

# CALIFORNIA Dairy Dispatch

RESEARCH, EDUCATION AND SERVICE TO SUPPORT THE DAIRY INDUSTRY

VOL. 13, NO. 4 • SPRING 2004

## New livestock feed test guards against mad cow disease

Researchers at the University of California, Davis, have developed a highly sensitive analytical test that detects minute amounts of animal-protein contamination in livestock feed. The new test is a major breakthrough for investigators working to protect the nation's food supply against mad cow and similar diseases.

The test uses DNA analysis to identify protein from ruminants—cows, sheep, goats and deer—in feed products intended to be eaten by other ruminants. The use of ruminant protein in livestock feed has been banned in the United States since 1997, because evidence suggests that livestock feed containing material from the carcasses of animals infected with mad cow disease can transmit the disease to healthy animals and, in turn, to humans.

A paper reporting development of the test is now under review by a peer-reviewed scientific journal. The University of California also has filed a patent application on the new procedure, which might be available for commercial use late this year.

“This test provides feed processors and regulators with a powerful tool for protecting livestock and consumers from mad cow disease,” said Jim Cullor, a veterinary professor who led the team that developed the test at UC Davis’ School of Veterinary Medicine. “It combines speed, accuracy and molecular biology attributes that are not (See **New Test** on page 2)



UC Davis Veterinary Professor Jim Cullor (above) led the team that developed a new test that detects minute amounts of animal-protein contamination in livestock feed.

## Probiotics and prebiotics awareness is increasing in the United States

Our bodies carry about 100,000,000,000,000 (100 trillion) bacteria, most in our colon and most are beneficial. They live and grow there and help prime our immune system so we can better fight infection. Some bacteria, however, are harmful and can cause infections, even disease. Some bacteria can produce byproducts from their growth that are associated with cancer. Consuming probiotics is

one approach to dealing with the negative activities of bacteria that live in our gastrointestinal tract or to which we are exposed.

Probiotic literally means “for life.” Perhaps the best way to think of them is as live, microbial cultures consumed or applied for a health benefit. Most probiotic products contain the bacteria from the genera *Lactobacillus* or *Bifidobacterium*, although other genera, including

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## New Test *from front page*

available in any of the existing analytical tests for livestock feed.”

### Prion diseases

Mad cow disease, also known as bovine spongiform encephalopathy (BSE), was first recognized in Great Britain in 1986. The epidemic of BSE that followed involved more than 178,000 cattle there and spread to other European nations.

BSE is caused by misshapen proteins called prions. The prions cause disease by triggering a slow-developing chain reaction of similar protein mutations. The prions eventually accumulate in the brain and cause debilitating neurological



The new test combines speed, accuracy and molecular biology attributes that are not available in any of the existing analytical tests for livestock feed.

symptoms and death. Sheep and goats are vulnerable to a prion disease called scrapie, deer and elk to chronic wasting disease and cows to mad cow disease or BSE.

Slightly more than 150 humans, worldwide, have contracted the fatal prion disease called new variant Creutzfeldt-Jakob disease, most of these cases occurring in Great Britain. It is believed these people became infected with prions by eating meat from cows that had BSE.

### New feed test

Up until now, federal regulators have used either microscopic analysis or more rapid antibody-based tests to monitor feeds for contamination. Both types of tests have their drawbacks. The microscopic analysis, which looks for bones, hair and muscle tissue, is a tedious process that can take days to perform. The antibody tests are much quicker, but may fail to detect contamination if it occurs at levels lower than 1 percent.

To overcome both the time and accuracy problems, the UC Davis

researchers used a technique called polymerase chain reaction (PCR), which makes it possible to replicate selected stretches of DNA and accurately identify them. This is a technique that has been commonly used for more than a decade in a broad spectrum of studies.

In this project, the researchers spiked seven different cattle feeds with predetermined amounts of meat and bone meal from cows, as well as meal rendered from fish, sheep, and poultry, and dried blood from pigs and cattle. DNA was then extracted from each of the spiked feed samples and replicated via PCR.

Further developments are allowing the test to detect ruminant DNA contamination well below 0.5 percent by weight.

One of the hurdles the researchers had to overcome in developing this test was the presence of “inhibiting substances” that occur naturally in the uncontaminated feed. These compounds interfere with the sensitivity of the PCR process, yielding false negative results. The researchers were able to identify these substances and chemically treat the feed samples so that the PCR tests would yield accurate readings.

In addition to Cullor, the UC Davis research team included Dairy Food Safety Laboratory staff researchers Mary Sawyer, Wayne Smith and graduate student Gabriel Rensen, as well as Bennie Osburn, dean of the School of Veterinary Medicine.

This research was supported by grants from The Bernice Barbour Foundation and the California Dairy Research Foundation. *ODD*



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California Dairy Dispatch is a quarterly publication of the California Dairy Research Foundation.

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For more information, contact:

**Joseph O'Donnell, Executive Director**

California Dairy Research Foundation

502 Mace Blvd., Suite 12

Davis, CA 95616

Phone (530) 753-0681

Fax (530) 753-1453

E-mail: [odonnell@cdrf.org](mailto:odonnell@cdrf.org)

Editor: **Corinne Esser**, CDRE, (530) 753-0681

Produced by **EditPros**, Davis, CA (530) 759-2000

# Probiotics gaining more importance in evolution of dairy industry

By Joseph O'Donnell

**T**he business of milk production is changing considerably. While the cost of milk production in the United States isn't the lowest in the world, it's on the lower end of the scale. Looking forward,



picture a global dairy industry without price supports. The countries with a higher cost of milk production will have to innovate or

face obsolescence. Pressures on commodity prices will continue to escalate—not just from our Oceania friends but also from other areas including Brazil, Eastern Europe and China, which are moving to expand their dairy industries. Anyone who has followed the brouhaha over outsourcing overseas understands the threat posed by countries with such low costs of land and labor. We also must innovate or we'll find ourselves out of business.

In our industry, I see two clear ways for innovation—through milk composition control and through fermentation.

The differing milk composition of varying mammal species are just variations on a theme. Composition is genetically controlled and can be manipulated. Just look at the enormous variation in milk compositions among mammals. If we can discover the role milk components play in delivering nutrition and health or if we can uncover the functional properties in milk components, we can integrate this knowledge with our understanding of the bovine genome to design

milk with more value. Additionally, we can apply separation science to refine this milk into value-added products. Commercial separation is already expanding in the form of milk protein concentrates, whey protein concentrates and the like. Think what you could do if you started with a material that contained high-value components at twice the concentration of the competition's raw milk.

The second approach to innovation lies with fermentation. Excluding alcoholic beverage makers, dairy producers rely more heavily on bacterial fermentation than any other food industry does. Fermentation in cheese, yogurt, sour cream, and other foods constitutes the first human approach to innovative product development. Fermentation holds a key role in innovation for the global dairy industry.

Research describing the role of bacteria in health and product development is expanding because of two factors. In the public domain, scientists have identified distinct genomic sequences for more than 11 lactic acid food-grade bacteria. Another key factor is consumer awareness. During the past 25 years, the entire concept of probiotic bacteria in the United States has grown from an esoteric awareness to increasing consumer buy-in. Consumer interest is half the battle in creating and successfully introducing new products.

This begs the question—where do we stand today on probiotic development? Our knowledge of the genomic sequences of probiotic bacteria can be applied in two ways. First, the roadmap of genomic sequences will lead to better understanding of the ways in which

we can manipulate fermentation bacteria to improve quality control and efficiency. Second, the genomic sequences will aid researchers in understanding the potential human health benefits of probiotics. Increased knowledge of probiotics will support health-related product innovation, thereby adding value and contributing efficiencies within our dairy industry.

While we're neophytes in comparison with our Japanese and European counterparts, Americans are finally waking up to the benefits of probiotics. Due to positive newspaper and magazine coverage of these healthy bugs, consumer awareness is increasing, and that's good news for the dairy industry. We must be careful, however, to deliver upon the health promise of probiotics without simply using it as a tool for adding high-fructose corn syrup and flavoring—lest we risk ending up like the soft drink industry.

Commodity products will always be with us—they are our lifeblood. But if it is profit we seek, we must focus continually on finding new value to add to our raw material. The best opportunities exist in the modification of raw material composition and/or processing designed to maximize the inherent value of the raw material to the consumer. The big advantage dairy has over most other foods is that the processing can be performed either artificially by machines or through biological functions. The availability of options and the ability to act on them is what defines the innovative potential of the dairy industry. *edd*

*This article was adapted from an article that ran in the March 2004 issue of Cheese Market News®.*

## Pro- & Prebiotics *from front page*

*Escherichia*, *Enterococcus*, and *Saccharomyces* (a yeast) have been marketed as probiotics. Probiotics thrive on nondigested sugars called fructooligosaccharides or “prebiotics” that, when passed into the colon, can serve to encourage the growth of probiotic microbes. Foods such as onions, asparagus, tomatoes, garlic, artichokes, honey and bananas can all help the bacteria thrive. While yogurt and fermented foods have been around for thousands of years and sale of probiotic-enriched products is a multibillion dollar business in Europe and Asia, Americans are finally beginning to accept the idea of consuming microbes to help them feel better.



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“Fermented milks are an important part of the everyday diet of people in Northern Europe, therefore, they value the live bacteria that are inherent to these products,” said Mary Ellen Sanders, a leading expert on probiotics at California Polytechnic State University, San Luis Obispo, and consultant for her company Dairy and Food Culture Technologies in Littleton, Colo. “Probiotics also have caught on in the United Kingdom, which maintains a diet and culture similar to that of the United States. The European Union has aggressively funded research on the value of probiotic bacteria, including large, controlled clinical studies on probiotics/prebiotics and cancer, and probiotics and irritable bowel syndrome, plus many more.”

On the international front, probiotic and prebiotic studies have yielded some promising results for a variety of ailments. Some recent studies appear in the next columns.

## Milk drink to lower blood pressure gains European presence

(11-24-2003) A new fermented milk, designed to help control blood pressure, has been launched in Iceland, only the second food in Europe to make such a claim. The drink is manufactured by Mjolkursamsalan, Iceland’s largest dairy company, using the patented Evolus technology developed by Finland’s Valio. The Finnish company launched its Evolus fermented milk on the home market in 2000, the first product to be sold in Europe with a scientifically established claim to control blood pressure. The new drink, introduced under Mjolkursamsalan’s LH brand, contains milk-derived natural tripeptides which have clinically been shown to control blood pressure. The action on blood pressure is produced by bioactive peptides, the result of fermenting milk casein with certain lactic acid bacteria. *L. helveticus* bacterium, widely used in cheesemaking, splits casein to the ile-pro-pro and val-pro-pro tripeptides that reduce blood pressure. The effect of Evolus in lowering blood pressure has been documented in several clinical trials, including a recent study published in the *American Journal of Clinical Nutrition*.

## German study finds potential for prebiotic sweetener

(12-4-2003) Regular consumption of the sugar replacer Isomalt appears to have a prebiotic effect on gut bacteria, according to preliminary findings of a study being carried out in Germany. Early results, highlight a functional health benefit of the low-calorie bulk sweetener, often used as a sugar replacer in hard sweets, and baked goods and snacks. It also revealed the growing awareness of prebiotics, a market still in development stage. While today’s European prebiotic market is restricted to a handful of companies (three companies hold 70 percent of the market share), new entrants are expected as awareness grows and consumers become increasingly interested in gut health. Frost & Sullivan predicts growths of 9.7 percent per year. Closely related to probiotics, prebiotics are carbohydrates thought to stimulate the growth and activity of certain beneficial bacteria in the gut. Ingredients that have so far been identified as having such activity include inulin, fructooligosaccharides, resistant starch and the sweetener tagatose. Finished products containing prebiotic ingredients include bread, chocolate, yogurt as well as supplements. In the four-week study on Isomalt, the ingredient was found to stimulate bifidobacteria in a group of 20 people. The firm is still assessing the potential of the prebiotic effect.

## Swedish dairy moves deeper into probiotics

(12-12-2003) Leading Swedish dairy firm Skanemejerier has gained the rights to use BioGaia's probiotic Reuteri bacteria in milk products for launch on the Scandinavian market at the end of 2004. The company was recently awarded Sweden's (and Europe's) first health claim to support the health benefits of probiotic bacteria, for its probiotic fruit juice ProViva. This drink contains *Lactobacillus plantarum* 299v (LP299v), licensed from another Swedish probiotics developer, Probi. BioGaia has seen a number of new licensing deals this year. Swedish food manufacturer Procordia has also recently gained rights to the bacteria and is set to launch probiotic fruit beverages and fruit soups for the retail trade at the beginning of 2004. The Reuteri bacteria are also available from Max Medica, which sells Probiomax Reuteri tablets in natural health stores, and Novartis, which sells Reuteri straws together with nutrition solutions for use in hospitals and health care institutions.

## Irish to investigate probiotics for stomach bugs

(11-26-2003) Ireland is investing in a new research center to focus on developing therapies, including probiotics and functional foods, to help treat debilitating gastrointestinal diseases. The Alimentary Pharmabiotic Centre (APC), based at the University College, Cork, will investigate probiotic bacteria and functional foods as one of the promising emerging treatments for intestinal disorders, including gastroenteritis, ulcerative colitis and Crohn's disease. The center is funded by Science Foundation Ireland (SFI) and is the largest Irish bioscience project to date, according to the country's Minister for Enterprise, Trade and Employment, Mary Harney. A recent report from Acute Gastroenteritis found that acute gastroenteritis results in the loss of 1.5 million working days every year in Ireland. The new research will investigate mechanisms by which intestinal bacteria influence health and disease and will explore opportunities for commercial exploitation by both the food and pharmaceutical sectors. The center also plans to educate industry and society on issues such as gastrointestinal disorders, probiotics and functional foods.

The center will be supported by Teagasc (the government food and agriculture research agency) and industry, with additional investment from the Irish biotechnology company Alimentary Health, linked to multinational Procter and Gamble. Ireland also recently

opened a functional food research center, aiming to boost the competitive advantage of Irish companies, particularly dairy ingredient firms, on international markets.

*The previous articles appeared in FoodNavigator.com, a Novis site, which produces a free weekly e-mail newsletter containing breaking news on food and beverage development.*

## New Zealand babies on bacteria bottle to battle allergies

(3/30/2004) Doctors want as-yet-unborn babies to test a new "probiotic" treatment to combat a worldwide

surge of allergic diseases. Researchers at the Auckland and Wellington medical schools are recruiting 225 pregnant women in each city who will agree to feed their babies a special daily mix of bacteria from the day they are born until aged two. New Zealand has one of the highest asthma rates in the world and also suffers above-average rates of eczema. Study babies will be given one of two bacteria which



**New Zealand has one of the highest asthma rates in the world and also suffers above-average rates of eczema. If this new treatment works, it will break the cycle of parents passing allergies on to their children.**

have been isolated by Fonterra, *Lactobacillus* and *Bifidobacterium*, every day for two years. Pregnant women will also take the bacteria in tablets for five weeks before their babies are due. Once their babies are born, parents will break open a capsule of the bacteria, mix it in with about 2ml of breast milk, and squirt the mixture into their babies' mouths with a syringe. Later the babies can be fed the mixture with a bottle and, after weaning, the contents of the capsule can be spooned on to their food. A third of the babies will get *Lactobacillus*, a third will get *Bifidobacterium* and a third will get an inert powder which has no health effect but will be used to test the effects of the probiotics. Parents will not know which one their child gets. If the treatment works it will break the cycle of parents passing allergies on to their children.

*This article was excerpted from [www.stuff.co.nz](http://www.stuff.co.nz). For more information on probiotics and prebiotics, visit [www.usprobiotics.org](http://www.usprobiotics.org) on the Web. *CD**

# Food industry pushes benefits of good bacteria

By Katy McLaughlin, staff reporter of The Wall Street Journal

**H**ere's what the food industry wants you to snack on in 2004—bacteria.

In an effort to create a market for products promising healthier intestines, some dairy and beverage companies are loading up products with ingredients called “probiotics,” or strains of bacteria that claim health benefits.

And, in a new twist, breakfast cereals, smoothies, energy bars and other health foods are getting a dose of “prebiotics,” which are essentially food for the bacteria.

Probiotics and prebiotics, the companies claim, promote better digestion, general health and even a stronger immune system.

In January, Dannon started rolling out to mainstream grocery stores a drink called DanActive. Previously sold mostly in health-food stores under the name Actimel, DanActive contains 10 times more beneficial bacteria than yogurt and naturally strengthens the body's defense system, says Dannon, a unit of Groupe Danone.

Horizon Organic launched two new lines of yogurt in August 2003 that include a prebiotic called Nutraflora. The dairy products and juices company also adds probiotics to its line of cottage cheese and sour cream, and says it plans to add Nutraflora to more products in 2004. Lids on Stonyfield Farm yogurt containers in stores now declare that the product contains inulin, a prebiotic.

Fifteen new foods and supplements described as probiotic were introduced in 2003, up from 10 the year before and five in 2001, according to market analyst Mintel Information Center.

DanActive, the drink Dannon is now marketing in U.S. grocery

chains, is a blockbuster in Europe and Latin America, where it's still called Actimel. It is a \$500 million-a-year business for Groupe Danone, representing about 8 percent of its dairy sales, according to a market report by J.P. Morgan. Stonyfield Farm is majority owned by Groupe Danone.



Many yogurts carry the National Yogurt Association's “live and active cultures” seal, which means that they have at least 100 million cultures per gram.

Companies say it has been hard to create a market for pre- and probiotic foods in the United States because Americans are too squeamish. “Americans think that all bacteria should be shot on sight,” says Julian Mellentin, the publisher of New Nutrition Business, a newsletter for the functional foods industry, which markets food products that promise health benefits. For that reason, he estimates that annual probiotic dairy sales in the U.S. total \$150 million, compared with \$3.7 billion in Europe.

Hoping to overcome the yick factor, companies are working hard to market the health benefits. For example, the prebiotic inulin adds fiber to foods that ordinarily don't have any, like yogurt, and studies show that prebiotics can help the body absorb calcium more effectively.

Most yogurts, including those made from soy, contain at least some quantity of probiotics, though it's legal to sell yogurt that doesn't contain any. Many yogurts carry the National Yogurt Association's “live and active cultures” seal, which means that they have at least 100 million cultures per gram. For frozen yogurt to qualify for the seal, it must contain 10 million cultures per gram. The National Yogurt Association advises on its Web site that many yogurt-covered candies, pretzels, and yogurt-flavored salad dressings don't contain live and active cultures.

Before consumers rush out to buy probiotic and prebiotic enhanced foods, it's important to understand that “the science is still evolving,” says Mary Ellen Sanders, a microbiologist who consults with food and supplement companies about probiotics. The biggest challenge is that there are about 20 strains of beneficial bacteria on the market, with uneven research touting different effects for each one. Food companies, however, may tell consumers only that a product “contains live active cultures” or has “acidophilus,” a common probiotic.

Sanders says that in spite of the questions surrounding the true benefits of probiotics and prebiotics, she eats plenty of yogurt herself and feeds it to her kids about twice a day. “I try to replace ice cream with it,” says Sanders. Another approach to figuring out whether a product delivers on its promises to help with intestinal upset, she says, is to simply eat it every day for a couple of weeks and see if there are results. For more information on probiotics, visit [www.usprobiotics.org](http://www.usprobiotics.org) on the Web. *edd*

*Excerpted from an article that appeared in The Wall Street Journal on Jan. 27.*

# News and Notes

## California's dairy industry worth billions to the state

During 2002, California's dairy industry, the largest in the nation, generated 257,800 full-time jobs and pumped \$35.1 billion dollars into the state economy, according to a study commissioned by the California Milk Advisory Board (CMAB). Additionally, in 2002, the state's dairy industry had an economic impact of \$47.3 billion in wages, revenues and related expenditures.

The study forecasts continued growth for California's dairy industry. It projects milk production will grow by 31 percent—to 45.8 billion pounds. The state's cheese production is projected to increase by 48 percent—to 2.55 billion pounds by 2012. At this growth rate, it's likely California will overtake Wisconsin as the top cheese-producing state by 2005.

The study was conducted by J/D/G Consulting, an independent dairy industry research firm in Chicago. To obtain a complete copy of the study, visit [www.dairyforum.org/](http://www.dairyforum.org/) on the Web and click on "California Dairy Facts," and then "California The Nation's Dairy Powe(r)house."

## Dairy science award in honor of DMI's Haines

CDRF recently announced the creation of a dairy science award in honor of William (Bill) Haines of Dairy Management Inc. The "William C. Haines Dairy Science Award," which was unveiled at the 6<sup>th</sup> annual Cal Poly Dairy Ingredients Technology Symposium in March, will honor individuals who have made a significant contribution to dairy science.

In naming the award after Bill Haines, most recently vice president of Product Innovation for DMI, CDRF wished to recognize his contribution to the field of dairy science. The award includes a plaque, a cash prize of \$1,000, travel expenses and the opportunity to make a presentation at a dairy industry event co-sponsored by CDRF.

"Not only is this a great honor, but being able to receive this announcement in the midst of so many friends and associates from my years in the dairy industry made it especially moving," said Haines. "I am very grateful—receiving this recognition represents a capstone to my career."

The award is open to U.S. and international scientists who have made a significant contribution to dairy science and the betterment of the dairy industry through research and development in the field of chemistry, biochemistry, microbiology, technology, nutrition, and/or engineering. Nomination forms for the 2005 award, which are due by Sept. 24, are available at [www.cdrf.org](http://www.cdrf.org) under "Awards/Giving." The winner will be announced in Spring 2005.

## Common Threads honors local dairywoman

Dairywoman Margo Souza of Stanislaus County was honored with the Common Threads award at the first annual Sacramento Valley Common Threads Luncheon held in March at the University Club in Davis.

Souza manages a 340-acre, 1,000-head dairy farm in Turlock in addition to growing more than 190 acres of corn and 113 acres of alfalfa, and working in the dairy industry for more than 20 years. Souza had



Dairywoman Margo Souza of Stanislaus County was honored with the Common Threads award at the first annual Sacramento Valley Common Threads Luncheon held in March at the University Club in Davis.

previously been employed as a nurse but took over for her father, who had started their family operation in 1933, to carry on a tradition of integrity and reliability.

Souza admitted to taking on all the jobs the men shunned in order to gain respect. Souza also did her best to become as informed as possible. "At the meetings I never went on the women's tours. I felt like I couldn't learn if I went on them. It was 10 years before they stopped asking me to go. Now my goal is to get other women to stop going on the tours," said Souza.

Souza's career accomplishments span from being the co-creator of [www.moomilk.com](http://www.moomilk.com), an educational Web site about dairies for kids, to eight years of service as school tour conductor with the Turlock Poultry and Dairy Festival.

Souza, who is active in a movement to bring milk vending machines to schools, takes great pride in seeing her efforts pay off. She said, "Last week I was at a school and I usually see these kids bringing Big Gulps and donuts for breakfast. But this one child was carrying a container of milk and it made my day." *edd*

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*Calendar of* **EVENTS**

**May 9-12, 2004**

**Fourth International Symposium on Recombined Milk and Milk Products.** The symposium theme, "New Challenges, New Ideas," will facilitate the exchange of information relevant to the recombined milk and milk products industry. The program will feature experts from around the world. Location: Cancun, Mexico, Moon Palace Resort. For more details, call USDEC at (703) 528-3049.

**July 12-16, 2004**

**Institute of Food Technologists Annual Meeting and Food Expo.** Location: Las Vegas, Nevada. For more information, call IFT at (312) 782-8424, send an e-mail message to [info@ift.org](mailto:info@ift.org), or visit [www.ift.org](http://www.ift.org) on the Web.

**August 8-11, 2004**

**International Association for Food Protection (IAFP) 91st Annual Meeting.** CDRF is sponsoring a session on safety of raw milk cheeses. Location: JW Marriott Desert Ridge Resort, Phoenix, Arizona. For more information, visit [www.foodprotection.org](http://www.foodprotection.org).

**September 28-October 1, 2004**

**6th Dairy Science and Technology Basics for the Farmstead/Artisan Cheesemaker.** Includes 1 day of hands-on cheese making activities, cheese sensory evaluations, and other considerations in starting a small scale cheese making business. Location: Cal

Poly Dairy Products Technology Center, San Luis Obispo, CA . For more information, please call Laurie Jacobson at (805) 756-6097 or send an e-mail message to [ljacobso@calpoly.edu](mailto:ljacobso@calpoly.edu).

**October 19-20, 2004**

**9th Annual Dairy Cleaning and Sanitation Short Course.** Designed to provide basics of plant and equipment cleaning and sanitation, as well as personal hygiene, and introduction to HACCP. Location: Cal Poly Dairy Products Technology Center, San Luis Obispo, CA. For more information, please call Laurie Jacobson at (805) 756-6097 or send an e-mail message to [ljacobso@calpoly.edu](mailto:ljacobso@calpoly.edu)

**October 23-27, 2004**

**National Frozen & Refrigerated Foods Convention.** Washington, D.C. Call 717-657-8601, e-mail [info@nfraweb.org](mailto:info@nfraweb.org), or visit [www.nfraweb.org](http://www.nfraweb.org)

**November 16-18, 2004**

**Health Ingredients Europe (HiE).** The Netherlands. The U.S.A. and Canadian Pavilions are organized by IFT. For information on the U.S.A. and Canadian Pavilions, call Jack Cacciabondo at (312) 782-8424 or e-mail [jcacciabondo@ift.org](mailto:jcacciabondo@ift.org). For FiE general information or registration information, e-mail [ahagenstein@cmpinformation.com](mailto:ahagenstein@cmpinformation.com), or visit [www.hi-events.com](http://www.hi-events.com) on the Web.