

# Savoring *indulgence*

The baking industry searches for ways to reduce sugar without sacrificing the joys of snacking.

by Donna Berry

Sugar reduction has been a hot topic of conversation over the past decade among average consumers, formulating labs and the federal government. Regulatory efforts intensified in the past few months, targeting sugar to decrease the consumption of processed foods, according to speakers at the International Sweetener Colloquium held earlier this year. Sweet treats equal indulgence, and that's something consumers are not willing to sacrifice in today's stressful, complex world. That creates a challenge for bakers.

Consumer demand for healthier indulgence was a key takeaway of Cargill's recently released "Sweet Delight — Decoding Consumer Bakery Decisions" research. It revealed health-related attributes registered as some of consumers' biggest unmet needs in the bakery space, spanning desires for portion control, balanced great taste and health, supplied energy boosts without sugar crashes and offered greater satiety, especially in the cookie and pastry space.

"We found consumers want the best of both worlds — indulgence and health — and the research indicated they were willing to pay more for baked goods that delivered on both attributes," said Courtney LeDrew, senior marketing manager, Cargill.

Despite this, most consumers don't want to give up the enjoyment that snacking provides.

"While a reduction in sugar and calories are key components to attracting wellness-minded consumers, those same consumers are also not willing to sacrifice an enjoyable eating or sensory experience," added Sarah Diedrich, global marketing director, sweetening and texturizing solutions, ADM.

## Making indulgence healthier

At the International Sweetener Colloquium, Beth Johnson, RD, founder and principal, Food Directions LLC, explained there are many efforts in place to address sugar consumption. One of them is the updated definition of healthy by the US Food and Drug Administration. She said that the new definition has a



Prunes' hygroscopic properties impart a richer texture on baked goods while also decreasing sugar, fat and calories.  
Sunsweet Ingredients



“very, very low sugar threshold.” That doesn’t mean that baked goods can’t move in that direction.

“Although generally not considered ‘healthy,’ sweet baked goods can be developed to provide more nutritional value while still providing the desired eating quality,” said Eric Shinsato, senior project leader, innovation and technical service, Ingredient Inc. “Sugar replacers, new and existing, can be combined to help lower sugar content and maintain a high level of indulgence.”

## NATURAL FLAVOR MODULATION SYSTEMS MAY ELEVATE AND REBALANCE THE TASTE AND MOUTHFEEL OF REDUCED-SUGAR BAKED GOODS.

And that appears to be what consumers want. ADM Outside Voice research showed that when considering new food purchases, less sugar and appealing taste are ranked as equally important.

Removing or reducing sugar in baked goods to make them a more permissible indulgence is not that simple. Sugar does a lot more in a formulation than sweeten products. The overall sensory profile must be considered, including how a reduction in sugar may impact taste, texture, structure, binding and browning.

“New sugar replacers, such as allulose, work well in baked goods by providing flavor, color and shelf life while reducing calories and overall sugar content,” Mr. Shinsato said. “Low-sugar syrups can also reduce the amounts of added sugars when replac-

ing traditional glucose syrups.”

Thom King, chief executive officer, Icon Foods, echoed that allulose tastes remarkably like sugar. When it is coupled with new purifications of high-intensity sweeteners, such as rebaudioside M (Reb M), “bakers can make deep clean cuts to added sugars and maintain all the mouthfeel and flavors sucrose has provided in the past,” he said.

Some sugar replacements provide added nutritional benefits for indulgent baked goods. Pure maple sugar is one such example.

“It has a subtle flavor and can be used in many applications without changing the flavor profile of the final product,” said Arnold Coombs, executive director of sales and marketing, Bascom Maple Farms. “When using maple sugar as an alternative to cane sugar in baking, less maple sugar is needed. And while it is a sugar, maple contains several minerals such as manganese and antioxidants that are not found in other sugars. A tablespoon of maple syrup contains approximately 33% of the Daily Value of manganese.”

Malt Products Corp. offers a range of alternative sweeteners with added benefits. Malt extracts, for example, are made from whole grain malted barley.

“Malt extracts have a characteristic malt flavor, and aromas ranging from mild to robust,” said Diego Guevara, executive vice president at Malt Products. “Malt extracts are naturally high in maltose, protein, amino acids, minerals, soluble fiber and antioxidants. In fact, they contain five times the antioxidant power of fresh broccoli.”

The company also offers extracts made from whole grain sprouted oats. They have a mild sweetness and the taste and aroma characteristic of oats, according to Mr. Guevara. The oats are minimally processed to preserve the nutrients found in the whole grain.

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Maintaining indulgence while lowering sugar content requires multiple ingredients to deliver the same taste, texture and richness consumers expect from baked goods.

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Consumers report they want the best of both worlds: health and indulgence.

Beneo

Both extracts provide functionality, including browning, crystal control, humectancy, improved texture and extended shelf life.

ADM recently introduced an agave ingredient with a sweetening potency 30% higher than sucrose, enabling bakers to use less of it to achieve reduced sugar content and calories while maintaining a preferred sensory experience. It has a neutral sensory profile and provides binding and browning properties.

“It also has great solubility, moisture retention and humectancy, enabling ease-of-use for bakers,” Ms. Diedrich said. “Plus, it’s derived from quality natural sources, has a low-glycemic index and is organic and non-GMO, helping build appealing bakery offerings.”

Agave syrup is a low-calorie, low-carb and reduced-sugar sweetener alternative for bakers. It contains trace amounts of vitamins and minerals, as well as phytonutrients that may have an antioxidant effect.

Polyols are also finding new life with the current health trends driving product development.

“Polyols, like maltitol, have been widely used in sugar-free baked goods for many years and are now finding their way into keto-friendly items,” Mr. Shinsato said. “Sweetness can be raised with natural and artificial sweeteners, with stevia and monk fruit being the top picks for new product development.”

Beneo offers isomalt, a sugar replacer derived from sugar beet that has only half the calories of traditional sugar.

“It provides a sweetening profile similar to sucrose but without the undesirable cooling effect of other polyols,” said Kyle Krause, regional product manager, functional fibers and carbohydrates, Beneo. “Isomalt can be used to reduce or replace sugars in various baked goods. It can



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Inclusions and other flavors can assist in the heavy lift of imparting indulgent qualities to reduced-sugar baked goods

Sunsweet Growers

also be combined with high-intensity sweeteners, without imparting unwelcome aftertastes.”

Prune ingredients also assist in the better-for-you, indulgent sweet baked good space. They are naturally sweet due in large part to sorbitol, which adds sweetness without impacting the glycemic index or total sugars of a product.

“Ingredients such as prune juice concentrate can take the place of other sweeteners, such as molasses, honey or other syrups, adding sweetness as well as health benefits associated with prunes,” said Kate Leahy, spokesperson, Sunsweet Ingredients. “Prune ingredients are hygroscopic, so they can give baked goods a richer texture even when the product has less sugar overall. This works because the fiber and sorbitol in prunes bind with moisture, enabling brownies, cookies and simple cakes to taste moist and chewy even with less fat and sugar.

“One of the best ways to lower total sugars with prunes and prune ingredients is to also reduce total fat in a formulation,” she continued. “If you replace 25% to 50% of the oil or butter with prune puree, prune concentrate and water, or prune bits rehydrated in water, for instance, you will most likely want to lower sugar by 5% to 15%. This way, you get the benefits of sweetness with less total sugars. A side benefit is the resulting baked good will also be lower in total calories and fat.”

### Cracking the combination

With many baked goods, it takes a systems approach to reduce sugar while still contributing all the functionality it provides such as bulk, moisture retention and more.

“Granulated sucrose is the most common and cost-effective sweetener used by bakers,” said Kandice Longmire, business development manager, sugar reduction, Batory Foods. “Its functional attributes are not limitless but close to it in the bakery world. They include color, volume development, solids, bake spread, moisture retention, shelf life extension, crystallization, tenderness and, of course, sweetness.”

Oftentimes a combination of ingredients is necessary to create a sugar substitute.

“Ingredient substitution of white granulated sugar usually will encompass a combination of ingredients based on the usage level of sucrose alone,” Ms. Longmire said. “A cake formula, for example, can easily contain 40% to 55% granulated sugar. A combination of soluble corn fiber and allulose can be used to not only replace the bulk, but the allulose can contribute to the color development for the reduced-sugar cake.”

Icon Foods has a sweetening system for bakers that contains leavening and mild acidulants coupled with fiber, allulose, erythritol, Reb M stevia and monk fruit. Mr. King suggested it makes “a perfect plug-in replacement for sucrose in baked goods.”

“It is functional, neutral in flavor, participates in Maillard browning and contributes mouthfeel similarly to sucrose,” he said. “This makes clean label sugar reduction in baked goods simple as pie.”

In baked goods, high-intensity sweeteners often rely on bulking ingredients, typically dietary fibers, which help build back structure in the baked good when sugar is reduced. For example, ADM/Matsutani LLC’s soluble dietary fiber can take the place of sugar, honey or syrups. It may be blended with butter or oil to create consumer-preferred texture and mouthfeel for low-sugar cookies, bars and more.

### Solutions beyond sweeteners

Manipulating other ingredients may assist with bringing back indulgence when sugar is reduced. Some may also help keep calorie content down.

Nourish IFF offers enzymes that assist with lowering added sugars in baked goods. It’s a clean label process that maintains sweetness with fewer calories.

“The enzymes work on the gelatinized starch during the bake and produce glucose,” said David Guilfoyle, North America design manager for bakery and fats and oils, Nourish IFF. “The end result is a baked good that maintains its color and sweetness at up to a 30% reduction of formulary sugar. When it is paired up with other technologies, a greater amount of formulary sugar reduction can be gained.”

Catherine Hogan, North America bakery marketing lead at Nourish IFF, added that one such technology is



Chicory root fiber provides both sweetness and bulk to baked goods when sugar is reduced.

Beneo

polydextrose.

“It is a low-calorie and sugar-free specialty carbohydrate that is also a dietary fiber,” she said. “It can replace the bulk that sugar provides in baked goods.”

Chicory root fibers in the form of inulin and oligofructose provide bulk solids while only containing 2 calories per gram, according to Mr. Krause.

“They are also proven prebiotic fibers, which deliver digestive health and other benefits associated with being prebiotic,” he said. “They can reduce sugar and added sugars while maintaining the taste and texture of the final product.”

Natural flavor modulation systems may elevate and rebalance the taste and mouthfeel of reduced-sugar baked goods. Wixon, for example, offers natural flavors that complement the reduction of sugar.

“Flavors such as vanilla, caramel, mocha and maple help to hide some of the off notes that are often found in healthier ingredients, as well as to give the bakery items a more indulgent taste profile,” said Denise Baldeh, director of research and development at Wixon.

Vegetable shortening can also be used when reducing sugar content from baked goods.

“Vegetable fats and oils can be used in baked goods to give a moist and tender texture when sugar content is reduced,” said Jackie Steffey, senior customer innovation manager, AAK. “Vegetable shortenings can promote creaming during the mixing process. Emulsifiers can be added to promote additional moisture retention and aeration in baked goods.”

Sometimes making little cuts in sugar here and there makes the most sense. Using sugar-free inclusions, for example, can provide some of those cuts.

“Inclusions enhance the product with flavor but may also add unwanted sugar,” Mr. King said. “Zero sugar-added inclusions and flavor bits that emulate berry, peach, chocolate mint and more flavors can achieve the taste and texture desired without sacrificing a reduced- or zero-sugar label.”

Eliminating sugar completely may be difficult, but there is always room for improvement.

“Providing a healthier, indulgent treat does not equate to the complete elimination of sugar,” Ms. Longmire concluded. “With advancements in ingredient technology and an abundance of sugar reduction solutions, there is always an opportunity to make improvements.”



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