

Supplements' time to shine

Market sees 14.5% sales growth and \$55.7 billion in sales for 2020

By Rick Polito

Silver linings were not a widely shared commodity in 2020. Dogs got extra walks. That Tiger King guy got famous. Home Depot parking lots got packed when Americans collectively decided their kitchens needed updating.

But one of the brightest silver linings shone on supplements.

NBJ is now calling 2020 the fastest growing year since we began tracking supplement sales in 1995. End of year reports and additional final data now put growth at 14.5%, up from earlier 12.1% projections, adding \$7 billion in additional sales and building a market now estimated at \$55.7 billion.

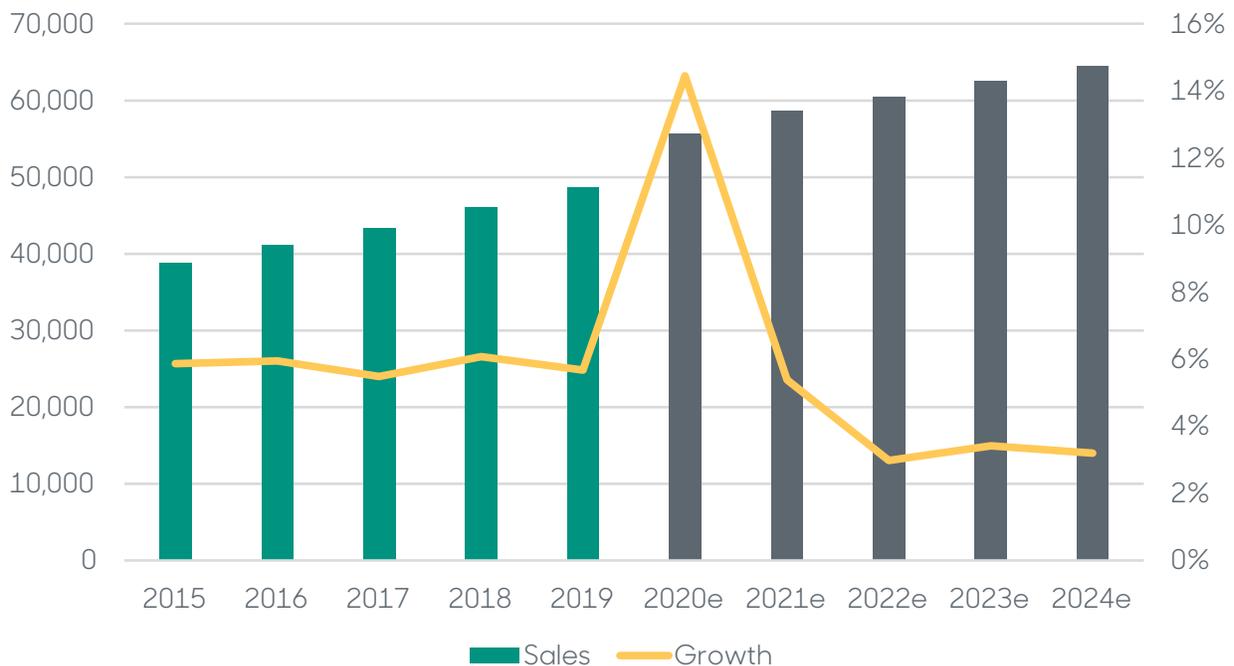
That 14.5% barely edges out growth in

NBJ Takeaways

- » 2020 marks the fastest growth in supplement sales in NBJ history
- » Vitamins lead the pack on sales, with herbs and botanicals in second place
- » Supply chain demands still being felt by brands

the second best year, 1997, when the market gained 14.4% in sales, but the industry is now vastly larger in size. The additional \$7 billion coming into the market is equal to half the entire 1997 market, when Amer-

SUPPLEMENT INDUSTRY SALES AND GROWTH, 2015-2024E



Source: Nutrition Business Journal (\$mil, consumer sales)

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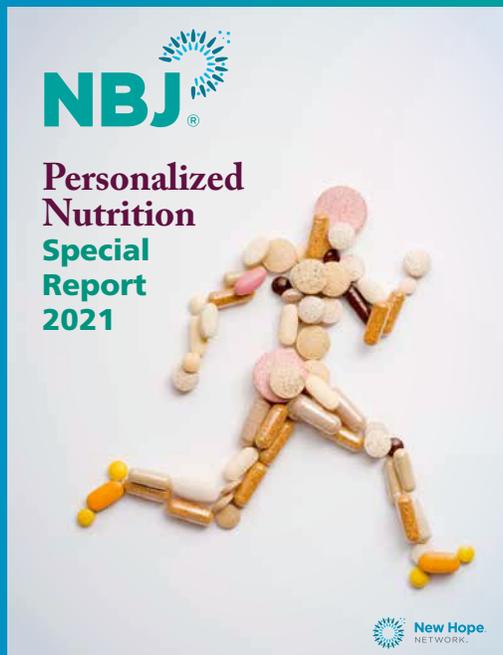
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Supplement sales driven by personalized nutrition grew 35% in 2020... what will happen next?



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**LETTER FROM NBJ:
REFRESH, RESTART, REBOOT**

It's worth asking why we don't see more IT techs wearing T-shirts that ask, "Have you tried restarting?" More often than not, a program needs a refresh, or the system needs a reboot.

People are like that too. That's why we have vacations. And governments have elections.

But do industries need reboots? It's not obvious that the best sales growth year ever (see "Supplements' time to shine" page 1) is a sign that a reboot is required, but at the same time, perhaps a moment when the sun is shining is the best time to get a view of the way forward. Or maybe supplement makers could take a new look at their place in a society that's taking a new look at everything, tiptoeing into a post-COVID age one vaccine at a time.

Or maybe it's just the arrival of millions of new consumers in the market that suggests 2021 is time for a restart.

In this issue, we look at a variety of trends that could be part of a restart. "Putting pills in the packet" (page 9), examines how Ok Capsule is providing a support structure that could enable more personalized nutrition brands to gain traction. In "Long winded" (page 16), we explore how the symptoms of long COVID match up with the practice of integrative care—and the role of dietary supplements in that care—as millions of new patients enter an era fraught with unknowns. "Machines making medicines" (page 5) reveals what technology has done to harness the power of artificial intelligence to match natural compounds to achievable health solutions.

What the industry can't let happen during this moment of societal pivot is to lose the opportunity through some series of missteps. One of the themes we've talked about this year for NBJ Summit was "Let's not F this up," and it's hard to be entirely confident we won't. The industry has rightly applauded federal regulators for action against brands that made illegal claims around COVID, but there is plenty of time for unscrupulous actors to push past the envelope, not just on COVID but in any number of eras.

For that and all the reasons above, it seems like time to, if not restart, then, revisit the relationship the industry wants to have with consumers. Immunity is quite rightly the conversation of the moment, but how does that conversation keep going after COVID has passed? As the threat of the pandemic eases, how do brands continue to talk to consumers about why general health still matters.

In their buying patterns, consumers have signaled they are ready for a reset. Is the supplement industry ready to meet them there?



Rick Polito
NBJ Editor in Chief

COVER STORY CONTINUED

icans spent \$13.9 billion on supplements.

Investment banker William Hood called 2020's growth an unmistakable affirmation that the supplement industry is strong and getting stronger. "The consumer has spoken," Hood said. "When a \$50 billion category grows 14.5% in a single year, you have to take note. That's \$7 billion of incremental sales in a single 12-month period."

Hood has been predicting a "new normal" of strong sales to follow 2020's gains, and while *NBJ* is projecting slower growth from a larger base in coming years, Hood is not alone.

Wellvest Capital Managing Director David Thibodeau said he sees a lasting momentum. "The entire industry got a BOGO (Buy One Get One Free) in 2020, bringing into the industry new consumers and re-energizing existing consumers. When a

*"The consumer
has spoken."*

– William Hood,

William Hood and Company

BOGO is over, the level of sales is always higher than before."

While demand for ingredients like elderberry and mushroom extracts shot through the roof, perhaps no other figure reveals just how strong a year it was for supplements than multivitamins. That a \$7.8 billion market can grow by 23% tells us that 2020 wasn't solely a story of immunity. Basic health has become a primary concern for more consumers.

Nutrition industry consultant Tim Avila said figures like that suggest the pandemic was a wakeup call for many. "It turns out 'my lifestyle won't just kill me later, it might kill me now' tends to generate a rethinking of what being healthy means," Avila said.

Health Wright Products CEO Scott Steinfeld said that consumers were not the only ones who may have taken a new look at supplements. Steinfeld said conventional medical doctors talking to patients about vitamin D and zinc "points to the fact that pharma cannot be the only answer to health-

care.” Dr. Anthony Fauci publicly saying he took vitamin D for immunity is the kind of headline the industry could never buy. “All contributors to our healthcare system were forced to relook at dietary supplements and recognize and accept benefits that might not otherwise be acknowledged,” Steinfeld said.

The silver lining of 2020 shone across supplement categories somewhat unevenly—gains in sports nutrition and meal replacements were small—but no category saw growth slow. Even minerals, which had been a sleepy category for most of the last decade, saw an amazing acceleration, shooting up to 13.9% from 2019’s 2.7%, ending the year as a \$3.5 billion market.

Vitamins lead the pack, not just in size but also in growth, with 21.5% gains in what is now a \$17.6 billion market. Look for a more detailed breakout in the *Supplement Business Report*, but vitamins D and C saw standout years.

After ending 2019 as the fastest growing supplement category, at 8.6%, herbs and botanicals more than doubled that rate in 2020, with an 18.5% gain that marked the second fastest category growth in 2020.

Americans spent \$11.4 billion on herbs and botanicals in 2020.

Channels saw winners across the board as well, but many believe that, more than anything, the pandemic accelerated trends already in tplay. The natural and specialty channel saw growth move up from 1.65% in 2019 to 5.5% in 2020 as demand grew, but ecommerce saw an astonishing surge. In 2019, *NBJ* tracked supplement sales online growing at 26.5%. In 2020, we estimated 69%, and that number could prove conservative.

Ecommerce is now an \$8.4 billion channel for supplements, up from \$5 billion in 2019. It was just \$2.5 billion five years ago and could reach \$14.3 billion in 2024, when it is projected to be just \$2.6 billion behind natural and specialty channel. For perspective, natural and specialty presently brings in well more than twice the sales *NBJ* estimates for ecommerce. In 2015, it was nearly six times larger.

Demands on supply

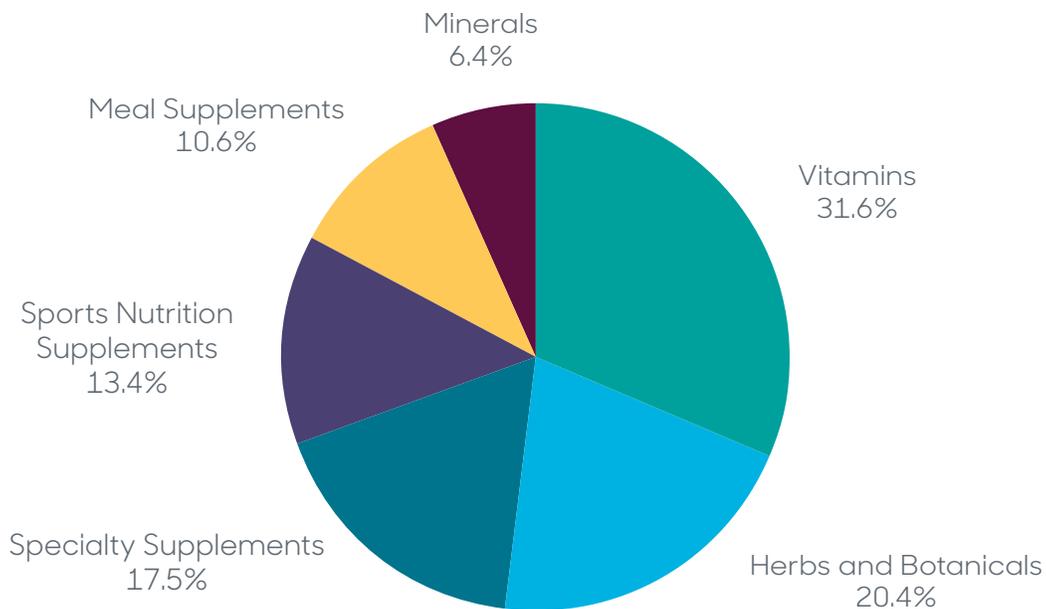
All this growth put no small strain on the supply chain. Patrick Sullivan, whose magnesium-focused **Jigsaw Health** brand

benefitted from that mineral market surge, said the demand put his company to the test. “Positive growth comes with many challenges,” said Sullivan. “When everyone in the industry needs to reorder everything all once, things get chaotic real quick.”

Lead times to replenish inventory at Jigsaw went from 14 to 22 weeks while stock moved out the door far faster than forecasted. “One year later, we’re still dealing with the challenges,” Sullivan said, pointing to even simple items like bottles and caps still in short supply.

Mark LeDoux, CEO at **Natural Alternatives International**, also pointed to trouble in the supply chain as a challenge that’s not going to go away soon but said the broader sales gains are likely to outlast the pandemic. “This is not a blip but a sea change,” Le Doux said. The pandemic, he explained “crystalized consumer and professional sentiment” around the benefits of supplements. “Every day that goes by sees a greater adoption of the proper role of dietary supplementation in helping ward off the ravages of a compromised immune system.”

SUPPLEMENT INDUSTRY SALES BY PRODUCT CATEGORY, 2020E



Source: *Nutrition Business Journal* (consumer sales)

Machines making medicine

Companies use AI to develop new natural products and discover novel applications for familiar ingredients

By Peter Rejcek

In 2020, an artificial intelligence system, dubbed AlphaFold 2, accomplished in days what the most cutting-edge techniques require months or years to unlock—the three-dimensional structure of proteins. Structure is linked to function, so the ability for AI to predict how a protein folds, based on its DNA sequence, means scientists can understand these basic building blocks of life at a scale and speed previously unimaginable.

For starters, AlphaFold 2 could revolutionize the understanding and treatment of some of the most intractable diseases, such as cancer or Alzheimer’s. Indeed, one of the biggest impacts of AI is expected to

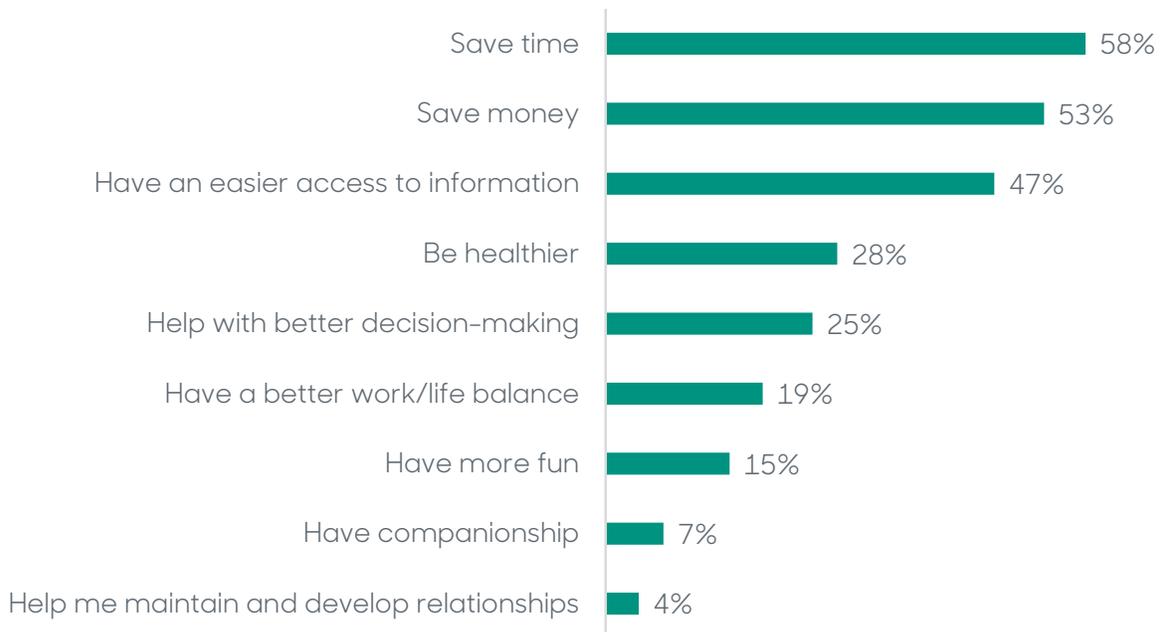
be in drug discovery and development. Private investment into companies applying machine learning and other AI techniques into therapeutics reached nearly \$14 billion last year, according to the Artificial Intelligence Index, a report produced by Stanford University’s Institute for Human-Centered Artificial Intelligence.

However, it’s not just big pharma that stands to benefit from these sophisticated algorithms, which ingest and train on huge datasets to discern patterns and make predictions. These same advances are being used to identify new phytonutrients or discover novel applications for well-established ingredients in the natural products industry.

NBJ Takeaways

- » Artificial intelligence is already at play in pharma and nutritional arenas
- » Key mergers and deep investment pockets point toward an acceleration in the field
- » Algorithms can connect the dots between health conditions and natural compounds quickly and accurately, significantly shortening product development timelines

REASONS WHY CONSUMERS WOULD USE ARTIFICIAL INTELLIGENCE



Source: 2018 Gartner consumer AI perceptions study, conducted online during January and February 2018 among 4,019 respondents in the U.S. and the U.K.

“We believe AI is the next generation of scientific tools to help us innovate, not only by identifying new phytonutrients but also by gaining a better understanding of how a compound or ingredient is beneficial,” says Tobe Cohen, chief growth officer at **Pharmavite**, which produces the **Nature Made** brand.

“We believe AI is the next generation of scientific tools to help us innovate, not only by identifying new phytonutrients but also by gaining a better understanding of how a compound or ingredient is beneficial.”

– Tobe Cohen, Pharmavite

AI platforms for plants proliferate

The 50-year-old dietary supplements company is embracing that future through a partnership with **Brightseed**, a startup founded in 2017 that recently raised \$27 million to build out its plant nutrient discovery platform—Forager.

“The core of Forager, our AI platform, is first about predicting the compounds that exist in plant sources ... and then predicting what these compounds would do for a specific health benefit. It’s focused on efficacy,” explains Sofia Elizondo, Brightseed co-founder and chief operating officer. “We connect the plant kingdom, at a molecular level, to biological health targets and apply AI to predict all of those relationships.”

Where Brightseed is focused on building the world’s biggest library of plant compounds mapped to benefits, health intelligence company **Onegevity** leverages its large multi-omics database (including transcriptomics, metabolomics and microbiomics) to create high-throughput predictions on its AI platform called Discovery.

“[Discovery] allows us to take biological evidence and chemical structure features to predict natural products that have

shared properties in their active sites,” says Nathan Price, Ph.D., co-CEO of Onegevity. “We can then screen against natural products and rapidly identify compounds that are predicted to have effects on various biological targets and processes.” Founded in 2018 in partnership with dietary supplements company **Thorne**,

Onegevity originally used AI and biometric data to provide personalized wellness recommendations to consumers.

Long on longevity and wellness

The two companies announced a merger earlier this year into **Thorne Health-Tech**, not long after Onegevity expanded its portfolio to include business-to-business solutions. One high-profile partnership is with **Indena**, a raw materials supplier in Italy celebrating 100 years in business in 2021, demonstrating that well-established players in the natural products industry see value in the emerging technology. That partnership is expect-

ed to focus on anti-aging formulations, among other applications.

One of the first companies to introduce longevity products based on the recommendation of machine-learning algorithms was **Life Extension**, a supplements company known for anti-aging brand formulations. In 2016, it partnered with a leading AI drug discovery startup, Hong Kong-based **Insilico Medicine**.

Founded in 2014, Insilico has raised more than \$50 million toward developing deep-learning technology to identify biomarkers of aging and to create novel drug therapies. The company made headlines in February for using its AI platform to discover both a drug candidate and novel pathway for treating a rare lung disease. It took just \$2.7 million and 18 months to validate the small-molecule drug through what is often a much more lengthy and costly pre-clinical phase.

The breadth of data available on the biology of aging, and the pathways involved, has outpaced Life Extension’s ability to assess longevity efficacy through clinical trials, according to Andrew Swick, M.S., Ph.D., Life Extension’s chief scientific officer. The technology created by Insilico Medicine offered a powerful shortcut to new solutions.

“In order to leverage the longevity pathway data in a relevant and timely manner,” Swick says, “we initiated a collaboration with Insilico Medicine so we could combine their outstanding expertise in AI with our deep knowledge of nutraceuticals.”

The result of the collaboration is Life Extension’s GEROPROTEC line of anti-aging formulas. In 2017, it introduced both Ageless Cell, a formulation of four

“Nobody’s AI algorithm is so perfect that you have to stop doing your experiments, but it can save you a lot of time and energy and tell you which experiments you should do.”

– Jeff Skolnick, Ph.D, efficacyAI

specific nutrients—myricetin, NAC, gamma tocotrienol and EGCG—that reputedly inhibit cellular aging, and Longevity A.I., which combines withaferin a, gamma-linolenic acid, and ginsenoside Rg3 (from Asian ginseng) to mimic the metabolic benefits associated with calorie-restrictive diets.

The need for speed

While the computer code and scientific research underpinning these platforms are highly technical and are still works in progress, the value proposition is pretty simple: algorithms can connect the dots between health conditions and natural compounds at a speed and confidence level that significantly shortens the develop-

ment phase of new wellness products.

For example, taking a “grind-and-find” approach to work through botanical libraries could take years. Companies like Brightseed claim to condense the match-making search between benefit and compound—and vice versa—down to months. Speed is built on data and processing power. In the case of Forager, the platform will have mapped more than a million plant compounds by the end of 2021, according to Elizondo.

A company spun out of Georgia Tech called **efficacyAI** claims its drug discovery platform, MedicascyAI (rhymes with efficacy), can link a health benefit to a natural ingredient in just weeks. Co-founder Jeff Skolnick, Ph.D., has spent the better

part of 15 years developing algorithms capable of making these analyses based solely on the chemical structure of the molecule and then drawing on a target prediction library that contains 97% of all human protein sequences.

MedicascyAI generates confidence levels as high as 80% that a small molecule, whether it’s a drug or botanical compound, will be safe and effective. “You can target key pathways that are associated, say, with energy production. You can map these things to mood, mental acuity—what’s the logical equivalent of a wellness prediction, in addition to mapping of a disease indication prediction,” Skolnick says.

“Nobody’s AI algorithm is so perfect that you have to stop doing your experi-

Algorithms aren’t just for allopathic medicine

Southwest College of Naturopathic Medicine brings 21st century technology to traditional herbalism

Just because naturopathic medicine approaches health from traditional practices doesn’t mean practitioners have turned their backs on the high-tech tools available to them today, including the promising computing power of artificial intelligence.

That convergence of the old and the new is taking physical shape at the Southwest College of Naturopathic Medicine, which is scheduled to complete construction of a state-of-the-art molecular biology and phytochemistry laboratory in 2021, as part of an expansion of the Ric Scalzo Institute for Botanical Research. The new facility will bring a more rigorous scientific approach to developing natural products by studying the molecular underpinnings of plant extracts in order to understand the link between compounds and biological pathways.

“That’s really what we feel has been missing from natural products research,” says Bill Chioffi, vice president of strategic partnerships and business development for the institute. “People are testing clinically, in patients, formulas that haven’t really been well developed on the back-end.”

Chioffi says the lab is approaching the task of product innovation with the mindset of a startup, building partnerships in both industry and academia. And part of that approach is leveraging new tools like artificial intelligence to deliver data-driven insights at a scale and speed beyond human capabilities.

“No scientist actually can keep up with the [scientific] literature nowadays,” notes Susan Trapp, Ph.D., who recently joined the institute as an expert in molecular biology, genomics (including research on the Human Genome Project)

and computational biology.

The latter is a scientific discipline that uses mathematical models to understand biological systems. AI and computational biology are merging, to the extent that the terms are sometimes used interchangeably when speaking about algorithms that ingest and analyze large datasets.

Take the example of echinacea, a popular dietary supplement that is marketed for a number of health conditions, using various parts of the plants, across a wide variety of formulations. An algorithm trained to sift through the scientific literature and other sources could quickly make predictions about optimal extractions for the kind of product desired.

“All of those factors can be sorted through with AI from the reams of data that’s out there about echinacea already,” Chioffi says.

Trapp says the nutraceuticals industry is still in its infancy compared to big pharma regarding the use of AI, computational biology, bioassays and other advanced lab techniques for developing new products. “We’re probably five to 10 years behind [when] utilizing all of these tools,” she says.

Chioffi says he believes the institute can help bring scientific rigor to the natural products industry and instill a thirst for research in the wider naturopathic community.

“Our great hope would be to work with manufacturers of botanical extracts to improve what’s being put out into the supply chain,” he says. “We’re really hoping to inspire the next generation of naturopaths to look at research as an avenue for their work.”

ments,” he added, “but it can save you a lot of time and energy and tell you which experiments you should do.”

AI already identifying potential products

There is certainly hope—and no small amount of hype—for what AI can do in helping design new products or discovering novel applications for existing ones.

In January, for instance, Brightseed announced its first AI-powered discovery for metabolic health: two compounds, found in more than 80 edible plant sources, that help clear fat from the liver. Forager helped further narrow the search by identifying which plant source is most sustainable and best expresses the compounds for extraction, among other criteria. One such source is black pepper, according to Elizondo.

The company is also working with **Danone North America** to identify plant compounds in the food giant’s raw soy that could provide previously unknown health benefits and claims.

In the case of MedicascyAI, the platform flagged a novel use of caffeine as a topical remedy for fungus, according to Skolnick. “That’s an example of a really beaten-to-death molecule that the algorithm predicted,” he says. “This is a massive hypothesis generator, which obviously has to be validated. I’m not saying it can’t be, but it gives you a short list of things to do. And that’s the power of it.”

The dietary supplements industry even holds something of an advantage over traditional pharmaceuticals, Elizondo notes, because plant sources tend to

have a much more robust safety profile than synthetic compounds.

“The big advantage in the natural products space,” notes Price at Onegevity, “is that compounds that are generally recognized as safe ... do not have the same regulatory approval process as do drugs and therefore can be moved quickly into trials to test efficacy.”

“Despite current health solutions continuing on a ‘one-size fits all’ approach, we have seen an increased demand for personalization, as people are seeing the benefits of better health outcomes.”

– Nathan Price, Ph.D., Onegevity

Can AI offer a personal touch?

Not surprisingly, Price says he believes there is “massive potential” for AI in the natural products industry that could stretch into offering personalized solutions. “Despite current health solutions continuing on a ‘one-size fits all’ approach, we have seen an increased demand for personalization, as people are seeing the benefits of better health outcomes,” he says. “We have developed our sophisticated AI system to utilize pattern recognition, deep neural networks and bioinformatics to deliver unparalleled molecular insights and personalization.”

Not everyone is convinced that AI can

so easily solve the personalization wellness challenge, however.

“I think we all got really excited about personalized health, because suddenly you can spit in a test tube and get genomic information, and that’s super cool,” Elizondo says. “What we’re missing is the same level of detail from what we eat.”

When people eat plants today, she continues, we’re lucky if we know the vitamin

and mineral content, let alone the phytonutrient content in the foods we ingest. She notes that the majority of FDA-approved small-molecule drugs are derived from these powerful phytonutrients in plants. “Without having the molecular-level visibility, there is no way that you can personalize nutrition,” Elizondo says.

Skolnick says he believes personalization is possible, but that it has a long way to go. The algorithms are optimized for the average human, he explains, and can’t account for individual metabolic rates or other factors without more extensive biometric data. “If you are talking about personalized nutraceuticals, we need, at the very least, genotyping and probably some kind of epigenetic information in order to say something intelligent,” he says.

Leveraging AI is not about chasing consumer trends, according to Cohen at Pharmavite. “It’s about leveraging technology and innovation to help consumers achieve the health and wellness outcomes they’re striving for. It goes beyond what’s happening in our industry at this moment and looks down the road at novel phytonutrients and compounds that could positively impact health in ways we can’t even imagine right now.” 

“I think we all got really excited about personalized health, because suddenly you can spit in a test tube and get genomic information, and that’s super cool. What we’re missing is the same level of detail from what we eat.”

– Sofia Elizondo, Brightseed

Putting pills in the packet

OK Capsule aims to support personalized nutrition startups with packaging, packeting

By Rick Polito

If personalized nutrition is about the science of connecting the dots between a person's health status and the nutrition that person needs to thrive, what Andrew Brandeis is bringing to market could be the pen that connects the dots between the ideals of personalized nutrition and the realities of selling supplements—especially for new entrants in the space.

Ok Capsule, the company Brandeis co-founded, aims to be a kind of contract manufacturer to the personalized world, putting the pills in the packets and shipping them to the customers, all branded to the client. “Why would you build out the massive infrastructure required to do personalized supplements if that’s not your business? If your business is telling customers what supplements they should take based on their DNA?” Brandeis asks.

The supplement industry is famous for having a barrier to entry so low that mice could clear the hurdle without picking up their feet, and the result of such slight friction has been a proliferation of brands to a level where no one actually knows how many players there are in the market. But that changes at the doorway to personalized nutrition, where the gate

is set much higher. Coming up with a personalization model, that might range from questionnaires to biomarker testing, is just the first step. To sell supplements within that scheme, brands must find a way to deliver regimens of nutrients and other ingredients that are, by definition, not one size fits all. That puts innovators in science on a collision course with the more mundane—but no less exacting—realities of manufacture, inventory, packaging, payment tracking and customer fulfillment.

That may be what has kept personalized nutrition from being the force it might deserve to be in the market. Despite the interest and scientific advancement, only a few players are actually selling supplements in the space. Right now, supplement sales directly through personalized nutrition models represents less than 1% of the U.S. market, a share many observers thought would be far higher at this point.

Brandeis, who is both a trained naturopath and a serial entrepreneur, says the logistics between the science of personalization and getting a personalized package to a consumer may be keeping new advances in personalization stuck in

NBJ Takeaways

- » Personalized nutrition can be a great health solution, but tying supplement sales into the equation has not always been simple
- » OK Capsule serves as a kind of contract manufacturer and customer fulfillment operation for personalized nutrition companies
- » Personalized nutrition could pose particular challenges for retailers and practitioners

the idea stage. He believes Ok Capsule can help grow the personalized nutrition market by “handling the entire back end and letting them improve on the front end.”

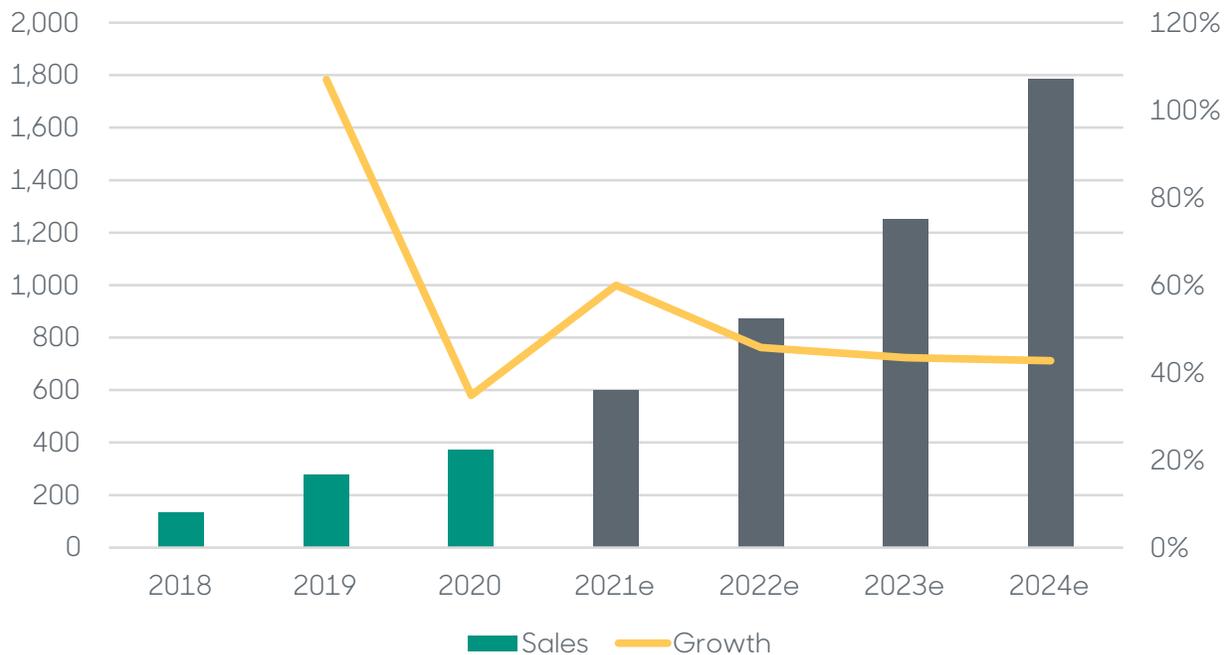
Supplement sales, Brandeis says, are pivotal for any realistic business plan that would finance the science behind personalized nutrition, and he sees companies with promising innovation shying away from actually selling supplements. “Some of the companies I knew were referring their customers to **Amazon** to buy the suggested supplements, and just getting a small affiliate commission from Amazon,” Brandeis says. “That’s not a really good margin, and it doesn’t really make for an effective business.”

Ok Capsule can sort pills into individualized packets, printed with the end consumer’s name and the client company’s branding. That’s essentially the end product that the two companies dominating supplement sales in the personalized space, **Care/Of** and **Persona**, deliver to consumers, but Ok Capsule will do it for anybody. Brandeis says the company can support questionnaire-based, genetics-based and

“Why would you build out the massive infrastructure required to do personalized supplements if that’s not your business? If your business is telling customers what supplements they should take based on their DNA?”

– Andrew Brandeis, OK Capsule

PERSONALIZED NUTRITION SUPPLEMENT SALES AND GROWTH, 2018-2024E



Source: *Nutrition Business Journal* (\$mil, consumer sales)

biomarker-based personalization models, practitioner-prescribed packets and really anyone who comes up with a way to customize a supplement regimen.

Widening the white space

Phil Vigeant, a supplement industry veteran who is advising Ok Capsule, says that ability to pivot from one personalization model to the next is pivotal not just for Brandeis's company. The company's success could help lay a foundation for the personalized nutrition landscape. Personalized nutrition can't grow without something like a contract manufacturer to support new ideas, Vigeant says. New ideas targeting niches and needs will be what brings new consumers into the space, he explains.

"Ok Capsule is agnostic on who wins or who doesn't," Vigeant says. "They can adapt to whatever a brand is doing."

Supplement Industry consultant Greg Horn remembers bringing personalized pill packet machines into select stores when he was CEO at **GNC**. The machines ended up being too expensive to be profitable at the

store level, and he can see how the whole enterprise could be not just too expensive but too complicated for personalization startups to tackle. Horn says it reminds him of how contract manufacturers help build new businesses. "This is just a much more sophisticated form of contract manufacturing," Horn says, "and it opens up the potential for the unlimited creative activity of marketing, but with a solid back end already built."

"It can definitely open it up to new players," Horn says.

Al Hariri, cofounder at **Vitagene**, a company selling supplement regimens based on genetic tests and other data, is one of those new players. Hariri says Vitagene focuses on what it's good at: creating personalized regimens. It lets Ok Capsule do the rest. "We essentially generate the recommendation, push it to them, and then they package it up and ship it to our customers," Hariri says.

Vitagene looked at building their own packet-sorting facility, but the price was high and the learning curve was steep. "If you really think about it, that becomes

its own expertise because now you have a physical manufacturing floor, machines, software, and it's all manufacturing excellence, which is on time packing, putting it together, getting it shipped out."

Ok Capsule made it easy. "That's what they're good at," Hariri says.

That ability to mesh with different players with different sets of expertise is what got **Findaway Adventures** interested in Ok Capsule, says Robert Craven, managing partner for the ventures group. Craven had worked with Brandeis when he was CEO at Megafood and Brandeis was "entrepreneur in residence" at the company. He's also been watching the evolution of personalized nutrition and saw the need for a company that could support new ideas.

"Each business or client for Ok Capsule is going to put their own spin on a target market, and so that creates a whole world of possibilities," Craven says.

As the number of new players and target markets expands, the awareness of personalized nutrition also rises. A rising

tide is in effect, says Craven, explaining that every new customer stands to add to the buzz and create more momentum.

Craven recalls taking his OK Capsule pill pack out at a dinner to take his supplements before the meal came. “Everybody wanted to know about it,” he says.

Dealing in details

The challenges of putting pills in packets don’t begin or end in the elaborate machines that do the sorting and packaging. Part of the learning curve for OK Capsule was discovering a new set of learning curves for each customer. Start-ups and brands with their own systems and interface mean OK Capsule has to adapt to fit. New customers, which can include retailers, are asking OK Capsule to create the interface, including questionnaire-driven protocols. “I’ve had several retailers approach us and say, ‘We want to offer a quiz. We want to do what Persona does,’” Brandeis says.

That tech support is crucial, says Greg Cooper, who sought out OK Capsule

“Each business or client for Ok Capsule is going to put their own spin on a target market, and so that creates a whole world of possibilities.”

– Robert Craven, Findaway Adventures

to support his **EasyVitaminPlan.com** brand. Cooper, whose family ran the **Arizona Health Foods** retail chain, was impressed with how adept the company was in making the tech work for his brand. “Whether it’s one guy with a gym or a chain with 1,000 stores, they’ve got to be able to adapt, and they are able to do it.”

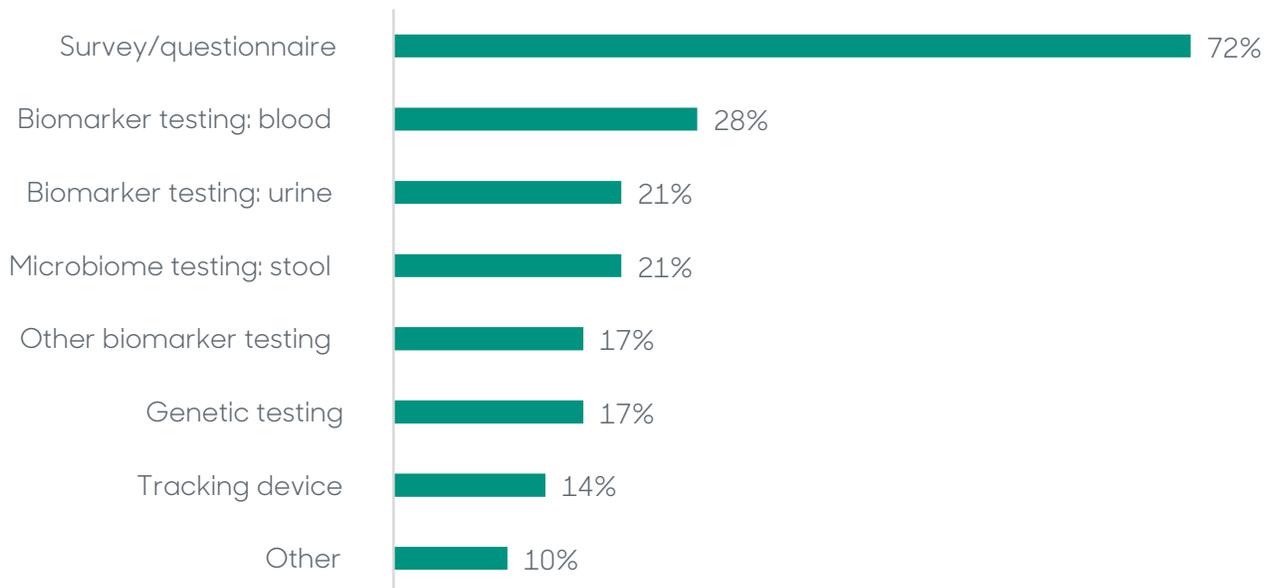
That adaptable tech creates a formidable barrier to entry, Craven says, explaining that OK Capsule has a sizeable head start on any contract manufacturer who might want to jump into the personalized space. “This is not a company that could just launch tomorrow,” Craven says. “You can’t just go out and buy a machine and get this thing going.”

Proving the models

Among the more promising targets for Brandeis’s company is retail. As personalized nutrition gains momentum, one of the bigger losers in the equation could be brick and mortar. Natural grocers, in particular, have suffered as sales migrate online, and personalized nutrition presents a subscription model that might shepherd even more shoppers out of the store.

A company like Ok Capsule that could handle the manufacture and fulfillment would allow a retailer to have a personalized nutrition offering that could create an ongoing relationship with its customers. Brandeis says the company

TESTING METHODS FOR USE BY COMPANIES PLANNING TO OFFER PERSONALIZED NUTRITION PROGRAMS OR PRODUCTS



Source: Nutrition Business Journal survey of nutrition industry, February 2021
 “What kind of testing will your personalized nutrition programs/products be based on?” n=29

is talking to “about 20 different retailers” about launches that could start in late 2021. A branded box with coupons for items that match the customer’s needs/interests could show up on that customer’s doorstep every month, or the box could be in the store for pickup. At the very least, a retailer could hold on to some slice of sales that would otherwise slip away, possibly permanently.

However, it may not be quite that simple, says Linda Shein, a consultant and retail/CPG board director who recently ran Wharton Business School’s retail innovation think tank. “While it is a great opportunity for retailers to offer private-label vitamin packs,” Shein says, “it’s not entirely a plug-and-play proposition.” Investment in training is needed for high-turnover sales associates to manage this new customer experience.

Shein points out that older supplements shoppers may visit stores because they don’t like shopping online and could require sales associates to guide them through the quiz and ordering process. Retail staff is already spread thin across

“The key question retailers must ask is, ‘Does this drive profitable business or is it a loss leader?’ It’s a fabulous opportunity, but it’s not as simple as just signing up”

– Linda Shein, LBShein & Company

other new services like curbside pickup and pick-pack-and-ship duties as stores become distribution hubs for online sales.

That training investment comes on top of whatever marketing investment and set-up costs are required, Shein says. “It’s a sexy thing for retailers to offer, given it’s the hot thing now, and it could certainly help build their customer data sets and drive business if managed and marketed correctly. That said, the key ques-

tion retailers must ask is, ‘Does this drive profitable business or is it a loss leader?’ It’s a fabulous opportunity, but it’s not as simple as just signing up.”

Practitioners could be another place where the services of a company like OK Capsule would be a good fit. Practitioners were delivering personalized nutrition regimens long before “personalized nutrition” was even a term and, like retailers, they also face challenges hanging onto sales. After the patient leaves the office,

many go online for the next purchase.

Scottsdale, Ariz., naturopath Guillermo Ruiz says he can see the advantage for practitioners of keeping sales “in your sandbox,” but practitioner-channel online operations like **Natural Partners’ FullScript** and **Emerson Ecologics’ Wellevate** already allow practitioners a vehicle to hold onto sales. That doesn’t mean it’s not an attractive way to connect with patients, he says. “It’s going back to

“This is just a much more sophisticated form of contract manufacturing, and it opens up the potential for the unlimited creative activity of marketing, but with a solid back end already built.”

– Greg Horn, Specialty Nutrition Consulting

almost like private labeling, but instead of having the practitioner’s name on the bottle, it would have your patient’s name on the bottle,” Ruiz says.

What Ruiz says he will be looking at it when he examines offerings like Ok Capsule will be the formulary. Practitioners, he notes, can have very exacting opinions on what products they use—the dosage, the format and the form of the ingredient. All the variations of a product would have to be available before he would feel confident using the services. “Maybe X brand has a great herbal adrenal complex, but their sleep complex has a couple of herbs that I don’t like,” he notes.

Brandeis doesn’t say Ok Capsule has figured out every challenge for every product and provider. What he does say is that he wants to help them get past those challenges. Flexibility is built into the platform. That makes it more possible for more players to enter the personalized nutrition market, he explains, and whatever the personalization model or the challenges, the end product solves some of the biggest problems in supplements. Compliance is one: “A packet with their name on it is a great way to get them to start taking their supplements every day,” he says. Plastic waste is another (OK capsules uses compostable packaging): “I don’t think we’re gonna be selling supplements in bottles in five years,” Brandeis says. “It just doesn’t make sense.”

Other challenges will come. More tools for personalization will appear, he says. Ok Capsule can be a pen to connect the dots. 🌱

Amazon as crystal ball

Can natural brands and retailers use e-commerce to predict trends?

By Marc Brush

Amazon carries 350 million products, says Betsy McGinn, founder of **McGinn eComm**, while the average grocery store has 47,000. The competitive challenge this poses for retailers is well established, but some brands are seeing opportunity beyond sales. As the buying world shifts its dollars online, the spotlight of innovation and discovery that was once the hallmark of tastemakers like **Whole Foods Market** and its fellow natural retailers inevitably shifts with it. Should brands be looking to Amazon for their new product development?

“Smart brands are already doing exactly that,” says McGinn. “You can absolutely find the innovation happening on Amazon’s platform.”

Amazon as market research

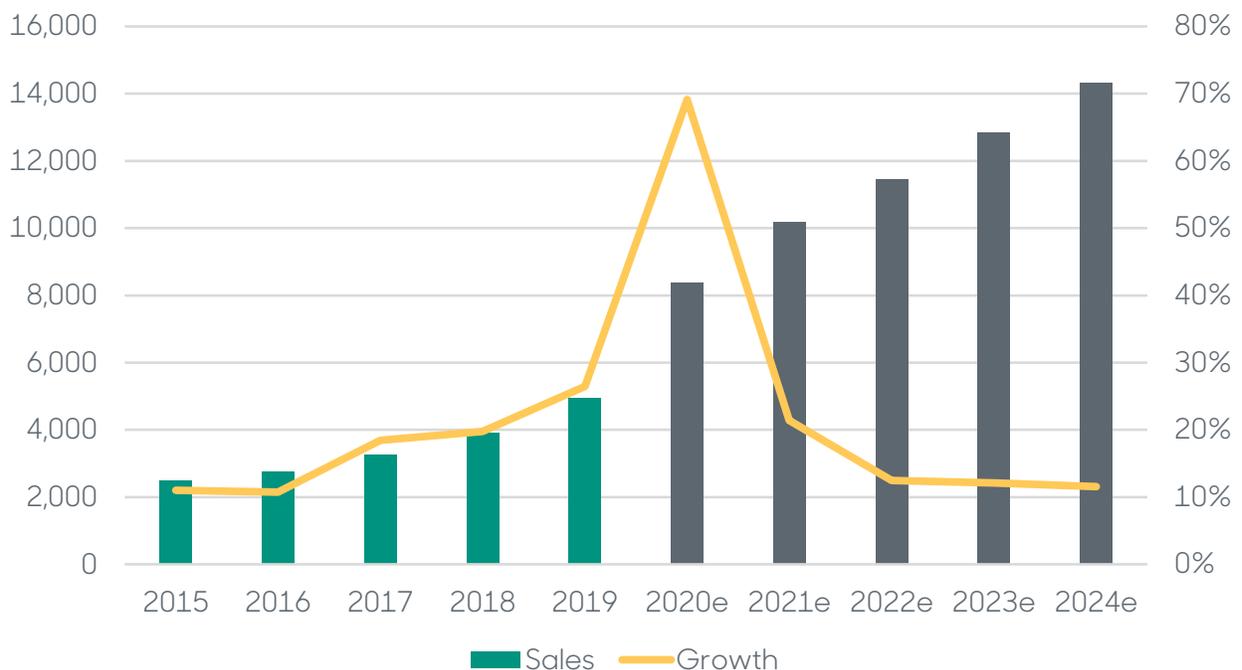
“This last year has turned the tide on shopping behavior,” says McGinn, who is also co-author of *The Amazon Roadmap: How Innovative Brands are Reinventing the Path to Market* and the former director of **Seventh Generation’s** e-commerce channel. “Under pandemic restrictions, brick-and-mortar retail became an in-and-out proposition,” she says, identifying the fears among consumers that their local grocery store might become a super-spreader hotspot.

At various points during the pandemic, supply chains were strained and shelves went bare. Category reviews by leading retailers were disrupted, costing new brands months in their finely wrought launch plans. In short,

NBJ Takeaways

- » Smart brands are now running category analyses on Amazon to understand health trends and the competitive landscape before launching new products
- » The human element of trendsetting in grocery, accelerated by Whole Foods in its heyday, has shifted away from risk toward a marketplace driven by low pricing
- » However dominant it is, Amazon is still far from the only way to market, and brands need to remember well-deployed offline launches sometimes set the stage for success on Amazon

SUPPLEMENT E-COMMERCE SALES AND GROWTH, 2015-2024E



Source: Nutrition Business Journal (\$mil, consumer sales)

the joy of product discovery on shelf vanished. Or rather, it went digital.

McGinn has the data to show that consumers already look to Amazon for product discovery in ways that once belonged to the buyers at natural retailers. “Consumers don’t search on **Google** for products,” she says, “they search on Amazon. Sixty-three percent of product searches start on Amazon, not Google, and only 22% of those start with a brand name.”

Some quick math reveals the importance of this development. According to McGinn, 77% of supplement sales online happen through Amazon. Overlaying that on *NBJ*’s e-commerce estimate of \$8.4 billion in 2020 supplement sales, that would represent nearly \$6.5 billion happening on Amazon alone. “The supplement category is one of the more developed categories online,” says McGinn. “Smart brands jumped in early.”

And more jump in all the time. With so much activity on the platform—Amazon shoppers go deeper now, often looking at second and third pages of search results—a growing roster of small brands are quickly reacting to consumer interest in ways that are influencing the category. Trends are unfolding at a never before seen pace. Thus, other smart brands are paying attention.

“We do category analysis for brands all the time,” says Rob Principe, Director of Business Development at **Netrush**, a full-service e-commerce retailer-agency hybrid that specializes in both supplements and Amazon. Principe was previously with **Megafood**, where he helped establish the brand’s e-commerce channel. “You can use Amazon to assess the entire size of a category, to study the top players, to drill down to specific products and delivery forms.” This kind of reverse-engineering can inform a brand about the true cost of entry to launch a new product and the quality attributes that might best differentiate and carve out a path to success. But this opportunity extends beyond brands.

“If retailers aren’t looking at Amazon, they’re missing the trends,” says McGinn. “The products are there, paving the way for what’s going to matter in 12-18 months.”

How did we get here?

E-commerce may be a young sales channel, but there are still history lessons to be

learned. As the new kids on the block, the first order of e-commerce business for supplement brands was simple: get on Amazon. A second order of business then quickly emerged, as brick-and-mortar merchandising strategies differed vastly from those online. Brands quickly realized they should forget the annual reviews in favor of a go fast/iterate strategy. The marketing algorithms matter more than personal relationships built over time with key buyers and grocery managers.

A third wave of e-commerce emerged over the past few years with the advance of digitally native brands, usually through **Instagram** and Amazon, with no terrestri-

“Everything on Amazon is an ad. It’s front and center, visible to 100% of the population, 100% of the time.”

— Betsy McGinn, McGinn eComm

al retail presence to speak of. These brands continue to present the established industry with the prospect of a death by a thousand cuts. Instead of competing with one mega-brand for Amazon keywords across dozens of SKUs, now a brand faces competition a dozen deep on a single SKU.

“Digitally native brands usually come on the fringes,” says Principe. “They want market share. They want proof of concept to become a big enough pain for the larger CPGs to buy them.” With some focused effort, they also offer a readily available source of forecasting data, including pricing trends.

“I’ve seen a rationalization in supplement pricing as sales went to digital and DTC,” says Errol Schweizer, an advisor to dozens of natural products companies on the heels of his tenure as VP of grocery at Whole Foods Market. At Whole Foods, Schweizer merchandised hundreds of companies across dozens of categories. “Over the last decade, retailers have really sharpened their pencils on pricing.”

As we embark on a fourth wave of e-commerce post-pandemic, a platform like Amazon is deep enough and smart enough to offer insights and clues beyond pricing alone. Are the digital tea leaves coming clear

enough to inform grocery stores and big brands about how to stock their shelves and build their SKUs—offline as well as on?

Maybe, maybe not. It’s important to note that Amazon, for all its breadth of selection, is just a real-time snapshot of the marketplace. Like the machines that run it, the platform lacks an intuitive, human touch, the kind that someone like Schweizer used to great advantage at Whole Foods. “Amazon is the everything store,” he says. “We were trend-forward at Whole Foods. We focused on the future of health and wellness, on mentoring new brands. I don’t see an equivalency there with Amazon.”

The missing data

While there are billions in sales happening on Amazon—with the competitive insights that follow—there are billions in online sales happening *off* Amazon too, and tens of billions happening offline. Amazon is not the sole source for trend watching, and activity off the platform is essential to fuel growth on it. “I’m an Amazon man,” says Principe, noting eight years tracking supplements on the site. Still, he says, “I believe a lot of a brand’s success happens off platform. Amazon will get you to a certain level, but you won’t take over the world through Amazon alone.”

Principe talks of triangulating data through Amazon and syndicated firms like **SPINS**. “Say you’re looking at nootropics,” he says. “SPINS shows you it’s a hot category, and that can validate what you find on Amazon before you hit go.” Maybe **Target**’s online store confirms the hunch. Or **Kroger**’s. The point is to look in lots of places and build a brand across several digital platforms for lasting success. Principe points to **Orgain**, the popular protein shake, as clear evidence. Orgain made it big by landing at **Costco**, and now does millions through Amazon as well.

Also implicit in the question of using Amazon to inform innovation is an assump-

tion that Amazon gives access to the real competition. But what if the real competition isn't on Amazon?

"Private label is the biggest competitive threat now," says Schweizer. "You have to look across the shelf, look directly to your right at products with a 30-40% price reduction and comparable quality. That's a rough moment when brands fully understand that threat."

There's also the competition coming from those death-by-a-thousand-cuts startups. "To see the innovation and trends, look at who's getting funding," says Schweizer. "All the big brands watch each other closely and compete accordingly, but that inbound stuff—especially with a strong DTC presence for customer experience and branding for a younger generation—that's the bigger threat. Big CPG can't fake that kind of authenticity."

"Pay attention to the ankle biters," echoes McGinn. "Do that search in those categories. Look at their content, their reviews. Look at where they show up in rankings. These are all clues to how well a brand is doing, and smaller brands can really excel at parsing this data well."

Why? Bigger brands often need the valida-

tion of data from conventional sources that just doesn't exist online. Tools like **Unicorn Smasher**, **Jungle Scout**, and **Helium 10** can triangulate into sales data, but with widely variable results. "You're not going to get that definitive number online," says McGinn. "Leaps of faith are often required, and good intuition matters. This can stall the process at bigger companies; and open the door for smaller ones."

Beyond the data

Say the tea leaves are decoded, the jungles scouted. It's fair to then ask a bigger question—to what end?

"We've regressed so much in this industry," says Schweizer. "Our conversations are about smaller and smaller groups of consumers. To be really trend forward means to take risk, to consider health and wellness as something other than the cheapest, lowest quality, most comforting products. This requires industry to think about macroeconomic growth, and expansion, and full employment."

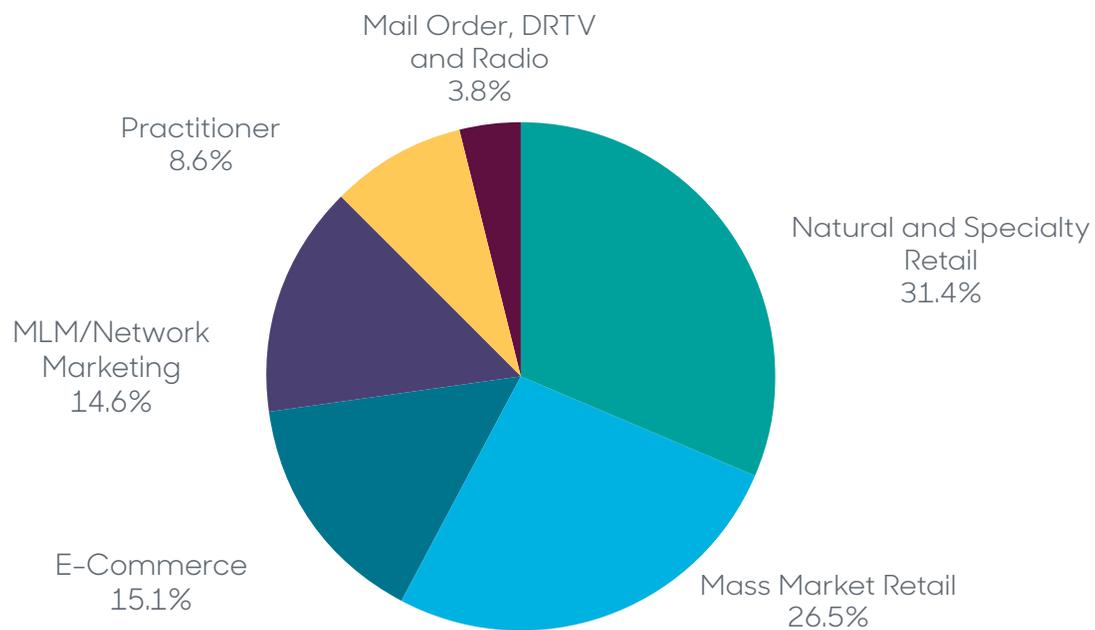
In this light, the biggest questions to ask about Amazon are not how to decode its secrets for competitive advantage but wheth-

er it stays serious about cracking down on illegal and illegitimate drugs sold on the platform as supplements and whether its employees can and will unionize.

Even the algorithm crackers see the limitations of platforms like Amazon. "I talk to brands all the time with decent sales volume, with cash flow to invest in advertising, and I have to tell them there can be diminishing returns here," says Principe. "In some categories, the market isn't even there, the keywords don't turn around. No one can take your \$500,000 in ad spend and return \$2.5 million in sales if the category won't support that."

But limitations notwithstanding, Amazon has quickly emerged as the best game in town for launching new products at scale. It offers real-time market research for those with the skills to parse it. This is the core advantage of the platform: a flattened experience with everything on offer and with all the competitive insights available for study. "Everything on Amazon is an ad," says McGinn. "It's front and center, visible to 100% of the population, 100% of the time." 🌱

SUPPLEMENT INDUSTRY SALES BY CHANNEL, 2020E



Source: *Nutrition Business Journal* (consumer sales)

Long winded

As long COVID perplexes the medical establishment, it presents opportunity for nutrition

By Melaina Juntti

Most people sickened by COVID-19 feel better after about two weeks. Once the acute infection clears, their symptoms mostly resolve, and they're able to resume their pandemic-altered lives.

This isn't the case for everyone, however. Research shows roughly 10% of people who contract COVID-19—including those with only mild to moderate cases—continue to suffer a mélange of strange, often debilitating symptoms several weeks or even months after the initial illness. Symptoms of what is known as long COVID vary widely, but common complaints include extreme fatigue, headaches, body aches,

shortness of breath, brain fog, trouble sleeping, nausea and cardiovascular issues.

With almost 30 million confirmed COVID-19 cases in the U.S. to date, experts now believe some 3 million Americans are COVID long-haulers.

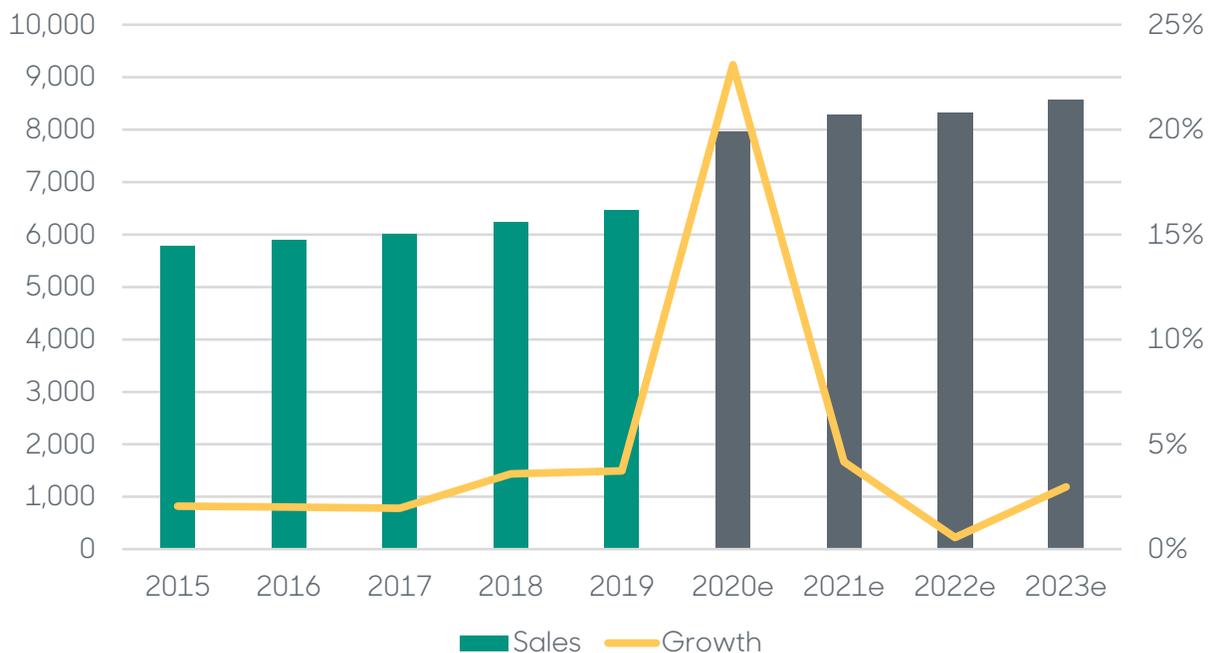
"We are entering a post-pandemic epidemic," says Aaron Hartman, M.D., owner of Richmond Functional and Integrative Medicine in Midlothian, Va. "Everyone is concerned with COVID-19 vaccines and variants right now, but long COVID is the tsunami nobody was expecting."

By "nobody," Hartman means most Americans, including the mainstream med-

NBJ Takeaways

- » The symptoms of long COVID are well aligned with integrative and functional medical practices
- » Nutrition poses a can't hurt / might help proposition many consumers are open to
- » The syndrome calls into question pre-COVID definitions of health, even among healthy-seeming individuals and athletes

MULTIVITAMIN SALES AND GROWTH, 2015-2023E



Source: Nutrition Business Journal (\$mil, consumer sales)

ical community. He says physicians and researchers in the U.K. and elsewhere across the world—as well as integrative and functional medicine practitioners stateside—have been talking about this issue for almost a year.

Fortunately, awareness is spreading fast. In late February, the revered Dr. Fauci finally addressed the condition, calling it “puzzling” and “alarming.” Meanwhile, the National Institutes of Health launched an initiative to study the causes and impacts of long COVID, giving it the official name post-acute sequelae of SARS-CoV-2 infection, or PASC.

But for the better part of 2020, conventional medical doctors were largely baffled by long hauler symptoms. Many failed to take their patients’ concerns seriously.

“Patients would come in and say they don’t feel right, their brain is foggy, they used to run three miles no problem and now they can’t even jog,” says Gina Serraiocco, M.D., internist and integrative medicine practitioner at the Palo Alto Medical Foundation’s Institute for Health and Healing. “To that, most doctors would say ‘well, your EKG looks OK, so don’t worry’ and send them on their way. There has been lots of dismissal and very few physicians saying ‘wait, this isn’t right.’”

Integrative insight

Unlike their conventional counterparts, integrative and functional medicine doctors have been on top of long COVID from the start. Trained to evaluate patients holistically, pinpoint root causes of illness and help manage symptoms, they’ve been digging in deep and presenting solutions—just like they do with other chronic conditions often overlooked by mainstream medicine.

“We’ve been dealing with peripheral patients for years,” Hartman says. “Chronic pain, chronic fatigue, fibromyalgia, depression and other weird symptoms—that’s our bread and butter, and long COVID is very similar. We’ve been looking at all the pieces, connecting the dots and putting together treatment protocols.”

After almost a year of caring for COVID long haulers, integrative and functional practitioners still don’t know for certain what’s triggering the problem, and they can’t offer any surefire cures. However, through clinical experience, research and trials of various integrative therapies, they’ve found a breadth of

solutions that can help manage long-hauler symptoms and put these patients on a path to recovery.

Long COVID care plans are highly individualized, but they typically center around sleep, mind-body practices and, perhaps most importantly, nutrition. Specifically, practitioners usually recommend plant-centric anti-inflammatory or antihistamine diets, along with supplemental vitamins, minerals and other essential nutrients to optimize levels in the body. They also suggest a range of nutraceuticals and botanicals that influence immune function, inflammation response, cellular energy production and other key biological processes, as well as supplements that help mitigate specific symptoms.

“People are not feeling well, and conventional medicine does not have a lot to offer for long COVID,” says Lise Alschuler,

controlled trials and data,” Hartman says. “How many people have to suffer before we can agree that these are really safe interventions that can be really helpful?”

With so many aspects of this new epidemic necessitating support of biological functions and symptom management, long COVID presents a pivotal opportunity for the dietary supplements industry to help a lot of people. The clinical observations and insights of integrative and functional medicine practitioners can inform industry on how best to meet consumers’ needs during this critical time.

What is this thing?

While these practitioners can see the various ways long COVID is impacting patients’ bodies, exactly what kickstarts these issues remains a mystery. “We have emerging ideas but

“Correlational studies show that 98% of people who died of COVID-19 had suboptimal levels of vitamin D on board.”

– Cheryl Myers, R.N., EuroPharma

N.D., professor of clinical medicine at the Andrew Weil Center for Integrative Medicine at the University of Arizona. “Patients are scared, frankly, and looking for help, and many of their symptoms are those that integrative medicine is ideally suited to address. Even if we don’t have exact data to support a supplement, if we can make the case that it is unlikely to harm but likely beneficial, most patients are willing to try it.”

It seems more conventional medical doctors are starting to buy in as well. Of course, plenty of anti-supplement bias remains, as evinced by the recent *JAMA*-published study and corresponding paper bashing vitamin D’s usefulness for COVID-19, but integrative and functional practitioners say they are fielding more and more calls from their mainstream colleagues seeking guidance.

“There is a huge need for care, so we can’t argue over whether there are randomized,

no clear understanding of what is going on,” Alschuler says. “Either the virus itself or, more likely, the body’s reaction to the virus sets into motion processes that are themselves symptomatic long-term. I suspect that over time we will find there is some element of autoimmunity or chronic inflammation, but then why is inflammation constantly triggered?”

There is also debate over whether this is a new condition entirely, related only to COVID-19, “or if COVID-19 is a particularly powerful trigger of chronic fatigue syndrome, which is often accompanied by fibromyalgia,” says Cheryl Myers, R.N., chief of scientific affairs and education at **EuroPharma**. “We also could be looking at more than one syndrome.”

For now, integrative and functional practitioners can only address what they do see, which is a whole lot of damage and dysfunction manifesting as specific symptoms. This

information is particularly important for the dietary supplement industry to know in order to offer appropriate solutions for long haulers' needs.

For some people, certain symptoms may be caused by actual organ damage from the initial virus. "The first thing anybody who has long COVID should check out is whether they have significant damage to an organ that needs repair," says Leo Galland, M.D., a functional-medicine internist practicing in New York City. "We know some people have heart problems after COVID-19; others have continuing damage to the lungs, brain or nerves. The approach to each of these will be different, so they should be evaluated by a specialist."

As for the neurological symptoms many long haulers experience, Galland classifies them into three categories: peripheral neuropathy, which accounts for loss of taste or smell; autonomic nervous system dysfunction, often causing dizziness and fatigue; and cognitive dysfunction. "One of the most common neurological complications is reminiscent of postural orthostatic tachycardia syndrome, or POTS," Galland says.

Getting down to the cellular level, Galland believes four key issues are likely driving much of the symptomology. "One is mitochondrial damage, which we know results from many infections, including coronavirus," he says. "Second is chronic inflammation, and related to that is mast cell activation." When the body feels threatened, he explains, such as by infection, mast cells are switched on to release histamine. In some long haulers, it seems mast cells have not yet been switched off.

The third issue is a deficiency in ACE2, a critical enzyme for tissue and organ protection and immune system balance—and the port of entry for COVID-19. "When the virus enters the cells, ACE2 is destroyed, which can cause cardiac damage, increased inflammation and neurological disturbances, including autonomic dysfunction," Galland explains.

Fourth, unfavorable changes to the gut microbiome are also at play. "It has been well documented that people hospitalized with COVID-19 have a depletion in beneficial anti-inflammatory microbes and an increase in pro-inflammatory microbes, especially *Enterococcus faecalis*," Galland says.

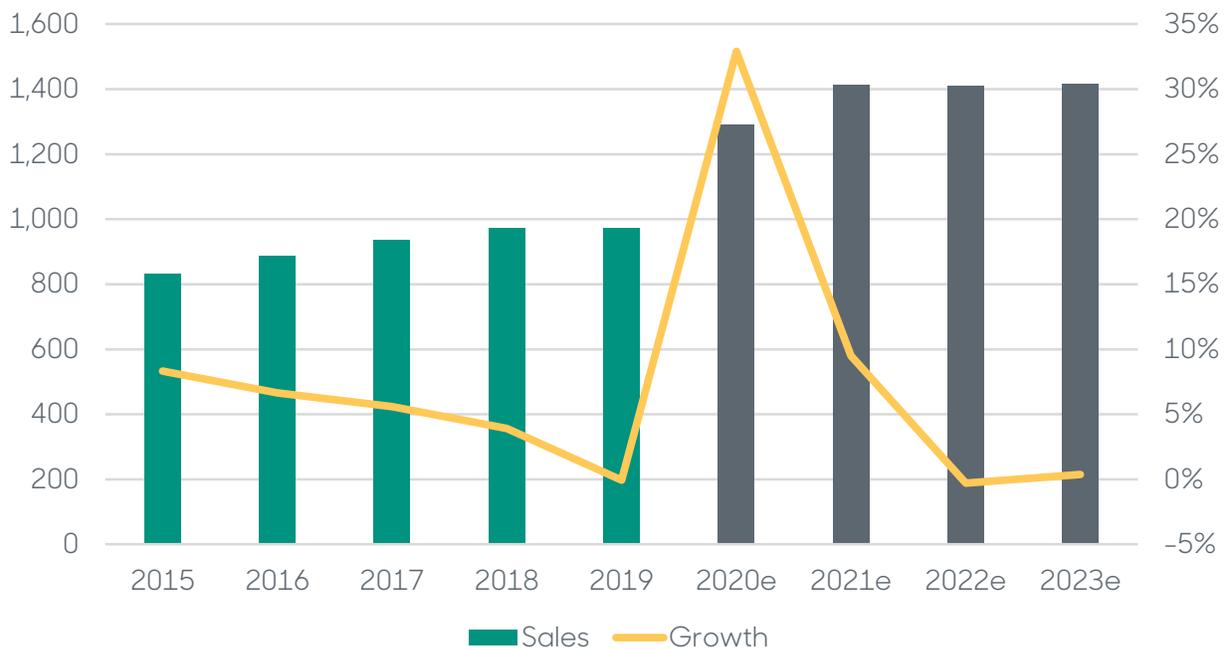
Additionally, the wide-ranging effects of post-traumatic stress disorder should not be overlooked. "Every one of my long COVID patients has a degree of PTSD, whether they had it before or suddenly have it now because COVID rocked their world," Hartman says. "They've gone into fight-or-flight mode, with leaky gut and upregulated pain receptors. If you're having limbic spirals, where your norepinephrine and cortisol levels are high, you won't sleep or digest food well, which need addressing for long COVID."

Who are the long haulers?

For dietary supplement companies to support long haulers, it's helpful to know which types of consumers are experiencing the condition and the factors that make each group vulnerable. Although "long COVID can hit anybody and everybody," says Serraiocco, certain people seem to be more prone.

Notably, observational studies show that more women than men are affected. "I think that's because women tend to mount a stronger inflammation response and are more prone to inflammation," Galland says. "Men

VITAMIN D SUPPLEMENT SALES AND GROWTH, 2015-2023E



Source: Nutrition Business Journal (\$mil, consumer sales)

get sicker, but women may have more prolonged inflammatory issues.”

Also, while long COVID appears to be striking adults who were relatively healthy before contracting the coronavirus, that’s typically not the real story. “We often see that they eat burgers every day, are very stressed or have allergy issues,” Serraiocco says. “Very few COVID long haulers truly had healthy lifestyles before they got COVID-19.”

Hartman has seen similar patterns in his practice. “COVID triggered the issue, but I look at what set a patient up for lingering symptoms,” he explains. “For example, if your diet is processed food, you’re obese or your cholesterol and A1C are up, these are all set-ups for long COVID. I’ve also seen a lot of SIBO dysbiosis, as well as hypermobility, or overtraining, which increases the risk of tissue inflammation. And none of my long-hauler patients have had optimal vitamin D levels—they’re all either low or crazy-low.”

He shares the example of one patient, a young basketball player, who got very sick with long COVID. “He was overtraining and his nutrition was terrible,” Hartman says. “He was an inflammation cascade waiting to happen.”

Aside from outwardly “healthy” people, long COVID is hitting those with preexisting chronic ailments especially hard—while also exacerbating their other conditions. “For some of my patients with mast cell or immune disorders,” says Galland, “after they are totally done with COVID-19 and its direct symptoms, their underlying inflammatory disorder has been cranked up.”

Natural solutions for long COVID

While care regimens are tailored to each long hauler’s symptoms and needs, practitioners universally stress building a strong nutritional foundation. “Infection is a very energy-consumptive process,” Alschuler says. “Usually, as they recover, people have some deficiency in essential vitamins, minerals and protein, so those need to be replenished.”

For her long COVID patients, Serraiocco recommends a high-quality multivitamin with high levels of vitamin D, B complex, selenium and zinc built in to support the immune system. Vitamin D, Alschuler notes, is especially important for long haulers, as emerging data link it to better recovery and competency.

“Higher-than-RDI dosages of vitamin

D are crucial to building a bulletproof immune system,” Myers says. “Correlational studies show that 98% of people who died of COVID-19 had suboptimal levels of vitamin D on board, whereas people who don’t get as ill tend to be in the higher quintile of vitamin D levels. This study doesn’t show that, if you take vitamin D for a year, you won’t get COVID-19, but this nutrient is ridiculously important.”

Beyond the basics, other useful supplements include quercetin, which promotes mast cell stabilization, along with vitamin C, luteolin, black cumin seed and over-the-counter antihistamines. Quercetin also, Hartman notes, helps with gut inflammation and zinc utilization.

“There also appears to be a role for endogenous antioxidant support post-infec-

tion,” Alschuler says. She and Serraiocco both suggest glutathione for this reason, as well as cofactors involved in glutathione production, such as magnesium glycinate. Galland adds that glutathione, along with NAC, is a first-line solution for respiratory and allergy-like symptoms.

To address inflammation, resveratrol and curcumin top the list. These two supplements, notes Galland, also help restore ACE2, which plays an important role in neuroplasticity, key for patients experiencing cognitive symptoms. “ACE2 restoration is really the thing that I believe underlies full recovery,” he says. Vitamin D, luteolin and rosmarinic acid can also enhance ACE2, Galland adds, as might CBD via an indirect mechanism.

Melatonin is another highly useful supplement for long COVID. “It’s an antioxidant with specific anti-inflammatory properties relative to this virus,” Alschuler says. “Melatonin also helps with sleep and normalizing adrenals, especially in POTS-like syndrome.”

For mitochondrial support, a variety of supplements may be beneficial, especially L-carnitine and coenzyme Q10. “The body

uses energy to perform many functions, including repairing damage,” Myers says. “Co-Q10 works inside the mitochondria and facilitates the transformation of fuel into cellular energy. If there is not enough Co-Q10 on board, the cell can’t make that transformation happen, and cellular activity and lifespan are diminished.” Galland says Co-Q10 and L-carnitine are also key for long haulers with cardiac damage.

Lastly, to restore balance to the gut microbiome, Galland suggests probiotics such as *Bacillus subtilis* and *Bacillus coagulans*, along with berberine from Oregon grape and prebiotics through foods with resistant starch.

Industry responsibility

Of course, even with physician endorsement, none of the aforementioned sup-

“ACE2 restoration is really the thing that I believe underlies full recovery.”

– Leo Galland, M.D.

plements are treatments or cures for long COVID. Rather, they are a viable means of supporting long haulers’ recovery and easing the symptoms interfering with their lives.

Responsible industry players know this, but in a time of such great need for dietary supplements, there will be unscrupulous players trying to cash in and threatening the entire industry’s integrity.

There will also be vocal supplement naysayers decrying the lack of randomized clinical trials for these products.

“The reflex response in the medical community is still to say supplements don’t help,” Galland says. “It is very difficult to judge therapeutic effects and whether any single intervention is really making a difference. We need randomized controlled studies to do that, but they are expensive, difficult to do, and time consuming. It becomes very easy to dismiss a treatment that did not undergo an RCT. There is a real bias.”

Thus, to counteract such bias and demonstrate that supplements truly can deliver on their value proposition, industry must stay vigilant, stay responsible and stay legal. 🌱

Overdue, overdone and underwhelming

Industry experts share praise, concerns about Amazon's new gatekeeper role

In December of 2020, Amazon began requiring comprehensive testing and other documentation—covering potency claims, facility GMPs and more—for supplements sold on the giant e-commerce platform. The requirements are a long time coming but appear both overly burdensome and insufficient. Still, say advocates and critics alike, it's a step in the right direction. *NBJ* reached out to a posse of industry leaders for their opinions.

Holly Bayne Attorney, Bayne & Associates

Amazon's new requirements for quality control documentation from sellers of dietary supplements are long overdue and, generally, welcomed by the responsible players in the industry. Amazon's ubiquitous e-commerce platform is a go-to choice for consumers and sellers alike, and without effective oversight by Amazon itself, quality cannot be guaranteed. What waits to be seen is whether Amazon will meaningfully engage with the major trade associations and other responsible stakeholders to ensure the requirements are well suited to the task and fit for their intended purpose. As the program is implemented, refinements may be needed, such as the requirement that CoFAs be provided by an "ISO/IEC 17025" accredited lab, which is overly broad and may unduly complicate the process. Since the passage of DSHEA and rise of the internet, responsible sectors of the dietary supplement industry have been committed to ensuring that unscrupulous actors selling adulterated and misbranded products are barred from e-commerce sales. Industry is ready and willing to work with Amazon to achieve this shared goal.

Karen Howard CEO/executive director, Organic & Natural Health Association

Amazon's sledgehammer approach to cleaning up the marketplace—a goal for all

ethical, quality brands—was clearly derived without the benefit of industry expertise and is rife with unintended consequences. Requiring that analytical test results must come from an ISO 17025 certified lab eliminates labs that are uniquely equipped to test for certain actives. Use of validation by input testing of non-standardized botanical powders demonstrates Amazon's limited understand-

Their past record selling products that did not meet labels claims, as our labs showed, means they need to prove those good intentions. We need to see what happens when the rubber hits the road.

— Jim Emme, NOW Health Group

ing of the inherent challenges involved. Porting over the LegitScript black-listed products identified by the debunked New York AG "DNA testing" is, at best, ill-informed. Fortunately, Amazon *is* seeking industry input. It is essential that all of the industry associations deliver a unified message to Amazon in support of stricter, and sensible, testing requirements. Requirements that both enable

legitimate, high-quality products to enter the market and ensure adulterated products are detected and removed from the market.

Megan Olsen Vice president and associate general counsel, Council for Responsible Nutrition

CRN appreciates that Amazon and other large retailers are launching retail standard programs to help ensure that the dietary supplements on their store shelves are safe and unadulterated. We recognize that these programs are necessary, to police the supplement aisle, and appreciate how they highlight the hard work of reputable companies that ensure their supplements

are safe and meet regulatory requirements. Multiple standards, however, can create a complicated patchwork of requirements that is difficult for both manufacturers and consumers to navigate. CRN has flagged these concerns for Amazon and other large retailers and asked for these retailers to consider building harmonized standards that allow manufacturers greater flexibility

in how they meet retailer requirements.

Amazon updated their supplement requirements in February to provide further clarity, including that manufacturers can use both third-party and in-house labs if the labs are ISO 17025 accredited, as well as clarifying that ISO 17025 accreditation was not needed for every test performed by the lab. CRN applauds Amazon for making these clarifications to help address industry concerns and is hopeful the company will continue to listen to concerns to build more flexibility into their requirements moving forward. CRN strongly believes that flexible standards and harmonization will better benefit both retailers and consumers by eliminating duplicative and costly testing and allowing retailers to confirm a manufacturer's quality systems that are already in place.

Michael McGuffin
President, American Herbal
Products Association

Amazon's revised dietary supplements compliance program is seen by many supplement brands as moving in a good direction. There is strong support for Amazon taking on an active retailer gatekeeper role and a perception that this will benefit consumers and responsible supplement companies.

One positive part of the program is the new requirement to have product labels visible on each seller's webpage. AHPA adopted a similar policy in 2006 to encourage product information be provided prior to purchase, so that consumers know what they are buying.

There are, nonetheless, concerns on some of the program's details, especially in the new responsibility for submitting evidence of manufacturing compliance. There is general support for this new requirement; if properly applied, it should ensure product quality. We expect Amazon to be receptive to suggestions for clarification and improvement of some details, and we will continue to share our ideas to make the program better.

Frank Jaksch
Co-founder and executive
chairman, Chromadex

With the robust consumer interest in supplements fueled by the pandemic, now is the time to ensure the health and safety of

millions of Americans who trust and rely on dietary supplements for their health.

Overall, ChromaDex is supportive of the new Amazon specifications for dietary supplements, it is a good first step. However, I would not expect these new specifications, on their own, to fix the problems with DS products that are available on Amazon. For example, the quality problems that were reported by NOW Foods will not be fixed with these new specifications.

We all know it will be easy for companies

We expect Amazon to be receptive to suggestions for clarification and improvement of some details, and we will continue to share our ideas to make the program better.

— Michael McGuffin, AHPA

selling supplements on Amazon to produce the required documents. Truly ensuring the quality of supplements sold on Amazon would require the implementation of a surveillance or testing program. If we use history as our guide, without a mechanism for policing and enforcing these specifications, it essentially does nothing to ensure the quality of products being sold.

Jim Emme
CEO, NOW Health Group

Amazon is coming at this with good intentions—and I appreciate that they sought direction from the trade associations—but it will be interesting to see how they go about enforcing it. Their past record selling products that did not meet labels claims, as our labs showed, means they need to prove those good intentions. We need to see what happens when the rubber hits the road. In a lot of ways, they're a tech company; they're not really a retailer. At some point there is going to be clarity, and we're going to find out real fast which brands aren't ready.

Wilson Lau
Vice president, Nuherbs

I agree with the reasons behind Amazon's new rules but worry about implementation. Amazon's processes are highly automated, so if your first submission isn't perfect, you may get trapped in limbo because you can't find someone to help complete the process. Another great concern is that Amazon is set up as a marketplace, where the listing may not be controlled by the brand owner, who needs access to update information to reflect com-

pliance. Lastly, even if the brand owner can meet all their requirements, the reseller may be selling other items that may not meet the requirements. If they are buying grey market goods or diverting it from other channels, will that behavior impact the brand owner and their listing?

Suzanne Shelton
The Shelton Group

Amazon has taken a good first step in managing a category that accounts for a significant amount of the supplements people buy and consume. They deserve kudos, even though they delayed until NOW Foods' tests revealing rubbish products forced their hand. I hear some manufacturers are panicked about meeting the requirements, which reminds me of when the cGMP requirements were first announced. Get it together, peeps. You should be able to comply. Requirements to prove identity and potency *might* stop no-name brands from selling active-ingredient-free knockoffs of expensive supplements—a practice that hurts *everyone*.

Proving quality is essential, but Amazon's requirements could and should be finetuned by industry input. They should also develop a database of reputable manufacturers, and when a newcomer launches a product in a high price product category, give them extra scrutiny. An advisory council from the industry would be a significant information resource for Amazon in managing the category better.

Mike Bush
CEO, Prenexus Health

While it is great that Amazon is focusing on quality and safety in the supplement category, their requirements were apparently developed without enough input from the industry. I am sure everyone in our industry can agree that testing of finished products varies from product to product and category to category. For example, probiotics require vastly different testing procedures than other supplements, and labeling requirements are also quite different, and I see no evidence that Amazon is taking into consideration labeling guidelines developed by well-informed industry groups. CRN and the IPA developed labeling standards for probiotics, but I do not see anywhere that Amazon has adopted or even fully understands the established guidelines and associated testing methodologies; although it would be fantastic if they took the lead and utilized the standards for the millions of dollars of probiotic supplements they sell.

Len Monheit
CEO, Trust Transparency Center

It's high time that Amazon applied checks on quality and accountability. For years, we at TTC have noted non-compliant Amazon-listed products, and this is a problem and a discredit to the industry.

However, the lack of a regulatory basis for some of their requirements, the opacity and heavy-handedness of their approach and inconsistency in rollout and even the scope of products to which the new rules will be applied (and exactly when), is worrisome as it continues to make it seem like their systems are arbitrary.

Brands are scrambling to do what they should have been doing from the outset—it's not rocket science; it's the law. The jury is still out on whether these brands finally take the

proper responsibility for the products they put on the market or continue to deflect to their contract manufacturers.

Elan Sudberg
CEO, Alkemist Labs

Amazon's new requirement for the supplement industry is a terrific movement towards cleaning up their part of this industry.

With the exception of the ISO 17025 lab chokepoint (Alkemist Labs is ISO 17025 certified), the majority of Amazon's quality documentation requirements should be available and not new. The good companies in our industry already do the work required and have the data. They just need to know where to put it.

To those who think these provisions are

To those who think these provisions are unreasonable, perhaps that's your cue to find another industry to play in, because at some point the FDA is going to notice that your quality program sucks.

– Elan Sudberg, Alkemist Labs

unreasonable, perhaps that's your cue to find another industry to play in, because at some point the FDA is going to notice that your quality program sucks.

Andy Dahlen
CEO, MegaFood

MegaFood applauds and supports Amazon's objective to upgrade standards for manufacturers in the supplement category. The requirement of ISO 17025 certification, commonly pursued by third party labs, only partially achieves that objective. We believe that Amazon should require manufacturers to be GMP certified so the actual process of manufacturing the products is elevated to higher standards. GMP certification includes a review and validation of the testing process. It

is encouraging that Amazon is engaging with the industry via trade associations to find the best approach to upgrade the standards.

Loren Israelsen
President, United Natural Products Alliance

The market power that Amazon can employ is unlike anything our industry has ever dealt with. They use the word "millions" to describe the number of dietary supplement SKUs on their platform. What that scale means for the future of the industry is doing things we've never been asked to do before and doing them in ways that are new to us. We need to remember that Amazon is a technology company, not a retailer with shelves to fill. It's AI, not A&P. For us, it's adapt or die.

We should also accept that Amazon is effectively part of our industry now. For the first time, we will know the people who are running these programs. We are going to start seeing them at industry events. There's been this big gray wall that we've never been able to see beyond and this new level of communication could help us understand what's behind it.

What this scale, technology and engagement means is that Amazon may be able to do what the FDA, the FTC, the trade associations and the plaintiff's attorneys have been trying to do for years, which is to clean up the supplement industry and ensure product quality. What we've seen so far is just the first step and it shows us why industry engagement is so crucial. We need to take that first step with them, and all the ones that follow it. 🌱

The artful merger

Dickensian times and record sales mark a complicated year for M&A

By Rodney Clark and Ian Malone of Aspect Consumer Partners

Charles Dickens was prescient when he wrote the following, although he surely had no idea that this passage would perfectly describe a time some 160 years in the future when a pandemic ravaged the entire globe. But here we are.

It was the best of times

(stock markets are hitting record highs),

it was the worst of times

(a pandemic continues to ravage the globe),

it was the age of wisdom

(efficacious vaccines have been developed at warp speed),

it was the age of foolishness

(populations refusing to wear masks or social distance),

it was the epoch of belief

(optimism is strong for a brighter future),

it was the epoch of incredulity

(deniers and skeptics abound),

it was the season of light

(the new year is off to a great start),

it was the season of darkness

(cracks in the “system” are numerous),

it was the spring of hope

(vaccines are here),

it was the winter of despair

(death and loss have marked a challenging year).

It is March 2021, and a year has passed since the global economy ground to a halt, people were required to work from home and stay indoors, and lockdown was fully under way. Today, people are starting to regain some normalcy in their lives, major swaths of business are starting to regain full traction, and Americans are getting vaccinated at a rate of more than two million per day. Optimism is the highest it has been in a year, and that is also true within the worldwide M&A market, especially for activity within the U.S. nutrition industry, where the focus on health, wellness and nutrition by consumers coming out of the pandemic has only increased.

Worldwide mergers and acquisitions volume reached \$2.2 trillion in 2020, substantially shy of the record volume of recent years and over 20% off from 2019 levels. In the U.S., total transaction volume declined more than 30%, to an estimated \$1.1 trillion (S&P Global market Intelligence), highlighting the ef-

fects of the COVID-19 pandemic. That being the case, there is significant room for optimism. While the pandemic acted as a drag on the pace of M&A activity in Q2 and Q3 of 2020, the pace of M&A activity increased dramatically in Q4 2020, signaling that better times are ahead for the deal market. That activity has only accelerated in early 2021, indicating a potentially very strong year for M&A and financing activity.

In contrast to the broader global and U.S. M&A markets, aggregate volume for NBJ’s Top 10 Deals of the Year topped \$13 billion for the full year 2020, surpassing the prior year but well below the record years of when activity was over \$40 billion (2017) by our estimates. Last year’s high level of activity was driven by two large, multi-billion dollar transactions: Mars acquisition of the remaining stake in KIND, which implied a \$5 billion valuation; and Pepsico’s acquisition of Rockstar for \$3.8 billion.

Following are *Nutrition Business Journal’s* top 10 deals of 2020.



Mars acquire remaining stake in KIND

It’s a whopper! At an estimated valuation of roughly \$5 billion for KIND, the Mars acquisition of the stake in KIND it didn’t already own ranks as the largest transaction in 2020 in the U.S. nutrition industry. This transaction was billed by the companies as a next step in their three-year long partnership, following the initial transaction in 2017 that saw Mars and KIND partner (via a minority investment by Mars) in expanding KIND internationally. This next phase of the partnership will bring the partnership to completion, with Mars owning 100% of the business and the two companies focusing both in North America and internationally.

It is no surprise that this transaction would happen (once a strategic acquirer makes an initial investment in a business, it almost always purchases the remaining stake at a later date), but the timing was surprising. In November 2020, on the heels of the pandemic, the transaction is of significance not only because of its size but also because of its signal that the M&A market in the U.S. was showing its first signs

of health. This transaction did mark the return to a healthier, more robust M&A market. Only weeks after this transaction, KIND itself announced a transaction, the acquisition of Nature's Bakery, best known for its better-for-you snacks, in particular, its fig bars.



PepsiCo acquires Rockstar

Given what we have gone through in the past 12 months, one almost forgets that pre-pandemic, in early March, another huge transaction was announced—

the \$3.6 billion acquisition by PepsiCo of Rockstar. This ranks as one of the largest ever transactions in the functional beverage space and helps solidify PepsiCo's competitive position within the rapidly growing and highly competitive energy drinks market. Rockstar was founded in 2001, is a pioneer within the energy drink market, and was the first to market with a 16-ounce canned beverage. In a very short time, the company has grown the brand to be one of the most iconic drinks brand on the market today.



Collier Creek combines with Utz Quality Foods

What the SPAC is going on? One of the trends that has emerged

over the past 12 months and has resulted in a massive amount of new capital for the M&A market is the resurgence of the Special Purpose Acquisition Corporation, more commonly known as a "SPAC." A SPAC is essentially a shell company set up by a group of investors with the sole purpose of raising money, through an initial public offering, to fund an eventual acquisition of another company. In 2020, this trend turned into more of a craze, with approximately \$82 billion in capital raised through SPACS. This is a huge amount of capital, much of it still waiting to be deployed.

Given the amount of capital raised, as well as the need for these companies to consummate acquisitions, it is no wonder that attractive, sizeable and/or healthy companies in the U.S. nutrition industry would end up the target of a SPAC. Utz Quality Foods is one such target. In June of 2020, Collier Creek and Utz announced an agreement to combine in a transaction valued at around \$1.56 billion, creating a pure-play snack food platform in the U.S. This transaction is not only significant as one of the largest SPAC deals in the industry but also because it marks the end of family ownership for the nearly 100-year-old brand (although the family will own over 50% of the company post closing).



Harbin Pharmaceutical acquires GNC

While a merger or an acquisition is most often a positive event in a company's corporate lifecycle,

sometimes it is not. In those cases when it is not, it often marks the end of a chapter for a company or brand, or in some cases the throwing in the towel or calling it quits.

For GNC, an industry pioneer in the marketing and sale of vitamins, minerals, supplements and other health-oriented products, the announcement that Harbin Pharmaceutical Group would purchase the company out of bankruptcy for \$770 million was likely a bittersweet end to a challenging period for the company. GNC had been battered by competition and the availability of vitamins direct-to-consumer—and then came COVID-19. In June of 2020 it officially filed for bankruptcy protection. Upon completion of the sale, the company has pared back operations, optimized its store footprint and is likely better positioned to succeed in a competitive environment under new ownership. Perhaps this new chapter will be a better one for a true pioneer in the VMS industry.



Coca-Cola acquires remaining stake in Fairlife

In early 2020, Coca-Cola

acquired the remaining ~57% stake in Fairlife from its joint venture partner, Select Milk Producers. Fairlife was founded in 2012 to produce milk beverages made using a patented cold-filtration process that removes some natural sugars while concentrating the protein and calcium naturally found in real cows' milk. The company has since expanded its portfolio of products and achieved over \$500 million in annual sales (2019).



New Mountain Capital acquires Natrol

In 2020, New Mountain Capital, a New York based private equity firm, chalked up two substantial investments in the VMS industry with the announcement they had acquired Jarrow Formulas, a brand strong in the probiotics, bone health and heart health segments,



and the subsequent \$550 million acquisition of Natrol, a leading vitamins, minerals and supplements brand, focused on

sleep, mood, stress and brain health. These two transactions are complimentary and align with the firm's long-standing sector initiatives in consumer health and wellness, life sciences and food ingredients. These transactions give New Mountain a significant presence in VMS and establish a strong multi-branded platform for future add-on investments. Previous investments include **Avantor**, **NuSil**, **Topix**, **Gelest** and **Aceto**.

MATRIX

Church & Dwight acquires Matrixx Initiatives

It was only a matter of time before Matrixx Initiatives, the manufacturer and marketer of over-the-counter cold remedies, including one of the best-selling products on the market, Zicam (#1 zinc supplement in the U.S. in VMS), was sold by its private equity owner, Gryphon Investors, to a strategic acquirer. Not only because the brand was likely a better asset in a strategic's portfolio of health and related products but also because Gryphon Investors had already invested in and sold C.B. Fleet to a strategic, Prestige Brands, in 2016. Thus, it was only a matter of time before a strategic sale happened—Matrixx was sold for \$530 million in December 2020 to Church & Dwight, a leading consumer packaged goods company with a historically strong appetite historically for acquisitions. This was a pricey transaction for Church & Dwight, at almost 6x net revenues and 15x EBITDA for 2021E, although the company believes it will be able to save \$5 million in annual synergies.

SMART SWEETS

TPG Growth invests in Smartsweets

In a world where corporate mission is becoming ever more critical to engaging with one's customers, Smartsweets has big ambitions. It is on a mission to "kick sugar and keep candy." And if the company's fast rise to a position of strength is a sign of anything, it's that customers feel the better-for-you snack company is on the right track. The company was launched in 2016 and, since that time, claims to have helped customers in Canada and the U.S. kick over 1 billion grams of sugar.

In October of 2020, TPG Growth acquired Smartsweets for approximately \$360 million.

myfitnesspal

Francisco Partners invests in MyFitnessPal

In what may be one of the most interesting transactions in the top ten for 2020, Francisco Partners agreed to acquire the MyFitnessPal platform from Under Armour for approximately \$345 million. The divestiture by Under Armour is part of its realigning and streamlining its digital assets and operations, whereby it planned to either sell or discontinue two of its three technology platforms, MyFitnessPal and Endomondo, the latter of which would be discontinued.

This divestiture also highlights another trend in the U.S. Nutrition industry that began prior to the pandemic and has continued unabated. That trend is the divestiture of brands and business by companies that purchased those same businesses only a handful of years prior but no longer deem them as part of their core focus. In Under Armour's case, it purchased MyFitnessPal in 2015 for \$475 million, only to divest it 5 years later at a much lower price.

Other businesses that have been acquired and then divested include **Krave** and **ZICO Coconut Water**, both of which were sold at high prices to a strategic acquirer and then divested back to the same owner at a much lower price. In a post-COVID-19 world we would expect to see this trend continue, if not accelerate, as strategics focus more closely on their core brands and businesses.

care/of

Bayer acquires Care/of

Direct-to-consumer and personalized health are two areas of keen interest for investors and acquirers alike. In fact, it is at the intersection of these two trends where many in the industry are focusing their time and energy. So, it is no surprise that one of the leading global giants in health and nutrition, Bayer, announced that it would be making a control investment in Care/of, a personalized and direct-to-consumer nutrition company. Care/of has a subscription service with a unique angle—they require users to take a quiz upon starting the subscription service, enabling the company to obtain robust data on customers and personalize vitamins and supplement recommendations. Surely this, as well as the DTC model itself, were attractive to its new owner. The investment is believed to give Bayer a ~70% control stake in the business and values the Care/of business at around \$225 million.

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Supplements get personal

Q&A with Noah Voreades

Few individuals follow the personalized nutrition space as closely as Noah Voreades. With a deep scientific and commercial background in personalization, DTC testing, gut microbiome and metabolomics, Voreades became interested in personalized nutrition over the last decade and has spent the last four years as the managing director at **GenBiome Consulting**. He has consulted on strategy, product development, R&D and industry intelligence for start-ups, established category leaders, private-equity and venture capital across VMS, personalization, genetic testing and microbiome.

NBJ: Has personalized nutrition been a success?

Voreades: Has it been a success? Yes and no.

Let's talk about the successes. Firstly, what all these personalized nutrition and supplementation companies have done is they've woken up the eyes of the consumer to what's possible, what's needed and, ultimately, where we're probably heading.

So, on the consumer side, I think it's matched some trends that have been happening outside the wellness space. Trends of leveraging big data, leveraging psychographic profiling and leveraging targeted marketing and outreach campaigns as a better way to get someone engaged with a brand to support long-term consumer health goals.

I think it's opened the eyes of the consumer that personalization is possible, that it's probably going to lead to a better outcome for them, and it started to raise their consciousness around what personalization looks like to them, what works for them, what they're willing to pay for.

The consumer feedback then funnels into the startup, personalized ecosystem and established brands looking to plant a flag in the category. On the big company side, what's important is that the success overall of the personalized nutrition space—as we're starting to see some financial exits happen, with Persona, Care/of, Baze, and Nutrino—is that large companies are starting to solidify their strategy over the next three, five and 10 years. And they're being pushed by digital health, retail health, big tech and the broader healthcare ecosystem. The primary uncertainty for most large consumer health and VMS companies is figuring out how they're going to do this from an internal or an external innovation

perspective. So, I think those are the positives.

Where it's probably fallen short is that the majority of the companies that received funding two to three years ago either underwhelmed, went out of business or, unfortunately, aren't positioned to create a holistic, end-to-end personalized nutrition or supplement platform that both the consumer wants and expects and that might be attractive to large companies, from an acquisition or partnering perspective.

Also, I think it's revealed that privacy is going to be increasingly important over time and that consumers are increasingly focused on where their data is being used. I think a lot of the smaller companies don't have the capabilities to ensure the highest level of privacy and data integrity.

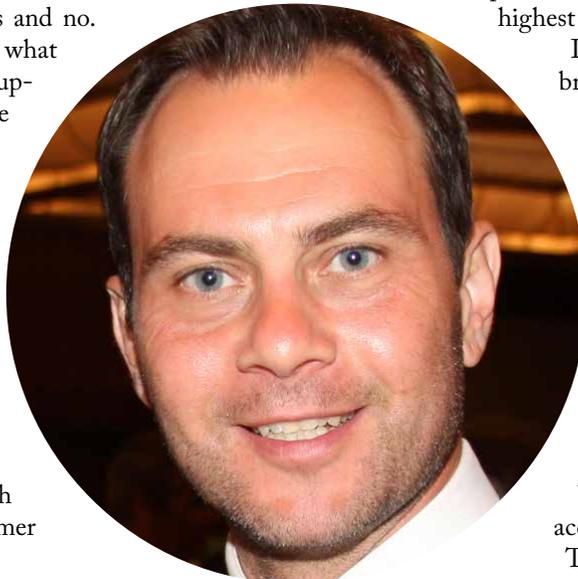
I also think it's exposed that we need broader and more diverse data sets, both from the type of inputs (for example, genetics, microbiome, blood, etc.) and also the populations. The majority of the data that goes into a lot of these personalized nutrition and supplement algorithms is typically based on European populations, typically Caucasian-centric data sets. But we know that our world is very diverse. Different ethnic or racial populations will have unique genetic, microbiome or blood-based biomarker responses, which must be accounted for.

The third thing where it's underwhelmed is in solving this “So what, now what?” problem.

Very few companies have done a great job, once they've delivered that report or those recommendations to a customer, of answering “Okay, so what now? What do I do with this? How do I incorporate it?” They've failed to really integrate a lot of the behavioral components that we know are necessary for maintaining long-term positive health actions.

NBJ: Is the challenge for personalized nutrition that it's both too personal—which gets into the privacy issues and an inability to effectively answer the “So what, now what?” for innumerable consumers—and not personal enough, not taking in diverse data sets as the baselines?

Voreades: I think it depends on who you ask. If you went and you asked a scientist to look at the majority of the personalized nutrition offerings, I think they would find that the majority of the



recommendations are overreaching; they're too personalized for where the state of the science currently is.

And if you look at probably the most successful personalized nutrition and supplement companies from a reputational strength position—DayTwo and ZOE, a new personalized nutrition service from data developed from the PREDICT studies, that are trying to move into more personalized health recommendations—the core theme is that all their algorithms and all their personalization is founded typically in a very large, peer-reviewed study of at least 1,000 people. So they started with a very reputable, scientific study in humans, very well-controlled, published in high-impact journals, and then they took all those learnings and said, “Okay, how can we translate this into a commercial business that's going to have some value?”

I think those companies have some of the strongest translational capabilities to be able to bridge that chasm between not personalized enough and too personalized for where the state of the science is today. Others worth mentioning, that have taken a very methodical data-driven, scientifically credible approach, are Inside Tracker and Thorne's Oneevity platform. With both of these companies, you have well-respected scientists creating the key foundational assets of the company. They have access to large customer bases, which can support further insights and refinement of algorithmic-derived recommendations, whereas a lot of the other companies in the space are pulling solely from peer-reviewed data sets. That doesn't mean those data sets are inaccurate. The challenge is you have to validate your algorithms with a sufficiently large independent data set for your personalization recommendation to be accurate.

If you don't have those very large data sets, it's going to take initial customers buying into your platform to be beta testers, or you're going to have to find some alternative way to validate personalized recommendations. Gathering a bunch of different sources of peer-reviewed information to create an algorithm makes it, in my opinion, a little more challenging to have a lot of veracity. An algorithm is not a static tool, but a living, breathing and

evolving system that needs to be constantly updated based upon customer data and/or the state of the science. This is very expensive, time-consuming and challenging to do properly. Therefore, if your foundational dataset and algorithm isn't founded in reputable science, it's like a house built on a weak foundation.

To give you a tangible example, 23andMe, one of the leading DTC genetic testing companies, leverages the power of their community to develop and refine algorithms. For a complex health condition like predicting weight, they reached out to hundreds of thousands of customers

to create their algorithm. When you are seeking to do this kind of personalization across diverse populations, you need very large numbers to see population-level differences.

The majority of the companies are capturing questionnaire-based data. I think you can learn a lot from a questionnaire to support personalized health recommendations, but there are some inherent challenges to truly know what's going on in the body. I think the challenge in collapsing that chasm between not enough and too much is in what consumers are willing to pay for and what they feel comfortable sharing. Questionnaires are fast, inexpensive, less invasive, and consumers are accustomed to answering questions.

Another significant challenge is from a manufacturing perspective, being able to formulate truly N-of-one type personalized supplement nutrition offerings. Can you do it in the format that consumers want to use? Can you do it in a food-based format and put together a truly personal-

ized nutrition plan, like a Freshly- or Blue Apron-type meal kit that's sent to your house on a weekly basis and is adjusted based on what you're doing that week? These are challenging manufacturing and supply-chain issues. Habit attempted to provide personalized meals, but quickly retreated from this approach.

NBJ: Is personalized a stand-alone business, or is it a feature of a broader business strategy?

Voreades: I think personalization is going to be a feature, but it's going to be a very core, central feature. I think, fundamentally,

The challenge is, you have to validate your algorithms with a sufficiently large independent data set for your personalization recommendation to be accurate.

long term, it's not going to be a stand-alone business, because to do the level of personalization that's needed—whether it's product development, fulfillment, having a way to keep your customer engaged (through an app, a website, coaching, text) whether it's advancing the state of the science—it's very, very expensive. And you also then have to figure out what's going to be your distribution strategy and how you're going to get into stores and all of that.

So, I think it's going to be shifting from a stand-alone business to a feature. One of the challenges now, for the large companies, is a lot of the ones that have had the most traction and growth, from a revenue and customer and reputation perspective, are either partnered or have been acquired. So, there's a shrinking pool of high-quality acquisition targets left.

But, ultimately, large companies seeking to compete in personalization need to evaluate and approach the right buy or build/partner strategy. Partnering is an option, but large companies need to realize revenue

gains will not happen overnight.

I think Clorox is taking a unique approach in hiring a lot of people with very strong DTC backgrounds, from some of the best DTC brands, to really understand how to penetrate and potentially build a personalization business there, or just build a better, direct-to-consumer business. It shows how important it is to have the right internal resources.

NBJ: What's the Noah Voreades crystal ball for 15 or 20 years from now? Do we even differentiate personalized nutrition from VMS, or is it all one thing?

Voreades: I think it's just going to be nutrition. I think "personalization" is going to be dropped because it's going to be the standard, and it's not going to be a modifier term anymore, it's going to be the table stakes.

I think my crystal ball is that the entire VMS category has a significant existential threat in the digital health space, in that these companies like Hims and Roman are very heavily capitalized. They have very strong internal data algorithms, brand power and development teams. And they're already starting to move down their product and service value chain into supplements. And there are so many others that could easily add a supplement to their product portfolio or to augment some services and subscription-based offerings that they have. Many of these digital health companies have very high valuations and will need sufficient revenue growth to justify exits.

The last of the VMS industry's competitive moats, which are quality and distribution, are quickly eroding. Quality can be sourced by digital health companies via large CoMans or going direct to ingredient companies to make their own branded offerings. Distribution in retail, which VMS owns, is being disrupted by digital health companies, too. Target and Hims have a strong partnership, Walmart is partnering with digital health Femtech companies, all with the hope of luring young, affluent urban consumers into stores versus e-commerce-only purchasing patterns. So, I think digital health is going to be in a very strong position to capture a lot of the personalized nutrition business, just because of how their companies are set up, how they're capital-

ized and how they're data-first companies.

Just to give you an idea, as far as money, according to Rock Health, U.S. digital health companies raised \$14.1 billion in venture funding across 440 deals, representing a 72% increase from 2018. That's approaching one fourth of the total supplement revenue for one year. While not all those digital health companies are going to care about personalized nutrition, it shows you how much money these companies have. And, in the case of Hims and Roman, they're, combined, to the tune nearly \$500 million a year in revenue, and they're billion-dollar-valued companies.

I think the other category that's really going to potentially have a lot of opportunity—we'll see if they can execute—are the retail health companies out there, meaning CVS, Walgreens, Rite Aid. You're starting to see some of those pivots happen already.

Rite Aid is thinking about reimagining their entire pharmacy section to look more like an Apple Genius Bar. And they're looking to retrain their pharmacists to have holistic health coaching skills and to recommend non-pharmaceutical options if people are coming in for non-acute disease symptoms, to manage general wellness and their lifestyle.

And then I would say the last sector with competitive potential is health insurance/healthcare, simply because they're the keepers of the biggest pool of data, which is our EHR information that, once that starts to get mined and leveraged with biomarker data from genetics, blood, urine and stool, gives them the ability to really get personalized. You're starting to see that evolution

of personalization happening within the health insurance space with Blue Shield of California, having their Wellvolution program and offering partner-based personalized wellness subscriptions if you meet certain criteria.

The dark horse in this race just may be Amazon, Apple or Google. All of these companies have been building products (Amazon Halo band, AppleWatch or Fit-Bit) to capture real-time customer data, have household penetration to provide recommendations via their in-home speaker assistant systems (Alexa, Apple HomePod or Google Voice) and are exploring other

I think digital health is going to be in a very strong position to capture a lot of the personalized nutrition business, just because of how their companies are set up.

health concepts, typically via M&A activities. Amazon acquired Pill Packs, Alphabet's Verily Life Sciences team is conducting a large personalization study called Baseline, and Apple has been partnering with health systems to capture data via its watch. If these companies wanted, they could easily add supplement offerings and consumer adoption would be incredibly strong.

NBJ: What should startups and companies coming into the personalized space right now be thinking about?

Voreades: I'd say, 23andMe took approximately 10 years and over \$700 million in VC funding to reach their inflection point, Care/of took four years and approximately \$80 million to be acquired by Bayer and Persona took three years and \$14 million to be acquired by Nestlé. VMS and consumer healthcare companies need to realize wins will not happen overnight and financial commitment needs to happen for transformational growth to occur. 🌱



2021 Editorial Calendar

2021 ISSUES (11 issues per year)

- The Guest Editor Issue
- Active Lifestyle
- Market Overview
- Awards
- Condition Specific
- Changing Consumer
- Finance
- Global Market Overview
- Branding & Marketing
- Supply Chain Innovation
- Digital Issue

2021 REPORTS

- Hemp Report 2021
- Personalized Nutrition Report 2.0
- Active Lifestyle Report
- Supplement Business Report
- Condition Specific Report
- Herbs & Botanicals Report
- Global Supplement Business Report
- Special Report on a 2021 hot topic

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