

Delivering on taste, texture and health: discover DSM's latest innovations at Food ingredients Europe



he food and beverage sector is one of the largest and most dynamic global industries. However, amid strong growth, producers worldwide are facing

new and evolving challenges in an increasingly complex landscape. At DSM, taste, texture and health are our guiding principles in helping to address consumer demands and market pressures. At Food ingredients Europe (FIE) 2022, delegates are invited to visit booth 4.A10 to discover how our recently launched solutions can drive innovation in the food and beverage market and make a positive impact on the health of people and the planet.

Consumer priorities have been in flux since the onset of the pandemic and this disruption is still present. With so much change in the air, Food ingredients Europe is the ideal platform for the industry to share knowledge and ideas, encourage innovation across the sector and ultimately, stand out in an increasingly dynamic marketplace. In this article, we will delve into three important themes shaping innovation in the food and beverage industry:

- 1 Plant-based innovation – including dairy alternatives, fish alternatives, beverages and next-generation proteins
- 2 Health and mental well-being – showcasing ready-to-drink (RTD), ready-to-mix (RTM) and protein bar concepts
- 3 Process efficiencies and sustainability – including plant proteins, baked goods, dairy and cheese

With an exciting array of taste, texture and health solutions at Europe's biggest food and beverage show, who says that consumers can't enjoy it all?

Next generation plant-powered solutions

Plant-based food and beverages have dominated food and beverage trade shows in recent years. And it's not hard to see why with 29% of consumers planning to increase their intake of plant-based foods.¹ But standing out in this crowded marketplace and keeping pace with consumers' taste, texture and nutrition expectations presents a complex task for manufacturers.

At the same time, the rise of plant-based foods isn't solely driven by consumer demand. There's a clear need for more diverse sources of protein if we are to feed the world's growing population sustainably. That's why we set ourselves an ambitious aim of reaching 150 million people with our solutions for nutritious, delicious, sustainable plant-based foods by 2030. These are some of the ways we plan to help meet that target:

Room for growth in plant-based dairy

The global plant-based dairy alternatives market is now worth €18 billion² and while this particular category has historically struggled to replicate the authentic cheesy or creamy tastes and textures that consumers love – recent ingredient breakthroughs in taste, texture and health benefits are beginning to turn the tide.

Meet us at booth 4.A10



**Food ingredients
Europe**

For example, DSM recently launched a new portfolio for plant-based cheese that overcomes common formulation challenges in creating authentic-tasting cheese alternatives. Discerning consumers are seeking dairy-like experiences in taste and texture and the plant-based cheese category is no exception. DSM's portfolio, which includes dairy-type flavors and concentrates, texture, nutrition and color solutions has been developed to create stand-out cheese alternatives that appeal to both plant-based purists and curious flexitarians alike.

With a combination of different flavor tools at their disposal, manufacturers can create a signature cheese-like flavor in the style of traditional cheese, like Parmesan, Gouda, cheddar, mozzarella and cream cheeses. We will have a range of innovative plant-based cheese prototypes at stand 4.A10 so you can see for yourself the exciting (and some surprising) opportunities in the

plant-based cheese space. Visitors can also hear the latest insights on plant-based cheese from DSM's principal application expert for plant-based dairy, Kees Muijlwijk, who will be speaking on December 7 at 3pm at Exhibitor Showcase Theatre (Booth 7.2G100), Hall 7.2.

Another example is oat-based dairy alternatives which are commanding an increasingly high portion of new product launches and sales.⁵ Of the most popular bases for plant-based dairy alternative drinks, the oat-based category has the highest growth projections, with an anticipated compound annual growth rate (CAGR) of 14% between 2020 and 2028.³ Such fast-growing demand has, unsurprisingly, attracted a lot of attention from brands with many looking for ways to set their oat-based alternatives apart from the rest.

To help manufacturers make the most of this opportunity, DSM recently launched Delvo®Plant Go, the latest member of the Delvo®Plant range of enzymes and sitting within DSM's uniquely broad portfolio of solutions for plant-based dairy alternatives. This new enzyme solution simplifies the production of oat-based dairy alternatives by enabling the liquefaction and saccharification processes to happen in one step instead of the previous two-step process. The liquefaction and saccharification processes are when the oat starches are broken down into their component glucose and maltose. By combining these two steps into one, manufacturers can benefit from a shorter and more efficient process without impacting on the delicious taste or texture of the end products. In fact, Delvo®Plant Go can reduce hydrolysis time by up to 30%.⁴

As well as time savings, oat-based dairy alternatives manufactured with Delvo®Plant Go require less energy and water, helping manufacturers achieve their sustainability goals. These improvements result in increased capacity or reduced costs – something that is particularly important given the current volatility in global markets. Stop by the Exhibitor Showcase Theatre (Booth 7.2G100), Hall 7.2 on December 7 at 11am to hear Anne Klok and Claire Price, innovation managers for Fresh Dairy and Plant-based dairy alternatives segments at DSM, discuss the latest developments for plant-based dairy alternatives.

Making a splash with plant-based fish alternatives

Another plant-based category going from strength to strength is plant-based fish. The global seafood alternatives market is predicted to reach \$1.3 billion by 2031.⁵ To help meet this demand, DSM launched Maxavor® Fish YE – vegan process flavors that enable an authentic fish taste experience in plant-based alternatives. While most commercially available seafood flavors on the market use fish or crustaceans, making them unsuitable for use in the growing plant-based category, DSM's Maxavor® Fish YE process flavors are vegan, Kosher and Halal, giving them broad consumer appeal. The natural flavors are derived from algal oil, which helps build authentic fish flavors in plant-based alternatives – including vegetarian fish nuggets and vegan fish sauce. Visitors to stand 4.A10 can enjoy this taste experience, with several exciting prototypes to sample, including vegan salmon patties with dill sauce and a vegan tuna sandwich filling.

Developing great-tasting fish alternatives with a similar nutritional profile to their traditional counterparts represents another challenge for manufacturers. Typically plant-based fish options lack certain nutrients like essential omega-3 fatty



acids. To help bridge this nutrient gap, DSM developed its life's™ OMEGA solution to deliver vegan eicosapentaenoic acid (EPA) and docosahexaenoic acid (DHA) – omega-3 fatty acids – to a wide range of food and beverage applications, now including meat and fish alternatives across the European Union. Derived from algae, this plant-based alternative to traditional fish oils helps improve the nutritional profile of products without impacting the marine ecosystem. In fact, when used in fish alternatives, life's™ OMEGA provides the same EPA and DHA as found in traditional fish products. This allows manufacturers to create nutritious plant-based products with on-pack nutrient claims, such as being a source of omega-3 and supporting heart, brain and eye health without impacting the marine ecosystem. DSM's Gilbert Verschelling will discuss the growing fish alternatives category and how manufacturers can help their plant-based products stand out on

December 6 at 3.30pm at Exhibitor Showcase Theatre (Booth 7.2G100), Hall 7.2.

Plant protein – with a difference

When it comes to meeting the nutritional demands of today's health-conscious consumers – high quality plant proteins represent an exciting opportunity. For individuals who choose to follow a flexitarian diet, plant-based products are often selected for their perceived health benefits and as a sustainable source of protein. But some consumers feel there are limited options on the market, with gaps in taste, texture, and nutritional profile. And manufacturers are taking note; there's a wave of new product development aimed at creating plant-based products that have delicious taste and texture, contain essential vitamins, macro- and micronutrients, are free from major allergens and include proteins from a diverse range of sources.



The DSM Vertis™ plant protein portfolio includes protein isolates, concentrates, blends, and textured vegetable proteins that are the foundation to creating nutritious and sustainably produced plant-based products. Vertis™ plant proteins are free from major allergens and have a broad functionality for a range of applications including dairy, meat and fish alternatives as well as performance nutrition.

Due to launch commercially at the end of 2022, DSM's Vertis™ CanolaPRO® will help manufacturers meet the demand for high quality, sustainable, delicious and nutritious plant protein that is free from the major allergens such as soy, gluten, and dairy. Vertis™ CanolaPRO® is a plant protein isolate with more than 90% protein content and contains all nine essential amino acids.

Vertis™ CanolaPRO® has a protein digestibility-corrected amino acid score (PDCAAS) of 1, making it comparable to soy or whey. It can be used as a single source to improve the nutritional quality of plant-based applications and can complement the amino acid profile of other plant proteins like those derived from legumes. It is also highly soluble and blends beautifully into dairy alternatives, meat

One example where DSM is helping customers to improve texture, sweetness and nutrition is through a complete portfolio for bars. Customers can add a nutritional boost with DSM's Quali® vitamins all while using a fully customizable premix solution that delivers the exact nutrient levels needed to target specific health benefits such as immunity. At the show, DSM will showcase innovations in the sports nutrition and weight management categories in novel consumer-inspired ready-to-drink (RTD), ready-to-mix (RTM), and protein bar concepts created using Vertis™ CanolaPRO®.

Along with the nutritional profile of food and beverages, color and appearance also have an important role to play in creating products that have shelf, and health, appeal. When checking ingredients labels, 80% of consumers state that they focus on whether the coloring used is artificial or natural.⁷ Unsurprisingly, products containing a natural colorant show significantly higher purchase intent than those with artificial colorants.⁷ DSM has developed a selection of natural colorings – CaroCare® - fermented β-Carotene, free of FD & Azo Dyes, giving products

A more cost-effective and sustainable solution for bread

When it comes to food waste, the baking industry faces a number of challenges when working with alternatives to DATEM. In particular, maintaining great volume and texture can be difficult when working with flour with increased FFAs (free fatty acids) such as in whole wheat flour and flour with diminishing quality over shelf life. DSM is launching Panamore® Xtense at FIE this year, a newly developed phospholipase for bread producers, designed to offer a suitable solution to work with more challenging flour types and qualities. At the same time, it performs similarly to DATEM: Panamore® Xtense and it maintains stability in dough, creates greater robustness and improves volume and shape in the end product. This is also highly beneficial when working with rich recipes, in frozen dough and parbaked applications.

Minimizing costly quality downgrades in dairy

In addition to developing signature cheeses using the adjunct cultures from the Flavor Wheel™, DSM is also working towards improving efficiency and sustainability in this area. Dairy manufacturers face significant challenges in reducing waste through bacteriophage contamination. A bacteriophage (or phage) is a virus that infects and destroys the lactic acid bacteria that are essential in cheese production, slowing down the fermentation process, which can negatively impact the flavor, yield and texture of dairy products. Due to variation in moisture levels during cheese production, delays in processing or phage contamination can lead to an unacceptable decline in cheese quality. The impact of phage contamination when left unaddressed can therefore be significant – just one week of phage-affected cheese production can result in losses of up to €200k.

Phage testing is a crucial part of dairy production but getting results is often a lengthy process. Currently, most dairies see results typically taking 5-10 days, with in-house analyses taking 4-8 hours. Because of the long lag time, these results often come too late and do not help dairies to prevent phage issues before they occur.

To address this inefficiency, DSM's Delvo®Phage test kit provides results in dairy within one hour, helping to increase yield and quality, reduce waste and boost value in dairy production by 5-10%. The easy-to-use Delvo®Phage test kit is a unique qPCR test kit offering phage detection results 'on the spot' at several steps during production of milk and cheese applications. DSM's Delvo®Phage test kit enables active bacteriophage monitoring and management in mesophilic and thermophilic dairy processes for reliable and consistent production, providing an early warning system for preventing phage problems. With this reliable, fast and versatile solution, it's possible to increase production capacity, improve quality, reduce economic losses, minimize production slowdowns and improve sustainability credentials through reduced waste.

Collaborative production

When it comes to producing fermented milk products, selecting and testing cultures is currently a lengthy and complicated process. Yogurt producers separately assess starter cultures for taste and texture properties, bioprotective cultures for shelf-life properties and probiotic cultures that support health benefits. Testing each culture in



alternatives and performance nutrition products like protein shakes.

With plant protein an important topic of discussion, catch Barbara Jacobs, application manager at DSM, discuss the topic online or join Bjørn Rasmussen, Head of Technical Sales Food, Vestkorn Milling (a DSM company), in-person on December 6 at 11am at Exhibitor Showcase Theatre (Booth 7.2G100), Hall 7.2. Both experts will share insights into the Vertis™ plant protein portfolio, as well as formulation and New Product Development (NPD) advice – these sessions won't be ones to miss!

Health and mental well-being

The pandemic has had a long-lasting impact on consumer priorities. One trend that looks set to stay is people using food and drinks to improve their physical and mental well-being. In fact, 42% of global consumers say they have more frequently sought out fortified or functional food and drink as a result of COVID-19.⁶

This opens the door to a number of exciting fortification opportunities across fresh dairy, beverage and plant-based applications. It can be challenging to create functional, nutrient-rich products that also have great taste and texture.

a healthy, vibrant orange color. β-Carotene is a natural pigment and the body's main source of vitamin A. This essential vitamin plays an important role in healthy vision, immune function, growth and development.

For more information on the nutritional opportunities in the functional food and beverage category, Maaïke Bruins, lead scientist at DSM, will be hosting an online discussion on nutrition and labeling. And Elisabetta Nisoli, Global Business Development Manager for Nutrition in Fresh Dairy and Plant-based dairy alternatives at DSM, will also be exploring inspiring health concepts for dairy online in a session available from November 28.

Boosting production efficiencies – sustainably

Beyond taste, texture and health, consumers are becoming more conscious about environmental issues, such as carbon emissions and food waste, and are taking proactive steps to address this – expecting brands and retailers to mirror these actions. Manufacturers must strike a delicate balance between delivering health, indulgence and sustainability as well as meeting their own carbon footprint reduction ambitions.

isolation can lead to unintended interactions once combined in an application such as increased post-acidification when combining bioprotective cultures and starter cultures.

To combat this, DSM has unveiled its first portfolio of all-in-one cultures for fermented milk products, Delvo®ONE, developed using its new AI-powered Culture Co-Creation Platform. This portfolio is made up of five different culture combinations, all offering taste, texture and health benefits with built in bioprotection, enabling yogurt manufacturers and DSM to collaborate on unique solutions that deliver on multiple product targets at the same time. This platform improves the accuracy and speed of dairy producers' new products development by reducing trial complexity during the culture selection process.

Meet DSM at Food ingredients Europe

FiE is a significant milestone in the food and beverage industry's calendar – an opportunity to discuss the latest trending topics and explore what's on the horizon for the food and beverage industry. DSM is excited to be hosting several discussions over the course of the exhibition – both online and in-person.

Visitors to stand 4.A10 will be able to speak to our team of experts and see our innovative food ingredients and expertise in action with a range of ground-breaking prototypes. From plant-based Parmesan and vegan tuna sandwich filling to ready-to-drink (RTD), ready-to-mix (RTM) sports nutrition and weight management beverages, now is the ideal time to explore how partnering with DSM can help you provide nutritious, delicious and sustainable food and beverages to consumers. In this growing, dynamic market, DSM will be at FiE to reveal how manufacturers and consumers can enjoy it all.

References:

1 FMCG Gurus Top Ten Trends for 2022 Global Report.

2 Euromonitor, 2022.

3 <https://www.grandviewresearch.com/industry-analysis/oat-milk-market>

4 Calculations based on total savings during oat hydrolysis steps, recovery not included.

5 <https://www.factmr.com/report/plant-based-fish-market>

6 FMCG GURUS: Evaluating the Long-Term implications of COVID-19 - July 2022

7 Global coloration study, DSM 2021



To find out more, please visit DSM at booth 4.A10 at Food ingredients Europe this December.