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# USDEC News

September 2007

## Darigold Hailed as "Exporter of the Year"

Darigold Inc., Seattle, Washington, was named 2007 "Exporter of the Year" by *Dairy Field* magazine.

"Exporter of the Year" is selected based on development and sales of products for overseas markets, foreign market-building initiatives, response to trends and developments in the global marketplace and industry leadership.

Almost one-third of U.S. dairy exports (by value) are milk powder, and Darigold is one of the largest producers and exporters. Moreover, Darigold exemplifies the transformation of the United States into a world-class milk powder supplier, progressing from production of nonfat dry milk (NDM) to U.S. government specifications, to standardizing protein to create skim milk powder (SMP) products for the international market. By working through their longstanding customer relationships, the co-op also has developed functionally enhanced milk powders and milk-powder blends and has started making milk protein concentrate (MPC).

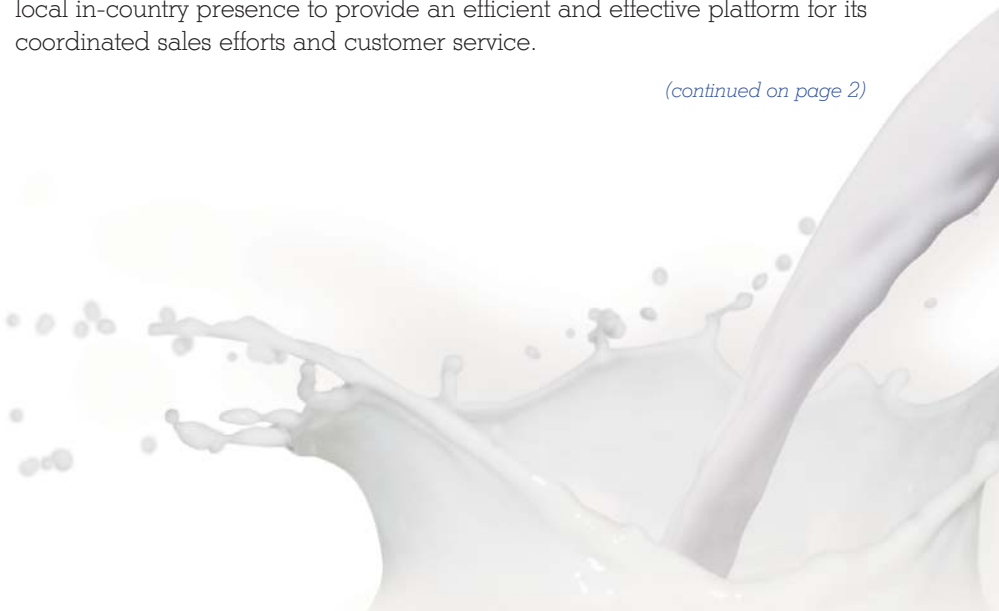
Darigold produces about 158,000 metric tons of NDM/SMP/MPC annually, as well as 50,000 metric tons of whey powder and whey proteins, 76,000 metric tons of cheese and 52,000 metric tons of butter. More than half of its milk powders and more than 80% of its whey proteins are sold overseas. The company is active around the world, particularly in Asia and Mexico.

Darigold employs a unique joint effort between its Seattle-based sales group and its long-term export partner, Seattle-based James Farrell & Co., to carry out global sales and deliveries. Coupled with frequent visits to customers in their target markets, the co-op uses James Farrell's expertise in logistics and delivery systems and local in-country presence to provide an efficient and effective platform for its coordinated sales efforts and customer service.

*(continued on page 2)*

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(continued from cover)

"Our export activities have reinforced the importance and value of strong relationships and commitment to customers and markets," says Dermot Carey, vice president, ingredients division. "Export marketing is a long-term commitment and the United States has finally arrived at the global dairy product stage as a legitimate player. We can sustain this position if we understand and respect

our role as a dependable, committed supplier.

"With the continued growth in global demand for dairy products there is a need for the United States as a supplier, and this offers tremendous opportunities to our industry. As we pursue these opportunities we will broaden our markets

and demonstrate the United States can compete in the global arena," Carey says.

Darigold will be recognized on September 10 during a live USDEC webcast event (go to [www.usdec.org/goto/webinar](http://www.usdec.org/goto/webinar)). The "Exporter of the Year" was launched last year with 2006 winner Davigold Foods.

## Codex Adopts Cheese Standards

On July 4, after more than a decade of work by organizations including USDEC and the International Dairy Federation, the Codex Alimentarius Commission (CAC) officially adopted standards for 16 cheese varieties at its annual meeting in Rome. The new standards will replace the existing cheese standards, which date back to the 1960s. The standards include country of origin labeling—endorsed by the Codex Committee on Food Labeling in May. The revised Codex standards reconfirm the generic nature of cheese varieties and bolster

arguments against geographic naming restrictions.

USDEC supports the standards, which are based on current knowledge of dairy science and contemporary cheese manufacturing technology and, therefore, should help limit non-scientific trade barriers in the future. Codex approval clears the way for the standards to be used as a basis to resolve trade disputes at the WTO.

The 16 adopted standards are for brie, camembert, cheddar, cottage cheese,

coulommiers, cream cheese, danbo, edam, emmental, gouda, havarti, mozzarella, provolone, samso, saint-paulin and tilsiter.

In addition, the Codex Committee on Nutrition and Foods for Special Dietary Uses adopted the nitrogen conversion factor compromise released by its working group in November and CAC confirmed the validity of the conversion factors. The established nitrogen-protein conversion factor for milk and milk products is 6.38 and for soy-protein is 5.71.

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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## In the News...

### New USDEC Members

- USDEC welcomes three new companies to the membership: **Brewster Dairy**, a Brewster, Ohio-based manufacturer of Swiss cheese, whey protein concentrate and lactose; **Farmland Dairies**, a Wallington, New Jersey-based fluid milk processor; and **Joseph Gallo Farms**, an Atwater, California-based manufacturer of cheese.

### New Companies

- **Dietrich's Specialty Processing**, Reading, Pennsylvania, is a new company focused on specialty ingredient blending and spray drying. It was formed by Tom Dietrich, formerly president and CEO of Dietrich's Milk Products.

### New Plants and Upgrades

- A former Kraft facility in Visalia, California, will reopen September 1 as **Provisions Food Co.** The plant will initially make nonfat dry milk; next year it will add lines for cream cheese, blue cheese and yogurt.
- **Great Lakes Cheese** will replace its cheese and whey plant in Adams, New York, with a new, larger facility. The new plant, expected to be operational in mid-2009, will be able to handle 1.1 million liters of milk per day, more than double the capacity of the existing factory.

- **F&A Dairy**, Las Cruces, New Mexico, is planning to buy nearly 6 acres of land to expand its cheese facility. The company intends to boost capacity to 1.6 million liters of milk per day.
- **Edy's/Dreyer's Grand Ice Cream**, a subsidiary of Nestlé, will invest \$30 million to expand its Fort Wayne, Indiana, ice cream novelty plant. The project, due for completion next summer, will add 65 jobs and 2,800 square meters for a new line to make Nestlé Drumsticks.
- **High Desert Milk Inc.**, a co-op of six Idaho dairy farms, has broken ground on a milk-drying operation in Burley, Idaho, that will handle 900 metric tons of milk per day. The plant will produce 30,000 metric tons of milk powder annually.
- **Pacific Cheese**, which further-processes bulk cheese from Hilmar Cheese and markets it, will build a \$10-million cheese processing facility in Amarillo, Texas, about 100 kilometers from Hilmar's new plant in Dalhart. Pacific's 37,000-square-meter facility should be complete by summer of 2008. The Hilmar plant comes on line this fall.

### Moves and Consolidations

- **Kraft Foods** will close its Lehigh, Pennsylvania, processed cheese operation and consolidate production of individually wrapped singles among three Midwestern plants by summer 2008. Natural cheese production lines will remain. More than 230 jobs will be eliminated.

### Acquisitions and Mergers

- **Sargento Foods** bought Portionables Inc., a Bellingham, Washington, manufacturer of frozen sauce and other value-added food products. Products are sold in the foodservice and food ingredient sectors throughout North America.
- **HP Hood** bought Crystal Cream & Butter, a 106-year-old, independent, Sacramento, California-based dairy, for an undisclosed sum. Hood operates 25 plants in a dozen states, but this is its first move into California.

### New Products

- **Kraft Foods** introduced a new line of probiotic cheese cubes and individual cheese sticks under the sub-brand *LiveActive*. The products have active cultures designed to improve gut health. In addition, a new cottage cheese contains prebiotic fiber.
- **General Mills** introduced *Yoplait Gogurt Fizzix*, a carbonated, squeezable yogurt snack. The product is targeted at older children.

# U.S. Specialty Cheeses

## U.S. Cheese Traditions

The United States is a nation of immigrants, and our cheese traditions started with our first settlers. Early in the 1600s, almost two hundred years before there was a United States, European settlers landed in North America. At the time, North America was referred to as the “New World,” reflected in names like New England, New York and New Jersey. One of the things the first settlers brought with them on their long journey to this new world was cheese. They brought cheese with them because they treasured it and knew there would be none waiting for them. Also, cheese was something they knew could survive the long journey across the ocean.

## A Taste for Cheese

For several centuries to follow, people from all over Europe, including the English, Italian, French, Swiss, German, Dutch, Scandinavian and many others, continued to migrate to the United States. They brought with them a taste for the traditional foods of their homeland, and cheese was one of the foods they cherished. Finding rich soil and lush grasses that reminded them of their homeland, it wasn't long before these immigrants began to settle down and farm the land. As they grew grains for their bread and grazed cattle on the lush grasses, fresh milk, cream and butter became available to them.

## Heritage of Cheese Making

In addition to having a taste for cheese, many of these immigrants also brought with them the expertise to make cheese. Any surplus milk was quickly made into cheese. Using centuries-old family recipes and traditional methods, these immigrants began making cheese, at first for themselves, and soon for others. They began producing cheeses similar to the ones their ancestors had enjoyed in Europe such



as cheddar, gouda, provolone and swiss. Together, they created a melting pot of cheeses for Americans to enjoy. An industry was quickly born, starting a long tradition of cheese making in the United States that continues today.

## American Originals

Soon after our nation was founded, Americans began to understand the vast natural resources available in the continent of North America. As time went on, they began to expand and move westward, eventually settling all the lands between the Atlantic and the Pacific oceans. Along the way, cheese makers in different regions began producing cheeses unique to where they had settled. American Originals like colby, brick, and monterey jack quickly became some of America's favorite cheeses.

## Agriculture & Dairy Science Programs

The cheese industry faced the problem of demand exceeding supply. Cheese makers did not have enough milk available to keep pace with the demand for their cheese. Early in the 1800s, agricultural programs were implemented that began to educate farmers on best practices for farming the land. As

farms grew larger and became more efficient, a steady supply of top quality milk also became available. At the same time, dairy science programs helped train cheese makers in new cheese making techniques and production efficiencies. This educational infrastructure fostered the steady growth of our industry, allowing it to keep pace with the growing demand for cheese.

## Cheese Making Innovations

American cheese makers have pioneered many advances in the world of cheese. In addition to producing many American Original cheeses, their innovative cheese making techniques have yielded new cheese styles that have become popular worldwide. The original fresh mozzarella, packed in water, was highly perishable. The production of low-moisture mozzarella was an American cheese making innovation that allowed mozzarella to be distributed nationally and worldwide. Since then, pizza has become one of America's favorite foods, and spawned a huge industry worldwide.

American cheese makers today lead the way in developing new products for their customers' specific needs. Our cheese makers work closely with their customers to create unique cheeses with specific flavors, textures and performance parameters.

## Special Nutrition & Dietary Needs

Many U.S. cheese makers produce cheeses that target specific nutritional and dietary requirements including:

- Low fat
- Reduced fat
- Low sodium
- Kosher
- Halal
- Organic
- Lactose-free

U.S. cheese makers also lead the way in producing unique products for other dietary needs. One example is natural cheese produced with active yogurt cultures. It yields a delicious, creamy cheese that is very low in sodium and lactose-free.

## A World Leader

Today, cheese makers in the United States produce thousands of varieties, types and styles of cheese. The average person in the U.S. consumes over 15 kilograms of cheese annually. To keep up with demand, our cheese makers produce over 4 million metric tons of cheese every year. That makes the United States the largest cheese producing country in the world. Along the way, our industry has led the way for advances in research, dairy science and cheese making techniques. This has fostered consistent quality, great production efficiencies and an unparalleled safety record. American cheese makers also consistently win top awards at international competitions.

## How Do Americans Eat Cheese?

The vast majority of cheese in the United States is used as an ingredient or component in prepared foods and recipes. That is true at home and when dining out. Cheese is a key ingredient in dishes at breakfast, lunch, dinner, and dessert. Some of the most popular ways Americans use cheese at home include:

- Omelets & other egg dishes
- Salads
- Soups
- Snacks and appetizers
- Cheese breads
- Sandwiches
- Cheeseburgers
- Wraps
- Pizza
- Pasta
- Desserts

## Convenience Drives Retail Purchases

Americans have always enjoyed using cheese as a special ingredient in their favorite recipes and meals at home. In America, like much of the world, both husbands and wives work outside the home. When surveyed, women who worked outside the home ranked cooking as one of the most time consuming daily household activities. Because of this, most Americans are preparing fewer meals at home. Those who do prepare daily meals have come to rely on the convenience and availability of partially or fully prepared foods. In fact, recent surveys indicate that the majority of American shoppers rank convenience as the top priority in choosing ingredients or foods they serve at home. In the average American supermarket, thousands of fully prepared foods can be found in the deli, bakery, grocery and frozen food departments. For those preparing their own recipes or meals, convenient ingredients are very important. With this trend, convenient forms of cheese have become very popular, with most Americans buying cheese that is already shredded, sliced or grated, ready to use in their favorite recipes.

## Convenient & Delicious, Cheese Stands Alone

A significant trend over the last two decades is that Americans and people all over the world are enjoying cheese as a stand-alone ingredient. Man has always appreciated cheese for its flavor, but, in its original form, cheese is also a convenient, portable food that requires no cooking and is ready-to-eat. In lunch boxes for families on the go, or as after-school snacks for kids, cheese is very popular. At holiday parties, family get-togethers, or just



watching sports with friends, people are also serving more cheese when they entertain. Served with simple condiments like fruit, nuts and crackers, cheese is well received by hosts for its convenience, and by everyone for its great taste.

## Foodservice Trends

Americans are dining out more often than ever before. To meet demand, the foodservice industry has grown steadily and today there are over 900,000 restaurants in the U.S. Independent operators and chain operators together employ almost 13 million people. Foodservice in the U.S. has become a huge industry. With different types of food and varying levels and styles of service, foodservice/restaurant categories include Quick Service Restaurants (QSR), Full Service or Family Restaurants, Casual Theme Restaurants, Fine Dining, and Hotels & Resorts. Studies indicate that when people dine out, their top criterion for selecting a restaurant or menu item is flavor or quality of taste. Chefs know that cheese delivers the flavor and quality of taste, and that's why cheese is menued so heavily in foodservice. At



breakfast, lunch and dinner, cheese is popular at all three day parts. It is also menued heavily in all categories including appetizers, salads, soups, breads, entrées and desserts. In food-service, anything that sells well on the menu sells better with cheese.

### The Cheese Course

In Europe, it has always been a tradition to serve special cheeses at a selected course before, during or after a meal. In particular, a cheese course is often served at the end of the meal. Several decades ago, as more specialty cheeses were produced, cheese courses became popular at fine dining. Today a cheese course or specialty cheese selection is available at close to one-third of all fine dining restaurants in the U.S.

### A Specialty Cheese Renaissance

Over the last two decades, appreciation for fine cheeses has grown

tremendously in the U.S., as it has all over the world. Not only are Americans eating more cheese, they are eating new and different cheese varieties. Above all, full-flavored cheese varieties have become the most popular. These include soft-ripened, washed-rind, smear-ripened and well-aged cheeses like cheddars aged from 2 to 10 years.

### New Generation of Artisanal Cheese Makers

Through growth and consolidation, cheese plants became larger, and as time went on there were fewer small cheese makers. That changed over the last several decades as small artisan cheese makers all over the U.S. began producing unique cheeses and giving them unique names to reflect their own region, traditions or ethnicity. Artisan cheese makers produced handmade cheeses in such small quantities that they were often not available beyond their own city or region of the country. Today, hundreds of artisan cheese makers all over the U.S. produce thousands of different cheeses—in fact, cheese is produced in 46 of the 50 states. As demand grew, cheese makers kept pace and many American artisanal cheeses are now available nationally and internationally.

### Award Winning Cheese

U.S. cheese is of top quality and consistently wins top honors at international competitions. At the 2007 World Cheese Awards in London, our cheese makers were awarded 13 gold, 17 silver and 12 bronze medals for their cheese entries. America is very proud of the heritage, craftsmanship and quality of its cheeses, and the passion our cheese makers show for their craft.

### Sharing our Treasures with the World

The secret is out, and the world has taken notice of the unique, special, top quality and award winning cheeses crafted in the United States. In fact, many U.S. specialty cheeses are now being exported to markets around the world. You will find them in some of the finest stores and restaurants worldwide. For more information, please contact the U.S. Dairy Export Council.



## Specialty Cheeses and Cheese Makers' Profiles

There are hundreds of specialty cheese makers in the United States and it would be difficult to profile every one of them. Therefore, in this edition we feature two companies and cheese makers that reflect the craftsmanship, variety and high quality cheeses the U.S. industry has to offer.

### Vella Cheese Company

**Cheese maker/Owner:** Ignacio Vella  
**Company:** Vella Cheese Co.  
**Location:** Sonoma, California  
**Star cheeses:** Monterey jack  
Monterey dry jack

Ignacio (Ig) Vella is a second-generation cheese maker and owner of Vella Cheese Company in Sonoma, California. In the 1930s, his father, Thomas, started the Vella Cheese Company. He produced monterey jack and other American Originals popular in that state, and a range of cheeses that reflected his Italian heritage. These factors came together when he created monterey dry jack. Ig started working with his father in the cheese factory as a young boy and when his father retired, he carried on the family cheese making traditions and still makes cheese today.

#### Monterey jack

Monterey jack was originally made by David Jacks in Monterey, California, in 1865. Made from whole milk, monterey jack was designed to be a fresh cheese that was creamy, buttery and melted well on a range of traditional Mexican and Hispanic dishes popular in this region of California. The cheese was originally made by placing fresh-made cheese curds in cheesecloth bags and hand rolling them into wheels. These were then stacked one on top of the other, pressing themselves into flat discs each weighing 3 to 4 kilograms. To this day, Ig Vella and his cheese makers still hand roll wheels of monterey jack, preserving these old, traditional cheese making techniques. Ig is the only cheese maker in the world still using this unique cheese production method.

#### Monterey dry jack

Long ago, whether by intention or accident, a large stack of monterey jack was left in a curing room for a long period. As the cheese aged, it became a hard cheese—buttery and nutty, not unlike parmesan, but still very different. Being made with whole milk, monterey dry jack was much more buttery in flavor and texture than parmesan.

In the beginning, the cheese was rubbed with diatomaceous earth containing a crystalline type of structure that coated the cheese and helped it cure properly. This use of diatomaceous earth was a traditional cheese curing technique, but Ig Vella and his father experimented with other coatings and eventually came upon one that worked even better. The new coating was a combination of cocoa powder, black pepper and cayenne pepper. Today, the cheeses

are still hand rubbed with this mixture before being placed in curing rooms on wooden racks where they are aged from six to twenty-four months.

Ig Vella, his cheese makers and their monterey dry jack have won best of class and best of show honors at the World Championship Cheese Contest, the U.S. Championship Cheese Contest, and the American Cheese Society conference. Monterey dry jack has also won a gold medal at the World Cheese Awards in London.

### Uplands Cheese, Inc.

**Cheese maker/Owner:** Mike Gingrich  
**Company:** Uplands Cheese, Inc.  
**Location:** Dodgeville, Wisconsin  
**Star cheese:** Pleasant Ridge Reserve

Uplands Cheese is a farmstead cheese producer owned and operated by two families, Mike & Carol Gingrich, and Dan & Jeanne Patenaude. In 1994, they combined their individual farms to work together on a larger scale. Their farm and cheese plant are located near Dodgeville, Wisconsin, in a region left untouched by glaciers and characterized by beautiful rolling hills known as "Uplands" from which they drew their company name.

Their herd of cows is fed and managed using natural "old world" practices. The cows graze in lush pastures from early spring through fall, as cows did many years ago, yielding milk with varied and subtle flavors and excellent nutritional value. As a farmstead cheese producer, their cheese is made exclusively from the milk of their own herd of cows. The cheese is made only during the open-pasture grazing seasons, from spring through fall.

#### Pleasant Ridge Reserve

Pleasant Ridge Reserve is made from raw, unpasteurized milk. It is a firm, washed-rind cheese, not unlike the famous Beaufort of France. The sweet flavors of the pasture, grasses, herbs, wildflowers, and clovers are detectable in every taste. Mike Gingrich describes Pleasant Ridge Reserve as the end product of a process linked to the seasons and life cycles of animals, as well as the prairie soils and climate of this particular region in Southwest Wisconsin.

Pleasant Ridge Reserve was awarded "Best of Show" at the 2001 and 2005 American Cheese Society conference, and the "Champion" at the 2003 U.S. Championship Cheese Contest—the only cheese to ever win best of show in both national competitions.

# Whitening Chicken Dark Meat with Whey Protein Concentrate & Whey Protein Isolate



By Gits Prabhu, Ph.D.  
PHD Technologies LLC

American consumers have expressed a strong preference for poultry white meat over dark meat due to color. Consumers associate white meat with leanness and health and dark meat with fat and high cholesterol. Although poultry dark meat is an excellent protein source, consumers have rejected it, and as a result the price of leg meat is less than a third of that of breast meat. Dark meat thus has evolved into being a by-product of the chicken industry. Modifying chicken dark meat to appear similar to white meat could open new markets and revenue sources.

A study was conducted to determine the whitening effect of whey protein concentrate (WPC) and whey protein isolate (WPI) either in powder or gel forms on chicken dark meat in a chicken nugget application.

*Gel preparation* – WPC and WPI gels were made by mixing 1 part protein to 5 parts water and cooked in an impermeable casing for 1 hour at 90°C. The gel was refrigerated overnight in a cooler at 4°C. The cooked gel was then ground through a 6.4 mm plate.

*Processing procedure* – A combination of chicken white and dark meat was ground through a 6.4 mm plate, mixed with dry ingredients and WPC/WPI gels and water for no longer than 3 minutes. The mixture was reground through a 4.8 mm plate and stuffed into 5 cm diameter fibrous casings and frozen. The frozen chubs were sliced into nuggets using a band saw. The nugget blanks were batter/breaded, then

par-fried in oil at 176°C for 30 seconds, and fully cooked in a convection oven using 176°C dry heat to an internal temperature of 71.7°C.

Preliminary studies showed that it was necessary to use a 50/50 combination of white meat to dark meat in order to achieve the same degree of whiteness of 100% breast meat. Therefore, the treatment that produced the best results contained 50% dark meat and 50% white meat in combination with 4% WPC powder and 20% WPI gel.

The test nuggets formulated using 50% dark and 50% white meat with 4% WPC powder + 20% WPI gel were compared to a 100% chicken breast meat control nugget. Nuggets were evaluated for proximate analysis, color (lightness L-value), texture and sensory attributes. Color was measured using a HunterLab color reflectance meter, texture was measured using a TAXT2 Texture Analyzer equipped with a 12.7 mm ebonite probe, and sensory evaluation was conducted using a 9 point hedonic scale for firmness, milk flavor intensity and purchasing tendency.

• L-values for the test treatment and the 100% white meat control were similar (Figure 1).

- Instrumental texture analysis showed that the peak force (firmness) for the test treatment containing the WPC + WPI gel was similar to that for the 100% white meat control (Figure 2).
- Sensory evaluation data showed that the panelists found the test product to be firmer than the control and were more willing to purchase the test product compared to the control. The panelists also found very low milk flavor in both control and test products (Figure 3).
- The control and the test products were also very similar in fat, moisture and protein content (Figure 4).

The results show that WPC and WPI in powder and gel form when used in conjunction with equal amounts of white meat and dark meat can whiten the appearance of the meat block in restructured chicken products. While adding significant value to chicken dark meat, the use of whey proteins does not negatively affect the sensory or nutritional attributes of the finished product. This study provides a cost-effective alternative for poultry processors to utilize dark meat.

## Chicken Nugget Formula

	Control %	Test %
Chicken breast	89.70	32.85
Chicken thigh	-	32.85
Water	8.40	8.40
Sodium Phosphate	0.40	0.40
Spice	0.42	0.42
Salt	1.08	1.08
WPC	-	4.00
WPI gel (1:5)	-	20.00
<b>Total</b>	<b>100.00</b>	<b>100.00</b>



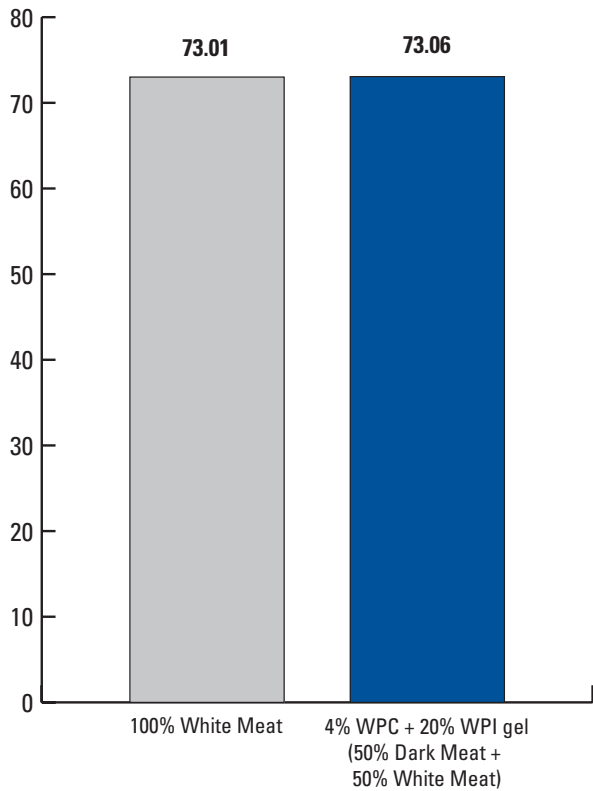


Figure 1: Hunter Lab (lightness) values

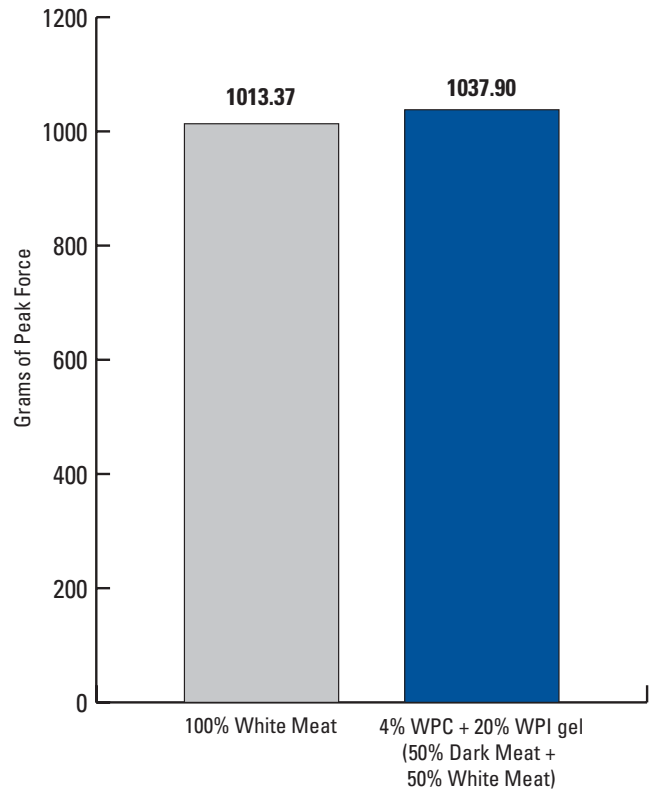


Figure 2: Texture Analysis

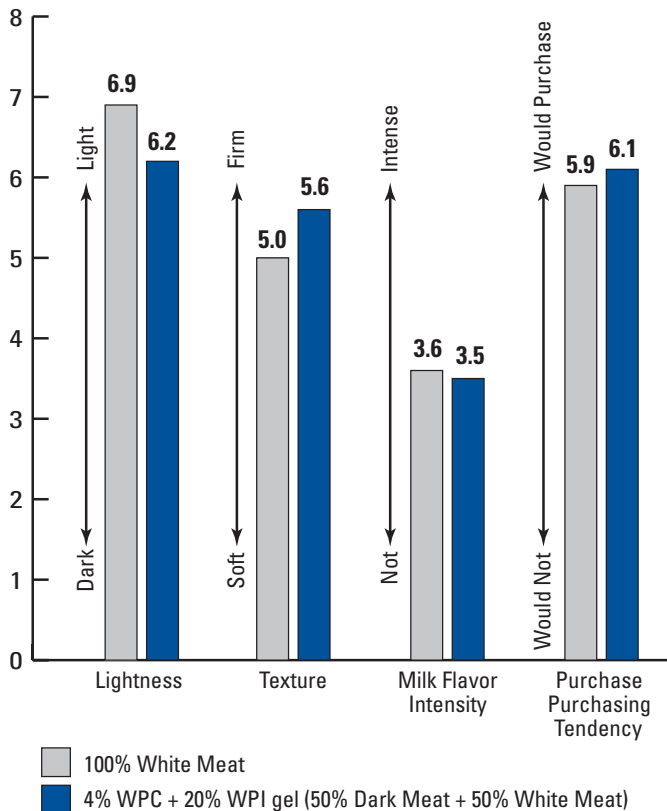


Figure 3: Human Sensory Panel Evaluation

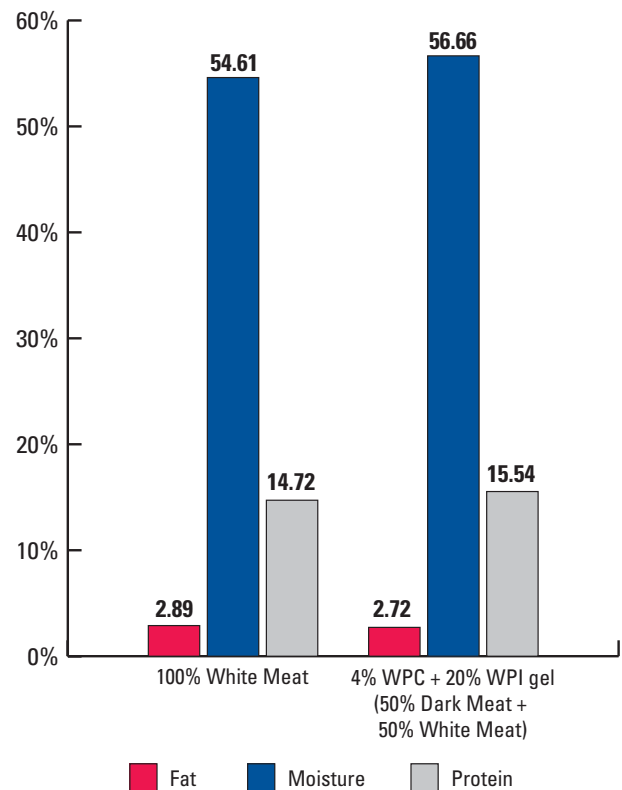


Figure 4: Proximate Analysis

# Dairy Proteins and the Prevention of Muscle Loss



Body muscle is important not only for physical performance but also for overall health and the prevention of disease and disorders including obesity, diabetes, osteoporosis and sarcopenia<sup>1a</sup>. Sarcopenia, the gradual loss of muscle mass with age, is a major concern for our ever growing elderly population. Studies have shown that you can prevent or counteract muscle loss through a proper diet that includes dairy products rich in high quality protein.

Life expectancy in most countries has increased steadily during the past century, in some cases as much as 25 years. In the year 2000, there were 600 million people aged 60 and over. By 2025 there will be 1.2 billion, increasing to 2 billion by 2050. As a result, the elderly make up the fastest growing population group today. This new situation creates many social problems and challenges in developed as well as developing countries, and sarcopenia is at the forefront.

Sarcopenia is associated with a decrease in the quality of life and has been linked to aging-related losses of strength, increased risks of disease, functional impairment, dependence

and mortality. In older adults, the loss of muscle mass or strength increases frailty and risk of falls and negatively affects the ability to perform daily activities such as climbing stairs, shopping for food and other items, or walking<sup>1a</sup>.

## Preventing Muscle Loss with Dairy

Once adults pass the physical prime of their teens and 20s, many lose an average of one-third to one-half pound of body mass a year, mostly in the form of lean body mass (LBM), or muscle. This is

significant as it translates to a loss of 1-2% per year which explains why sarcopenia is widely prevalent and an issue of growing concern, especially after age 50.

During aging, it is important to choose nutrient rich foods to help slow down the rate of muscle loss. Aging is frequently associated with a change in taste, smell and thirst sensations, often resulting in a loss of appetite. Medicines, depression, forgetfulness, reduced activity and the inability to swallow may also decrease appetite. At the same time however, a person's protein requirements may be increasing. The elderly are particularly prone to developing protein-calorie malnutrition, as well as many other vitamin and mineral deficiencies. There is a perception that elderly people consume adequate protein; however, the prevalence of under-nutrition is a common problem, especially in women. This was found to be especially true in India, where levels

rose to 60% in women over age 70. Bone health, muscle function, muscle strength, muscle mass and immune functions are all impaired with low protein intake. The human body reacts to protein deficiency by taking amino acids (the building blocks of proteins) away from muscle tissue and other areas of the body, leading to muscle loss and weakness.

Dairy proteins, specifically casein and whey, are high quality proteins with an amino acid composition similar to that of the human body and a rich source of essential amino acids (EAAs). Studies have shown that EAAs are primarily responsible and seem to be the most important factor for the amino acid-induced stimulation of muscle protein growth in the elderly<sup>2</sup>. Dairy proteins are also a rich source of the branched-chain amino acids (BCAAs), leucine, valine and isoleucine. The combination of the three BCAAs makes up approximately one-third of the skeletal muscle in the human body and plays an important role in protein synthesis. Leucine especially helps support normal maintenance and growth of new muscle<sup>3,4,5</sup> and milk is a rich source of leucine. A study by Koopman showed that "Co-ingestion of protein and leucine improved whole body protein balance in both the lean young and the elderly when compared



to the ingestion of protein alone<sup>6</sup>. Dairy products including milk, yogurt, cheese and whey protein concentrate are easy to digest and are rich sources of protein and other nutrients important for good health and the prevention of muscle loss.

**Branched Chain Amino Acid Content of Key Proteins**

Protein Source	BCAAs g/100 g Protein
Whey Protein Isolate	26
Egg White Powder	22
Milk Protein Isolate	20
Soy Protein Isolate	17

**Building Strong, Healthy Muscles**

Multiple studies have shown that strength training in the elderly improves body composition, increases muscle mass and protects against sarcopenia. Although resistance exercise stimulates muscle protein synthesis, it alone is insufficient to build muscle mass. Muscle loss may occur in people of all fitness levels, even serious and professional athletes. A combination of strength training and consumption of high quality protein is the most frequently prescribed recommendation to help combat muscle loss during aging. Dairy proteins, especially whey protein, have long been a favorite of strength training athletes as they rapidly replenish the amino acids lost during exercise that are necessary to build and repair muscles post-exercise.

Dairy protein (in the form of whey, casein, fluid milk or extracted milk protein) have been shown in a number of independent studies to directly stimulate whole body and/or muscle protein synthesis in humans under both periods of inactivity and exercise conditions. These findings are not surprising given the high quality of dairy protein and the similarity of its amino

acid composition to that of total body protein<sup>7</sup>. They also support the beneficial role of dairy proteins in building and maintaining muscle mass in individuals of all ages, including the elderly.

The importance of fast- and slow-absorbing proteins are a consideration in building LBM. Whey protein is known as a “fast” absorbing protein because it results in a rapid increase in blood amino acids. Casein, its milk counterpart, is a “slower” absorbing protein. The combination of these two proteins may provide the ideal situation, giving high protein synthesis stimulation with whey protein and the steady stream of amino acids in the bloodstream over a prolonged period of time from casein. At the 4th International Whey Conference in 2005, Dr. Stuart Phillips from McMaster University in Canada<sup>1b</sup> proposed that a 1:1 blend of whey to casein may be optimal to stimulate muscle protein anabolism following resistance exercise, given the ability of whey protein to stimulate muscle protein synthesis and that of casein to suppress the breakdown of muscle protein<sup>8</sup>. Studies have also shown that the intake of milk or a whey protein beverage following resistance training promotes greater gains in muscle mass or lean body mass than carbohydrate alone<sup>9,10</sup>.

Protein sources vary in quality and EAA content. There are a number of studies that have demonstrated the superiority of dairy protein over soy protein in stimulating muscle protein synthesis, including the following:

- In a randomized intervention study of 20 healthy adults on an adequate protein diet and under non-exercise conditions, milk protein resulted in a greater stimulation of whole body protein synthesis than soy protein<sup>11</sup>.
- In a short-term study, milk intake stimulated nitrogen uptake, a predictor of muscle protein synthesis, to a greater extent than soy after exercise in young men. In a long-term, 12-week follow-up study, exercise plus



consumption of milk resulted in a trend towards greater muscle fiber size than with soy consumption<sup>12</sup>.

- A recent study compared the effect of soy milk versus cow’s milk on the degree to which muscle is built back up after exercise in young male adults. The results showed that both soy and cow’s milk resulted in a positive net muscle protein balance when consumed following exercise. Both beverages also increased muscle protein synthesis; however, the cow’s milk produced a 34% significantly greater response than the soy milk<sup>13</sup>.

**Muscle Loss and Obesity**

People are not always aware of their muscle loss because at the same time that muscle begins vanishing from our bodies, fat often starts accumulating. Few people actually lose weight every year and most are merely replacing LBM with fat.

Muscle loss is not only a concern in aging adults, but also in younger individuals who are overweight or obese. Some researchers believe that individuals who have less muscle to begin with will pay a higher price during aging<sup>14</sup>. When a person loses weight, they often lose both fat and muscle. New research found that dairy foods



may actually help dieters maintain muscle and lose even more fat. The findings of two separate clinical trials on obese African-American adults were published in *Obesity Research* and revealed that including 3 servings of dairy (i.e. 240 ml of milk, 170 g of yogurt, and 175 g of cheese) daily results in greater fat loss and in either maintaining or increasing lean mass. When following a reduced calorie diet, participants lost twice as much weight and fat if consuming more dairy products<sup>15</sup>.

## Summary

Osteoporosis (bone loss) is often labeled the cause when we hear about the increased incidence of falls and fractures among the elderly; however, medical researchers are beginning to realize that sarcopenia is responsible for as many, if not more, of the disabilities in this age group. A new understanding of age related muscle loss is emerging, along with positive implications for the future. Instead of being an unavoidable part of aging, like gray hair and wrinkles, sarcopenia may be reversed or slowed significantly by strength-training exercise and proper nutrition. Nutrient rich dairy products are important throughout life to help prevent and minimize this debilitating condition in the elderly, a population of growing importance for the future.

For additional information visit the U.S. Dairy Export website, [www.usdec.org/publications/monographs.cfm](http://www.usdec.org/publications/monographs.cfm)

## References

1. American Dairy Products Institute and European Whey Products Association. *The Wonders of Whey... Catch the Power. Proceedings of the 4th International Whey Conference.* Chicago, IL, 2005. To order, visit [www.adpi.org](http://www.adpi.org). a) Wolfe, b) Phillips.
2. Volpi, E., H. Kobayashi, M. Sheffield-Moore, B. Mittendorfer and R. Wolfe, *Am. J. Clin. Nutr.* 78: 250-258, 2003.
3. Ha, E. and M.B. Zemel. *J. Nutr. Biochem.* 14: 251, 2003.
4. Katsanos, C.S., H. Kobayashi, M. Sheffield-Moore et al. *Am. J. Physiol. Endocrinol. Metab.* 291: E381, 2006.
5. Layman, D.K. and D.A. Walker. *J. Nutr.* 136: 319s, 2006.
6. Koopman, R., L. Verdijk, R. Manders et al. *Am. J. Clin. Nutr.* 84: 623-632, 2006.
7. Reeds, P. and P.J. Garlick. *J. Nutr.* 133: 2953s, 2003.
8. Boirie, Y., M. Dangin, P. Gachon et al. *Proc. Natl. Acad. Sci. USA* 94: 14930, 1997.
9. Chromiak, J.A., B. Smedley, W. Carpenter et al. *Nutrition* 20: 420, 2004.
10. Rankin, J.W., L.P. Goldman, M. Puglisi et al. *J. Am. Coll. Nutr.* 23: 322, 2004.
11. Morens, C., C. Bos, M. Pueyo et al. *J. Nutr.* 133: 2733, 2003.
12. Phillips, S.M., J.W. Hartman and S.B. Wilkinson. *J. Am. Coll. Nutr.* 24: 134s, 2005.
13. Wilkinson, S., M. Tarnopolsky, M. MacDonald, J. MacDonald et al., *Am. J. Clin. Nutr.* 85: 1031-1040, 2007.
14. Marcell, T., *J. Gerontol. A Biol. Sci. Med. Sci.* 58: M911-M916, 2003.
15. Zemel, M.B., J. Richards, A. Milstead et al. *Obes. Res.* 13: 1218, 2005.

## Darigold, Inc.

The Northwest Dairy Association (NDA) Cooperative and Darigold products emerged in 1918 to combine dairy producer efforts to create and market quality dairy products. As it approaches the 90th anniversary milestone, the co-op has achieved worldwide market reach via Darigold Inc. The Seattle, Washington-based marketing and processing arm of the co-op, Darigold Inc. has grown domestic and international sales to top \$1.5 billion annually.

"Darigold's history reflects the cooperative's commitment to quality from farm to shelf, no matter where the shelf may be," says Dermot Carey, vice president of Darigold Inc.'s Ingredients Division.

### Processing Pros

The co-op's nearly 600 independent member producers are located in five Pacific Northwest states: Washington, Oregon, Idaho, Northern California and Utah. As the fourth largest U.S. co-op by milk volume, NDA produces a total of 3 billion liters of milk annually. Member co-op herds vary in size from 50 to 20,000 cows, and are often multi-generational dairy producer enterprises.

Milk travels directly from the farm to Darigold's 10-processing plants. Three dairy ingredients facilities are located in the Washington state towns of Lynden, Chehalis and Sunnyside. Two additional ingredients facilities are located both Caldwell and Jerome, Idaho. Five additional Darigold plants (in the states of Washington, Idaho and Oregon) create finished consumer dairy products.

Cheese and powder operations incorporate innovative technology with efficient, flexible production capabilities along with ongoing comprehensive maintenance and capital upgrades, Carey says. The goal is to create customer-driven solutions to fit the needs of both domestic and international customers, he explains.

"The food companies we serve are helping meet the growing demand for more dairy protein, calcium and better nutrition. Darigold provides our customers with value-added food ingredient solutions," Carey says.

*Darigold* brand dry milk, milk product blends, milk protein concentrates, dry whey, whey protein, bulk butter and cheese are currently exported to China, SE Asia, Middle East, South America, Europe and Mexico. Export customers include small independent food processors as well as multinational food industry giants. To ensure top-level customer service, the Darigold Inc. Ingredients Division exports through close partner James Farrell & Co., also based in Seattle.

"We have a long history of supplying and supporting export markets and customers. We are committed to serving our customer needs through innovative products, the latest technologies and superior customer support and value," Carey says.

Darigold Inc.'s export product applications include:

- Nonfat and skim milk powders for high quality infant formula, cottage cheese, yogurt, ice cream, fluid milk, baked goods and confectionary products.
- Milk protein concentrates for infant formulas, nutritional products, processed cheese and yogurts.
- High quality whey powder and whey protein fractions as dietary supplements for health and fitness-oriented products.

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## James Farrell & Co.

Since 1920, marketing and distribution company James Farrell & Co. (JFCO) has proven its reliability as a quality ingredient supplier to business partners around the globe. As a result, it has become a top U.S. exporter by container volume and a leading exporter of U.S. dairy products.

JFCO performs marketing, logistics, customer service and finance for processor partners on both a domestic and international basis. Headquartered in Seattle, Washington, the company continues to grow, with sales offices strategically located around the world.

JFCO strives to provide a measurable level of value for partners in every activity it performs. The company combines marketing and distribution strengths with quality production capacities of producers, to create vertically integrated supply chains for its diverse customer base throughout the world.

"We focus on providing our U.S. producers the most effective means of marketing and distribution possible in today's world," says Steve Miller, JFCO president.

JFCO has farm-level understanding and involvement with the dairy business. The company works closely with U.S. dairy farmers to provide animal health and feed ingredient solutions. This farm level interaction expands the perspective necessary to understand, and effectively execute processor partner sales strategies.

At the dairy product processing plant level, JFCO cooperates closely with production, quality control and sales teams.

The close contact allows JFCO to provide overseas customers with innovative dairy ingredient solutions to meet their unique needs while also meeting manufacturer needs.

"It is this mutually synergistic business model that provides for long term relationships, and sustainable value," Miller says.

### Dairy Export Line

James Farrell & Co. exports U.S.-manufactured dairy products including:

- Butter
- Buttermilk Powder
- Cheese (Cheddar, Mozzarella)
- Colostrum Powder
- Condensed Fluid Milk
- Demineralized Whey
- Instantized Milk Powders
- Lactose
- Milk Permeate
- Milk Protein Concentrate (MilkPro™ 40; MilkPro™ 56 and MilkPro™ 70)
- Skim Milk Powder
- Whey Permeate
- Whey Powder
- Whey Protein Concentrates (WPC 34, WPC 34 Heat Stable, WPC 80 and WPI)
- Whole Milk Powder

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## Joseph Gallo Farms

Joseph Gallo Farms, a family-owned, fully integrated farming, dairy and cheese producing enterprise, has been providing its customers with a wide variety of all-natural specialty cheeses since 1979. Today they offer their customers over 20 varieties and blends of cheese in a range of package sizes.

Located near Atwater, California, the company operates five dairies – all within 10 miles of each other – along with a large cheese plant. Joseph Gallo Farms provides a ready market for the 132 million liters of milk that the dairies produce each year. Today they manage over 15,000 cows and 15,000 acres. This makes them one of the nation's largest dairy farm operations.

As the producer of a wide variety of all-natural cheese, Joseph Gallo Farms is the first (and longest standing) cheese producer nationwide to be granted government approval to label its products with “No Artificial Hormones”. The cows producing the milk for Joseph Gallo Farms cheeses are never treated with the controversial rBST/rBGH hormone or any of the other artificial hormones, a practice followed since opening for business in 1979.

Joseph Gallo Farms manufactures kosher-certified cheeses for their customers. According to Michael D. Gallo, CEO of Joseph Gallo Farms, “The kosher designation is very important to our traditional Jewish consumer. The kosher designation provides our customers with additional assurance of the quality and purity of our product.” Kosher products are also important for export to areas where consumers are looking for these products to meet certain dietary restrictions.

In addition to making cheese, Joseph Gallo Farms processes its whey into whey protein isolate (WPI) using a state-of-the-art membrane filtration process.

This product is also kosher and is fully certified for export to the European Union and around the world.

Joseph Gallo Farms has won many awards for its wildlife- and environment-compatible farming practices. In 2004, the farm adopted a comprehensive nutrient management plan for all five dairy operations. It also added a methane digester at one dairy to generate electricity from manure. This innovative system now meets most of the energy needs of the cheese plant. In addition, using a renewable energy resource in this manner reduces greenhouse gas emissions and provides many other important environmental benefits.

Speaking to agricultural groups and civic organizations, Michael Gallo emphasizes how the company's goals – producing quality products and ensuring environmental responsibility – have positioned the company for continued success. “Healthy land means healthy animals, and healthy cows make for wholesome milk and cheese”, says Gallo. “Our goal is not just producing the best cheese, but also showing heart and compassion to the animals and land that make our product possible.”

Joseph Farms is a study in total integration, balancing business and environmental elements to maintain cost-effective farming operations and highly productive cheese processing while protecting the environment. Company guiding principles and standards were set in the 1940s and have evolved during the past 60 years. The Gallo family grew up enjoying the grassland environment, and today they are committed to saving the environment for future generations while providing quality products that meet the needs of their customers.



### Product Offerings

#### Specialty Cheeses:

- Asadero
- Baby Swiss
- Cheddar Longhorn
- Colby Longhorn
- Havarti
- Longhorn
- Marbled Cheddar
- Marbled Jack
- Medium Cheddar
- Mild Cheddar
- Monterey Jack
- Mozzarella
- Muenster
- Pepper Jack
- Provolone
- Sharp Cheddar
- Swiss
- Shredded Cheese: Confetti Mix, Taco Mix, Pizza Mix

#### Kosher Cheese Varieties (block, sliced and shredded):

- Monterey Jack
- Mild Cheddar
- Medium Cheddar
- Sharp Cheddar
- Colby
- Mozzarella blocks
- Marble Cheddar
- Marble Jack
- Pepper Jack

#### Whey Powders:

- Whey Protein Isolate

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# Leprino Foods Dairy Products Company

Leprino Foods Dairy Products Company started its operations in 1950 as a small cheese manufacturing unit attached to the family's grocery business. The original Denver, Colorado location of the grocery continues to serve as headquarters for Leprino Foods. Today, Leprino is the largest U.S. exporter of whey products and a world leader in premium quality pasta filata cheese manufacturing.

Leprino's largest and newest mozzarella production facility went online in January 2003 in Lemoore, California. Its other eight U.S. production facilities are located in the states of California, Colorado, Michigan, Nebraska, New Mexico and New York.

Exporting for over 25 years, Leprino formally established its international division in 2005. Leprino exports to more than 25 countries in Asia, South America, Central America, the Caribbean, Europe, the Middle East and North America. The company is certified for export to the European Union and to Chile. Its cheese products are halal certified and the whey products are halal and OU kosher certified.

Leprino realized major export growth between 2001 and 2006. The company's export units jumped 64% during the five-year period. It also expanded the number of countries served by 35%, grew its foreign customer base by 41% and increased foreign export partnerships. Leprino currently holds cheese and whey processing technology patents in 17 countries, with more patents pending in several other countries.

The Leprino business culture actively seeks to establish "an unparalleled standard of excellence in people, products and service," says Lance Allen, VP International Operations. To continue to grow its global sales, the results-oriented company will build on Leprino's core mission: "principled leadership, strong management disciplines, superior technology, a sense of urgency and passionate commitment as a way of life."

## Product Offerings

### Cheese Innovator

Leprino's numerous technological advances in the mozzarella cheese industry have led to its role as the principal and often exclusive premium-quality pasta filata cheese supplier to major pizza chains, independent pizza operators and frozen food manufacturers throughout the United States and the world.

Leprino reports its R&D emphasis accounts for the majority of technological breakthroughs in mozzarella cheese production over the last 35 years; the company is the largest industry holder of mozzarella cheese patents. The pasta filata process traditionally used in mozzarella is utilized throughout Leprino's wide range of cheese products for the foodservice and processed food industries, providing ideal cheese functionality in a wide range of product applications and cooking environments.

A primary export example is Leprino's patented process to produce Quality-Locked® Cheese (QLC®). The individually quick-frozen, pre-shredded mozzarella provides an increased shelf life that is ideal for export purposes.

The QLC line includes mozzarella, pizza cheese, Performance Plus™ cheese, flavored cheese and blends in shreds, dices or chunks. Leprino additionally offers custom QLC formulations and private label cheeses.

Leprino also exports its string cheese line. The string cheese extrusion process creates a consistent coating surface to provide fewer tails, twists and curls than with a molded stick cheese. An array of shapes cut to ideal customer length is also available thanks to extrusion. String cheese from Leprino is individually quick-frozen for long shelf life and is available in bulk.

### Single-Source Whey

Manufacturing from a single, uniform source of mozzarella-derived liquid whey creates what the company describes as "exceptionally consistent



and very high grade" sweet whey, whey protein concentrate and lactose. The Leprino whey line offers products suitable for applications including confections, health foods, baby formulas, ready-to-drink beverages, protein gels and nutrition bars.

Temp Pro Plus™ is an 80% whey protein hydrolysate modified to obtain unique functional properties well suited to high heat and other applications where water binding is not desired. Performing particularly well in retorted, ultra-heat-treated (UHT), and aseptic ready-to-drink (RTD) beverages, Temp Pro Plus™ can successfully be blended in RTD beverages at 12% or more protein.

Leprino's whey products available for export also include:

- Temp Pro™: Heat-stable in retort and UHT processes for up to 6% protein in ready-to-drink (RTD) beverages.
- Gel Pro™: Provides exceptional gelling for yogurt, surimi, and heat-set products; egg white replacer.
- Batter Pro™: For use in batters and breadings to complement texture and reduce fat absorption in deep fat fryers.
- Whey Protein Concentrate (WPC) WPC 80% (instantized and non-instant), WPC 35%.
- Lactose: 200, 100 and 40 mesh.

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## Protient, a Division of ABF Ingredients

A leading manufacturer of specialty proteins, Protient products are used in sports and health drinks and bars, infant formulas, cereals, nutritional supplements, milk replacers, confectionery, soups and sauces.

U.S.-based dairy ingredients company Protient was founded in 1998, funded by venture capital. In 2005, the specialty protein manufacturer and its five processing facilities was acquired by ABF Ingredients, a division of multinational Associate British Foods.

Today, St. Paul, Minnesota-based Protient has expanded its marketing reach to export channels all over the world including South America, South Africa, Australia, Europe and Asia. Each of Protient's five U.S. facilities is highly specialized to create an efficient network. Manufacturing plants are located in the states of Minnesota, Utah, Wisconsin and Nebraska, with a protein powder blend-specific facility in Missouri.

### Product Offerings

Protient focuses its efforts on development and production of specialty whey and milk protein ingredients designed specifically for health, nutrition and food manufacturing applications.

Specialty capabilities at Protient include its expertise and leadership in protein purification utilizing membrane processing technology; functional and nutritional hydrolyzed proteins; extruded protein ingredients; extensive custom formulation and dry blending capabilities.

"We provide customers with superior powder performance and functionality,"

says Mr. Jeff Saforek, VP of sales and marketing. He notes the company's applied research and development service includes technical support, prototype food development and innovative ingredient research.

Protient is currently the sole U.S. source of milk protein isolates (MPI) with 90% protein. Created from ultra-filtered fresh skim milk, Protient MPI contains both whey and casein.

"It is an easily digestible complete dairy protein that acts as a good source of both calcium and phosphorous," says Jeff Saforek. Features and applications include foam stabilization for whipped products like ice cream, meringues and mousse; emulsification for meat, soups, sauces and dressings; water binding and gel matrix formation for yogurts, cheese and bakery goods; thermal stability for beverages; and a balanced amino acid profile for applications in product segments including medical food, infant formula, sports nutrition, diet and meal replacement products.

Protient additionally offers milk protein concentrates (MPC) containing 56%, 70% and 80% protein.

Protient supplies whey protein isolates (WPI) with 90% protein (regular and instantized); whey protein concentrates (WPC) with 80% protein (regular and instantized); and WPC34% in standard and heat-stable versions. Other protein levels are available to customer specification. Protient also offers whey powder specialty protein blends and lactose.

The company's protein hydrolysates provide varying degrees of hydrolysis and

**PROTIENT™**  
An ABF Ingredients Company

protein levels, with customizable protein hydrolysates available. Protient R&D efforts currently include a focus on milk hydrolysates.

ABF Ingredients has put the main focus on developing the hydrolysate market with the formation of Proteol, which is a new business unit established in 2007. Proteol develops higher performance protein systems with applications in the food, pharmaceutical fermentation and cell nutrition industries. The products currently under development include high-performance milk and whey hydrolysates designed to meet the complex needs of the pharmaceutical development segment.

### Contact Information

The new Protient website will soon debut at [www.protient.com](http://www.protient.com); information about Protient is also available at its parent company website: <http://www.abfingredients.com/eshop.php/page/id/31/protient.html>

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