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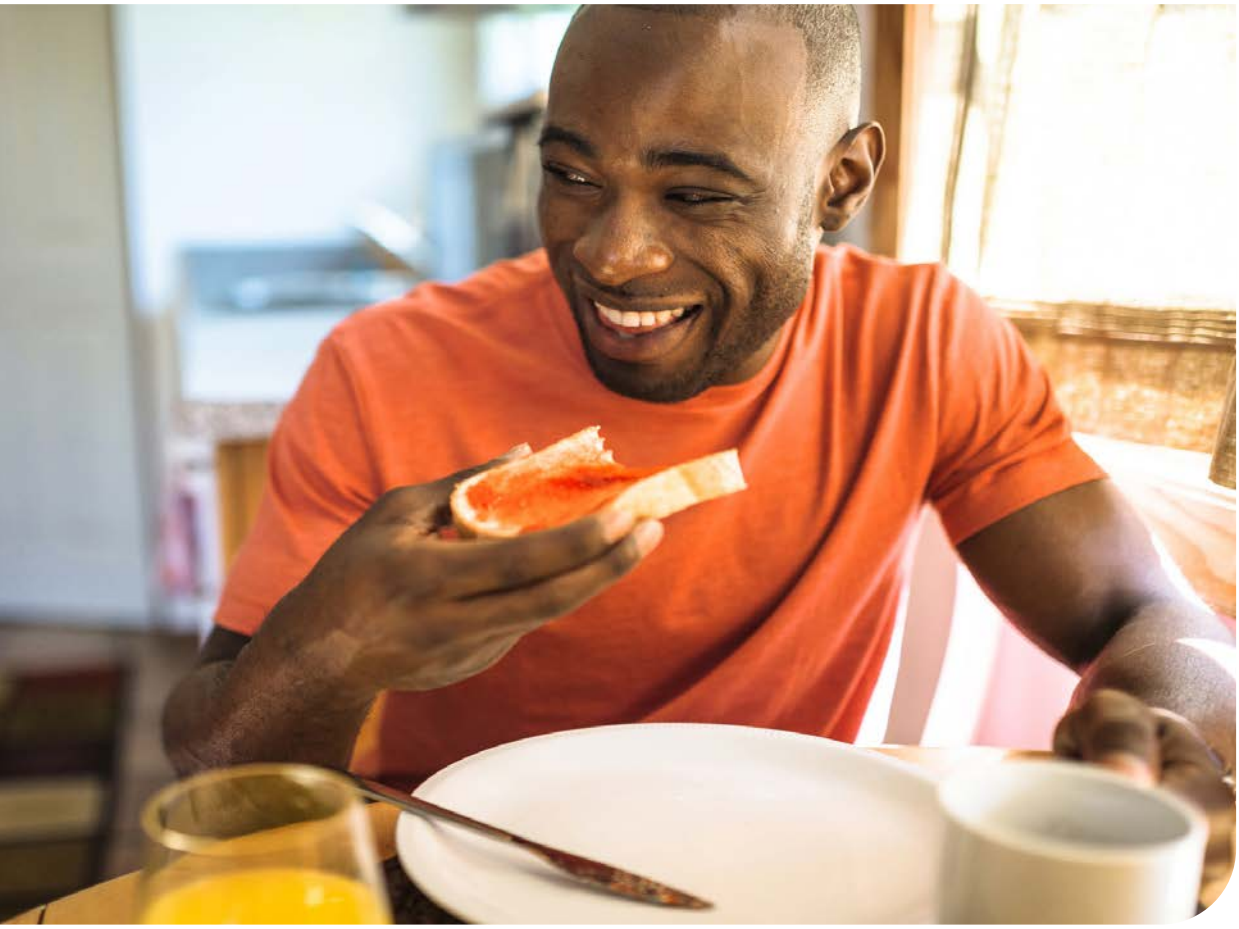

A-peeling pectin finds growing market for reduced-sugar, label-friendly formulation

Cargill® Helping the world *thrive*

For centuries, cooks relied on pectin to thicken jellies and jams. Today, this time-tested ingredient is sparking new innovations, as formulators rediscover its aptitude for thickening, gelling and protein stabilization.

Part of pectin's appeal lies in its upcycled origins. It's made from the leftovers of juice production – apple pomace and citrus peels. Couple these renewable roots with consumers' positive perceptions, and it clearly checks the "label-friendly" box.

"There's a bit of a nostalgia factor with pectin, as shoppers associate it with grandma's kitchen," says Iliana Nava, technical service manager for Cargill's hydrocolloid products. "But it's not just familiar, it's also highly functional in formulas – and that's why it's turning up in all kinds of applications."

In yogurts – whether dairy or plant-based – pectin helps maintain decadent textures and mouthfeel, stabilizes proteins and prevents syneresis. In reduced-sugar beverages, it adds body and mouthfeel back to the formulation. For chewy confectionery applications, pectin provides structure, controls moisture, and even helps resist melting in hot climates. That's a lot of functionality packed into a simple plant fiber.

"Pectin is a key structural component of the plant world. You'll find it in most plant cell walls, where it binds with water molecules to hold everything together," Nava explains. "Advances in processing technology allow us to hone in on these unique properties. As a result, we've created a full suite of pectins under our UniPECTINE® brand with varying gel strengths, setting temperatures and rates, as well as viscosities for maximum processing and product development flexibility."

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Finding the perfect pectin

The company's pectin lineup includes both high-methoxyl (HM) and low-methoxyl (LM) pectins. HM pectins, which need a high solids content (greater than 60%) and a low pH (2.8-3.5) to form a gel, are used to create chewy confections and thick jams. They also have application in reduced-sugar beverages, where they add viscosity and improve mouthfeel.

In addition to their thickening and gelling properties, HM pectins make acidified dairy beverages possible. Left unprotected in acidic conditions, dairy proteins will stick together, forming large, unappealing clumps. HM pectins form a protective "net" around the proteins, preventing them from aggregating together.

LM pectins work a little differently, as they rely on calcium to form a gel. According to Nava, that means solids content and sugar levels are less important, making LM pectins the perfect choice for many reduced-sugar applications.

Cargill's UniPECTINE® portfolio includes two distinct groups of LM pectins: conventional (LMC) and amidated (LMA). LMC pectins are highly dependent on calcium to form a gel, creating networks that resist high temperatures for excellent baking stability. In contrast, LMA pectins are more tolerant to calcium variability and create thermoreversible gels.

"Pectins bring a lot of functionality, but sometimes to achieve all of a brand's texture goals, we'll combine them with starches, fibers or other hydrocolloids," Nava adds. "Because we understand how all these ingredients act independently and in combination, we can help formulators quickly land on the best texturizing solution for their unique needs."

Like most hydrocolloids, Nava says pectin works best when processors follow specific steps for dispersion, hydration and solubilization. “As soon as pectins encounter water, they grab onto it,” she explains. “That means, if we add pectin directly to water, it’s going to create large clumps instead of going smoothly into solution.”

Fortunately, there’s an easy fix. Start by combining pectin with another dispersion aid already part of the formula. Many ingredients can serve this role, including sugar, dextrose, propylene glycol, syrups or even fats and oils. Next, add the mixture to ambient water under agitation and heat to 90°C for 15-20 minutes. Nava says beverage applications are the main exception to this approach. Here, since the goal is viscosity and mouthfeel (not gelling), there’s no need to heat the solution.

Reliable, sustainably-sourced supply

Given its versatility and label appeal, it’s no surprise that pectin demand is at an all-time high. In response, Cargill opened a $150 million HM pectin plant in Bebedouro, Brazil, in September 2021. Built in the heart of Brazil’s citrus-growing region, the new plant’s proximity to citrus fields ensures an abundant supply of fresh fruit peels – the raw material required for premium pectin production.

The Brazilian plant also keeps with Cargill’s commitment to source ingredients sustainably. This includes proximity to citrus suppliers and their Rainforest Alliance-certified farms, which helps minimize CO_2 emissions from raw material transport and promotes regenerative agriculture practices. Taking sustainability one step further, the Bebedouro plant is powered by thermal energy generated from biomass and biogas.

The new facility complements Cargill’s three other pectin plants located in France, Germany and Italy, spreading the company’s production across two continents. Nava credits these state-of-the-art production facilities with Cargill’s industry-leading pectin lines.

Our expertise in processing allows us to unlock the full potential of pectin,” Nava says. “As a result, we can offer solutions that create unique textures across a wide range of setting temperatures and pH levels. While today’s pectins still make a great jelly, they also do a lot more.”