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In many countries, firms involved in producing dietary supplements remain operational as essential services during the COVID-19 pandemic. Dietary supplements, in fact, are in more demand than ever, with market data showing skyrocketing sales.

Amidst this positive news, however, the supplement supply chain is definitely experiencing negative impacts of national lockdowns and logistical bottlenecks. Nutritional Outlook hosted a webcast on April 16th asking industry experts about what supply chain challenges they are seeing. (Turn to page 24 for more.) Along the way, several of the webcast panelists reminded us of this truism: Dietary supplement manufacturers who have strong relationships with their raw material suppliers are much better positioned to withstand supply shocks resulting from the pandemic—and to gain the ability to change course quickly as needed.

Webcast panelist Michael McGuffin, president of the American Herbal Products Association (AHPA; Silver Spring, MD), said: "My view is that there's not likely to be a long-term shortage for most ingredients for companies that maintain excellent relationships with their suppliers."

McGuffin said that some herbs, such as immunity-supporting herbs like Echinacea, elderberry, and honeysuckle, may become limited in supply due to increased demand, at least until subsequent harvests replenish the supply. However, he said, good supplier relationships will help companies navigate these challenges. "I think the corrections will be fairly immediate for companies that are the kind of business where they understand that their relationship with their supplier is a partnership," McGuffin said. For instance, he said, in cases where disruptions are due to transportation issues and not necessarily because raw materials aren’t available, suppliers can help their clients overcome these obstacles. By contrast, McGuffin said, companies that do not have such established relationships, or who are used to buying ingredients "on the spot market and who hound their suppliers for another dime here or a dollar there" are "going to have a harder time long-term."

Larger firms are fortunate to have long-standing, established supplier relationships. Take NOW Health Group, NOW CEO Jim Emme, who was also a webcast panelist, said: "We have seen some slowdowns with materials coming in from overseas, different parts of Asia or South America. That said, we’ve got to applaud our vendors for [their] Herculean efforts to keep products flowing in."

Companies like NOW also understand that eventually, suppliers may have to raise prices as supply shifts, said Emme. "We have seen pricing go up on some botanicals and crop items. Many of our agreements are locked in with long-term contracts, so because of that, our vendors have been able to honor those, and it’s worked out successfully," he said. "But we know full well that eventually, things are going to go up before the demand subsides."

There’s another very good reason to prioritize a trustworthy supplier relationship at this time: to avoid being vulnerable to the increased economic ingredient adulteration that the market is almost certain to see as ingredient shortages occur.

Panelist Elan Sudberg, CEO of Alkemist Labs (Garden Grove, CA), said: "History has showed us that when demand increases, so does adulteration...We will see more adulteration happening," he said, ranging from "the usual suspects" to things "as common as flow agents and fillers that are going to probably increasingly be used to cut and dilute material."

Panelist Shaheen Majeed, worldwide president of Sabinsa (East Windsor, NJ), said: "Manufacturers absolutely need to prepare for the economic adulteration that always happens either with strained supply or increased demand. Today, unfortunately, we have both. So, adulteration is inevitable. Now, if manufacturers are working with new suppliers they have not vetted, they must seriously ramp up their testing programs right away. I would encourage they ramp up their testing program regardless. It’s just the nature of the beast right now, and we need as an industry to be very cautious."

Communication between suppliers and purchasers is also key during this time, said Majeed. "Things are changing so quickly, and no one living has gone through anything like this before, on this scale, so there’s a lot we cannot predict. There is going to be disruption and uncertainty, but focusing in with your partners will help minimize some of those doubts. Transparent communication will help everyone manage things better. So, have those frequent communications with your suppliers to discuss forecasting, and keep them apprised as things change and evolve. It’s the best way for you to keep your material coming in. And if you need to change a product formula due to supply issues? "We understand that, and we’re going to need to have those conversations—to have them sooner than later," he added.

Securing responsible suppliers, and vigorously testing ingredients, has never been more important. It’s the new normal, as some might say. "The best control you can have over supply is excellent and consistent relationships with suppliers," said McGuffin.

We at Nutritional Outlook continue to wish you and your loved ones well during this time. Please keep in touch with us.

Jennifer Grebow
Editor-in-Chief
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Dietary Supplement Businesses Remain Essential Services during COVID-19 Pandemic


Although an earlier version of CISA’s guidelines updated on March 19 did not specifically mention dietary supplements as essential services, many industry leaders said at the time they believed supplements would be considered essential because they fall under categories already deemed essential by CISA, including food and agriculture (dietary supplements fall under food-category regulations in the U.S.), healthcare/public health, and critical manufacturing.

Under the healthcare/public health category, the new March 28 CISA guidance now includes as critical infrastructure “manufacturer workers for health manufacturing...[including] dietary supplements.” CISA also specifies as essential “workers who support crucial supply chains and enable functions for critical infrastructure,” which likely includes companies along the dietary supplement supply chain, including ingredient suppliers, distributors, manufacturers, and testing labs (analytical laboratory services are also specifically listed as essential).

Those in the dietary supplement and natural products industries could additionally consider themselves essential according to the food and agriculture category of CISA’s March 28 guideline, which includes as essential “workers supporting groceries, pharmacies, convenience stores, and other retail (including unattended and vending) that sells food, animal/pet food and pet supply, and beverage products...”

It’s important to note that the CISA list at the federal level does not automatically mean supplement companies can assume they can operate as essential services. Ultimately, it is states and local governments who make that decision.

The CISA federal guidelines state that they are only “advisory in nature” and are “not, nor should it be considered, a federal directive or standard.” CISA’s guidelines note that “State, local, tribal, and territorial governments are responsible for implementing and executing response activities, including decisions about access and reentry, in their communities, while the federal government is in a supporting role. Officials should use their own judgment in issuing implementation directives and guidance.”

Nevertheless, the CISA list is likely to make dietary supplement companies operating throughout the U.S. feel more comfortable and confident that they would be considered essential services permitted to actively stay in business.

Individual states have released guidelines on which businesses they consider essential and will continue to permit operating in their state. California, for instance, specifically lists dietary supplements as business considered essential. Under the food and agriculture category for the state, California lists “workers supporting cannabis retail and dietary supplement retail” as essential workforce.

Ultimately, supplement manufacturers need to look at their own local orders and determine whether or not they would be authorized to stay in business.

During a webcast hosted on March 26 by the American Herbal Products Association (AHPA; Silver Spring, MD), speaker and attorney Trent Norris, Esq., a partner at Arnold & Porter LLP (San Francisco), advised supplement companies continuing to operate to arm their employees with a letter “on your letterhead...[describing] why this employee needs to be working within your business, that your business is exempt.” He also advised that companies ensure employees carry their company badge or ID with them at all times, and that companies appoint “a designated point person or a phone number that can be called by someone on the ground” if an employee is being challenged about continuing to actively work during the lockdowns.
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Healthy Sales

Dietary supplement sales skyrocket during the COVID-19 pandemic.

BY JENNIFER GREBOW, EDITOR-IN-CHIEF

Dietary supplement market sales are skyrocketing so far during the COVID-19 pandemic. In early April, Nutritional Outlook spoke to market researcher IRI (Chicago) and other supplement leaders about what the supplements market can expect moving forward in the short term, at least.

Supplement Sales Could Outperform Last Recession

“What we are seeing now is unprecedented growth with COVID-19,” said Joan Driggs, vice president of thought leadership and content for IRI. IRI tracks U.S. multilevel sales, including in mass market, grocery, drug, and convenience stores (but excluding specialty vitamin stores such as The Vitamin Shoppe). “If you’re looking at the vitamin/minerals supplements market right now, it’s very positive,” she said.

Historically, dietary supplements generally sell well, even during times of recession, as consumers look towards supplements as an affordable way to maintain their health. During the 2008 recession in the United States, for instance, dietary supplement sales grew. “The market did do well in the last recession,” said Driggs. “I think that while consumers will be concerned about their physical health and the physical health of their loved ones,” Driggs said. “I think that while consumers will be concerned about their financial health, certainly, some of these CPG categories are really recession proof.”

Driggs shared IRI data showing how supplement sales shot through the roof during the recent weeks of the COVID-19 pandemic. In terms of supplement sales overall, first she looked at the past year’s sales, noting “In the 52 weeks ending March 8, 2020, the total market was up more than 6%. That’s a pretty healthy leap for the category." Then she drilled down to the one-week period ending March 8, 2020, during which coronavirus concerns in the U.S. began to scale. During that week, she said, sales growth for overall dietary supplements skyrocketed to more than 35%.

By purchasing supplements, consumers take comfort in feeling like they are supporting their health in a time of great uncertainty.

“Vitamins and supplements, right now in particular, are viewed as a small measure of control that people have over their lives, in a really uncertain time,” said Driggs. “There’s a lot of anxiety. There’s a lot of the unknown. People don’t know how this is going to shake out. They don’t know how long it will take to shake out. So, they’re looking for a little bit of control and taking things like vitamins and supplements to maybe shore up their immunity or keep themselves healthy. It’s what they’re doing to help keep themselves safe.”

And, indeed, while supplements can’t treat or prevent disease, they can help support well-being. “Supplements are not intended to diagnose, treat, cure, or prevent disease. This does not mean that during a time of crisis like this, they can’t play a role in supporting overall health and wellness,” said Brian Tanzer, manager of scientific affairs for The Vitamin Shoppe, in April.

He continued: “People may not have access to nutritious foods for one reason or another, so supplements can help fill gaps in their nutrition. If a person does not get adequate nutrition through diet and/or supplementation, their immune system can..."
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be further compromised. The stress of the COVID-19 pandemic can further deplete essential nutrients that the body needs to maintain health. So, although supplements have no direct effect on the COVID-19 virus itself, they can certainly help support overall health and wellness during this very stressful time.

The Winners

Already, we’ve seen sales of certain supplements skyrocket like never before. Unsurprisingly, many of these supplements target immune health.

Ingredients like vitamin C, vitamin D, zinc, and elderberry—an immune-health botanical ingredient that already saw soaring sales last year—are what Driggs said can be considered “the beneficiaries of the current situation.” Their sales growth, she said, “will make your head swim.”

If elderberry sales growth was impressive in the last year, sales shot into the stratosphere in recent weeks: Elderberry sales were up 170% over the past year, but during the one-week period ending March 8, 2020, sales were up a whopping 415%.

The same impressive growth is true for zinc, which saw 15% sales growth during the 52 weeks ending March 8, 2020—but which saw sales skyrocket 255% during the one-week period ending March 8, 2020.

Vitamin D, “the sunshine vitamin,” also continues to gain attention as more people are confined indoors. Driggs said that sales during the one-week period ending March 8, 2020, grew 22%.

Even multivitamins are benefiting as consumers look for general ways to boost their health. For instance, said Driggs, adult multivitamins are already a $1.6 billion market in the markets IRI tracks. Adult multivitamin sales grew 1% in the past year—“1% of $1.6 billion is a lot,” Driggs pointed out—but sales growth accelerated to 23% in the one-week period ending March 8, 2020.

Even children’s multivitamin sales are growing. Driggs said, as parents look to keep their children healthy during this time. “Child multivitamins—again, a much smaller category—are up more than 2% for the year, and in that one-week period when people were really going out and trying to arm themselves, that category was up 47%,” she said.

Driggs said multivitamins are among the supplements that are “in it for the long haul.” She noted: “People are trying to protect themselves and protect their children.” In order for a supplement to be successful at this time, “it has to make sense,” she added. “There’s not a magic bullet out there. It’s eating right, getting exercise, getting good sleep, trying to ease your anxiety—and multivitamins are a good bet just in case you have some kind of deficiency in your diet.”

Steve Mister, president and CEO, Council for Responsible Nutrition (Washington, DC), seconded in April growing consumer interest. “We’ve already seen an increased interest in supplements since coronavirus came to the U.S., and there are a number of reasons: some people are using products that are immunity boosting because they want to really protect their immune function and build their immune function. Other people are using multivitamins and their daily vitamin and minerals because they just want to be sure that they’re getting all of the nutrients and that their body is going to perform as best it can under all of this stress. There are other products, like sleep products, like melatonin, that are doing very well because, again, people are reading that sleep contributes to a strong immune function, and so they want to be able to get a good night’s sleep, and they are incredibly stressed and fearful when they read about what’s going on in the world right now.”

Possible Dips: Sports Nutrition?

Some supplement categories could see sales declines, however. Sports nutrition sales could take a hit as many state social distancing orders mandated health clubs and gyms to close.

“I think sports nutrition is going to have to do a little bit of reinventing itself,” said attorney Kevin Bell, partner at Arnall Golden Gregory LLP (AGG; Washington, DC), in April.

Daniel Fabricant, PhD, president and CEO of the Natural Products Association (Washington, DC), said, “I’m concerned about possibly sports nutrition, with gyms closed. With gyms closed, they may suffer some losses there. We hope people find a way to stay healthy and continue their exercise regimens, even during the crisis. That’s very important—that they continue to do some form of activity.”

Bell added: “Here’s something else you’re going to see: everybody is going to start claiming that everything is for health and wellness and will boost your immune system.”

Shopping Behaviors

It’s no surprise to imagine that in this time of social distancing, online supplement sales will further skyrocket. Compared to the last recession, online sales will be even more robust—and could be further extended via subscription ordering.

Said Driggs, “This is different from the past recession—e-commerce is so much bigger, and e-commerce helps with social distancing. As part of e-commerce, there’s auto-replenishment. So, if people get into a groove, this could become a habit, and they’ll just stick with it, particularly if they stay healthy throughout COVID-19. They’re going to look at it as either: 1) this has been a positive change, or 2) just a positive part of their routine that they’ll just keep going.”

Supplement purchasing will not be the first purchases consumers are likely to cut during a recession, she added. “As people dig in more into the recession, they’ll be more likely to cut out other things.” For instance, she said, even prior to the current pandemic, consumers were reducing the amount of money they spend on dining out, health clubs, nail salons, and hair salons. During the recession, she said, “Those could all be argued as discretionary expenses that are no longer on the table.”

But consumers are likely to keep their supplements, Driggs said. “People might be feeling that, ‘Well, you know what? I’m already cutting out a lot of expenses that I had before. This is something that’s pretty critical to my current state of well-being, so I’m going to stick with it.’”

Mark LeDoux, chairman and CEO, Natural Alternatives International (Carlsbad, CA), said in April: “For the first time in decades, I have seen ‘mainstream’ TV doctors extolling the virtues of taking zinc and vitamin C and vitamin D supplements to help tune up the human immune system. They are also extolling the virtues of increasing fruit and vegetable consumption and getting adequate fluids and antioxidants in your system. I very much doubt that this industry will be in a recession anytime soon.”
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Dietary supplement manufacturers will be relieved to hear that, so far, the COVID-19 pandemic has not had a negative effect on supplement sales overall. (For more on this, turn to page 14.) It remains to be seen whether that positive picture changes for certain supplement categories moving forward.

Looking ahead, what challenges will the supplement industry grapple with as a result of the COVID-19 pandemic? One primary concern is whether there will be negative supply chain effects that could ultimately lower the safety and quality of dietary supplements.

First: Supplements Are Safe
First and foremost, FDA emphasizes that the novel coronavirus cannot be transmitted through dietary supplements or their packaging. FDA says on its website: “Currently, there is no evidence of food or food packaging being associated with transmission of COVID-19.”

_Nutritional Outlook_ asked a handful of dietary supplement industry leaders, as well as some supplement manufacturers, whether they’ve heard that consumers are fearful that they could contract coronavirus from dietary supplements. They said no.

Rather, the concerns regarding supplement safety are more fixated on whether or not factors such as limited FDA oversight during this time, coupled with the possibility of increased economic adulteration due to supply shortages, could create risk of unsafe and low-quality ingredients and manufacturing within the supplement market in the future.

FDA Scales Back Inspections, SAER Requirements
Social distancing requirements spurred by the pandemic have led FDA to scale back on both foreign and domestic routine facility inspections, including at food facilities—and, under that umbrella, dietary supplement facilities. These routine inspections are critical in ensuring that dietary supplements are being produced according to current Good Manufacturing Practices (cGMPs).

The COVID-19 pandemic, however, has made performing these routine physical inspections dangerous. Thus, on March 10, FDA announced it had postponed most foreign facility inspections through April, citing burdens including protecting its staff as well as global travel restrictions. A week later, on March 18, FDA announced it had also scaled back on routine domestic inspections.

In both cases, FDA said it is restricting inspections to “mission critical” cases. “Mission critical” means Class I recalls (recalls related to foodborne illness outbreaks or related to the COVID-19 pandemic itself), said Tara Lin Couch, PhD, senior director of dietary supplement and tobacco services at EAS Consulting Group LLC (Alexandria, VA). Couch made her comment during a webcast presentation hosted on March 26 by the American Herbal Products Association (AHPA; Silver Spring, MD).

In lieu of physical site inspections, FDA has said it will rely on other means of regulating companies. Said Couch during the AHPA webcast: “Some of these alternative methods and tools that they referenced in regards to these foreign inspection delays is denying entry of unsafe products into the U.S.—so, obviously, border control can help to facilitate that process; doing physical examinations or sampling of products and materials at the border; reviewing the firm’s previous compliance history...Also, informing the foreign governments and...
working with them in advance in lieu of on-site inspections.” In place of domestic site inspections, FDA would rely on similar tools, including records review.

When announcing FDA’s suspension of routine domestic inspections, FDA Commissioner Stephen Hahn, MD, said manufacturers should continue to follow cGMPs, even if they aren’t being inspected. Said Hahn: “Inspections are just one part of a robust and multi-pronged approach to overseeing the safety and quality of FDA-regulated products; however, inspections are not what cause quality to happen. Safety and quality need to be owned by the industry, and firms have the primary responsibility to reliably produce quality products.”

FDA has further scaled back requirements for serious adverse event reporting (SAER) during the time of the pandemic. Whereas food and supplement companies are typically required to report serious adverse events to FDA within 15 business days upon being notified of the event, on March 20, the agency, citing FDA staff shortages during the pandemic, updated its rule to allow companies to instead keep track of SAERs and report them to FDA “within six months of the restoration of adverse event reporting processes to their pre-pandemic state”—another pullback of the agency’s immediate oversight.

Own Their Own

Will FDA’s alternative oversight measures be enough to ensure that companies producing supplements continue to adhere to cGMPs and continue to produce safe and quality products? Can FDA rely on supplement brands to be on their best behavior?

Some are fearful that FDA, by making it broadly known that the agency is no longer routinely inspecting manufacturers, has opened the door to bad actors.

“The part I didn’t like was announcing that they are essentially not doing any inspection of foreign facilities—in essence, telling the industry, ‘You’re on your own for a little bit. You’re going to have to govern yourself for a little bit.’ That’s really what they told them,” says attorney Kevin Bell, partner at Arnall Golden Gregory LLP (AGG; Washington, DC).

Having worked in the industry for many years, Bell says, “You get to know a lot about who cares about what...which contract manufacturers cut corners, which ones don’t, and which ones don’t get caught violating cGMPs. I find it humorous that there’s a belief that every contract manufacturer out there in the United States is following their cGMPs and that it’s just a few that don’t.”

He continues: “And then when you start talking about not doing inspections of foreign facilities? That’s close to a license to steal, in my opinion, especially when you talk about raw ingredient manufacturers...”

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What challenges will the dietary supplement industry grapple with as a result of the COVID-19 pandemic?

from other countries, who we already know are cutting corners and not complying with cGMPs. This now says, ‘Hey, not only that, but we’re not going to be looking over your shoulder anytime soon. So go for it.’ When you’re talking about China? Who has just gone through this horrendous experience? And they haven’t just gone through it; they’re still in it?”

It’s not unlikely to imagine that among raw ingredients suppliers around the globe who have suffered severe economic losses due to the pandemic, there will be some who turn to economic adulteration.

“I think it is fair to be concerned about that,” says Steve Mister, president and CEO of the Council for Responsible Nutrition (Washington, DC). “I think there is an opportunity at this point for there to be mischief, and we would hope that companies would resist that temptation.”

Daniel Fabricant, PhD, president and CEO of the Natural Products Association (Washington, DC), says: “I mean, everyone’s gotta be on their toes. FDA’s kind of abandoned their post, and it’s up to the industry now. We have a promise to keep with the American public, and so I think we will. I think our members, the legitimate manufacturers, are going to do just that. They’re going to step up to the plate.”

Fabricant adds: “This is why we worked on things like SSCI.” SSCI is the Supplement Safety Compliance Initiative, which sets benchmarked standards across the dietary supplements industry to improve manufacturing quality.

Still, many worry that not all manufacturers can be trusted. Mark LeDoux, chairman and CEO of supplier Natural Alternatives International (Carlsbad, CA), says: “One can always maintain the belief that, under duress, the true character of executives and managers will be on prominent display. That’s my worry. While the majority of companies engaged in the production of supplements are reputable, there remains a significant portion who will maximize their profits in this environment by doing as little as possible in terms of quality oversight.”

Supply Chain Impact: Possible Shortages, Economic Adulteration

Increased economic adulteration is a credible threat due to COVID-19, especially considering that there could be less available supplies of some ingredients due to global restrictions on manufacturing and trade.

During the aforementioned AHPA webcast on March 26, speaker and attorney John Hagan, Jr., a partner at Arnold & Porter LLP (Chicago), said: “It is estimated now that 75% of U.S. companies are having some supply chain disruptions, and so coming up with contingency plans and stress testing are very important.”

During a Q&A portion of the webcast, AHPA president Michael McGuﬃn said he had read about potential challenges in India, for instance, including potential “disruptions in state-to-state transport. So, some states are closing their borders to trucks coming in from other states, which certainly sounds like it will make it difficult to get things to ports in a central state.” (For more on this, turn to page 24.)

In a March 24 interview, CRN’s Mister also mentioned concerns he’s heard about supply chains in India. “The one thing we have started to hear is concerns from some manufacturers who have supply chains in India. Because India is pretty much on a national shelter-in-place ordinance—like what some of our states have done here, but the entire country—it is making it very hard. Even if the facilities are open, transportation to get them to an airport and then ﬂy them out of the country is apparently being slowed down.”

Given these challenges worldwide, there are real risks of impending supply shortages—and of resulting economic adulteration. Take the botanical dietary supplement supply chain. We turned to Mark Blumenthal, founder and executive director of the American Botanical Council (ABC; Austin, TX), and Stefan Gafner, PhD, chief science ofﬁcer for ABC and technical director of the Botanical Adulterants Prevention Program (BAPP), a joint program between ABC, the American Herbal Pharmacopoeia (AHP; Scotts Valley, CA), and the National Center for Natural Products Research (NCNPR; University, MS). Blumenthal and Gafner shared their concerns.
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Said Gafner: "I think that responsible dietary supplement manufacturers already have a sufficient ingredient identity testing program in place to ensure that their products are authentic. That's simply a basic requirement of being a 'responsible' manufacturer. However, due to the higher than normal consumer interest in herbal ingredients that have immunomodulatory benefits, as well as those herbs believed to support the respiratory system, there is a risk of adulterants finding their way into herbal ingredients where adulteration is often not expected. In addition, new schemes of adulteration may be cooked up to fool standard authentication tests for those herbs that are currently in high demand.

"Another issue is the qualification of a new vendor in case the usual supply chain is no longer able to deliver the ingredient. While companies often have a backup supplier, this may not be the case for all ingredients. There may be situations when there is a lot of pressure on procurement managers to find new suppliers quickly. However, companies may be better off to have a product out of stock rather than to approve a new supplier without having done a thorough audit, as required by GMPs for supplier qualification.

"In other words, at the end of the day, given what is most likely an inevitable increase in the availability of adulterated ingredients, botanical dietary supplement manufacturers and other buyers are advised to double-down—perhaps even triple-down—on their identity testing protocols."

Supplement manufacturers might not be able to purchase the all of their ingredients the way they once did. AGG’s Bell posits that in some countries, suppliers might "take care of their own people before they start manufacturing for exportation to other countries."

Bell says the potential supply chain ripple, added to suspended FDA inspections, is alarming. "That is the epitome of the Wild West," he says, "because we’re going to be dealing with a lot of things. Shortages of some ingredients. I’m hearing news that some factories aren’t making what they used to make. They’re now making what they think people want. So, less of this type of an ingredient; more of stuff that might now go to immune system products. And they can switch that quickly. And so companies over here saying, ‘Oh, well, I’m going to go back to my same three companies to buy my amino acid for sports nutrition’—they may not have the kind of volume that they had, or [their supplier] may not even be making it anymore because they’re as low as they can, and that’s going to force contract manufacturers to try to cut corners where they can, and that can be done in a few different ways.” Manufacturers could start using cheaper, lower-quality ingredients, he says. Or they could start "pixie-dusting"—cutting back on the amount of an ingredient in a product.

**Companies should expect to exhibit heightened scrutiny when testing incoming ingredients, given that economic adulteration could be more likely.**

**Due Diligence, Planning Ahead**

Companies can take control and plan ahead for these upcoming challenges by doing their due diligence. For instance, companies should expect to exhibit heightened scrutiny when testing incoming ingredients, given that economic adulteration could be more likely. They should also be prepared to make changes quickly if needed, and to have backup plans, not only for ingredients and materials but also for personnel.

During the AHPA webcast, speaker Sean Murray, president, U.S. food testing division, Eurofins, described how his company and its testing labs are focused on planning for redundancy. “You’ve got to be thinking about the fact that a large group of people could be taken out” if employees become ill due to coronavirus and can’t work. You need to think about how to replace those groups of workers in the interim. The same goes for other suppliers the company relies on, including couriers. Backup plans, including cross-training employees, are a key part of preparing ahead of time, “because if you’re trying to make these changes in the midst of a rampant local situation, it’s going to be difficult.” He said: "Have at least one backup...even if it’s just one, it massively improves the reliability of your suppliers of your operation."

Streamlining supplement formulas is another way to potentially skirt ingredient supply shake-ups that companies could experience, advises AGG’s Bell.

"I think what companies ought to do is step back and say, ‘Okay, I’ve got 20 ingredients in this sports nutrition product. I could probably take 10 of them out right now without thinking about whether it would affect the efficacy of the product.’ Reducing the number ingredients not only could lower a company’s cost of goods, by reducing the number of ingredients, companies also..."
reduce the number of headaches and risks they will encounter in terms of potential ingredient supply or quality problems. “You’ve just reduced the risk factor by several ingredients,” Bell says.

Additional precautions from regulators would also be nice to see. In addition to encouraging companies to participate in the self-regulatory SSCI program, NPA’s Fabricant and NAI’s LeDoux say they wish FDA would use its power to issue import alerts to ports of entry, encouraging them to deny entry to ingredients that aren’t on FDA’s list of ingredients with submitted new dietary ingredient notifications (NDIs)—crucial during this time when foreign inspections are down. “All FDA would have to do is proffer a memo to the ports, and the ports could detain [an ingredient] on import until those companies submitted an NDI notification,” says Fabricant. This would prevent “materials coming in that are knocking off NDIs,” with no data filed with FDA.

LeDoux calls this an “easy solution.” “One easy solution is to close the nation’s borders to all products from anywhere that does not have a recognized NDI AKL (acknowledgement) notification number. That is not a heavy lift for the agency at all and would require a signature on a piece of paper directing the customs and border enforcement component of Homeland Security to offer that protection.”

Long-Term Changes?
In the long term, could the potential supply chain challenges the dietary supplement industry experiences as a result of the pandemic have the industry reevaluating where and from whom it sources ingredients?

LeDoux predicts that “China is going to lose a lot of their primary manufacturing status in this industry.” He continues: “I think ‘Made in China’ is going to be a long-term problem for many years to come. People are going to be willing to pay more for products that have no exposure to China. The challenge is to reactivating the primary chemical industry that 30 or 40 years ago supplied these vitamins and other compounds to industry.”

Other countries could pick up some of that business. Domestic suppliers will also be taking another look at sources closer to home, he says.

“Companies located elsewhere with combinations of educated workforces and industrial policies encouraging investment and growth are going to emerge, whether they are in the USA, Europe, or other parts of the world, and are going to inherit business,” LeDoux says. “Also, I predict many countries will make provisions for investment credits and other incentives to assure that future crises will be addressed by domestic manufacturing versus a reliance on foreign suppliers.”
WEBCAST: COVID-19 AND THE DIETARY SUPPLEMENT SUPPLY CHAIN

What will the short- and long-term challenges be? Speakers at Nutritional Outlook’s April 16th webcast discussed.

BY JENNIFER GREBOW, EDITOR-IN-CHIEF

ONE OF THE FIRST DISRUPTIONS dietary supplement ingredient suppliers experienced at the outset of the COVID-19 pandemic involved logistics—specifically, transportation. Not only was labor unavailable to transport goods, but companies faced severely spiked transportation costs.

Nutritional Outlook hosted a webcast on April 16th featuring several ingredient suppliers from various countries, as well as other industry experts, to learn about the challenges companies are facing worldwide as a result of the pandemic.

Transportation Troubles
Dietary supplement businesses, including retailers, manufacturers, and raw material suppliers, remain operational in many parts of the world today. Consumers, it turns out, regard supplements as essential during a pandemic, as skyrocketing sales indicate.

While we are 100% operational, there have been operational challenges with regard to staff transportation and shipping logistics,” said Majeed. “In many cases, we’ve been moving materials using our own transport and providing our own staff or labor. Labor was just not available—for example, unloading and loading of goods at docks and warehousing.” Despite these challenges, Majeed said Sabinsa continues to be able to transport its goods to its customers.

It’s become more expensive to transport those goods. Numerous speakers, including Majeed, testified that currently, the cost of transport has drastically gone up. “Logistical transportation costs have absolutely increased,” he said.

Wilson Lau, vice president of Nuherbs (San Leandro, CA), has observed these changes in China where his company primarily sources ingredients. Lau said, “Right now, airfreight from China is horrendous—prices spiked two to three times—and the availability is low because a lot of those air shipments’ bandwidth has gone to personal protective equipment (PPE), which is as it should. Also, the number of flights has been greatly reduced because people aren’t traveling back and forth between China and the U.S., China to Europe, etc.”

Another webcast panelist, Michelle Li, vice president of operations for supplier Scientific Living (Irvine, CA), expressed similar experiences. “In the past few weeks, we’ve seen some congestions due to the reduction in cargo flights and shipping vessels. And this is causing a delay in our shipping efforts. There’s no surprise that we do see a surge in transportation costs, especially for air freight, and as we heard earlier. Some of these costs are three to five times the amount we normally saw before the coronavirus outbreak. Ocean shipments are less impacted from a pricing-increase standpoint, but we are seeing longer lead times due to indirect services. These longer lead times at ports around the world also take into account customer clearance processes that have been extended to somewhat decreased inspection activities.”

Li added: “We’re not only seeing these changes and effects from our Chinese partners, but also our partners in India, South America, and parts of Europe.”

And Majeed said: “Sea and cargo transport is still somewhat limited and definitely more expensive, and by more expensive, I mean we’ve seen rates as high as 400% over normal rates. And while this will probably stabilize as more movement picks up (be it air or sea), more permissions are granted, and more workers are able to come back, we don’t see prices coming back to pre-virus days. That’s something we’ll just have to be mindful and careful of as we move on.”

Supply: Short and Long Term
And what about actual supply shortages? At this time, is there enough supply of ingredients out there to meet demand? The answer is largely yes—for now. Webcast panelist Ettore Milano, PhD, medicinal plant purchasing manager for supplier Indena S.p.A. (Milan, Italy), said, “The main issue of the moment relates to the logistics and transportation, not the sourcing of ingredients.”

Many companies had stored inventory of ingredients in the short term—and smart companies even began stocking up when news of the COVID-19 pandemic hit months ago. Said Sabinsa’s Majeed, “We certainly kicked it up a notch when reports not only from China but also from our Chinese office [emerged] that various lockdowns were happening over there. We realized there would be a fundamental shortage throughout the world, and so we took action in late October or November to process more material and to stock up our warehouses. So, we’ve been airlifting immediate goods that our customers needed, and putting sea shipments that have been going out regularly for the past few months. So, we’re on track as of whenever the lockdown had happened. We’ve been adequately supplied, with our houses being full.”

Supply is sufficient for now, but that could change soon, panelists pointed out. Even if companies had built up inventory, that inventory won’t last forever. Said Nuherbs’ Lau: “On the supply side, we’re currently fortunate that we and our partners
have quite a bit of inventory in stock, but for some herbs that are hot, such as honeysuckle, it’s going to be an issue because harvest is a month or so away, so we burn through our current inventory due to increased demand, it’s going to be hard, with harvests being so close.”

He continued: “What I’m really worried about is the fall/winter, if there is a secondary outbreak of COVID-19 in China, in certain places, that might be more localized than, say, shutting down or quarantining a whole region or the country. When it happens to that level, are there going to be people to go harvest these fall crops? Or even the summer crops? If it does come back in the fall/winter, are there going to be people out in the fields picking it, or will they miss the harvest due to this, and there will be a severe supply chain shortage?”

“I think that’s true around the world,” he added. “It’s not specific to China. There are harvests going on here in the U.S., and if it’s more mechanized, then maybe one person on a big combine can go pick all the wheat up, but for example if you need people in the fields to pick apples, if you don’t have enough people out there, you’re not going to pick it. So that’s what I really worry about in the short term/medium term is how this is going to impact harvests as they come up. Once it’s harvested, then it’s just a matter of timing. The supply is there, but it’s a matter of getting it out, so that’s a bottleneck of days or months, but the issue is if you can’t get the raw input. Then you have a real supply issue.”

Sabinsa’s Majeed expressed similar concerns. “As the growing season progresses here in India, getting people into the fields to plant, to nurture, to harvest material for the world’s output is going to depend on a lot of factors, and it really comes down to how organized their systems were before this pandemic. [In India specifically, migrant workers have been hit hard, especially up North, and that’s going to have a short-term and a long-term effect that this nation will feel for months if not years to come.”

Lau said, “Hopefully I am always looking at things from the side of the farmer and being slightly pessimistic, but overall I think if anyone comes to you with an overly optimistic viewpoint of the supply chain and saying that they have everything under control, I’d be very worried. I think this is the time to have a Plan A, B, C, D, E, F, and then keep going down the line as far as you can.”

What Will Demand Look Like Later?
The fact that demand is significantly increased for dietary supplements overall, and for products for immune health specifically, has made it even more challenging to meet demand with current supply chain obstacles. Webcast panelist Jim Emme, CEO of NOW Health Group, spoke to the increased demand. He said, “We’ve not only seen an increase in immune products, we’ve seen an increase in personal care, essential oils, aromatherapy, homecare systems. It seems like as people are quarantined at home, there are spa days that are happening because they can’t go to a spa. They’re doing it themselves. So, we’ve seen interruptions due to high demand across every category that we sell—not just immune products.”

Scientific Living’s Li said: “From a supply chain point of view, this growth can be somewhat double-edged, as we see many parts of our global supply chain struggle to keep up with the increase in these demands…We started bringing in extra inventory prior to the Chinese New Year, with the anticipation that there would be potential shutdowns. But between the extra inventory that we’ve been building and the shipments that are in route on the ocean as we speak, we are only fulfilling a portion of the void that’s created by the COVID-19 crisis.”

It’s also uncertain whether this higher demand will ultimately taper off to more normal levels later. Said Li: “Based on the current retail data, we do see a spike in demand for dietary supplements. One of our major short-term challenges is to really balance an inventory to meet the increase in demand, but also avoid severely overstocking. So, at this point, it’s difficult for us to tell if the increase in demand from what we see today will translate into longer-term, higher sales volumes for a lot of these products.”

She continued: “One scenario is if COVID-19 persists and we may continue to see higher unemployment rates and slowdown in our economy. As a result, are we going to see less discretionary spending for a lot of these health and wellness products? But on the other hand,…if we take a glimpse into future trends based on what we have already seen in China where e-commerce sales spiked during the three months of quarantine, and we continue to see that demand grow, after this quarantine has ended there is an optimistic mentality that maybe in the States, this preventative health and wellness mentality will perhaps stay, and we need to prepare for this.”

Ongoing Change
The only guarantee in the face of the COVID-19 pandemic is that obstacles and solutions will continue to shift. Said NOW’s Emme, “Overall we realize that there are many things that are fragile in this entire supply chain right now. It could be a transportation problem—just because we’re not having one today doesn’t mean we won’t have one tomorrow. The problems are changing by the hour. The challenges are occurring day in and day out, around the clock.”

Even as a country like China begins its initial recovery for now, other parts of the globe are increasingly impacted, meaning that the supplement supply chain should expect to continue seeing challenges worldwide. Said Lau: “China’s back open and up and operational; however, my assumption is that COVID-19 is going to come in waves to different parts of the world. So, I think it’s going to be an ongoing challenge for the near future.”

Scientific Living’s Li said the same. “We did see the supply shock initially start off in China, but it’s now becoming a larger, global supply issue.”
Keeping Up with E-commerce

As e-commerce sales grow, brands must find effective ways to address packaging needs, including channel differentiation and brand security.

Editor’s note: This article was written prior to the emergence of the COVID-19 pandemic.

E-commerce sales continue to rise as consumers demand greater convenience. According to the 2019 Internet Retailer Top 1000 Report, consumers spent $517.36 billion online with U.S. merchants in 2018, up from $449.88 billion spent the year prior. Even when the final sales take place in a store rather than online, the first step to most purchase decisions starts at the search bar.

As e-commerce platforms continue to grow, brands face the prospect of SKU proliferation and the challenges of ensuring products reach consumers in excellent condition. As manufacturers and brand owners take on increasingly complex supply chains with fast-changing needs and opportunities, it is critical for them to understand and equip themselves with the right solutions to remain competitive.

Different Solutions for Different Channels

Whether companies sell to consumers through their own online channels, or through third parties like Amazon, flexibility is critical to meet market shifts. Without the right tools and infrastructure to enable faster changeovers, diverse batch runs, and fluctuating volumes, brands may not be adequately prepared to meet product demand surges in a less predictable marketplace. This means investing in solutions like digital printing presses that can handle changeover and small volume needs—or automated packaging equipment that handles different package formats, sizes, and shapes.

Additionally, companies are updating packaging to better suit e-commerce needs, sometimes offering two iterations of a product’s package: one for store shelves and another for e-commerce. For example, The Honest Co. adopted a dosing-cap closure to reduce product leakage for its laundry detergent during shipment to online consumers. Additionally, Tide has reduced packaging material—particularly plastic in its e-commerce offerings compared to versions of these products sold at brick-and-mortar stores.

This dual approach to packaging design is evidence that traditional retail is still very much alive despite the growth and change that e-commerce has brought. In fact, according to the TimeTrade 2017 State of Retail survey report, more than 70% of consumers say they prefer to shop in a brick-and-mortar store compared to an online retailer. This attitude drives brands to consider adopting omnichannel distribution and, rather than creating variations of packaging for the same product, commit to one package design that meets all their needs, from shelf appeal to lightweighting.

While the omnichannel approach could simplify production and save cost since it eliminates the need to run separate lines for products only applicable to one channel, CPGs utilizing it are faced with tight order-fulfillment timeframes, as customers now expect two-day shipping. According to PMMI’s Omnichannel Retail whitepaper, brands can address these logistical concerns by instituting distribution facilities as close to the consumer as possible or partnering with logistics facilities across the country.

Combatting Counterfeiters and Challenging Environments

While e-commerce affords consumers a convenient purchase experience and provides brands the opportunity to reach target geographies far and wide, it also creates vulnerabilities to counterfeiting—especially when retailing through third-party channels. When consumers receive a knock-off instead of the true product, disparities in quality, performance, or even product safety are detrimental to brand integrity.

To mitigate counterfeiting, brands maintain authenticity by implementing overt security features into their packaging. For example, companies have begun to include tamper-evident labels that allow consumers to distinguish the true product from an imitation. This includes the use of hologram
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films to create packaging that can differentiate a product at the point of sale. Additionally, manufacturers can include visual effects on the hologram such as emerging images, microletters, or other microscopic symbols. Consumers can discern the true product from the imitation by inspecting the label for distinctive marks that were embedded by the original equipment manufacturer. Brands can also alter the product beyond the label by incorporating symbols onto the product. Apple, for example, places small text on their lightning connectors, among other measures to help signify to consumers the product’s authenticity.

In e-commerce, shipping product through challenging environments where the brands have little control can result in damaged products as well as displeased consumers. When selecting materials and containers, it is crucial to account for durability in the face of tough conditions such as friction or impact from other loose goods contained in the same package, moisture, fluctuating temperatures, and even vibration. Increasingly, companies have utilized both rigid and flexible plastic packaging to better protect their products. This is because plastic packaging is durable enough to prevent product damage without the risk of breakage that comes with glass. As an example, Consolidated Mills redesigned its glass jar food product to feature a PET jar with a metal lug closure to make their new package easier to ship.

Maximizing Brand Differentiation

Amid the rise of e-commerce, more brands must connect with consumers in ways that are different from the traditional retail settings where shelf impact can lead to sales. Consumers increasingly interact with brands online, basing purchase decisions on reviews and seeking unique brand experiences. In response, brands are offering greater opportunities for personalization. According to “The Deloitte Consumer Review Made-to-Order: The Rise of Mass Personalization Report,” 70% of respondents reported that they are willing to pay a 10% premium or more for personalized products. Whether building a made-to-order product or simply customizing lettering, colors, and flavors—or adding messages to specially giftwrapped items—consumers increasingly expect opportunities for personalization and customization.

The resulting explosion of SKUs requires firms to supply a greater variety of products at smaller quantities, which can be difficult if using a traditional printing press. Traditional presses are designed to run larger batch sizes and thus have the potential to create waste by producing an excess number of units for a certain promotion, seasonal item, or customized design. As an alternative to traditional printing presses, manufacturers can utilize digital package printing technologies to produce high-quality, detailed packaging that reinforces brand image. The technology enables greater flexibility for faster changeover between designs. As such, manufacturers can better stock shelves in a timely fashion with products tied to seasons, holidays, and special events, satisfying the need to manage multiple SKUs.

Digital printing can also be used to create differentiating designs in e-commerce. This channel presents unique branding opportunities for companies to engage consumers during the first contact with cartonboard boxes used to deliver their goods. Businesses can seize a new branding opportunity by promoting other product lines on the box or selling the space to other companies. Integrating interactive features onto the cartonboard that promote a customized feeling can also help drive consumers to a brand’s website and simply increase awareness.

Tom Egan is vice president, industry services, for PMMI, The Association for Packaging and Processing Technologies.

PMMI, The Association for Packaging and Processing Technologies, represents more than 900 North American manufacturers and suppliers of equipment, components, and materials as well as providers of related equipment and services to the packaging and processing industry. We work to advance a variety of industries by connecting consumer goods companies with manufacturing solutions through the world-class PACK EXPO portfolio of trade shows, leading trade media and a wide range of resources to empower our members. The PACK EXPO trade shows unite the world of packaging and processing to advance the industries they serve: PACK EXPO International, PACK EXPO Las Vegas, Healthcare Packaging EXPO, PACK EXPO East, EXPO PACK México, EXPO PACK Guadalajara, and ProFood Tech. PMMI Media Group connects manufacturers to the latest solutions, trends, and innovations in packaging and processing year-round through brands including Packaging World, Automation World, Healthcare Packaging, Contract Packaging, ProFood World, Mundo PMMI, and OEM. PMMI Business Drivers assist members in pursuing operational excellence through workforce development initiatives; deliver actionable business intelligence on economic, market, and industry trends to support members’ growth strategies; and actively connect the supply chain throughout the year. Learn more at pmmi.org, packexpo.com, and pmmimediagroup.com.
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Immune health is on a lot of people’s minds these days. “The immune system is one of the most complex in the body, and also one of the most important, as its prime function is to protect us against all kinds of infections—including viral,” says Sid Shastri, MSc, director of product development and marketing, Kaneka Probiotics (Newark, CA).

And while the immune system comprises everything from the thymus, tonsils, adenoids, and spleen to lymph glands and bone marrow, “scientists estimate that between 50% and 75% of all immune cells reside in the gastrointestinal tract as gut-associated lymphoid tissue, or GALT,” Shastri says. “So, it’s no understatement to claim that a healthy immune system emanates from a healthy gut.”

A healthy gut emanates, in part, from a healthy probiotic supplementation routine. But probiotics’ benefits go well beyond the gut, as well. And what we’re seeing these days is a renewed appreciation—and deeper understanding—of the benefits of probiotics.

**Growth Medium**

While consumers are hardly pinning their hopes on a supplement-based cure for the current COVID-19 pandemic—and no responsible party would suggest they do so—the pandemic reminds us that baseline health is tantamount to an insurance policy at times like this, and that what we take into our bodies can bolster and defend it against illness.

“As such, probiotic intake is becoming more prevalent,” says John Deaton, vice president of science and technology, Deerland Probiotics & Enzymes (Kennesaw, GA). “We’re seeing probiotics not only in supplements but increasingly in a variety of functional foods and beverages, from kombucha and hot chocolate to breakfast cereals and sports bars.”

The numbers back him up. *Nutrition Business Journal* reports “sizable 7% sales jumps in 2017 and 2018” for probiotic products, Deaton notes, and though growth evened out at a steady 2% in 2019, the calmer pace, Deaton surmises, is “likely because probiotics evolved from fad to must-have.”

Indeed, only 5% of supplement users included probiotics in their regimens in 2008, but that percentage had more than doubled to 13% by 2016, according to that year’s Council for Responsible Nutrition’s Consumer Survey on Dietary Supplements.

**Mounting Evidence**

It took probiotics to get to that point. While Elie Metchnikoff first observed the beneficial bacteria back in 1905, almost a century had passed before the International Scientific Association for Probiotics and Prebiotics arose in 2002, notes Shaheen Majeed, president worldwide, Sabinsa (East Windsor, NJ).

“Subsequent to that,” he continues, “the World Health Organization’s establishment of a probiotic definition then stimulated the rapid growth in research, clinical trials, and safety assessments we see now.”

And research really is mounting. “New discoveries are emerging at a fast pace,” Deerland’s Deaton says. His back-of-the-envelope PubMed search uncovered more than 27,000 papers published thus far, 13,017 of which dropped within the last five years and 3,770 of which arrived in 2019 alone. And with 1,091 papers going live in the first three months of 2020, he says, “That’s more than 12 papers per day!”

**Firm Foundation**

The research intensity reflects probiotics’ importance to “both human and animal health and wellbeing,” Deaton says. “And
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A healthy gut emanates, in part, from a healthy probiotic supplementation routine. But probiotics’ benefits go well beyond the gut, as well.

it’s incredibly important that this research be published through the process of rigorous peer review and made available for all, including research and data showing negative results.”

Category insiders agree. As Kaneka’s Shastri says, “Rigorous research isn’t just important for probiotics; it’s the essential foundation of the category.”

Jennifer Montgomery, regional probiotics marketing manager, DuPont Nutrition & Biosciences (Madison, WI), even believes that investment in clinical research is the industry standard, and a sign of a company’s seriousness.

“Probiotic research is increasingly being performed with rigor similar to what we see in medical research,” she adds. “Although probiotics’ aim is to support and maintain health, statements around this aim right-clicked on studies using the precise strains and dosages being offered to consumers.

Study results also depend on the subject populations involved. Deerland’s Deaton adds, “Although age populations in probiotic trials haven’t necessarily expanded,” he says, “it’s becoming clearer that a careful breakdown in age between children and adults is important in clarifying benefits.”

For example, a child’s microbiome has largely formed by age three; thus, many microbiome-related effects appear in cohorts younger than this, Deaton explains. By contrast, because the diversity of key microbiota species decreases with age, “supplementation with probiotics in this older cohort can yield specific immune benefits for this population.”

Adding to the specificity are studies that focus on probiotic effects in different gender and lifestyle cohorts, Deaton continues, “with distinct benefits seen among women and athletes.”

Beyond the Gut
And as previously mentioned, the scope of benefits under investigation has expanded well beyond those affecting the gut.

Notes DuPont’s Montgomery, “Though traditional endpoints of intestinal and immune health are still the main drivers, new areas, such as metabolic and mental health, are becoming increasingly important.”

Deaton cheers this development. “Research into novel areas where probiotics can provide support is acutely relevant in current times,” he says. “It’s now so universally accepted that maintaining a healthy gut has benefits for overall health that it’s driving more clinical research assessing on a strain-by-strain or defined multi-strain basis what probiotics can really do to support health in increasingly busy and hectic lives.”

Already, probiotics’ benefits with regard to infant colic, cardiovascular health, sports nutrition, healthy aging, skin condition, and urinary-tract and vaginal health enjoy wide support in the clinical literature. Adds Majeed, “Recent research on the microbiome’s influence on the production of hormones has expanded interest to neurological benefits, thus connecting the gut to brain health.”

Feuz considers this gut-brain axis “a very innovative and dynamic research area.” Meanwhile, she says, Lallemand’s in-house science watch found that only 30% of new clinical studies registered in 2019 investigated gut health, including research on irritable bowel syndrome, Helicobacter pylori, constipation, and infant colic. The next most-studied fields were metabolic syndrome, at 17%, and, at 12%, that dynamic axis between gut and brain.

New Frontiers
When asked to pick the probiotic research that’s captured their attention recently, category experts shared examples that covered the waterfront.

John Quilter, vice president and general manager, Kerry (Beloit, WI), points to “really interesting” research affirming probiotics’ role in gastrointestinal and upper-respirato-
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PROBIOTIC YEAST SUPPORTS VAGINAL HEALTH

BY SEBASTIAN KRAWIEC, ASSOCIATE EDITOR

A RECENT CLINICAL STUDY demonstrated the ability of the probiotic yeast strain Saccharomyces cerevisiae CNCM I-3856 from Gnosis by Lesaffre (Milan, Italy)—branded Quatreflora—to support vaginal health in women. The results were presented during Probiomes Americas 2019 in Vancouver, Canada, and have not yet been published.

In the study, 60 healthy women of child-bearing age, with regular menstrual cycles, normal vaginal flora, normal vaginal pH, and the same efficient contraception method for at least three months, were given either 500 mg per day (2.5x10^10 CFU) of Quatreflora, 1000 mg per day (5x10^9 CFU), or placebo. After four weeks of daily oral supplementation, vaginal samples showed that the migration of probiotics from the intestine to the vagina occurred in 21% of subjects taking 500 mg daily, 16% of subjects taking 1000 mg daily, and in zero subjects from the placebo group. This proportion is comparable to what was observed in previous studies with lactobacilli probiotics, in which 25% of women had the probiotic in vaginal microbiota after four weeks of supplementation. The study also shows that the probiotic survives through the gastrointestinal tract, finding its way into the stool of 80% of subjects taking 500 mg daily, and in 100% of subjects taking 1000 mg daily.

“As far as we know, the migration of a probiotic yeast from rectum to vagina has never been described before our pilot clinical study” said Silvia Pisoni, marketing manager, Gnosis by Lesaffre, in a statement. “Probiotics are very promising candidates in preventing or restoring the imbalance of the vaginal microbiota. According to the findings of the trial, we really believe Quatreflora may contribute to the delicate women’s health.”

Reference

“The strain also produced significant amounts of propionic acid and butyric acid while fermenting cholesterol-rich foods,” notes Majed. “The results open up a new, previously undiscovered direction to explore—the idea that these bacteria could use cholesterol as a carbon source for growth is fascinating.”

A randomized, double-blind, placebo-controlled crossover study confirmed that Lallemand’s Bacillus subtilis Rosell-179 and Bifidobacterium lactis LAFTI B94 strains deconjugated bile acids in overweight, but otherwise healthy, adults, Feuz notes. “The deconjugation of bile acids through microbial bile-salt hydrolase activity has previously been thought to be a regulator of bile acids and cholesterol in the host,” she says. “This study is of high interest as it further establishes the interrelationship between gut microbiota, probiotics, and metabolism, providing a robust scientific foundation for including probiotic formulations as part of an effective dietary-intervention strategy.”

And Kaneka’s Shastri is intrigued by a new meta-analysis demonstrating that probiotic intervention significantly reduces the risk of overall infection in patients undergoing colorectal surgery for cancer. The probiotic intervention was not only associated with fewer infections at the surgical-incision site than was the placebo, he notes: it was associated with a diminished incidence of pneumonia, as well. “This clearly shows that probiotic administration had a positive effect beyond gut infections, as gut probiotics were capable of boosting the immune response in patients’ lungs,” he says. “The logical next step would be to start unravelling the molecular pathways involved, with the ultimate goal of screening for optimal probiotic strains based on their production of such molecules.”

And in an as-yet-unpublished study, researchers looked at the effects of Deerland’s Bacillus subtilis DE111 strain at a dose of 1x10^10 CFU versus placebo in 91 children aged 2 to 6 who attended daycare. After eight weeks, results showed an apparent positive modulation in gut-microbiome profile without altering the overall microbiome equilibrium in children receiving the probiotic. Specifically, researchers saw increased alpha-diversity, suggesting increased functional diversity within the microbiome. The probiotic also increased levels of gut genera...
associated with immune regulation and reduced inflammation.

Results of both clinical trials, Deerland’s Deaton says, “support the diversity of probiotic benefits. Probiotics taken orally not only impact gut health and the gut microbiome, but have systemic benefits including mitigation of cardiovascular disease and support of immune health.”

Looking Ahead
We’ve come a long way from the days when good gut bugs were all about digestion.

“The advance of and easy access to research techniques measuring whole-microbiome and metabolomic shifts in study populations has created new possibilities for assessing efficacy and creating a deeper understanding of the potential mechanisms of action of many probiotic strains,” Deaton concludes. “As this knowledge grows, clinical-trial development becomes more targeted, in-depth, and inclusive of novel areas of health support.”

And that’s a positive sign of the times, as far as Shastri is concerned. “The human body’s different microbiomes have gone from being ‘useless bystanders’ to key players in so many aspects of health,” he says. “Such a paradigm change generates a lot of hype and hope that need to be turned into solid facts, and there’s no other way to do that than with rigorous research.”

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

References
Exploration of the human microbiome has exploded since 2007 when scientists at the National Institutes of Health (NIH) Common Fund launched the Human Microbiome Project (HMP). This groundbreaking study gave way to a deeper understanding of how trillions of microorganisms living in our bodies—including bacteria, viruses, fungi, and even parasites—can influence human health.

“The way we understand the human microbiome has changed phenomenally in a relatively short space of time,” observes Lucien Harthoorn, PhD, research and development director at UK-based prebiotics development company Clasado Biosciences. Yet, while this vast body of science has uncovered numerous ways the microorganisms within us impact everything from digestive wellbeing to maternal health to immunity and more, many questions remain.

A second phase of the Human Microbiome Project—called the Integrative Human Microbiome Project (or iHMP)—was initiated to determine how the microbial makeup of subjects influenced specific health conditions and disease states.

Anke Sentko, vice president of regulatory affairs and nutrition communication for Beneo (Germany), says iHMP examined “the role of the microbiome in human health and disease through a study of the changes occurring in the microbiome and host over time.” The three model conditions examined by iHMP included pregnancy and preterm birth, inflammatory bowel diseases (IBD), and type 2 diabetes.

“Findings from this second phase will help to characterize these conditions and predict the onset of disease or patient outcomes,” she explains. Also, iHMP may help to identify new opportunities for dietary interventions in the future, Sentko suggests. Ahead, we look at some of the research objectives of current microbiome studies in the works.

The Multi-Omic Microbiome Study Pregnancy Initiative (MOMS-PI)

One study within iHMP analyzed how the microbiome of expectant mothers can correlate to preterm birth.

Researchers found that pregnant women who delivered preterm (prior to 37 weeks gestation) had significantly lower levels of the bacteria Lactobacillus crispatus and elevated levels of other microorganisms within the Prevotella species and nine other taxa. The study also found that elevated levels of these specific microorganisms were correlated with proinflammatory cytokines in the vaginal fluid. Notably, these elevated taxa are often linked to vitamin D deficiency.
Inflammatory Bowel Disease Multi’omics Database (IBDMDB)

Another clinical trial within the iHMP examined the dysbiosis of the microbiome among those with inflammatory bowel disease such as Crohn’s disease and ulcerative colitis. It’s estimated that approximately three million Americans live with some form of IBD, according to the Centers for Disease Control.9

The study identified clear microbial features in hosts with IBD. For instance, an unclassified Subdoligranulum species was significantly reduced in IBD subjects, potentially interfering with bile acid metabolism and short-chain fatty acids. Further research is needed to determine if this reduction was host or microbiome driven.

Integrated Personal ’Omics Project (IPOP)

With data from the World Health Organization estimating 422 million people worldwide have type 2 diabetes, scientists are seeking ways to better understand this disease.

This iHMP study analyzed 106 healthy subjects as well as those with prediabetes for four years. Researchers observed many notable differences in the microbiome of those with insulin resistance, prediabetes, and healthy subjects. For example, during immune system challenges such as a respiratory viral infection, healthy participants, participants with insulin resistance, and healthy subjects. For example, during immune system challenges such as a respiratory viral infection, healthy participants, participants with insulin resistance, and those with insulin sensitivity all exhibited significantly different molecular and microbial changes.

Fiber and Flora

In addition to the work done through HMP and iHMP, major studies of the microbiome are being conducted around the world. The journal Nature estimated over $1.7 billion has been invested in research of the human microbiome (20% of that going to the HMP and iHMP).5

This massive investment in research has, of course, spurred innovation in the dietary supplement and functional food and beverage industries, particularly in the area of prebiotics and probiotics.

“The information generated by...[The Human Microbiome Project] is available for use by researchers and manufacturers alike, which has huge benefits to the industry,” comments Clasado Biosciences’ Harthoorn. “Businesses of all sizes now have access to insight and data on the building blocks of human health, bringing unique viewpoints and ideas to the market accordingly. As the industry progresses, efforts are being made to better understand and interpret the data, and more clearly identify how it might directly lead to the improvement of human health.”

Oliver Hasselwander, development leader, microbiome venture, DuPont Nutrition & Biosciences (Copenhagen, Denmark), points to probiotic supplementation as potential catalysts for a healthy microbiome. “Probionts can elicit their health benefits through several mechanisms, such as modulation of composition or activity of the microbiome, of the immune system, systemic metabolic responses, via the central nervous system, improving epithelial barrier function, and increasing colonization resistance against pathogens,” he explains. These actions are mediated by key effector molecules; metabolites or enzymes, such as lactase; and bile salt hydrolases.

Meanwhile, the lack of dietary fiber in the typical Western diet has led to a surge in interest in prebiotics. Prebiotics also have a significant effect on boosting the growth of beneficial bacteria in the gut, notes Harthoorn. “These bifidobacteria are crucial to establishing and re-establishing a healthy balance of the microbiota composition, which we call eubiosis.”

Further Exploration

Stephen O’Hara, CEO of the UK-based life science company Optibiotix, suggests we’re in the “very early stage of a revolution in healthcare where we will start to see pre- and probiotics that may manipulate certain aspects of the microbiome, and so improve healthcare.” He points to science that is seeking ways to “precision engineer the microbiome to increase the presence of a particular bacterial species and metabolites, their gene expression, their enzymes, and even short-chain fatty acids.” Hypothetically, this could also be done to reduce the levels of microbial species linked to disease states. “I think the future lies in the targeted manipulation of the microbiome,” he says.

Of course, continued research is needed to see these interventions in action. “While we understand and can demonstrate that the microbiome can be modulated, there are still gaps in demonstrating that the role of the microbiome is causally linked to positive health benefits, particularly in human clinical studies,” says DuPont’s Hasselwander. He points to continued areas of interest and exploration including how the microbiome impacts nutrient and medication bioavailability and function; research of how digestive health impacts brain function, often called “the gut-brain axis” and how microbial intervention could impact weight gain and obesity.

What’s abundantly clear is that consumers are paying attention and are looking for ways to improve their health by way of the microbiome. “Health Focus International’s 2018 Global Trend Study found that among those surveyed, 42% were very or extremely interested in the gut microbiome,” notes Be-neo’s Sentko.

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References

Natural sweeteners such as stevia (*Stevia rebaudiana*) and monk fruit (*Siraitia grosvenorii*) have skyrocketed in popularity as consumers look for safe, clean-label options to reduce their sugar intake. With the rising prevalence of serious health issues such as obesity and type 2 diabetes, sugar reduction and blood sugar control are top of mind for many.

Industry has stepped up to meet the mounting demand for low- and reduced-sugar foods and beverages featuring ingredients like stevia and monk fruit. According to the Global New Products Database from UK-based market research firm Mintel, the percentage of products containing artificial sweeteners declined between 2014-2019, while the inclusion of natural sweeteners steadily increased. Additionally, a February 2019 presentation from Mintel at the International Sweeteners Colloquium event reported that 59% of surveyed U.S. consumers expressed they would like to see more food and beverages with naturally sourced sweeteners.

Yet, when it comes to foods and beverages (especially sweets), taste is king and consumers have a hard time compromising on flavor and experience. Early introduction of stevia was received with a somewhat tepid response, as many consumers grappled with stevia’s bitter notes and aftertaste.

To address palatability, suppliers in the industry have developed novel ways to improve the flavor profile of these natural formulas through innovative farming techniques, cutting-edge processing and formulation, and continued experimentation.

### Advancements in Agronomy

A primary tactic used to address the issue of taste is the selective breeding of stevia plants to yield higher levels of minor steviol glycosides like rebaudioside M and D, Reb M and Reb D, as they’re commonly called, have a flavor and sweetness more similar to sugar, especially when compared to the legacy, major steviol glycoside rebaudioside A (Reb A).

HB Natural Ingredients (Irvine, CA) has invested in the development of new varieties of stevia with higher concentrations of “more desirable and better-tasting glycosides” like Reb D and Reb M, as well as innovative ways to achieve a higher yield of total glycosides per acre. “While these glycosides have improved taste compared to the more common Reb A, limited availability and high cost still restrict their broad-based use by the industry,” explains Joseph Zannoni, CEO of HB Natural Ingredients.

Thom King, head food scientist and CEO at Icon Foods (Portland, OR), points to soil amendments, selective breeding tactics, and extraction through advanced resin bed filtration as prime ways to improve the quality and quantity of glycosides.

PureCircle (Chicago, IL) has developed a new proprietary stevia leaf variety, which the company claims provides significant advantages compared to previous generations of stevia plants. “These new stevia plants yield greater quantities of our next-generation stevia ingredients,” says Alina Slotnik, vice president of global marketing for PureCircle. “That means more efficient production of our best-tasting stevia leaf sweeteners and our flavor-enhancing and functional ingredients, while improving cost-efficacy and supply chain sustainability.”
81% GROWTH OVER THE PAST 10 YEARS.

Any Questions?

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of its crop, but that the company planned to expand to 90% use of the new varietal in 2020. The company collaborates with farmers across North America, Latin America, Asia, and Africa to cultivate and source its proprietary stevia plants.

When it comes to monk fruit, however, King says agronomy plays a lesser role in the development of its flavor and sweetness, "since it is an actual fruit that grows on trees and has a longer time to maturity."

However, the vertically integrated producer of plant-based sweeteners, Layn (North Beach, CA) has developed a proprietary variety of monk fruit that can naturally produce 20% more mogrosides. With the increased levels of mogrosides in the new variety, called Super V Fruit, the company aims to reduce the land, water, and other natural resources needed to grow monk fruit, the company said in a press release.

### Processing and Formulation

It’s not just how the plants are grown, but how the extracts are formulated and processed that’s important to developing an ideal sweetness and flavor profile.

One popular formulation trend seen in the category is the blending of natural sweeteners to deliver an ideal taste and texture to finished products. The food science division at Icon Food has taken to combining natural sweeteners, King explains, to better replicate the taste, mouthfeel, and functionality of traditional sugar. As an example, he cites the company’s branded sweetening system KetsoseSweet+, which combines the rare sugar allulose with stevia and monk fruit. “This combination has parity with the sweetness level of sucrose (table sugar). Since allulose is a saccharide, it functions in Maillard and enzymatic reactions.”

Additionally, Cargill developed ViaTech Stevia Leaf Extract, a branded line designed to help formulators achieve up to 50% sugar reduction. "At Cargill, we’ve spent more than 300,000 hours studying the unique properties of the stevia leaf, searching for the optimal balance of sweetness and taste. As part of that research, we developed our ViaTech portfolio of stevia leaf extract sweeteners," explains Andy Ohmes, global director of high-intensity sweeteners for Cargill. "ViaTech uses a proprietary taste-prediction model to precisely predict which combinations of sweet components deliver optimal taste and sweetness."

Enzyme-modified extracts, such as HB Natural Ingredients’ Vitosa line, allow formulators to improve taste and reduce cost, says Zannoni. “These ingredients overcome the bitterness and delayed sweetness onset seen with traditional leaf extracts, in addition to having a solubility in water over 50%. Furthermore, the Vitosa products provide a uniform and consistent taste profile and are used by formulators as both ‘general use sweeteners’ (FDA GRAS) and as ‘natural flavors’ (FEMA GRAS).” HB Natural Ingredients strategically partnered with Batory Foods (Rosemont, IL), a national distributor in the sweetener solutions category, to solve food and beverage manufacturer challenges associated with stevia and other sweetener systems.

Katharina Pueller, director, natural sweetener business at SweeGen (Rancho Santa Margarita, CA), describes how the plant-based bioconversion of stevia sweeteners is making them more sustainable and scalable. “This means that enzymes are added to a stevia leaf extract and bio-convert molecules into better-tasting ones. This process mimics the maturity process in the leaf. The end products are non-GMO and best-tasting.”

Icon Foods’ King also underscores the benefits of enzymatically modified stevia for both yield and flavor. “The enzymatic addition of glucose moieties to a steviol glycoside structure results in a mix of glucosylated steviol glycosides and steviol glycosides,” he explains. “The glucosylated steviol glycosides have shown to have fewer off-notes and are GRAS status for use in food products.”

### Growing Market Share and Usage

The major forces driving growth of natural sweeteners—sugar reduction and cleaner labels—show no signs of abating.

“As long as the consumer trends continue to lean into clean-label sugar reduction, the demand for clean-label sweeteners and sweetening systems will continue a rapid growth cycle,” predicts King. “Consumers demand clean-label sugar reduction coupled with tastes they can enjoy that replicate sugar without the metabolic effects. Continual innovations in processing methods and agronomy will make constant and never-ending improvements and increased consumer acceptance."

However, achieving the right taste will remain key, urges Cargill’s Ohmes. "Consumers want reduced-sugar foods and beverages made with familiar ingredients—but not at the expense of great taste.” Taste, he says, will remain "the single biggest driver of purchase intent.”

*Lisa Olivo of Olivo Copy & Creative is a writer, copywriter, and creative consultant serving the health and wellness industry. She specializes in content creation and brand communications.*
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Plant Based

What does it take to win in the plant-based market?

BY KIMBERLY J. DECKER

ime was when following a plant-based diet meant eating a lot of salads. Fortunately for the 38% of Americans now trying to add more plant-based foods to their routines¹, today’s options aren’t nearly so limiting.

Roughly 800 new plant-based products hit shelves from 2017 to 2019, per Mintel’s Global New Products Database (GNPD), reflecting not just the category’s popularity, but its mainstream status, too. Yet that status is tipping an already-crowded market toward overflowing, even as rising consumer expectations make it harder for any SKU to stand out.

So while consumers may be “clearly intrigued by the tidal wave of new plant-based products,” says Melissa Machen, senior technical services specialist, plant protein, Cargill (Minneapolis), “brands have just one chance to impress. Manufacturers will need to up their formulation games or risk watching the category dissolve into a passing fad.”

Far from Fringe
Plant-based eating may be the dietary phenomenon of our era—and beyond. As Hamutal Cohen Yitzhak, CEO, director, Else Nutrition Holdings Inc. (Tel Aviv), puts it, “With more plant-based products and brands emerging, it’s evident that plant-based isn’t fringe; it’s the future.”

The movement’s ascendance has struck Cargill’s Machen for some time, particularly in the widespread availability of plant-based options not just in supermarkets, but also on menus and at institutions. “Innovative brands have launched a tsunami of products into this space, giving consumers a plethora of choices and ways to try alternative proteins,” she says.

And from Jenny Palan’s perspective, “Collaborations with food-biz majors and colonization of the traditional dairy and meat cases are definitely signs that plant-based has moved beyond being just a fringe category to being established.”

Flexing Their Muscle
Another sign of its status, says Palan, a strategic market research manager at Kerry North America (Beloit, WI): “Plant-based has evolved beyond appealing solely to vegans and vegetarians.”

According to the 2019 International Food Information Council Foundation Food and Health Survey, one third of consumers eat...
plant-based protein daily, with three quarters viewing it as healthy. Yet 2018 polling from Gallup found only 5% of Americans identifying as vegetarian, and fewer still—3%—as vegan.

So the wheel of the plant-based bus rests largely in the hands omnivores and flexitarians—the latter of whom comprised 44% of U.S. consumers in supplier ADM’s (Chicago) 2020 OutsideVoice Protein Perception & Awareness Study. And their top motive for plant-based purchasing: “healthy living/healthy aging.”

Healthy perceptions are just the start. “Consumers are more aware of the potential negative effects to the planet of consuming animal products,” says Chris Kerr, CEO and cofounder, Good Catch (New York City), “including damage to the ozone layer from farming beef, and overfishing of our oceans for seafood.”

The result, he believes, is “an increased desire and even need for products that ease these unnecessary harms to the environment and our health. This has allowed the plant-based sector to grow exponentially.”

**New Meat; New Milk**

Much of that growth comes from plant-based meat and dairy, which has “really changed consumer perceptions and increased acceptance of plant-based alternatives,” says Jatin Sharma, global market manager, Roquette (La Madeleine, France). “Today’s products have a similar taste, look, and texture to what consumers expect, which has helped break down stereotypes that consumers might have had after being disappointed with alternatives from the past.”

Christine Addington, senior dairy technical service specialist, Cargill (Minneapolis), agrees. “It’s amazing how the plant-based dairy space has grown and evolved with products that are actually tasty and have good texture.”

She recalls as a graduate student helping a major food manufacturer create a plant-based yogurt. “At the time there were few technical solutions available to create an acceptable product,” she says. “Fast-forward 10 years and we have ingredients that allow us to craft products very similar to dairy yogurt.”

Similar, perhaps even more revolutionary, progress has attended the evolution of plant-based meats. Burgers, patties, sausages, and crumbles were “category pioneers,” Cargill’s Machen says, and for good reason: “Burgers are a forgiving format, as they’re usually served on a bun with condiments and toppings that add flavor, texture, and juiciness.”

Now, “We’re seeing products that closely mimic traditional meat in color, texture, and bite,” she declares. “It’s clear that some brands are striving to create products that are indiscernible from meat, and they’re making significant progress toward that goal.”

**Thank a Food Scientist**

Their strategy: “It starts with better ingredients,” Machen says.
JUST THE WAY YOU ARE: GOING PLANT-BASED FOR PLANT’S SAKE

When consumers think of “plant-based,” alternatives to meat and dairy usually come to mind. But, says Christine Addington, senior dairy technical service specialist, Cargill (Minneapolis), “Terms like plant-based and vegan are turning up in many applications outside dairy and meat. Snacks, cereals, sauces, convenience products—the plant-based revolution seems to be everywhere.”

That makes sense to Ryan George, marketing manager, Kerry North America (Beloit, WI). Tracking the Mintel Global New Products Database from 2017 to 2019, he saw plant-based launches grow 600% for dressings and vinegars, 300% for savory spreads and dips, 186% for sauces and seasonings, and 129% for snacks.

Why so much plant-based innovation? Consider that snack seasonings like sour cream and onion or nacho cheese are traditionally dairy based, George says. “Consumers are still looking for the rich, dairy-like taste in these applications, but in plant-based formats.”

Not all plant-based patrons want dairy or meat replicas, adds Kendall Miller, brand manager, Ancient Harvest (Boulder). “Some just want a clean nutrition label with easily recognizable ingredients that come from plants and have been minimally processed,” she says.

She’s seen this shift everywhere “from tradeshows to marketing communications,” she says. “There seems to be a growing callout of plant-based ingredients on packaging in multiple categories.”

Like infant formulas. “That’s an area where product developers are now using organic, hypoallergenic ingredients,” notes Mindy Leveille, strategic marketing manager, proteins, Kerry Taste & Nutrition (Naas, Ireland). And hypoallergenicity is key, “as the plant-based formulas are often solutions for infants with intolerances or allergies.”

Such is the case with Else Nutrition. The company’s namesake product is a plant-based formula that’s not just free of allergenic dairy ingredients, but of soy, too. “We’ve used the benefits of almonds, tapioca, and buckwheat to create a new plant-based, soy-free alternative to formula that imitates human milk’s nutritional composition,” says Hamutal Cohen Yitzhak, CEO and director of Else Nutrition Holdings Inc. (Tel Aviv).

“We know that a product like this isn’t a fad, but a necessity for families who have been searching for a real alternative to dairy and soy formulas,” she says.

The formulation emerged from the knowledge that the essential fatty-acid profile of almonds almost mirrors that of breastmilk, obviating the need to “piece together the fatty-acid profiles from various highly-processed oil sources,” Yitzhak explains. What’s more, the formulation’s combination of almond and buckwheat yields a protein profile resembling breastmilk’s.

Even pasta’s getting in on the plant-based game. “Pasta has always been plant-based,” notes Greg Forbes, CEO, Explore Cuisine (Red Bank, NJ). But Explore’s products, he believes, are different. “If you look at protein levels, our legume-based products have significantly more protein than traditional pasta. We’ve also got a lot more fiber.” Their edamame spaghetti delivers about 40 grams of protein per 100 grams, is very high in fiber, and has 7 grams of net carbs.

Forbes notes that the company launched a spirulina-boosted edamame pasta with the protein, fiber, and lower carbs of the original, but with spirulina-sourced iron, too—a mineral often in short supply among vegetarians. “We’re looking at how to take our base ingredients and add superfoods to them,” he says. “To me, it’s the best product we’ve ever made.”

And those ingredients start with food science. That’s why Mindy Leveille, strategic marketing manager, proteins, Kerry Taste & Nutrition (Naas, Ireland), sees improvements in the category as “a tribute to food scientists and researchers finding ways to integrate new ingredients that make taste and texture come alive.”

Consider that texture defects in plant-based meat often arise when proteins display low solubility and poor gelling and water-holding capacities. Plant proteins have “come a long way in the last decade,” Machen notes, with solubility, mouthfeel, and stability all improving to the point where “we can produce meat analogues that are closer to their animal-protein counterparts.”

Adds Addington, “With a greater understanding of the molecular structure and chemistry of plant proteins, we can work with them in ways that are ideal for their inherent physical makeup. We’ve also made substantial advances in processing technology, which allows us to produce plant proteins with better taste and color, as well as solubility.”

Power Proteins

Machen believes pea protein stands out as novel enough to excite, yet not so much “that it feels unfamiliar to consumers.”

Cargill’s Puris pea protein is highly soluble, dispersible, and ideal for plant-based dairy thanks to its mouthfeel, Machen says. For meat analogues, it’s available in textured and powdered forms, both of which contribute meaty chew and viscosity along with “strong nutritional attributes.”

The company minimizes the pea protein’s characteristic “beany” notes by using yellow-pea seed varieties selected for their minimal off flavors and a hexane-free process that further tilts the protein’s profile toward neutral.

Silvia Schnicker, area marketing head, Americas, and global market manager at Roquette, notes that the company’s Nutralys pea protein also has “a pleasant taste” in plant-based applications. Roquette follows a mostly mechanical protocol to mill the peas into flour, disperse the flour in water, and then physically separate the starch, fiber, and proteins, which are gently dried “to preserve quality,” she says.
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Roquette is already looking beyond pea and in late-2019 launched its first textured protein made from fava bean. Schnicker describes it as environmentally appealing, sustainable, and having “all the characteristics of being the next big thing in the plant-based protein domain.”

But Jacquelyn Schuh, product marketing director, alternative proteins, ADM, encourages processors to consider established proteins like soy and wheat gluten, which she credits as “among the best texture-enhancing ingredients with wide availability and cost-effectiveness.” Like newer pea and bean proteins, they also create the right bite, crumble, and juiciness in meat alternatives, she says.

**Success Stories**

Success Stories  
Such ingredients have yielded success stories in alternative-dairy and -meat spaces.

“Vegan cheese is certainly one of the most challenging applications,” Cargill’s Addington says, “but it’s also an extremely exciting space to watch.” Dairy proteins contribute critical properties that translate as stretch, mouthfeel, texture, aging, and flavor, she notes, and plant ingredients don’t perform as well.

“That said, a number of manufacturers have dived into this space and launched vegan shredded, sliced, and block cheeses that sometimes get really close to duplicating traditional dairy characteristics,” she adds. “With help from hydrocolloids, starches, and fibers, industry’s making improvements every day.”

Advances in alternative meats have also attracted attention, with technologies like high-moisture extrusion allowing processors to “make strides toward recreating the texture, appearance, and bite of striated muscle fibers.” Machen says—qualities that she notes are among the most difficult to recreate.

As for nuggets and patties, textured pea and soy proteins continue to deliver convincing texture, and Machen mentions that some brands are even tackling plant-based seafood.

**Smooth Sailing**

Good Catch is at the vanguard. Inspired by “a lack of plant-based seafood options despite the immense growth of plant-based meat,” Kerr says, the founders created a plant-tuna of their own.

The principal hurdle involved replicating tuna’s characteristic “layering of protein,” Kerr says, which is especially apparent in the cooked fish. “We spent 18 months working on this flaky texture before even diving into taste development.”

Ultimately, the company settled on a formulation comprising a six-legume blend—peas, chickpeas, lentils, soy, fava beans, and navy beans—and algae oil, which Kerr calls “the special plant ingredient that captures seafood’s authentic flavor.” Running that mix through a “leading-edge process” produced the texture and taste the company aimed at.

With that accomplished, “We have products in the pipeline that expand beyond plant-based tuna and dive into the frozen category, including plant-based crab and whitefish,” Kerr notes. And a joint-distribution deal with Bumble Bee Foods “shows that we’re breaking ground in the space. The commitment of long-established industry members shows that the direction for the category is up.”

**Room to Grow**

Their achievement, and those of plant-based frontrunners like Beyond Meat and Impossible Foods, marks a substantive turning point for the category, and the industry.

But, says Roquette’s Sharma, “Though the quality and appeal of plant-based products has improved significantly, we still have to work at bringing all the sensory and nutrition aspects together in one product.”

Nailing the organoleptics remains complex in meat analogues, where the “distinct bite, chew, succulence, lubricity, and firmness are difficult to replicate,” Machen says. Despite advanced proteins, formulators still often need hydrocolloids, starches, and binder systems to “achieve the optimal balance between a firm bite and juiciness,” she notes.

Alternative dairy also has wrinkles to iron, including texture. Milkfat supplies much of the texture and mouthfeel we associate with dairy, and in its absence, native starches, chicory root fiber, and pectins can contribute richness and creaminess. “These label-friendly ingredients also provide stability and syneresis control while withstanding nondairy applications’ harsh processing,” Addington says.

And despite the advances of flavor-masking systems in correcting the beany, earthy, malty, and sulfur-like notes that haunt some plant-based ingredients, taste remains a purchase barrier—the primary purchase barrier, in fact, per ADM’s OutsideVoice Protein Segmentation Study.

**Quality, Not Quantity**

Regarding nutrition, Jing Zhou, protein clinical scientist, Ingredion Inc. (Westchester, IL), believes it’s important to try to match plant-based alternatives’ nutritionals to their dairy and meat models, given the role they play as vegan and vegetarian consumers’ primary protein sources.

“While plant-based protein sources are perceived to have lower protein quality,” she notes, “many—like cereals and legumes—are complementary regarding their amino acid profiles. So if a person is consuming proteins from a variety of sources, including complementary ones, they should get enough protein of good quality.”

Kerry’s ProDiem Complete plant protein combines complementary pea and rice proteins in a ratio that’s nutritionally equivalent to dairy, egg, or meat, Leveille says.

Adds ADM’s Schuh, “Soy proteins offer high protein quality, with a PDCAAS (protein digestibility corrected amino acid score) of 1, and can be a further value-add when blended with pea protein, ancient grains, and legumes to achieve a well-rounded, functional nutritional profile.”
Yet plant-based foods best their animal counterparts vis-à-vis their higher fiber and lower saturated fat and cholesterol contents. “These factors improve metabolic health,” Zhou says, “which is a factor in people’s decision to switch to plant-based alternatives in the first place.”

Plant-based foods are also richer in potassium, magnesium, and vitamins E and C, “which presents opportunities to develop foods to support cardiovascular, nerve, muscular, and immune health,” Zhou continues. That said, poor showings in vitamins B12 and D, calcium, iron, and zinc mean that products, especially dairy alternatives, often need fortification to bring nutrition up to par, she says.

**Clean Sweep**

And while plenty of consumers flock to plant-based products in search of “cleaner” alternatives to traditional meat and dairy, plant-based products don’t always live up to that reputation. This can be a problem, as 60% of respondents to ADM’s OutsideVoice Primary Research Study claimed that recognizable ingredients influence their purchase decisions, while two-thirds expressed interest in labels with the shortest ingredient lists.

“Keeping ingredient lists clean and familiar will help elevate the health reputation of plant-based products,” says Ryan George, marketing manager, Kerry North America (Beloit, WI). “Key ways of doing this include using natural flavors, extracts, and preservatives; clean-label options for maintaining freshness and shelf life; and clean-label plant-based dairy and meat systems.”

However, Kerr counters, “Clean’ doesn’t necessarily mean a short ingredient list. All plant-based alternatives need a series of building blocks to attain the mouthfeel, performance, and flavors we seek—the same way a house’s foundation is the combination of elements that create a habitable structure. It’s never just the protein alone.”

In the end, says Kendall Miller, brand manager, Ancient Harvest (Boulder), “If consumers want to eat more cleanly, they need to look for labels that have recognizable ingredients that come from real whole foods.”

**What Will It Take?**

Other than clean labels, nutrition, and spot-on organoleptics, what else will it take for a plant-based competitor to survive to the next round?

“In simplest terms,” surmises Kerr, “perpetual innovation. Look at where the sector was 40 years ago, 10 years ago, and now today. Imagine where it will be in just a decade. The advances that a relatively small amount of R&D accomplished in the last four years alone has reshaped a 70,000-year-old paradigm, and none too soon.”

*Kimberly J. Decker writes for the food and nutrition industries from her base in the San Francisco area.*

**Reference**

Weight management is becoming more measured and practical, with consumers opting for holistic approaches over crash diets and too-good-to-be-true supplements.

**Fight Cravings**

One great way to manage one's weight is to eat food or take supplements that heighten the feeling of satiety—in other words, that make one feel fuller for longer. This, in turn, prevents a person from eating excessively or frequently throughout the day, as we are all prone to do. A number of popular weight management ingredients operate in this way, though from a variety of different mechanisms.

Fiber is a good example of an ingredient that not only supports satiety for weight management but can also have positive effects on blood glucose. IFF Health supplies a fiber derived from fenugreek seeds called FenuLife that not only supports weight management and blood glucose but also reflux. In a study published in *Phytotherapy Research*, the ingredient was found to significantly increase satiety and improve insulin response when given to subjects in 8-g doses. Compared to no treatment and 4 g of FenuLife, the higher 8-g dosage was associated with significantly higher measures of satiety and fullness, and significantly lower measures of hunger and prospective food consumption.

Another ingredient from IFF Health that promotes satiety is SlimPro, which is made up of fish protein hydrolysates derived from whole blue whiting fillets. “[SlimPro] increases the satiating hormones CCK and GLP-1 during the digestion process, leading to a sensation of satiety and, as a result, supports weight loss,” explains Li. A study published in *Food and Nutrition Research* found that supplementation with SlimPro at doses of 1.4 and 2.8 g per day for 90 days significantly increased levels of CCK and GLP-1, and significantly improved body composition. Compared to placebo, supplementation significantly improved body weight, body mass index, fat mass, extracellular water, waist circumference, thigh circumference, and hip circumference.
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According to the researchers, the mechanism of action for weight management for the ingredient may be both indirect and direct. The indirect mechanism is the decrease in food intake stimulated by CCK and GLP-1 secretion, which leads to a decrease in total calories. The direct mechanism is the decrease in adipose tissue mass mediated by GLP-1 interaction with leptin.

An ingredient distributed by PLT Health Solutions also promotes satiety in a unique way. "Supresa Crave Control, derived from the flowers of a special cultivar of Crocus sativus L., offers a special route to weight loss support—by enhancing the neurotransmitter serotonin and reducing the desire to snack between meals," explains Fink. Crocus sativus L. is more commonly known as saffron crocus.

In a randomized, placebo-controlled, double-blind study published in Nutrition Research3, mildly overweight women were given either Supresa or placebo twice daily for eight weeks. Neither the supplement nor placebo group had any caloric restrictions during the course of the study. Results showed that compared to placebo, subjects taking the supplement saw significantly decreased snacking frequency. The group taking Supresa also saw significant reductions in body weight compared to placebo, demonstrating that reductions in snacking had a tangible effect.

According to the researchers, "Modulation of norepinephrine and dopamine pathways, as well as selective serotonin reuptake inhibition, represent likely targets for a central component of saffron efficacy." However, the researchers don’t rule out the possibility that saffron may have a direct effect on the GI tract, considering the physiology of appetite involves complex central and peripheral mechanisms under the control of different signaling peptides in the stomach mucosa and GI tract.

The ingredient is also versatile. "While Supresa can be used as a standalone ingredient, it can find its place in any weight loss product or program because its unique benefit—support for the control of craving—works as a complement," explains Fink. "Supresa is a perfect ingredient for use in foods and beverages, especially in meal replacement and meal program applications. It has a low organoleptic impact. Other trending uses are lollipops, gums, chews, and shakes because it offers a low dose, minimal organoleptic impact, and excellent solubility."

**Fight Stubborn Fat**

Some weight management ingredients not only support satiety but also work through a variety of other unique mechanisms. One example is CitruSlim, a combination of citrus flavanone-O-glycosides and eurypeptides from Eurycoma longifolia.

"This potent blend promotes an anabolic state, reduces cortisol (which encourages accumulation of belly fat), activates AMPK (adenosine monophosphate-activated protein kinase, an enzyme needed to burn fat and sugar), as well as reduces triglycerides and fatty liver," explains Annie Eng, CEO, HP Ingredients (Bradenton, FL). "The ingredient accelerates weight and fat loss by encouraging the production and sustenance of energy, which thus increases calorie burning. This also impacts appetite through reducing hunger periods and intensity, as well as prevents the body from storing fat."

In an unpublished study, Eng says, 50 moderately overweight men and women participated in a six-week program that involved stress management, nutrition intervention, and exercise. Forty subjects received 200 mg per day of CitruSlim, and 10 received placebo during the course of the study. Supplementation with CitruSlim saw significant reductions in weight loss averaging 2.7 kg. Of the weight loss, 2.4 kg represented fat loss, suggesting that 87% of the total weight loss is body fat loss, explains Eng. While the placebo group also saw significant weight reduction, it was to a much lesser extent.

Results also showed that the testosterone: cortisol ratio significantly decreased by 15% among subjects compared to placebo. "As such, the conclusion is that CitruSlim promotes an anabolic state through maintaining normal low cortisol levels and normal high testosterone levels; higher testosterone contributes to increased sustained energy and reduced fatigue," says Eng. "This leads to the success of weight loss, which then increases rates of compliance or continuing with the program as a lifestyle even after the weight mark has been achieved."

Eng brings up a valid point about compliance. Supplements shouldn’t be used as a way to lose weight but as an assist. Changing one’s eating habits and exercising can be a frustrating endeavor if results are slow, or nonexistent. Therefore, taking an efficacious supplement not only promotes results but also persistence with a healthier lifestyle.

Another way to improve compliance is through delivery formats. As Fink mentioned before, PLT’s Supresa ingredient is a versatile solution that can be incorporated into foods, beverages, and even confections. PLT has also released a water-dispersible version of its Slendacor ingredient to meet demand for products in these categories.

"One of the major changes has been the proliferation of delivery systems for weight management ingredients and products," says Fink. "We’re seeing a lot more beverages, foods, gummies, and dissolvable powders."

Slendacor is a patented formulation that combines turmeric, moringa, and curry leaf. "Slendacor’s patented approach to supporting weight management targets fat metabolism: it inhibits accumulation of fat in fat cells (lipogenesis) and enhances breakdown of fat cells (lipolysis)," explains Fink.

These effects not only support the weight and appearance of users, but also help improve their health overall. In a recent double-blind, placebo-controlled clinical trial4, 140 overweight men and women were either given 900 mg of Slendacor per day or placebo for 16 weeks. Results showed that subjects taking the supplements saw significant decreases in weight compared to placebo, as well as significant reductions in waist and hip circumference. Beyond that, subjects taking Slendacor also saw significant improvements in lipid profiles compared to placebo. More specifically, these subjects saw reductions in low-density lipoprotein (LDL) cholesterol, and increases in high-density lipoprotein (HDL) cholesterol, resulting in a significant improvement in LDL:HDL ratio.

In addition to the ingredient being available in a water-dispersible version, because Slendacor has been studied in both men and women, this fact opens it up to a more diverse set of formulations. "Most weight management clinicals are conducted on women only," says Fink. "So, if one were developing a product targeting man or for the general population, one might feel more comfortable with the Slendacor science."
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Glucose, is a multifunctional approach to managing proper blood glucose levels and oxidative stress as well. “There is no magic bullet for weight loss, and many consumers are no longer looking for one. They want options that are nutrient-rich, efficacious, and convenient, delivering results that not only affect their appearance but also ensure they remain healthy. Dietary supplements and functional foods need to be incorporated into consumers’ overall lifestyles.”

“As consumers are continuing to become more educated, they have also been shifting their diets to fit in food options that are more nutrient rich, opening up opportunities for brands to deliver functional foods and beverages that offer the nutrient profile that consumers need to improve their target metrics,” says Brewster.

References

Support Overall Health
For some, weight loss may mean fitting into an article of clothing, but for others, it has far greater implications for their long-term health and even mortality. Obesity can have a great deal of comorbidities stemming from lifestyles of obese individuals. “Excess weight can increase the production of pro-inflammatory cytokines, resulting in an inflammation imbalance,” explains Rob Brewster, president of Ingredients by Nature (Montclair, CA). “This can start a chain of reactions that affect the body’s ability to manage proper blood glucose levels and oxidative stress as well.”

Because of this inflammation imbalance, a sedentary lifestyle and obesity can eventually lead to prediabetes. “This means that their fasting glycemia is above the normal range, but not high enough to cause type 2 diabetes,” says Brewster. Luckily, prediabetics still have a chance to normalize their blood glucose levels and reverse the condition with major lifestyle changes. Supplements, like Ingredients by Nature’s Eriomin Glucose, can help.

“Our lemon flavonoid blend, Eriomin Glucose, is a multifunctional approach to prediabetes management,” he explains. “The flavonoid eriocitrin is able to support healthy blood glucose function by addressing insulin sensitivity, generating potent antioxidant activity to balance a rise in reactive oxygen species, and inhibiting cytokine production to help manage the inflammation response within a healthy range.”

Black seed oil will also support health factors related to obesity, says TriNutra’s Zelkha. “There have been more than 50 recent studies into the effects of black seed oil (BSO) for a wide degree of applications, including those that have demonstrated benefits for those who are overweight and positive effects on metabolic health,” he tells Nutritional Outlook. “Research on a branded black seed oil, ThymoQuin, which is standardized to 3% thymoquinone and has a free fatty acid content below 2%, revealed its ability to improve metabolic balance and liver function—two vital areas that need to be addressed with obesity-induced conditions.”

A recent animal study found that the standardized black seed oil supported metabolic function and fatty liver in mice given a high-fat diet. The high-fat diet increased blood pressure and fasting blood glucose in mice; however, supplementation with the black seed oil created significant reductions in blood pressure and fasting blood glucose. It also had hepato-protective effects, reducing hepatic fat accumulation and preventing the development of non-alcoholic steato-hepatitis, and liver fibrosis. According to Zelkha, black seed oil may also work synergistically with omega-3 fatty acids to support conditions related to obesity—specifically, insulin resistance and fatty liver.

MUSHROOM SUPPORT WEIGHT, CHOLESTEROL IN STUDY
A study recently published in the American Journal of Biomedical Science and Research found that proprietary water-soluble polysaccharides from Agaricus bisporus (H2Oslim by Nutraceuticals Group; Bloomingdale, NJ) may reduce body weight and support lipid parameters. In the randomized, double-blind, placebo-controlled study 100 healthy overweight volunteers were given either 400 mg per day of H2Oslim or placebo for 12 weeks, and evaluated at baseline, 4, 8, and 12 weeks.

Results showed that subjects taking H2Oslim experienced significant reductions in body weight, waist circumference, plasma total cholesterol, and LDL cholesterol, compared to placebo. Both groups showed similar food intake habits and energy levels. Changes in weight and waist circumference showed significance compared to placebo at week 4 to week 12, with lipid parameters showing significance at week 12. Based on the results, the researchers conclude that polysaccharides from the common mushroom Agaricus bisporus are an efficacious, allergen-free, and water-soluble alternative to chitosan.
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A men’s aren’t getting any younger. According to Census Bureau data from 2019, the median age has increased from 37.2 years in 2010 to 38.2 years in 2018. Meanwhile, the percentage of the American population who is 65 years old or older reached 16% in 2018, which is a 30% increase since 2010.1

As men age, there will be an increased demand for products and ingredients that support healthy aging. A 2019 report by market researcher Technavio predicts that the global antiaging ingredients market will experience a 5% CAGR through to 2023.2 A growing interest in antiaging products for men will create opportunities for new ingredients that can address issues like prostate problems, sexual dysfunction, and muscle loss. Here are some of the recent developments in men’s healthy aging ingredients that are creating opportunities for new and established brands.

**Maca Reduces Fatigue, Sexual Dysfunction**

Previous studies have affirmed maca root’s (*Lepidium meyenii*) positive effects on sperm count in both humans3 and animals4. New clinical trials are assessing its efficacy as a strength enhancer, vitality booster, and sexual performance aid. One study, a randomized, double-blind, placebo-controlled clinical trial, assessed the effects of a patented Peruvian maca ingredient—Lepidamax from Nutrition 21 (Purchase, NY)—on these three dimensions in 47 healthy subjects (22 males and 25 females) between the ages of 18 and 53. Participants were randomly assigned to receive either three 700-mg doses of Lepidamax-brand maca root per day (n=25) or a matching placebo (n=22) for the duration of the trial. All participants were assessed for body composition and handgrip strength at intake and on day 28. All participants completed the Profile of

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**Entering the Testoster-Zone**

New developments in healthy-aging ingredients for men

BY MIKE STRAUS

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Men’s Health

Mood States questionnaire and the Derogatis Interview for Sexual Functioning both at intake and on day 28.

The male participants in the treatment group saw statistically significant increases in handgrip strength and sexual behavior, as well as a statistically significant decrease in fatigue, relative to the placebo group. The study authors concluded that maca root may reduce fatigue, boost strength, and improve sexual function in healthy men.5

Aimee Masterson, marketing director for Nutrition 21, says that the men’s healthy-aging market is being driven by consumers’ desire to maintain their health into old age. As life expectancy rises, Masterson says, more aging men will seek out products to help them live well.

“Consumers aren’t just looking to manage aches and pains,” Masterson says, “but to live their most optimal life at any age. That’s why we’re seeing sports nutrition and vitality products targeting the ‘aging male’ profile.”

**Fenugreek Extract Maintains Strength and Fitness in Aging Men**

Fenugreek extract (Trigonella foenum-graecum) continues to show positive results in clinical trials assessing its efficacy as a fitness supplement. Aging men, according to Gencor (Irvine, CA) Marketing Director Maggie McNamara, make up a large and growing segment of the active-living supplements market, and among their primary health concerns are their mobility and capacity to live independently. These consumers are seeking supplements that aid in their ability to stay fit.

“Difficulty moving around is one of the top concerns of aging Americans,” McNamara says, “The elderly face challenges and opportunities that previous generations didn’t encounter. Twenty percent of men over the age of 60 have testosterone levels below the normal range, and that figure rises to 50% for men over 80. This is due to sex hormone-binding globulin (SHBG) binding to testosterone and decreasing levels of total and free testosterone over time.”

McNamara notes that low testosterone levels can result in loss of muscle mass, loss of bone density, and loss of libido. Age-related testosterone loss also causes decreased metabolism and an increase in inflammation, she says, which is why testosterone-boosting supplements are gaining popularity among older adults.

One 2016 randomized clinical trial6 assessed the efficacy of Gencor’s branded Fenugreek extract Testofen on reducing symptoms of andropause in 98 healthy, physically active men between the ages of 43 and 70. Participants were randomly assigned to receive either 300 mg (n=35) or 600 mg (n=31) of Testofen, or a matching placebo (n=32), per day for 12 weeks. Participants were assessed on muscle strength, aerobic endurance, body composition, body mass, total testosterone, and Functional Threshold Power at baseline and after 12 weeks.

Relative to the placebo group, the 600-mg group showed statistically significant increases in lower body strength, Functional Threshold Power, and total testosterone levels. The 600-mg group also showed decreases in body mass and increases in percentage lean mass relative to both the placebo and 300-mg groups.

McNamara says that aging men are becoming more open to the idea of taking supplements to assist with healthy aging. Sexual health supplements, in particular, are becoming more popular among older adults.

“Supplements to improve male sexual health now abound. The widespread misconception that elderly adults no longer have sex has long been discredited. While sexual activity generally declines with age, a study published back in 20087 found that more than half of those aged 65 to 74 continued to be sexually active.”

**New Study Reveals Tongkat Ali’s Mechanisms of Action**

Research on tongkat ali (Eurycoma longifolia) as a sexual enhancer has, in the past, focused on its ability to boost testosterone and sperm count. Now, though, new studies are showing that it also interacts with enzymes to promote proper erectile function.

A 2019 *in vitro* chromatography study revealed an important mechanism of action behind LJ100, a branded tongkat ali supplement produced by HP Ingredients (Bradenton, FL). Using an aqueous tongkat ali extract standardized at 10 micrograms per milliliter, the researchers determined that the extract successfully inhibited Rho-kinase II (ROCK-II) activity by up to 81%. In contrast, a vehicle control substance produced only a 2% inhibition of ROCK-II. The study authors concluded that “The traditional use of *E. longifolia* as aphrodisiac and for male sexual disorders might be in part due to the ROCK-II inhibitory potential.”8

Annie Eng, CEO of HP Ingredients, says that other studies on LJ100 have found other mechanisms of action that account for its other effects. Eng says that HP Ingredients’ 15 clinical trials on LJ100 have revealed that tongkat ali also heightens sexual fulfillment by boosting dopamine and improves vasodilation by inhibiting phosphodiesterase-5 (PDE-5), arginase, and angiotensin I–converting enzyme (ACE).
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“Our human clinical studies also support the claims that LJ100 reduces reactive oxygen species, thereby increasing the nitric oxide–cGMP signaling pathway to produce harder erections, and also increases an alpha pheromone to improve libido, sexual communication, and sexual behavior.”

Eng says that the men’s healthy-aging industry has been aggressively advertising testosterone replacements. She notes that LJ100 positions itself differently, instead promoting the idea of waking up the dormant testosterone production system and endogenously unbinding free testosterone.

New Study Demonstrates Relationship between Diabetes and ED

The connection between blood health and men’s sexual health is becoming more evident as a result of new clinical studies. One 2019 randomized, double-blind, placebo-controlled trial examined the effect of a branded French maritime bark polyphenol extract, Pycnogenol, on the lipid profile and erectile function of 53 men with a mean age of 49 who exhibit normal testosterone levels and who meet the IIEF-5 diagnostic criteria for erectile dysfunction.

Participants were randomly assigned to receive either 120 mg of Pycnogenol per day (n=32) or a matching placebo (n=21) for three months. The Pycnogenol group was divided into subgroups of participants with comorbid diabetes mellitus (n=15) and participants without comorbid diabetes mellitus (n=17). The placebo group was also divided into subgroups of participants with (n=10) or without (n=11) diabetes.

All participants were assessed via the IIEF-5 Questionnaire at baseline, once per month during the trial, and one month after their final dose. Participants also provided blood samples at baseline, one month into the trial, upon conclusion of the trial, and one month after the conclusion of the trial. Participants’ blood serum samples were tested for cholesterol, high sensitive C-reactive protein, glucose, and triacylglycerols.

After three months, Pycnogenol administration caused a statistically significant improvement in erectile function in both treatment groups. Participants with diabetes saw a 45% improvement in IIEF-5 scores, representing an improvement from severe to moderate erectile dysfunction. Participants without diabetes saw a 22% improvement in scores but remained within the moderate severity category. There was no statistically significant change in the placebo group’s IIEF-5 scores.

Carolina Burki, director of product development at Horphag Research (Chicago), maker of Pycnogenol, says that Pycnogenol boosts nitric oxide production and thereby supports blood health, which explains its effect on erectile function. Burki says that erectile dysfunction can be an indicator of an underlying health problem such as heart disease or diabetes, which is why studying the efficacy of erectile health supplements in populations with these diseases matters.

“Numerous studies have shown that Pycnogenol’s ability to promote nitric oxide production can improve erectile function, and separate studies have found that Pycnogenol improves microcirculation and blood glucose levels in diabetes patients,” Burki says. “But this new research is particularly interesting because those with diabetes often have a higher incidence of erectile dysfunction.”
Men’s Health Ingredients Ready for Primetime

Aging men are looking for ways to recapture the strength, vitality, and sexual performance of their youth while also addressing issues like blood pressure and prostate health. Men are also increasingly becoming more welcoming of and interested in antiaging products, particularly natural ingredients, as consumers seek out alternatives to pharmaceuticals. As the population continues to age, more opportunities will open up for brands that can demonstrate proven benefits through clinical trials.

Mike Straus is a freelance writer living in Kelowna, Canada. He has written for publications including Canadian Chiropractor, Grow Opportunity, and Massage Therapy Canada.

References
1. U.S. Census Bureau website. “Population estimates show aging across race groups differs.” Published online June 20, 2019.
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W
hile food is a necessity, purchasing
food can also be a very emotional ex-
perience. Certain flavors can provide com-
fort, not just because they might taste good,
but because they can bring back childhood
or other fond memories. The idea of "com-
fort food" exists in every type of cuisine,
often characterized by simplicity and indul-
gence. Flavor manufacturers work hard to
accurately replicate nostalgic flavors, and
consumers are all too happy to put them
into their grocery cart, particularly now.

"Consumers want to connect to simpler,
happier times through comfort foods and
indulgent, nostalgic flavors," says Sian Cun-
ningham, marketing insights and strategy
specialist for Kerry (Beloit, WI). "Reinvent-
ing classics and nostalgic favorites are ways
to bring newness to products, but still keep
them accessible and familiar. Through ev-
erything that’s going on in the world right
now, consumers find comfort and even an
emotional connection with nostalgic fla-
vors across product categories."

Nostalgic flavors have already been
trending, according to Nutritional Outlook’s
article "2020 Flavor Trends for Food and
Beverage," but with the current COVID-19
pandemic and shelter-in-place orders from
state and local governments, consumers
are stocking up on their indulgent favorites.

"During past periods of turmoil, finan-
cial downturn, and other crises, consumers
have typically stocked up on pantry sta-
ipples, and the data above shows this is still
true. But, while austerity is being practiced
by many, we’re also seeing an increase in
purchases of nostalgic and indulgent food
and beverage," writes Lauren Piek, content
marketing specialist for Kerry, in a blog
post. "Because many North American con-
sumers are now in a restricted living state
with no set end date, they’re also stocking
up on indulgent products such as beer, soft
drinks, chocolate, and wine."

A number of other important flavor trends
can still translate to these uncertain times.
For example, in its 2020 Taste Charts, Ker-
ry found that consumers want to enjoy the
flavors of exotic locations through regional
spices, herbs, and produce. Now, while travel
is severely restricted, this desire to experi-
cence other cultures through food is particu-
larly important. According to Cunningham,
these flavors include "peppers with a prov-
enance connection like Hatch, Calabrese,
and Anaheim peppers, to the specific spice
blends or pastes of a region, like harissa, tog-
arashi, and sambal, but also fruits, spices,
and herbs that are not traditionally found in
America—like starfruit, dragon fruit, prickly
pear, lemongrass, and sumac."

For manufacturers, perhaps the best way
to innovate and bring nostalgic or exotic
flavors to consumers is through beverages
and snacks. "Both [are] low-investment,
low-risk categories that lend themselves as
a good vehicle to new trends and trial," ex-
plains Cunningham. [N]

References
1. Grebow J. "2020 Flavor Trends for Food and
Beverage." Nutritional Outlook, vol. 23, no. 1
(January/February 2020): 54-60
2. Piek L. "Changing Consumer Preferenc-
es and Grocery Sales During COVID-19." Kerry
website. Published April 1, 2020. Ac-
cessed at: https://kerry.com/insights/kerry-
digest/2020/grocery-sales-during-covid-19
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