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MONOGRAPH

DEEP DIVE:
2015-16 INGREDIENT MARKET FORECAST

Trends and business intel in 10 of today's most vital ingredient sectors

Includes SWOT analysis

Underwritten By

GWI
the INGREDIENTS SUPERSTORE

Gencor™
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Contents

State Of The Ingredients Market

Quality concerns erode consumer confidence, but innovations still drive growth

The dietary supplements industry in the U.S. today is at a bit of a crossroads — born of being in the crosshairs. Consumer confidence in supplement quality is at historic lows, and nobody seems to have answers. Some of the leading metrics for the collapse of consumer trust include:

- Third-party groups like ConsumerLab and *Consumer Reports* test products from store shelves and the score is never 100 percent satisfactory.

- The New York Attorney General's kangaroo court nevertheless did significant and, perhaps, lasting damage to consumer confidence that what's listed on the label is in the bottle.

- The *New York Times,* which leads media coverage throughout the country, always comes down on the side of more rigorous regulations no matter the industry, and it has never been a fan of supplements. It has made hay aplenty from the New York attorney general's ham-handed sting operation.

- Yes, DNA barcode testing is inappropriate for botanical extracts, but let's just call that the wrong weapon for the right war. Three of the leading botanical organizations — American Botanical Council, American Herbal Pharmacopoeia, and the University of Mississippi's National Center for Natural Products Research — have established a Botanical Adulterants Program for a reason. Identity and quality issues around botanicals are a significant issue.

- The FDA issues 483s and more damning Warning Letters on a weekly basis to companies not complying with aspects of GMPs — and while some are minor like not having written SOPs, on occasion they reflect practices that give no thought to product quality.

• Sports supplements and weight-loss pills are adulterated with pharmaceuticals so often that it sometimes seems like the only thing keeping those sectors going are consumer ignorance of the problem and a greater dollop of hope that a miracle pill will solve their vanity issues.

• Fly-by-night internet-only supplements of questionable veracity are easily available, and nobody seems to be able to do anything about it.

Serious headwinds. And yet, where some perish, others prosper. Both the ingredients and supplements sectors are in the midst of significant innovation shifts to meet the demands of the post-modern shopper — suppliers offering whole-food sources of ingredients are cropping up to serve the expanding stable of whole-food supplement makers, non-GMO certification is way up, organic supplements are starting to blossom, the need for enhanced testing of ingredients and transparency of supply chains and business operations are becoming standard business practices. And the great promise of nutrigenomics and personalized nutrition is coming sooner than one might think. Savvy companies are positioning themselves to address these issues.

"The supplement industry has slowed down considerably within the past year, barely surpassing the 5 percent growth mark," says James Johnson, research analyst at *Nutrition Business Journal*. "While many will point to the negative headlines as the culprit, this is merely taking a shortsighted look. We are increasingly seeing signs that food is becoming a 'frenemy' of supplements. People are trimming back or eliminating supplement usage due to a feeling of confidence that the food they are eating is providing the nutrients needed."

How to reverse the decline? Convince people that supplements are a better source of nutrients than food? Make supplements fun? Continue to blur the lines between food and supplement?

The rise of "whole-food" supplements is coming along at the same time that consumers are looking for more naturally nutrient-dense real foods: Superfruits and superfoods are the rage these days. Supplement gummies are rising at an outsized 30 percent and nutritional powders even more as adults realize they don't have to pop a pill to get uber doses of nutrients. So there remains hope.

"Organic supplements are coming around," says Nancy Smithers, who is a lifetime organic achievement award winner from the Canadian Health Food Association and founder of Nova Scotia Organics line of supplements, which is established in Canada and just now entering the U.S. market. "The thought process is why wouldn't you do vitamins and supplements organic along with everything else you take that's organic? Why would you put something in your body doused in pesticides?"

Nova Scotia Organics sources its ingredients from organic farmers in Canada as well as from Orgenetics, which won the *Functional Ingredients* Editor' s Choice Award at Engredea 2012 for best ingredient supplier for supplements. Based in California, the pioneering company provides 100% USDA certified organic nutrients derived from fruits, vegetables and botanicals from vertically integrated farms in India.

QUALITY STANDARDS REMAIN JOB 1

But first things first: What to do about those incessant quality scandals – and calls for pre-market approval of supplements as a way of dealing with them? Ingredient suppliers are getting on board.

"Gencor supports and embraces the current shifts toward improved quality assurance," says Megan Luu, marketing and advertising coordinator at Gencor Lifestage Solutions, based in California with offices in India and Hong Kong. "We can all see the trend in the industry is toward increasing regulatory, evidentiary and safety standards, and it is very much our intention to remain in front of these requirements."

Among other initiatives, Gencor now sends chain of custody documents along with the standard Certificate of Analysis.

Green Wave Ingredients also has U.S. offices in California, and uses a network of more than 100 ingredient manufacturers across China. To maintain quality in a country that both is the world's main ingredient supplier as well as punching bag for shoddy quality, GWI has a significant program to vouchsafe ingredient integrity. It uses only suppliers that have been in business for at least three years, qualifies manufacturers, sends raw materials out to third-party labs, inspects material both incoming and before being shipped to overseas markets, then tests them again at its U.S. facility.

"It means we get products from quality resources," says Hamlet Chen, GWI's marketing director. "For us, quality is never a concern but a guarantee."

The 2015 New York attorney general's campaign against adulterated or contaminated supplements sent shock waves through the industry, which was quick to attack the DNA barcode testing protocol used but less quick to come up with concrete actions to address the underlying issue everyone knows about. For all the earnest talk about the importance of testing material, and eyeball rolling from the responsible core of the industry that is already doing things right, enough bad actors with no real motivation to do the right thing could certainly lead to heavy-handed legislation nobody wants.

The industry looks to continue its fallback posture of playing defense against the slings and arrows of outrageous media coverage, figuring the current anti-regulatory Congress will continue its do-nothing ways. But markets have a funny way of running ahead of regulations and legislation. For companies responding to the new consumer impetus around quality, transparency, nutrient-dense ingredients and supplements, and innovation hitting the mark on the personalized nutrition front, the future spells opportunity. For mid-level players, a question mark remains around their fortunes — are they smart enough to ask the right questions of suppliers and testing labs to ensure ingredient quality, or will they risk a calamitous product recall or class-action lawsuit in pursuit of a few pennies per kilo saved on that last purchase order? Everybody hopes the bad guys will "self-deport" their ways to another line of work. Until that happens — and nobody around here is holding their breath on that one either — we can expect continued head winds.

Probiotics: No. 1 And Rising

There are some 10 trillion bacterial cells inhabiting the human gastrointestinal tract and yet there are only 10 billion human cells in the entire body. It raises the legitimate question of just what we are made of and who's running the show here.

Probiotics — the so-called "friendly bacteria" populating the GI tract — are the No. 1 ingredient by sales in both natural and conventional retail channels, according to SPINS data. What's more, our understanding of how bacteria affect our health — let alone how probiotic products might — has barely scratched the surface.

The probiotic market today is worth double-digit billions, and promises continued rapid growth. Although the competition is deep, consumer demand is skyrocketing.

Probiotics Market Forecast To 2020

SALES & GROWTH	2014	2015e	2016e	2017e	2018e	2019e	2020e
Natural & Specialty	404	473	547	630	720	818	924
Growth	18.6%	17.1%	15.8%	15.1%	14.4%	13.6%	12.9%
Mass Market	526	588	653	722	797	877	963
Growth	13.9%	11.7%	11.0%	10.6%	10.4%	10.0%	9.8%
Direct	484	577	679	792	914	1,048	1,196
Growth	23.4%	19.2%	17.6%	16.7%	15.4%	14.7%	14.1%
Total	**1,414**	**1,638**	**1,878**	**2,144**	**2,431**	**2,743**	**3,083**
Growth	**18.4%**	**15.8%**	**14.7%**	**14.1%**	**13.4%**	**12.8%**	**12.4%**

Source: Nutrition Business Journal

"We are only now beginning to understand the connection the gut has to every other part of the body," says James Johnson, research analyst at *Nutrition Business Journal*. "If the current scientific understanding of the gut holds up, there is no reason why every food, beverage and supplement should not have a pro- or prebiotic inside."

Sales of probiotic supplements and products are growing like the contents of a petri dish someone forgot to refrigerate overnight — $1.4 billion in 2014, 18 percent higher than 2013 sales, according to *NBJ.* Those bugs will continue to bring in billions, an estimated $2.1 billion in 2017, and $3.1 billion in 2020. And every day seems to bring a new study touting the healthy powers of probiotics.

The leading target for probiotics continues to be women, ages 18-40, says Mike Bush, interim president of the International Probiotics Association and vice president of business development at probiotic supplier Ganeden Biotech. There's more potential for a finer focus on that demographic, like the Credible Cravings bar designed for pregnant and nursing mothers. He also sees great potential in probiotics-fortified food for kids and athletes.

Another opportunity is the infant formula market. While select infant formulas do contain probiotics, they represent only about 6 percent of the market by volume. By 2024, Lux Research forecasts the probiotic/infant formulas market will claim 72 percent of the infant formula market share by volume.

While the benefits are strain-specific and condition-specific, consumers mainly look for a general claim that they link to digestive health, says Bush. "Probiotics recognition is at an all-time high," he says.

"We see the main trend in probiotics to be in functional food," says Bush. "Consumers want probiotics in a way that's convenient to their lifestyles. That's why we're focusing on fortifying foods that consumers are already eating," he says, citing coffee, tea and cereal as examples of a few of the 85 food products that use the company's Ganeden BC30 strain.

INGREDIENT INNOVATIONS BROADEN CATEGORY SCOPE

Ganeden Biotech's BC30 strain of Bacillus coagulans was the pioneer of the so-called "spore former" bacteria, which means it is protected by a shell that keeps the bacteria alive until it reaches the specific pH of the lower GI tract. The protective shell also protects the bacteria from the heat and shear processing conditions that are encountered in food and beverage manufacture. With that unique attribute, the company is successfully integrating the probiotic into food and beverage delivery formats that consumers habitually turn to on a daily basis, such as coffee and tea.

Fellow ingredient supplier Sabinsa has its own spore-former, LactoSpore, which is finding success in applications ranging from digestion to sports and in product formats ranging from foods and drinks to even soap and topicals.

"Spore-forming probiotics such as LactoSpore have allowed formulators to test the limits when it comes to formulating with probiotics," says Shaheen Majeed, marketing director for Sabinsa.

Majeed noted that marketers have wised up enough to begin asking about specific strains.

"This means that many non-strain-specific probiotics will find it difficult to stay on the market. Even the bacteria belonging to the same species are not equivalent in their physical and biological activity."

Other advances in manufacturing technology, like Nutracutix's LiveBac process, have extended probiotics' shelf life, ensuring consumers ingest live organisms. The company's BIO-tract delivery technology helps the bugs make it through the gauntlet of stomach acid and into the digestive tract where they're most helpful, according to Nutraceutix President and CEO Tim Gamble.

SCIENCE & MARKETING BROADEN CATEGORY SCOPE

Diversity would seem the rule in probiotics. There are some 50 different strains found in thousands of food, beverage and dietary supplement applications worldwide, and in the past dozen years, the clinical research supporting the use of these bacteria has exploded.

Is it possible to take a supplement with perhaps 10 billion CFUs of a particular strain and actually have health effects within 1,000 different species and 10 trillion bacteria? The answer lies in probiotics' ability to both down-regulate inflammatory responses as well as create a more suitable pH environment for other bacteria to proliferate. The easiest health application for probiotics is on digestive health because the large intestine is where probiotic bacteria tend to exert their most obvious health benefit.

With emerging science, probiotics are finding a market beyond gut health and immunity. Calling it a "fascinating area of research," Mary Ellen Sanders, Ph.D., with probiotics consultancy Dairy & Food Culture Technologies, says a developing area of research focuses on the role of the gut microbiota on metabolic syndrome – a predictor of diabetes, obesity and cardiovascular disease.

"We know that gut microbiota is different in healthy compared to obese or diabetic subjects. What we don't know is if this is a result of, or a consequence of, obesity or diabetes. We also don't know if probiotic supplementation could impact the development of these conditions," Sanders says.

Since 2011, researchers around the world have discovered links between microbiota and a range of brain disorders including autism, ADHD, anxiety, mood, stress, impulse control, even schizophrenia. The so-called gut/brain axis has been so popularized in the last few years that it's even segmented to target gluten with such popular books as *Grain Brain*, by David Perlmutter, M.D. (Hodder & Stoughton, 2014).

The Human Microbiome Project is a $173 million initiative funded by the National Institutes of Health by doing a deep dive at the gut flora of 300 healthy young adults. It is aiming to do for gut bacteria what the Human Genome Project did for our understanding of DNA. And just as consumers can now pay $89 to get a gene scan of their bodies, they now can pay the same to get a bacterial scan of their gut. The future is in personalized care, and between your DNA and your bacteria, everyone will have a much more complete picture of just what we're made of. Supplements, the thinking goes, will be able to fill in the gaps to bring about a finer picture of optimal health, one person at a time.

SWOT ANALYSIS

STRENGTHS

- **Innovation:** Delivery systems, production methods, scientific claims and new areas of research.
- **Science:** Scientists are just now discovering the many benefits of probiotics, and as more research is completed the more we see how beneficial good bacteria is to overall health.
- **Human Microbiome Project:** Mapping gut bacteria will do for probiotics what the Human Genome Project did for understanding DNA in everyday life. When completed, it will bring attention to the huamportance of a healthy gut.
- **Global awareness:** As the probiotics market continues to grow, consumers are predominantly aware of the health benefits associated with probiotics.

WEAKNESSES

- **Strain confusion:** Not all probiotics are created equal; all probiotic characteristics, such as benefits to the host, survivability, safety, efficacy and the benefits to the consumer can differ wildly from strain to strain.
- **Lack of knowledge:** Although most know probiotics provide a health benefit, they are unaware of the differences in probiotics, and the wide range of ways that they can be consumed. Consumer education is important in making the right choices.
- **Regulations:** Absence of FDA regulation on probiotic strain-specific science and efficacious doses. In Europe, the European Food Safety Authority is doing its level best to keep consumers in the dark about probiotic health benefits.

OPPORTUNITIES

- Innovation and emerging science for probiotics has manufacturers developing products outside of the dairy cases and supplement aisles. This will lead to continued product growth and innovation across many markets.
- In addition to digestive and immune health, research shows benefit on protein utilization, muscle recovery, heart heath, brain health, skincare and even metabolism, which can help fight obesity.
- Educate the public in order to minimize confusion and further explain what exactly probiotics are, where they are found, which ones are most effective and why fermented foods are not the only safe and effective option.
- Regulation on probiotic strain-specific science and efficacious doses.
- Infant formula market. You heard it here first.

THREATS

- Lack of FDA regulation and strain-specific science can make industry become untrusted by consumers.
- Regulatory constraints (Global approvals, EFSA and claim hurdles)
- Unethical or uninformed probiotic marketers
- Probiotic products must provide a perceived effect in order to ensure repeat buys of the product. Otherwise, the probiotic market is at risk of falling prey to "shiny object syndrome." Formulate with the same strains and doses used in the published research studies!

Bigelow tea with Ganeden BC30

Vitamin K2 Is Ready For Prime Time

Vitamins have cache above most other supplements by virtue of their definition: Essential for life, have to be taken in by dietary means. Vitamins are required to prevent deficiency diseases, which is measured by Daily Value quantities: 90 mg vitamin C to prevent scurvy, 600 IU vitamin D to prevent rickets, and so on.

"The word 'vitamin"' brings with it a certain connotation: It's required to achieve optimal health," says Eric Anderson, senior vice president of sales and marketing at NattoPharma, supplier of the MenaQ7 brand of K2, which established the market and has conducted most of the clinical research behind the long-chain menaquinone-7 form of K2. "This is now demonstrated in human clinical studies based on evidence from population studies, which show that those who consume vitamin K2 have healthier bones and hearts."

Vitamin K Market Forecast To 2020

Vitamin K, H, Combo Vitamins, Others	2014	2015e	2016e	2017e	2018e	2019e	2020e
Natural & Specialty	573	643	719	801	887	976	1,069
Growth	12.4%	12.2%	11.8%	11.5%	10.7%	10.0%	9.5%
Mass Market	260	268	277	286	297	310	324
Growth	3.4%	3.3%	3.1%	3.4%	3.7%	4.3%	4.5%
Direct	698	761	828	899	975	1,055	1,142
Growth	8.4%	9.1%	8.8%	8.6%	8.5%	8.2%	8.2%
Total	**1,531**	**1,673**	**1,824**	**1,987**	**2,159**	**2,341**	**2,534**
Growth	8.1%	9.1%	8.9%	8.7%	8.5%	8.3%	8.2%

Source: Nutrition Business Journal

Vitamin K2 works by activating two critical proteins — osteocalcin, which brings calcium to bones, and matrix GLA, which takes calcium out of arteries.

"The common link is calcium," says Anderson. "Everyone knows calcium is good for building strong bones, but few understand the detrimental effect it can have on the vascular system. If the body is not properly utilizing calcium in the bones, it ends up in the soft tissue where it can do serious harm."

Two K2 studies stand out. K2 first made waves in an observational study conducted in Rotterdam, the Netherlands, which followed 4,800 healthy men and women over age 55 and found a 50 percent cut in heart attacks, 50 percent drop in cardiovascular-related deaths and 25 percent fewer deaths over all in those with the highest quintile of vitamin K2 levels compared with the lowest quintile. **www.ncbi.nlm.nih.gov/pubmed/15514282**

The second was published just in April of 2015. The double-blind, placebo-controlled intervention trial found 180 mcg/day MenaQ7 for three years with 244 healthy postmenopausal women led to significant reversal in arterial stiffness — and atherosclerosis is linked to one out of every four American deaths. **www.ncbi.nlm.nih.gov/pubmed/25694037**

"Vitamin K2 is now recognized as being the last identified vitamin with a deficiency in the West," says Anderson. "Here is a vitamin that provides clinical health benefits."

SO WHY HAVE WE NOT HEARD OF IT?

What's needed now is a major CPG company or supplements brand to pick up and champion K2 — as Schff's MegaRed did with krill or Rexall Sundown's Osteo Bi-Flex did with 5-Loxin.

"The company that gets the next leading major brand to market will become the market share leader quickly," says Anderson. "We need a marketing company behind it."

If that giant mainstream marketing company were to make a deal with a K2 supplier, it would likely not make money for the supplier, who would be expected to break even at best in the deal. But that's to be tolerated, because it's the second-, third-, and sixth-generation marketers that would pay full value, and everyone would benefit by the expansion of the pie thanks to the first-generation marketing giant that would build consumer understanding and acceptance of this new ingredient. It remains to be seen whether that will happen in a standalone K2 supplement or integrated into an existing multi format.

Because K2 helps hearts and bones, the obvious first target is postmenopausal women. But because the prime determinant of whether a woman will get osteoporosis is her peak bone mineral density as an adolescent, K2 should also be formulated into children's multivitamins as well.

An efficacious dose in micrograms — 1/1,000th the quantity of milligrams — makes it easier to integrate into formulas. While somewhat expensive at about 3 cents per dose per day, the cost in use has dropped by at least half over the last five years as more brands have picked up on K2, according to Francis Foley, president of Xsto Solutions, the exclusive North American sales and marketing partner of K2 Vital, the brand from Norwegian K2 maker Kappa Biosciences.

"Our sales are growing 70 to 100 percent year-on-year growth," says Egil Greve, president and CEO of Kappa Biosciences. "This growth requires bigger volume, and bigger volume creates better scale advantages, bringing the cost down which again contributes to a broader reach. Thus, we do expect the vitamin K2 market to remain a very interesting segment for at least the next five years."

INNOVATIONS MAKE A GOOD THING BETTER

Innovations in the space are allowing K2 integration into different forms. Kappa Biosciences scientists found stability issues when K2 was combined with minerals. They theorized minerals were physically shearing the long K2 molecule during the mixing phase of manufacture. In response, they developed a beadlet form of K2 powder, called K2 Vital Delta, which essentially adds an armor coating to protect the K2 molecule from physical degradation.

"As time goes on and more formulation demands are created, it is likely new K2 product forms will be created," says Foley. "It's possible we will be looking at MK-9 as a source of menaquinone in the future."

NattoPharma won the 2015 NutrAward for best new ingredient with its K2 crystal form of K2, branded MenaQ7 PURE, a crystalline, all-trans menaquinone-7. The higher the percentage of trans, as opposed to -cis (we're talking the arrangement of atoms within a molecule), the greater the purity. That affects the biological activity of the ingredient.

"Ingredients sold should be tested and guaranteed all-trans," says Greve. "We do, however, on a regular basis, find K2 ingredient vendors with as low as 15-17 percent trans levels and a high level of impurities. Naturally, these products are offered at a lower cost."

The original K2, old-school, shorter-chain menaquinone-4 K2 remains on the market, available from the likes of AIDP. It was developed first, by researchers in Japan, and remains a pharmaceutical drug there.

"The science on MK-4 has been a great inspiration for current research on MK-7," says Greve. "MK-4's resemblance to MK-7 is evident, the biggest difference being bioavailability and dosage. MK-4 has only a 1.5-hour half life and requires dosages in milligram quantities, whilst MK-7 has a half life of 72 hours and is dosed in microgram quantities."

So while vitamin K2 is growing quickly in its acceptance, it remains for now somewhat of a niche. But the scientific dossier is showing provocative results, ingredient innovations are delivering flexibility to formulators, and the price per dose is hitting the sweet spot. Here we have a vitamin, with a study published in a major journal demonstrating a vitamin deficiency disease tied to bone and heart health, that could save millions of lives.

At the NutrAward ceremony in Anaheim this past March, Frode Bohan, NattoPharma's chairman of the board, summed up the ingredient's prospects. "We believe vitamin K2 will be the next vitamin D3."

SWOT ANALYSIS

STRENGTHS

- Research shows it not only reverses atherosclerosis, but spectacularly reduces risk of heart attacks and overall deaths.
- It's an official vitamin — that makes it easier to accept as a new supplement ingredient.
- Research shows positive effects with as small a dose as 45 mcg, up to 180 mcg. Tiny!
- Along with blockbuster nutrients calcium and vitamin D, K2 could be the "tri-essential" of bone health.

WEAKNESSES

- K2 is presently a niche product and technically challenging to manufacture, so the market has not been widely exploited.
- Ingredient buyers confused about cis vs. trans issue regarding ingredient purity.
- Stability challenges make it difficult to formulate with minerals.
- Expensive —but price is dropping dramatically.
- Most research to date on MK-7 conducted by same research team. (This is starting to change.)

OPPORTUNITIES

- The ingredient is one major marketer away from becoming the next blockbuster.
- Huge categories: heart and bone health, as well as children's health.
- If MK-7 is better than MK-4, why not MK-9?
- Potential for new product development from K2-only supplements to multi's, foods to beverages.
- The awareness is growing and the primary applications are seeing more and more research support.

THREATS

- Price
- Ingredient buyers unaware of ingredient quality issues and shop solely on price, which could lead to substandard product and health effects that do not meet the hype.

SimplyOne Heart Smart: NuperNutrition is innovating the heart-health category with a patent-pending formulation featuring vitamins A, D3 and K2 in a chewable tablet, offered as in both vegan and regular versions.

Curcumin Remains As Good As Gold

Curcumin continues to be good as gold, maybe even better, as far as ingredients go. The forecast for the phenol phenom, treasured for thousands of years by Ayurvedic and Chinese healers, is as bright as the compound's sunny hue.

Polyphenolic curcumin is the main curcumoid that gives the spice turmeric its rich yellow color. The spice is made from the roots of the Curcuma longa plant, a relative of ginger. While SPINS tracks turmeric, not curcumin, the sales data shines. Across departments in natural markets (except Whole Foods) sales reached $28,074,535 in the 52 weeks ending Dec. 28, 2014. That's a 35-percent increase over the previous year's numbers. Tumeric's golden glow reaches into the mainstream as well. Sales across departments in that market skyrocketed over the previous year's numbers, increasing nearly 88 percent to reach $8,663,093 in the 52 weeks ending Dec. 28, 2014.

Curcumin Market Forecast To 2020

Tumeric	2014	2015e	2016e	2017e	2018e	2019e	2020e
Sales	163	196	233	276	323	375	433
Growth	21.0%	20.0%	19.0%	18.0%	17.1%	16.3%	15.5%

Source: Nutrition Business Journal

Raw material supply giant Green Wave Ingredients pegs the global market capacity for curcumin at around 300-400 metric tons, with the North American market occupying 60 percent of the total market.

"With curcumin supplement sales taking the top ranking in the natural channel and gaining traction in the mass market, as well as emerging opportunities in foods and beverages, there is no better time to bring attention to the benefits and tremendous market potential of this ingredient," says Linda Doyle, Vice President of Global Marketing for OmniActive Health Technologies, manufacturer of CurcuWIN.

THE GOLD STANDARD IN RESEARCH

Eastern practitioners have valued it for eons. Marco Polo packed it. Curcumin's been healing through history. Why the popularity in recent years? A treasure trove of research. There's horde of scientific evidence of the compound's power in a time when consumers want to see the proof in the pudding, er polyphenol. "Customers are becoming increasingly more preferential toward evidence-based ingredients," says Lauren Goldberg-Smot, RD, Registered Dietician at DolCas Biotech, LLC, manufacturers of BCM-95 curcumin.

There are literally thousands of studies attesting to curcumin and tumeric's anti-inflammatory, antiviral, antioxidant, antibacterial and anti-fungal powers, making them a top antidote for some of the world's most rampant illnesses. And, the pile of research is building like the heat in a good curry. "This amazing botanical is the single most helpful natural ingredient you can take for almost every disease or illness," nutrition industry legend Terry Lemerond, who heads supplements manufacturing company EuroPharma, said in his "Terry Talks Nutrition" podcast. **www.newhope360.com/breaking-news/double-barreled-disease-blaster-curcumin**

The list of conditions curcumin may help includes diabetes, allergies, arthritis, depression, IBS and Alzheimer's. A 2014 study of 40 people with knee osteoarthritis found that those who took 1,500 mg of Sabinsa's Curcumin C3 Complex brand of curcumin daily for six weeks had significantly less pain and better function than the placebo group. Another C3 Complex study found that supplementation with one gram per day for 30 days slashed triglyceride levels.

DolCas B95, meanwhile, is currently being used as an adjunct to chemotherapy treatment, notes Goldberg-Samot. "It has an amazing ability to work as an adjunct to Western medicine," she says.

Last year, the American Cancer Society revealed the anti-tumor benefit of curcumin in terms of its ability to reverse the progression of tumors. "The finding made curcumin the hottest herbal ingredient in the anti-tumor research area," says Hamlet Chen, Director of Marketing for ingredient supplier Green Wave Ingredients. "The demand for curcumin products in a variety of applications is growing exponentially. Consumers see that it has a wide range of health benefits and are even using it prophylactically," he says.

Research has also started to reveal curcumin's fat-blasting powers. Studies have shown it may lower lipid levels in the blood and prevent clots. "Curcumin will definitely penetrate into the lipid management section of dietary supplements," says Shaheen Majeed, Sabinsa Corporation Marketing Director. Sabinsa's Curcumin C3 Complex, the most clinically studied curcumin on the market, has recently been shown to help manage the blood lipid profile.

All the research is fueling new products, says Majeed. "The clinical studies are now getting more focus from the formulators and results from the clinical studies are getting translated into the products," he says.

BIOAVAILABILITY BLOW OUT

Companies have invested serious R&D dollars into boosting curcumin's bioavailablity. While it may be "the single most helpful natural ingredient," it doesn't help much if the body flushes it before it can act. Manufacturers have boosted bioavailability through a variety of techniques. One method is by adding a lipid. Indena's clinically studied Meriva Phytosome curcumin more easily permeates cell walls. Another is to add piperine, a black pepper extract.

"It has been like an arms race for who can claim the highest bioavailability," says Gergory Ris, Vice President, Sales, Indena, USA, Inc. "Sadly, much of these claims are unfounded, and some claiming mythical levels don't have toxicity data to support the safety of their product. Secondly, they don't have clinical evidence to support efficacy either."

"Too much focus on the discussion of bioavailability and lack of clinical studies or improvement in health condition due to use of bioavailable curcumin has put a serious question mark on such products and ingredients," agrees Majeed. "These products are expensive in comparison to the quantities of curcumin inside them and customers are basically paying for excipients rather than the product under the promise of high bioavailability."

Research has recently yielded a solution to curcumin's other natural challenge, its inability to dissolve in water. Sabinsa recently launched uC3 CLEAR, a completely water-soluble version of the ingredient. Previously, unappealing sedimentation was a challenge for formulators.

ALL THAT GLITTERS…

With studies piling up and researchers solving curcumin's natural challenges, what could possibly blemish this golden ingredient's future? Adulteration. Adulterated material can be added into the natural extracts of curcumin, via synthetic dried material or low-quality turmeric powder presented as curcumin. "And not all 95-percent curcuminoids are the same," says Majeed. "The adulterated materials are sometimes hard to identify for even the qualified and experienced manufacturers…. To reduce the costs, some suppliers deviate from GMP and create turmeric extracts, which do not have proper testing, or studies to ensure safety."

The reckless promotion of poor quality products is another threat to the sector, says Indena's Ris.

The industry needs to act ASAP to fight shoddy products. "It's important to create a robust mechanism in the industry to inform, and educate consumers to beware of such adulterations," says Majeed.

Manufacturer's face another challenge with curcumin: it stains. That lovely golden color can turn a facilities' walls a deep orange. Though with glowing sales, they may find it worth it even if curcumin's Midas touch leaves bright fingerprints.

SWOT ANALYSIS

STRENGTHS

- Tons of research. In vitro? In animals? In humans? Indeed. With more on the way.
- Even mass market consumers are beginning to embrace the gold.
- No negative side effects

WEAKNESSES

- Threat of adulteration.
- While the standard spec for curcumin is 95%, many existing products in the market have yet to be qualified.

OPPORTUNITIES

- Beverages. With new water-soluble formulations, consumers can gulp down the gold.
- Little c may fight the big C: recent research shows promise for fighting and treating cancer.
- New research reveals potential for lipid management category

THREATS

- Consumer confusion surrounding bioavailability (and claims of bioavailability)
- Reckless promotion of poor-quality products.
- Low-priced sub-quality products disturb market price and threaten ingredient reputation and consumer health.

Terry Naturally Curamin

Caffeine Keeps Its Buzz On As Natural Sources Start To Thrive

Without caffeine, the world may not stop spinning completely, but it might just roll on a good bit slower. Ninety percent of adults on the planet consume it every day. **www.fda.gov/downloads/UCM200805.pdf** Eighty percent of American adults imbibe daily. We love caffeine. Caffeine sales continue to zip along and promise to continue to do so unless notoriously hardworking Americans replace the 3:00 pm coffee break with the afternoon siesta.

Caffeinated products across all departments in conventional outlets reached $207,886,224 in the 52 weeks ending Dec. 28, 2014, according to SPINS. That's a 9.6 percent increase over last year's sales, a bit less, well, caffeinated, than the previous year's growth rate of 11.8 percent, but upwards nonetheless.

Most synthetic caffeine is produced in China — China Shijiazhuang Pharmaceutical Group, the largest pharma co-op in China — is responsible for about half the global market. But another major global manufacturer is facing bankruptcy and has terminated its production. This incident may result in a slightly tightened market supply — but will also lead to the increase of market share of other manufacturers.

NEGATIVE BUZZ

The energy drink market remains a $15 billion dynamo and negative buzz around the health effects of the beverages has simmered down a bit since the roiling outrage of 2012 and 2013. The most recent concern surrounds the sale of powdered caffeine directly to consumers (apparently, getting it in your jerky, gum and Cracker Jacks isn't enough for some people). After a teenager died after consuming pure powdered caffeine, six U.S. senators urged the FDA to immediately ban its direct-to-consumer retail sales. A single teaspoon of this stuff is has about the same amount of caffeine as 25 cups of coffee. The attention prompted the American Herbal Products Association (AHPA) to enact a prohibition on selling caffeine in bulk form in retail and the United Natural Products Alliance (UNPA) approved a similar "no-sale" policy. The Council for Responsible Nutrition (CRN), amended their requirements related to the sales and marketing of caffeine to discourage direct-to-consumer sales of powdered caffeine as well.

What actions the FDA may take to regulate the ingredient remain as unclear as the dregs of your morning macchiato. "While it's difficult to forecast if the FDA will step up their regulatory efforts on caffeine, if we see any immediate changes it will likely be in the labeling requirements that force products to list the amount of caffeine," says Jackson Zapp, Vice President of Marketing at Applied Food Science, manufacturers of PurCaf organic caffeine and GYUSA.g, a guayusa leaf extract. Currently, the FDA doesn't require manufacturers to list the precise amount of caffeine in a product, though the American Beverage Association recommends members to do so. Energy drinks manufacturers have begun to follow suit.

"One noticeable target of the FDA has been the effort to continue to draw the line between supplements and food products, especially when it comes to energy drinks," says Zapp. The FDA is also paying close attention to caffeine and kids as delivery mechanisms proliferate.

On the other side of the pond, the EFSA delivered a draft of a long-awaited risk assessment on the safety of the ingredient, concluding a 400-mg daily intake of caffeine and 200-mg single dose of caffeine "do not raise safety concerns for adults in Europe."

MUCH MORE THAN A STIMULANT

Research has already shown that caffeine boosts our mood and our performance:

www.ncbi.nlm.nih.gov/pubmed/15887055
www.ncbi.nlm.nih.gov/pubmed/15568206
www.ncbi.nlm.nih.gov/pubmed/17514640

Yet evidence is just beginning to brew regarding how the ingredient benefits our brain. "Caffeine's potential beneficial effect for maintenance of proper brain function has only begun to be adequately appreciated," says Frank Jaksch, CEO, Chromadex, manufacturers of PURENERGY caffeine. Epidemiological studies inversely linked the consumption of moderate amounts of caffeine to cognitive decline. Other studies link a higher consumption of caffeine to a lower risk of dementia.

www.ncbi.nlm.nih.gov/pubmed/?term=gelber+rp+coffee+dementia

Some scientists suggest that the caffeine in coffee is one of the richest sources of healthy antioxidants in the average person's diet, says Jaksch. "And their newest research points to the caffeine as the source of powerful antioxidants that may support damages from free radicals," he says.

NEW, IMPROVED CAFFEINE

The quest for a caffeine alternative to appeal to consumers worried about taking too much caffeine or manufacturers with an eye on potential FDA regulations has led researchers to develop new caffeine products. PURENERGY by Chromadex is a combo of caffeine and a pterostilbene. In a human study the company found the compound delivers 45 percent more caffeine than ordinary caffeine with a boost that lasts far longer. The product allows formulators to reduce the total amount of caffeine in their products by as much at half without sacrificing the energy boost.

CLEAN CAFFEINE

The consumer trend toward clean labels is also shaping the caffeine market. "We've been receiving more and more requests for caffeine extracts from natural sources like green coffee and green tea, along with more novel sources like guayusa tea leaves," says Zapp. "The overall trend shows consumers want to understand every ingredient in their product and caffeine is no exception."

Companies are innovating away from harsh chemicals and finding ways to extract caffeine from plants without them. Water extraction, CO2 extraction and organic solvents help ensure the product is as clean and safe as possible, says Zapp.

ALTERNATIVE NATURAL SOURCES

Sales of guayusa, a South American holly plant related to yerba mate, are rippling across natural channels like Channing Tatum's abs in "Magic Mike." (The actor owns a stake in Runa Tea). Sales across departments in natural supermarkets (except Whole Foods) reached $1,450,009 in the 52 weeks ending Dec. 28, 2014, according to SPINS, up by nearly 94 percent from the previous year. Stunning, but not like the rate of growth between 2012 and 2013, when sales shot up by 326 percent.

"Hunters in the Amazon drink it for better acuity and strength," says Randy Kreienbrink, Director of Marketing and Certified Food Scientists at BI Nutraceuticals, a supplier of guayusa powder. People who enjoy the Amazonian lore but are unlikely to hunt for more than a parking spot like the mellow flavor, and the "calm" energy, which may come from the L-theanine in the botanical, a compound known for relaxing the brain. Guayusa leaves have about two percent caffeine, less than coffee beans, but more than green tea, guarana and yerba mate. What they don't have are tannins, which explains the mellow, malleable flavor, says Kreienbrink.

Keep an eye on yaupon, another yerba mate cousin. Beyond its natural kick, which is about the same as yerba mate, it's got two other things going for it: it's grown in the U.S. and, its flavor is a bit more appealing than yerba mate. An early study from Texas A&M (it's grown from East Texas to Georgia) suggest a yaupon extract may have anti-inflammatory powers. The plant's Latin name is not so appealing, however. The Scottish botanist who named it Ilex vomitoria did so in reference to the way Native American men chugged huge amounts to induce vomiting and gain energy right before big events like weddings and hunts. That might be finally be one Native American marketing angle companies won't use to attract customers.

"New" natural sources and innovative formulations will continue to lift caffeine sales, which show no sign of slowing.

SWOT ANALYSIS

STRENGTHS

- Mature ingredient
- Science backs safety when consumed responsibly

WEAKNESSES

- Public concern over safety issues
- Recent negative buzz around pure caffeine powders

OPPORTUNITIES

- Cognitive health, a source of salvation for all those aging boomer brains?
- Antioxidant powers emerging
- "Cleaner" formulations
- "New" natural sources, like yaupon and guayusa
- Novel delivery methods, public embracing everything from breakfast cereal to gummy bears

THREATS

- Misuse of products
- FDA scrutiny and possible regulation

LYFT Clean Caffeine Energy Stick

Booming Collagen Market Brings Beauty From Within

Many people look forward to living a long life. But it's hard to find someone who isn't concerned with the physical symptoms that come with aging, from wrinkles to joint pain. Wouldn't it be great if there was some uber ingredient that touched on many of these symptoms of aging?

Turns out there is: collagen. The most abundant protein found in the body, collagen accounts for 30 percent of our total supply, and it mostly resides in connective tissues in the skin and joints such as cartilage, skin dermis, bones, tendons, ligaments and blood vessels. When we're young (remember when?), collagen is abundant and allows us to move with ease, plus enables our sin to stretch and move without sagging or developing wrinkles. As we age collagen production naturally slows and the overall amount depletes, which can result in undesirable wrinkles in the skin and painful stiffness in the joints.

And it's finally caught on in the U.S. market…

"Consumers in the U.S. are finally waking up to the realization that a healthy and strong skin matrix on the inside results in that firm and youthful skin we are all after," says Jessica Mulligan, vice president of sales and marketing at NeoCell, the market leader in CPG collagen products. "The markets for collagen and other beauty ingestibles are the most highly developed in Japan, Europe and South America. In Japan, where the belif in 'beauty from within' goes back centuries, consumers are collage-crazy – Japan actually just came out with a collagen beer!"

NeoCell, the supplements brand leader, has been growing by double-digits every quarter since 2008, and in the first quarter of 2015 sales were up by 34 percent, according to Mulligan.

Part of the reason for that success has been a relentless diligence to new product formats — powders and soft-chews complement their supplement lines.

"Continuing to invest in new and innovative delivery systems is a big focus of ours," Mulligan says. "It is also becoming increasingly important to companies to invest in the science behind their products. Consumers want to know and trust that the claims on a label have been clinically shown to do what they are purporting to do."

Even with the unrivaled success, one of the drawbacks of collagen remains persnickety consumer impatience — they want instant results for skin health or joint pain! Mulligan says their consumer reports say nail strength is improved within two weeks, joint pain subsides in three weeks, more lustrous skin in three to four.

"The biggest strength of the collagen market is that once consumers try the ingredient, they don't want to get off."

SHOW ME THE SCIENCE

Collagen research is strongest in areas of joint health, skin and nails. Collagen Types 1 & 3 are used for beauty benefits. Type II is used for joints. Collagen supplier InterHealth Nutraceuticals has a patented, undenatured, type II collagen, UC-II, with four research studies supporting joint comfort, mobility and flexibility.

In one, 55 healthy men and women had their joints stressed via a standardized stepmill protocol. Those who took 40 mg UC-II for 120 days had significantly greater knee extension compared to placebo and exercised longer before experiencing joint discomfort and recovered faster from joint discomfort after exercising compared to baseline.

In another, among 52 subjects with osteoarthritis, 40 mg/day UC-II increased joint comfort, mobility and flexibility.

What's interesting about the osteoarthritis group is the usual supplement standard of care is glucosamine and chondroitin. So a research study looked at both protocols head to head: among 186 subjects, one-third took 1,500 mg glucosamine + 1,200 mg chondroitin, one-third took 40 mg UC-II, and one-third took placebo. Only the collagen group experienced statistically significant improvements.

"Manufacturers want new ingredients that are clinically proven to work and that are safe," says Paul Dijkstra, CEO of InterHealth. "Innovation allows them to differentiate their products in the marketplace and re-invigorate the entire category. The collagen market is growing at a healthy rate, and our UC-II customers are sharing in that success."

Another collagen supplier, BioCell Collagen, has a different type of collagen than InterHealth — a hydrolyzed form that breaks down the collagen into small molecular-weight fragments to maximize absorption. Its patented combination also delivers chondroitin as well as hyaluronic acid. Studies show BioCell's collagen can reduce skin dryness and wrinkles. In a study, after 12 weeks, 76 percent of study participants taking 1 gram/day experienced a reduction in skin dryness, while 13 percent experienced a reduction in fine lines and wrinkles. A double-blind, placebo-controlled human clinical trial found 1 gram/day led to a significant reduction in pain and stiffness in those with a history of chronic history of joint pain.

Canada's Natural Health Products Directorate has approved BioCell Collagen to help relieve joint pain associated with osteoarthritis of the hip and knee and to help maintain healthy skin.

A study published in February 2015 found benefits in those engaged in intense weight-training exercise. "This opens up a new category in sports nutrition regarding connective tissue protection and recovery from post-workout soreness and limiting repetitive, overuse-related injuries," says Suhail Ishaq, president of BioCell Technology.

Other innovations in the collagen supply space include a proprietary blend of collagen with calcium. Offered by supplier AIDP, the branded ingredient, KoACT, was found in studies on postmenopausal women to be superior to calcium and vitamin D in slowing down the leaching of calcium from bones and rebuilding new bone strength.

"As a segment, our collagen products are growing," says Kathy Lund, vice president of business development and marketing at AIDP. "The awareness and trend on collagen may now be moving to the U.S. Consumers may now be focused on addressing the root cause of aging issues that collagen addresses."

SWOT ANALYSIS

STRENGTHS

- Innovative delivery formats make is easier for consumers to consume
- Research on a range of health concerns — hair, skin, nails, joints
- Research shows better results on joint health than standard-bearers glucosamine and chondroitin
- Market already well established in Japan and Europe

WEAKNESSES

- Large doses in some collagen products — as much as 6 grams per day
- Effects seen in anywhere from two to six weeks depending on the health concern – and consumers want instant results

OPPORTUNITIES

- Marketing efforts targeting men

THREATS

- "Beauty from within" will not catch on because it's easier for consumers to understand topical solutions to beauty.

NeoCell Beauty Bursts: These gourmet collagen soft chews feed the skin with nutrients in a non-pill format. They taste scandalously like candy.

Adaptogens Have Arrived — In Some Cases, Beyond What Supply Can Provide

Something natural that helps with energy, libido, mood and maybe even menopause? Yes, please. Adaptogens may be a group of ingredients made-to-order for today's aging boomers, stressed-out millennials and driven athletes — and more and more Americans are discovering them. Plus, there's plenty of room for growth and diversification — as long as growers can keep up.

True to their name, adaptogens help the body adapt to different stressors, helping maintain homeostasis, particularly in the adrenal system. Ayurvedic healers have used them for thousands of years to boost immunity and bring about a state of balance in various organ systems.

"Over the years, our American lifestyle has become increasingly stressful," says P. K. Davé, president of Albany, New York-based Nature's Formulary. The company makes Ayurvedic supplements and bodycare products. "Statistics have shown that stress can cause a variety of health conditions, such as lack of energy and lethargy. Consumers are turning to products that help combat stress as well as improve energy levels to get them through the day," he says. Stress, and its impact on health, is not going away anytime soon. Manufacturers are meeting consumer demands not only with tablets, pills and tinctures, but with a buffet of functional beverages and foods.

WHAT THEY'RE NOT

It's critical for consumers and manufacturers to understand the difference between adaptogens and stimulants. Though both may help performance and energy levels, stimulants do so for only a short time, often followed by a decrease in working capacity. Adaptogens help increase resistance to stress and fatigue over the long term, without any period of poor performance afterward. Some companies have been mixing the two. "Spiking of adaptogens with stimulants should be carefully followed by regulatory bodies, especially in relation to sports nutrition," says Shaheen Majid, Marketing Director, Sabinsa Corp. "It's definitely a threat."

Another danger looms among irresponsible companies who crank up concentration without supporting research. The industry has seen what can happen when irresponsible players up the dosage and lower the quality. "Think kava and ephedra," says Davé. "Quality is paramount and lack of it can destroy a category. In addition, as concentrated (and proprietary) formulations enter the market, there must be rigorous, ongoing research on safety."

ASHWAGANDHA

Human clinical evidence is growing for Withania somnifera, prescribed by Ayurvedic healers for five millennia to help with stress reduction, memory and cognition, endurance and strength, sexual function and mood. In the last couple years, studies have supported the plant's powers to help with symptoms of bipolar disorder, depression and anxiety, and to help kids with ADHD.

A 2012 trial from the Department of Neuropsychiatry and Geriatric Psychiatry at Asha Hospital in Hyderabad, India found that adults who took 300 mg of ashwagandha twice daily for 60 days demonstrated significant improvement in perceived stress, general health, depression and anxiety compared to those who took a placebo. Their stress levels dropped an average of 44 percent. Ashwadangha's been one of Nature's Formulary's best sellers, says Davé.

Ayurveda's flagship plant is ripe for inclusion in the sports nutrition market.

Ixoreal BioMed's KSM-66 Ashwagandha has been clinically shown to promote muscle strength, growth and recovery and is therefore suitable for use in sports formulations. KSM-66 has been clinically shown to promote muscle strength, growth and recovery. The non-GMO, organic product has been documented to help not just in the physical aspects of sports function but also the mental aspects, according to Ixoreal Director, Kartikeya Baldwa. To ease inclusion in sports formulations, it was recently certified as approved by the Banned Substances Control Group, a leading independent dietary supplement certification provider.

MACA MADNESS

Also called "Incan Viagra" and "Peruvian ginseng," so many people have been scrambling for this super-root that demand has severely outstripped supply. Grown in the Peruvian highlands and used to enhance libido and stamina since the Incan Empire (though apparently not foolproof against smallpox or Spaniards), the Chinese have been gobbling maca as a ginseng replacement. Chinese companies have been willing to pay up to 10 times the going rate, reported *Nutrition Business Journal.*

Through September 2014, the value of legal maca exports to China rose to $6 million, compared with $540,000 for all of 2013, according to the Wall Street Journal. Sales of maca supps reached $106 million in 2014, compared to $75 million in 2009, according to *NBJ.* Sales of maca products across departments in the 52 weeks ending Dec. 28, 2014 hit $8,786,474, up 18 percent over the previous year, according to SPINS.

If the stuff's been around since the Incans, why the recent maca mania? Sex, sports and menopause. A few relatively recent, small studies have shown it helps all three. One 2009 study of eight cyclists found those who took maca for 14 days rode faster and had more sexual desire than before supplementation. Another, published in 2015, looked at 29 postmenopausal Chinese women who either received three grams per day of maca or placebo for 12 weeks. The maca group had less depression and better blood pressure.

Facing a squeezed supply and rising prices for this heritage crop, the market is seeing an influx of lower-priced products with adulterated, less potent maca. These could erode customer faith in the plant and the companies that sell it. Two leading competitors, Navitas Natural and Gaia, have joined forces in a pledge to purchase only high-quality maca. Gaia is even providing its high-tech purity testing to Navitas to ensure the quality of the product.

Other adaptogens are attracting attention as well. Rhodiola's popularity is finally seeping beyond Siberia. A recent University of Pennsylvania trial found that the plant treated mild to moderate major depressive order about as well as Zoloft, though the pharmaceutical caused twice as many side effects. Clearly, if growers can keep up with demand, and the industry can squash emerging adulterated and unsafe products, the market for adaptogens will continue to grow.

SWOT ANALYSIS

STRENGTHS

- Versatility
- Demand for stress relief doesn't seem to be waning
- 5,000 years of Ayurvedic history, modern trials beginning to emerge

WEAKNESSES

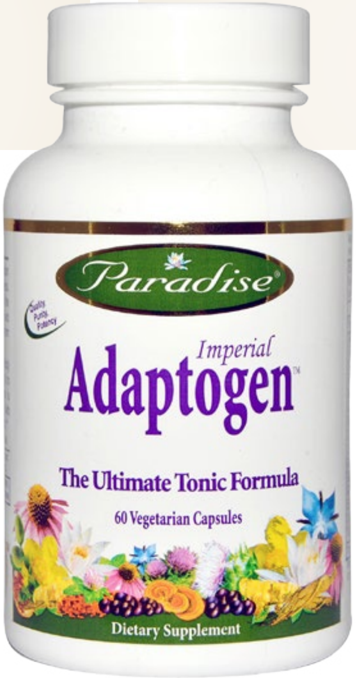
- Supply, especially for maca, scarcity as macan prices explode
- Some consumer confusion between adaptogen and stimulant
- Misplaced expectations

OPPORTUNITIES

- Differentiation, find your niche
- Sports nutrition
- Cognitive health
- Functional foods and beverages

THREATS

- Adulteration
- Irresponsible formulation with too-high-to-be safe concentrations



Paradise Imperial Adaptogen

Protein Diversifying Amid Growth

Protein continues its upward trajectory, based on consumer demand for the only macronutrient to have never taken a health hit. Even as consumers are starting to differentiate between good fats and bad fats, whole-grain carbs and cheap refined carbs, there is no good protein and bad protein — it's all good. The bull market in protein is creating a bigger pie, so that whey protein continues its rise even as plant proteins eat into its market share.

The Rise And Rise Of Protein

Sales (Sports Nutrition sub category)	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015e
Powders/Formulas	1,935	2,053	2,218	2,379	2,507	2,751	3,067	3,419	3,867	4,134	4,432
Pills	131	138	151	163	162	167	187	200	213	225	239
Drinks (for core sports)	184	202	227	251	278	300	325	379	437	513	599
Sports Supplements Total	**2,250**	**2,392**	**2,595**	**2,793**	**2,947**	**3,218**	**3,579**	**3,999**	**4,518**	**4,872**	**5,270**
	2,250	2,392	2,595	2,793	2,947	3,218	3,579	3,999	4,517	4,872	5,270
Growth	**2005**	**2006**	**2007**	**2008**	**2009**	**2010**	**2011**	**2012**	**2013**	**2014**	**2015e**
Powders/Formulas	4.4%	6.1%	8.0%	7.3%	5.4%	9.8%	11.5%	11.5%	13.1%	6.9%	7.2%
Pills	8.4%	5.0%	9.5%	8.2%	-0.5%	3.2%	11.9%	6.8%	6.7%	5.5%	6.1%
Drinks (not incl. gatorade, etc.)	18.7%	9.5%	12.5%	10.5%	10.8%	7.9%	8.5%	16.7%	15.2%	17.4%	16.8%
Total	**5.7%**	**6.3%**	**8.5%**	**7.6%**	**5.5%**	**9.2%**	**11.2%**	**11.7%**	**13.0%**	**7.8%**	**8.2%**
Market Share	**2005**	**2006**	**2007**	**2008**	**2009**	**2010**	**2011**	**2012**	**2013**	**2014**	**2015e**
Powders/Formulas	86.0%	85.8%	85.5%	85.2%	85.1%	85.5%	85.7%	85.5%	85.6%	84.9%	84.1%
Pills	5.8%	5.7%	5.8%	5.8%	5.5%	5.2%	5.2%	5.0%	4.7%	4.6%	4.5%
Drinks (not incl. gatorade, etc.)	8.2%	8.4%	8.7%	9.0%	9.4%	9.3%	9.1%	9.5%	9.7%	10.5%	11.4%
Total	**100.0%**	**100.0%**	**100.0%**	**100.0%**	**100.0%**	**100.0%**	**100.0%**	**100.0%**	**100.0%**	**100.0%**	**100.0%**

Market Share	2013	2014
Whey	48.5%	48.2%
Milk	11.1%	10.7%
Egg	8.6%	8.6%
Casein	14.1%	14.4%
Soy	10.0%	9.7%
Rice	3.5%	3.8%
Pea	3.2%	3.4%
Other	1.0%	1.2%
Total	**100.0%**	**100.0**

Source: Nutrition Business Journal

In the US, two out of five consumers are increasing their amount of protein in their diet, according to Steve French at the Natural Marketing Institute. Consumers see protein as helping to increase energy, maintain muscle mass and strength, and help manage their weight. “The consumers understand the benefits,” says French.

The US leads the world in this protein surge — 42 percent of American consumers believe a high-protein label claim is very or extremely important, according to data from Innova Market Insights. Western Europe follows with consumers in Italy and Spain in the very or extremely important group at 34 percent, France at 24, U.K. at 23 and Germany at 17 percent.

“Because there are less products out there in Europe, consumers will be more interested when they’re exposed and understand benefits, so I expect innovation in Europe,” says Yasemin Ozdemir at Innova.

In developing countries such as Eastern Europe, non-animal proteins are gaining sway. That’s mostly because these are less expensive forms.

“Economic development leads to higher protein diets,” says Christopher Shanahan at Frost & Sullivan. “As a given region’s income increases, so does its taste for food rich in proteins. In 10-plus years, non-animal proteins will be a significant part of diets in these developing regions.”

MORE PROTEINS IN MORE APPLICATIONS

Dairy proteins reign supreme. In the sports nutrition world — where protein got its start — about three of every five products use dairy proteins (read: whey). Whey is used because it’s the fastest protein source – that is, it gets to the muscles fastest, and body builders wanted that immediate effect.

But there’s been a shift in that market as athletes realize they would prefer the amino acid effect to prolong over a longer period of time. So protein blends with slower metabolism rates have been formulated so that muscle protein synthesis is elevated for a longer amount of time. Soy is an intermediate protein that takes between 60 to 120 minutes to digest, whereas casein is a slow protein that requires between three and five hours to digest.

A 2012 study presented at the Experimental Biology meeting solidified the blending concept among the elite athlete set. It found that a blend of protein sources — 50 percent casein, 25 percent whey, 25 percent soy – was superior to whey alone for prolonging muscle building and recovery after exercise.

It was only two years ago that three of every four protein-centric products contained one protein source, while most of the rest contained two protein sources. The shift to blends is underway. "We expect this pie chart to be different," says Shanahan at Frost & Sullivan.

After dairy proteins in the sports nutrition world, about 22 percent of products now use plant proteins, 5.7 percent use straight-up amino acids, 8.2 percent creatine and 4.8 percent other, according to Shanahan.

In the plant protein space, soy is (the aging) queen. The healthy halo around soy has dissipated, and pea and rice protein have stepped in. (Hemp has high allure with a certain niche demographic.)

"We see strength in our ability to offer proteins that are non-GMO, organic, scalable, sustainable and economical," says Tyler Lorenzen, vice president of business development at World Food Processing, based in Iowa, which has soy and pea proteins. "The strength of our offering is supply from domestic source, clean flavor, high protein content and free from common allergies. There's demand for ingredients that are manufactured in the USA and not China."

The pea protein market in 2013 was pushing $50 million, according to Shanahan, and rising. He predicts a CAGR of 10-15 percent going forward.

"Pea protein has the strongest message right now," says Shanahan. "Pea protein is a very attractive space."

In the natural products market – where protein innovations are fast and furious and reaching whole new consumer sets from women to millennials – pea protein seems to be the rising star. Pea is gaining favor as flavor becomes less of an issue with better-tasting isolates.

"There seems to be a shift to pea protein, blends and organic proteins," says Kathy Lund at ingredient supplier AIDP. "Rice and pea make up the majority of our business, but we are expanding into egg and other alternative plant proteins such as wheat and hemp. We are vey bullish on all of our proteins including egg white."

Protein hydrolysates break the protein into an even smaller particle size than isolates, can be more easily metabolized, and result in faster muscle recovery.

Protein beverages are huge, led by Muscle Milk. While chocolate and vanilla flavors are *de rigeur,* a new opportunity is opening in the fruit flavored, clear beverage space, thanks to technology innovations from suppliers.

Protein Gummies (RAP Protein Gummies) and protein-fortified cereals (Cheerios protein) are examples of new categories leveraging the power of protein.

Nutrition bars seem to be filling the product format niche nicely. While growth of the category is off of its 20 percent highs, bars are still up a surprising 11 percent over the last year, and the amount of protein being formulated in is back up over 10 grams per serving.

And have we mentioned Greek yogurt? While we have not yet reached peak protein, we may well have reached peak Greek yogurt – that creamy, decadent, double-protein dairy product. The interesting thing is that the Greek yogurt movement is now moving into other applications apart from yogurt. "This is an important trend and there's a lot of demand for Greek yogurt. How do we expand it into other food categories that are not yogurt?" says Vicki Fligel, business development manager of functional dairy at Glanbia. "You can put it into other food groups like cereals, bakery products, dairy not yogurt, beverages, any kind of functional food group you can put in Greek yogurt powder. It's not just high protein, it's also around flavor. Consumers say flavor is at the top. There are a number of cereals that claim Greek yogurt powder. It's coming. It's the new trend."

In short, protein is hotter than ever even as sources and applications fluctuate broadly. Protein continues to grow in terms of people interested, and it's a simple enough concept that the normal consumer understands. So everyone wants a piece of protein pie in their product lines that makes it easier for consumers to fit enough protein into their daily lives. It's up to suppliers, manufacturers and marketers to deliver compelling formats that bring the people what they want.

SWOT ANALYSIS

STRENGTHS

- Positive attributes easily understood by consumers
- Consumer demand in developing and advanced economies
- Diversified sources reach vegetarians and omnivores alike
- It's all good

WEAKNESSES

- Crickets and insect sources may prove to be allergenic
- Soy has a GMO, estrogen and flavor villainy problem

OPPORTUNITIES

- Breakfast foods. Protein consumption is best evenly spread throughout the day, and it's mostly a dinner-centric macronutrient now.
- Non-GMO, organic, grown in the USA
- Technology solving flavor issues with some sources
- Bread. We have high-fiber bread. Where's the high-protein bread?
- Clear beverages
- Protein coffee, anyone?
- We're talking value-added products

THREATS

- Consumer demand for nutrition to come from whole foods, not components
- GMO issue with soy
- Amino acid adulteration scandal may have legs
- High demand and competition leading to a commodity market
- Keener consumer understanding of protein quality may hit lower-quality proteins (PDCAAS ranks egg, whey and soy as perfect 1.0, whereas yellow pea is 0.64 and whole wheat is 0.42).

Amazing Grass Amazing Meal Original Blend

The Master Mineral Continues Its Magnificent Run

The majority of Americans don't get enough of the master mineral, and it seems that every day research unveils another reason why it's critical to our health. It's a perfect formula for further growth in the sector.

The numbers are already ramping up. Across departments in natural supermarkets (except Whole Foods), sales reached $19,758,867 in the 52 weeks ending Dec. 28, 2014, nearly a 35-percent increase over the previous year, according to SPINS. Between 2012 and 2013, sales of products with magnesium increased by nearly 26 percent. And, this year magnesium finally overtook calcium in popularity in the ConsumerLab.com Survey of Vitamin and Supplement Users.

Magnesium Market Forecast To 2020

Sales	2014	2015e	2016e	2017e	2018e	2019e	2020e
Natural & Specialty	287	338	390	442	491	533	574
Growth	18.0%	17.7%	15.4%	13.4%	11.1%	8.4%	7.7%
Mass Market	236	269	303	334	363	390	416
Growth	15.3%	14.2%	12.6%	10.1%	8.8%	7.4%	6.8%
Direct	160	186	212	242	274	307	339
Growth	18.5%	16.0%	14.5%	13.8%	13.4%	11.9%	10.5%
Total	**683**	**793**	**905**	**1,018**	**1,128**	**1,229**	**1,329**
Growth	**17.2%**	**16.1%**	**14.2%**	**12.4%**	**10.9%**	**8.9%**	**8.1%**

Source: Nutrition Business Journal

"Magnesium is still trending up due to all of the new clinical findings regarding the problems associated with its deficiency and the fact that there is such a high incidence of deficiency being demonstrated in people," says Max Motyka, Director of the Human Products Division, Albion Human Nutrition.

BEYOND BONES

Sure, magnesium's critical for bone strength and growth. But we're finding out how crucial it is for so much more. To begin with, it regulates cholesterol, sparks the nervous system and relaxes muscles (including the biggie: your heart).

We need magnesium to help our bodies absorb calcium. Calcium tightens muscles, while magnesium relaxes them. All of those calcium supps need to be balanced with magnesium, and research shows we need far more than then 2:1 calcium-magnesium ratio the last generation of scientists swore by. The ratio should be 1:1, asserts many magnesium moguls.

A growing body of research supports magnesium's positive effects on the brain. In 2014, AIDP, manufacturer of Magtein, a proprietary blend of magnesium L-threonate created to boost the mineral's bioavailability, released a white paper outlining Magtein's ability to boost magnesium levels in the brain. The mineral helps the brain's synapses fire more efficiently. Four published preclinical studies found that the product improved long-term and short-term memory in rodents.

Consumers are beginning to reach for magnesium to solve sleep and stress issues. With its top-selling Natural Calm, the Anti-Stress Drink, Natural Vitality targets the cognitive health market. The supplement relieves stress by restoring healthy magnesium levels and balancing calcium intake, according to the company. Research is also beginning to reveal insight into the mineral's effects on the microbiome. A 2015 **www.albionhumannutrition.com** study found that after six weeks on a magnesium-deficient diet, mice exhibited signs of depression. The researchers attributed it to the way the lack of magnesium disrupted of the gut-brain axis. Brazilian researchers found the mineral helped a group of pro volleyball players jump higher and spike harder. **www.newhope360.com/breaking-news/magnesium-spikes-athletic-performance**

FOR THE HEART, AND THE HEART OF ALL DISEASE?

A 2013 review of cardiovascular disease research studies dating back to as early as 1937 found that low magnesium levels, not cholesterol or saturated fat intake, are the greatest indicator of all aspects of heart disease. **www.newhope360.com/research-and-insights/researcher-calls-magnesium-key-link-heart-disease** Author Andrea Fosanoff, PhD, who conducted the review over 10 years, told the Nutritional Magnesium Association that we've been vilifying the wrong ingredients: "These numerous studies have found low magnesium to be associated with all known cardiovascular risk factors, such as cholesterol and high blood pressure, arterial plaque build-up (atherogenesis), hardening of the arteries and the calcification of soft tissues. This means we have been chasing our tails all of these years going after cholesterol and the high saturated-fat diet, when the true culprit was and still is low magnesium."

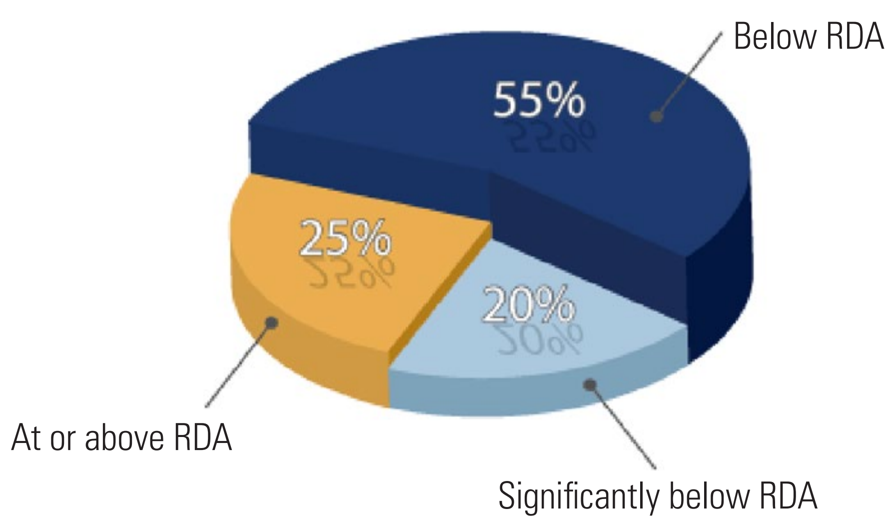
But there's research that pumps out potential for growth in magnesium sales even further than cardiac studies. In a 2014 study published in the European Journal of Clinical Nutrition, **www.newhope360.com/ingredients/study-backs-magnesiums-effect-inflammation** researchers concluded that magnesium's positive effect on chronic disease may be because the mineral inhibits inflammation. Yes, this once overlooked mineral may be the key to fighting inflammation, the mother of all chronic disease.

MORE MAGNESIUM PLEASE

The industry needs to step up marketing efforts, especially among the medical community, to raise awareness of American's lack of, and need for, magnesium, says Motyka. The challenge is for companies to create more and novel ways for consumers to address their lack of magnesium, once they're aware of it. "Supplement companies are trying to put out magnesium products that come in a better variety of forms," he says. People are becoming tired of constantly swallowing pills." Bring on the functional foods and beverages.

U.S. Intake Of Magnesium

Percent of U.S. population meeting Recommended Daily Allowance (RDA)



Estimated U.S. Intake of Magnesium Recommended Daily Allowance

SWOT ANALYSIS

STRENGTHS

- Most American's are not getting enough
- And many of us are finally realizing it

WEAKNESSES

- **Public awareness:** A lot of people still don't know how important it is
- People don't know what they're missing — yet

OPPORTUNITIES

- Any inflammation-based illnesss
- All those calcium supps need to be balanced with magnesium at twice the amount many people still believe is necessary
- Aging boomers fighting osteoporosis with calcium need more magnesium
- Soothing the minds of all those stressed-out millennials
- Boomer brains: Mg as a memory booster
- Brain health — memory and de-stress
- Sports nutrition
- New forms, foods

THREATS

- Lack of education to the hundreds of biochemical reactions of which magnesium is a vital co-factor

Natural Vitality Kids Calm

Omega-3s' Castle Is On Shaky Ground

After spending several years raising $4.9 million toward a national education campaign on the benefits of omega-3s, trade group the Global Organization for EPA + DHA Omega-3s (GOED) launched its campaign on March 25, 2015.

Its test campaign in Charlotte, N.C., left everyone feeling pretty optimistic. It had found that through a combination of TV and print ads, shelf-talkers in stores and billboards, GOED was able to boost omega-3 sales an impressive 3 percent each week the campaign was active.

Omega-3 Market Forecast To 2020

Fish & Animal Oil	2014	2015e	2016e	2017e	2018e	2019e	2020e
Natural & Specialty	531	523	516	511	507	505	502
Growth	-2.0%	-1.6%	-1.2%	-1.0%	-0.7%	-0.5%	-0.6%
Mass Market	358	344	336	340	350	365	382
Growth	-6.6%	-3.8%	-2.2%	1.1%	3.0%	4.1%	4.8%
Direct	247	253	262	272	285	300	316
Growth	1.4%	2.5%	3.3%	4.0%	4.6%	5.2%	5.5%
Total	**1,136**	**1,120**	**1,114**	**1,123**	**1,142**	**1,169**	**1,200**
Growth	**-2.8%**	**-1.4%**	**-0.5%**	**0.8%**	**1.7%**	**2.3%**	**2.6%**

Source: Nutrition Business Journal

According to GOED's research, 5.95 percent of respondents to the different media messages were new users of omega-3s. Moreover, 2.6 percent of respondents said they became new users due to the campaign.

"We estimate from the consumer survey data that 28,000 to 61,000 new consumers entered the category in Charlotte, N.C., as a result of the campaign," GOED's Ellen Schutt said.

That's important because the mainstream omega-3 market lost almost $150 million in retail sales between mid-2013 and mid-2014.

Sales of DHA were down 3.9 percent, flax was down 5 percent, fish oil concentrates were down 11.4 percent, and even krill was down by 4 percent, according to SPINS data.

Then, as if the media picture and the overall sales numbers weren't all worry-making enough, the Peruvian agency that monitors the world's largest supply source for fish oil and fish meal announced in October 2014 that it would be closing the fishing season three months early due to low biomass readings of the resident fish population.

Just the reduction of anchovy oil itself drove up prices an estimated 25 percent. The findings are consistent with a situation in which real growth exists only in emerging markets, while sales in larger and more established markets are kept from stagnating or contracting only by the growth of ingredient prices.

WHERE SOME PERISH, OTHERS PROSPER

The closure of the Peruvian fishery also has had another unexpected outcome: It has given an opportunity for other suppliers in the omega-3 space to capture some of the media limelight. This includes algae oils, krill oil, calamari, flax, borage, and the newest player in the game: ahiflower.

For years, Martek (now DSM/Lipid Nutritionals) has had a monopoly on the algal market. Its flagship product, life'sDHA, truly pioneered the algae omega-3 industry, says David Hart, vice president of Qualitas Health, a new EPA-only algae supplier on the market. "Life'sDHA has been around for many years and has become one of the 'go-to' ingredients for infant formula," Hart said. "Martek did a wonderful job to develop the science and understanding around DHA specifically, and why it is so important for infant development."

Life'sDHA is now found in hundreds of products and is a mainstay in infant formula. The algae ingredient contains only DHA and is in a triglyceride structure. In February 2014, Market Research & Consulting published its Omega-3 Market Analysis and Segment Forecasts to 2020. Highlights include:

- Supplements and functional foods were the largest application segment for the market with a share of over 55 percent and consumption close to 12.8 kilo tons of omega-3 ingredients in 2012.

- Pharmaceutical and infant formulas were the other large application segments in the market together accounting for 33 percent of the global revenue.
    - Consumption of omega-3 ingredients in infant formula is expected to be the fastest growing segment over the forecast period with an estimated CAGR of 15.3 percent from 2014 to 2020. The infant formula market is the world's fastest-growing packaged food category, primarily due to the development of markets in Asia (particularly China) and Eastern Europe, and to a lesser extent in the Middle East and Latin America. An estimated 87 percent of infant formula sold in 2011 was fortified with DHA and ARA.

By comparison, Life'sDHA newest competitor on the market, Almega PL, from Qualitas, contains only EPA, and is based in a polar-lipid structure. Qualitas in 2014 signed a distribution partnership for the US supplements market with Xsto Solutions.

With flax, the discussion has gone beyond the small conversion of ALA to EPA, and rather is focused on the unique health benefits of ALA omega-3. In particular, increased intake of ALA (1g/d) was associated with a 10 percent lower risk of death from heart disease, and a 35 to 50 percent lower risk of stroke in men who consumed more than 1g/day. In addition, the Institute of Medicine established a daily requirement for ALA of 1600 mg per day. This means that nutrient content claims for ALA can be made on products that contain 160 mg of ALA per serving. It is worthwhile noting that the FDA has disallowed any nutrient content claims for DHA and EPA as the IOM has not established a daily requirement for them – much to the consternation of the GOED trade group.

There's a new omega-3 on the market and it is called ahiflower oil. The ingredient offers a sustainable, non-GMO, plant source of combined omega-3+6 fatty acids with superior SDA, EPA, ALA and GLA properties.

Ahiflower oil is a proprietary branded form of Buglossoides arvensis seed oil. It is one of the richest natural plant sources of stearidonic acid (SDA) known, offering manufacturers the opportunity to incorporate a non-GMO vegan source of omega-3 into their products.

The product is ideal for consumers and formulators seeking a fatty acid that is closer biologically to the EPA found in fish oil; it also provides an alternative to conventional plant sources of omega-3s.

As an oil, ahiflower is stable. Like any long-chain fatty acid, it is susceptible to oxidation, so care has to be taken in handling and processing to keep it from oxidizing. Nearly two years of data show it does quite well in storage.

SWOT ANALYSIS

STRENGTHS

- Baseline quality and purity standards have safeguarded the sector against contamination, adulteration or quality issues.
- Unsurpassed scientific backing on a range of health issues.
- Official qualified health claim for EPA + DHA on cardiovascular health.

WEAKNESSES

- Media coverage born in highly questionable studies that go uncontested.
- Short-chain ALA omega-3 sources like flax and chia piggy-back on science surrounding long-chain DHA and EPA omega-3s.
- Lack of recommended intakes in major countries like USA and Canada leave consumers uncertain about how much is enough.
- Sustainability concerns with both fish oil and krill.
- High price of krill.

OPPORTUNITIES

- National PR campaign ought to move the numbers.
- New sources offer consumers choice.
- High concentrates allow more DHA and EPA into smaller capsule sizes.
- Additional research cementing health benefits for cardio, joint, obesity and others.
- New research shows flax has cardiovascular benefits in its own right. Institute of Medicine has set a Daily Value of ALA at 1,600mg/day, whereas no such level has been set for DHA and EPA. That leaves room for nutrient content claims around ALA.

THREATS

- Biased meta-analyses get picked up and disseminated.
- Negative media coverage.
- Lingering fears of heavy metals – despite the fact that supplements are thousands of times more purified than straight fish or seafood consumption.
- Price increases.

Nordic Naturals Omega-3

Game Changer: Natural Colors And Flavors

The warning light for the death of artificial colors and flavors is flashing a bright Velveeta orange. In April, Kraft announced it would replace artificial colors with natural ones in its iconic Kraft Macaroni & Cheese Dinner. The change is just the latest, perhaps brightest, sign on the growth charts for natural colors and flavors.

The popularity of natural colors and flavors has been growing for a while – SpongeBob and Darth Vader-shaped Kraft mac and cheese were colored naturally even before the big Blue Box announcement. But in 2014, natural flavors actually overtook artificial flavors in the global flavors market, according to a new report by Allied Market Research. According to AMR: "The natural flavors segment took over the lead to hold the majority of share in terms of value, with a strong demand for organic processed food and beverages driving growth in this segment. The growth outlook for natural flavors remains strong while synthetic flavors may witness negative growth." AMR predicts the global flavors market to reach $15.2 billion by 2020.

CONSUMER-DRIVEN CHANGE

Though Kraft claims their mac 'n cheese ingredient swaparoo was not a result of the 270,000 petition signatures a couple bloggers delivered to their corporate HQ, companies are finding it hard to ignore the public clamoring for cleaner ingredient lists. Sensient Natural Ingredients, a California-based flavor and fragrance supplier, calls it a "natural evolution," a change in part catalyzed by the digital evolution, according to Jean Shieh, Sensient Marketing Manager.

Through outlets like social media, more and more consumers are gobbling up content about health and wellness trends. "If consumers have any question about their food, answers can often be found through a few swipes. Today's consumers expect 'natural' and are moving away from food products containing artificial flavors, but at the same time, consumers want food that tastes good," she says.

EUROPE LEADS THE WAY

That evolution got a huge boost from the Southampton Six Study, a 2007 British study funded by the U.K. federal food safety agency that showed artificial colors and/or the common preservative sodium benzoate increased hyperactivity in kids. **www.newhope360.com/colorants/natural-colors-sales-overtake-synthetics** In response, the European Union began requiring that food labels indicate if a product contains any one of the six dyes included in the study. The label states the product "may have an adverse effect on activity and attention in children."

Over here, the FDA wasn't impressed. After a 2011 Food Advisory Committee meeting review of existing research, they concluded there wasn't enough evidence to prove that foods with artificial colors caused hyperactivity. They said further research was necessary, but a label was not. Manufacturers like Kraft, Coca-Cola and Walmart voluntarily removed the artificial food colors and dyes from the products they distribute outside the U.S. But for the goods they sold in the states, it stayed business as, artificially, usual.

MILLENNIAL MOTIVATION

With voices echoing across the internet, millennials are a major force behind the trend toward natural colors and flavors, says Donald Wilkes, President, CEO, of Los Angeles, California-based flavor manufacturer Blue Pacific Flavors, Inc. "Today's millennial consumers are challenging and disrupting traditional marketing paradigms on food marketing and labeling," he says. "With over a 90-plus percent internet penetration, millennials are influencing a wide range of consumers and CPG companies on natural, organic, non-GMO and clean-label food products even though the majority of Americans are still consuming traditional processed foods. Given the power of these influential millennials and the evolution on how marketers are using Big Data in major food and beverage companies, it is easy to see why natural flavors and colors are on trend."

Increasing selectivity by retailers like Whole Foods regarding what they'll allow as "natural" ingredients has also been a driving force, says Mike Cammarata, Research Scientist with Philadelphia-based FMC Health and Nutrition. The company recently opened a new blending facility in Delaware to help meet the increased needs for natural ingredients.

They may be on trend, but natural colors and flavors are not always easy. Beyond innovating ways to increase shelf stability, one of the biggest challenges facing food and beverage companies using natural flavors and colors is the difference within regulations among international markets. "Without global harmonized natural flavor and color ingredient listings, it continues to be very challenging for the food industry and their respective supply chains to address these variations on 'natural' labeling," says Wilkes.

'NATURAL' CONFUSION

'Harmonized regulations' seem far off when domestic agreement about a definition for "natural" remains out of reach. So far, lawsuits and the FDA have both failed to provide a definition, reports Nutrition Business Journal in its clean label issue. A *Consumer Reports* poll found the term so "misleading, confusing and deceptive" that the group launched a campaign to ban the word from food packaging.

Regardless of what the box says, blue or otherwise, the fact that every day seems to bring headlines of another national chain company axing the artificial means the future of natural colors and flavors should be brighter than even Velveeta orange.

SWOT ANALYSIS

STRENGTHS

- Growing (louder and louder) consumer demand
- Growing tech support, and supporting products, for natural ingredient formulations

WEAKNESSES

- Natural not as shelf stable as artificial, formulation challenges
- Some public confusion around "natural"

OPPORTUNITIES

- New natural formulations for existing products
- New products, and sources, constantly emerging
- Increasing public acceptance of more muted colors
- Growth in developing markets (Russia, Asia Pacific) of public concern for ingredients

THREATS

- Regulatory foot-dragging by the FDA
- Price
- Flavor may be just different enough to turn off consumers from what they're used to

Kraft macaroni and cheese

Todd Runestad and **Shara Rutberg** are authors of this edition's Deep Dive.

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