

CALIFORNIA Dairy Dispatch

RESEARCH, EDUCATION AND SERVICE TO SUPPORT THE DAIRY INDUSTRY

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CDRF: 20 years of innovation through dairy research and education

This April marks a milestone for the California Dairy Research Foundation (CDRF) – two decades of service to the state’s dairy industry or, as Executive Director Joe O’Donnell says, “20 years of trying to deliver the bounty of nature’s most perfect food to consumers in a global market.”

The CDRF does so by managing nutrition research and education for consumers and food science research and education for food companies. Additionally, the foundation supports producer education programs for dairy producers by providing on-farm assistance for meeting strict environmental regulations, as well as maintaining the health and welfare of the herd.

The CDRF was formally established in 1988 as California’s growing dairy industry acknowledged the need to diversify and increase consum-

(see **20 years** on page 2)



From left, Linda S. Adams, secretary California EPA, presents GEELA award to Michael Payne, director of CDQAP, Denise Mullinax, assistant director of CDQAP, and Deanne Meyer, Environmental Module leader CDQAP.

Dairy partnership receives California’s highest environmental award

The California Dairy Quality Assurance Program (CDQAP) became one of a select group of organizations or projects to receive California’s highest and most prestigious environmental honor, the Governor’s Environmental and Economic Leadership Award (GEELA).

In November, the CDQAP received an award for “Environmental and Economic Partnerships,” having demonstrated exceptional leadership in building public-private collaborations, helping to conserve California’s resources, and protecting and enhancing the environment.

“I’m proud to honor this year’s award recipients for their sustained commitment, innovative solutions and strategic investment to pro-

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er understanding of the nutritional value of dairy products. Recognizing the necessity of coordinating research projects, the CDRF was created with a mission of promoting research and development activities that directly benefit California's dairy producers, processors and consumers by increasing the value of milk and dairy products.

While the CDRF at age 20 differs little in structure from when it launched – it remains a nonprofit organization with a modest staff

focused on maximizing resources and managing research at some of the leading land-grant universities in the state and nation – the projects it oversees have changed over the years.

According to O'Donnell, who joined CDRF as its first executive director in 1990, "When the CDRF was incorporated, the primary industry concern was falling fluid milk consumption in the face of expanding milk production. Consumer eating habits were changing significantly as they lost sight of the important nutritional value of dairy products due in part to a lack of choices in the supermarket dairy case. As a result, sodas were able to make inroads in the beverage marketplace and nutrient-poor, fried snacks competed against other dairy foods. Furthermore, consumers were becoming more health conscious but receiving mixed nutritional messages. For example, saturated fat was demonized as a "bad" food and replaced with chemically hydrogenated fats that contained "trans" fat. At the same time, the industry was losing out by not capitalizing on the myriad health benefits delivered through milk and other dairy products. Today, through research, we understand that saturated fat in moderation is a good thing and trans fats are not so good. We also know that dairy plays a key role in weight management, immunity, gut health and many other aspects of daily health. Current research is focused on understanding the natural system that delivers the health benefits of milk and dairy products in order to develop dairy products attractive and functional to consumers."

Then and Now: How the CDRF led the way in future industry trends

Dairy research has always been at the forefront of some of the hottest food trends. Under the CDRF, the state's dairy industry spearheaded research



that is being translated to current food innovation:

In the early 1990s, the CDRF managed John Krochta's research at UC Davis to create edible films and coatings from whey protein isolates. His pioneering work, which is featured on the www.ediblefilms.org site, was recently highlighted in a *New York Times* article and continues to pave the way for a host of films delivering everything from moisture protection to freshening breath and fighting cold symptoms. With growing concerns over food safety, these films have great potential as food protectants.

In a 1994 article in the CMAB's *Milk Advisor* newsletter, nutritionist Joan Walsh talked about the future role of understanding genetics to health against the backdrop of the human genome project. Today, the human genome and the bovine genome are mapped, and the industry is using these tools to better understand the system by which milk delivers nutrition. The CDRF facilitated the creation of the International Milk Genomics Consortium (www.imgconsortium.org), a group dedicated to the global development of new products, based on the natural nutritional advantages of milk. In October 2008, the IMGC will present the 5th International

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Symposium on Milk Genomics and Human Health at which leading scientists will meet to share data and collaborate.

The dairy industry is one of the most regulated industries in the United States, especially so in California, which prides itself on being a leader on environmental issues. In 1997, the CDRF initiated a revolutionary program to bring academic, industry and governmental interests together to understand and comply with the federal, state and local laws and regulations. That voluntary program, the California Dairy Quality Assurance Program (CDQAP, www.cdqa.org), has become a model for the nation in how industry and regulators can work together to educate, share resources and create solutions that work for all parties. Last November, the CDQAP was awarded the Governor's Environmental and Economic Leadership Award – the state's highest environmental honor (see article on page 1).

Foods with added probiotics are one of the biggest trends at retail this year. The CDRF has long led the charge for better understanding of the health benefits attributed to these “friendly bacteria” and their natural association with dairy foods through research, hosting scientific gatherings and in 2001 creating an informational Web site – www.usprobiotics.org – that is often cited as a resource in articles and by food manufacturers. Dairy plays a starring role in this “probiotic revolution,” appearing in everything from yogurt, cheese and smoothies to cottage cheese.

More than 10 years ago, O'Donnell suggested that emerging countries would be increasing their consumption of dairy products. Working with the most nutritious food in the world, it wasn't that ambitious to think that these underdeveloped



populations would soon desire more dairy. At the time, however, some considered the idea of countries like China being interested in dairy a long shot at best. These days, China is at the top of every wish list for companies looking at international markets. The CDRF continues to support research and education tied to milk powders and dried dairy ingredients – products important to the export dairy market.

Looking to the future

California was built on innovation. The dairy industry continues to be a significant part of the state's economy, based on the innovative products it produces and the way it does business. Research makes this happen – from new products that meet consumer's desire for healthy food choices to the protection of the industry's reputation and consumer confidence through sound on-farm food safety practices.

Remaining responsive to the changing needs of the industry is a hallmark of what makes the CDRF successful. Current projects focusing

on milk genomics and the biological activity and health impact of milk's components as well as continued support of programs like the CDQAP and ongoing education will help the state's thriving dairy industry remain competitive in an ever changing and increasingly uncertain business climate.

The CDRF grew out of a desire to maximize effectiveness by directing resources and budgets where they would have the most influence. Twenty years later, this model still stands strong – the CDRF is the only regional organization of its kind. Its strength lies in the deep understanding of the needs of the industry and the ability to tap a wide variety of research facilities to address these needs as well as actively pursuing co-funding through grants and affiliated industries to extend research efforts.

Remaining responsive to the changing needs of the industry is a hallmark of what makes the CDRF successful.

Today, the CDRF manages over \$3 million in projects annually, supported by both the industry and other sources. Through the CDRF, research activities have grown and the results are more readily available to commercial, educational and marketing sectors for the ultimate benefit of dairy farmers.

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CDQAP *from page 1*

tect our environment and boost our economy,” said Governor Arnold Schwarzenegger.

The CDQAP comprises 17 regulatory agencies, dairy organizations, environmental advocacy groups and the University of California. The partnership offers classroom and on-farm assistance in meeting regional, state and federal environmental regulations.

“California’s dairy industry is the most heavily regulated in the country,” said CDQAP Director Michael Payne. “Nowhere else are monitoring and reporting requirements for water quality more comprehensive than in the Central Valley. California dairies also face the strictest regulations in the nation for control of dust and air emissions.”

Making sense of these complex regulations and providing outreach to the state’s nearly 2,000 family dairy farms requires leveraging financial, personnel and technical resources of each of the partnering organizations.

With new air and water regulations being promulgated or modified, the CDQAP has responded by offering a variety of courses, some statewide in scope and some specific to particular regions. Producers frequently take more than one class. Since the program’s formation in 1997, some 2,400 producers or dairy advisers have attended one or more CDQAP classes for a total of more than 8,400 classroom contacts.

The CDQAP reaches dairy producers through a variety of other methods including Web pages, newsletters, alert bulletins, and symposiums and advisory board presentations. Information from the CDQAP is also made available for industry, university and regulatory publications.



Producers who complete environmental certification are provided with a road sign, which prominently displays their commitment to environmental stewardship. From left, Wayne Nastri, U.S. EPA, and Chuck Ahlem, National Dairy Promotion and Research Board, unveil Hank Van Excel’s sign in 2004. (Photo by Casey Freeman/Lodi News Sentinel)

Because class curricula and materials are developed collaboratively with the regulatory and academic experts, dairy producers have come to trust that finding the CDQAP logo on materials means that they are getting concise, factual and timely information.

The CDQAP also offers producers the opportunity to prepare for and undergo a third-party environmental compliance evaluation. To date 256 dairies have successfully completed these on-farm audits.

CDQAP partners include the U.S. Environmental Protection Agency, California Environmental Protection Agency, California Department of Food and Agriculture, California Resources Agency, State Water Resources Control Board, California Department of Fish and Game, USDA’s Natural Resources Conservation Service, Milk Producers Council, California Dairy Campaign, Western United Dairymen, California Farm Bureau Federation, the California

Milk Advisory Board and Sustainable Conservation.

While core funding has been provided for a decade by the California Milk Advisory Board, other partners including U.S. EPA and the California Department of Food and Agriculture have been generous with grants and other in-kind support.

The Governor’s Environmental and Economic Leadership Awards program was established in 1993. Recipients are selected by a large panel of evaluators and the Secretaries of Cal/EPA, the Resources Agency, Business, Transportation and Housing Agency, the Department of Food and Agriculture, the State and Consumer Services Agency, and the Governor’s Office. For more information about GEELA, visit the Cal/EPA Web site: <http://www.calepa.ca.gov/Awards/GEELA/>.

For more information, contact CDQAP toll-free at (866) 662-3727, or visit www.cdqap.org.

CDQ

Global Interaction with the International Dairy Federation

For the California dairy industry to remain a strong force in the global market, it is important to partner with international dairy organizations. The go-to organization for scientific and technical dairy expertise on a global scale is the International Dairy Federation (IDF). CDRF's Executive Director Joe O'Donnell has worked with IDF for many years. He is a past chairman of the IDF Standing Committee in Nutrition and Health and currently serves as program chair for the 2008 IDF World Dairy Summit, which is in Mexico City this November.

IDF membership includes 53 countries and accounts for 82 percent of the worldwide milk production. IDF represents the dairy sector worldwide by providing the best global source of scientific expertise and knowledge in the development and promotion of quality milk and dairy products to deliver nutrition, health and well-being to consumers. IDF achieves this by developing scientific knowledge, exchanging information, addressing global developments and facilitating networking.

IDF is made up of national committees, constituted by dairy organizations in each country. The national committees nominate representatives for IDF working bodies and promote IDF to the dairy sector in their countries, as well as providing funding to IDF.

National committees are represented in the general assembly, which is the supreme authority of IDF. A board of directors contributes to the development and achievement of objectives, and the Science and Programme Coordination Committee ensures coordination and supervision of scientific, technical and economic

consideration of dairy issues. The daily organization of activities are managed at the IDF head office, under the leadership of Director General Christian Robert.

IDF Services

IDF provides a source of authoritative dairy scientific and technical information through newsletters, bulletins, guidelines and review papers. IDF provides expert advice covering a wide range of dairy issues through its 1,200 member experts. IDF organizes an annual World Dairy Summit and other international seminars to provide discussion of worldwide dairy issues and global networking opportunities for members.

IDF Partners with Other International Organizations

IDF is the platform for the international dairy sector to discuss standards for international trade and to achieve



consensus on issues discussed in Codex. The Codex Alimentarius Commission was created in 1963 by the Food and Agricultural Organization of the

United Nations (FAO) and the World Health Organization (WHO). IDF experts work with the Codex Committee on Milk and Milk Products. Besides dairy commodity standards, IDF's current activities in Codex focus on:

- Food hygiene and safety,
- Food labeling and additives,
- Methods of analysis and sampling,
- Nutrition,
- Contaminant and drug residues,
- Export certification systems.

IDF and the International Organization for Standardization (ISO) jointly develop and publish international standard methods for sampling and analysis for milk and milk products. IDF and the World Organization for Animal Health (OIE) partnership allows exchange of knowledge and information on the dairy sector and any aspects of animal health, welfare and food safety.

IDF and FAO have developed several joint publications including:

- FAO/IDF Guide to Good Dairy Farming Practice (2004),
- FAO/IDF Issue: A farm-to-table approach for emerging and developed dairy countries (2005),
- FAO/IDF Annual Dairy Development Newsletter.

To download free copies of these, go to the IDF Web site at www.fil-idf.org and click on publications, then free publications.

IDF and Environmental Issues

IDF recently announced that it will be increasing its focus on improving the global dairy industry's environmental positioning. IDF Director General Christian Robert stated, "IDF is already leading projects on environmental issues, such as fresh water treatment, re-use of processed water, reducing on-farm emissions of greenhouse gases, effluent treatment and reduction of dust. But this new initiative should add to our understanding of the issues and improve our ability to guide the dairy industry down the path of sustainability."

For more information about IDF, visit www.fil-idf.org. IDF's new dairy nutrition Web site can be accessed at www.idfdairynutrition.org.

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4th International Symposium: Milk Genomics and Human Health

By Sandra Tuijelaars, International Dairy Federation

More than 80 international experts in nutrition, genomics, bioinformatics and milk research gathered in Napa, Calif., in November for the 4th International Symposium on Milk Genomics and Human Health. Titled “Milk: from Genes to mRNA to Proteins,” the symposium was organized by CDRF. Sessions focused on the proteomics of milk, regulation of milk protein expression, post-translation modification of milk proteins, proteomics of milk peptides and glycopeptides, and bioactives of milk proteins. In addition, the International Milk Genomics Consortium (IMGC) provided impromptu highlights from researchers around the world.

Bruce German (UC Davis) started the symposium by explaining IMGC’s goals to assemble the genetic instructions for the molecules in milk that arose through evolution, and to ultimately understand the basis for their production in milk and the nutritional advantage that they provide.

The first presentation by Jenny Graves (Australian National University) demonstrated the value of comparisons between the genomes of distantly related species (such as marsupials and monotremes). Peter Williamson (University of Sydney) described a gene discovery program to exploit recent advantages in genomics for dairy industry developments. The Bovine Genome Sequencing Consortium organized manual gene model annotations which were presented by Monique Rijnkels (Baylor College of Medicine). As part of the Bovine Genome Database Consortium, David Adelson (University of Adelaide) presented a bovine quantitative trait locus (QTL), which includes a Web-accessible database of bovine QTL and linked it to the bovine genome assembly.

During a discussion on gene diversity and expression, Margaret Neville (University of Colorado) questioned whether long chain polyunsaturated fatty acids (LC-PUFA) in mouse milk are synthesized in the mammary gland or are transported from the liver. She suggested it might be possible to genetically modify the mammary glands of dairy species to secrete higher concentrations of LC-PUFA, which would be advantageous for human diets. Anke Schennink (Wageningen University) presented results from the Dutch milk genomics initiative, which revealed that large genetic variations in milk-fat composition through selective breeding can significantly improve dairy quality.

Bo Lönnerdal (UC Davis) began the second day with a discussion on bioactive milk proteins in relation



Joseph O'Donnell welcomes symposium participants

to their structural features. Sharon Donovan (University of Illinois at Urbana-Champaign) presented research that showed that coupled with improved barrier function, colostrum supplementation appears to enhance innate immunity. Helen Raybould (UC Davis) reported that an understanding of the mechanisms and pathways underlying nutrient detection in the GI tract has important implications in metabolic disease, such as insulin resistance and obesity.

Patrice Martin (L'Inra au Salon international de l'agriculture) presented results on comparative gene expression profiling experiments performed to understand the underlying mechanisms of α s1-casein interacting with other caseins. Tim Reinhardt (USDA/ARS) highlighted the use of shotgun proteomics and addressed some of the challenges that result from a high abundance of several key milk fat globule membrane proteins.

Anne Donnet-Hughes (Nestle Research Center) presented recent work examining a natural bacterial inoculum in breast milk. Neil Price (USDA/ARS) showed results of metabolic “chase” experiments using probiotic oligosaccharides and human milk oligosaccharides.

During the final day, participants were guided to the content and applications on the IMGC Web Portal, which were designed to be simultaneously easy for novices to browse and get results, yet powerful enough to answer detailed and abstract questions about the biology of milk and its health-giving properties for more knowledgeable users. The portal, at www.imgconsortium.org, is also an interactive environment in which users can add to the repository of knowledge of specific genes by contributing lactation-specific annotations or reference materials.

Information about the 5th International Milk Genomics Consortium Symposium in Sydney, Australia on Oct. 14-16, 2008, can be found at www.cdrf.org.

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NEWS AND NOTES

Drake elected first ADSA woman president

With the symbolic passing of a ribbon, Mary Ann Drake became the first woman president in the 101-year history of the American Dairy Science Association (ADSA). Outgoing president, Gary Hartwell, passed the presidential ribbon in a ceremony last July at the annual ADSA meeting in San Antonio, Texas. Drake is an associate professor in the North Carolina State University (NCSU) Department of Food Science (recently renamed the Department of Food, Bioprocessing and Nutritional Sciences). She serves as director of the NCSU Sensory Service Center, the DMI Pilot Sensory Lab, and is an active investigator in the Southeast Dairy Foods Research Center. Her research program is focused on flavor and flavor chemistry of dairy products, and she is credited with



Gary Hartwell passes the presidential ribbon to MaryAnne Drake

developing universal lexicons to describe and document these attributes with sensory analysis. Other research in her lab focuses on how flavor varies with processing and storage of dairy products. In the past year, the DMI Pilot Sensory Lab has worked with 15 companies and four universities in addition to doing work for DMI and the U.S. Dairy Exports Council.

Rascal Flatts Says, 'Milk Rocks!'

Country music group Rascal Flatts is backing the Milk Rocks! campaign and will offer fans a chance to sing with them live onstage. The "Be a milk rock star" push, part of the broader Milk Rocks! public service effort, promotes health and nutrition and was created by MilkMedia, which designs milk carton side panels and lunchroom



posters in more than 95,000 elementary, middle and high schools across the country. The band will pre-record messages to fans explaining contest rules as well as nutritional facts about milk, which can be seen on milk cartons, school lunchroom posters and a Web site prior to the live concert. A MilkMedia representative said impressions expected to be as high as 1 billion views. For more information, visit www.milkrocks.com.

Double-digit growth for area cheese makers

Surge in demand puts local artisans in expansion mode

Rising demand for artisan products is floating all boats among North Bay cheese makers, with local producers reporting double-digit growth in sales and many building larger facilities.

The surge of new artisan cheeses and yogurts coming from the area is acting as a counterweight to dwindling herds, as a smaller volume of milk is being used to make higher-value products.

Among the many artisans, Marin French Cheese has been operating there for 143 years. The oldest cheese maker in the United States is also in expansion mode, according to technical operations manager Alex Borgo.

"We've applied for permits to build a new curing room. We'd like to double or even triple production during the next year," he said.

Last year, the Petaluma Sheraton was the site of the first Artisan Cheese Festival. Coordinated by dairy industry leader Lynne Devereaux, the festival drew attendees from as far away as Toronto and was a runaway success.

Can an industry that touts small-batch production expand successfully?

"That's the challenge," said Devereaux. "We're at a critical turning point. We must maintain artisan quality while increasing quantity to meet demand."

This story, by Lorelee Stevens, was excerpted from an article that appeared in the Dec. 10, 2007, *North Bay Business Journal*.

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Calendar of **EVENTS**

April 1-4, 2008

20th Annual Cheese Short Course I teaches each participant the basic scientific information and practical skills needed to understand and manufacture cheese (includes one day of hands-on cheese making). Location: Cal Poly Dairy Products Technology Center, San Luis Obispo

April 15-17, 2008

Dairy Herdsman Shortcourse. The University of California Cooperative Extension will be hosting a dairy herdsman shortcourse, designed for working dairy employees. Its purpose is to provide the people who do the actual work on the dairy the opportunity to receive information about the latest technology and training in all aspects of dairy management. Simultaneous translation will be available at the sessions to assist Spanish-speaking attendees. To register, or for further information, visit <http://cefresno.ucdavis.edu/Dairy/>, or contact Gerald

Higginbotham, dairy advisor, UC Cooperative Extension at (559) 456-7558. Location: Veterinary Medicine Teaching and Research Center, Tulare.

July 7-11, 2008

ADSA annual meeting. Location: Indianapolis, Ind. For more information, visit www.adsa.org on the Web.

September 9-12, 2008

10th Dairy Science and Technology Basics for the Farmstead/Artisan Cheesemaker

Learn the basics of quality cheese manufacture with emphasis on artisan/farmstead cheese manufacture. 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