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Perspective: **Export Expertise**

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Greek yogurt co-product: exploring the potential

U.S. dairy manufacturers have delighted in Greek yogurt's soaring sales volume. Conversely, they have struggled with the problem that's arisen alongside it: disposal of the growing quantity of co-product obtained through the traditional straining process.

Earlier this year, the dairy checkoff-funded Dairy Research Institute (DRI) and U.S. Dairy Export Council (USDEC) embarked on a project to explore options to add value to this stream. Short-term possibilities include optimizing usage as an on-farm energy source, but our initiative focuses on going far beyond that: to fast-track identification and development of innovative processes to turn this stream into a valuable co-product, for feed as well as premium food uses.

Based on growth forecasts, co-product volume will swell to more than 1 billion lbs. next year, heightening a problem that's already triggered environmental concerns, alarmist media coverage and per-plant costs of \$3 million-\$8 million annually, depending on a company's volume and handling strategy.

Cheesemakers can sympathize. In the not-too-distant past, whey from cheesemaking was a problem to solve, rather than a revenue stream.

Whether the co-product stream from Greek yogurt manufacturing can be a revenue generator like cheese whey is unknown. But industry leaders are working together to investigate the possibilities.

The DRI/USDEC project, in concert with the pre-competitive industry-wide work undertaken by the checkoff-funded Innovation Center for U.S. Dairy®, brings together U.S. dairy manufacturers, academia and equipment suppliers in a collaborative, pre-competitive forum. The project explores potential processing methods for the co-product stream, viable applications for fractions derived from further processing, more efficient and environmentally friendly disposal options, and regulatory issues that might affect its utilization.

Our initiative focuses on fast-track identification and development of processes to turn this stream into a valuable co-product, for feed as well as premium food uses.

The first phase of the project sought to characterize the co-product stream. All the major U.S. Greek yogurt players, a group that covers 30 manufacturing sites, took part.

Compositional analyses of product from those plants indicated lactose comprises about 60 percent of the solids from the co-product stream. Organic acid solids and mineral solids (sodium, potassium, calcium and magnesium)

account for most of the remainder. True protein levels are low.

The research indicates there is potential value to be extracted from the co-product stream. But that extraction comes with a number of challenges, not the least of which is regulatory. Co-product obtained through the traditional straining process fails to neatly conform to established product definitions.

With less than 10 percent protein (on a dry matter basis), it does not qualify as whey, according to Codex Alimentarius standards. But whether it can be called permeate is unclear. Such basic regulatory questions need answers before we can expect widespread use in human food and beverages.

Early applications research indicates several possibilities, the most promising being rehydration beverages, sweeteners and sodium replacement ingredients.

Regulatory certainty is only one of the hurdles. The product's composition makes it difficult and costly to process using existing technology. In addition, researchers are still in the early stages of identifying the components that offer the best nutritional and functional potential, as well as the applications where they might be used.

To overcome these challenges, researchers are looking at new, cost-effective technologies to process the Greek yogurt co-product in order to extract the most value. Early applications research indicates several possibilities for use in foods and beverages, the most promising being rehydration beverages, sweeteners and sodium replacement ingredients.

Dairy ingredient manufacturers worried about additional dairy ingredient volumes coming onto the market and potentially putting downward pressure on pricing need not be concerned. While the volume of co-product is significant and rising, we are talking about a stream equivalent to about 56 million lbs. of product solids in 2013, with lactose comprising the bulk at about 34 million lbs. To put that in perspective, the United States produced more than 1 billion lbs. of lactose and an estimated 900,000 lbs. of whey permeate in 2012.

Many of these topics were discussed at the groundbreaking DRI/USDEC Greek yogurt co-product roundtable on Nov. 20 in Rosemont, Ill. The attendance and enthusiastic participation from yogurt manufacturers, dairy research centers and equipment providers displayed at the meeting testified to the industry's interest in and commitment to resolving the problem. While still in the early phases, it is a textbook example of how a pre-competitive effort can work to solve industry issues and grow the U.S. dairy sector as a whole.

The DRI/USDEC project will continue to explore market potential for Greek yogurt co-product fractions. In the meantime, other options may provide more immediate help to yogurt manufacturers.

The DRI/USDEC study found that, at present, about half of U.S. Greek yogurt co-product is used "as-is" as animal feed, with the remainder disposed of through anaerobic digestion or land spreading. In the short term, the project will further examine the methods and economics of concentrating Greek yogurt co-product for animal feed, and investigate best practices for digesters.

We are also fast-tracking research to identify and implement methods to concentrate, dry and extract valuable components from this stream. Certainly, more efficient and cost-

effective utilization is in the cards, and we are optimistic that new nutritional or functional ingredients will emerge. **CMN**

Note: The U.S. Dairy Export Council is primarily supported by Dairy Management Inc. (DMI) through the producer checkoff that builds on collaborative industry partnerships with processors, trading companies and others to enhance global demand for U.S. dairy products.