirements of the Japanese as well as Korean markets. In 2011, he joined Sabinsa Corp., New Jersey, as vice president, scientific affairs, and explores new product concepts as well as technical and regulatory matters related to the U.S. and Canadian markets. He has been a speaker at various internationally held conferences, such as the Sustainable Cosmetics Summit, the SupplySide Science Tour, Fi Korea, HBA, and the CME group of the American Chemical Society. He is passionate about Sabinsa products and loves to talk to R&D and product development groups about the innovation and science behind the products.

www.sabinsa.com

David Jiang, PhD, Director of Technical Services/R&D
VitaTech Nutritional Sciences Inc. • Tustin, CA

As an employee of four years with VitaTech® Nutritional Sciences Inc., David Jiang’s area of expertise and primary responsibilities are overseeing the formulation of tablets, capsules, and powder products, including the innovation of new and appealing chewable and powder products.

David is a member of the American Botanical Council and enjoys reading, swimming, and traveling. He received his doctorate in nutritional sciences at Texas A&M University.

vitatech@vitatech.com
www.vitatech.com

Thomas T. Tierney, President and CEO
VitaTech Nutritional Sciences Inc. • Tustin, CA

Thomas T. Tierney is CEO of VitaTech® Nutritional Sciences Inc., a legacy contract manufacturer and developer of science-based supplements and nutraceuticals. He is known industry-wide as a thought leader in formula innovation and production processes, and has mentored successful branded consumer product firms and specialized-channel marketing enterprises. Tom is a 29-year Trustee of the University of California, Irvine, Foundation, with leadership engagements in stem cell, memory, PTSD, and health delivery systems. He has been active in the natural products industry since 1971 and also has served as a Trustee or Director of Bastyr University, Orange County Performing Arts Center, Laguna Art Museum, and the Defense Orientation Conference Association.

His academic credentials include a B.S. in business from Wayne State University and a MS in logistics from Air Force Institute of Technology, as well as Certified Nutrition Specialist designation.

vitatech@vitatech.com
www.vitatech.com
Vitatech Nutritional Sciences Inc. is a 60-year, U.S.–based manufacturer and innovator of dietary supplements and nutritional products. We formulate, manufacture, and package nutritional solutions in powder, two-piece capsule, and tablet form in a FDA-licensed, cGMP, NSF Certified for Sport pharmaceutical environment.

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Stuart R. Gelbard, Owner
Barrington Nutritionals • Harrison, NY

Stuart began his career in the nutraceutical industry while attending Bentley University (1981). In 1991, he branched out and started Barrington Nutritionals. Since then, the business has expanded to three offices with nationwide warehousing. Stuart takes great pride in staying an active member of the industry and is currently a supporting member of CRN, NPA, DCAT, NIA, and AHPA. He is dedicated and very passionate about doing business with integrity and compassion by offering the highest-quality ingredients with superior customer care—all while having fun.

www.barringtonnutritionals.com

Jingshi Joe Zhou
CEO
TSI Group Ltd.
Shanghai, China

Jingshi Joe Zhou is the CEO and cofounder of TSI Group Ltd., which was established in 1996. Prior to cofounding TSI, Joe was a senior research scientist at both Amway and Avon. Joe was educated both in China and the United States and has received advanced degrees in chemical engineering, chemistry, and industrial pharmacy.

www.tsiinc.com

Kevin Le
Director of Business Development
TSI China Company, Ltd.
Shanghai China

Kevin Le began his career at Cognis Nutrition & Health after graduating from University of New South Wales with a Master of Science in biotechnology. In 2006, Kevin joined TSI Australia as a sales manager of functional-ingredient business development. In 2012, Kevin was appointed the director of business development for China and Southeast Asia.

www.tsiinc.com

Larry Kolb
President
TSI USA Inc.
Missoula, MT

After graduating from Arizona State University with a Bachelor of Science degree in business administration, Larry served as vice president of Charles Bowman and Co. and marketing manager for Nurture Inc. In 1996, Larry cofounded TSI and is president of the TSI USA branch. He serves as an advisory board member to UNPA and NBJ.

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Time (hr)
0% 10% 20% 30% 40%

% Change *P<0.05

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Oat Beta-Glucan Gets a Better Cholesterol Meta-Analysis


A soluble fiber in oats, called oat beta-glucan, is widely regarded for its ability to help lower human cholesterol. At least five national health agencies around the world permit related oat beta-glucan health claims. Multiple studies back up these health claims, but ingredient supplier DSM Nutritional Products (Parsippany, NJ) realized that of the published meta-analyses available on oat beta-glucan studies, none were restricted to studies involving 3 g of beta-glucans or more daily—the dosage required for compliance with all oat beta-glucan health claims around the world.

Because DSM has stake in the oat beta-glucan market, the company funded a selective meta-analysis of studies based on the 3-g dosage. The results were still positive—significant reductions in LDL and total cholesterol—but they were, in a way, noticeably different from those of previous investigations.

"Although generally confirming the results of previous meta-analyses, that oat products reduce serum cholesterol, the present results differ in that the magnitude of the effects seen are 50%–100% greater than those reported in previous meta-analyses," said the researchers. DSM says the high dose of oat beta-glucan allows this compound to escape the food matrix once it is consumed, which allows it to form a viscous gel and bind to cholesterol in the small intestine.
**RESEARCH BUZZ**

**Menopause Formula Boasts Third Clinical Trial**

EstroG-100 is already a popular menopausal formula, now manufactured into finished health products by the likes of NOW Foods, Doctor’s Best, and Swanson Health Products. Results of a third clinical study, though, could really open the market for this herbal mix.

For 12 weeks, 70 women in various menopausal states (pre, peri, and post) were assigned to an EstroG-100 dietary supplement or placebo. Based on participant responses to questionnaires, EstroG-100 significantly reduced a large number of menopausal symptoms, including insomnia, vertigo, joint and muscle pain, hot flashes, and vaginal dryness. The results back previous trials of three months and an entire year of supplementing with EstroG-100.

“As far as we know, there are no menopause ingredients in the nutra market today that bear a comparable Phase II trial and Phase III human clinical trial study with similar protocols,” said Michael Jeffers of EstroG-100 supplier Helios Corp. (Santa Fe, NM), who added that study participants have seen significant health improvements in as little as one week.

EstroG-100 is an herbal combination of Angelica gigas root extract, Cynanchum wilfordii root extract, and Phlomis umbrosa root extract. The formula is non-estrogenic and is backed by New Dietary Ingredient (NDI) status.

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**Pycnogenol, Post-Pregnancy**


One of the original applications for Pycnogenol, today’s most famous pine bark extract, was in venous health. A new study on women with varicose veins now puts the use of Pycnogenol for pregnancy back in focus.

Varicose and spider veins frequently occur in women (and towards their heels) immediately following pregnancy. For this trouble, there are compression stockings, but such garments can only provide a physical impediment to excessive blood flow downward.

In a recent study, 133 women wearing compression stockings for six months following pregnancy demonstrated significantly improved health parameters if they also consumed Pycnogenol daily. The extract was associated with significant reductions in number of varicose veins and visible clusters of spider veins. Self-reports of leg cramps also decreased significantly.

Pycnogenol supplier Horphag Research (Geneva) says what it learned from this study is that Pycnogenol can actually improve the tonality and elasticity of varicose veins. The study adds to an already strong number of studies on Pycnogenol for vein health. In 2006, researchers even found the pine bark extract to be more effective at reducing edema than the pharmaceutical drug Daflon.

While the market for venous insufficiency may seem small in the United States, Horphag contends that it is already quite large in Europe.
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<thead>
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<th>Page(s)</th>
<th>Company Name</th>
<th>Website</th>
<th>Phone Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>54</td>
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</tr>
<tr>
<td>15</td>
<td>Organic Technologies</td>
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<td>740/622-0755</td>
</tr>
<tr>
<td>56</td>
<td>Pacific Nutritional Inc.</td>
<td><a href="http://www.pacnut.com">www.pacnut.com</a></td>
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</tr>
<tr>
<td>35, 49</td>
<td>Pharmachem Laboratories Inc.</td>
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<td>26–27</td>
<td>Sabinsa Corp.</td>
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<tr>
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<td>Synergy Flavors Inc.</td>
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</tr>
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<tr>
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