



Fertile ground for innovation in plant protein

Demand for meat alternatives is booming, as U.S. consumers modify their protein preferences to include a healthy dose of plants. Mintel data suggests that nearly a third of Americans now opt for meat-free days, with even more (35 percent) noting they get most of their protein from sources other than red meat.¹

What's behind the explosion? Proprietary research from Cargill indicates health perceptions figure prominently in the move toward meat alternatives. In a survey of more than 1,900 U.S. shoppers, nearly half admitted they felt better about eating plant proteins.²

That health halo is clearly sparking interest in the burgeoning category, but Cargill's Melissa Machen says formulation innovations, coupled with vastly expanded availability, are the real drivers.

"We're seeing these products make inroads not just in grocery stores, but quick-service restaurants, too," she explains. As one of the company's plant protein experts, Machen is on the front lines of this formulation frenzy. "Analogues are becoming mainstream, making it easier than ever for consumers to purchase and enjoy these meat alternatives."

Product developers have come a long way since category pioneers tested the waters with early renditions of veggie burgers. "As consumer interest in plant proteins has skyrocketed, so has product innovation," Machen says, noting that the growing appeal of alternative meat products has arrived hand-in-hand with dramatic improvements in both flavor and texture. "Consumers who were turned off years ago are giving meat alternatives a second chance and finding a different, very satisfying experience."

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Formulation feats

Still, Machen admits there are plenty of challenges to formulating great meat analogues.

"It can be difficult to emulate the savory flavors and succulence of traditional meat products," she says. Difficult, but not impossible. For flavor issues, formulators are tapping yeast extracts, natural flavors – and even mushrooms. To re-create that distinctive meat bite, plant proteins with improved texture hold the key.

"Historically, it was pretty challenging to mimic meat's complex texture with a soy-protein flour," Machen recalls. Fast-forward to today, however, and a new generation of textured plant proteins, from a variety of crop sources, make it possible to create texture definition and a meat-like bite.

For its part, Cargill offers several options, including what has long been the workhorse in this space, **Prosante**[®] textured soy flour (TSF). This economical and adaptable ingredient is available in numerous shapes, sizes and even colors, enabling formulators to mirror meat's natural fibers. Equally important, it has a neutral flavor and is a high-quality protein, making it an easy tool for formulators to use.

While TSF remains the go-to ingredient for many product developers, others are looking for an alternative to soy. For this growing group, Machen suggests pea protein, which she says offers similar functional product performance.

"Pea protein, whether used as a textured ingredient or a powder, is a highly functional component in plant-based meat analogues," she explains. "It's important for texture, contributes to viscosity and has good nutritional attributes too – that's a great foundation to build upon."

Machen points out one distinction between the company's two plant proteins. Textured soy flour is a nutritionally complete protein based on its PDCAAS (Protein Digestibility Corrected Amino Acid Score). Pea protein (whether in powdered or textured form) is not considered a "complete" protein, though it still delivers good nutritional benefits. Cargill's pea protein ingredient offerings provide a minimum of 80 percent protein. Plus, Machen says it's easy to blend pea protein with a complementary protein like rice, thus creating a complete protein source.

When Cargill added pea protein to its ingredient lineup, the company chose to partner with **PURIS™**, one of the largest suppliers of the legume. Produced from yellow pea seeds, PURIS pea protein offers a number of unique attributes. Chief among them – its neutral flavor profile.

"Flavor can be a real factor with many of the newer plant proteins," Machen notes, but says it's not an issue with PURIS pea protein. In large part, that's because of the company's long-standing focus on flavor. "They've spent years refining their non-GMO yellow pea seed varieties, carefully selecting lines that minimize off-flavors," she continues. That overriding commitment to flavor extends to their processing facilities, where a proprietary process enables PURIS to bring out the best flavor possible.

Tuning in to texture

Plant proteins alone will only take you so far, however. To replicate other aspects of meat's textural properties, formulators must turn to hydrocolloids. Methylcellulose, for example, produces a firm, heated texture and soft, uncooked texture, just like a traditional meat or poultry product.

Carrageenan is another common ingredient in meat alternatives, where it's used as a binder to help with gel formation and water retention. Machen says Cargill's **Satiagel®** carrageenan line delivers a firm, sliceable structure and eating texture – critical attributes in the world of meat alternatives. Formulators may even add starches and fibers to their binder systems as they work to achieve the optimal balance between a firm bite and juiciness.

Water and moisture levels are also important to the overall texture, flavor and firmness – and in this space, starches have a role to play. Cargill's **SimPure®** line offers functional, label-friendly starches that can also help produce a firm, meaty texture due to their water-binding capabilities.

Plant proteins, hydrocolloids, fibers and starches – there are a lot of components for product developers to consider. But, reminds Machen: "Texture is critical to the consumer eating experience, and there is a fine balance between juiciness and softness." Mimicking the succulence and mouthfeel experienced with conventional meat forms requires multiple ingredients and plenty of formulation fine-tuning. Fortunately, ingredient suppliers like Cargill have a growing array of tools and extensive formulation experience to help guide the way.

"New technology, coupled with an increased focus, has brought tremendous improvements to this space," Machen says. "Brands are striving to create products that are indiscernible to meat, and they're getting closer to achieving that goal every day."

PURIS™ Pea Protein is a trademark of PURIS Foods, a Cargill strategic partner.

References:

¹ Economy, P. "Has Fake Meat Reached a Tipping Point?" Inc.com. June 19, 2019. <https://www.inc.com/peter-economy/has-fake-meat-reached-a-tipping-point-all-of-a-sudden-plant-based-meat-alternatives-are-everywhere.html>

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