

Gelatin replacements evolve

As the industry innovates, choices more closely resemble gelatin

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Photo provided by Ingredion.

It turns out that candy companies have all sorts of reasons for wanting to avoid gelatin.

They might want to save money, create a different texture, or they want to be able to officially claim that their gummies are vegetarian, kosher or halal.

That's according to a new white paper from Ingredion, "The Use of Starch-Based Products in Confectionery Applications" by Joe Eisley, a food technologist with the ingredient company.

"While many manufacturers are turning to starch and pectin as alternative gelling agents for their vegetarian, halal, and kosher products, most are turning to starch to reduce gelatin usage for cost-saving purposes," Eisley explains. "This is especially true for kosher gelatin, which is very expensive."

And, as companies like Ingredion continue to innovate, more and more choices are available to candy makers, whatever their reason may be.

Of course, after the confectionery maker knows why they want to use a gelatin replacement, the next question, what's their best option?

Eisley outlines the pros and cons of four different types of starches:

1. Thin-boiling (acid-thinned) starches
2. High amylose corn starch
3. Starch-hydrolysis products, such as low-DE maltodextrins and dextrins
4. Pregelatinized or cold-water-swelling instant viscosifying starches

Thin-boiling acid-thinned starches, typically used for gummy and jelly

confectionery, are made from corn, wheat and potatoes and then are treated with acidity.

They also require a lower cooking temperature than other starches, allow the candy maker to use either kettle cooking or continuous cooking and they're relatively inexpensive. However, with the exception of some of the modified potato starches, they don't usually create a very clear or elastic candy as compared to gelatin.

And as confectionery manufacturers and ingredient companies continue to innovate, the possibilities for using starches in candy continue to evolve.

More and more candy makers are turning away from acid-thinned corn, wheat, and potato starches. Instead they are using **high amylose corn starches**, a hybrid corn variety that is typically used for gummy and jelly confectionery.

It tends to produce a much stronger gel with faster setting times vs. other starches. And it has an increased drying rate, which translates to faster product turnaround.

However, it requires a higher cooking temperature (330F-340F) to gelatinize and fully cook; they can't be used alone because fast setting causes "tailing" problems during depositing; their faster gelling rate requires more sophisticated handling. And the starch produces an opaque rather than a clear gel.

Then there's **starch-hydrolysis products, such as low-de maltodextrins and dextrin**, which are typically used in chewy candy, pan-coating, hard candies, lozenges, cough drops, and compressed tablet confectionery.

This type of starch creates a different texture; can be used to replace more expensive ingredients such as gelatin, gum arabic and gum tragacanth; has a low viscosity at high solids; provides excellent binding properties and forms glossy, resilient films for use in pan coating and hard candies.

However, they may require good mixing for proper dispersion.

And finally, there's **pregelatinized, or cold-water-swelling instant viscosifying starches**, which are great for cold-extruded chew candy, fudge, and marshmallows.

They don't require cooking, can withstand further heating, and provide structure, body, viscosity and moisture binding properties. But, they also require a good mixing to ensure proper dispersion and to avoid lumping.

These types of starches can also be a great addition to confectionery marshmallows, because once they're added in, they help with the cutting and forming of the candy.

"This prevents 'pillowing' and helps the final product retain its shape," Eisley says.

As for the future, Eisley predicts that starch innovation will likely focus on creating products that more closely resemble the clarity, elasticity and texture of gelatin in

gummy and chewy candy. And potato starches offer the most promise.

“As we learn more about how to manipulate their texture and clarity, we should be able to develop starch products that can more ably function as true gelatin replacers,” he writes.