



FORMULATORS' ROUNDTABLE:

Balancing Sugar Reduction, Taste and Function in Dairy

From day one, dairy products meet a wealth of nutritional and emotional needs in consumers' lives.

Milk provides calcium for growing (and aging) bones. Special events and accomplishments are often celebrated with a scoop of ice cream. Yogurt offers a nutritious and convenient meal or snack. But increasingly, the sugar content in dairy is under the microscope as awareness grows regarding sugar's role in obesity and chronic disease.

As dairy manufacturers are tasked with reformulating these consumer favorites, they face the challenges of maintaining sweet taste and replicating sugar's functional properties in complex dairy systems. We gathered a panel of Cargill experts to get their insights, including Christine Addington, Senior Technical Services Specialist, Dairy; Vince Cavallini, Applications Manager, Research and Development; Wade Schmelzer, Principal Scientist, Beverage Applications Team; Mark Fahlin, Business Development Manager, Dairy; and Mandy Kennedy, Senior Marketing Manager.

Q. Are there specific products where you're seeing more interest in sugar reduction?

A. CHRISTINE: We see a lot of requests for yogurt; mostly due to the labeling laws that are coming that highlight added sugars. The category has gotten more complicated as well. For many years, there were just a handful of brands, but now, there's a divergence in the market – with Greek and Icelandic having varying levels of sweetness and sourness. It's changed perceptions of sweetness in the category. We also see a lot of interest in chocolate milk. Moms want it to be a healthy option for their kids.

Q. What levels of sugar reduction do you think are possible for dairy beverages, yogurt, ice cream and dairy alternatives?

A. WADE: It really varies by application. We've done work in the flavored milk space for years, getting all the way to no-sugar-added. In yogurts – especially Greek and drinkable varieties – sweetness is not only balancing acidity, but it also helps mute any protein aftertastes. It is definitely possible to develop great-tasting yogurt products, especially with a few grams of sugar remaining. In ice cream and frozen novelties, sugar brings so much more to the table. It impacts the freezing point of mixes and sensory characteristics of the ice cream, including sweetness, mouthfeel and texture. Given this functionality, we have tended to focus on sugar reductions ranging from 25-50%.

VINCE: In dairy alternatives, similar to flavored milks, we can get to no-sugar-added.

Q. Is there an “acceptable” level of sugar grams per serving?

A. MARK: Dairy products are unique in that half the sugar is lactose, which is inherent to milk and not counted as added sugars. One of the challenges is knowing what will resonate with consumers. Is it having a certain level of added sugars, or a specific number of calories? There will be some experimentation in the marketplace to see what resonates visually on labels – and obviously, you have to deliver on taste. Customers are struggling with that and reaching out to us. We're taking the approach of getting sugars as low as possible, ideally under 10 grams per serving. Single digits are compelling.

Q. As customers are working toward the new labeling requirements, what challenges are you finding when reducing sugar in dairy?

A. WADE: We've recently been exploring opportunities with dairy alternative beverages. In addition to sweetness, sugar helps to create body and mouthfeel. To recreate that experience, you need to replace that mouthfeel with a texturizer.

CHRISTINE: In flavored milks, it's just a minor adjustment. Carrageenan or a similar solution is typically used to add mouthfeel back.

VINCE: Sugar does a good job of masking sourness or acidity in yogurt; it's a natural function of the lactic cultures. If you pull back on sugar, more of the sourness comes through.

WADE: We have stevia sweetener products with different dynamics of sweetness. For example, some have a quick hit of sweetness up-front, and a little sweetness on the back end, which may be a better fit in certain dairy applications. So we are really focused on understanding our customers' needs around sweetness, so we can select the right sweetener to help achieve their goals for a specific brand.

Chocolate is a complicated flavor profile. Switching to a different sweetener can express the chocolate in a different way. It's a challenge when we move to no-sugar-added: how do we deliver on the same expectations? We may use stevia; we may tweak the type of cocoa butter we're using, or other ingredients can come into play. It depends on what we're trying to do for the customer. If you already have a full-sugar version on the market, there's an established expectation on taste.

Q. How is the ice cream category impacted by sugar reduction trends?

A. MARK: Ice cream often gets a pass in terms of sugar, calories and fat, because it's a special occasion food. But with recent entrants that only have around 300 calories in an entire pint, that thinking is being challenged.

VINCE: Taking sugar out affects freezing point depression and loses some of the fatty mouthfeel, so you need to find other solutions to get the results you want. We've done quite a bit of work in the space. Erythritol can be very effective. Another ingredient we use is chicory root fiber to help replace body and mouthfeel. It's a combination of these ingredients to replace the functionality of sugar and potentially fat. I think the wheelhouse is in "reduced sugar." It's certainly not a space where I envision going to "no sugar added."

MARK: In the U.S., which is so diverse, it's not just one overarching trend. Many do want lower sugar – but one of the paradoxes is that you risk alienating your core customers who say, "don't change the product I love." You also have to consider what you want your label to look like as the reductions go deeper – how much erythritol do I want on it? Those are decisions product development managers have to take into account in the world of clean label.



Q. Let's talk about some of the reduced sugar prototypes you've worked on.

A. MANDY: Our vanilla soft serve tradeshow prototype was a big hit. People said they would not have imagined that it had 25% less sugar. They kept coming back for seconds and thirds.

WADE: Another popular prototype is our strawberry drinkable yogurt. We were targeting a 50% sugar reduction, and got it down to 4 grams of added sugar. That may vary a bit depending on the base profile of the yogurt system – you might end up with 6 grams of added sugar, or you might be able to get it down to 2.

VINCE: We've done quite a bit of work in chocolate milk, both in reduced sugar and no-sugar-added. We did some kids' sensory testing, putting our 25% reduced sugar version against the current market leader's full-sugar version. Ours scored quite well, with average scores of 7.9 on a 9-point scale and comments that it tasted "super-duper good."

WADE: People don't realize how much sugar is in coffee drinks, whether a retail product or in a coffee shop. We have a mocha iced coffee prototype, where we were striving to cut as much sugar as possible. We were able to reduce added sugar from 24 grams down to 9 grams in a 9½ fluid-ounce serving, using a product in our ViaTech® portfolio. Essentially, it enabled a 33% calorie reduction, just by removing that added sugar.



LEARN MORE: cargill.com/sugarreduction

Great-tasting sugar reduction

Based on comparable full-sugar products



Vanilla-Flavored Soft Serve Ice Cream

Featuring Zeros[®] erythritol, ViaTech[®] stevia sweetener and Oliggo-Fiber[®] chicory root fiber



25%
Sugar Reduction



25%
Fat Reduction

8g added sugars and 9g fat per 2/3 cup serving



Lowfat Chocolate Milk

Featuring ViaTech[®] stevia sweetener



25%
Calorie Reduction

NO
Sugar Added

0 added sugars and 2.5g fat per 8 oz serving



Strawberry Drinkable Yogurt

Featuring EverSweet[™] steviol glycosides, Oliggo-Fiber[®] chicory root fiber and Vitex[™] texturizers



50%
Sugar Reduction

Excellent source
of dietary fiber,
protein and calcium

4g added sugars per 7 oz serving



Mocha Iced Coffee

Featuring ViaTech[®] stevia sweetener, Zeros[®] erythritol



52%
Sugar Reduction



33%
Calorie Reduction

9g added sugars per 9.5 oz serving



Vanilla Chai-Flavored Protein Smoothie

Featuring ViaTech[®] stevia sweetener, Zeros[®] erythritol and PURIS[™] pea protein



35%
Sugar Reduction



43%
Fat Reduction

9g added sugars, 1.5g fat and 12g plant protein per 8 oz serving