



The future of plant-based foods and taste solutions



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Diving into the plant-based trend

We are living in a period of great change in many ways, and consumers' changing demands for food products have far-reaching consequences throughout the food value chain. This is no more pronounced than in the demand for foods that are healthier for people and the planet – epitomised by the disproportionate growth in plant-based foods in the last few years.

As the food industry tried to cater to the growing demand for plant-based food, they mainly targeted flexitarians – consumers keen on replacing part of their meat/dairy intake with products that look, taste, and feel like meat/dairy but which contain reduced meat and dairy for

ethical, animal welfare, environmental, and/or health reasons¹. Therefore, began the race to make plant-based food indistinguishable from the real deal. This is where the challenges started.

The switch to a flexitarian diet

Consumers are increasingly focusing on eating more plants and reducing, not avoiding, animal-based ingredients, while also expecting high-in-protein, clean labels and affordability:

According to the FMCG Gurus survey in 2022, consumers looking for more variety in their diets while eating less meat, "flexitarians", rose from 26% in 2020 to 31% in 2022.

In another survey, 47% of global consumers

are following a diet around the avoidance or moderation of animal products (Mintel).

The struggle with taste & nutrition

However, because flexitarians alternated between animal and animal-free products, the comparison between plant-based and conventional meat or dairy remained front and centre, with most customers not finding the products doing justice to the actual flavour experience of the thing being imitated, despite claims like "almost real." On top of this, meat alternatives tended to cost more than conventional meat products² and alternative dairy-like cheeses tended not to provide the same nutritional value as conventional



notes are left in the finished products. Luckily, taste modulation tools like off-note maskers can help reduce the undesirable taste and in parallel, can even boost the meat or dairy flavour put into the products working in synergy with other flavour components to make the product taste more desirable.

Bringing juiciness and mouthfeel to the fore

Turning a soybean into a meat fibre-like structure is a task. As plant proteins are treated to make them look like 'meat' through extensive processing like extrusion, the resulting product tends to be very dry. Dryness is also one of the major problems faced by companies producing vegan products. Ingredient developers have also developed modulation technologies to combat the issue of dryness and make these products more moist, juicy, succulent and enticing.

Experiencing the umami/mouthfeel

When it comes to dairy alternatives, eliminating the dairy fat compromises the milky and creamy mouthfeel, making the products appear flat. Adding plant-based fat as a substitute can give an oily mouthcoating that may be undesirable. Flavour technologies existing today offer solutions that boost the creamy mouthfeel and taste, giving the product more body even in low-fat systems, without any off-putting oily mouthcoating, making the products richer in taste and texture.

In parallel, the democratization of umami leads to a certain expectation of this taste in products like meat alternatives. Umami solutions can be found in a wide range and can provide neutral or specifically oriented profiles to boost the deliciousness of vegan products.

Flavour signatures expertise

Creating a 'meat-like' or 'cheese-like' product may be easy, but differentiating a 'cheddar' from 'Parmesan,' or to make it more complicated, a 'breast meat' from 'thigh meat' may be challenging, but it is essential. These problems often exist with vegan seafood. Nitrogen compounds-amines- are widely used in the creation of vegan seafood precisely to make the seafood product taste and smell fishy. However, making a 'Cod' taste different from a 'Salmon' --instead of generic fishy- is where the flavourists' expertise plays a key role by delivering the flavour note that makes the

cheeses do³, ultimately leading to few repeat customers.

Plant-based innovation

Thanks to technological advancements, plant-based innovation has been incredible. Whether genetically engineering certain compounds critical to animal protein or using precision fermentation to turn cells into protein-making machines, we have come a long way. While early on, certain alternative meat companies could mimic "heme" like compounds found in blood, certain dairy alternative companies have claimed to have successfully created a "casein" like protein found in animal milk, to give the same stretch to vegan cheeses that conventional cheeses have. Also, mimicking the taste of or developing the fermentation process plays a key role in the plant-based cheese world.

Meat protein alternatives do not stop at plant-based. Given the rise in consumer interest in animal cruelty, "slaughter-free" or "cruelty-free" meat and dairy are emerging based on more complex technologies around 3D printing of meat and cultured meat.

All of this means that we cannot predict where trends, regulations and innovation will lead, but it is likely that a hybrid between meat and plant-based will continue to grow as it caters to consumers who want to get the best of both worlds.

Innovation challenges and solutions

When it comes to repeat sales, taste is king and this means both flavour and texture play a crucial role. If developers claim something to be a "chicken," consumers want to see the juicy

muscles and taste the white meat; if they claim they created "cheese," they want to see it stretch and brown and experience the mouthfeel.

Masking off-notes and boosting flavour

One of the biggest challenges faced by companies producing plant-based products is off-notes. Certain off-notes are inherent to plant proteins, such as bases of soya, pea, wheat, mushroom and others, resulting in bitterness, astringency, chalkiness or just a generic beany and earthy protein taste. Developers are looking for masking solutions to make sure no undesirable



difference.

Better, healthier?

With the word "Plant-Based" comes an inherent expectation of it being better or healthier for you. While some products make claims on protein content, some protein sources may not have a high enough protein digestibility-corrected amino acid score (PDCAAS) to make such declarations; thus, mixing proteins for nutritional value or functionality is widely seen. Since the ingredients in the products may not alone be able to provide that option, many product developers have also opted for fortification to make nutritional claims. When it comes to taste, table salt, sugar, and fat are known to make products taste good; however, they also come with health risks. Fortunately, various taste modulation technologies can help product developers achieve their sodium, sugar and fat reduction goals without compromising the product's taste, helping developers to meet consumer and regulatory demands for healthier food.

The future of plant-based alternatives

2020 saw a rise in different plant-based products' innovation and launch. However, this growth has been stunted by the limitations on taste, texture and price compared to conventional

products. But this is not the end of this trend. For example, it is now easier to find and eat plant-based alternative dishes at restaurants, with some focus on ethnic versions, where meat usually remains at the centre of the plate. According to the Plant Based Foods Association (PBFA), four times more foodservice operators plan to increase their plant-based offerings in 2023 while the current offerings are expected to remain stable⁴.

We are now witnessing a revaluation of this market trend, with some categories decreasing and some of the trendier brands falling back on their investment or dropping out of the market entirely. Meanwhile, meat alternatives like minced, nuggets, balls and sausages are becoming more common while niche markets for plant-based alternatives to foie gras, eggs, seafood and specific meat pieces are likely to grow.

Consumers' last words

Conventional animal protein production still has a more significant impact on the environment with more significant water, land, and energy consumption and higher greenhouse gas emissions. Furthermore, reducing animal protein consumption remains a way to reduce animal suffering and the risk of animal-borne diseases and antibiotic resistance. Consumers today are increasingly aware of these realities and desire

healthier and more sustainable options.

Plant-based products are and never were here to replace conventional meat or dairy products. However, as awareness grows, the need for these products to meet the health, sustainability and taste demands of discerning consumers will rise. As a flavour solutions manufacturer, we try to take note and understand market trends and develop and suggest products to help food producers keep pace with the changing reality of the market.

References:

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