

CALIFORNIA dairy dispatch

CALIFORNIA DAIRY RESEARCH FOUNDATION NEWS • FALL 2009 • VOL.19, NO. 2

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Innovative research helps maintain markets for milk powder

By Rafael Jiménez-Flores, Ph.D.,
Cal Poly DPTC

Over the last two decades, the Dairy Products Technology Center (DPTC) has worked on programs and research for the continual improvement of milk powder, including projects on volatile flavor classifications, packaging studies for the improvement of transport and export, improvement of microbiological quality and spore counts, and composition.

Collaborations among DPTC scientists and quality managers in processing cooperatives throughout the San Joaquin Valley developed during the early 2000s resulted in the improvement of milk powder. Work from this partnership has yielded many practical results, among them a baseline of information and data on California milk powders that can be used in many ways. For example, we have gathered expertise over several cycles of milk production on the recurring environmental and industrial

conditions influencing fluctuations in the milk powder properties during the production year and with seasonal changes. This is particularly true with non-fat dry milk (NFDM), which, unlike the world-traded skim milk powder (SMP), is not regulated to a minimum of 34 percent protein. Through research, we now know that NFDM produced in California is consistently *higher* in protein content than that produced in other areas – a key marketing tool.

Our milk powder microbial survey and spore improvement project at DPTC gave us a much better understanding of the production and processing conditions that impact the quality of the finished product. These projects started as California dairy initiatives when there was virtually no pressure to compete in the world market and most of the milk powder was sold as a commodity within the United States. Nevertheless, through the vision of the CDRF board, projects

were implemented that have yielded very important basic information that paved the way to innovative research. Just one example is the analytical procedures developed for the elucidation of the geographical point of origin of milk powder.

The growth in the international trade of milk powder created the need for better analytical methods for the geographical identification of milk powder. The DPTC undertook a project, co-funded by CDRF and the

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US Dairy Export Council, with the goal of identifying analytical techniques that were compatible for the identification of the geographical point of origin. Given the extensive database of milk powder produced in California, valid comparisons were made from these powders and powders produced elsewhere. It was evident that no single technique could yield the sufficient accuracy and confidence to answer the basic "point of origin" question.

The challenge is that milk, like any other biological system, varies in composition according to the environment and feed, as well as the genetics and breed of the cow.



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California Dairy Dispatch is a quarterly publication of the California Dairy Research Foundation.
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Rafael Jiménez-Florez, Ph.D.

Additionally, variations in milk composition and properties may be due to processing conditions. We suggest creating a certified laboratory in which unusual analyses of a complex and comprehensive nature can be performed for the benefit of the dairy industry.

Our data indicates that a combination of the analyses of color (and components responsible for this property), minerals (which reflect the soil and environment of the cows and their feed) and microbial ecology of the sample (which is a result of milk production environment, as well as processing conditions) can be used to determine the geographical location of a skim milk powder sample.

The results have given us new insights into milk powder and its properties in addition to being able to identify them. The mineral content of milk powders has significance in nutrition due to the need for accuracy in labeling minor minerals as nutrients. Color was an unexpectedly good indicator of the origin of milk. While color-generating components in milk have minor relevance, color in milk powder results from components in the original milk and those generated through processing.

Microbial ecology of milk powder is a subject we have studied for a long time, in particular concerning spore formers. Thanks to the wealth of information gathered on the California milk powder, we can distinguish it from many other powders produced elsewhere.

As the market for milk powder continues to grow, this will give California processors a marketable advantage in meeting the needs of national and international buyers.

Functional Glycobiology Program at UC Davis launches Web site

We are pleased to announce the launch of the new Web site for the Functional Glycobiology Program <<http://fgp.ucdavis.edu>> .

The Functional Glycobiology Program is the result of five years of successful collaborations among researchers of the Milk Bioactives Program.

The new Web site (<http://fgp.ucdavis.edu>) describes the program, its mission, researchers, affiliates, and partners, the science behind the program, and translational activities. The Web site also features news items and announcements related to the program and provides links to affiliated projects, programs, institutions, and funding agencies.

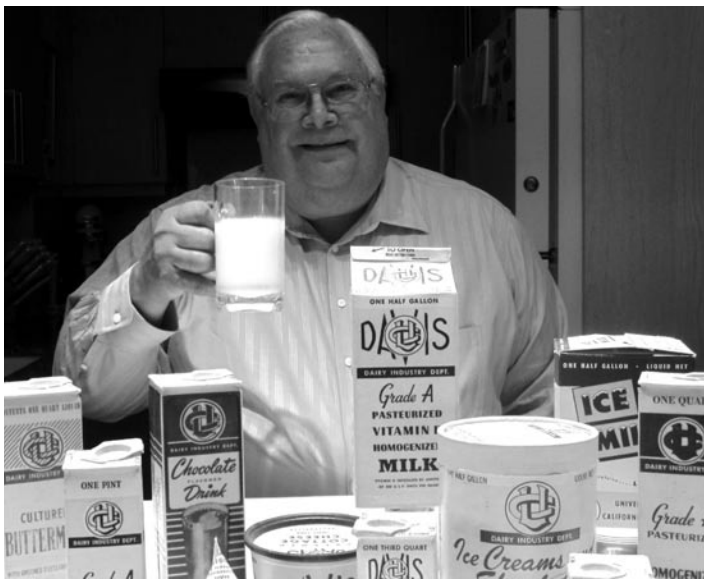
CDRF investigators receive honors & awards of distinction

Lifetime achievement award for Bruhn family

John C. Bruhn, a dairy food processing specialist emeritus in the UC Davis Department of Food Science and Technology, was honored for his life's work improving the quality and taste of milk, cheese and other dairy products.

Bruhn became a UC Cooperative Extension specialist soon after earning his doctoral degree from UC Davis in 1968. In the 1970s, he led a national effort to identify the source of iodine contamination on dairy farms and at food processors. He also helped to establish the Dairy Research and Information Center at UC Davis in 1995 and served as its founding director until 2002.

The California Cheese and Butter Association recently presented John and his wife, Christine Bruhn, a consumer foods specialist at UC Davis, a shared lifetime achievement award.



John Bruhn

“Joe O’Donnell and CDRF played important roles in my career and helped with so many projects that contributed to this award of distinction, said John Bruhn. “This was particularly true during the last five years when Cooperative Extension’s budget was cut so severely. CDRF and the Dairy Institute of California picked up the drop in funding equally, thus allowing my outreach education efforts to continue.”

LoCascio named Postdoctoral Fellow by Ewing Marion Kauffman Foundation

Riccardo LoCascio, a Ph.D. candidate in microbiology and business development fellow at UC Davis, was one of

13 leading scientific postdoctoral researchers selected by the Ewing Marion Kauffman Foundation of Kansas City, MO, to become the first class of Kauffman Postdoctoral Fellows. The yearlong program uses entrepreneurship education and mentorship to equip the fellows to commercialize their scientific discoveries.



Riccardo LoCascio

The Fellows were selected from a pool of 115 applicants by a blue-ribbon advisory panel, made up of successful scientist-founders and Kauffman Foundation fellows with expertise in the realms of scientific innovation and entrepreneurship.

LoCascio is currently working on CDRF-managed milk bioactive projects under the leadership of Dr. Bruce German.

UC honors Mitloehner for air quality research

UC Davis Cooperative Extension air quality specialist Frank Mitloehner was honored by the University of California Division of Agriculture and Natural Resources for his air quality research. Mitloehner is one of five UCCE academics to be awarded the 2009 Distinguished Service Award. The awards recognize and reward outstanding accomplishments by UC Cooperative Extension academics in five areas – new professional, extension, research, leadership, and teamwork. Mitloehner aims to improve livestock production systems and describe the nature of their environmental impact. Some of his research studies concern air quality in the San Joaquin Valley, which ranks as the worst in the country. Mitloehner’s research is vital to California’s \$4.6 billion, 1.8 million-cow dairy industry because producers must comply with strict new pollution regulations.

Affectionately called “Dr. Dairy Air” by his students, Mitloehner has become an internationally respected expert for his work determining the amount of gas emitted by cattle. He has developed new ways to measure airborne pollutants and methods to measure the impact of cattle on air pollution. One of his most visible studies is his work conducted in ‘bovine bubbles,’ which contain cattle and allow precise measurements of their gas emissions. At the invitation of the Office of the Chief Economist in the White House and the USDA, he serves on a federal advisory committee on climate change.

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Bennie Osburn receives prestigious AAVMC award

The Association of American Veterinary Medical Colleges (AAVMC) awarded the “AAVMC Senator John Melcher, DVM, Leadership in Public Policy Award” to UC Davis School of Veterinary Medicine Dean Bennie Osburn, DVM, PhD, DACVP.

“Dr. Osburn exemplifies outstanding and visionary leadership – he looks for opportunities, sometimes creates opportunities, and then is resourceful and deliberate in efforts to bring those prospects to reality. He is an enthusiastic promoter of, and tireless advocate for, veterinary medicine, and the AAVMC and the profession have benefited directly from these activities,” said John Pascoe, executive associate dean at the University of California, Davis School of Veterinary Medicine.

At UC Davis, Osburn increased the number of DVM students and residents and developed K-12 outreach activities to encourage the next generation of veterinarians. His newest initiative is the development of a multi-campus

school of global public health. Under his leadership, the school’s annual research budget rose 100 percent to \$96 million.

Osburn also has guided the school in establishing centers of excellence in comparative medicine, vectorborne disease, zoonotic and food animal disease, wildlife health,



Bennie Osburn

equine analytical chemistry and other disciplines. Dr. Osburn was instrumental in establishing the UC Veterinary Medical Center–San Diego in 1998 and the Western Institute for Food Safety and Security in 2002.

Osburn’s experience in the school includes 20 years as associate dean for research and graduate education programs, acting director of the Veterinary Medicine Teaching and Research

Center in Tulare, and six years heading infectious disease and immunology programs at the California National Primate Research Center.

German named director of Foods for Health Institute

Professor Bruce German, Department of Food Science, has been named the new director of the Foods for Health Institute. German is an internationally known scholar and leader in the field of food and health. He leads a milk genome project on campus that has gained significant financial support and attracted wide interest because of the interdisciplinary way in which the research effort has been conducted. Through the milk genome project, he has demonstrated that collaborations



in research across broad disciplinary areas are possible and can lead to much more success than would individual, isolated efforts.

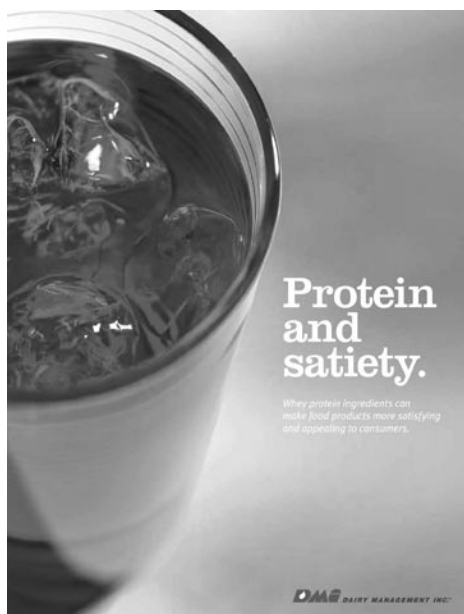
The Foods for Health Institute was organized to bring together campus faculty to collaborate in an area of research where UC Davis has the potential to be dominant in the world. The core components include research and outreach in the arenas of: medicinal nutrition, food engineering and processing, quality of life, and policy analysis and education methods. German replaces former director MRC Greenwood, who recently began her position as president of the University of Hawaii. German can be reached at (530) 752-1486, or by e-mail at jbgerman@ucdavis.edu

Dairy Management gives Web site a makeover

Dairy Management, Inc. (DMI) has given its innovation Web site a makeover with a new navigation system, and extra market and technical information for manufacturers.

InnovateWithDairy.com was set up to provide relevant and up-to-date information to researchers, food formulators, and marketers on the use of dairy ingredients.

In the updated version of the Web site, DMI has added extra information for marketers.



This Protein and Satiety brochure can be found on www.innovatewithdairy.com

“We added a market insight section containing market research and consumer insights that can be helpful in planning and development of new products,” said DMI spokesperson Kara McDonald.

Easier to navigate

DMI has also made the site easier to navigate so that manufacturers can

quickly find the information or tips they are looking for.

McDonald said: “Viewers can quickly locate topics of interest, whether it is a dairy ingredient like cheese or whey protein used in a specific application, or the latest dairy product and nutrition research, and then quickly view all site content related to that topic.”

Content overview

DMI has split InnovateWithDairy.com into three main sections: Product Research, Nutrition and Ingredients and Applications.

In the Product Research section manufacturers can read about developments in dairy product and ingredient research, and access technical information. The Nutrition section covers topics such as probiotics, dairy proteins, and weight management, and gives updates on regulatory matters. And the Ingredients and Application section includes a formulation library alongside information on adding dairy ingredients to food and drink products.

Providing information on dairy ingredients is the goal of the web site so the potential audience extends beyond dairy product manufacturers to other corners of the food and drink industry where dairy ingredients are used.

Lee Blakely receives 2009 American Dairy Products Institute Award of Merit

The American Dairy Products Institute (ADPI) selected Lee E. Blakely as its 2009 Recipient of the Award of Merit. The Award of Merit was established in 1991 to recognize individuals who have

made a significant difference in the processed dairy products industry.

Blakely has enjoyed a long, multi-faceted dairy career, which has spanned an unusually broad range of responsibilities in fields of teaching, manufacturing, quality assurance and marketing.



Lee E. Blakely

Over the course of his career, Blakely has contributed in many ways and roles to the advancement of the American dairy industry.

After receiving his doctorate, Blakely began teaching future dairy industry managers as an assistant professor at the University of Wisconsin-River Falls and later moved to the well-regarded dairy science program at Texas Tech University in Lubbock, Texas.

After several years of teaching Blakely’s expertise was sought by the dairy industry, and he joined Dairyman’s Cooperative Creamery Association (DCCA) in 1973 as senior vice president of manufacturing.

In 1999, DCCA merged with Land O’ Lakes where Blakely assumed the role of vice president of quality assurance. In 2002, Blakely was named chief technical officer for Cheese & Protein International LLC, which was acquired by Saputo and reorganized as Saputo Cheese & Protein. Blakely, who retired last fall, still remains active in the dairy business taking on various consulting assignments from Land O’ Lakes and other industry clients.

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Emergency disposal lessons and carcass composting data presented to CESA

Michael Payne, DVM, Ph.D., gave a presentation on the Emergency Animal Disposal Workgroup (EADW) to the California Emergency Services Association (CESA) at its annual conference held this year in South Lake Tahoe, Calif., October 5-8. Established in 1965, CESA is a professional organization for local and state emergency managers, planners and interested academic and private organizations. Dr. Payne covered the formation of the EADW as a result of the 2006 heat and humidity event in California's Central Valley, various work products of the group, the forms of assistance it has provided and the study findings related to pathogen reduction and environmental impacts associated with the composting of bovine mortalities.

Probiotics to star in new TV documentary series

Probiotics are to take center stage in a new series of TV documentaries, the first of which will be screened next Fall on major TV channels in the United States, including Public Service Broadcasting outlets, National Geographic and Discovery, along with European and Asian networks.

The first documentary, *Probiotics – Micro Warriors of the Digestive Tract*, will aim to educate consumers and health care professionals, the series' executive producer David Knight told NutraIngredientsUSA.com.

"There's a lot of confusion about probiotics and we are on an educational mission," he said. "We aim to tell people what they are and how they work with advanced animation graphics. But this

won't be a stiff science show – as well as being educational it will also be engaging and entertaining."

Health and well being

The film will be the most comprehensive, complete and up-to-date film ever produced on probiotics and their contribution to overall health and well being, he added.

It will feature interviews with leading scientific and medical experts such as microbiologist Dr Lynne McFarland, and Dr Eamonn Quigley, president of the World Gastroenterology Organization. Also included will be the personal testimony of patients who have benefited from probiotics, plus explanations of their mode of action and the global regulatory environment.

Knight also includes health care professionals as part of the documentaries' target audience. "There's lots of scepticism about how

effective probiotics among health care professionals such as gastroenterologist. We want to provide the education to help them keep more of an open mind."

Although the series is receiving funding from industry, Knight said the programs would be rigorously independent. "We have explained to our sponsors that the goal is educational not promoting a particular brand."

This article by Mike Stones, was excerpted from the Oct. 26 issue of DairyReporter.com.

Fortified milk, red meat aid toddlers

Feeding toddlers fortified milk or red meat can improve their levels of iron, critical for brain development.

Otago University researchers altered what 225 South Island toddlers ate

CONTINUED AT RIGHT

Research grants available for young probiotics researchers

Companies active in the probiotics field are aiming to expand scientific knowledge of the relationship between probiotics, gastrointestinal microbiota and the body, with two new \$50,000 research grants (**application deadline, Feb. 16, 2010**).

To help promote probiotics and build relationships with researchers and institutions, Danone and Yakult formed the Global Probiotics Council (GPC) in 2004. For the last two years the partners have offered funding for young investigators to carry out new research on probiotics.

This year the focus is on the role of probiotics and gastrointestinal microbiota, and the goal is to provide preliminary data that will attract future funding from the National Institute of Health and other sources.

The rules state that applicants, who may be senior fellows with a committed faculty appointment or faculty members with a max of five years of their first appointment, must be in the United States.

Further details, including information on applying for the Young Investigator Grant for Probiotics Research, can be found at **www.probioticsresearch.com**

for five months. Placing them on a diet featuring either fortified milk or red meat seemed to stop dropping iron levels.

The children were split into three groups – some ate red meat dishes twice a day, another group was given iron-fortified powdered milk, a third was given non-fortified powdered milk.

The researchers measured the protein ferritin, which indicated levels of iron in the blood, at the start and end of the five-month experiment.



The levels for those drinking the fortified milk increased 44 percent, while they stayed about the same for those fed red meat and fell for those on regular milk powder.

The results of the study were published in the October 2009 issue of the *American Journal of Clinical Nutrition*.

Excerpted from IDFA Smart Brief, Oct. 16, 2009

Dairy proteins again linked to blood pressure benefits

A combination of milk proteins may reduce salt-induced increases in blood pressure by about 10 mmHg, according to results of a rat study from Valio.

The combination of isoleucine-proline-proline (IPP) and valine-proline-

proline (VPP), with or without plant sterols, were found to attenuate the development of hypertension in salt-loaded type 2 diabetic rats.

“This study provides further evidence of the beneficial cardiovascular effects of casein-derived tripeptides in a novel animal model in this context,” wrote the researchers in the *Journal of Functional Foods*.

The results are in line with conclusions from a meta-analysis from Chinese scientists and published in *Nutrition*. Researchers from Soochow and Peking Universities focused on the efficacy of the same milk-derived peptides as the Valio researchers: IPP and VPP.

The meta-analysis concluded that pooled data from the trials showed that the milk tripeptides were associated with a 4.8 mmHg reduction in systolic blood pressure and a 2.2 mmHg reduction in diastolic blood pressure.

For the new study, researchers from Valio and the University of Helsinki used an animal model of type 2 diabetes, and fed them a salt-enriched diet. The animals were supplemented with the tripeptide product with or without plant sterols.

At the end of the study, improvements in blood pressure in the region of 10 to 12 mmHg were recorded.

Furthermore, improvements were observed in blood vessel function in the tripeptide groups. The presence of the plant sterols had no effect on blood pressure.

This article by Stephen Daniells was excerpted from the Nov. 4 issue of *Nutraingredients.com*.

Source: *Journal of Functional Foods*
Published online ahead of print, doi: 10.1016/j.jff.2009.09.003 “Casein-derived bioactive tripeptides Ile-Pro-Pro and Val-Pro-Pro attenuate the development of hypertension and improve endothelial function in salt-loaded Goto-Kakizaki rats” Authors: P. Jakala, A. Hakala, A.M. Turpeinen, R. Korpela, H. Vapaatalo

Five dairy servings a day can trigger weight loss, says study

New research suggests that increasing dairy consumption from three to five servings a day in the context of a reduced calorie diet can help fight obesity.

Researchers at the New Curtin University of Technology in Australia conducted a 12-week trial to study the impact of eating more cheese, yoghurt and low fat milk on weight levels.

During the study period participants ate a low calorie diet that reduced their total energy intake to below normal requirements. At the end of the 12 weeks the researchers found that those people who ate five servings a day instead of the normally recommended three servings lost more weight. In addition improvements in the risk factors for cardiovascular disease and diabetes were recorded.

Dairy benefits

Those eating more dairy products benefited from higher mean levels of weight loss, high mean levels of fat mass loss, greater drop of fat mass loss, and greater total percentage abdominal fat loss.

Fat content

With obesity rates on the rise, the relationship between dairy and weight management has come under scrutiny. The high fat content in cheese, cream and other dairy products have prompted some nutritionists to link dairy to weight gain. But this research, which was funded by the ATN Centre for Metabolic Fitness and Diabetes in Australia, builds on other recent studies suggesting that the opposite may be true.

This article, by Guy Montague-Jones, was excerpted from the Oct. 23 issue of *DairyReporter.com*

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Calendar of Events

Jan. 17–20	Dairy Forum 2010 For more information, visit http://www.idfa.org	Arizona Biltmore Resort and Spa, Phoenix, AZ
Feb. 9–12	Frozen Dairy Desserts Manufacturing Short Course For more information, visit www.calpoly.edu/~dptc	DPTC, San Luis Obispo, California
March 2–3	12th Annual Dairy Ingredients Symposium For more information, visit www.calpoly.edu/~dptc	InterContinental Mark Hopkins, San Francisco
March 23–26	22nd Annual Cheese Short Course For more information, visit www.calpoly.edu/~dptc	DPTC, San Luis Obispo, California
July 11–15	ADSA, PSA, AMPA, CSAS, ASAS Joint Annual Meeting For more information, visit http://adsa.psa.ampa.csas.asas.org/meetings/2010/index.asp	Denver, Colorado
Sept. 7–10	12th Annual Dairy Science and Technology Basics for the Farmstead/Artisan Cheesemaker For more information, visit www.calpoly.edu/~dptc	DPTC, San Luis Obispo, California
Oct. 12–13	Dairy Technology 101 For more information, visit www.calpoly.edu/~dptc	DPTC, San Luis Obispo, California