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## Designer milks



Milk fractionation technology meets consumer demand for nutrition and value

**M**ilk fractionation allows food and beverage manufacturers to keep all of the best components milk has to offer — its texture, taste, protein content and calcium — and remove lactose to provide value-added milk and dairy protein concentrates.

“I view it as a molecular sieve,” said Shakeel Ur-Rehman, who worked with researchers from the Dairy Products Technology Center (D.P.T.C.) at California Polytechnic State University (Cal Poly), San Luis Obispo, on the fractionation technology that was used in the development of a dairy product called Mootopia before he joined Select Milk Producers, Artesia, N.M., as director of research and development. “There are holes in the membrane that allow certain materials to go through and we can customize the membrane and process conditions to separate or keep whatever we choose.”

Select Milk Producers turned to the D.P.T.C. for product and process development assistance to develop the value-added brand Mootopia that is sold in H-E-B supermarkets throughout Texas. The product line includes a 2% reduced-fat chocolate milk, low-fat milk and a fat-free milk, and provides up to 14 grams of protein per serving, up to 50% more protein and up to 25% more calcium than a serving of whole milk. In addition, the products are lactose-free and the 2% reduced-fat Mootopia Chocolate milk has up to 70% less sugar than other commercial chocolate milks.

The fractionation technology

used by Select Milk Producers was mirrored in the development of protein concentrates with its partner company, The Good Cow Co., Boise, Idaho. The Good Cow Co. uses the fractionation technology to develop shelf-stable protein concentrates sold and shipped overseas to the U.S. military to help soldiers meet their protein intake needs. The Good Cow Co. also has worked with the Southeast Dairy Foods Research Center (S.D.F.R.C.) at North Carolina State University, Raleigh, for research assistance on the sensory attributes of its latest product, Athlete's Honey Milk, a high-protein, high-calcium, low-fat, lactose-free milk. Both the D.P.T.C. and the S.D.F.R.C. are a part of Dairy Management Inc.'s National Dairy Foods Research Center Program.

The technology to fractionate dairy products has been around for years, but was used in the past to process whey, the co-product of cheese manufacture, into value-added dairy ingredients. The concept of taking apart milk and putting it back together is now gaining more attention as a commercial reality. Milk is already widely recognized as a nutrient rich food, but fractionating and concentrating desired milk components to meet specific consumer needs is the next opportunity in the segmentation of the beverage market for high-quality customized dairy and food products.

Manufacturers may ride the crest of consumer inter-

est in value-added food and beverage products by taking a close look at how fractionation may benefit their product lines. It is not just about value-added milk — as the protein concentrates made with the technology may boost the protein content of products, reduce or eliminate lactose, and serve as a functional food ingredient — all which help to keep product nutrition labels simple with natural dairy ingredients.

Helping consumers cut through the clutter of ingredient information on food product labels will be essential to success in the future marketplace, according to a Mintel International Group Ltd. consumer study of America's drinking habits.

“The potential for using milk fractionation technology to create clean label, value-added foods and beverages is very exciting,” said Nana Farkye, Ph.D., a professor in the Cal Poly Dairy Science Department and key researcher at the D.P.T.C. Mr. Farkye and other members of the D.P.T.C. have done research on milk fractionation technology and helped a number of companies work with the ultrafiltration membranes and pilot scale lab facilities at the D.P.T.C.

With Mootopia, the membrane technology system, which included ultrafiltration, nanofiltration and reverse osmosis, allowed Select Milk Producers to remove the lactose without changing the other nutrients of milk, compensating the loss of lactose content with protein from the same milk to make protein-fortified, reduced lactose milk.

“It is still rich and creamy and has a little more viscous nature because of the protein content,” Mr. Farkye said.

Both Select Milk Producers and The Good Cow Co. continue to utilize the dairy research centers for fractionation expertise, sensory work and use of the cutting-edge pilot lab equipment.

“The beauty of this is we can create a product that provides the nutrients of two to three glasses of milk in one serving by breaking it apart and putting it back together again from the original source milk,” said Trish Corby, president of The Good Cow Co. “This is the kind of innovation that reaches the consumer searching for value-added products.” DBN

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