

12
14

food technology

www.ift.org

Advancing Food & Health Through Sound Science



A New Crop of **PLANT PROTEIN PIONEERS**

'free-from' foods
exploring encapsulation
healthful foods directory
pathogen detection advances

IFT
feeding the minds
that feed the world



A NEW CROP OF PLANT PROTEIN PIONEERS



Move over animal protein. Developers of plant-based products are getting down to the molecular level to build burger and chicken alternatives that taste and chew like the real thing.

Pull a package of Beyond Meat chicken-free strips or beef-free crumbles from the freezer case and a two-word product descriptor catches the eye: real meat. Yes, real meat—not meat alternative or meat replacement. The term makes perfect sense to company founder Ethan Brown and his team of product developers and marketers, who like to think of the plant-based protein products they're bringing to market as meat—just meat that's even better than the animal protein varieties to which the term has traditionally been applied.

"We argue that animal meat and plant meat are one and the same," says Tim Geistlinger, vice president of R&D for the El Segundo, Calif.-based company. "They're all constructed of proteins, fats, nucleic acids, carbohydrates. All of these things exist in living things, and plants are living. Animals are living. Now it's just a matter of reconstructing things. You're assembling them in a way that is similar to what animal meat is like in terms of density and structure and fiber."

"Whoever said that meat had to come from a cow?" Bob Connolly, Beyond Meat marketing vice president, asks rhetorically. "We can make meat from plants." The home page of the Beyond Meat website maintains that

this is so; it invites website visitors to "meet America's newest meat."

Merriam-Webster suggests that the Beyond Meat argument has merit. While the first dictionary listing defines meat as "the flesh of an animal used as food," follow-up definitions describe it as "the part of something (such as a nut) that can be eaten" and "solid food as distinguished from drink."

The plant meat terminology is provocative, says Jaime Athos, president and CEO of Turtle Island Foods, Hood River, Ore., maker of *Tofurky* brand meat substitutes. He thinks that is a good thing. Athos is a fan of Brown and Beyond Meat and appreciates the interest in meat alternatives that the high-profile company is generating. "It's fantastic for us," he says. "I love the attention that they're bringing to our types of products."

Welcome to the exciting new realm of

Beyond Chicken Grilled Strips boldly tout their status as both "real meat" and "100% plant protein." Photo courtesy of Beyond Meat



A new generation of meat replacement products is sprouting up in the marketplace, giving consumers a growing array of options for meatless Monday—or any other day of the week. @abadontan/1Stock/Thinkstock. Burger photo courtesy of Meat Foods. Image illustration by Leslie Pappas.



The majority of Tofurky users are flexitarians (who eat meat and fish only occasionally); vegetarians and vegans account for less than 20% of purchasers. Photo courtesy of Turtle Island Foods

plant-based protein products, a world where R&D teams are scrutinizing animal and plant protein at the molecular level in a bid to create plant-based offerings with taste and textural properties comparable to beef and chicken. Their efforts have drawn the attention—and capital—of investors as notable as Bill Gates as well as recognition from culinary superstars like Alton Brown. The chef said in a recent magazine article that Beyond Meat chicken-free strips could be substituted for chicken in about 30% of all recipes that use the real thing (Brown, 2013). Gates is also an investor in San Francisco-based Hampton Creek, where scientists reportedly screened 3,000 plants to arrive at the optimal ingredients for the company's plant-based egg substitute, which is used in its *Just Mayo* and *Just Cookies* refrigerated cookie dough (Packaged Facts, 2014).

In another California-based entrepreneurial venture, scientists and culinary professionals at Impossible Foods in Redwood City are laboring to perfect the taste of a plant-based burger so authentic that it “bleeds” in a way that is akin to a rare beef burger. The burger incorporates “plant blood” that Impossible Foods scientists have bioengineered from the heme molecule found in hemoglobin, the compound in animal blood that gives red meat its characteristic taste. The heme that Impossible Foods uses, however, is reportedly extracted from the roots of legumes (Nosowitz, 2014). Impossible Foods is the brainchild of Stanford University biologist and physician Patrick Brown (no relation to Beyond Meat's Brown), who says that he hopes to have the Impossible Foods burger available at retail as early as the end of 2015 (Rusli, 2014). The fact that it currently costs \$20 to produce one of the burgers may mean that the timetable will need to be adjusted, however.

Beyond Meat has a new burger offering waiting in the wings as well. Its soy-free *Beast Burger*, formulated from a mixture of plant proteins, including pea, moringa, and hydrilla (an aquatic plant), is slated to arrive in supermarkets early in 2015. The *Beast* boasts a nutritional profile that Geistlinger says has more omega-3s than a serving of salmon, more calcium than a glass of milk, more iron than a serving of steak, more protein than a beef burger, and more antioxidants than a serving of blueberries. Connolly says that Beyond Meat will introduce a total of eight new products, including chicken-free nuggets and plant-based meatballs, in the first quarter of 2015.

Beyond Meat products are made using a proprietary extrusion process developed by University of Missouri professor and IFT member Fu-hung Hsieh and licensed to the company. (See sidebar on page 24 for Hsieh's description of the way in which the chicken-free product concept originated.)

Geistlinger describes the manufacturing process as a “very gentle cooking process” that uses steam, pressure, and heat to partially cook the plant proteins. “What that means,” he says, “is that it makes the proteins unfold in a very controlled way.” Then they're cooled, also in a controlled way, which causes the proteins to integrate and fold upon each other in a way that creates the desired fibrous texture of meat. “It's balancing texture and moisture to create mouthfeel,” says Geistlinger.

A Look at the Market

U.S. per capita meat consumption has been declining since 2007 (NCC, 2014). Meanwhile, sales of meat alternatives climbed by 8% between 2010 and 2012 (Mintel, 2013).

Mintel 2013 survey data show that more than a third (36%) of consumers use meat alternatives; those in the 18–24 age range have the highest usage rate—46%, followed by those aged 25–34 with a usage level of 43%.



Such statistics come as no surprise to marketers at Garden Protein International, Vancouver, Canada, which introduced what is now an extensive line of center-of-the-plate *Gardein* brand meat substitutes to the U.S. market in 2009. "The drive is really coming from Millennials," says Russell Barnett, vice president of marketing, Garden Protein International. "That's because they grew up with plants as an option. They grew up turning over the package and identifying ingredients."

Among those who are purchasing meat alternatives, 16% are using them alongside animal protein, suggesting that the products can stand on their own as food options and are not merely meat substitutes in the minds of many consumers (Mintel, 2013). Vegetarians and vegans represent about 4% of the U.S. population, but 47% of consumers eat at least one vegetarian meal a week (VRG, 2012). It's this latter segment of the market that makers of meat alternatives tend to get excited about.

"Who we are really targeting with the brand," says Beyond Meat's Connolly, "are people outside the category. We are really targeting mom, who is faced with the challenge of serving up dinner to the family seven days a week."

Personal health concerns are the number one motivation for going meatless, according to a recent consumer study conducted by Acosta Inc., a Jacksonville, Fla., sales and marketing company. The high cost of meat and seafood, worries about genetically modified organisms (GMOs) and preservatives, and concern about the environmental impact of meat production were other factors survey respondents cited (Acosta, 2014; Figure 1).

June Lim, president of StarLite Cuisine, a Seal Beach, Calif.-based maker of vegan Mexican entrees,

Garden Protein International introduced three gluten-free Gardein brand items earlier this year. Photo courtesy of Garden Protein International



StarLite Cuisine highlights its use of pea protein on packaging for Enchiladas Suizas. Photo courtesy of StarLite Cuisine

started learning about her father's vegetarian foods business as a child. She says she's seen a major evolution in mainstream consumer response to vegetarian/vegan products over the course of the past few decades. It's gone from "ewwww" to "wow," she notes. StarLite Cuisine has been slowly but steadily expanding its taquitos and tacos from their West Coast retail base; last year, the company added gluten-free enchiladas to the lineup, says Lim.

While purveyors of plant-based products like Beyond Meat and Hampton Creek have been making headlines in the past year or two, more established players like Turtle Island Foods and Garden Protein International are showing strong growth. Garden Protein saw sales surge 37% for the 52-week period ending Sept. 7, 2014, according to IRI Infoscan data, and Turtle Island Foods' sales climbed by 18% while overall frozen/refrigerated meat substitute sales in supermarkets, drug stores, mass merchandisers, and select club and dollar stores were up 1.8% to \$402 million for the period. Garden Protein's performance was apparently not lost on executives at Pinnacle Foods, Parsippany, N.J., which markets *Birds Eye* vegetables and a variety of other brands. Pinnacle last month announced plans to acquire Garden Protein for \$154 million with the goal of leveraging the complementary *Birds Eye* and *Gardein* brand equities.

A new player in the meat substitute segment, Lancaster, Pa.-based Neat Foods, founded by husband-and-wife team Phil and Laura Lapp, is attempting to crack the market by going the shelf-stable route. The company offers a variety of meat substitute mixes made primarily from pecans and garbanzo beans as well as a *Neategg* mix derived from chia and garbanzo beans. The concept was born after Laura, a former

neuroscientist, started getting experimental in the kitchen. Phil, a sales executive for Auntie Anne's Pretzels at the time, thought he saw a niche in the marketplace for the products, which are currently available in about 1,500 retail outlets, including Whole Foods and Wegmans, with Target scheduled to roll out *Neat* mixes in several hundred stores this fall. The company hopes to move into the frozen food aisles in the first quarter of 2015 with the launch of *Neatballs*, a meat-free version of meatballs.



With the addition of eggs and water, meat replacer Neat yields a meal in minutes.
Photo courtesy of Neat Foods

"The idea of using nuts and beans as a meat substitute has been around for decades, but no one thought about doing it commercially," says Phil Lapp.

Protein Power

Consumers' mounting interest in plant-based protein is clearly part of a bigger-picture trend: their ongoing love affair with protein. More people now look for protein on the Nutrition Facts Panel even as fewer of them check labels for fat and calorie content, says Darren Seifer, food and beverage analyst for Chicago-based NPD Group. NPD data show that more than three-quarters (78%) believe that protein contributes to a healthy diet, and more than half of adults want to consume more of it.

"Protein is the new black," says consultant Kantha Shelke, principal of Chicago-based Corvus Blue LLC. "Just as people believe that black makes one look slimmer, people have come to believe that protein can make them thinner."

"There are only three macronutrients," says Rachel Cheatham, president and CEO of Chicago-based Foodscape Group LLC. "You've got protein, fat, and carbohydrates. If you really think about it, protein is the one that arguably has never been demonized."

"I don't think the average consumer is thinking, 'I need to get more plant protein in my diet,'" says Cheatham. "But they're starting to put it together: I know I need to eat more plant-based food, and I know that I need to eat protein to feel full."

Although the market potential for plant-based protein products

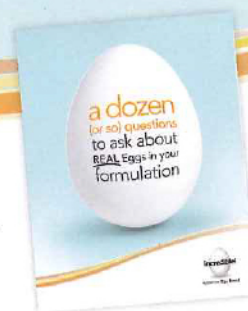
Why should you use **REAL Eggs** in your formulations?

There are more reasons than you might imagine. **REAL eggs are:**

Incredibly functional (with 20+ functionalities)

Natural | Label friendly | GMO-free

Gluten-free | American produced



Download our **FREE brochure!**

"a dozen (or so) questions to ask about **REAL Eggs** in your formulation"

AEB.org/Questions

incredible!

American Egg Board

©2014 American Egg Board | AEB.org | 847.296.7043



IFT Member Fu-hung Hsieh on the Story Behind Beyond Meat

The entrepreneurial venture Beyond Meat has been gaining traction in the marketplace and attracting a fair amount of media attention in recent months. But the story of Beyond Meat's vegetable protein-based meat alternatives really starts with soft-spoken IFT professional member Fu-hung Hsieh, a professor of bioengineering at the University of Missouri.

It's a story that goes back more than two decades, years in which Hsieh labored in his lab to create a soy-based meat analog that chewed like chicken. Eventually he met with Ethan Brown, who was looking for a way to bring a sustainable

meat substitute to market, and in 2009, Beyond Meat licensed Hsieh's technology from the University of Missouri. Hsieh, an IFT Fellow, took some time out to explain how everything came together.

When did you start working on developing a meat alternative?

It was in the late 1980s and early 1990s, shortly after I left Quaker Oats and came to the University of Missouri and had a new APV Baker 50 mm twin-screw co-rotating extruder set up and in operation.

What got you interested in using plant protein in this way?

When I was a graduate student at the University of Minnesota in the early 1970s, I was fascinated by the development of texturized vegetable protein products and I was also aware of some of the shortcomings. For example, these products require hydration. They do not have the whole-muscle appearance, and more importantly, they do not have the mouthfeel of real meat. I also recognized that plant protein is generally much more resource-friendly than meat protein. A meat alternative made from plant protein that meets the needs of consumers could have a significant impact in many areas.

How did you zero in on the ingredients used in Beyond Chicken Strips?

Soy protein and pea protein were selected because they are high in protein quality and also abundant. Amaranth and carrot fiber were used due to their functionality and images for health-conscious consumers. Many other similar ingredients could be used too.

What else can you share about the process of creating this product?

The dry ingredients are mixed in a blender and fed to a twin-screw extruder. Within this piece of equipment, the ingredients are mixed with water, kneaded, heated, and finally pushed through a specially designed long cooling die where the

final fibrous meat analog product is formed. The process is continuous, and it takes about one minute from powdery dry mix to a fibrous product resembling cooked chicken breast meat.

How did the licensing connection with Ethan Brown and Beyond Meat come about?

It was initiated by Ethan. He became aware of our work through the introduction of Jason Matheny, founder of New Harvest (a charitable organization dedicated to building a sustainable, healthy, and humane food system). After several visits, he decided to proceed with the licensing agreement with the University of Missouri.

Did you ever get discouraged over the course of the years that it took to create the chicken-free strips?

No, not at all. Having conducted many other research projects in the laboratory, I know there are always unexpected challenges here and there.

Did you think that the outcome would be what it is—a product that has been so successfully commercialized?

Yes, when I was developing the process and the product, it was my dream that someday they would be commercialized and be beneficial for consumers. I did not know what to expect, however, when this became a reality because I have never had this kind of experience.



Fu-hung Hsieh, a professor at the University of Missouri, spent decades perfecting his soy-based chicken replacement. Photo courtesy of the University of Missouri.

▶ A video detailing Fu-hung Hsieh's experience creating the chicken substitute now marketed by Beyond Meat is available at <http://www.ift.org/Knowledge-Center/Learn-About-Food-Science/Day-In-The-Life/Fuhung-Hsieh.aspx>.

is clear, formulating with plant proteins brings with it a variety of challenges, starting with taste. "Most plant proteins come with marked off-tastes from the plant source," says Shelke. "They are generally bitter and not easily accepted by finicky consumers."

Texture can also be an issue. "Proteins love water, and most foods made with plant protein ingredients require additional ingredients for moistness and better taste," Shelke says. In addition, many consumers miss the familiar taste of dairy or eggs.

Developing the next generation of plant-based protein products requires substantial investment in product research and new manufacturing equipment. Food scientists have not yet come up with all of the technologies needed to make these foods palatable, according to Shelke. Hampton Creek has raised \$30 million in capital so far, and a \$50 million round of financing was in progress this fall (Buhr, 2014).

The Plant Protein Palette

Expect to see product developers incorporating multiple plant protein sources into their formulations and experimenting with up-and-coming plant protein ingredients.

"We like to blend a variety of proteins in our products," says Beyond Meat's Geistlinger. »



AlgaVia™ whole algal protein has applications in a broad range of food and beverages, including baked goods, soups, sauces, and meat alternatives. Photo courtesy of Solazyme

Post's *Great Grains Protein* cereal (Cheatham, 2014). When StarLite Cuisine was working to formulate its frozen vegan enchiladas, the company opted for pea protein from Roquette instead of soy, says Lim. "We're very pleased with the pea protein," says the company president, adding that its neutral flavor is a plus. StarLite even highlights the fact that the enchiladas are made with pea protein on the front of its packaging.

- **Rice Protein.** Sales of its *Oryzatein*® brown rice protein have climbed by nearly 400% since it was launched in 2009, according to Axiom Foods. *Oryzatein* protein, which can be incorporated into beverages, baked goods, confections, sports nutrition products, and more, is enzymatically extracted from whole-grain rice using proprietary processes that do not require the use of hexane. It is gluten-free and GMO-free.

- **Microalgae.** Right on the cutting edge of plant-based protein ingredients is microalgae, a microscopic form of algae produced using fermentation technology.

Microalgae food ingredients deliver whole-food nutrition because they are derived from single-cell organisms. Microalgae ingredient marketers include Solazyme, South San Francisco, Calif., with *AlgaVia*™ and Roquette with *algility*™ HP whole algal protein.

"Because Solazyme's *AlgaVia* is a whole-food ingredient, it offers more to customers and consumers than just protein," explains Sally Aaron, *AlgaVia* marketing director, Solazyme microalgae food ingredients. "It is a unique source of protein, fiber, healthy

lipids, and micronutrients such as lutein and zeaxanthin.

"The macronutrients are completely protected by the microalgae cell wall, so the protein has limited interaction with other ingredients," says Aaron. This makes it easy to use in a broad range of applications including beverages, bakery, soups, sauces, and cream—with minimal impact on the product texture and function."

In addition to its strong nutritional profile and versatility, microalgae are a planet-friendly, renewable resource, according to Roquette, which this summer opened a new facility in France that is dedicated to

Doctors Embrace Plant-Based Diet Paradigm

This past summer Chicago-based cardiologist Kim A. Williams wrote a blog about the health benefits of the vegan lifestyle he had adopted more than a decade earlier. The blog generated some serious buzz because Williams is president-elect of the American College of Cardiology.

In his blog Williams wrote that when he went vegan in 2003, replacing the chicken and fish he was consuming at the time with meat substitutes, his LDL cholesterol plummeted by 80 points within six weeks. Although Williams acknowledges that more research is needed to document the heart health benefits of a vegan diet, he says that he regularly recommends this approach to his patients.

Williams is not the only medical professional to advocate the benefits of plant-based eating. The second annual International Plant-Based Nutrition Healthcare Conference drew more than 400 physicians and clinicians to San Diego, Calif., this fall for sessions presented by prominent advocates of

plant-based eating including Dean Ornish and T. Colin Campbell.

The conference was sponsored by The Plantrician Project, a St.

Louis-based nonprofit organization established to

communicate the benefits of plant-based eating to medical professionals. Its website (www.plantricianproject.org) describes a plantrician as a "physician or clinician empowered with knowledge of the benefits of whole food, plant-based nutrition." The Plantrician Project's board of directors includes Beyond Meat CEO and founder Ethan Brown.



Figure 1. Factors Influencing Consumers' Decision to Practice or Consider a Vegan, Vegetarian, or Flexitarian Diet. From Acosta Sales & Marketing

Personal Health Concerns	61%
Rising Cost of Meat/Seafood	45%
GMOs, Preservatives, Animal Diseases, etc.	41%
Environmental Impacts of Meat Products/Harvest	33%
Curiosity	32%
Personal or Ethical Beliefs	21%
Other	4%

microalgae production.

Beyond Meat is among the companies that have begun to experiment with microalgae. "We're looking at incorporating microalgae, and we're looking at how it responds in our products," says R&D head Geistlinger. "We're definitely testing that."

The fact that it is processed without the use of chemical solvents will enhance the appeal of microalgae, according to Shelke. She predicts that it will initially make market inroads in pet foods and performance products like nutritional bars and beverages.

• Hemp, Alfalfa, and Fava Bean Protein.

Ingredients like hemp, alfalfa, and fava (also known as faba) bean protein powders have been attracting more attention among food and beverage manufacturers seeking to shift their formulations away from soy protein and whey protein, says Jim Saunders, president of Ingredient Alliance LLC, El Segundo, Calif., a supplier of plant-based ingredients. He notes that all are gluten-free, nonallergenic, free of GMOs, and easily digestible.

The company has several R&D projects in the works that use the ingredients in applications such as meal replacements, cereals, baked goods, and beverages.

Among the most notable are cookies, muffins, and brownies made with hemp protein powder for Starbucks supplier La Boulange and a high-protein probiotic beverage for Amway made with fava bean protein.

"There's a tremendous growth cycle right now for hemp protein in particular, and I'm very confident that fava bean will be in as much demand as pea and brown rice protein because of its characteristics, its costs, and the fact that we are growing and processing it in North America," says Saunders.

Alfalfa protein, which Ingredient Alliance is sourcing from France, has a nutritional profile that is very similar to egg white protein and is high in omega-3s, beta-carotene, lutein, and more, according to the company.

Keeping It Clean

Marketers of products formulated with plant protein frequently cite their clean label benefits, including their use of non-GMO ingredients.

Beyond Meat made a conscious decision to steer clear of genetically engineered products. Genetic engineering "opens up a lot of possibilities" for product development, says Geistlinger, but he adds that "we've made a very specific choice not to do that because we know that's not what our audience wants."

Besides, he emphasizes, it's not necessary. "What's really great is that we have learned by sourcing different materials and applying first principle rules of chemistry and protein folding that we can create a lot of things that we need to create using existing natural sources. It's made it clear to us that we don't need to go GMO."

Consultant Cheatham observes that while the spate of new plant-based products arriving in the marketplace

PEANUT FLOUR

PLANT-BASED PROTEIN NON-GMO • GLUTEN FREE ROASTED PEANUT FLAVOR KOSHER • PRODUCT OF USA • HALAL

12% and 28% fat peanut flours
40% and 50% protein levels
Variety of roast levels



Organic versions available!



GOLDEN

PEANUT AND TREE NUTS

Applications:

- Nutrition bars
- Beverages
- Confections
- Dry blends
- Seasonings
- Dry peanut butters

Contact us today to receive a sample.
770-752-8195 • www.goldenpeanut.com

can deliver bona fide nutrition benefits, the health-conscious consumers who are drawn to them will most likely be paying close attention to what is on the label. So product developers will be well-advised to keep ingredient labels as simple and clean as possible. "It's the consumer that is tuned into the idea of plant-based eating that's tuned into clean label and tuned into non-GMO," says Cheatham. "I do think they track together."

"What I would hope would happen is that we'll see more products come out that have various plant-based proteins in them—whether it's soy, or pea, or rice bran—but don't have any extras that aren't needed—whether it's artificial flavors or colors or different kinds of fillers. The [plant protein-based] products with the lesser amounts of those ingredients will probably triumph in sales with the public."

Exactly what packaged products and plant protein ingredients will prevail in the marketplace? That remains to be seen. With a host of emerging plant ingredients now available and a variety of plant-based packaged food products set to arrive in supermarkets in 2015, what is clear is this: there's a brave new world out there for plant protein. And if marketers at companies like Beyond Meat have their way, mainstream consumers may soon be thinking of plant protein products not merely as substitutes for burgers, bacon, or pork chops but as delicious and healthful "plant meat" that is every bit as good as the real thing. **FT**

Mary Ellen Kuhn is Executive Editor of Food Technology magazine (mkuhn@ift.org).

Online Exclusive

For more information on some of the basics of plant protein and diet, see *Food Technology's* Online Exclusive, "Demystifying Plant Protein Nutrition," which can be found at <http://www.ift.org/food-technology/online-exclusives.aspx>.

REFERENCES

Acosta. 2014. The personalization of protein. October. Acosta Sales & Marketing, Jacksonville, Fla. www.acosta.com.

Brown, A. 2013. Tastes like chicken. *Wired*. Sept. <http://www.wired.com/2013/09/fakemeat>. Accessed Oct. 16, 2014.

Buhr, S. 2014. Hampton Creek in a management pickle as it seeks to raise \$50 million in funding. *TechCrunch*. Sept. 17. <http://techcrunch.com/2014/09/17/hampton-creek-in-a-management-pickle-as-it-seeks-to-raise-50-million-in-funding>. Accessed Oct. 20, 2014.

Cheatham, R. 2014. Leveraging the power of plant proteins. Presented at SupplySide West, Las Vegas, Nev., Oct. 7.

Mintel. 2013. Meat alternatives—U.S. Mintel Group Ltd., Chicago, Ill. www.mintel.com.

NCC. 2014. Per capita consumption of poultry and livestock, 1965 to estimated 2014, in pounds. National

Chicken Council, Washington, D.C. www.nationalchickencouncil.org.

Nosowitz, D. 2014. The problem with veggie burgers so real they bleed. *Modern Farmer*. Oct. 24. <http://modernfarmer.com>. Accessed Oct. 25, 2014.

Packaged Facts. 2014. Proteins: classic, alternative, and exotic sources. June. Packaged Facts, New York, N.Y. www.packagedfacts.com.

Rusli, E. 2014. The secret of these new veggie burgers: plant blood. *WSJ*. Oct. 7. <http://online.wsj.com>. Accessed Oct. 23, 2014.

USB. 2014. Consumer attitudes about nutrition, health and soyfoods. United Soybean Board, St. Louis, Mo. www.soyconnection.com.

VRG. 2012. How often do Americans eat vegetarian meals? And how many adults in the U.S. are vegetarian? Press release, May 18. Vegetarian Resource Group, Baltimore, Md. www.vrg.org.

AS GOOD AS WHEY

BUT BETTER

- ✓ Builds Muscle, Power & Strength*
- ✓ Naturally Free of Dairy, Cholesterol & Hormones
- ✓ Allergen-Friendly Clean Label
- ✓ Faster Absorbing Leucine*
- ✓ Lower Cost
- ✓ Low Sodium

Formulate With THE Rice Protein



See the full studies at:
nutritionj.com
annexpublishers.com
& search for
"Oryzatein"

ALSO ASK ABOUT

OryzOlait™ Rice Milk

Avenolait™ Oat Milk

VegOtein P™ Pea Protein - Now Organic & Large Inventory

Cannatein™ Hemp Protein

Incatein™ Sacha Inchi Protein

AXIOM[®]
F O O D S

Since 2005

1.800.711.3587

AxiomFoods.com • info@AxiomFoods.com

PRODUCT INDEX

Healthco

• See our ad on page 45.
www.healthco-intl.com

IFC Solutions

Organic and Organic compliant food colors; Organic lecithins (liquid and powder); Organic food anti-stick/release agents; Organic ingredients (including glycerin, vegetable oils, etc.)

Mid America Food Sales Ltd.

Milne Fruit Products

MLG Enterprises Limited

Vegetable oils; Whole wheat flour; Evaporated cane juice powder

PLT Health Solutions

• See our ad on Inside Back Cover.
www.plthealth.com
 Botanicals; Fruits; Vegetables

PROVA Inc.

Vanilla natural flavor; Cocoa extracts; Coffee extracts; Caramel natural flavor; Chestnut natural flavor

SK Food International

Stevia Ingredients Inc.

Natural sweeteners; *Nectevia* (agave nectar fortified with stevia)

SupHerb Farms

Basil blanched superfine organic

TIC Gums Inc.

• See our ad on page 75.
www.ticgums.com
 Gums

Tree Top Inc.

Van Drunen Farms

Freeze-dried fruits, vegetables, and herbs; Drum-dried fruits and vegetables; Frozen herbs and vegetables

Woodland Foods

Variety of organics, including spices, mushrooms, rice, grains and seeds, beans, dried fruit, flavors, nuts, and legumes

PROBIOTICS

A&B Ingredients

Pediococcus acidilactici

DuPont Nutrition & Health

Blends and single-strain probiotic

cultures scientifically proven to help keep the digestive system running smoothly and to support the body's immune system

Ganeden Biotech Inc.

GanedenBC³⁰ Probiotic (*Bacillus coagulans* GBI-30, 6086)

Healthco

• See our ad on page 45.
www.healthco-intl.com

Rochem International Inc.

PROTEINS

A&B Ingredients

Pea protein isolate

ADM

• See our ad on page 25.
www.adm.com
 Soy; Wheat

Agropur Ingredients

AIDP Inc.

American Egg Board

• See our ad on pages 21, 23.
www.AEB.org
 Egg

Arla Foods Ingredients Group P/S

Axiom Foods

• See our ad on page 31.
www.axiomfoods.com
 The originator of chemical-free plant protein extraction continues to master more proteins, including our signature *Oryzatein* rice protein 90% isolate and soluble options, plus pea, sachinchi, etc.

Batory Foods

Animal; Gelatin; Hydrolyzed collagen; Dairy; Casein, Caseinate; Milk protein; Crisps; Whey protein; Dried egg product; Egg yolk powder; Egg white powder; Whole egg powder; Plant; Pea; Soy; Wheat

Batory Nutra, a division of Batory Foods

Caseinate; Hydrolyzed gelatin; Milk protein concentrate; Milk protein isolate; Pea protein; Protein crisp; Soy protein concentrate; Soy protein isolate; Sweet whey; Whey protein concentrate and isolate

Bioriginal Food & Science Corp.
 Hemp

Botanic Innovations LLC

Cranberry seed nutri-powder; Organic pumpkin seed nutri-powder; De-fatted fruit, vegetable, and herb seed nutri-powders

CHS

• See our ad on pages 60–61.
www.chsinc.com/food-and-ingredients/food-ingredients
 Soy protein

Davisco Foods International
 Dairy

Draco Natural Products

Pea

DuPont Nutrition & Health

Soy protein concentrate; Soy protein isolate

Fortitech Premixes by DSM

Glanbia Nutritionals

Dairy

Golden Peanut Company

• See our ad on page 30.
www.goldenpeanut.com
 Peanut

Healthco

• See our ad on page 45.
www.healthco-intl.com

Hilmar Ingredients

Whey protein concentrate 80%; Whey protein hydrolysate; Whey protein isolate; Lactoferrin; Alpha-lactalbumin

Idaho Milk Products

IdaPro[®] milk proteins contain native whey proteins and micellar casein ideal for muscle protein synthesis, long-term amino acid release, and lasting satiety in active nutrition applications.

Ingredient Alliance LLC

Hemp; Flaxseed; Faba bean; Quinoa; Chia seeds

Ingredion Incorporated

• See our ad on page 27.
www.ingredion.us
VITESSENCE™ PULSE Proteins include a range of proteins derived from lentil, chickpea, faba bean, and pea.

International Dehydrated Foods Inc.

• See our ad on page 56.
www.idf.com
 Chicken powder; Powdered beef; Powdered turkey

Mid America Food Sales Ltd.

Rochem International, Inc.
 Soy

Solazyme

AlgalVia™ Whole Algal Protein

Vyse Gelatin Company

Gelatin; Gelatin hydrolysate; Collagen

Woodland Foods

Wheat; Beans; Peas; Lentils; Rice; Corn; Polenta; Seeds

RESEARCH & CONSULTING

BatchMaster Software

Draco Natural Products

Product development; Assistance in formulating prototypes

ESHA Research

• See our ad on page 11.
www.esharesearch.com
 We offer guidance for food product creation and government compliance through our professional services division.

iTi Tropicals, Inc.

• See our ad on pages 68, 74.
www.ititropicals.com
 Innovation services

Mid America Food Sales Ltd.

rtech laboratories

• See our ad on page 84.
www.rtechlabs.com

Stevia Ingredients, Inc.

Export ready; Fair trade; Kosher (certified Oregon Kosher); Non-GMO; Zero carbon footprint; Product development; Co-packing

SOY

ADM

• See our ad on page 25.
www.adm.com
 Flour; Isoflavones; Soy protein concentrate; Soy protein isolate

Agropur Ingredients

Batory Nutra, a division of Batory Foods

Milk/soy protein crisps; Soy grits; Soy protein isolate