



Plant-based report, part 3:

The challenges and opportunities for plant-based meat, fish, and seafood





Introduction

While plant-based alternatives to meat, fish, and seafood have improved enormously over the past decade in terms of taste, texture, and appearance, most products would still fail in a blind test – and the clean label backlash against products perceived to be “ultra-processed” has begun. In this report, we look at how brands and manufacturers can overcome these challenges and navigate the category with success.

The plant-based report 2023 is published in three parts throughout the year. You are reading part three.

Plant-based 2.0: Has the health halo faded?



Plant-based diets are often characterised as healthy options delivering higher nutritional quality. But the rise of plant-based meat analogues manufactured by food tech companies has left many critical of the 'ultra-processed' approach being taken.



Susie Stannard, consumer insight manager at the UK's Agriculture and Horticulture Development Board (AHDB), notes that while there is currently a health halo around the term 'plant-based', the media has begun to question some of the possible health impacts –

particularly with some of the unhealthier and more processed dishes.

"This raises questions for consumers," she says.

This is confirmed by market research company Mintel. "What got brands here, won't get them there," it warns, indicating that if manufacturers want to continue to enjoy the growth levels they have in the past 10 years, they will need to pivot.¹

Evaluating the category during Veganuary 2023 – the first month of every year when the public is encouraged to adopt a vegan diet –, Mintel says: "Plant-based eating often carries the association with being higher in nutritional quality and better for health. But the surge in recent years of plant-based analogue products that many classify as ultra-processed has placed this reputation under pressure, with consumers in many markets globally questioning the level of processing of some plant-based products.

"While meat-like plant-based alternatives have captured attention, many adults who limit or

avoid meat prefer less processed plant-based protein options. Brands will need to continue to refine their offerings to address these preferences."

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Familiarity and trust in important

Mike Hughes of FMCG Gurus adds: "Consumers want reassurance that meat alternatives contain real ingredients that they recognise and trust." He notes that research from the company shows that more than three-quarters of consumers believe plant-based products should be made with familiar and well-known ingredients.

"This indicates that brands must provide consumers with streamlined and concise

ingredient lists that have fewer ingredients, without making exaggerated claims. By doing this, brands will begin to break down these negative stereotypes of plant-based foods,” says Hughes.

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Consumers want reassurance that meat alternatives contain real ingredients that they recognise and trust.”

Mike Hughes, head of research and insight, FMCG Gurus



Steve Osborn, food technology scout and commercial development director at The Aurora Ceres Partnership warns that the excitement over the food tech investment opportunity in the plant-based category has begun to tail off. Some companies that have focused on raising large rounds of investment are now struggling to get results in the space as consumer backlash over perceptions of ultra-processed foods have hit hard.

“You've got the big investment companies [that] have been throwing big money at companies like Impossible and Beyond, but there's been a bit of a backlash to that now,” he notes, adding that such products are relatively costly, and may not be clean label.

“We've seen that sort of massive shift in terms of acceptability,” he says.

Indeed, Osborn notes that given the consumers being targeted by such products, it was inevitable that there would be some backlash: “All we've been doing in the industry for the last 20 years [is] talking about clean label and how



we don't want our food to sound like a chemistry set, regardless of the function of the ingredients.”

“It remains the big problem. The tech side of plant-based is everything we've come to dislike about labelling; full of stabilisers and emulsifiers, with an ingredient list that's ridiculously long. We have to apply those rules really hard and fast, because if plant-based has got a future in the way that it currently [does], then people have to pick up a pack and understand it.”

Connect new ingredients with cultural origins

Peter Wennstrom, founder and lead consultant at the Healthy Marketing Team (HMT), warns that an important consideration is familiarity, noting that more traditional whole food recipes for plant-based products – such as a bean burger – are clearly seen as a food recipe and are tied to cultural understandings of food.



“Food comes from recipes,” he says. “If you look at it from the cultural [perspective], one way we accept new meals and dishes is to understand that it comes from somewhere; you eat Thai food or you eat Japanese or you eat a poke bowl.”

“Suddenly you're actually eating almost plant-based meals, but you don't think about it

because you're just eating, say a poke bowl, and that's trendy and it tastes good. It's nice food that comes from somewhere.”

Wennstrom cites the growth in seitan protein as a great example of how to connect to a food and a recipe rather than a functional ‘substitute’: “The best way to sell it is as Asian – with Asian origin and to come with Asian recipes – because then it's exciting. It has to do with food, otherwise, it's just some kind of replacement.”

“It's easy to accept an oat milk; it's made with oats. With meat, it's more like ‘here's a plant-based burger’ ... but what's that made of? When you start to study the ingredient list, you start to get a bit confused,” he says.

However, Wennstrom notes that companies are now looking to “take the fight up front” by bringing whole-cut meat replacement solutions to the market: “A solid piece of meat is a totally different ballgame to minced meat,” he notes. “Suddenly, you need to deliver on the same level as an entrecote or a chicken breast. That's the fight you have to take.”



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Plant-based products that deliver on taste, texture and nutrition

Interview with Emmy Nitert van Schijndel
business development manager
taste, texture, and health at dsm-firmenich



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Interview with Emmy Nitert van Schijndel, business development manager in taste, texture, and health at dsm-firmenich.

Consumers want plant-based products to taste good and deliver appealing texture – and meet their nutritional needs. We spoke with Emmy Nitert van Schijndel, business development manager in taste, texture, and health at dsm-firmenich, about the role that fortification can play in facilitating the shift towards healthier and more sustainable diets.

The plant-based meat alternatives market is opening up to a wider demographic of people looking to add diversity to their diets. With this expansion in consumer appeal comes more scrutiny towards a product's taste, texture and nutritional profile, and flexitarian consumers expect meat alternatives to be just as good on those aspects – if not better – as the traditional meat and fish that they are still buying.



“The motivation to improve personal health is a key driver for consumers to choose plant-based products,” says Nitert van Schijndel.

“Increasingly, consumers are seeking to not only benefit from the positive plant halo of the category, but choose their products from fact based, substantiated, front of pack claims. For example, over 70 % of consumers looks for vitamins on the label,” she added, citing the results of a 2019 study conducted by DSM on global health concerns.

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Emmy Nitert van Schijndel, business development manager in taste, texture, and health at dsm-firmenich

Recent consumer research however shows that 46% of the consumers worry they are not getting the right nutrition. At the same time, more than half of consumers find healthy food too expensive. Sometimes, people are simply unaware of their nutritional needs, as evidenced by the latest global health concerns study conducted by DSM-Firmenich in 2023.

Helping plant-based products deliver nutritional needs

While plant-based diets offer a range of nutritional benefits – less saturated fat and cholesterol and more fibre and folate, for example – the reality is that meat and fish contain several essential vitamins and minerals that most plant-based alternatives lack. For example, a pea-based product that mimics fish

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might contain some vitamin B2 but will lack most of the other B-vitamins, as well as omega-3 fatty acids EPA and DHA and vitamin D (among other micronutrients), compared to traditional fish.

To help formulators optimise the nutritional profile of their plant-based products, DSM-Firmenich has developed a range of vitamin and mineral premixes for meat and fish alternatives. life'sOMEGA algae oil with DHA and EPA is a great solution to help bridge the nutrient gap often present in plant-based fish alternatives. The company also has a portfolio of canola, pea, and fava plant proteins under the Vertis™ brand, to help formulators achieve the right protein quality and content for their products.

“Through adding nutrients to plant-based foods, consumers are able to get the right amounts of vitamins and minerals in an easy and affordable way without drastically changing their diet,” explains Nitert van Schijndel. “We believe it



is important to inform consumers about the importance of nutritious and sustainable diets, the role of micro- and macronutrients and the benefits and watch-outs.”

DSM-Firmenich is also aware that fortification can be a challenge for many brands, as it can be challenging to understand which micronutrients

to add, why they are important and what to put on the front of the pack. To this end, an interactive [Fortifull Nutrition Guide](#) has been launched, to help formulators create nutrient-rich plant-based products.

“In five clear steps, the Fortifull Nutrition Guide takes user input on the type of product, region

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and base protein of the product and highlights the missing micronutrients in the plant-based alternative, in comparison with their traditional beef, pork, poultry or fish counterpart,” says Nitert van Schijndel.

“Armed with a clear overview of nutritional gaps, producers can preview a range of solutions to fill these, and then access the relevant nutrition and health claim suggestions. The guide also delivers a wealth of supporting information, such as white papers that provide detailed information about each micronutrient, its sources and recommended daily intakes.”

Giving consumers choice in the plant-based space

Following a plant-based diet is a path that more and more consumers are choosing today. Delivering on taste, texture and nutrition is critical however, not only for encouraging more consumers to follow this path, but also for widening the choice of products found on the supermarket shelf.

“This is already seen in the high growth rates of the fish alternatives market, with consumers eager to try expanded offerings on supermarket shelves,” continues Nitert van Schijndel. “But it also goes further than that. If we expect consumers to transform their diets, then it’s time to find innovative ways of creating tasty, nutritious, and fun food that’s good for you and good for the planet.”

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This, believes Nitert van Schijndel, will be driven by giving consumers greater choice. “It is key that plant-based moves into a category on its own, instead of being ‘the alternative’, to convince vegetarians, flexitarians and meat eaters alike,” she says. “We are looking forward to continue to work together with brands, to formulate new products with an improved nutritional profile and the right consumer messaging.”

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Novel ingredients and emerging processing technologies

The ability to achieve such goals – and formulate tasty plant-based analogues of meat, seafood, egg, and dairy – requires a specific focus on proteins, carbohydrates, lipids, vitamins, and minerals.

Steve Osborn from The Aurora Ceres Partnership notes that food manufacturers must select the most suitable combination of these ingredients to create a final product with physicochemical, functional, sensory, and nutritional attributes that mimic those of the animal-based food it is designed to replace – adding that each category of plant-based food (meat, seafood, egg, or dairy analogue) requires a different set of ingredients to obtain such desired attributes.

Osborn adds that developments in extrusion, protein spinning, and other texturizing technologies have enabled manufacturers to create plant-based alternatives with a “strong bite” and texture that are more similar to meats.

“You want nice long-chain proteins because [they] will give you that mouthfeel and that

texture that you want,” he says. “[...] But generally beans and other legumes don't give you that – they have a very short texture from shorter-chain proteins, so you need to extrude it or use technologies to create those longer chains.”

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Steve Osborn, food technology scout and commercial development director, The Aurora Ceres Partnership

Besides texture, Osborn also warns of the importance of balancing plant-based products nutritionally – adding that the challenges in the area create an opportunity for ‘complete’ protein sources such as those from fermentation technologies and marine sources.

“Many plant proteins are not complete, so from a nutritional perspective they are inferior to a meat or a dairy protein,” he says, noting that in order



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to get the right nutritional balance, companies generally mix different plant protein sources at specific ratios to create a more ‘complete’ analogue.

“Adding more ingredients adds more complexity, and that complexity just opens up more

difficulties in formulation because, depending on what you blend together, you're going to affect the product specs like taste, texture, or the product's ability to hold water," he warns.

"If you can skip that and just have a mycoprotein or an algal protein that is completely balanced – that has all the essential amino acids in there – then it's nutritionally superior to all the other plant proteins."

Indeed, Osborn suggests that a number of companies are now exploring the development of plant-based foods using new 'whole biomass' mycoprotein technologies and marine sourced ingredients like algae. In addition to providing a nutritionally 'complete' range of amino acids, such solutions also have a more rounded nutrition profile that contains vitamins, minerals, and other phytonutrients.

"When you have a protein isolate, like soy or pea, then you can create textures really nicely but you effectively strip away the nutritional value too."

Allergens warning!

As companies look to bring new plant-based proteins, they should be aware of the potential issues of allergenicity.

"As a species we haven't been used to concentrated pulse proteins and other plant proteins in the way that we potentially will be exposed to them in the future," he says. "And the one thing we know about proteins is they're invariably allergenic."

"So how do we deal with that allergenicity, or the potential of that allergenicity, from these concentrated plant-proteins?"

While Osborn adds that he'd not yet encountered specific issues with allergenicity for newer plant-based proteins, it is worth considering the fact that proteins with similar roles in foods are major allergens: "When you look at the key allergens we already have – soy, milk, etc – you can perhaps see other similar proteins like pea, mushroom or algal proteins having potential allergenicity too."



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Why malted ingredients are shaking up the plant-based space

Interview with Andrew Leedham,
head of marketing and Richard Platt,
senior product technologist at Muntions



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Interview with Andrew Leedham, head of marketing and Richard Platt, senior product technologist at Muntons.



Malted ingredients are clean label, hold natural nutritional value, and can improve the taste and texture of finished products – all benefits that resonate with both consumers and manufacturers. We spoke with Andrew Leedham, head of marketing and Richard Platt, senior product technologist at Muntons, about the untapped potential of malt in the plant-based innovation space.

What are the key consumer drivers when it comes to meat-free alternatives?

Andrew: “There are two main drivers in the meat-free space as we see it today: ‘striking a balance between planet and pocket’, and ‘meeting consumer needs to live well and feel well’.

“The health of the planet remains the number one global issue of concern among consumers who are taking more personal control over their impact on the environment. Arguably most meat substitutes are more environmentally sustainable than meat, however there is still opportunity to improve this further through reformulation or repositioning.

“Second, health and wellbeing remains a top spending priority for consumers, with the primary goal of healthier living being to ‘feel well’ followed by aging well, physical health, looking good and mental health concerns. Meat substitutes are well placed to meet this consumer trend.

“Companies are already promoting the health benefits over meat, and this positioning will continue to be important as consumers look for healthier food options. Whilst taste and texture to meat products is a key driver, consumers appear unwilling to compromise on health, putting familiar and clean ingredients ahead of sensory preference.”

What are consumers looking for when they purchase meat-free alternatives?

Andrew: “Research shows that consumers want meat substitutes that taste good and use clean label ingredients. These two attributes have been lacking in much of the recent product launches, so present an opportunity for manufacturers to capitalise on.



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“Health claims are popular in this category, with some seeing significant increases including protein, fibre and cholesterol. However, one reason that some consumers aren’t committing regular consumption to meat substitutes is because they’re seen as unhealthy. The artificial nature of many substitutes is off-putting for some, so the growing use of clean label claims should be a focus for companies in the future. Consumers are also referencing a lack of taste and texture to their meat counterparts.”

What are some of the solutions you have developed?

Andrew: “Malt has little penetration within the plant-based sector and when reviewing the trends of this market, it was hard to understand why. The industry was struggling with artificial ingredients flooding ingredient declarations, products were improving in taste and texture yet unable to achieve groundbreaking results for consumers, and consumers were interested in the sustainable credentials of products yet no manufacturer had focused on this trend.”

“It became clear that Muntons and our malted ingredients had a significant role to play in driving the category forward. Malt is a clean label ingredient used for centuries due to its natural colour and nutritional values of B-vitamins and essential amino acids. It is also known around the world for its natural glutamates, adding and enhancing flavours to the world’s best loved brands. Whilst the process of malting is energy intensive, Muntons is certified with EcoVadis Platinum, putting them in the top 1 % of business globally for their efforts and achievements in providing green solutions.”

PlantMalt Mill-roast 1250



PlantMalt Slow-cooked 1000



PlantMalt Cut-grain 30



What differentiates these solutions from other meat alternative ingredients on the market?

Richard: “Our malted ingredients align with a number of trends from both manufacturers and consumers in today’s market. As well as being clean label, they hold a natural nutritional value whilst improving the taste and texture of finished products.”

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Richard Platt, senior product technologist, Muntons



“The ingredients undergo a time-honoured process of just heat and water for seven days to unlock the grain's flavour precursors. Through processing into the seven ingredients in the PlantMalt range you see today, we can influence flavours, succulence, and cooked meat appearances.”

What are some of the key benefits these bring, both to formulators and consumers?

Richard: “Sourced from a grain of barley or wheat, consumers will be satisfied that demands for a clean label, non-GMO product are met. Our cut-grain 30 ingredient is designed to achieve a meat-like texture whilst maintaining succulence within an application. Many of our

products are available in a liquid or dried format to suit manufacturers processing needs.”

What is in your product pipeline just now?

Richard: “Muntons is proud of its sustainability credentials; so, it is natural for us to try and implement these benefits into our ingredients and their functions. Plant-based will remain a priority across a number of its subcategories. However, the synergistic opportunities on flavour and environmental impact within cocoa and milk replacement / reduction using malted ingredients are also at the forefront of our mind to help manufacturers improve their environmental impact.”



Breaking out of the niche:

A battle of margins

Peter Wennstrom from HMT notes that for brands looking to break out of the niche, creating 'simple' substitutes for existing products can drive growth. However, he warned that in order to maintain growth in the mass market, the price of products also has to become more affordable and comparable.



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“They must immediately deliver the same or better than what you're substituting,” he says, noting that for products that act as ingredients, the way into the mass market is easier.

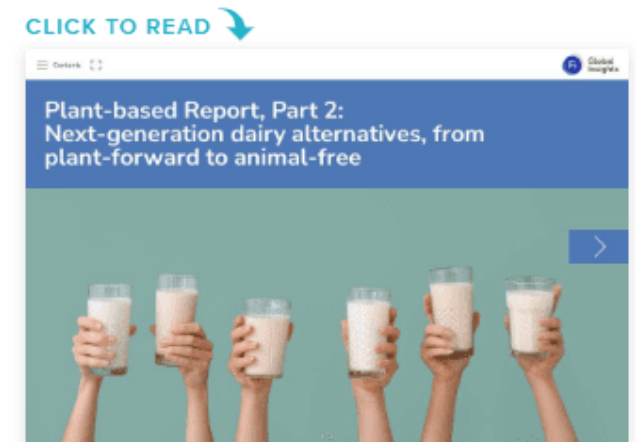
“If it goes into the foods and drinks as an ingredient, then it blends in,” he says, adding that the same is true of certain types of plant-based meat replacements – such as minced meat or chicken style pieces.

“In these cases, it becomes part of the meal, you use it exactly as you would the meat, and because of that you also have the familiarity – it’s an easy swap.”

However, he warns that companies looking for growth in volume must also be able to handle lower margins and be compatible price-wise: “You then are moving into the retail spaces and the retail economics.”

But in Wennstrom’s opinion, the ‘healthy’ thing to do is to regard plant-based as a niche: “Basically it's a lifestyle segment. It is a niche [and] companies need to see it as a niche. They

should behave like a niche and have a premium product for special people.”



Assessing the ‘hybrid’ opportunity

Osborn notes that, while the food industry has become “obsessed” with plant-based essentially being an interchangeable term for meat analogues, there are potential opportunities in both “whole plant” and hybrid applications.

“You’ve got to question whether meat analogues [are] actually the future of plant-based, or whether we should just actually be looking at

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better versions of more traditional wholefood-based products like bean burgers,” he says.

Osborn adds that the role of hybrid products in the plant-based conversation has been historically poor given that flexitarian and meat reducing consumers are “the real opportunity market”.

“Is that the future? To get away from the super complex labels of the science-led plant-based [products] - the Impossible Burger approach – and instead say we should be incorporating plant-based ingredients into meat products to

reduce the overall meat content,” he questions.

Indeed, Osborn notes that while some supermarket private label ranges have trialled such hybrid products, the approach has not – yet – been explored properly: “I don't think they know what to do with it, and nobody's really pushing it because we've all got very excited about the more ‘tech’ side of things.”

He also notes that for some products, taking a hybrid approach could come easier – and almost be a return to more traditional methods of production: “At what point did 95 to 100% pork sausages become the baseline?”

“Surely sausages were about using up what was left over and padding it out with rusk and things like that. But now [...] it's got to be 100%, otherwise it's not worth having,” he notes.

“Actually, a sausage is meat and veg and oats and all sorts of things like that – and that's good from a health perspective. It's good from a sustainability perspective. Let's go back to those traditional values.”

“

Is that the future? To get away from the super complex labels of the science-led plant-based [products] - the Impossible Burger approach – and instead say we should be incorporating plant-based ingredients into meat products to reduce the overall meat content.”

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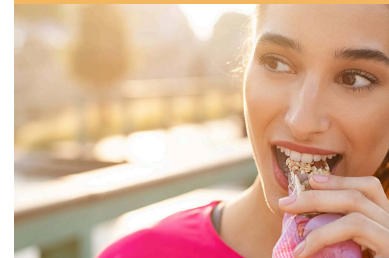
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Key takeaways

- While plant-based foods currently benefit from a health halo, both consumers and media have begun to question this – resulting in a backlash against ultra-processed plant-based foods.
- Excitement over the food tech investment opportunity in the plant-based category has begun to tail off as companies in the space report poor financials and consumers question the nutritional value of these products.
- Familiarity is key to consumer acceptance. More than three-quarters of consumers believe plant-based products should be made with familiar and well-known ingredients.
- The nutritional profile of plant-based foods remains a challenge, but new ingredient technologies for mycoproteins and marine-sourced ingredients may offer potential.
- Hybrid applications that effectively reduce meat consumption by swapping some animal protein for more plant-based foods could be a huge and underexplored opportunity for the market.





References

[1] www.mintel.com/food-and-drink-market-news/veganuary-the-future-of-plant-based-food-and-drink/

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