

Digestive health: Fibre and far beyond

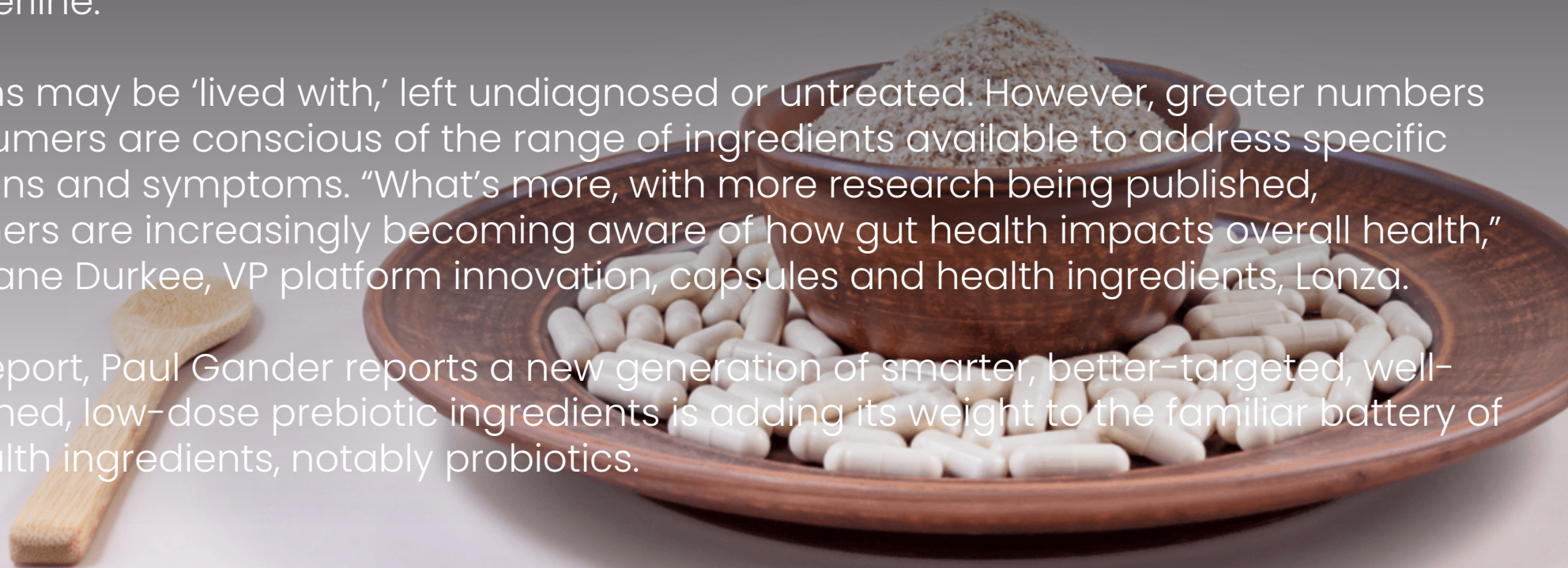


Introduction

Like so many health conditions and sets of symptoms in many different areas, digestive health is something of an iceberg, afloat with only a fraction of its mass visible above the waterline.

Problems may be 'lived with,' left undiagnosed or untreated. However, greater numbers of consumers are conscious of the range of ingredients available to address specific conditions and symptoms. "What's more, with more research being published, consumers are increasingly becoming aware of how gut health impacts overall health," says Shane Durkee, VP platform innovation, capsules and health ingredients, Lonza.

In this report, Paul Gander reports a new generation of smarter, better-targeted, well-researched, low-dose prebiotic ingredients is adding its weight to the familiar battery of gut-health ingredients, notably probiotics.



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Market and
consumer data

In its most recent report on the topic, Mordor Intelligence puts the global compound annual growth rate (CAGR) for the digestive health supplements market at 6.9%. Among the key regional markets, North America is the largest—valued at US\$2.97 billion in 2020, says the report, while Asia Pacific is the fastest-growing.

Mintel's Vitamins & Supplements report for the UK, published in September 2021, overall paints a picture of peak-pandemic growth followed by inevitable decline. From rapid growth through the emergence of the coronavirus up to the first quarter of 2021, largely driven by immune health concerns, VMS sales have been falling away gradually ever since.



[Exploring the digestive health market whitespace, consumer needs - video](#)

This drop-off in comparison with peak demand in 2020/21 is expected to continue, according to Mintel, but with demand likely to remain above pre-pandemic levels.

Of the 1,279 adult consumers polled in the summer of 2021 who said they took VMS

products in the previous 12 months, over 50%—unsurprisingly—put immune health as one of their target benefits. 'Bone and joint health' and 'energy levels' were the second and third most popular type of benefit, with digestive health in fourth place, nominated by 25% of

consumers.

Gut health is one of those areas where consumer attitudes and awareness appear to be evolving rapidly in different markets. Mordor Intelligence quotes the American Dietetic Association on US consumer awareness regarding prebiotics and probiotics. According to the association's figures, while 81% of US consumers were aware of the link between probiotics/prebiotics and a healthy digestive system in 2011, this figure had risen to 88% just six years later.

On the other hand, globally, sales of supplements targeting gastrointestinal health are commonly put at just over 6% of total sales. Proportions of consumers at least claiming some sort of digestive

complaint appear higher. The Ingredient Transparency Center (ITC) Insights, 2021, collated data from 1,000 consumers across the United States, and 1,000 split equally between the UK and Germany. Digestive complaints appeared around one third of the way down the table of self-declared problems, with some 12% of US consumers and 17% in



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Florian Isermeyer

both the UK and Germany highlighting the category.

When women's responses are analysed separately, figures are slightly higher in all three markets. Meanwhile, the ITC is not alone in underlining the significant variations between country and country, not only in terms of consumer behaviours, but also awareness.

For example, specifically on the prebiotic side, while 37% of Germans polled gave gut/digestive health as the chief reason for taking prebiotics, the figure for the United States was

28%. On the other hand, 30% of US consumers gave immune health as the prime reason for using prebiotic supplements, as opposed to 24% of Germans.

When it comes to language and terminology, UK consumers are significantly more aware of the association between prebiotics and the microbiome and microbiota than those in the United States or Germany, says ITC, which carried out its research on behalf of the Global Prebiotics Association (GPA).

Of course, this focus on North America and parts of Europe

ignores some of the most dynamic markets for digestive health supplementation.

“Overall, consumer awareness of the human gut microbiome has increased significantly over the past 10 years or so,” says Florian Isermeyer, head of Novozymes' Digestive Health Venture, part of its OneHealth division. “And as a market, China is growing relatively faster than other parts of the world.”

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Challenges and opportunities





Obstacles to further growth in gut health supplementation include—to pick up on the terminology—the very unpredictable nature of this microbiome. “The challenge here is that you may have variability in the product, but also in the microbiome,” says Len Monheit, executive director at the GPA.

There may be great variation, he admits, between what a ‘healthy’ and ‘unhealthy’ microbiome looks like, and in the concept of ‘dysbiosis.’ Yet research continues to move towards greater specificity, he says. “It is still achievable and desirable to design the programme [...] to be specific enough both in impact on the microbiota at species and strain levels, and to ultimately

“**We see consumers who are concerned with gut health using a variety of probiotic and prebiotic supplements and fortified foods, in addition to naturally-fermented and high-in-prebiotic foods.**”

Michael Bush

connect this with a health benefit—and measurement to support it.”

The overlap between foods and supplements in digestive health is an interesting one. In the Mintel research from 2021, of the 657 non-consumers of any type of VMS, one third explained that they preferred to source their vitamins and minerals from food and drink. This may be of particular relevance to the digestive health sub-category.

The larger numbers now working from home could contribute to a greater reliance on fermented and other home-produced food and drink products, Mintel speculates, potentially at the expense of VMS consumption. If so, this could be more widely indicative of the pressures on digestive health products in developed markets.

At Prenexus, supplier of the PreneXOS brand of

xylooligosaccharide (XOS), CEO Michael Bush paints a picture of a changing landscape when it comes to nutrition in this space. “We see consumers who are concerned with gut health using a variety of probiotic and prebiotic supplements and fortified foods, in addition to naturally-fermented and high-in-prebiotic foods,” he says.

“There is a shift from supplements to fortified foods, as consumers do prefer to consume their functional ingredients through food products, rather than through daily consumption of pills,” Bush adds. As well as supplements, he expects to see food, drink and petfood launches using the company’s ingredient, which is derived from the sugarcane plant.



Delivering functional ingredients via fermentation



In fact, while consumer-prepared foods and beverages are a social media phenomenon, few in the industry see them as an existential threat. At California-based ingredients supplier AIDP, business development director

Samantha Ford emphasises “the convenience factor.”

“That’s top-of-mind for a lot of consumers,” she says. The real growth, she believes, is in branded foods formulated and fortified with gut-healthy nutrition. “The trailblazers in this space are doing really cool things, adding functional ingredients such as prebiotics to a drink, but talking about the way it makes you feel,” says Ford. “It’s very creative.”

But options for delivering supplements are also expanding. “Delivery formats should be weighted just as highly as nutrients when innovating in this space,” says Stef Vanquickenborne, VP capsules and health ingredients R&D.

In particular, the DRcaps system from Capsugel can optimise challenging ingredients such as probiotics, she says. “They deliver contents at the right time, at the ideal location. This allows for better product performance and user experience—critical factors for repeat purchase.”

A further development, also from Capsugel, has been DUOCAP capsule-in-capsule technology. “This can be used

for immediate release or combined release; for example, solubilised prebiotics in the outer capsule and probiotics in the inner capsule,” she says. “The prebiotic releases immediately and the probiotic releases later.”



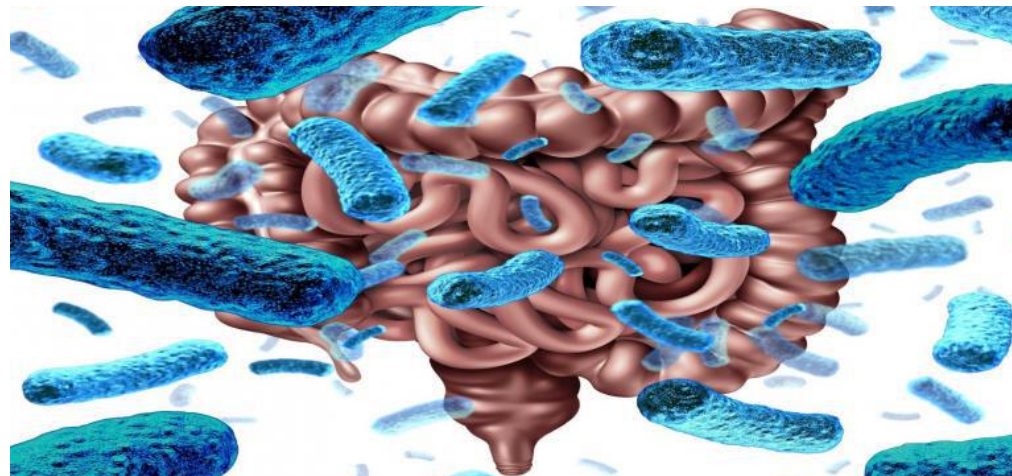


Ingredients making a splash

Recent years have seen Danish-based Novozymes making a string of acquisitions in the area of probiotics, in North America as well as Europe. “We recognise that probiotics have come on a huge journey over the past 10-to-15 years, offering both strong science and unique consumer health benefits,” says Isermeyer.

“With the newer generation of prebiotics, there are many more delivery options ... [which] opens up significant VMS opportunities.”

Len Monheit



There is an opportunity for companies to meet shifting consumer needs by developing products with probiotic, prebiotic and postbiotic ingredients.

Success stories for Novozymes in this area include the Pylopass probiotic (or technically, a postbiotic), available as a supplement for several years now in around 50 countries, and used to alleviate symptoms of the *Helicobacter pylori* bacterium in the gut. These bacteria can cause gastritis or

ulcers if left untreated.

The company points to this and other probiotics, including those addressing the symptoms of irritable bowel syndrome (IBS), which not only target gastrointestinal issues in general, but also take aim at specific issues.

Isermeyer is sceptical when it comes to probiotics which claim to address more than one health indication—even though consumers may like the idea. “We see their potential as being rather limited,” he says. “You want strong and credible science, whatever the health area. You want the best strain for a specific, measurable benefit.”

The consumer perspective on this could be more nuanced, as AIDP’s Ford points out in relation to prebiotics. “Recent surveys suggest that digestive health is one of the top reasons why people take prebiotics,” she says. “But then, new users are commonly aware of other potential benefits: immune health and brain health are often mentioned.” Alongside probiotics,

Novozymes is, naturally enough, just as interested in the ways in which enzymes can support digestive health. “They have been quite neglected over recent years, and we feel they have a unique role, not only in breaking down food but also in disease prevention,” Isermeyer says.

Among other projects, his group has been developing combinations of enzymes and probiotics. “We’re not ready to launch publicly, but we’ve been looking at the two working together synergistically: enzymes faster-acting, with a high specificity, and probiotics offering longer-lasting effects,” he explains.

Lonza, too, lists blends of enzymes such as amylase, lactase, cellulase, lipase,



Nutrients such as probiotics, prebiotics and—increasingly—postbiotics are being shown to positively impact the gut-immune health connection.

galactosidase, bromelain and protease among the classes of ingredient which have been shown to relieve gastrointestinal discomfort. Botanicals such as ginger and turmeric also have digestive health benefits, Durkee adds.

Monheit at the GPA is understandably bullish about the prospects of prebiotics, in particular. “This market is going to do ten times what it’s doing now, and it’s not going to be inulin, for example,” he says, indicating just one example of

an earlier generation of prebiotic fibres. “With the newer generation of prebiotics, there are many more delivery options, as substantiated efficacious doses have dropped,” he says. “This opens up significant VMS opportunities, some met with prebiotics alone, some with a combination of pre- and probiotics.”

The issue of efficacious dosage is far from trivial, particularly in the context of prebiotics. Prenexus makes much of the fact that its ingredient requires low usage levels of just 1g daily while, at the opposite end of the scale, some prebiotic sources may have usage levels of up to 25g.

But the advantages go beyond dosage. “You’re starting to see

terms such as 'smart' and 'precision' being applied to prebiotics," says Monheit. "You can trigger them for action on specific probiotics, even when they're not in the formula, or in relation to particular short-chain fatty acids."

Prenexus spells out this specificity in different terms. "Ours is a highly selective prebiotic, as it does not support the growth of 'bad' bacteria, and produces virtually zero side-effects, as compared to more traditional prebiotics which require much larger serving sizes," says Bush. Brand-owners and consumers are more keenly aware of the differences between one prebiotic source and another, just as there has been a growing awareness of different probiotic strains and strengths.



Consumer awareness of microbiome opens market opportunities

In relation to its own research results, AIDP, too, talks about 'precision'. "Some prebiotics ferment very early, while we ensure that ours carry all the way through to the end of the gut, and have a high degree of specificity in the bacteria they feed," says Ford. "We also look at what specific health outcomes are linked to that." In XOS, for

example, the benefits of the prebiotic can be influenced by the chain length and degree of polymerisation, she says.

Among other low-dose bioactives proving popular in different types of formulation, says AIDP, are its GutGard liquorice-based ingredient and green kiwi, which combines

soluble and insoluble fibre, enzyme activity and a prebiotic function.

What ingredient are you seeing making a splash in the digestive health category?

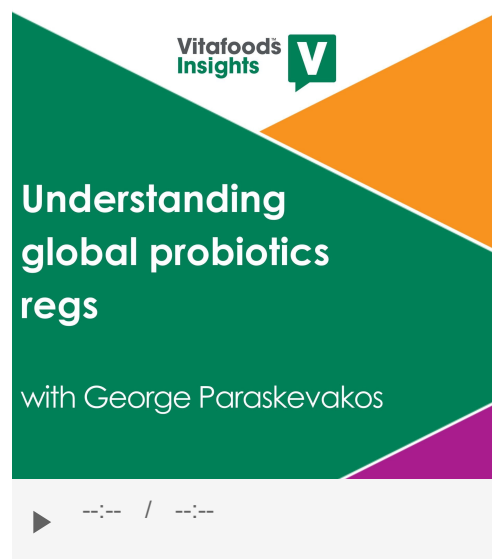
- ☐ Probiotics
- ☐ Prebiotics
- ☐ Dietary fibres
- ☐ Enzymes
- ☐ Botanicals

[See results](#)



Marketing rules and
crystal balls

As has been long understood, the regulatory terrain around consumer marketing and claims is far easier to negotiate in North America than in Europe. As Ford at AIDP puts it: “The path to market is a lot faster, and the ability to talk about health benefits is much more relaxed, though it always has to be based on science.”



On the other hand, while consumer awareness of—and interest in—prebiotics from a gut-health perspective is growing, the lack of a regulatory definition is proving to be a category challenge, certainly in the US, Monheit says. “There are those out there calling things like apple cider vinegar a ‘prebiotic’, but it’s not,” he explains. “And not all fibres are prebiotic. And there are prebiotics that are not fibre, such as polyphenols.”

This lack of regulatory clarity is, unsurprisingly, mirrored in consumer understanding, as Monheit’s research has revealed. “When asked, around two-thirds of people got the correct definition of ‘probiotic’, but with ‘prebiotic’, ‘synbiotic’ and ‘postbiotic’, that proportion tails off,” he says. “They may

“The path to market [in North America] is a lot faster and the ability to talk about health benefits is much more relaxed, although it always has to be based on science.”

Samantha Ford

think they know what they are, but much of the time, that isn’t actually the case.”

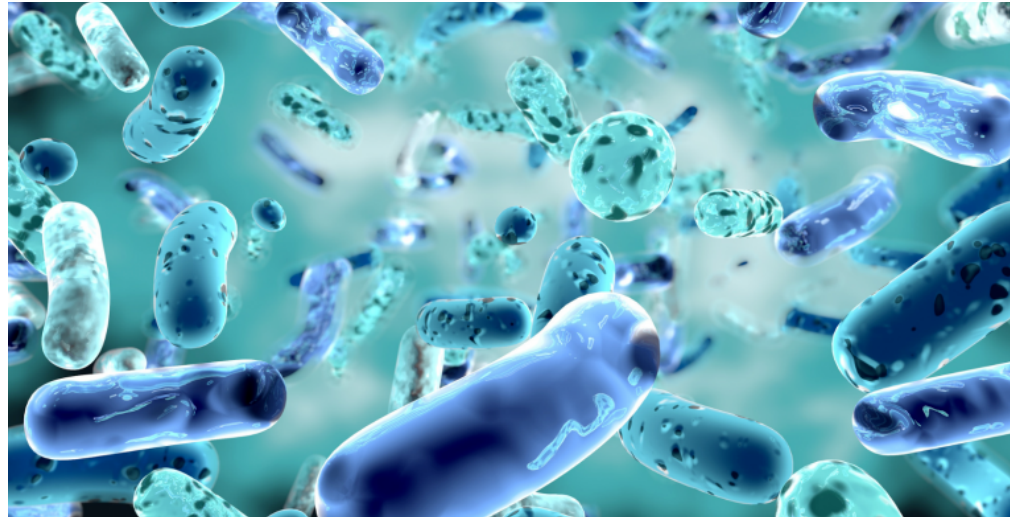
Given the increasingly specific modes of action of these products, brand-owners will need to consider how best to explain them. “Marketing and messaging needs to continue to evolve to speak broadly, but for those with an ‘appetite’ – pun intended – let’s describe the dynamics of what’s happening,” he argues.

With more research grappling with these dynamics, the implications could go well beyond consumer communication. “As our ability to understand complex mechanisms continues to increase, this will open up other claim strategies, especially in the US with its structure-and-function claims environment,” says Monheit.

One example of ‘complex mechanisms’ can be seen in Lonza’s Resistaid arabinogalactan prebiotic,

which is derived from the larch tree. “This was recently shown in a clinical trial to improve gut microbiome balance by reducing the Firmicutes-to-Bacteroidetes ratio, as well as increasing the abundance of Bifidobacterium,” says Durkee. This provides a mechanistic perspective to the prebiotic’s immune health—as well as gut health—benefits, says the company.

The overall sense, across different markets, is that the pandemic has left more consumers with a stronger understanding of the preventative health benefits of nutrition, whether through supplements, fortified foods or, for example, fermented products. This applies to the gut just as much as immune or cognitive health.



How the pandemic is reshaping the probiotic cultures landscape

Ford at AIDP believes that active ingredients from named plant sources will play a more prominent role, as this segment develops. “Food-based products such as our green kiwi have a story behind them, with no chemicals or solvents used in the process, and a powerful enzyme activity, too,” she says.

“It’s a nice, holistic approach to gut health.”

“In the future, we’d expect to see more classes of bioactives, whether probiotics, postbiotics or enzymes, for example, to deliver the best health benefits,” says Isermeyer at Novozymes. “After all, one in two consumers

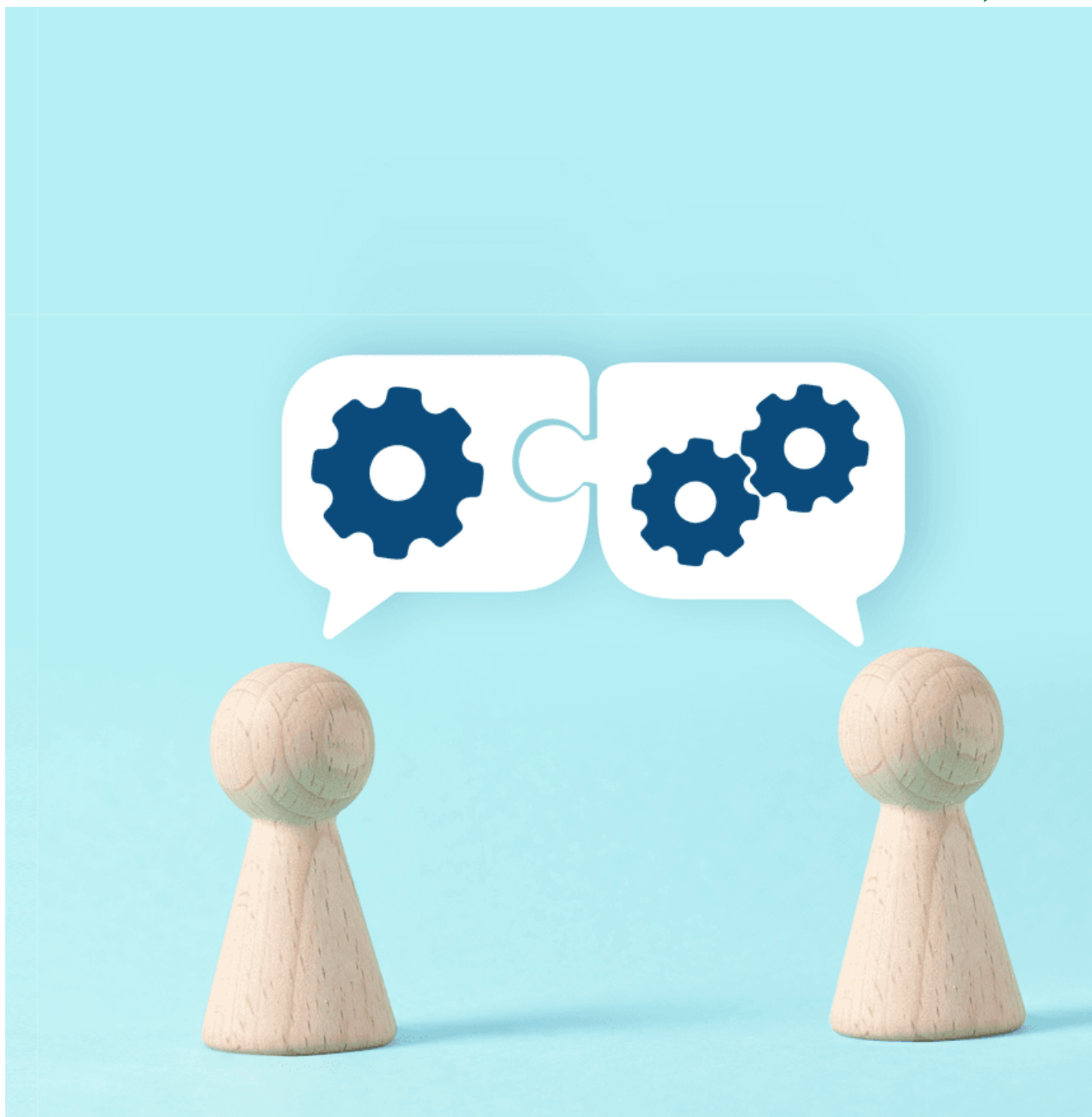
suffers from some sort of regular digestive health issue. It may not be growing as strongly as cognitive health, for example, but we see this area as having huge potential.”

The GPA agrees that the role of bioactives will only strengthen. “You’re going to see more combinations: pre- and probiotics, pre- and postbiotic, prebiotic blends, too,” says Monheit.

Will consumers pay more for this new generation of product? “That’s yet to be proven,” he admits.

Industry Experts - Q&A

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Q&A

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1 How has the digestive health category evolved in the last two years in response to consumer demands for preventive nutrition products?

In recent years the attention of the consumers on the health of gastrointestinal tract has grown from year by year and the scientific knowledge has led to expand the offer of products: starting from the wellbeing of the gastrointestinal tract to general health thanks to the strong scientific evidences

supporting the gut brain axes and the relation with immune system, inflammation, cardiovascular health and so on. The supplementation for the gastrointestinal discomfort changed from acute treatment to preventive use in order to maintain the general health and wellbeing. In a first time the probiotics were the mainly products, but in the last years the consumers focused their attention on prebiotic fibers, botanical extracts able to prevent gastric ulcers, to reduce the intestinal permeability and, in general, to improve the overall health by taking care of the gastrointestinal tract. In the meantime, also the products formulation changed from the capsules/tablets to foods, supplemented by active compounds, to everyday use.

2 What unique ingredient(s) do you offer in the digestive health category?

BIONAP researches, develops and produces extracts starting from plants commonly used as folk remedies in Sicily and Mediterranean areas. MUCOSAVE™FG is the best proposal in our hands for digestive health categories; it is a standardized

powder extract, clinically proven, easy to formulate in solid forms.

MUCOSAVE™FG, a blend of two herbal extracts containing polysaccharides of prickly pear cladodes (*Opuntia ficus indica* (L.)) and biophenols of olive leaves (*Olea europaea* (L.)). MUCOSAVE™FG is a unique combination specifically created for mucosal support and to counteract the main symptoms caused by gastrointestinal disorders. MUCOSAVE™FG has a strong mucoadhesive ability due to the *Opuntia* polysaccharides and a soothing effect from olive biophenols.

Thanks to this combination, MUCOSAVE™FG is able to protect sensitive mucosae and prevent mucosal alteration and disease. In the clinical trials the treatment with MUCOSAVE™FG reduces gastroesophageal reflux disease (GERD) symptoms, such as heartburn and abdominal pain, by the second day. It is an all-natural plant product which improves the Quality of Life, by



increasing the wellbeing of users during early stages of supplementation.

Moreover, MUCOSAVE™FG is able to improve the intestinal microbioma through a prebiotic activity and their production of short chain fatty acid involved in the gut brain axes.

3 In what applications can your ingredient(s) be incorporated, and do they offer particular benefits compared to similar products?

MUCOSAVE™FG can be used in food supplements and medical devices for the health of gastrointestinal tract, it is able to work in the stomach resolving GERD symptoms alone or in combination with other anti-acid agents but, in the meantime, to improve the intestinal health.

Thanks to its physical properties, MUCOSAVE™FG is suitable to be formulated in capsules, tablets, sachets in combination with probiotics agents without particular advices or pharmaceutical technologies.

Additionally, MUCOSAVE™FG is vegan, Halal certified, verified by true ID, naturally lactose and gluten free; moreover, it is produced within a sustainable chain. This is an ingredient supported by a lot of preclinical and clinical studies confirming the action of 400 mg/die of extract on wellbeing of gastrointestinal tract.

4 What are the whitespace opportunities for product developers and marketers in the digestive health category?

Nowadays the products in the market have a single activity on the gastrointestinal discomfort, while one of the whitespace opportunities is to produce food supplements by using ingredients that are able to take care of gastrointestinal tract and simultaneously to improve the overall health by the gut brain axes and by acting on immune system, inflammation, cardiovascular health and so on, as wide supported by scientific literature.

[Click HERE to read BIONAP's article](#)



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Digestive Health – Panel Discussion

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Biographies

Our expert contributors

Michael Bush, CEO, Prenexus

Michael Bush is the CEO of prebiotic manufacturer Prenexus health. Previously Michael was the president and CEO of the leading probiotic manufacturer, Ganeden, which was sold to Kerry in 2017. Michael is also a board member for several for and not-for-profit organizations, including Executive Board Member of the International Probiotics Association (IPA).

Shane Durkee, VP platform innovation, capsules and health ingredients, Lonza

Shane Durkee is the vice president of platform innovation, ingredients, and dosage form solutions at Lonza. An internationally trained R&D executive with more than 25 years of experience in the consumer healthcare industry, Shane has a background of developing new and innovative products, platform capabilities and technologies.

Samantha Ford, director of business development, AIDP

Samantha Ford is a clinical nutritionist and has a master's in applied nutrition from Northeastern University. She has worked with companies including ProCaps Laboratories and Amway. Currently, as director of business development at AIDP, she works collaboratively with industry partners and businesses across the wider health and nutrition business.

Florian Isermeyer, venture lead gut comfort, OneHealth, Novozymes

Florian Isermeyer is the venture lead gut comfort for the OneHealth division of Novozymes. Florian has been engaged in New Business Development activities with Novozymes since 2011. He is currently focusing on Human Health and building a venture for Novozymes around remedies to food sensitivities (lactose, gluten, etc.). He comes with an education from Stockholm School of Economics and the University of St. Gallen.

Len Monheit, executive director, Global Prebiotics Association

A recognized industry analyst and thought leader, Len Monheit has over 20 years of experience in the natural products and dietary supplement industry, with over 15 years background in digital media. He was the founder of NPIcenter; served in multiple roles with New Hope Natural Media, including executive director of strategic business development; and was general manager, US, for William Reed. In addition to his role with GPA, he is also CEO of Trust Transparency Research.

Stef Vanquickenborne, VP R&D, capsules and health ingredients, Lonza

Stef Vanquickenborne currently serves as vice president R&D, capsules and health ingredients with Lonza, bringing expertise from his long tenure at Capsugel when it was acquired by Lonza. He has worked in VP, senior director and project development positions related to capsules and systems projects, and is also a software development engineer.

Thank you for reading the

Digestive Health Report 2022

Got feedback? Mail vitafoodsinsights@informa.com

