



NATIVE STARCHES:

Thinking Outside of the Box

For the past 50 years or so, modified starches have been the workhorses of food formulation. Depending on the application, these chemically or enzymatically altered ingredients have helped contribute to a product's texture, mouthfeel and shelf-life stability. They tolerate heat, acid and shear in processing, can function as an emulsifier, and help a product maintain stability in freezing and thawing – all critical functions in the age of convenience foods.

But now, with growing consumer demand for products that contain familiar and minimally processed ingredients, product formulators are scrambling to find new alternatives to modified starches.

Enter native starches. These starch ingredients, most typically from corn, cassava, potato, rice and tapioca, have not been modified, but merely stripped down to the starch component. However, they don't as of yet have all the functional benefits of their modified cousins. To address some of their limitations, suppliers are now developing the next generation of functional native starches that have been adapted to handle heat and moisture in processing, making them more versatile in food applications.

A key application where native starches are showing promise is in replacing modified starch in convenience products, such as the dressings and sauces in frozen entrées that must stay stable through freezing and thawing. "This is tricky for label-friendly starches," noted Michelle Kozora, technical services director for Cargill. "We have done some work to adapt native starches to bring some of the same function as modified starch. We have made them physically stronger so they can perform more like a modified starch."

Native starches from tapioca and potato, she said, have proven to be good solutions, giving products a similar mouthfeel and body. In addition, suppliers are finding that combinations of native starches from different botanical sources can achieve the same function as a single modified starch.

While these ingredients are evolving quickly and becoming increasingly functional, they do still have some challenges. One of the functions Kozora is working on is to help improve the water-holding properties in frozen entrees. "When you microwave a product, you don't want to have water pooling, and you want to maintain a smooth consistency. So that is one of the things we have been working on."

Another key issue that suppliers are still trying to address is the retort process used for canned goods, which involves high pressure and high temperatures. Dairy and yogurt are also a tricky space, she added.

"A lot of modified starches have been used in yogurt, and it's a very cost-effective solution. So the challenge is to find a cost-effective alternative that can survive a highly processed application."

Although most formulators agree the functionality is coming, in the interim, many of these current formulation issues can be addressed with a broader, more holistic approach. "To be successful in developing label-friendly products," Kozora said, "formulators have to start thinking differently and understand all the tools they have available. The tool box is shrinking as far as what consumers want, so it's important to take a second look at these ingredients."

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Following are some tips to help formulators think outside the box when replacing modified starches and formulating with label-friendly ingredients.

1. It's all about compromise

Formulating (or reformulating) products with label-friendly alternatives, like native starch, is seldom a one-to-one replacement. But formulators typically want to do what they have always done: Take out the modified starch and replace it with a single native starch. “Companies are telling us they are trying this and saying it doesn’t work and then moving on,” Kozora said. “What we are seeing in the label-friendly product formulation space is that it is usually not a single component that will take an ingredient’s place, but potentially two or three items.”

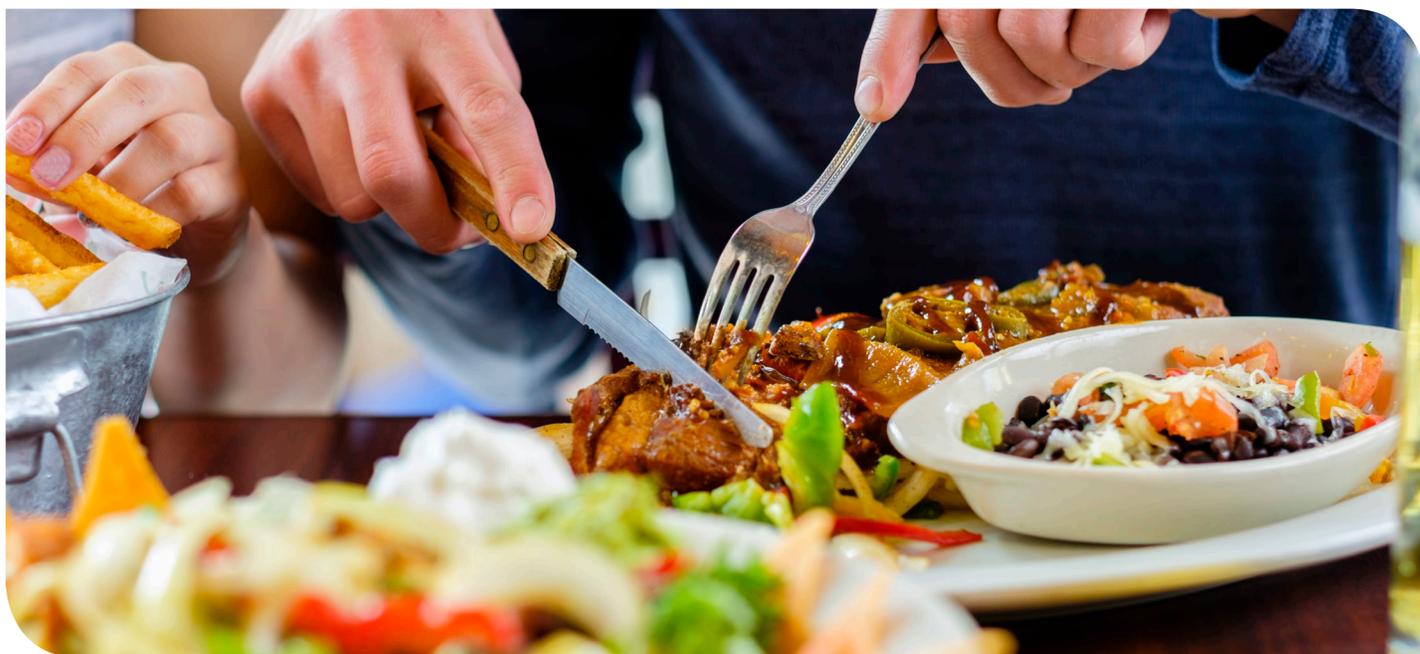
Formulators would do better to move away from this old-school approach and instead start thinking about what is not working right. Is it the mouthfeel, cling or viscosity? Kozora recommends a trial-and-error process in which a company can try removing traditional ingredients individually and noting the negative changes. Additionally, they can identify label-friendly ingredient alternatives and then try them at high and low usage levels to see what works best.

“When you take an ingredient out, you start to understand what’s missing. Is it the texture, or the mouthfeel? Does it change the emulsification or stability?” she said. “The whole system can change, so you have to look at the bigger picture.”

2. Set priorities

Beyond compromising on ingredient function, formulating with label-friendly ingredients may also require a formulator to determine their priorities for the product. For example, many label-friendly ingredients not only require multiple alternatives; they are also very expensive. At the same time, companies – especially those reformulating an existing product – expect the cost-price formula to remain the same. It is not always possible.

This, again, can be addressed by taking a broad, balanced approach. You have to look at the whole formula, Kozora explained. “Say you have a frozen prepared entrée and you are focused on the sauce. We might ask if there is meat in the formula that could be replaced by a textured soy ingredient. This could help reduce the cost.”



3. Check in with your customers

In this age of demand for product transparency and “clean label” products, it is possible that consumers may now be willing to accept certain trade-offs in product taste or mouthfeel, for example, in return for label-friendly, wholesome ingredients.

“Consumers are becoming more forgiving of what a product looks like,” Kozora said. “They now understand that they may have to shake the product or stir it or that it might be a bit grainy, but it’s okay because they know it has familiar ingredients and they know where those ingredients come from.”

This step is particularly important for companies that are reformulating existing products, noted Shiva Elayedath, senior technical services manager for Cargill. “Many companies are reformulating products that have been on the market for a decade or more,” he said. “They are assuming that the product needs to be exactly the same.” But times have changed. “It’s a good idea to check back with consumers rather than trying to match exactly what you have because it may not be necessary,” he said.

4. Find the right partner

This holistic process often takes time, a commodity that many companies, facing pressure from marketing and promotional schedules, have little of. Look for a supplier partner that is willing to collaborate on your needs and priorities, but also get to solutions quickly. A supplier with a good understanding of consumer trends and a varied portfolio of ingredients can provide invaluable insights to the challenges presented by label-friendly ingredients. These lessons can be critical in this brave new world of label-friendly product development.

SimPure™

Simple ingredients. Pure functionality.™

Cargill recently launched the SimPure™ portfolio of label-friendly functional native starches. The first product, SimPure™ 99560, was developed to address the need for stability through freeze/heat cycles common to convenience foods. This customized starch system can replace modified starches in frozen-ready meals without compromising taste, texture or appearance.