U.S. Dairy Export Council®

INSIDE:

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USDEC News
December 2006

Davisco Named "Exporter of the Year"

USDEC member Davisco Foods International Inc. was named 2006 Exporter of the Year by *Dairy Field*, a U.S. dairy industry trade publication. The magazine recognized Davisco as "a pioneer in the value-added dairy ingredients export business" and acknowledged its "crucial role in growing global demand for U.S. dairy products" through worldwide sales efforts.

Davisco Foods, a family-owned cheese and whey processor based in Le Sueur, Minnesota, was among the first in the U.S. market to recognize the value and potential of dairy exports, and is an ongoing innovator in product development, applications and research investments, *Dairy Field* says.

The ever-increasing importance of the international market to U.S. dairy industry interests led *Dairy Field* to highlight individual company efforts by creating the new Exporter of the Year honor. The criteria for consideration include: role in driving the growth of global dairy demand; industry leadership in advancing U.S. dairy exports; company resources committed to export market development; significant export sales; and the role of exports in the overall company growth strategy.

"We are heavily into exporting, it's our biggest market, but we don't talk about it much (in the domestic market). We're surprised and honored to be named the *Dairy Field* Exporter of the Year," says Polly Olson, Davisco's vice president of sales, marketing & new business.

Olson accepted the honor on behalf of Davisco on October 12 in Phoenix, Arizona, at Stagnito's Top Gun Conference, an event for top-level food and beverage industry executives hosted by *Dairy Field*'s parent company. Matt McKnight, USDEC's vice president of export ingredients marketing and industry affairs, presented the award.

A major U.S. exporter of whey products, Davisco provides about 65% of the global whey protein isolate (WPI) market and exports products to 50-plus international markets. Davisco produces whey, whey protein concentrate

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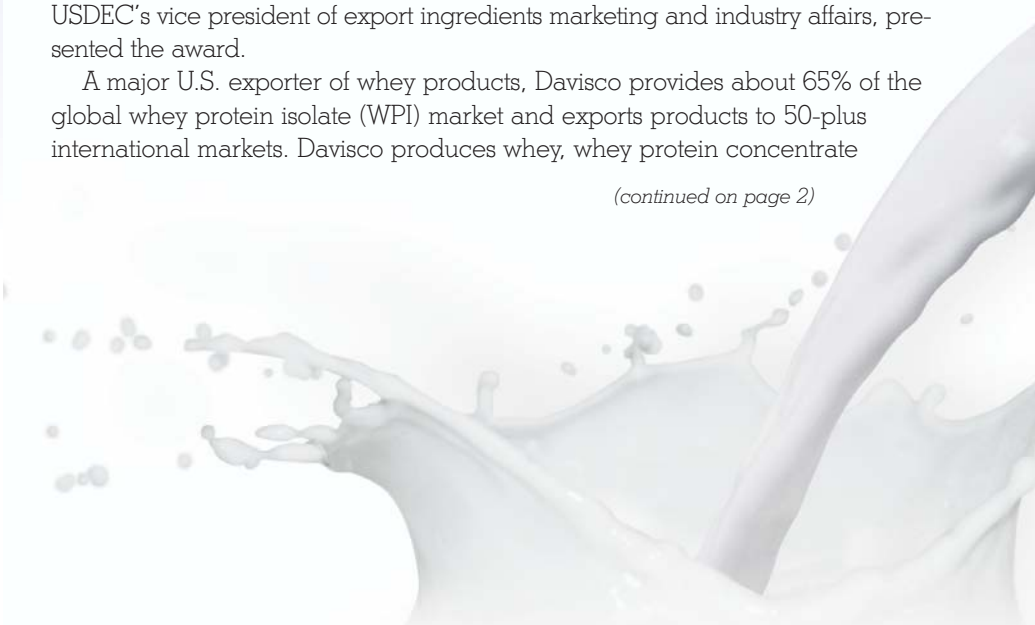


(WPC), WPI, whey permeate, hydrolyzed whey proteins and lactose. The company's global marketing and R&D efforts are focused on milk proteins for infant formula, sports nutrition and functional food/nutraceutical products. Davisco's profile in the "Meet Our Members" section of this issue offers detailed information on its latest branded whey fraction innovation.

Davisco entered the global whey protein market more than 20 years ago by establishing the first American whey ingredient office in Europe in Geneva; it additionally has an office in Mexico City and a newly-opened office in Shanghai. Rather than relying on phone, fax and e-mail or intermediaries, Davisco has a commitment to maintain first-hand personal contact with its global customers, explains David Curta, Davisco's international sales manager. "It's an opportunity for us to really understand what a new market is looking for," says Curta.

Your link to more information:
Dairy Field magazine:
http://www.dairyfield.com
Exporter of the Year coverage:
http://www.dairyfield.com/content.php?s=DF/2006/08&p=19

Polly Olson of Davisco Foods (middle) accepts Dairy Field's Exporter of the Year trophy from Pierce Hollingsworth, director of special projects, Stagnito Communications (left); and Matt McKnight of USDEC.

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.

U.S. Market Situation and Outlook

Over time, U.S. milk production has increased about 1.3 to 1.4% per year. But fueled by record-high farmgate milk prices in 2004, U.S. dairy producers have embarked on a two-year period of expansion at a rate three times faster than usual.

From January 2004 to June 2006, U.S. dairymen added 161,000 cows – the equivalent of a new 1,200-cow herd every week. In the last 24 months through September 2006, U.S. milk production was 224.4 thousand metric tons (MT) per day, up 4.7% (+9.7 thousand MT per day) from the previous 24 months.

Naturally, dairy product production was also higher. Total cheese production in 2006 (through August) was up 6.7% from 2004 levels and butter production was up 17.1%.

U.S. commodity prices have been weak most of the year, as product surpluses and growing inventories weighed on markets. However, the market situation has begun to turn.

Lower farmgate milk prices in 2006 (milk prices down 17% from a year ago) have curtailed expansion. Cow numbers in the third quarter of 2006 stood at 9.107 million.

In the June–September 2006 period, U.S. milk production was up 1.4% from prior-year levels – back at the historical annual growth rate. The U.S. Department of Agriculture (USDA) projects 2007 milk production will be 83.4 million MT, up 1.0% from 2006 output.

On cheese and butter, inventories appear sufficient to satisfy needs through the key end-of-year holiday buying season. However, if production continues trending downward, supplies will be tighter in 2007.

U.S. markets for dry ingredients have already turned, with prices strengthening considerably since the spring.

Ingredient manufacturers report light inventories and little or no product available for spot sale for the remainder of the year. Buyers are lining up 2007 supplies. In the last three months, spot prices for nonfat dry milk (NDM) are up about 18%, while prices for sweet whey and whey protein concentrate with 34% protein (WPC 34) have jumped 42% and 24%, respectively, according to USDA.

U.S. production of WPC 34 slowed this summer, while manufacturers boosted output of WPC 80. At the same time, feed users are finding it less expensive to use WPC 34 in their formulations rather than mixing WPC 80 and sweet whey.

More than anything else, robust overseas demand for milk solids for food and feed use has contributed to the tight supply situation. In the June–August period, U.S. exports of NDM/SMP (skim milk powder) were 86.2 thousand MT, up 42.9% from a year ago, while shipments of whey proteins were 89.9 thousand MT, up 32.7%.

U.S. dairy market at-a-glance

Milk production statistics, 2006				
	Production (Jan-Aug)	Change vs. a year ago	Exports (Jan-July)	Change vs. a year ago
U.S. milk production (Jan-Sept)	6,200,000 MT	+2.9%		
U.S. cow numbers (Sept)	9,107,000	+0.5%		
Production per cow (Jan-Sept)	25 kg/day	+2.0%		
Dairy products – Production and Exports, 2006				
Total cheese	2,800,000 MT	+3.2%	40,000 MT	+27%
American cheese	1,200,000 MT	+3.2%		
Mozzarella cheese	945,000 MT	+3.5%		
All other types cheese	695,000 MT	+3.0%		
Butter	439,000 MT	+7.5%	5,000 MT	+54%
NDM + SMP	488,000 MT	+0.9%	176,000 MT	-5%
Sweet whey	335,000 MT	+4.3%	131,000 MT	+10%
WPC	125,000 MT	+13.8%	52,000 MT	+58%
WPI	9,000 MT	+10.1%	5,000 MT	+25%
Lactose	298,000 MT	+2.4%	128,000 MT	+16%

Source: USDA; USDEC

In the News…

New companies

- The **Artisan Cheese Exchange** was formed as an export management and trading company linking U.S. specialty cheese makers with trading partners in export markets. The company will represent artisan cheese makers nationwide, providing product consolidation, export documentation and supply-chain support. It also has established relationships with importers and distributors in key export markets. The Artisan Cheese Exchange has also joined USDEC's membership.

Name changes

- The name WestFarm Foods has been retired and the company has returned to using its long-standing legal corporate name **Darigold, Inc.** "We are enormously proud of the Darigold heritage and are excited about the future of our great organization. Returning to the Darigold name – Darigold products, Darigold people, and Darigold facilities – will allow us to share the Darigold experience with our customers and consumers," says Darigold, Inc. president & CEO John Underwood.
- The Mid-America International Agri-Trade Council (MIATCO) changed its name to **Food Export Association of the Midwest USA**. The group is a non-profit organization that promotes the export of food from the Midwestern region of the United States.
- BL Ingredients, an Evanston, Illinois-based unit of Ireland's Lakeland Dairies, changed its name to **Socius Ingredients**.

New plants and upgrades

- **Southwest Cheese Co.**, Clovis, New Mexico, held a grand opening ceremony October 6, 2006. The plant, a joint venture between Glanbia plc and the Greater Southwest Agency, handles 3.2 thousand tons of milk per day, producing about 113.3 thousand tons of cheese and 7.5 thousand tons of high-value whey proteins per year.
- **Unilever** completed a $7-million expansion of its Good Humor-Breyers ice cream plant in Hagerstown, Maryland.
- In March 2006, **Hilmar Cheese** broke ground on a new cheese and whey plant in Dalhart, Texas. When completed in the fourth quarter of 2007, the plant will be able to handle 2.3 thousand MT of milk per day and will sell cheese and whey to domestic and export markets.
- **Nestlé** will build a $359-million production facility in Anderson, Indiana to make Nesquik ready-to-drink flavored milk and Coffee-Mate creamers. The 9,472,551-square-meter plant, which will be the largest for Nestlé in the United States, will replace seven contract packers.
- **Kraft Foods** will invest more than $10 million to upgrade its Lowville, New York, cream cheese plant, the largest cream cheese operation in the Kraft system.
- **Groupe Danone** will invest $66 million to expand its Stonyfield Farm yogurt plant in Londonderry, New Hampshire; the increased production of organic yogurts will be earmarked for export to Europe.

New products

- **Bravo Foods** reached a production agreement with HP Hood. Hood will produce 70 million bottles a year of Slammers and Bravo! brand shelf-stable, single-serve flavored milk drinks.

Acquisitions and mergers

- **Sartori Foods**, Plymouth, Wisconsin, acquired Antigo Cheese Co., Antigo, Wisconsin, and Blackfoot Cheese Co., Blackfoot, Idaho. Both make aged Italian cheese.
- **Lifeway Foods**, Morton Grove, Illinois, the leading U.S. processor of kefir, acquired rival Helios Nutrition, Sauk Center, Minnesota. Production will be consolidated at Lifeway's Morton Grove facility.
- **Dean Foods** acquired Jilberts Dairy, Marquette, Michigan.
- **Agri-Mark**, Methuen, Massachusetts, merged with Allied Federation of Cooperatives, a group of 26 small co-ops in New York.

Moves and consolidations

- **Crystal Cream & Butter** closed its downtown Sacramento, California, plant and consolidated production at its newer facility at the south end of the city.
- **Kraft** will close its Rupert, Idaho, string and cream cheese plant in January and move production to other facilities in Wisconsin, New York and Missouri.
- **Kraft** will close its Visalia, California, cottage cheese/sour cream plant in April 2007 and consolidate production at a larger, more modern facility in nearby Tulare, where the company currently makes parmesan, cheddar cheese and whey powder.
- **Cass-Clay Creamery** will cease production at its Mandan, North Dakota, plant. Output will be consolidated into its Fargo, North Dakota, operation.

U.S. Cream Cheese

Soft-fresh cheeses

The United States is a nation of immigrants and much of our heritage and traditions reflect that immigrant ancestry. This is especially true with soft-fresh cheeses like cream cheese. Throughout the long history of cheese making in Europe, most countries had their own version of a fresh cheese and hundreds of different types were produced. In England it may have been cottage cheese or clotted cream; in France fromage blanc or neufchâtel; in Italy ricotta or mascarpone.

Made at home

When immigrants from England first arrived in America they brought cows with them on the boat. Milk, cream, and butter were the first products they enjoyed, and any surplus milk was quickly made into cheese. The first cheeses they made were various styles of soft-fresh cheeses, similar to what we know today as cottage cheese or cream cheese. They were easily made by combining fresh milk and some form of starter culture, typically buttermilk or sour cream.

Eaten at home

One reason these cheeses were eaten at home, or on the farm, is that they were intended to be eaten soon after making. Soft-fresh cheeses are only one step removed from milk itself and their flavors are meant to be milky, creamy, and above all, fresh. Another compelling reason to make them at home was that they weren't found in many stores. Until early in the 20th century, most soft-fresh cheeses were not available in regional or national distribution. Perishability, the lack of adequate refrigeration, and the lack of sanitary packaging, made it impossible to distribute them successfully.

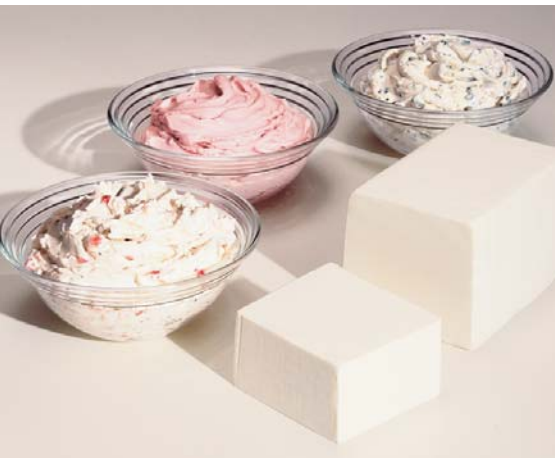


Photo courtesy of Wisconsin Milk Marketing Board, Inc.

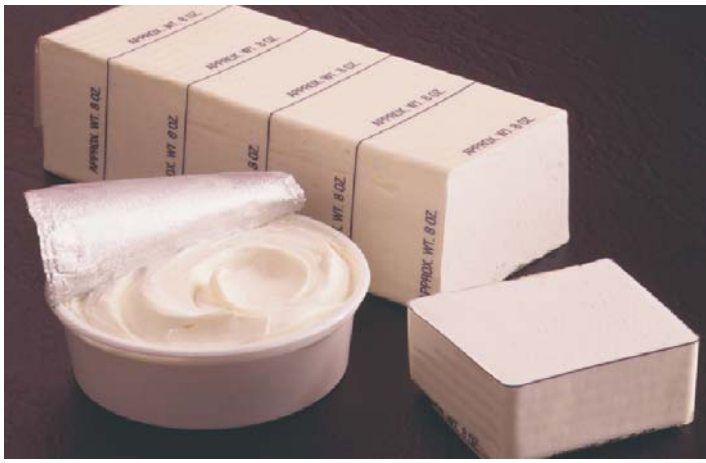


Photo courtesy of Wisconsin Milk Marketing Board, Inc.

Creole cream cheese

Certain parts of the United States fostered traditions that led to cream cheese as we know it today and one of the first was Louisiana. Prior to the United States purchasing Louisiana and surrounding areas, they were French territory. Many parts of Louisiana were settled by French, and also by Creoles from Nova Scotia. One of their food traditions was the French cheese known as neufchâtel, and a similar variety of cheese was produced by many home vendors in the area. Sometime around 1850, a new tradition developed when vendors, competing to sell their baskets of cheese at the market, would turn out a piece of fresh cheese from a basket, and then top it off with spoonfuls of fresh cream. This style of cheese was originally known as Creole but eventually acquired the nickname of "cream cheese". This was one of the first cheeses that helped define the style of cream cheese in America.

Ethnic traditions

The next region that used large volumes of cream cheese was New York, and one ethnic group more than any other affected cream cheese usage in New York, and eventually all over the U.S. As large numbers of Jewish immigrants settled in and around New York City, they opened traditional Jewish delicatessens and bakeries.

In the delicatessens, they used cream cheese to make cheese blintzes and many other delicacies, including New York Style Cheesecake, which became a new American dessert favorite. Their bakeries also made bagels popular in the U.S., fostering the very popular American breakfast tradition of bagels and cream cheese.

Packaging innovations and new technologies

At the turn of the 20th century in New York City, several local dairies made their own versions of neufchâtel and cream cheese, and began distributing them all around the area. What initially made distribution possible was a new packaging material called tin foil. In 1906, one dairy began to mold fresh cream cheese into small 8-ounce (112-gram) squares and wrap them tightly in tin foil. Parallel to that, the advent of ice deliveries and iceboxes also made it possible for consumers to better store fresh dairy products like cream cheese.

Another New York cheese maker developed a product he deemed unique and creamy enough to be named after the city of Philadelphia, known for its culinary traditions. It was one of the first cream cheese brands to be distributed

nationally and it was a huge hit. Within 50 years, Philadelphia Brand cream cheese went from national to international and at the time was the world's largest selling packaged cheese.

Cream cheese today

Over the years, cream cheese's popularity has continued to grow, and today American cheese makers produce over 300,000 metric tons of cream cheese per year. Along the way, innovations in cheese making and packaging have increased the quality, consistency, and shelf life of cream cheese. It is packaged in a wide array of sizes, and containers from foil-wrapped to plastic tubs. The most popular cream cheese is the original or full-fat variety containing at least 33% butterfat. New products that have grown significantly include whipped, low-fat, and nonfat cream cheese. U.S. cheese manufacturers also led the way in customizing products and packaging for many different markets around the world.

Flavored cream cheese and cream cheese spreads

Because cream cheese is mild, and has high moisture content, it carries other flavors well. Sweet and savory flavors both work well and a wide range of flavored cream cheeses are now popular. Another category that has grown significantly is that of cream cheese spreads, popular not only at breakfast but also in appetizers and sandwich spreads.

The most popular *sweet* flavors include:
- Strawberry
- Maple & Walnut
- Pineapple
- Chocolate
- Honey & Cinnamon

The most popular *savory* flavors include:
- Garlic & Herbs
- Garden Vegetable
- Roasted Garlic
- Pesto
- Sun-Dried Tomato & Basil

Cream Cheese Applications

In addition to being popular at retail, cream cheese usage at foodservice has continued to grow steadily. Many different trends are responsible for this increase, including operator attitudes, diner's preferences, lifestyle changes, and other demographics. But the most important factor affecting cheese usage at foodservice is its "Quality of Taste". For people dining out, good flavor or quality-of-taste remains their top criterion for choosing the restaurants they patronize, and for the food they choose from the menu. Consumers believe that cheese delivers that quality-of-taste, and they eagerly seek out menu items that contain cheese. One chef summed it up by saying, "Anything that sells well on the menu, sells better with cheese." Here is a snapshot of how operators menu cream cheese in the U.S., and some significant trends that have affected cream cheese usage at foodservice.

Photo courtesy of Wisconsin Milk Marketing Board, Inc.

Fried cheese appetizers

No one part of the menu has seen a greater increase in cream cheese usage than hot appetizers. Hot cheese appetizers are big sellers, and the leaders in the category are breaded cheese sticks and cheese stuffed appetizers. The most popular stuffed appetizers are Jalapeño peppers filled with cream cheese, breaded, and deep-fried. Many other popular cheese appetizers are also stuffed with cream cheese.

Once made purely in-house, the popularity of fried cheese appetizers skyrocketed when food manufacturers began to produce pre-breaded, frozen products, ready for the deep fryer. Fried cheese sticks and cheese stuffed appetizers are now on virtually every casual, family, and fast-food menu in the U.S. As a sales technique, these items are often served in small amounts and odd numbers, prompting many groups to order more than one appetizer plate and share these.

Photo courtesy of Wisconsin Milk Marketing Board, Inc.

Hot cheese dips

Another hot cheese appetizer popular all over the U.S. is Spinach & Artichoke Dip, typically served with nachos or various breads for dipping. Variations of this item can be found on most every appetizer menu, and most include cream cheese.

Cold appetizers

Cheese spreads and cold cheese dips have also become very popular at food-

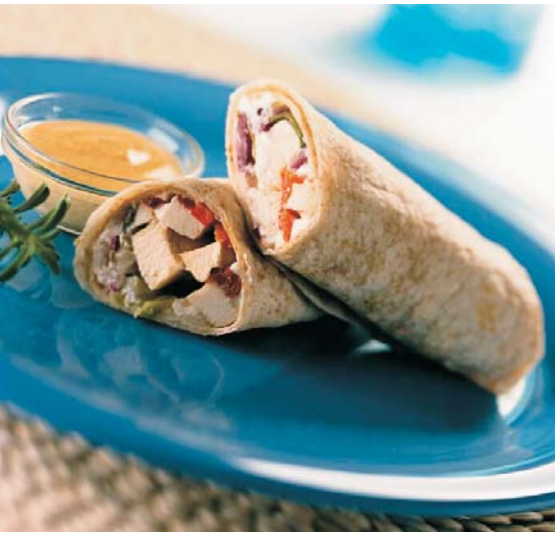


Photo courtesy of Wisconsin Milk Marketing Board, Inc.

service—not typically On-The-Menu but, instead, On-The-Buffet. Whether they are served at catered events, receptions or private parties, a wide range of flavored dips and spreads have become popular, typically served with crackers or vegetables for dipping.

Retail-foodservice

Another growing trend has been the sale of more prepared food at supermarkets. In-store delis, also known as "Retail-Foodservice" departments have also made great use of cream cheese dips and spreads in deli trays and party platters.

Breakfast

Cream cheese is heavily present on breakfast menus in a host of ways, but the most popular item of all is bagels & cream cheese. Whether it's at home, on the run, or at the office, bagels continue to be one of the most popular ways to enjoy cream cheese at breakfast in the U.S. Widely marketed, bagels may come from a bagel shop, coffee shop, convenience store, or restaurant. One big factor supporting the popularity of bagels & cream cheese is their convenience and portability. Instead of eating them at a restaurant, many people take them to the office for breakfast. In fact, this trend of eating breakfast at the work desk has become so popular that many marketers now refer to this meal occasion as "Deskfast". Recognizing the popularity of cream cheese, operators are constantly using cream cheese in new ways on the menu. Several national breakfast chains recently introduced a new breakfast, "cream cheese stuffed French toast".

Hotel breakfasts

Foodservice programs also include buffet breakfasts at U.S. hotels. Many hotel chains offer business travelers a breakfast buffet with their room package. These types of hotels are becoming increasingly popular with business travelers and budget-minded families on leisure travel. Toast, bagels, English muffins, and sweet muffins are popular items often topped with cream cheese. For those in a hurry, these foods are also easy to grab and go, on the run.

Sandwiches and wraps

Americans love sandwiches and these are very popular at foodservice. Cream cheese has seen increased usage on sandwiches for several reasons. The rich flavor of cream cheese goes well on sandwiches, providing a very good mouth feel that quality-of-taste diners are looking for. Its soft texture and moisture content also makes it a good carrier of other flavors, allowing operators to blend a variety of herbs and spices into the cream cheese. Another thing that makes cream cheese ideal for sandwiches is its texture, which adheres well to breads, meat and other ingredients, helping to hold the sandwich together as it is eaten.

Wraps have been popular for decades and are seeing a resurgence. With low-carb diets being all the rage and wraps having less carbs than bread slices, wraps are popping up on menus everywhere. Cream cheese, besides having the ability to deliver a variety of flavors, helps hold finished wraps together. This attribute has made cream cheese one of the most popular cheeses used in wraps.

Top 10 cream cheese flavors

- Plain
- Garlic & Herbs
- Vegetable
- Sun-Dried Tomato & Basil
- Chives
- Pesto
- Smoked Salmon
- Roasted Garlic
- Honey & Cinnamon
- Strawberry

Cheesecake — king of desserts

Cheesecake is one of the biggest-selling desserts on restaurant menus, and equally popular at lunch or dinner. The "Cheesecake Factory" is a highly successful restaurant chain in the U.S. that capitalized on the cheesecake's popularity by using "cheesecake" in their restaurant name. They are a top quality, full service restaurant with a complete menu of appetizers, entrées and desserts. With dozens of flavors to choose from and a cheesecake for everyone's taste, cheesecake helped make them famous.

For more information about U.S. cheeses see the **"Information About Cheese Products"** section of our website. Link address: http://www.usdec.org/Products/Cheese.cfm?navItemNumber=1214

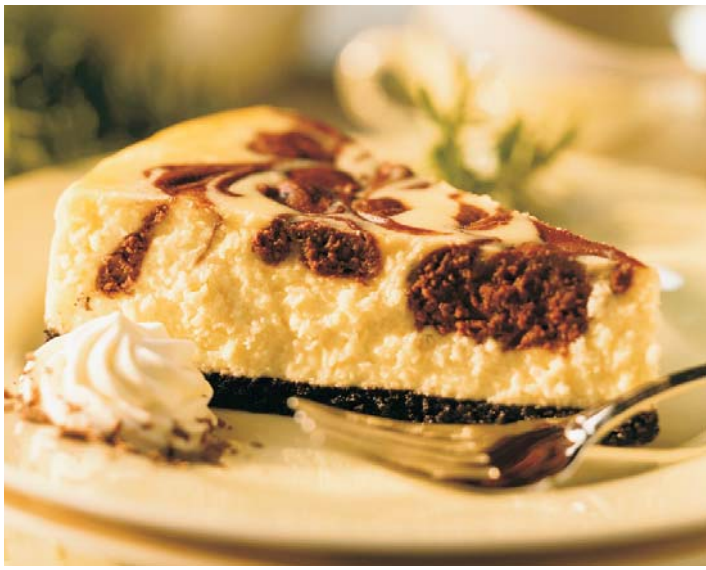


Photo courtesy of Wisconsin Milk Marketing Board, Inc.

U.S. Whey Protein Ingredients

What are whey proteins and where do they come from?

Whey proteins are water-soluble proteins that are naturally present in milk. On average, liquid milk contains around 3.2% protein. Whey proteins account for 20% of this amount. Under the generic term "whey proteins", we find the following proteins: beta-lactoglobulin, alpha-lactalbumin, bovine serum albumin (BSA), immunoglobulin (Ig) and proteose peptones. Whey also contains many other important molecules found in smaller quantities such as lactoferrin and lactoperoxidase; and, depending on the manufacture process, glycomacropeptide (GMP).

Whey proteins derive their name from "whey", which is produced during either cheese or casein manufacture; after the curdling of the casein. Liquid whey contains water, lactose (milk sugar), protein, fat, vitamins and minerals.

What technologies are used by U.S. whey protein ingredient manufacturers?

Advances in processing technologies allow ingredients manufacturers to separate the different constituents of whey in order to obtain the desired finished product. The separation technologies can be membrane filtration, ion-exchange chromatography or a combination thereof. After refinement the protein solution is pasteurized and then dried.

Typically, U.S. whey protein ingredient manufacturers modify the lactose to protein ratio of their finished products and are able to offer whey proteins concentrates (WPC) with protein levels varying from 34% up to 85%, and whey protein isolates (WPI) with protein levels of 90% and up.

In some cases, whey protein ingredients are further processed with either extrusion or enzymatic technologies.

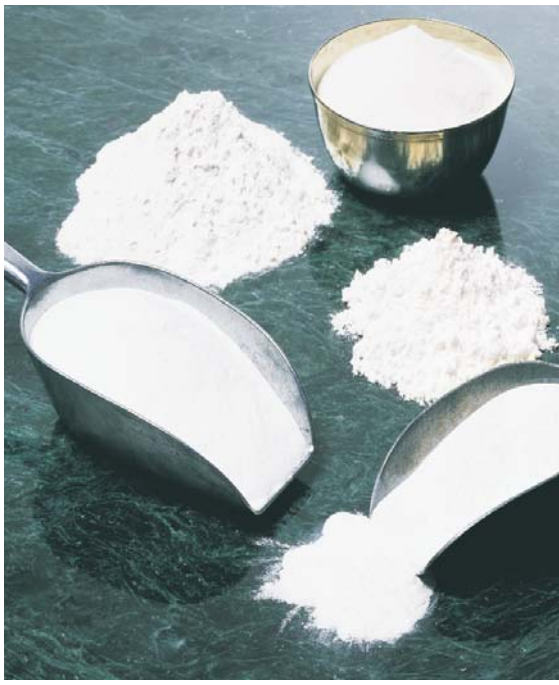
In the case of extrusion, whey proteins ingredients are combined with a carrier (such as tapioca starch or rice flour) and water; the slurry is then run through an extruder. The product obtained through this process is a hard, fluffy protein crisp.

In the case of the enzymatic process, whey protein ingredients are mixed with water. Proteolytic enzymes are then added under very specific pH and temperature conditions. The enzymes cut down the protein molecules into smaller particle size yielding smaller proteins, polypeptides and peptides. These molecules are desirable for their bioactive, nutritional or functional roles.

Use of whey protein ingredients in meal replacers: what's the latest?

The meal replacement types of food were born from the consumer's desire for convenience, portability and good nutrition. This category targets people managing their weight, busy people looking for quick healthy alternatives, sports enthusiasts and athletes.

Whey protein ingredients have become an ingredient of choice for most meal-replacement manufacturers. This is primarily due to the nutritional benefits as well as the functional characteristics of whey proteins.

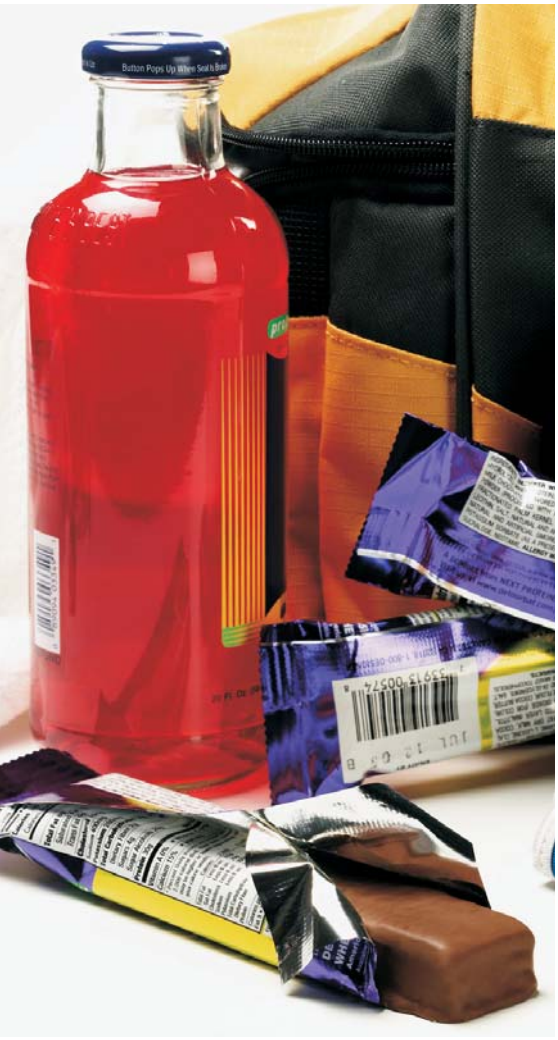


Meal replacement products need, by definition, to be nutritious, portable,

Separation technologies

The principle behind membrane filtration technology is to circulate a liquid through pipes that are equipped with porous membranes. Due to the high pressure with which the liquid is circulating, smaller particles will pass through the pores of the membrane (permeate) whereas larger particles will remain on the inside of the membrane wall (retentate). Depending on the pore-size of the membrane and the pressures involved, different components of whey will be isolated. Ultrafiltration (UF) technologies are typically used to obtain whey protein concentrate from liquid whey. Mostly, lactose and minerals are separated in the UF permeate, whereas whey proteins remain in the retentate.

The principle behind ion-exchange chromatography is to circulate liquid whey through a vessel filled with electrically charged resin beads. This technique takes advantage of the natural characteristics of whey proteins. Since whey proteins carry charges they temporarily become attached to the resin beads through weak bonds, whereas the water, lactose, fat, vitamins and minerals pass through. Once enough liquid has been circulated, the pH of the column is inverted so that the whey protein solution may be collected. This technology also allows for the selective modification of the ratio between the various major whey protein molecules, such as β-lactoglobulin and α-lactalbumin.



convenient and, above all, for any chance of commercial success, they need to taste good.

Examples of products available on the market

We find whey protein ingredients in meal replacement products targeting satiety (the sensation of feeling full). These products come in powder form and customers simply need to add water (or any other liquid) to have a delicious shake in an instant. By consuming such products, individuals are able to limit their caloric intake and consequently control or lose weight.

Whey proteins are also found in products targeting low-glycemic-index audiences. Due to the presence of whey proteins (as well as other low-glycemic-index carbohydrates), the consumption of such products will not trigger as high an insulin response as their regular-glycemic-index counterparts would. This is particularly important for people suffering from diabetes, hypoglycemia and metabolic syndrome.

Whey proteins may also be found in high-protein products. These products are designed for consumers interested in diets that are low in carbohydrates and high in proteins.

Most meal replacement products designed for athletes and sports enthusiasts contain whey proteins. This is particularly important since athletes are constantly focused on lean muscle mass maintenance and whey proteins are known to contain high levels of branched chain amino acids (BCAA) which are beneficial to maintain muscle.

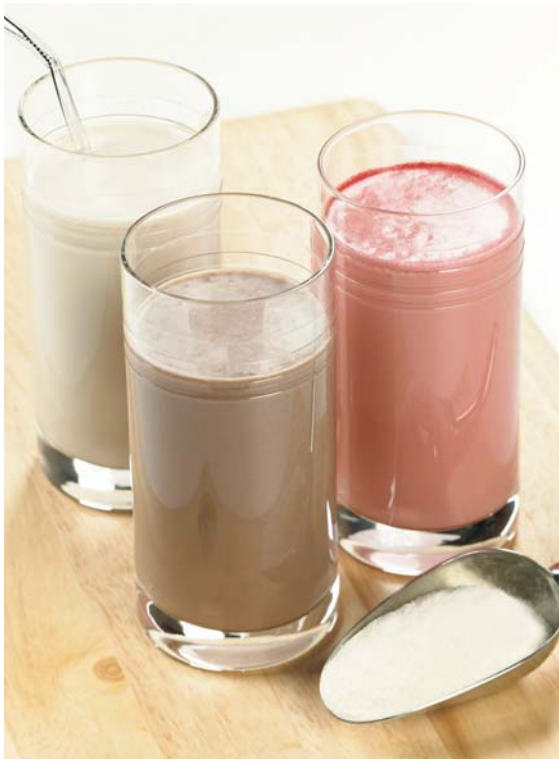
Some meal replacement products do not cater to any specific audience but are simply a good way to consume high-quality nutrition in a portable way. Such products offer a balanced nutrition and whey proteins, thanks to their excellent amino acid scores, are quite often preferred to other protein sources.

What nutritional role do whey proteins play in meal replacement products?

Proteins are the building blocks of the human body. Our bodies break down the proteins we eat into small proteins, peptides and amino acids that are then absorbed into the bloodstream. These amino acids are then turned into new cells, enzymes, hormones and numerous other compounds responsible for the proper functioning of our metabolism.

Nutritionists would select whey proteins as an ingredient in a meal replacement food system because whey proteins provide all the essential amino acids (EAA) in the right proportions for use by the body. Whey contains over 50% of EAA which have to be part of an everyday diet since they cannot be synthesized by our bodies. On average, whey protein also contains a minimum of 20% of BCAA. BCAA, comprising Leucine, isoleucine and valine, are especially known to sports enthusiasts and body builders as they serve as catalysts and building material for muscle growth and lean muscle mass maintenance. This knowledge is reaching the general public and people of all ages are becoming aware of the benefits of whey protein on muscle health and body composition. For the aging population, the consumption of high-quality proteins such as whey proteins, in combination with resistance exercise, may help to delay the loss of muscle strength and mass (i.e. sarcopenia).

Whey proteins are also easily and rapidly digested. Typically most amino acids from whey proteins pass into the bloodstream within 2 hours of consumption. Since whey proteins are digested at such a rapid rate, it may be recommended to use an additional source of protein that is digested more slowly, in the design of a meal substitute. Milk proteins, such as those found in skim milk powder and milk protein concentrate and isolate, are often chosen for this purpose. They are also excellent sources of high-efficiency, high-quality protein. And, depending on the type of milk protein, it may take the body up to 6 hours to fully digest them.



What functional characteristics are food scientist looking for in whey proteins ingredients?

Whey proteins are very complex molecules with several structural levels. Whey protein ingredients such as WPC and WPI are water-soluble over the entire pH range (pH 2 to 10). When in solution, they impart very little texture or mouthfeel. They also exert excellent emulsification and foaming properties. Food scientists have been known to also capitalize on the gelling or texturizing properties of whey proteins when food systems are subjected to certain pH, mineral and temperature parameters.

In meal replacement products sold as mixes, food scientists are primarily looking at whey proteins as ingredients that disperse and dissolve well. Since whey proteins are almost 100% soluble, they impart no chalkiness or grittiness to the reconstituted drink. Furthermore, since they create very little viscosity, they may be used in large amounts. Thanks to their excellent organoleptic properties, they do not require the use of large quantities of masking agents or flavoring systems.

Whey proteins are ideal in acidified Ready-To-Drink (RTD) beverages. For an innovative product, WPI can be added to any water and flavor base to make clear and tasty beverages with high levels of proteins. Whey proteins can also be used in neutral pH RTD beverages – shake-type products. Care must be taken in selecting all the ingredients in the formulation. Whey proteins will provide emulsification and can impart a desired mouthfeel/thickness to the finished product.

From Dutch chocolate, cookies'n crème to pineapple/orange/banana, the flavor profile of these beverages is left to the imagination of the food scientists.

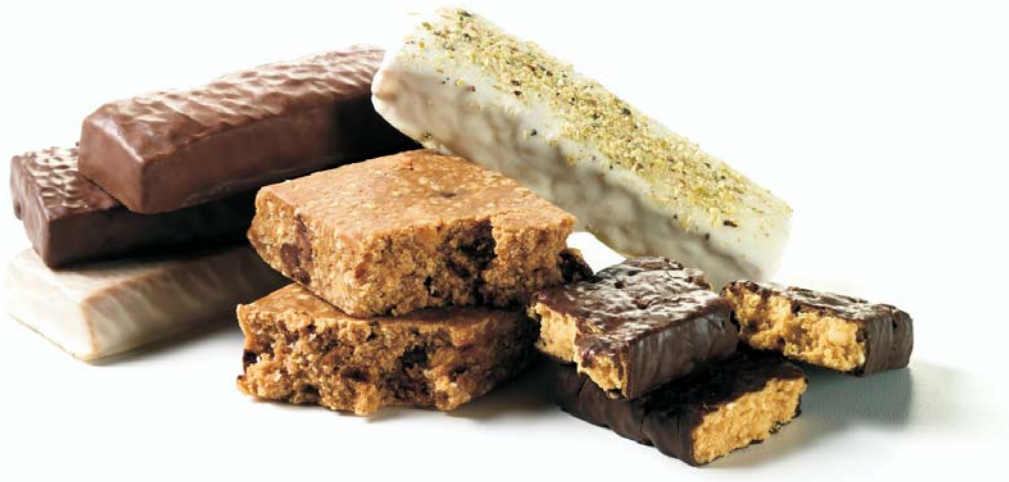
In meal replacement bars and baked goods, many functional characteristics of whey proteins and further processed proteins are fully shown. WPC, WPI and extruded whey products can all serve to increase the protein level of the product. The challenge with bars is that, during storage, the moisture in the product migrates between the various ingredients which lead to less desirable texture as well as a reduced shelf life. Specialized whey protein ingredients can be used to maintain texture and increase the shelf life of the products.

Food scientists in the nutrition industry at large have also been very successful at incorporating whey protein ingredients in ice cream and frozen specialties (greater overrun imparted by whey proteins), flans and custards (increased gelling characteristics and water retention imparted by whey proteins), functional mixes such as high protein omelets (gelling), creamed soups (texture), high protein breads (moisture retention), muffins, pancakes and other products.

What should food scientists expect from U.S. whey protein manufacturers?

U.S. whey protein manufacturers have very modern processing facilities and R&D centers. They continuously explore and improve the functional attributes of whey proteins. As such they have created several specialized WPC and WPI with specific target functions and health benefits. With the combination of additional processes (such as extrusion, enzymatic processes…) applied to whey protein ingredients, U.S. whey protein manufacturers are only limited by their own imagination. Discuss your product ideas and protein needs with your U.S. whey protein supplier. Their expertise will help you create innovative products while saving time and money.

For more information about U.S. whey protein ingredients their manufacture and uses see the **"Information About Whey & Lactose Products"** section of our website. Link address: http://www.usdec.org/Products/Whey.cfm?navItemNumber=1215



Whey Protein: Physiological Effects and Emerging Health Benefits

USDEC sponsored a symposium titled "Whey Protein: Physiological Effects & Emerging Health Benefits" at the Institute of Food Technologists (IFT) Annual Meeting and Food Expo in June 2006. Organized by the National Dairy Council, Dairy Management Inc., and the U.S. Department of Agriculture (USDA), this symposium highlighted the multifaceted effects of whey protein. As they investigated whey's influence within various subpopulations such as the elderly and obese adults, experts in the field presented the latest results on whey's contributions to weight management, satiety, immunity and muscle and body composition. Topics at the symposium included the following:

Effects of whey protein on body weight and fat in supplemented overweight and obese adults

Presenter: D. J. Baer, USDA-ARS Diet and Human Performance Laboratory, Beltsville, Maryland, USA

In a double-blind, randomized controlled trial of 90 overweight or obese individuals, we investigated the effects of adding to their free-living diet 60 g/day of whey or soy protein compared to carbohydrates on body weight, composition, and other health-related outcomes. After 6 months of supplementation, body weight and fat of the group consuming the whey protein were lower than the group consuming the carbohydrate treatment, whereas there were no differences between the group consuming the soy treatment and the groups consuming the carbohydrate or whey treatments. Waist circumference was lower in the group consuming the whey protein than the two other groups. These changes were observed without a significant change in energy intake. Concomitant with changes in body composition, the group consuming the whey protein had a significant decrease in blood pressure compared to the group consuming the soy and carbohydrate treatments. Protein intake may alter insulin response; and therefore, may play a role in changes in body composition. In fact, subjects consuming the whey and soy protein treatments had improved insulin sensitivity compared to those consuming the carbohydrate treatment. These results suggest that dietary protein is associated with improving body composition and that whey protein specifically may help improve some risk factors for chronic diseases.

Influence of whey protein on satiety and food intake regulation

Presenter: H. Anderson, University of Toronto, Ontario, Canada

Whey protein has been shown to stimulate satiety and suppress food intake for longer periods than carbohydrates. Further research is required to elucidate the mechanism by which whey protein modulates satiety factors. Whey protein stimulates insulin secretion and this may be a factor; the role of glycomacropeptide (GMP) also remains to be clarified. The individual effects of proteins, peptides and amino acids also would require investigation.

Immunomodulatory properties of milk proteins and emerging clinical implications

Presenter: G. Krissansen, Auckland University, New Zealand

This presentation, in two parts, examined (a) milk protein immunomodulatory properties and (b) the effect of lactoferrin in cancer treatment. (a) An overview was provided of the bioactive components and properties of both casein protein and whey protein. Clinical benefits together with examples of

commercial bioactive milk derivatives were examined. (b) This segment reported on the anti-tumor activity of bovine lactoferrin in mice. The oral administration of lactoferrin was conducted in combination with immunotherapy and chemotherapy treatments. The results indicated lactoferrin enhanced the sensitivity of tumors to both immunotherapy and chemotherapy regimes.

Interaction of exercise and whey protein to promote muscle anabolism

Presenters: R. R. Wolfe, University of Texas Medical Branch and Shriners Burns Hospital, Galveston, Texas; S. Phillips, Department of Kinesiology, McMaster University, Ontario, Canada

Muscle plays a central role in whole body protein metabolism by serving as the principal reservoir for amino acids to maintain protein synthesis in vital tissues and organs in the absence of absorption of amino acids from the gut. Further, altered muscle metabolism plays a key role in the genesis, and therefore prevention, of many common pathological conditions and chronic diseases. Exercise and nutrition are the most effective means of maintaining muscle mass and strength. However, resistance exercise alone does not induce an anabolic state in muscle. Rather, it sensitizes the muscle to the anabolic effect of amino acids. Whey protein is a good natural source of amino acids, and this ingestion of whey protein following exercise induces an anabolic state in muscle. The anabolic effects of whey protein on muscle protein synthesis are equally effective whether the protein is ingested either 30 minutes before or immediately after resistance exercise. The insulin response to ingestion of whey protein may also play a role in the anabolic response.

Experimental work indicated that both acute and long term whole body protein synthesis/nitrogen balance was greater/more positive with milk protein compared to soy protein. Additional long term trials demonstrated that milk protein promoted greater gain in lean body mass and greater loss in fat mass. The role of branched chain amino acids (these amino acids are present in high levels in whey) may be significant as activators of muscle synthesis.

The role of protein intake on muscle and body composition in elderly people

Presenter: W. W. Campbell, Purdue University, West Lafayette, Indiana, USA

Research has demonstrated that muscle mass and strength declined with age in normal healthy people. Progressive loss of muscle resulted in sarcopenia and increased risk of physical debilitation and frailty. Inadequate protein intake below the RDA (Recommended Dietary Allowance) of 0.8 gram of protein per kilogram of body mass per day) exacerbated this process. The potential for dietary protein in excess of RDA in combination with exercise to counter the loss of muscle mass was reviewed in this presentation. Resistance exercise has been shown to increase muscle mass in older people. However, exercising subjects consuming an RDA protein quantity lost lean body mass (LBM) while subjects consuming 125% RDA protein gained LBM. Research results indicated that incremental gains in LBM in response to additional protein intake over those obtained from resistance exercise were not easily quantifiable. In relation to the role of protein quality, a comparison of soy and beef protein resulted in no demonstrable effect on LBM.

For additional information about the nutrition topics presented above please consult the following USDEC monographs at http://www.usdec.org/publications/monographs.cfm?navItemNumber=1210:

- Whey Proteins and Seniors Nutrition
- Sarcopenia and Whey Proteins
- U.S. Whey Ingredients and Weight Management
- U.S. Whey Proteins in Sports Nutrition
- Whey Proteins and Body Composition
- Whey Proteins and Immunity

Bongrain Cheese USA

History

BC-USA is a subsidiary of Bongrain S.A., headquartered in Paris, France. Named after their founder, cheese maker Jean-Noël Bongrain, Bongrain S.A. is an international company whose primary business is specialty cheese. To be closer to the burgeoning cheese market in the U.S., Bongrain S.A. brought their French cheese making traditions to the United States, and in 1978 began producing cheese there. Their efforts met with great success and they quickly grew to operate three factories that produce a wide variety of specialty cheeses under several different brands. BC-USA was then formed in 1990 to bring together all of those various entities.

Products and brands

Drawing upon their French heritage and expertise, BC-USA produces several soft-ripened cheeses, including *Alouette Baby Brie* in several sizes and *Delice de France Grand Camembert*. Their Fresh Cheeses include *Alouette Spreadable Cheese* and *Alouette Elegante Gourmet Layered Cheese*. These brands enjoy great popularity in supermarket, club store and mass merchandiser deli and dairy departments. *Alouette Spreadable Cheese* is sold in a large variety of flavors. It is the largest-selling premium spreadable cheese in the U.S. BC-USA also produces the *Saladena* line of crumbled cheeses.

Additionally, BC-USA manufactures the *Smithfield* brand of cream cheese in plain bars and in soft spreadable, flavored varieties in retail and foodservice formats. They also produce cream cheese under private label for retail and foodservice.

Production and distribution

Today, BC-USA operates three cheese plants in the U.S.: Fleur de Lait-East in New Holland, Pennsylvania, Kolb Lena Cheese Co. in Lena, Illinois, and Fleur de Lait-West in City of Industry, California.

International markets

BC-USA products are currently distributed in Mexico, Central America, South America, and the Caribbean. Below we highlight five reasons why BC-USA has done so well in the international markets:

1. They have a wide range of specialty products targeted to retail and foodservice markets.
2. Their products are delicious and top quality, inspiring repeat business.
3. Brand name recognition is high. Customers know BC-USA brands and perceive them as top quality.
4. They are experts in shipping and distribution. Customers appreciate the reliability of their sourcing with minimal shortages or back orders. Also, when products arrive, they are in superior condition.
5. Pricing is fair, benefiting distributors, retailers, foodservice operators, and consumers.

Contact information

For more information on Bongrain products and worldwide distribution, please contact:

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Davisco Foods International Inc.

Davisco Foods International Inc. is a family-owned U.S.-based global cheese and food ingredient company founded in 1943 by Stanley Davis. The company has more than two decades of experience serving export markets, with offices in Mexico and Switzerland as well as partnerships with companies in Tokyo and the European Union.

Based in Le Sueur, Minnesota, Davisco has five processing facilities in the United States. The combined capacity processes 5 million liters of milk per day into cheese and whey ingredients. On an annual basis, Davisco produces about 84,000 metric tons (MT) of cheese and 5,000 MT of whey protein isolate (WPI).

A long-time industry leader, Davisco is a product-development innovator and an aggressive investor in research to demonstrate the health benefits of whey proteins. Davisco additionally creates new applications for ingredients and designs custom solutions and products for customers.

Specialized ingredients

Davisco produces refined edible lactose, premium deproteinized whey and whey protein concentrate (WPC) with 34%, 65% and 80% protein levels. In addition, Davisco's specialized ingredients such as WPI, pure individual whey protein isolate fractions and hydrolyzed WPI have long been recognized by the international market for their functionality.

BiPRO is a WPI produced through an ion-exchange process. It is fully soluble from pH 2 to 9, has high gel strength and a bland taste.

BioPURE-alpha-lactalbumin is part of Davisco's BioPURE line of isolated whey protein fractions. The ion-exchange processed *BioPURE* line carries a clean, bland flavor and is fully soluble in a wide pH range. Other products in the line are beta-lactoglobulin, glycomacropeptide (GMP) and immunoglobulins (IgG).

Clinical research found that evening intake of *BioPURE-alpha-lactalbumin* increased subjects' plasma tryptophan availability and improved both sleep and morning alertness. The results were particularly favorable for subjects with sleep complaints.

"When articles about the research hit the press, our phone was ringing off the hook with inquiries from all around the world," says Polly Olson, Davisco's vice president of sales, marketing & new business. "We've seen a huge amount of interest in the infant formula market and from people in the sleep market. It's the hottest thing going; everyone is analyzing if they are getting a good night's sleep."

Unique functional and nutritional properties are also available through Davisco's *BioZate 1* and *3*, highly purified hydrolyzed whey proteins. *BioZate 1* contains bioactive peptides shown to have anti-hypertensive properties, reducing both systolic and diastolic blood pressure in pre- and stage-1 hypertensive humans by altering angiotensin converting enzyme (ACE) activity. *BioZate 3* contains peptides to extend the bar shelf life by providing a softer texture over time.

Contact information

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DAVISCO
FOODS INTERNATIONAL, INC.®

Glanbia Nutritionals Inc.

Glanbia Nutritionals Inc. is a leading provider of science-based dairy and nutritional products with enhanced health benefits. A subsidiary of the Irish dairy firm Glanbia plc, Monroe, Wisconsin-based Glanbia Nutritionals' U.S. production facilities based in Monroe, Wisconsin, create a variety of specialty dairy and whey ingredients

Glanbia Nutritionals has recently expanded its U.S. marketing operations to include new sales offices in China, Brazil and Uruguay. The Shanghai office will respond to rising demand for nutritional ingredients in Asia-Pacific. The Brazil and Uruguay offices will work exclusively with the South American market. "We are focused on providing our customers with innovative nutritional solutions. That's our commitment – no matter where you are in the world," explains Kelly Czerwonka, Glanbia Nutritionals' marketing manager.

Stateside, Glanbia plc partnered with the Greater Southwest Agency to create Southwest Cheese. The resulting $190-million processing facility located in Clovis, New Mexico, will produce 20 metric tons (MT) of cheese and 1.4 MT of whey protein per hour, and "will have a big impact on whey protein customers around the world," Czerwonka says.

Glanbia's beverage and bar solutions are expected to be expanded following the September 2006 acquisition of California-based Seltzer Companies Inc. by Glanbia plc. Seltzer specializes in the development and supply of bulk fine nutrients (amino acids, minerals and vitamins) and nutritional premixes.

Glanbia Nutritionals' ongoing focus on science and industry-specific applications led to the 2005 expansion of research capabilities at the company's R&D center in Twin Falls, Idaho. The building was expanded into a 511-square-meter facility, a new lab-scale processing system to test nutritional ingredients in prototype beverage and bar products was incorporated and new staff was hired.

A recent example of the company's research involves modified whey protein concentrates (MWPC) – whey with concentrated immunoglobulin, lactoferrin and phospholipid proportions. Specialty MWPCs can turn standard whey emulsifiers into functional health-promoting ingredients, providing additional stability and acting as an alternative to the use of non-natural emulsification systems, according to Glanbia Nutritionals' research. The MWPC utilized in the study is commercially available through Glanbia with versions to suit various applications.

Glanbia Nutritionals' most recent product innovation is *Provon A-190* whey protein isolate (WPI). This highly purified source of whey protein is created using the natural and gentle cross-flow microfiltration (CFM) process. Officially launched in March 2006, *Provon A-190* is being marketed in Europe, Asia and South America for use in beverage mixes, sports beverages, isotonic beverages, fortified juices and smoothies. It is soluble in a wide pH range and has a neutral flavor specifically designed for protein-fortified beverage application, says Eric Bastian, vice president of R&D at Glanbia Nutritionals. "I'm really excited about this *Provon A-190* ingredient. It helps solve a lot of the flavor and astringency issues that you have when using proteins in nutritional beverages," Bastian adds.

Protein product power

Glanbia Nutritionals' wide range of U.S.-made products includes: specialty whey protein isolates, whey protein concentrates, heat-stable whey proteins, whey fractions, milk proteins, dairy calcium and lactose products. Detailed product and brand listings are offered within Glanbia Nutritionals' new website's application solutions for protein fortification, sports and performance, weight management, health and wellness, processed food, vitamin and mineral fortification, and personal care markets.

Contact information

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Tropical Foods, LLC

Strategically located in the Miami, Florida, export district, U.S.-produced dairy, food and beverage export distributor Tropical Foods LLC serves nearly 30 countries throughout the Caribbean, Mexico, Latin America and Asia.

Tropical Foods, founded in 1993, primarily exports perishable dairy foods including yogurt, cheese, cultured dairy foods and fresh juices and blends. Its retail and wholesale customer base includes supermarkets, club stores, food service distributors and restaurant chains. "We act as the export arm" for U.S. dairy food and beverage suppliers, says Steve Ross, Tropical Foods' president.

Proper handling of perishable products is a crucial aspect of Tropical Foods' service to export customers, as is export-specific support such as quotations, consolidation, shipping documentation, product labeling and registrations. Tropical Foods provides manufacturer-direct shipments to customers to ensure long product shelf life and maximum stock keeping unit (SKU) selection, as well as dairy case category management and plan-o-grams to promote maximum retail sell-through, Ross says.

As a representative of several large U.S. manufacturers under both exclusive and non-exclusive marketing agreements, Tropical Foods matches manufacturer marketing allowances for export customers. Customized marketing programs include direct sales efforts, in-store promotions, point-of-sale (POS) and merchandising equipment, custom signs, co-branding strategies and implementation, TV, radio and newspaper advertising and national account rollout services.

Tropical Foods offers personal attention to specific customer requirements through its knowledgeable, trilingual sales and office staff. "Tropical Foods continually monitors key trends in the food industry and maintains ongoing communications with the trade to respond to new opportunities and meet demand quickly," says Ross.

The distributor offers flexibility in pricing and minimum orders to accommodate the demands of smaller markets, and participates in USDA trade missions and food shows. It carries affiliation with USDEC as well as the USDA Foreign Agricultural Service Florida Food Exporter.

Product line-up

Tropical Foods distributes the following dairy brands to export markets, and additionally helps larger customers develop private label programs:

LaYogurt – More than 40 flavors in Original, Light, Calcium Enriched, Custard and Tropical Sabor Latino varieties. Available in 6-oz. cups and variety club packs, with dynamic new packaging. Fifty-day shelf-life is ideal for export applications.

Crystal Farms – Crystal Farms produces nearly 32,000 tons of cheese annually, with shreds, slices, snacks and processed cheese available for export, as well as butter and cream cheese.

Dannon – A worldwide leader in yogurt and smoothies, Dannon leads the food-service yogurt category with 43% market share. Light-N-Fit Smoothies are among the top Dannon drinkable line sellers. Kid-branded products include Cup, Sprinklins, and Danimals yogurts.

Nestle Nesquik – Eight flavors of milk fortified with extra calcium. Packaged in resealable 16-oz. bottles with 60-day shelf-life.

Contact information

Tropical Foods website
(available in both English and Spanish):
www.tropicaltrading.com

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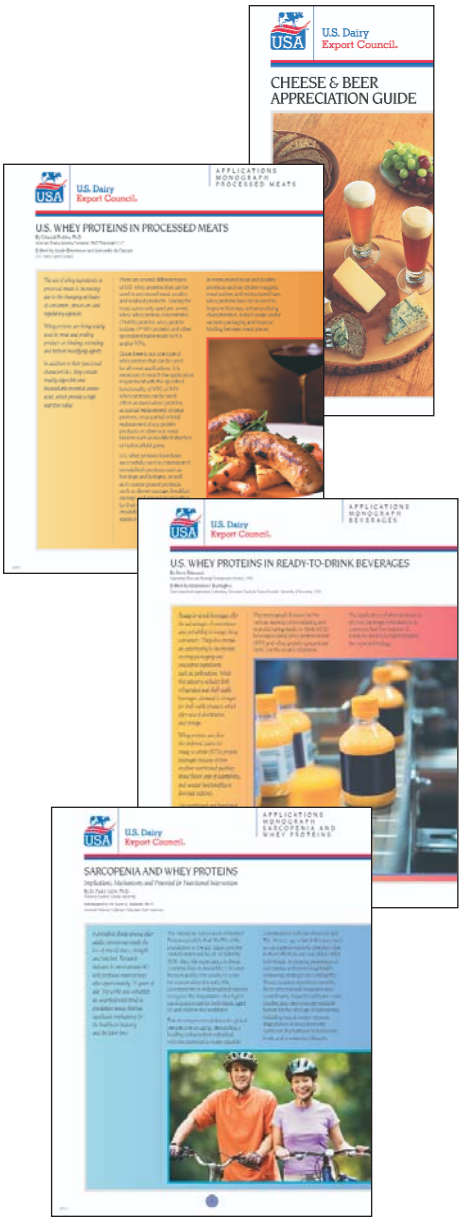
See Our New Publications



USDEC has four new publications:

Cheese & beer appreciation guide

A consumer guide to enjoying U.S. cheeses and their pairing with beer — including their conjoined history, descriptions, tasting tips and suggestions for selecting and serving both beer and cheese.

U.S. whey proteins in processed meats

A monograph designed to educate users of whey products in meat applications. Includes complete information on the functional benefits of whey in processed meats and related products, typical formulas using whey ingredients, and a Q&A section.

U.S. whey proteins in ready-to-drink beverages

A monograph designed to educate users of whey proteins in RTD beverage applications. Includes information on the development of RTD beverages: the selection of U.S. whey ingredients, processing and packaging; also includes beverage formulations using WPC and WPI.

Sarcopenia and whey proteins

A monograph designed to educate users of whey proteins in the prevention or treatment of sarcopenia (loss of muscle mass among seniors). Includes a scientific summary of the issue for health professionals and product developers, and the latest research on the physiological and metabolic implications of sarcopenia, whey protein's effects on muscle protein metabolism and the unique role of whey protein in the management of sarcopenia.