CALIFORNIA
dairy dispatch

CALIFORNIA DAIRY RESEARCH FOUNDATION NEWS • SUMMER 2009 • VOL.19, NO. 1

In This Issue...

Research helps boost production of aged California Cheddar

Cheddar is one of the most popular varieties of cheese sold in the world and one of the most flexible. It comes in mild, mellow flavors and robust, sharp versions that will thrill any palate. While all cheese markets have grown over the past decade, the market for aged Cheddar, in particular, has expanded rapidly as consumers look for natural cheeses with unique, intense flavors.

Cheddar production is second only to Mozzarella in California, where most of the milk used in cheesemaking is Grade A with a microbial count of less than 50,000 colony-forming units (cfu) per ml. However, because of its good quality, there was anecdotal evidence suggesting that California milk could not be used to produce good-quality, aged Cheddar cheese. This is due to the incorrect notion that a high count of natural microflora in milk contributes positively to cheese ripening and flavor development. Also, as the state's cheesemaking processes are highly mechanized, it was thought that California Cheddar cheese, which is mostly made by the stirred-curd method, would be distinctly different from Cheddar made by the traditional milled-curd method and not able to compete in the aged Cheddar marketplace.

This was the situation facing Cal Poly researchers, led by Dr. Nana Farkye. With support from cheese industry partners, Hilmar Cheese Co. and Kraft Foods, and funding from the California Dairy Research Foundation, Dr. Farkye set out to demonstrate that with proper starter selection, good-quality, aged Cheddar cheese could be made using the stirred-curd method and using California milk. In addition to the cheese industry partners, starter culture companies also participated in the research by supplying cultures that would work under cheesemaking conditions specific to California.

"This project was important to Hilmar because we saw two opportunities for aged Cheddar – first to diversify our product mix and second to meet the growing U.S. consumer demand for more intensely-flavored cheeses," said Phil Robnett, VP of Cheese for Hilmar Cheese Company. "We didn't want to do so by duplicating something that already existed. We wanted a unique product with our own flavor profile that could be produced consistently in the volumes required by our customers. The opportunity to work with Cal Poly and have the benefit of their facility, equipment and staff resources allowed us to evaluate

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more options in detail in a reasonable timeframe."

The project played a role in enabling Kraft Foods to work with Hilmar to produce acceptable aged California Cheddar for national distribution.

"Industry involvement was imperative to the success of this project," said Farkye. "Hilmar and Kraft provided input not only in the planning but also sampled and graded cheeses, provided cheesemaking supplies and, most important of all, their expertise as cheesemakers in producing large volumes of cheese with consistent quality. The culture companies also helped to evaluate samples before they were sent to the third party sensory lab."

Ultimately the project successfully demonstrated the ability to produce quality aged Cheddar from California milk. Kraft aged Cheddar (produced in California and elsewhere) is available throughout the U.S. Hilmar sells aged Cheddar to private label, regional and national brand cheese packagers for retail grocery, food service and ingredient companies in the U.S. and throughout the world, and under the Hilmar label at the Hilmar Visitor Center in its California facility.

Milk Genomics & Human Health Symposium schedule now available

The speaker program for the 6th International Symposium on Milk Genomics & Human Health is now available. The three-day event, which will be held Sept. 28-30, 2009, at the Mercure Paris Porte de Versailles Expo Hotel in Paris, France, will feature international experts in nutrition, genomics, bioinformatics and milk addressing the status of milk-specific genomic research. Members of the IMGC also will meet to set future agendas for the group.

Speaker topics include:

- Selection of animals on milk composition
- Strategies to differentiate farm milk
- Qualitative and quantitative profiling of bovine milk fat globule membrane protein fractions
- Using comparative genomics to understand milk's unique biological functions
- The annotation of the lactation genome
- Comparative transcriptomics and genomics of mammalian lactation
- Regulation and consequences of mammary development
- Insights from comparative genomics/the Lactoscan project
- Milk and immunity – from mechanisms to outcomes
- Milk and autoimmunity
- The rumen metagenome

Speakers include Erik Mullaart of CRV BV, Toon van Hooijdonk from Friesland Campina, Michael Affolter of the Nestlé Research Center, Bruce German from UC Davis, Monique Rijnkels of the Baylor College of Medicine, Peter Williamson of the University of Sydney, Christophe Lefevre of Deakin University, Mark Thomas of University College London, Peter Henson of the University of Colorado Health Sciences Center, Felicie Faucon from the Institute de l'Elevage-CNEIL, Johan van Arendonk of Wageningen University, Marion Boutinaud of the Institute National de la Recherche Agronomique, Harsharn Gill of the Department of Primary Industries in Australia, Chris Linington of the University of Glasgow and Bryan White

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For more information, contact:
Joseph O'Donnell, Executive Director
California Dairy Research Foundation
502 Mace Blvd., Suite 12
Davis, CA 95618
Phone (530) 753-0681
Fax (530) 753-1453
E-mail: odonnell@cdrf.org

Editor: Corinne Esser, CDRF, (530) 753-0681
Contributing Writer: Jennifer Giambroni
Produced by EditPros, Davis, CA (530) 759-2000

During tough economic times, nutrition can be jeopordized

By Joseph O'Donnell, Ph.D.

With the economy in the tank, doom and gloom reigns over every industry – even dairy. While the perception is that people need to eat in good times and bad so commodities like dairy should not be greatly affected, this is far from reality. The sad fact is, when it comes to shrinking budgets, what tends to go first is good nutrition. Hunger trumps health in tough times as consumers look to address the empty belly first and deal with the long-term consequences of poor food selection later. This translates to selecting cheaper, less nutrient-dense foods over nutrient-dense foods like dairy. Sure, everyone tightens the belt in hard times – more processed cheese and less aged Cheddar – but consumers will also switch from butter, cream cheese, sour cream and the like to the various chemically hydrogenated spreads because of the difference in price. And, as these products reformulate to reduce the villainous *trans fat* content, they are regaining marketshare.

Fluid milk, as a grocery staple, will feel less of a pinch but it will be affected as well. Some people will cut back while other will opt for cheap soft drinks as a beverage option. Again, nutrition gets sacrificed in the name of the dollar. It doesn't matter if you live in the United States or a Third World country, when you are looking to feed your family in the most economical way possible the calories will win over nutrition every time. What is most affected is our health. Obesity exists in poor countries as well as rich ones. While the drivers differ, the underlying principle is the same – both consume too many low nutrient-dense foods.

All of the physiological systems in our bodies suffer from a poorly balanced diet – including digestive and nutrient processing systems. With inefficient metabolism, calories cannot be properly utilized, appetites are not suppressed, health declines and obesity reigns. I predict that the tough economy will result in higher obesity rates, due to the increasing consumption of empty calories. We can also expect all of the other health issues surrounding a deficient diet to be amplified as well – calcium, vitamins, protein and other minerals. These will have varying degrees of impact on our population in the short term and can result in dire long-term consequences.

Dairy is strongly recognized for its nutrient profile – it's what separates milk and dairy foods from all others. Science is now in a position to describe specifically how dairy delivers nutritional benefits. This means more than just protein, vitamins and minerals but also direct interactions between components of milk selected through an evolutionary process (not serendipitous, as with plants) to stimulate, modulate, enhance and suppress biological activities in humans. These biological activities are responsible for the regulation of appetite, immune function, digestion and untold functions yet to be discovered.

The challenge in tough financial times is to offer consumers affordable, balanced nutrition that will satisfy the hunger without overloading on calories,

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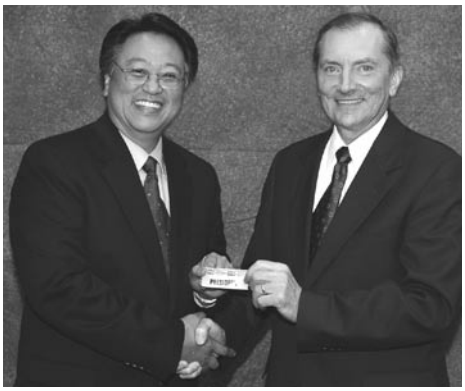
of the University of Illinois. Additional speakers will be announced.

Symposium registration is $450 through Aug. 23, 2009, and $500 thereafter, and includes all program materials and daytime meals as well as a Monday evening reception. Sponsoring members of the International Milk Genomics Consortium can register at the rate of $400 through Aug. 23, 2009, and $450 thereafter. Student rates and special hotel room rates also are available. Additional program information is available at www.milkgenomicssymposium.org. Online registration is available at www.acteva.com/go/cdrf.

The symposium is presented by IMGC sponsoring members: CDRF, CNIEL, DairyAustralia, Dairy Farmers of Canada, Dutch Dairy Association, National Dairy Council and Teagasc. Event sponsors include the International Dairy Federation and the U.S. Dairy Export Council.

Tong named president of American Dairy Science Association

Phillip Tong, director of the Cal Poly Dairy Products Technology Center in San Luis Obispo, Calif., was recently sworn in as the 93rd president of the American Dairy Science Association (ADSA) during the organization's joint annual meeting in Montreal.



ADSA's past president Don Beitz passes the presidential torch to Phil Tong.

"As incoming president, I hope to continue to move the ADSA in directions that will reinforce its role as the leading scientific organization in dairy science for the benefit of consumers, industry, government, academia, other allied groups, and the ADSA membership," stated Tong.

"I plan to build on the efforts of my predecessors with the tremendous dedicated ADSA staff, other elected ADSA representatives and member volunteers to launch new efforts to meet new developments, opportunities and challenges facing this 103-year-old institution. Our core values of 'objectivity, integrity, open-mindedness, inclusiveness and commitment' remain unchanged and continue to guide ADSA as we set goals to evolve and stay at the cutting edge in scientific discovery and product/technology innovation."

His goals include expanding the reach and impact of the *Journal of Dairy Science* to the global dairy science community, boosting the content and attendance of the annual scientific meeting to continue its reputation as the premier source for dairy science information, and launching new initiatives that tap technology to enhance the organization's ability to reach larger numbers of people in the United States and throughout the world, involved in milk and dairy foods from farm to table.

As a former student and now a professor, Tong also recognizes the importance of student involvement in the growth of ADSA, both in membership as well as in grooming future leaders. He plans to engage the student population through the Student Affiliate Division (SAD) and identify other avenues to attract more students with interests in dairy animal science and dairy food science and related disciplines into ADSA.

Membership in ADSA has grown from the original 19 charter members in 1906 to over 4,000 individual members (professional, sustaining [corporate], post-doctoral students, graduate students, undergraduate students and life members) and institutional members. ADSA has three divisions: Dairy Foods, Production, and the SAD. The ADSA publication, *The Journal of Dairy Science* is the top-ranked dairy research journal in the world.

For more information about the ADSA, visit www.adsa.org. The 2010 ADSA annual meeting will be held July 11-15, 2010, in Denver, Colorado.

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especially carbohydrate (e.g., sugar) calories. We are very close to being in that position. After years of research into these questions, the industry is starting to implement the technology. While it will take several more years to see actual product formulation based on biologically active aspects of dairy products, it is coming and will be soon enough to affect the health of the greater population. What we are doing is fine-tuning the definition of a balanced diet.

Delivering nutrition lies at the heart of the dairy industry. We can tout the health merits of dairy products until the proverbial cows come home. Consumers will hear the buzz but still opt for cheaper, unbalanced diets in hard times. As a global industry, we need to help consumers design diets that can do both – be affordable but also contain enough of the critical dairy components necessary to maintain good health. To do that we need to continue a fast-paced effort to identify these dairy components and convert them into products that will meet the needs of consumers struggling to feed their families. We're almost there.

"The challenge in tough financial times is to offer consumers affordable, balanced nutrition that will satisfy the hunger without overloading on calories, especially carbohydrate (e.g., sugar) calories."

This article first appeared in the January 2009 issue of *Cheese Market News.*

News & Notes

Milk guzzling children may live longer, says study

Consuming plenty of dairy products at a young age may lower stroke risk and lead to a longer life, according to a 65-year follow-up study.

Some studies have suggested that dairy-rich diets contribute to heart disease because of high levels of saturated fatty acids and cholesterol. But new research published in the journal *Heart* and funded by health charities suggests that children who eat lots of milk and cheese may live longer.

Studying data from the Carnegie ("Boyd Orr") survey of diet and health in pre-war Britain, researchers from Bristol University and the Queensland Institute of Medical Research looked for links between dairy consumption during childhood and mortality.

Tracking the lives and the dairy intake of 4,374 children between 1948 and 2005, the researchers found that 1,468 (34 percent) of them had died, and 378 of those deaths were caused by coronary heart disease and 121 were due to stroke.

Professor Richard Martin, one of the authors of the study, told *Dairy Reporter*: "This finding was all the more compelling because the children in the study were drinking high-fat milk."

Not only did the study suggest that dairy-rich diets in childhood do not contribute to heart problems later, they found that higher childhood calcium intake was associated with lower stroke mortality.

In addition, children who were in the group that had the highest calcium intake and dairy product consumption were found to have lower mortality rates than those in the lower intake groups.

"Children whose family diet in the 1930s was high in calcium were at reduced risk of death from stroke," said the study authors. "Furthermore, childhood diets rich in dairy or calcium were associated with lower all-cause mortality in adulthood."

Martin said the study is one of the first to look into dairy consumption at mortality over such a long period.

This article by Guy Montague-Jones, appeared in the July 29 issue of the Dairy Reporter.

Jiménez-Flores wins IDFA Research Award

Cal Poly Dairy Science professor **Rafael Jiménez-Flores** won the International Dairy Foods Association Research Award in Dairy Foods Processing. The award, which was presented during the ADSA annual meeting, recognizes individuals whose research allows for the development of new products and improvement in the quality, safety or processing efficiency of dairy foods. The award, given by the ADSA, includes a plaque and a $1,500 honorarium.

Jiménez-Flores

Jiménez-Flores also organized and served as chairman of a symposium session on milk enzymes, featuring five world-renowned experts, that was presented during the Montreal meeting.

Is this bacteria good for you? Do your homework when it comes to probiotics

Ten years ago, many people considered the idea of eating billions of bacteria to improve health a wacko alternative medical practice. Now, you'd have to live in a media- and marketing-free bubble to be unaware of probiotics, the "good bacteria" that Jamie Lee Curtis is so excited about in those yogurt commercials.

But while marketers have done a fantastic job of spreading their message about the health benefits of probiotics, and probiotic products have been popping up all over the supermarket – from Dannon's Activia to chocolates, fermented milk, cereals and granola bars – it's less clear exactly what those benefits are.

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Much of the confusion comes from a basic misunderstanding – namely that all probiotics are the same. A little digging into the research reveals that nothing in the probiotic product world is simple. Grand and false generalizations are rampant, and it's best to know exactly what you want and why when you head to the supermarket.

What's important is that each strain has different effects, and it's impossible to generalize about what they can do as a group, says Mary Ellen Sanders, a food microbiologist who is a consultant for the dairy industry in Centennial, Colo.

The little solid science behind probiotics – that they can help conditions like diarrhea associated with taking antibiotics, vaginal infections, and diarrhea in children who have rotavirus – comes from studies on specific strains of bacteria. What happens in one study does not apply to all probiotics.

The picture becomes even blurrier when you consider that studies can look at a strain by itself, in combination with others, and at different dosages over different periods of time.

"You really do see a hodgepodge [of studies] out there, and that's one of the issues that makes this field really difficult," says Sanders.

So what can these bacteria do for us?

Probiotic bacteria have been in our food supply for decades, and the bacteria in yogurt, *Lactobacillus bulgaricus* and *Streptococcus thermophilus*, have been around much longer. They are certainly safe. But do healthy people need them? That depends on whom you ask.

"No, absolutely not," said Sanders. "This is not an essential nutrient to a person's diet."

But, she says, there's a chance that by taking the right ones at the right dose, you could be doing yourself a favor. Some research has shown that strains like *L. reuteri* ATCC55730 (trade name Protectis) may have immune-enhancing effects.

Dr. Michael Roizen, chief wellness officer of the Cleveland Clinic, has a diplomatic answer to the question. "The answer is we don't know the answer. But the intriguing data is maybe."

The jury is still out. Both Sanders and Katz think that the probiotic picture will become clearer as we better understand the bacteria that naturally live in our bodies.

The National Institutes of Health has taken the first step in this process by funding the Human Microbiome Project, a massive effort to identify the trillions of bacteria that colonize the human body much the same as the Human Genome Project mapped out our own genetic makeup.

This article, by Brie Zeltner of Plain Dealer Reporter*, is excerpted from the June 16 issue of* Ohio Real-Time News.

Russ Hovey joins UC Davis

The University of California, Davis, Department of Animal Science has hired Russ Hovey as an associate professor specializing in lactation and mammary gland biology.

Hovey is a native of Australia and grew up just outside of Brisbane. His involvement in dairying began as a high school student raising a Jersey heifer. Hovey milked cows during his summers and fitted cows for shows across Australia. He received his undergraduate and graduate degrees at the University of Queensland, and his Ph.D. from Ruakura Research Center in New Zealand. He did post-doctoral work at

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Russ Hovey

Nominations due for Haines Award

The California Dairy Research Foundation is accepting nominations for the William C. Haines Dairy Science Award through Sept. 22, 2009.

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.

In addition to industry recognition, the winner receives 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 the CDRF. Nomination forms are available at www.cdrf.org under "Awards/Giving." The winner will be announced in March 2010.

the National Institutes of Health to gain additional experience in genetics and human medicine-related research.

"While our research is all about what makes the mammary gland tick, this has a lot of potential relevance to everything from mastitis to milk composition," said Hovey. "Our overall goal is to improve efficiency of the dairy cow by understanding how her udder works."

To contact Hovey, call (530) 752-1682, or e-mail him at rchovey@ucdavis.edu.

Dairy Web resource

DAIReXNET, a national dairy Web resource bringing science-based, peer-reviewed materials to the dairy industry, hosted its second producer/allied industry webinar on "Financial Outlook for the Dairy Industry" and co-sponsored a third webinar with the University of Illinois on "Feeding Strategies with the Current Milk Prices." These webinars are free to the public. Additional webinars are planned for the future on timely topics. Notices and archives of past sessions for these webinars will be located on the DAIReXNET home page at www.extension.org/dairy+cattle.

Troubleshooting tool for dairy lameness

Dairy producers now have access to a software program that lets them determine how to reduce lameness in their herd, based on an analysis of environmental factors on the farm.

"Lameness is so complicated because many factors are involved in determining whether or not a cow gets lame and whether or not she stays lame," said Dr. Nigel Cook, head of the University of Wisconsin-Madison School of Veterinary Medicine's Food Animal Production Medicine section. "To communicate where a farm is failing is really difficult. We really needed a step-wise analytical tool."

Working with experts from Zinpro (www.zinpro.com), the company that sponsored production of this analytical tool, Dr. Cook was able to apply his knowledge to what is now called the "First Step" software tool.

Based on years of research, the First Step software provides a methodical way to capture data and store information. Farmers enter data on 20 different areas that can affect cow lameness, including bedding, walking surfaces, hoof trimming, hygiene, biosecurity, freestall ventilation, and heat abatement strategies.

Once the assessors have been identified and entered, the program goes to work. It compares the farm's data with industry standards. Through a set of automated reports, this information can be used to home in on an individual farm's problems.

"The program helps the consultant determine the most significant areas to focus on," Dr. Cook said. "It's a trouble-shooting tool. It identifies why that farm in particular is having a problem."

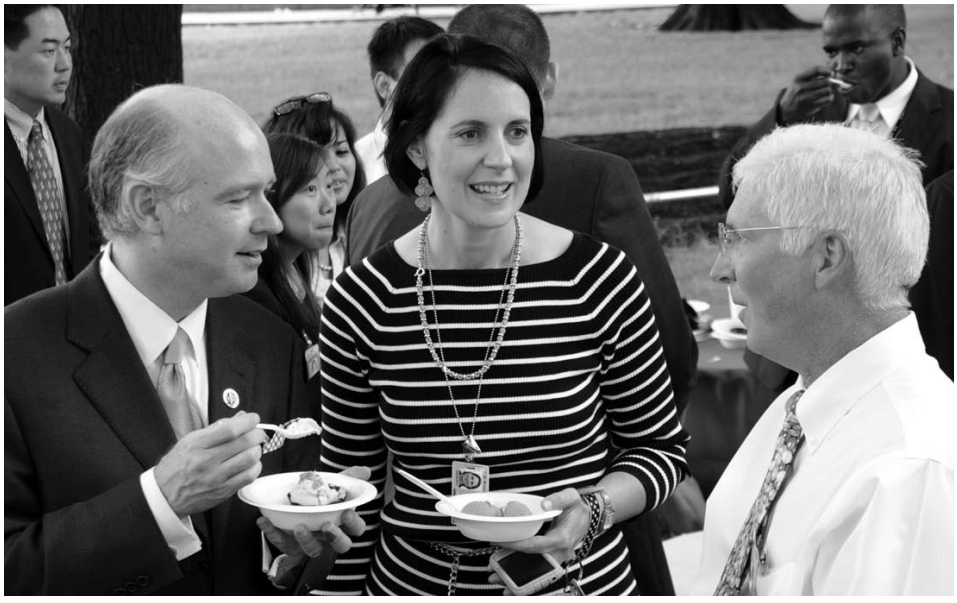
In the past, consultants assessed hoof-trimming, stall comfort or foot-bathing in isolation, but there was a risk of missing other factors that can contribute to lameness.

This article appeared in the May 12 issue of DairyBusiness.com.

Cal Poly Probiotic Ice Cream Goes to Capitol Hill

A prototype ice cream made by the Cal Poly Dairy Products Technology Center played a starring role in the International Dairy Foods Association's 27th annual June Capitol Hill Ice Cream Party. The English Toffee Reduced-Fat Ice Cream with Probiotics, which was created to sample at the annual Institute for Food Technologists meeting earlier in the month, was served in the VIP tent at the annual event for more than 8,000 members of Congress and their families.

The ice cream has about 27 percent less fat than normal ice cream and features probiotics, beneficial bacteria linked to digestive health and immunity. It is not commercially available but was created to showcase dairy ingredients to food processors and manufacturers attending the annual IFT event.



Members of Congress enjoy ice cream from Cal Poly, made with Real California milk.

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California Dairy Research Foundation
502 Mace Blvd., Suite 12
Davis, California 95618

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Calendar of Events

Sept. 20–24	**IDF World Dairy Summit "United Dairy World 2009"** For more information, visit http://www.wds2009.com	Berlin, Germany
Sept. 22	**Nominations due for Haines Dairy Science Award**	See page 6 for details
Sept. 28–30	**6th International Symposium on Milk Genomics & Human Health** Contact Jennifer Giambroni at info@imgconsortium.org or visit www.milkgenomicssymposium.org for details	Paris, France
Sept. 29–Oct. 3	**World Dairy Expo** For more information, visit www.world-dairy-expo.com/gen.home.cfm	Madison, Wisconsin
Oct. 13–14	**Dairy Technology 101** For more information, visit www.calpoly.edu/~dptc	Cal Poly Dairy Products Technology Center, San Luis Obispo, California
Oct. 28–31	**Worldwide Food Expo** For more information, visit www.worldwidefood.com/	Chicago, Illinois