

Idaho Dairymen Make Big Business from Byproducts

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GOODING • When Eric Bastian was a young boy growing up in southern Utah, he'd often visit a local cheese factory for buckets of whey to feed to his pigs.

"Whey is great feed for farm animals," said Bastian, who today is director of research and development at Glanbia Foods.

The Utah cheese factory Bastian knew as a boy, and many others like it across the country, offered the leftover cheese liquid for free in those days. Farmers reciprocated in kind, taking it off the factories' hands.

Those days are long gone.

Whey, liquid that's left over from making cheese and one of several milk byproducts, is today a valuable commodity used in such things as baby formula and protein bars. Rarely, if ever, is it used anymore as feed for animals — let alone given away.

A focus of today's cheese manufacturers in south-central Idaho — Glanbia Foods and Jerome Cheese, for instance — is turning liquid whey into lactose and whey protein powders, which then are sold to companies across the globe that specialize in baby foods and health products.

There seems to be no shortage of demand. In just one month's time — April 2012 — more than 87.2 million pounds of lactose was manufactured in the United States, up 8.3 percent from April 2011, according to the U.S.

Benefits of Whey

Whey products are highly valued for their nutritional benefits, according to the U.S. Dairy Export Council. They contain proteins, vitamins, and a wide variety of minerals and other constituents such as lactose and lipids. Because of their high nutritional value and bioactive properties, whey products are increasingly used in products designed to improve health and wellness. Below are some ways whey is used and its benefits:

Bakery: Improves texture and enhances moistness; can be used as an egg replacer, lowering cholesterol content and reducing microbiological risks of finished products; can provide toasted flavors; provides vitamin and mineral fortification.

Beverages: Prevents sedimentation; contributes to a smooth mouthfeel; can provide a mild dairy flavor; provides protein, calcium, vitamins and minerals; delivers probiotics, lactoferrin and other bioactive or nutraceutical components.

Confectionery Helps create the desired texture; improves flavor and can provide nutty flavors; contributes to the caramelized color associated with many confections; can be used as a fat replacement; can be used to substitute for the milk solids in confectionery coatings.

Department of Agriculture. Concentrated whey protein reached 37.1 million pounds, up 6.9 percent over the same month in 2011.

The popularity of whey sheds new light on the Magic Valley's cheese manufacturers, who, as they diversify, may no longer fit that particular title.

"Don't think of this as a cheese factory or a whey factory," Bastian said, noting the company is always researching new ways to use milk byproducts. "This is a milk processing factory."

Dairy's Big Picture

Idaho doesn't have much of a market for the sale of whey products, said Micah Robinson, Glanbia's whey plant manager in Gooding. But because of the state's impressive dairy industry, it is the perfect place to manufacture them.

Idaho is the country's second highest milk-producing state, according to the U.S. Department of Agriculture, and is ranked third in overall agricultural production. More than 1.14 billion pounds of milk was produced in the Gem State in September 2012, for instance, a 2.3 percent increase from the same month in 2011. Glanbia, one of a few processing companies in south-central Idaho, processes about 9.5 million pounds of milk at its Gooding facility every day.

Dairymen do face a few challenges. Of particular concern, said Paul Patterson, an economist at the University of Idaho, is high feed prices. Higher milk prices during the first half of 2013 will improve margins, he said, but they are not expected to last.

Immigration and labor issues also remain a priority for the industry, said Bob Naerebout, executive director of the Idaho Dairymen's Association. "Obviously, we're pretty excited about the discussions on immigration reform going on in Washington right now. The vast majority of our workforce is foreign-born, but there's not a good visa program in place. That's critical for employment."

Dairy products: Provide body and texture in processed cheese applications; reduces syneresis and has a probiotic effect in yogurts; creates a smooth texture and freeze-thaw stability in ice cream.

Dry mixes: Dissolves in water quickly; improves product texture; contributes a bland, slightly sweet flavor.

Infant products: Increases overall nutritional value; provides high-quality proteins in a readily digestible form; good source of calcium, vitamins and minerals.

Nutritional products Increases overall nutritional value; provides high-quality proteins, calcium, vitamins and minerals; contributes to a food's healthful image and clean label.

Processed meats and seafood Helps adhere bread crumbs or batters to meat and fish; improves yield; helps create the desired texture; adds chew, bite and firmness; improves sliceability; adds color to improve visual appearance; enhances flavor.

Seasonings and flavors Acts as a flavor carrier; contributes a mild dairy flavor; provides uniform coating; prevents caking.

Snacks Acts as a flavor carrier; increases the volume of snack seasonings; provides uniform coating; extends shelf life.

Animal feed: Increases nutritional value, provides protein, vitamin and mineral fortification.

Source: U.S. Dairy Export Council

Amid those concerns, demand for milk byproducts is a boon.

“Any byproducts,” Naerebout said, “whether it’s used in baby formula or compost, helps the dairy industry to be more successful.”

More to Cheese than Meets the Eye

Whey is not a new thing, of course.

“When you make cheese, the product is there,” said Bill Riebesell, plant manager of Jerome Cheese. “So we have to do something with the leftover minerals and nutrients.”

Manufacturers didn’t always have the means or know-how to do that, which is why the liquid often was used to feed animals or dumped onto farm fields.

They eventually learned.

Jerome Cheese, owned by Minnesota-based Davisco Foods International, makes whey protein powder that it sells to companies all over the world. Those in turn use it in such things as protein bars, baby formula, baked goods and even makeup.

It is not an easy task to turn the liquid into a salable product, said Garcia, during a private tour of Glanbia’s Gooding whey plant on Jan. 25.

Once milk arrives at the facility, it is put into tanks where it is pasteurized. It then is placed into vats, where starter cultures are added to help it coagulate. The jelly substance continues to sit in the vats until it firms up enough to cut with an agitator. The cheese curds and whey then are separated, each going through more individualized processes and testing.

“Cream is put back into the cheese and the whey moves on to the next step,” he said. The whey is filtered several times, each time making it more concentrated. Proteins are separated from the lactose or milk sugar.

“We take whey and concentrate it, remove water from it, fractionate it,” Garcia said. The plant’s goal for protein is to achieve 34 percent whey concentrate. It then can be used in a variety of ways, he said, including in baked goods, beverages and even processed cheese.

The lactose is sold to companies that make baby formula.

Powdered Products

Most of Glanbia's customers are outside the state, said Robinson. Asia, for instance, is the company's largest buyer of lactose. Europe is a big buyer of protein, but so is the U.S. Health-food companies are big players, said Janna Verburg-Hamlett, the facility's quality control manager, as she pulled out sample bags of the powdered products during the tour.



"You can try them," she said, holding the bags open. "Notice the difference?"

The lactose had a taste similar to sugar, its texture a little coarse. The protein was sweeter, a little smoother.

When you see a health bar or milkshake whose packaging says it contains whey protein, there's a good chance it came from Glanbia, Verburg-Hamlett said.

Riebesell echoed similar sentiments about Jerome Cheese, saying his company's products also are a big player in the health-food industry. You'd be surprised at how many products contain whey protein, he said.

At Glanbia, finished lactose and protein powders are stored in a 17,000-square-foot warehouse the company built in 2010 that can hold up to 16 million pounds of product at a time. Fifty-five-pound bags sat in storage Jan. 25, as did some 2,000-pound super-sacks.

Robotic arms and dollies package and move the sacks, readying them for shipment. "Those robots save a lot of backs," Robinson said.

Hope for Growth

The manufacturing of whey helps people young and old all over the world receive protein they might otherwise lack in their diets, Robinson said.

Whey protein — a mixture of proteins isolated from whey — is a rich source of the body's essential amino acids, is efficiently digested and absorbed and is the most nutritious protein available, according to the magazine *Men's Fitness*. Whey protein isolate is the most pure form, containing 90 percent or more protein. It has little to no fat, lactose or cholesterol. Whey protein concentrate, on the other hand, has anywhere between 29 to 89 percent protein; as the protein level decreases, the amount of fat and lactose increases.

Because of its demand, Robinson said he sees only good things for the continued manufacturing of whey.

Naerebout, of the Dairymen's Association, said the dairy industry is encouraged by the demand, noting that Idaho's dairy industry is only as strong as its production. That in some ways comes back to pricing and a margin "that's running close to the costs of production right now." "Whey has gone from being completely of no value, when you'd dispose of it in fields, to something that is extremely valuable," he said.

Meanwhile, the manufacturers producing the whey have only good things to say about Idaho dairy producers.

"Here in Idaho we have all the milk we need," said Garcia. "The farmers do an excellent job. ... I don't think we'll ever run out of milk."

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