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USDEC News

Editorial TRADITIONAL CHINESE

在不斷成長的全球乳品市場需求下，席萊博國際股份有限公司(Schreiber Foods Inc.)以其傑出的成績展現了其在全球乳品市場的領導地位，Dairy Foods雜誌評選為”2008年度出口商”。席萊博國際股份有限公司以加工乳酪及乳脂乳酪的專業對於全球事業的拓展有相當強的實力。

美國的乳酪製造商於今年的世界乳酪大賽當中，再次展現了美國乳酪優異的品質及多樣化，從切達乳酪、戈貢佐拉乳酪到乳脂乳酪等新鮮的軟質乳酪的28個獎項中贏得了56面獎牌。於本期的季刊中，您可以瀏覽更多關於世界乳酪大賽的報導！

美國乳品出口協會致力於做為美國乳品出口廠商及使用者的橋樑，定期舉辦乳清研討會，讓業界先進能更了解乳清蛋白的應用。本期的季刊中將介紹乳清蛋白及乳品礦物質於麵條上的應用做為強化蛋白質及鈣質的來源。這個應用提供了麵條在功能上及營養方面經濟實惠的益處。第五屆的國際乳清研討會在9/7-9/9於巴黎舉辦。現場來自44個國家，超過600位的製造商、採購及學術專家參與的這次的研討會，會議中探討乳清產品於健康與營養方面新產品研發、行銷及應用。

此外，在本期的季刊中，我們將介紹美國乳品出口協會的4個會員：DairyAmerica, Inc., Erie Foods International, Inc.,

(continued on page 2)



(continued from cover editorial)

International Ingredient Corporation and Main Street Ingredients。最後，網站上有許多美國乳製品的相關報導，如果您有任何的問題或建議，歡迎隨時與我們聯絡。希望您能喜歡這期的季刊！我們的聯絡方式如下：

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Editorial

ENGLISH

Schreiber Foods Inc. has been honored by Dairy Foods magazine as "2008 Exporter of the Year" for exhibiting exceptional commitment to the global market and demonstrating leadership in growing global dairy demand. With specialties in processed cheese and cream cheese, Schreiber Foods' dedication is evident in its long-term plans for international expansion.

U.S. cheesemakers again demonstrated the quality and breadth of U.S. cheeses at the World Cheese Awards this year. Cheeses from the U.S. walked away with a country record of 56 medals in 28 classes of cheese, ranging from cheddar to gorgonzola to cream/fresh cheese with savory additives.

Serving as a bridge between U.S. suppliers and end-users, USDEC actively sponsors and organizes seminars to educate the trade on the variety of applications for whey protein. A newer application for whey protein and dairy minerals is the protein and calcium fortification of Asian noodles. This application offers both functional and nutritional benefits for Asian noodles at a very economical cost.

The 5th International Whey Conference (IWC) was held in Paris on September 7–9. Over 600 whey manufacturers, buyers and academic experts from 44 countries attended to learn about new developments with whey ingredients in the areas of health and nutrition, applications, innovative consumer products, marketing and processing.

Finally, this newsletter profiles 4 USDEC members: DairyAmerica, Inc., Erie Foods International, Inc., International Ingredient Corporation and Main Street Ingredients.

Please enjoy this issue of **USDECNews** which contains in-depth articles on the topics listed earlier and more. If you have any questions or suggestions please feel free to contact us by email or telephone. Thank you.

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USDEC News is published by the U.S. Dairy Export Council (USDEC) and is designed to provide up to date information about the U.S. dairy industry for the benefits of our international partners.

USDEC was formed by Dairy Management Inc. in 1995 to enhance the U.S. dairy industry's ability to serve international markets. USDEC is an independent non-profit membership organization representing dairy processors, exporters, milk producers and industry suppliers.

USDEC supports international buyers of dairy products by providing information about U.S. suppliers, their products and capabilities. We bring buyers and sellers together through conferences, trade missions and trade shows. USDEC furnishes application and usage ideas for U.S. dairy ingredients through seminars, one-on-one consultations and technical publications. We assist with foodservice promotions, menu development and education. We also work with local authorities to resolve market access issues that ensure reliable delivery for customers and importers. When you work with USDEC and its members, you are partnering with companies that manufacture and export more than 85% of all U.S. dairy products.

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Schreiber Foods Honored as “Exporter of the Year”

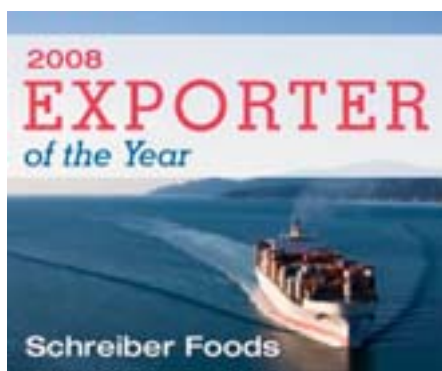
Dairy Foods magazine named U.S. Dairy Export Council (USDEC) member Schreiber Foods Inc. its 2008 Exporter of the Year. The publication awards this honor to a company that exhibits exceptional commitment to the global market, service to export customers and leadership in growing global dairy demand.

Schreiber’s dedication is evident in its long-term international expansion. The Green Bay, Wisconsin-based cheesemaker made its first export sale, a shipment of cheddar to Algeria, in 1991. Seventeen years later it sells thousands of tons of natural and processed cheese, cream cheese and cheese analogs annually to 34 countries worldwide.

Schreiber’s was a long journey from modest beginnings. The company was one of four that participated in the first United States (U.S.) dairy trade mission sponsored by the National Dairy Board in 1991. At that time the U.S. was still a dairy export novice and few people beyond U.S. borders considered the nation a potential supplier. “Schreiber leaders had a strategic vision to grow internationally,” says Bret Drake, the company’s export team leader. “We pursued that strategy by starting with a small staff and attending food shows to learn the business.”

Schreiber learned quickly, helping overall U.S. cheese exports to grow by 166% over the last 10 years, from 37,435 metric tons (MT) in 1997 to 99,431 MT in 2007. In helping build that volume, Schreiber also helped solidify the U.S. reputation for quality and service.

“By all accounts, Schreiber brings a value to the business as a supplier by providing good service and by paying close attention to customer needs,”



says Marc A. H. Beck, USDEC’s senior vice president, export marketing.

For example, early in its export efforts, the company sought out globally recognized halal certification organizations and then modified its purchasing requirements to comply with the needs of its customers. “We have

gained experience over time working with diverse cultures and providing products that are desired by the consumers in these cultures,” says Deborah Van Dyk, Schreiber’s vice president, industry and regulatory affairs.

It helped that Schreiber representatives were often there in person to listen. “Early on, Schreiber had the foresight to recognize the importance of having an in-country presence,” says Beck. Outside the U.S. the company operates plants in Brazil, Germany and Mexico, and joint ventures in four other nations. “It’s a sign that they are not building business for the moment, but for the long-term,” says Beck. And there is vast long-term potential in world dairy markets, particularly for cheese. “In general, world income is rising and people who historically might not have been able to afford cheese are now able to purchase it,” says Van Dyk. “The spread of the fast-food industry around the world has increased not only consumption but also awareness of cheeses used for sandwiches.”

One of the biggest challenges Schreiber faced was convincing people outside the U.S. that the country has a thriving dairy industry and, in particular, expert cheesemakers. Says Van Dyk, “They are becoming increasingly aware that the U.S. does offer high-quality products at competitive prices.” That, in no small part, is thanks to Schreiber Foods.

More information on Schreiber Foods is available in the March 2007 issue of **USDECNews**.

Editor’s note: Schreiber was recognized on November 18 during a live USDEC webcast event (to view go to <http://w.on24.com/r.htm?e=108551&s=1&k=35FFC0486ABBB7BF985C805C200B949A&partnerref=usdechomepage>).

U.S. Cheesemakers Triumph at World Cheese Awards

United States (U.S.) cheesemakers demonstrated their expertise at this year's World Cheese Awards, September 29, in Dublin, Ireland, walking away with a U.S. record of 56 medals in 28 classes of cheese, ranging from cheddar to gorgonzola to cream/fresh cheese with savory additives.

"The U.S. performance attests to the quality and breadth of U.S. cheeses and the care, precision and skill of U.S. cheese craftsmen," says Angélique Hollister, marketing director, cheese and manufactured products, for USDEC, which co-sponsored the event. "In the past, when consumers thought of great artisan cheeses, they would think of Europe," said Hollister. "That is no longer the case and has not been the case for years. As U.S. cheesemakers have shown time and again at the World Cheese Awards, they can stand toe-to-toe with any French, British, German or Swiss manufacturer out there."

Twenty-four U.S. companies received honors, the highest number of U.S. cheesemakers ever to be recognized in the competition. Of the 56 medals, 16 were gold, 19 silver and 21 bronze – all record highs. The previous U.S. best of 44 medals came in 2004, although



International Cheese Experts Judging the Competition

U.S. companies have won 40-plus medals in three of the last four years.

More than 2,400 cheeses from all corners of the globe vied for the taste buds of the 12-judge panel comprised of chefs and food experts.

Among the 2008 U.S. winners, Fiscalini Cheese Company, Modesto, California, took home a gold, two silvers and two bronzes for its cheddar, bocconcini mozzarella and semi-hard Lionza; Estrella Family Creamery, Montesano, Washington, earned two golds and three silvers in five different categories; Crave Brothers Farmstead Cheese, Waterloo, Wisconsin, picked up two gold medals in rind-washed cheese categories; and Sartori Foods, Plymouth, Wisconsin, won two golds and a silver in the "New Cheese" categories for its Sartori Reserve line.

Sartori Reserve Raspberry Bella Vitano also won the USDEC-sponsored trophy for "Best U.S. Cows' Milk Cheese."

The Bella Vitano line combines the creamy smoothness of a young cheese with the crystalline crunch of an older one—"the best of those two worlds," says Jim Sartori, president.

"Competing against the very best and winning at an international event not only shows how far Sartori Foods has

come, but that the whole U.S. cheese industry has come a long way," says Sartori, who had also won the "Best U.S. Cows' Milk Cheese" award in 2006 for his Sartori Reserve SarVecchio Parmesan.

The care that contributes to the winning performance of U.S. specialty cheeses translates to all U.S. varieties and is one reason U.S. cheese exports increased by 166% to nearly 100,000 metric tons (MT) from 1997 to 2007. In 2008 U.S. export shipments are on track to reach almost 150,000 MT in 2008 – a gain of almost 50% in a single year.

"Even though the U.S. is one of the globe's top milk producers, one of the hurdles the U.S. dairy industry has had to overcome in the global marketplace is the misapprehension that we do not know cheese," says Marc A. H. Beck, USDEC's senior vice president, export marketing. "When cheese buyers from around the world see the accolades we receive year-after-year at this prestigious competition, they understand U.S. cheese expertise and that our products are as good as or better than cheese produced anywhere else."



Fiscalini Lionza Cheese

In the News...

New USDEC Members

- USDEC welcomes three new companies to the membership: **American Farm Bureau Federation**, a general farm organization based in Washington, D.C.; **Hercules USA**, a New York-based trading company; and **Ohio Farm Bureau Federation**, a Columbus, Ohio-based farm organization.

Company Recognition

- **Davisco Foods International**, Le Sueur, Minnesota, received the Governors' International Trade Award from the state of Minnesota. This award honors Minnesota companies, organizations and individuals who have excelled in the international marketplace. The award highlights the crucial role exports play in Minnesota's economy and recognizes the recipient's efforts to expand and promote the state's exports. Davisco has shipped dairy products to more than 60 countries over the last 25 years.

New Plants and Upgrades

- **Dairy Farmers of America** will invest \$21 million to expand its Fort Morgan, Colorado, balancing plant. The project, expected to be complete by May 2009, will boost capacity by 880,000 liters per day. The plant produces nonfat dry milk, condensed milk and sweet cream, which are sold to other processors for solids to make cheese, yogurt and ice cream.
- **Hilmar Cheese Company** will expand its Dalhart, Texas, cheese and whey plant. The project, due for completion in 2010, will double capacity to 4.2 million liters of milk per day.
- **Kraft Foods Inc.** added digesters at its Lowville and Campbell, New York, cheese plants to turn whey into biogas. The move will enable the company to cut natural gas purchases by a third and eliminate the expense of hauling the whey for disposal.
- **Milk Specialties Global (MSG)**, Carpentersville, Illinois, acquired a feed-grade manufacturing facility in Whitehall, Wisconsin, from **SPF North America**. MSG will use the plant to spray-dry dairy ingredients

for the feed industry, including hydrolyzed whey protein concentrate, hydrolyzed vegetable protein and other custom products.

- **Nestlé** will expand its Anderson, Indiana, beverage plant just two years after opening. The company will invest \$200 million over the next two years, adding 11,000 square-meters and creating 135 new jobs. The plant makes *Nesquik* flavored milk and *Coffee-Mate* creamer.
- **Protient, Inc.**, St. Paul, Minnesota, started production of whey protein isolate (WPI) at its Juda, Wisconsin, plant. The facility also makes whey protein concentrate (WPC) and lactose. Protient's WPI is used primarily in low-carbohydrate products, nutrition bars and powdered beverages; the company is also targeting applications for satiety.
- **Saratoga Cheese Corp.** will build a new \$40-million specialty cheese factory in Auburn, New York. The plant will handle about 300,000 liters of milk per day to make feta, havarti, muenster, fresh mozzarella and other specialties. The project is expected to be complete in 2010.
- **Unilever** reached an exclusive licensing agreement with **Starbucks** to manufacture, market and distribute Starbucks ice cream in the United States (U.S.) and Canada. The coffee-flavored line of ice cream, which has been made by other manufacturers since 1996, will continue to be sold in supermarkets, but not in Starbucks coffee shops.
- **W&W Dairy** opened a 1,400-square-meter plant in Monroe, Wisconsin, to produce cheese for the growing Hispanic cheese market in the U.S. The facility turns out about 7 metric tons (MT) of cheese per day, with capacity to double as business grows.

Moves and Consolidations

- **Dean Foods** made a number of moves to rationalize its ice cream manufacturing capacity. Its **Purity Dairies** unit will cease ice cream production at the Nashville, Tennessee, plant, and shift output to other Dean plants in Tennessee and Alabama. Its **Land-O-Sun** (a subsidiary of Dean Foods) ice cream

plant in Hickory, North Carolina, will close in November and production will be moved to other Dean facilities.

Meanwhile, Land-O-Sun has acquired **Driggs Farms of Indiana**, an ice cream manufacturer based in Decatur, Indiana. That plant employs 200.

- **H.P. Hood** will close its **Crowley Foods** cultured dairy product plant in Bristol, Virginia, and move production to other facilities. Hood acquired Crowley in 2004.
- **Protient, Inc.**, a unit of **Associated British Foods**, closed its Norfolk, Nebraska, milk protein plant, just months after expanding and upgrading. No reason was given for the closure. The company is working to determine the future of the facility.
- **Saputo Inc.** will close its Hinesburg, Vermont, mozzarella plant rather than rebuild following a fire on September 29th. Since the incident, production has been transferred to other Saputo facilities in Wisconsin and California. The company says the move will save them \$2.2 million annually.

New Products

- **Cabot Cooperative Creamery** introduced *Reduced Fat Cheddar Cheese with Omega-3 DHA*, the first cheese product on the U.S. market to feature Martek Biosciences' *life'sDHA*, a vegetarian form of Omega-3 made from algae. Omega-3 is linked to a number of health benefits, including brain and eye development and cardiovascular health.

People in the News

- **American Dairy Products Institute** named Dale Kleber CEO. Jim Page, the previous CEO, passed away in April. Kleber has more than 20 years' experience in dairy and food-related businesses, including a stint as vice president/general counsel for Dean Foods.
- **Associated Milk Producers Inc.** (AMPI) of New Ulm, Minnesota named Ed Welch president and CEO. He succeeds Mark Furth, who retires after 38 years with AMPI, the last 19 as president/CEO. Welch was previously COO of the company.

Cheese Trends in the U.S. Bakery Sector

Consumers have an abundance of options when purchasing bakery products in restaurant channels. As more bakeries look to differentiate themselves in the marketplace, many have experimented with unexpected ingredients and innovative recipes to create new and unique taste experiences for consumers. Much of the recent innovation in both sweet and savory bakery products has been bolstered by the use of flavorful cheeses.

Cheese incorporations into bakery products are experiencing strong growth in the foodservice sector, with the number of bakery products containing cheese nearly tripling on U.S. menus since 2005. As consumer palates become more refined, yet increasingly experimental, cheeses have become a welcome addition to a variety of bakery products.

Cheese can be used to set apart classic baked goods and a growing number of innovative cheese applications are bringing gourmet appeal to menu items. For instance, fine dining restaurant *Gotham Bar & Grill* uses cheese to create a unique mix of sweet and savory flavors with its Honey Crisp Apple Tart. The dish incorporates tangy cheddar cheese into the tart's crust for a new and flavorful expression of the classic pastry crust.



Casual dining chain *Au Bon Pain* features a hearty bakery selection, including its Cheddar Apple Bagel. This flavorful bakery item mixes the sweetness of apple with tangy cheddar cheese for a sweet and savory treat. *Starbucks* has also spiced up its bakery selection with its Pumpkin Cream Cheese Muffin, which combines classic fall flavors with rich cream cheese.

One bakery segment that has been a prime platform for experimenting with cheeses is artisan breads. As artisan bakery products gain popularity in restaurant channels, many dishes are integrating cheeses to further augment their gourmet appeal. Consider casual dining chain *La Madeleine*, which boasts a traditional French café and a robust bakery. *La Madeleine's* Roasted Garlic and Cheddar Bread, for example, is authentic sourdough bread that is accented with roasted garlic and savory cheddar cheese.

Panera Bread similarly features an extensive bakery menu, with artisan selections such as its Three Cheese Loaf with parmesan, romano and asiago cheeses, and its Asiago Cheese Sourdough Loaf. The restaurant recently added to its artisan selection with the introduction of the Cranberry Walnut Panettone; this sweet bread is made with eggs, sugar, butter and cream cheese and accented with orange peel, cranberries and walnuts.

Many restaurants are further innovating with the use of bold cheeses to add strong flavor to baked goods. For example, *Paradise Bakery & Café* fea-



tures a Spinach and Cheese Quiche that is filled with spinach, eggs, cream and a blend of cheddar, monterey jack and parmesan cheeses. In the same way, *Great Harvest Bread Company* uses bold-flavored feta cheese in its Spinach Feta Bread.

Beyond gourmet expressions, cheese is also appearing in a growing number of healthy bakery products. As consumers become more concerned with health and wellness, they are looking for food that tastes good and is good for them. Cheese is frequently used as a flavorful component in nutritious bakery items. For example, smoothie chain *Jamba Juice* boasts a hearty bakery selection to accompany its nutritious smoothie offerings. Its Sourdough Parmesan Pretzel, for example, is fortified with protein (15 g), calcium and vitamin B, providing health-conscious diners with a nutritious, yet cheesy snack that is high in protein and low in cholesterol.

Using cheese in a healthy bakery product is noteworthy for the category, but with its natural protein and calcium content, there is opportunity to leverage cheese as an appetizing addition to nutritious baked goods.

As interest in flavorful cheeses grows, there is ample opportunity for bakeries to continue experimenting with unexpected cheese components. Many restaurants have embraced the addition of cheeses into a growing number of savory bakery items; however, as demonstrated by *Gotham Bar & Grill*, there are many ways to experiment with cheeses in sweet baked

goods and dessert pastries. Innovating with tangy varieties such as cheddar, asiago or parmesan compliments the sweetness of the dishes and will differentiate these products on bakery and dessert menus.

Finally, touting cheese for its nutritional content presents much opportunity in the bakery sector. As consumers continue to seek savory healthy foods,

cheeses such as mozzarella, colby and monterey jack can also serve as flavorful additions to wholesome bakery items. Consumers continue to seek products with new and exciting components and those bakery items integrating cheese in novel capacities will likely have a broader appeal.

U.S. Dairy Industry News

IWC 2008



The 5th International Whey Conference (IWC)—**WheyVolution**—was held in Paris, September 7-9, 2008. Over 600 whey manufacturers, buyers and academic experts from 44 countries were in attendance to learn about the most current news and developments with whey ingredients. The primary areas of focus at the conference were health and nutrition, new applications, innovative consumer products, marketing and processing.

Today there is an increased global awareness of the connection between health and diet. Whey products have been clinically proven to have a beneficial impact in a number of areas, including body mass and weight management. The IWC 2008 agenda included 14 presentations in the area of nutrition from experts in Australia, Canada, China, France, the Netherlands, Switzerland, the U.K. and the

U.S. Several key nutritional messages emerged from the presentations.

Protein Quality

Amino acid composition is a key factor in determining the quality of a protein. Quality varies greatly by protein source (i.e. dairy, eggs, meat or vegetable) and whey protein is well recognized for being very high in quality. Recent studies validate the need to re-examine the criteria used to measure protein quality in terms of achieving optimal health.

Weight Management

Both body weight and body composition are positively affected by an increase in whey protein consumption. Whey protein helps increase satiety, reducing food intake. In addition, the loss of lean muscle mass during weight loss is minimized for improved well-being.

Bone Loss

High protein diets safely help reduce bone loss in all age groups; whey protein is especially beneficial in helping to reduce age-related bone loss.

Muscle Loss

Whey protein helps prevent or minimize muscle loss, especially during aging due to its "fast digestion" properties and high leucine content. Leucine stimulates muscle protein synthesis and inhibits protein breakdown.

Other areas where whey protein has potential benefits include gut health, immunity and cardiovascular health.

The U.S. dairy industry had strong visibility at the event with both USDEC and Dairy Management Inc. in attendance as key sponsors and exhibitors. These organizations are recognized for their contributions in the development, promotion and funding of whey protein-based research with a specific emphasis on nutrition.

The next IWC will take place on September 11-14, 2011 in Chicago, Illinois, USA.

Additional information on IWC 2008 is available at www.iwc-2008.org

Asian Noodles with Whey Protein and Dairy Minerals

Gary Hou, Wheat Marketing Center, Portland, Oregon

For centuries noodles have been an important part of the diet of many Asians. Currently, over 40% of the total wheat flour consumed in Asia is in the form of various types of Asian noodles. In South Asia, raw and parboiled yellow alkaline noodles are the most widely consumed. Today, Asian noodles are considered to be a global food, enjoyed by more and more individuals each year. Instant fried noodles are of special interest and are gaining popularity around the world because of their convenience, pleasant taste and affordable price.

Wheat flour is the primary ingredient used in Asian noodles and is comprised of starch (65-75%), protein (8-14%), vitamins, minerals and fiber. However, wheat flour is not considered nutritionally well balanced as flour protein lacks certain essential amino acids, such as lysine. As a result, both the protein efficiency ratio (PER) and the protein digestibility corrected amino acid score (PDCAAS) of wheat gluten (the primary form of flour protein) are much lower than in many other protein sources from plants and animals.

Whey protein concentrates provide a high quality source of protein. Virtually all the essential amino acids in whey proteins are present at levels that exceed the Food and Agriculture Organization of the United Nations (FAO) and the World Health Organization (WHO) nutritional intake recommendations. Additionally, whey proteins comprise a number of peptides and protein fractions that may promote general health and well-being.

Dairy mineral complex, also known as milk calcium, is a natural source of calcium and other minerals derived from milk (e.g. phosphorous, magnesium and potassium) with high bioavailability. Incorporating dairy mineral complex into Asian noodles provides additional

nutritional value for populations with a low calcium intake.

USDEC recently conducted a comprehensive project at the Wheat Marketing Center in Portland, Oregon to investigate the nutritional gain and quality improvement of Asian noodles fortified with 1) whey protein concentrate (WPC) and 2) WPC and dairy minerals. The specific objectives were to identify the impact of whey protein and dairy mineral fortifications on noodle formulations, processing parameters, noodle color, noodle texture, nutritional value and cost. This study was done using two types of WPC (high-gel WPC 80 and standard WPC 80) and a dairy mineral complex. Both WPCs contained at least 80% protein.

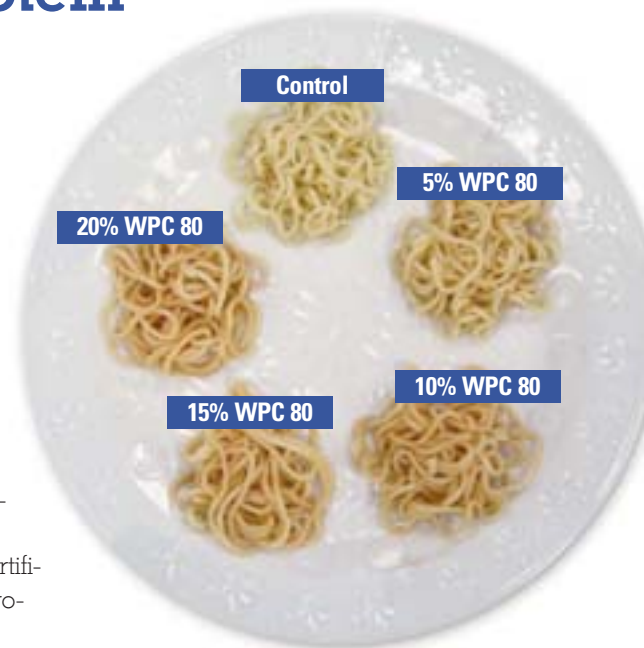
Results

Noodle Formulation and Processing Parameter Modifications

Asian noodles are traditionally produced by mixing flour with salt and an alkaline salt solution to form a crumbly dough. The dough is compressed into a sheet which is further compressed to the desired thickness. The sheet is then slit and cut into noodle strands. The production of raw yellow alkaline noodles is complete at this stage.

Parboiled alkaline noodles are made by cooking raw alkaline noodles in boiling water for 45 seconds. To make instant fried noodles, raw alkaline noodle strands are waved and steamed for 2–3 minutes to gelatinize the starch and stabilize the waved shape, then cut and formed into 100 g noodle blocks which are deep-fried for 60–90 seconds at 150°C.

When preparing noodle dough fortified with WPC 80 and dairy minerals, the dairy ingredients were dry-blended with the flour before mixing with the salt solution. Since the amount of water in the noodle formula is relatively low, it

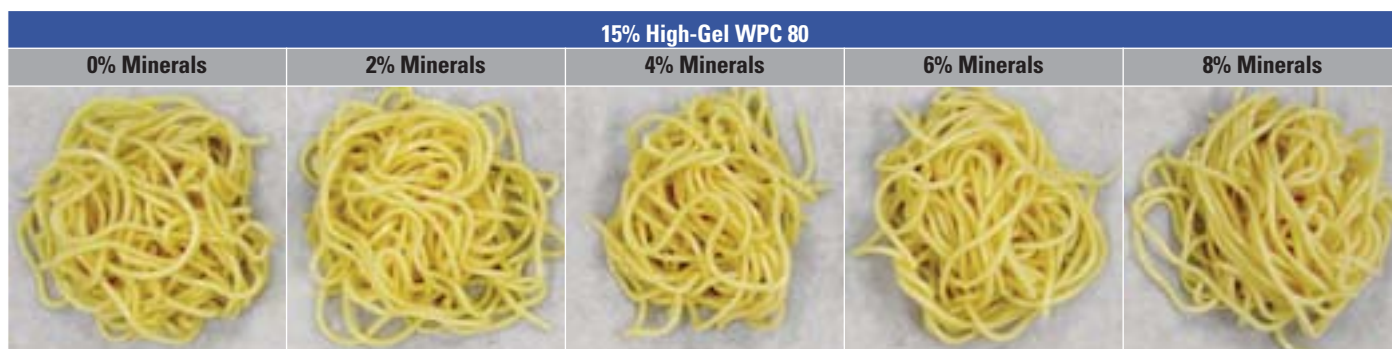


Cooked Instant Noodles Fortified with Standard WPC 80

is not possible to disperse WPC 80 in the solution before mixing. Compared to the control, the amount of water in the noodle formulas had to be reduced when WPC 80 was added. Without a reduction in water, the noodle dough particles were wet, very lumpy and stuck to rollers during the sheeting process. At a 15% addition level, the high-gel WPC 80 and the standard WPC 80 reduced the water in the alkaline noodle formula by 2% and 8.5%, respectively. For instant fried noodles, 10% high-gel WPC 80 and standard WPC 80 reduced the water by 3% and 8%, respectively.

The noodle dough mixing time was also adjusted to optimize the dough condition for sheeting. The addition of WPC 80 reduced dough mixing time by up to 50% in all noodle production. Without a reduction in mixing time, the noodle dough particles became too large and very hard, making it difficult to process during sheeting. Reducing dough mixing time minimizes these problems while at the same time increasing noodle production output.

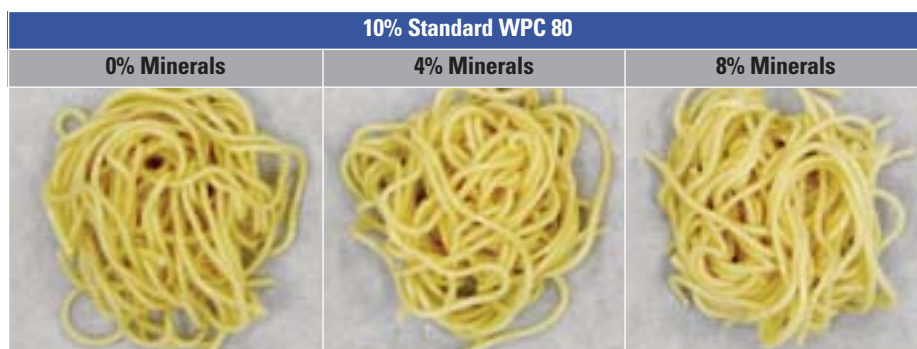
Parboiled Wet Noodles Fortified with WPC 80 and Dairy Minerals



Functional and Nutritional Benefits of Fortifying Asian Noodles with WPC 80

Table 1 on the following page shows the recommended noodle formulations (using both high-gel and standard WPC 80), the impact on noodle sensory quality, the nutritional information and the estimated costs for producing 100 g of noodles.

Although the main objective of the study was to improve the nutritional value of Asian noodles through WPC 80 fortification, a significant improvement in noodle quality was also observed. WPC 80 not only improved noodle brightness and yellowness, it also significantly increased noodle bite and chewiness. At a 5–15% fortification level, the improved noodle sensory attributes were profound and highly preferred. Higher addition levels, however, caused difficulty in noodle processing and the finished noodles were too hard and had a rough texture. A whey protein flavor was also detectable in the cooked noodles. The improvement in noodle texture due to the addition of WPC 80 indicated that the functional properties of whey protein could be useful to minimize product defects due to variations in wheat flour protein levels. Also, with the addition of WPC 80 it is possible to use soft wheat flour (lower protein than hard wheat flour) to overcome excessive hardness. This will also lower raw material costs. It was noticed that, with the exception of parboiled alkaline noodles, the time required to fully cook noodles for serving increased by 1–2 minutes for raw



alkaline noodles and instant fried noodles as a result of the addition of WPC 80. However, noodle sizes could be reduced to offset the longer cooking time requirement. The texture and hydration qualities imparted by the addition of WPC 80 could prove to be highly desirable in additional types of applications, including soups.

The nutritional benefits of WPC 80 fortification in Asian noodles were very significant. In raw alkaline noodles, a 15% addition of WPC 80 to the formula increased the protein content by 100% when compared to the control. In parboiled alkaline noodles, a 15% addition of WPC 80 increased the protein content by over 90%. In instant fried noodles, the protein content was raised 100% by fortifying with WPC 80 at a 10% level.

The additional costs to achieve these functionally and nutritionally improved noodles were quite moderate. Adding WPC 80 to the formula increased the cost from USD \$0.03 to 0.05 per 100 g of noodles, depending on the type of noodle and WPC used.

Functional and Nutritional Benefits of Fortifying Asian Noodles with WPC 80 and Dairy Mineral Complex

Table 2 summarizes noodle formulations fortified with both WPC 80 and dairy minerals and the impact on the noodles sensory quality, nutritional value and cost. The study showed that 4–6% of dairy minerals added to noodles fortified with 10–15% WPC 80 gave similar noodle quality to the control (without dairy minerals). At a 4% dairy mineral addition level the calcium and total mineral content increased by over 2,700% and 150%, respectively. At this usage level, the costs increased by USD \$0.01 – 0.02 per 100 g of noodles.

In summary, this study clearly demonstrated the significant advantages of fortifying Asian noodles with WPC 80 alone or in combination with dairy minerals to improve the nutritional profile and texture. Some formulation and processing parameters modifications may be necessary however, the associated cost increases are very moderate. The nutritional and functional benefits received from fortifying Asian noodles with dairy ingredients makes this a worthwhile investment.

Table 1. Asian Noodles Fortified with WPC 80: Sensory, Nutrition and Cost Attributes

Noodle Type	Raw Alkaline Noodle		Parboiled Alkaline Noodle		Instant Fried Noodle	
	% WPC 80 ^a		% WPC 80 ^a		% WPC 80 ^a	
	15%	15%	15%	15%	10%	10%
WPC 80 Type	High-Gel	Standard	High-Gel	Standard	High-Gel	Standard
Noodle Formulation						
Flour	85	85	85	85	90	90
WPC 80	15	15	15	15	10	10
Water	31	24.5	31	24.5	30	25
Salt	1	1	1	1	1.5	1.5
Potassium carbonate	0.6	0.6	0.6	0.6	0.1	0.1
Sodium carbonate	0.4	0.4	0.4	0.4	0.1	0.1
Sensory Characteristics vs. Control^b						
Noodle color	Brighter & yellower	Good brightness & yellowness	Good brightness & yellowness	Brighter & less yellow	Yellower	Brighter & yellower
Cooked noodle texture	Firmer & chewier	Firmer & more elastic	Firmer & more elastic	Firmer & chewier	Much firmer bite	Much firmer bite
Nutritional Information per 100 g of Noodles						
Calories (kcal)	267.7	282.2	157.0	170.6	454.1	442.6
Protein (g)	16.2	17.1	9.5	10.4	16.8	17.5
Carbohydrates (g)	47.6	50.9	27.9	30.8	62.1	65.1
Fat (g)	1.5	1.7	0.9	1.0	16.0	13.3
Calcium (mg)	25.5	33.7	15.8	21.2	21.3	27.7
Iron (mg)	0.12	0.13	0.07	0.08	0.10	0.10
Magnesium (mg)	3.1	7.3	2.2	4.8	2.6	6.0
Phosphorus (mg)	36.1	44.9	21.2	27.1	29.6	36.4
Potassium (mg)	227.0	225.9	133.2	136.6	78.0	71.1
Cost Increase vs. Control Formula per 100 g of Noodles						
U.S. Dollars	0.05	0.04	0.03	0.03	0.05	0.04

^a % of (flour and WPC 80) weight ^b Control noodles did not contain WPC 80

Table 2. Asian Noodles Fortified with WPC 80 and 4% Dairy Minerals: Sensory, Nutrition and Cost Attributes

Noodle Type	Raw Alkaline Noodles		Parboiled Alkaline Noodles		Instant Fried Noodles
	% WPC 80 ^a		% WPC 80 ^a		% WPC 80 ^a
	15	10	15	10	10
WPC 80 Type	High-gel	Standard	High-gel	Standard	High-gel
Noodle Formulation					
Flour	85	90	85	90	90
WPC 80	15	10	15	10	10
Dairy minerals	4	4	4	4	4
Water	31	25	31	25	31
Salt	1	1	1	1	1.5
Potassium carbonate	0.6	0.6	0.6	0.6	0.1
Sodium carbonate	0.4	0.4	0.4	0.4	0.1
Sensory Characteristics vs. Control^b					
Noodle color	Similar	Brighter & less yellow	Similar	Similar	Similar
Cooked noodle texture	Similar	Similar	Similar	A bit softer	Harder & rougher
Nutritional Information per 100 g of Noodles					
Calories (kcal)	261.6	273.3	165.6	172.4	433.2
Protein (g)	15.9	14.1	10.1	8.9	16.8
Carbohydrates (g)	46.5	52.2	29.4	32.9	61.8
Fat (g)	1.5	1.5	0.9	0.9	13.8
Calcium (mg)	725.5	754.8	459.9	476.8	900.2
Iron (mg)	0.15	0.11	0.09	0.07	0.13
Magnesium (mg)	43.9	47.5	28.1	30.4	53.9
Phosphorus (mg)	429.2	441.2	271.6	278.3	523.8
Potassium (mg)	244.3	230.7	154.6	145.5	107.1
Cost Increase vs. Control Formula per 100 g of Noodles					
U.S. Dollars	0.02	0.02	0.02	0.02	0.01

^a % of (flour and WPC 80) weight ^b Control noodles were fortified with WPC 80 only

Lactose Improves Pig Diets

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It is well understood that providing lactose in the diet the first few weeks post-weaning improves pig feed intake and gain through the nursery period. The importance of this response is the subsequent reduction in days to market and the increase in throughput that results by making sure pigs get off to a good start and by adding weight in the nursery. Research and field experience clearly demonstrate that pigs make an easier transition from sow's milk to dry feed when lactose is included in the diet, resulting in higher feed intakes, increased gain and fewer starve-out pigs. The obvious nutritional benefit of providing lactose is its improved digestibility compared to starches from cereal grains, due to the pig's natural state of development of digestive enzymes after weaning. However, enhancement of feed palatability and improvements in intestinal health are likely equally important in explaining the observed response to lactose.

In 2007, the price of dairy products used to provide lactose for pig feed reached unprecedented levels. This pressured feed manufacturers and nutritionists into lowering the lactose levels of pre-starter and starter diets to bare minimums in order to optimize the economic return of lactose inclu-



sion. Many factors have contributed to a softening of the lactose market in 2008 and whey prices are now in many instances at 25% of the highs reached in mid-2007. During this same time period, the price of corn and other cereal grains has soared. These market swings have resulted in some of the smallest price differentials between the cost of corn and lactose ever observed in the swine feeding industry. This situation presents an opportunity to re-evaluate optimal lactose levels in starter programs and take full advantage of the positive

relationship between lactose level and pig performance.

A recent cooperative research effort by researchers at the University of Kentucky, the University of Missouri and Ohio State University has reconfirmed the value of feeding aggressive levels of lactose in the third and fourth week post-weaning. At each of the three universities, a trial was conducted to evaluate the response to 0, 2.5, 5, 7.5 and 10% lactose increase from day 14 to 28 post-weaning. Pigs were weaned at the age of 15 to 20 days and averaged 6.2 kg. After one week of a common phase 1 diet containing 20% lactose and one week of a common phase 2 diet containing 15% lactose, pens of pigs were administered treatment diets.

Responses to increasing the lactose in diets from day 14 to 28 post-weaning were observed at each of the three university research sites. Figure 1 illustrates the average daily gain (ADG) response when data from the three trials were combined. Although the analysis indicated a linear response, it appears that the response was maximized at 7.5% lactose. The improve-

Figure 1. Effect of Lactose Level on Average Daily Gain, days 14-28 Post-Weaning

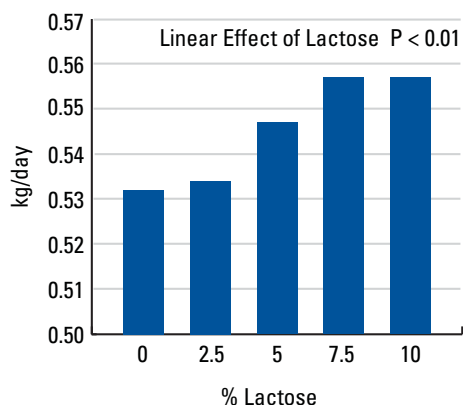
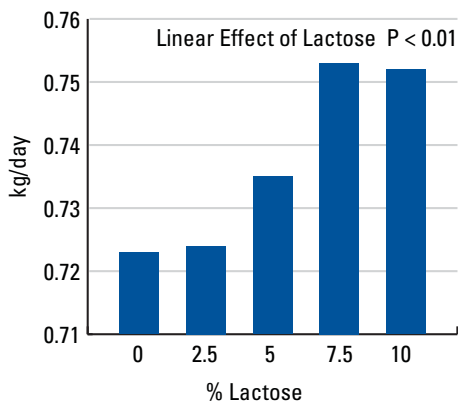


Figure 2. Effect of Lactose Level on Average Daily Feed Intake, days 14-28 Post-Weaning



ment in ADG as pigs were fed higher levels of lactose was a result of increased average daily feed intake (ADFI) (Figure 2).

The economics of feeding the various lactose levels for pig weights from 10.0 to 18.1 kg are presented in Table 1. The added gain from each inclusion of lactose was calculated by comparing the total amounts of gain during weeks 3 and 4 to the total gain for pigs fed 0% lactose during this period.

The pigs fed 7.5% lactose gained approximately 0.45 kg more than pigs on the diet without lactose. The cost of gain for each lactose fortified feeding was calculated from the reported feed efficiency numbers and calculated diet costs for each treatment using \$6/bushel for corn, \$413/MT for soybean meal and \$441/MT for whey permeate (lactose source) with realistic costs for other fixed ingredients.

Estimates of the relationship between the differences in nursery exit weight and the impact on market weight are variable; however, it is generally accepted that a 0.45 kg advantage in weight at the end of the nursery will increase through the subsequent grow-finish period. For this study an estimate of reduced days to market was made by assuming that 0.45 kg of extra weight out of the nursery would result in a 0.9 kg heavier pig at marketing, and that the average daily gain in finishing would be 0.84 kg/day. A cost of \$0.12/day for yardage and a finishing feed conversion of 2.80 were used with average cost of medium energy finishing feed assumed to be \$309/MT. When the costs of gain in finishing and yardage are considered, the additional weight out of the nursery for pigs fed 7.5% lactose from day 14 to 28 would result in a \$0.19/pig benefit compared to the pigs having no lactose in the diet during this period.

Benefits

In conclusion, the benefit of lactose levels up to 7.5% in the third and fourth week post-weaning for pigs that averaged 6.2 kg at weaning and

Table 1. Economic Comparison of Feeding Various Lactose Levels from Day 14 to 28 Post-Weaning

Measure	Lactose %				
	0	2.5	5	7.5	10
Initial body weight (d-14), kg	10.38	10.25	10.21	10.27	10.33
Final body weight (d-28), kg	17.74	17.71	17.87	18.07	18.14
Total gain, d 14-28, kg/pig	7.36	7.46	7.66	7.80	7.81
Feed:gain, d 14-28	1.36	1.35	1.34	1.35	1.34
Diet cost, d 14-28, \$/MT	412.52	417.14	422.07	426.91	432.03
Total feed cost, d 14-28, \$/pig ^a	4.16	4.22	4.32	4.48	4.53
Added gain from lactose, kg/pig ^b	--	0.109	0.308	0.445	0.458
Cost of added gain in the nursery, \$/pig ^c	--	0.06	0.16	0.32	0.37
Estimated reduction in days to market ^d	--	0.26	0.74	1.06	1.09
Value of reduced yardage, \$/pig ^e	--	0.03	0.09	0.13	0.13
Cost of making up gain in finishing, \$/pig ^f	--	0.09	0.27	0.38	0.40
Net benefit, \$/pig ^g	--	0.06	0.20	0.19	0.16

^a Total gain x feed/gain x diet cost.

^b Total gain from treatment – total gain from 0% lactose.

^c Total feed cost of treatment – total feed cost of 0% lactose.

^d Added gain from lactose x 2 (multiplication factor for nursery exit weight to market weight) divided by 1.85 (finisher average daily gain).

^e Estimated reduction in days to market x \$0.12 (yardage).

^f Added gain from lactose x 2.80 (finishing feed conversion) x \$0.14 (average cost of finishing feed).

^g Value of reduced yardage + Cost of making up gain in finishing – Cost of added gain in the nursery.

were fed diets with pharmacological levels of copper, 6% fish meal and antibiotics was demonstrated in three different environments with different pig sources.

Assuming 24 pigs/sow/year and a net benefit of \$0.19/pig by feeding 7.5% lactose from day 14 to 28 post-weaning, the net return to the producer would be \$45,600 for every 10,000 sows in production.

This calculation assumes feeding to a constant market weight and fewer days to achieve that weight due to feeding increased lactose in the starter period. Using another scenario, if barn days are fixed the additional 0.45 kg out of the nursery would result in selling an additional approximate 0.9 kg of market weight, and the economics is even more favorable. Using August 2008 lean hog prices and factoring in the added feed cost, the

benefit would be greater than \$0.50/pig (greater than \$120,000 per 10,000 sows).

Regardless of how the economics are calculated, the bottom line is that current lactose pricing provides an opportunity for the swine industry to be aggressive with lactose levels in starter diets to maximize performance through the nursery period and improve production efficiencies to market.

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Reference

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DairyAmerica, Inc.

DairyAmerica, Inc., a federated marketing company, is an association of nine producer-owned dairy cooperatives who work together to market and supply quality dairy products to a diverse and expansive customer base in the United States (U.S.) and internationally. The Fresno, California-based company was founded in 1995.

The following member cooperatives, spread across 14 states in the U.S., are members of DairyAmerica, Inc.: AgriMark, Inc., California Dairies Inc., Dairy Farmers of America, Land O'Lakes, Inc., Lone Star Milk Producers, Maryland & Virginia Milk Producers Association, O-AT-KA Milk Producers, Inc., St. Albans Cooperative and United Dairymen of Arizona.

DairyAmerica markets 100% of the milk powder produced by their member companies. The export product line consists of nonfat dry milk (NDM), dry buttermilk, dry whole milk powders and other special protein blends. All products are packaged, marketed and sold under the DairyAmerica brand name.

In 2007, DairyAmerica exported approximately 170,000 MT of U.S. dairy products, the majority of which was exported to Mexico. In 2008 exports are projected to grow to over 225,000 MT with continued growth the following year.

DairyAmerica's export markets are expanding and currently include the following: China, Southeast Asia, Mexico, South America, the European Union and North Africa.

According to Rich Lewis, chief executive officer of DairyAmerica, "The company mission is to provide a consistently high level of service, in addition to superior dairy products, to customers. DairyAmerica reaches out to markets

around the globe to be their first choice of supply for milk powders."

DairyAmerica is dedicated to providing the best transportation available to ensure products are delivered to customers on time and in excellent condition. In order to streamline the distribution process dairy ingredients are shipped from DairyAmerica or directly from their member companies. Procedures are in place to trace all products from the point of origin to their shipping destination. The experienced in-house logistics team works closely with customers to identify the optimal transportation solution at the most competitive rate.

Product Line

All DairyAmerica products meet or exceed the requirements established by the American Dairy Products Institute (ADPI) and are also available in kosher versions. The powders are packaged in 25 kg multi-wall kraft bags with a polyethylene inner liner, or other approved closed containers such as tote bags.

Nonfat Dry Milk – DairyAmerica NDM is obtained by removing the fat and water from fresh Grade "A" milk. The product is made from pasteurized nonfat milk to which no preservative, alkali, neutralizing agent or other chemical has been added. The following types of Grade A and Extra Grade NDM are available for export:

- *Low Heat NDM* is commonly used in the manufacture of cottage cheese, frozen desserts, soups, puddings, recombined milk, cultured products and beverages.
- *Medium Heat NDM* is well-suited for applications including the manufacture of recombined milk, dry mixes,



confections, puddings and frozen desserts.

- *High Heat NDM* powders have been subjected to a high heat treatment. These powders are especially suited for baked goods, dry mixes and processed meat applications.

Dry Whole Milk – An Extra Grade Spray Dried Whole Milk Powder available with a fat content of either 26% or 28.5%. This product is commonly used in the manufacture of confections, pies, cakes, custards and other bakery products.

Dry Buttermilk – A dried milk product manufactured from buttermilk produced during the churning of sweet cream into butter. Because of its unique flavor, dry buttermilk is a favorite ingredient for prepared mixes, frozen desserts, and baked goods. Available for export in Grade "A" Sweet Cream and Extra Grade Sweet Cream.

Protein Blends – Wet and/or dry blends with both dairy and nondairy ingredients to meet the specification and functionality requirements of specific customer applications.

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Erie Foods International, Inc.

Erie Foods was launched in 1938 when pioneer and founder, Arden Reisenbigler, purchased a casein manufacturing plant that he proudly named "The Erie Casein Dryers". Today, the Erie, Illinois-based company provides specialized U.S.-manufactured dairy ingredients to more than 20 countries in North and South America, Europe, the Middle East and Asia.

Erie Foods' dairy ingredient export sales make up 9.3% of its total annual sales. In 2008 dairy export sales are projected to increase by 370% versus 2007, which showed a 31% gain over 2006. Key export markets include Egypt, Morocco, Mexico, Russia, Poland, Singapore, Korea, the Dominican Republic and Honduras.

In addition to corporate, research and manufacturing operations in the U.S., Erie Foods has a strategic global network of offices, dairy manufacturing operations and partnerships in Europe and Australia. "With offices, production sites and affiliated companies throughout the world, Erie continues to maintain its efforts to provide superior products and services to the global marketplace," says David R. Reisenbigler, president and chief executive officer.

Erie Europe, a subsidiary of Erie Foods, participates in the planning and implementation of manufacturing and marketing functions for Erie Foods and its affiliated companies. Erie Europe offers a U.S.-manufactured product line including milk protein concentrates (MPCs), whey protein concentrates (WPCs), sodium caseinate and unsalted butter.

Production & Distribution

The Erie Foods research and manufacturing facility in Rochelle, Illinois, produces a wide range of ingredients for the food and pharmaceutical industries. It is a U.S. Food & Drug Administration-registered manufacturing site and additionally carries a "superior" rating from the American Institute of Baking. The company's quality control testing program follows Hazard Analysis and Critical Control Point (HACCP) principles.

Erie Foods' dairy ingredient systems are designed and formulated based on industry requirements and specific customer requests. The company offers dairy ingredients with various physical and functional properties including particle size, bulk density, dispersibility, viscosity and hydration capacity.

International food, nutraceutical and pharmaceutical industries have utilized the specialized custom processing systems at Erie Foods for the last 10 years. The company's processing services include twin screw extrusion, pilot and full-scale agglomeration/granulation, drying, low temperature grinding, precision blending, particle coating, and product formulation and development.

"Key to Erie's continued success is the ability to respond quickly to customer demand in the areas of new product development, custom processing and product distribution," Reisenbigler says. "We work closely and confidentially with potential clients to formulate and process intermediate and finished products. This allows clients to develop, manufacture and market specialty ingredients in a timely, efficient and cost-effective manner."

In addition to its research and manufacturing facility in Rochelle, Illinois, Erie Foods operates an 18,580-square-meter distribution facility in Rochelle. Built in 2003, this facility is equipped with state-of-the-art inventory control systems and provides domestic and worldwide access from the U.S.

Product Line

Erie Foods offers international customers U.S.-manufactured dairy ingredients including MPCs, WPCs, caseinates and lactose. Dairy blends and base mixes are also available. Applications include bakery, cheese and meat products, health and nutritional supplements, sports nutrition products, infant formulas and pharmaceuticals.

"Each product is engineered to deliver the precise functional, physical and nutritional properties necessary for processing conditions and the formulation requirements," says Reisenbigler.



Milk Protein Concentrate – Highly nutritional, low-lactose products manufactured from fresh skimmed milk in Erie Foods' unique low temperature processing system. MPCs offer solubility, dispersibility and functionality in applications. MPC 40, MPC 42, MPC 56 and MPC 70 are available for export.

Whey Protein Concentrate – High biological value protein; for use in a wide pH range. Suitable for nutraceutical and functional food applications. WPC 80 is available for export.

Lactose – Offers numerous functional benefits including the enhancement of color, flavor and texture in foods. Available in superfine to extra course crystals.

Calcium Caseinate – High nutritional properties; primarily used in food and pharmaceutical applications.

Potassium Caseinate – Highly functional milk protein developed to achieve rapid dispersibility and solubility in food and pharmaceutical applications.

Sodium Caseinate – Soluble in food and pharmaceutical applications; suitable for products that require high emulsification and rapid dispersion. Available in fresh curd, extruded and instantized varieties.

Hydrolyzed Sodium Caseinate – Highly functional milk protein that offers emulsification properties, solubility, and fat and water binding capabilities.

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International Ingredient Corporation

International Ingredient Corporation (IIC) is a manufacturer of dairy-based specialty feed ingredients for use in animal feeds and pet food. The St. Louis, Missouri-based company is owned by the Fred E. Brown family and grew out of the International Distributing Corporation that began in 1959 as a sugar distributor to the feed industry.

IIC has been exporting U.S.-made dairy-based feed ingredients since 1986, giving its export division over 20 years of experience. Their export success earned them the honor of being recognized as the "Missouri Agriculture Exporter of the Year" by the Missouri Department of Agriculture. Major export markets include China, Mexico and Canada as well as other Asian and Latin American countries.

Approximately 25% of IIC's sales volume is from export sales. The company anticipates continued growth in its domestic and export business in coming years by developing new products and expanding into additional markets.

Production & Distribution

Currently, IIC has nine plant locations in the U.S. where it manufactures specialty ingredients including cheese powders, milk chocolate powders, dried milk, dried dairy powders and other specialty ingredients. These products are manufactured through the processing of co-products from the food, dairy and beer industries.

"At IIC, we continually evaluate renewable resource materials for use as components in our products," says Jim Sullivan, IIC's president. "This is a complex process that includes procurement, best-use analysis, processing, animal nutrition research, marketing and regulatory compliance."

The products manufactured by IIC are specifically formulated to provide consistency in nutrient composition and optimal animal performance. IIC products have been developed to possess enhanced handling characteristics such as improved flowability and reduced caking.

In 1994 IIC set up the first purpose-built whey permeate processing plant in the world in Monroe, Wisconsin and today operates two additional plants in the U.S. where permeate is processed into a dairy ingredient called Dairylac® 80. University research projects have shown that Dairylac® 80 is an economical alternative to dried whey, and the swine feed industry around the world has replaced much of the more expensive dried whey with dried permeate.

The goal at IIC is to provide high quality, service-backed and research-proven products. Each research-proven ingredient assures customers of consistent nutritional quality and product performance.

Customer service at IIC is as important as the high quality products they sell.

"We pride ourselves on being a dependable source of quality products as well as our ability to exhibit extraordinary, friendly and flexible service," says Ken Simpson, VP of sales for IIC.

Research & Product Development

Product development is a key focus at IIC. The company employs six animal nutritionists that provide technical support to the sales team in addition to product development and quality assurance responsibilities. They also utilize a Nutrition Advisory Board to provide scientific nutritional counsel and leadership to product development efforts.

"We have sponsored more than 150 research trials at the research institutions of our Nutrition Advisory Board members. We continue to make a significant economic investment in determining the optimal use of dairy products in animal feed applications," says Dr. Kevin Halpin, vice president of nutrition at IIC.

Product Line

Dairyloc® 80 – Granular, β -lactose enriched, dried whey product, containing 80% lactose. Ideal lactose source in pig starter diets and animal feed applications.



**INTERNATIONAL
INGREDIENT
CORPORATION**

Milk Chocolate Product – Real dairy chocolate nutrition and palatability, research-proven to partially replace dried whey and eliminate the need for flavors. Ideal source of milk protein, lactose, minerals and energy in pig starter diets and other feed applications. Improves palatability.

Cheese Plus Cheese Product – Premium dried cheese product. Source of dairy nutrients for use in pet foods and swine starter feeds. Improves palatability.

Cheese Whey – All-dairy, perfect blend of cheese and whey products to replace dried whey and provide the palatability of cheese. Excellent alternative to dried whole whey that provides dairy nutrients and improves palatability in swine starter feeds and other animal feed applications.

Nutri-Gold® Dried Milk – Dried milk product produced from fresh, whole-some dairy-case milks. Ideal source of real milk nutrients for feed applications.

All of IIC export products are packaged in 25 kg multi-walled kraft or bags.

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Main Street Ingredients

Founded in 1989, Main Street Ingredients is a leading developer of functional dairy-based ingredients. The La Crosse, Wisconsin-based manufacturer has served international markets since 1989.

Main Street's export sales increased more than 80% from 2004 to 2007, posting \$4 million in 2004 and \$25 million in 2007. The company reported an approximate 15,000 MT increase in commodity ingredient exports during the same time period. Main Street currently exports dairy products to more than 20 countries in North and South America, Europe, the Middle East and Asia.

The company's ongoing export success received recognition this year in the form of the 2008 Governor's Export Achievement Award. "Receiving the Governor's Export Achievement Award underscores the ongoing success of our mission to provide quality U.S. dairy products to international markets," says Bill Schmitz, president of Main Street Ingredients.

The company creates and markets dairy-based ingredients including functional stabilizer systems, proteins and custom-formulated blends. The Main Street operation includes a contract manufacturing facility which gives the company the capability to provide private-label nutritional systems and retail products for healthy living and sports nutrition products.

In addition to dairy ingredients, Main Street provides personalized technical assistance to its international customers. Highly trained technicians help customers select the right dairy ingredients to meet their functional requirements in areas including viscosity, mouthfeel, flavor, color, appearance and shelf stability. The company specializes in dairy ingredients for a variety of food applications including functional protein formulations, ready-to-drink beverages, nutritional bars, powdered beverage drink mixes, ice cream and other frozen desserts, soups, sauces and gravies.

Investment in Growth

To accommodate rapid growth and industry innovation goals, Main Street has invested in facility expansions and upgrades at its La Crosse manufacturing operation. The facility has grown from

3,716 square-meters to 21,368 square-meters over the last decade.

The 2007 La Crosse facility expansion added 2,044-square-meters, including a 745-square-meter state-of-the-art quality control laboratory, offices and employee facilities. The \$2.8 million project also increased capacity with the installation of a high-end processing and packaging line.

"The focus of this project was to increase manufacturing capacity, build a superior on-site quality control facility and provide additional space for our employees," says Dave Clark, CEO of Main Street Ingredients. "Our strategic vision is to support our two greatest assets—our customers and our employees."

Constructed in 2005, the company's Research & Development Center is led by food scientists specializing in dairy ingredients. The facility is equipped with an in-house applications laboratory and pilot manufacturing plant to provide new product concept development, least-cost product formulation and product matching support, Schmitz notes. "From functional beverages to indulgent yet healthier ice creams, our technical team is dedicated to providing our customers with the latest nutrition research, current consumer trends and new product developments," he adds.

Stringent documentation and review, combined with rigorous control, result in continuous improvement in the company's manufacturing processes. Accreditations are renewed through audits by industry organizations. The manufacturing facility is Grade A certified, USDA-approved and rated superior by the American Institute of Baking. It is also NSF® (National Sanitation Foundation) and Organic certified.

Product Line

Main Street's dairy ingredients line includes *Cornerstone*™ functional proteins, *Gemstone*™ bakery ingredient mixes and *Capstone*™ dairy ingredients. The company also offers their *Keystone*™ line of hydrocolloids and stabilizers. All of the products are kosher and many are available in organic versions.

The *Cornerstone*™ line of functional proteins and protein blends is created with



proprietary processes and advanced milk and serum protein technologies. The line features products formulated from U.S.-sourced dairy products including regular and instantized whey protein concentrates (WPC 34 and WPC 80), regular and instantized whey protein isolate (WPI), milk protein concentrates (MPC 42 and MPC 80), milk protein isolate (MPI), caseins (acid and rennet) and caseinates (sodium and calcium).

Dairy ingredients for bakery-specific applications are provided through the company's *Gemstone*™ line. The line includes ingredients such as nonfat dry milk substitutes, donut-base blends, whole egg replacers, sugar alternatives, nutritional replacements and other products and ingredients designed for the bakery industry.

Main Street's *Capstone*™ ingredients offer a wide range of functional U.S.-sourced dairy product ingredients for the food industry. This economical line includes whole and skimmed milk replacers, ingredients for frozen desserts and flow agents for use in powder systems, such as shredded cheeses.

The company's *Keystone*™ gum-based stabilizer systems are designed to enhance desirable characteristics such as viscosity, consistency, mouthfeel, body and texture, flavor, appearance and shelf life. Applications include ice cream, cultured dairy products, yogurts, sour cream, cottage cheese and processed cheese, among others.

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