

# Dairy

P L A N E T

ISSUE NINE – September '09

## Spreading dairy's health message

Dairy Innovation Australia's members are reaping the rewards of health and nutrition roadshows conducted by the Dairy Health and Nutrition Consortium.

The Consortium is an industry initiative that focuses science on health-boosting dairy foods. It is administered by Dairy Innovation Australia and the Geoffrey Gardiner Foundation. Its members are Fonterra Australia, Murray Goulburn Co-operative, Tatura Milk Industries, Warrnambool Cheese & Butter, Parmalat Australia and Dairy Australia.

Between March and June 2009, the Consortium and its research partners – CSIRO Human Nutrition, The Baker IDI and Deakin University – took their message directly to the Consortium's industry members.

The roadshows outlined new dairy-focused clinical research capabilities created by the Consortium. They offered companies the opportunity to engage in direct conversation with clinical researchers, share feedback on the first study outcomes and provide new perspectives for the design of clinical trials.

The linkages formed with clinical researchers are being translated into product development projects for the members of the Dairy Health and Nutrition Consortium.

*For more information, contact Barbara Meurer-Grimes on (03) 9974 8710 or Craig Miller, Geoffrey Gardiner Foundation, on (03) 9606 1918*

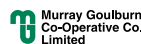


*Tony McKenna conducts a tour of the Tatura Milk Industries plant. With him were: (left) Lesley MacLeod, Dairy Innovation Australia; Manny Noakes, CSIRO Human Nutrition; Iain Halcrow, Tatura; and Danielle Klose, CSIRO Human Nutrition.*

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#### OUR MEMBERS:





*Dairy Innovation Australia CEO,  
Lesley MacLeod*

## FROM THE CEO

***It's more than half way through the year, and the pace is still accelerating at Dairy Innovation Australia.***

***The Spray Drying Symposium in April was a great success, providing a forum for cutting-edge research for more than 200 international delegates. Following the conference, we've been working with members and research partners to roll out process improvements in drying technologies and apply resource minimisation tools.***

***The Dairy Health and Nutrition Consortium has completed a roadshow that took research teams to members, to discuss applications of research findings in the health and nutrition area, particularly around a secondary analysis of the 2007 National Nutrition Survey for dairy consumption patterns of Australian children.***

***There have been a number of changes to Dairy Innovation's Board, with the retirement of foundation members Jo Davey, Paul Ford and Tony McKenna. We are grateful for their dedication and skill, and look forward to welcoming new Board members in the next month.***

***In this issue of Dairy Planet we write about a number of programs, NIZO, University of Queensland and University of Melbourne, which are key to advancing our knowledge and capability for applications in the Australian industry.***

## Improved water and power use in dairy product manufacturing

Reducing and improving water use is a significant challenge for Australian dairy product manufacturers who want to save money and reduce their 'carbon footprint'.

The 2007/2008 Australian Dairy Manufacturing Industry Sustainability Report has found that it takes about 1.5 litres of potable water to process a litre of raw milk. This varies significantly between individual processors and depends on their dairy product mix. Industry-wide, about 26% of water is recycled from sources such as milk evaporator condensates.

Dairy Innovation Australia is working with NIZO Food Research in The Netherlands to identify practical opportunities to reduce water and energy use in dairy plants.

The research is led by Elankovan Ponnampalam from Dairy Innovation and Coen Akkerman from NIZO, and is supported by Dairy Australia.

NIZO Food Research has been involved in sustainable dairy processing for many years and has carried out projects that have achieved significant reductions in water and energy use in the dairy industry.

They have found that combined water and energy saving programs result in the best 'payback', as water savings projects are rarely cost-effective in their own right.

*For more information, contact Mike Weeks on (03) 9974 8714*

## Grant scheme invests in new dairy processing technologies

Dairy Innovation Australia will invest more than \$900,000 over three years in a major multi-disciplinary research program at the University of Queensland.

Led by Associate Professor Hilton Deeth, the program will focus on five research areas: thermal processing; non-thermal processing; dairy microbiology; new product concepts; and dairy nutrition.

The program, which represents a total investment of \$4 million, will provide a broad but flexible range of research capability and innovation outcomes to Dairy Innovation and its member companies. It will also facilitate cost-effective access to the extensive range of resources and expertise at the University of Queensland.

### Calling all researchers

In October 2009, Dairy Innovation will again invite applications for funding under its Processes and Products Grants Scheme for Research and Innovation.

Details of the process and research priorities for the application round will be announced on the Dairy Innovation Australia website.

For more information on the Scheme or how to apply, contact Ian Powell on (03) 9974 8712 or visit [www.dairyinnovation.com.au](http://www.dairyinnovation.com.au)

## Victorian research to the world

Dr Sally Gras from the University of Melbourne has been awarded a 2009 Victoria Fellowship.

Dr Gras and her research group have partnered with Dairy Innovation Australia on a project investigating the analysis, control and consequences of the microscopic structure of curd and cheese.

The \$18,000 Fellowship recognises young researchers with leadership potential and aims to enhance their future careers, while developing new ideas that could offer commercial benefit.

Dr Gras will use the Fellowship to fund a study mission to Europe investigating dairy product microstructure and functional food research. She will also present dairy research at the first international Symposium on Microstructure of Dairy Products in Norway.

*Dr Sally Gras has received a research grant to look at the microscopic structure of curd and cheese.*

*For more information, contact Ian Powell on (03) 9974 8712*



## Put dairy in your diet for science

Deakin University is looking for clinical trial participants to help investigate the role of dairy as part of a healthy diet.

The trials will compare how fats and proteins from dairy and other sources are digested and what nutritional benefit they deliver in healthy people and in overweight or diabetic patients.

If you are a man aged between 40 and 60, you can make a contribution to dairy science by participating in the trials. You will have access to your health check results and the expenses you incur as the result of your participation will be reimbursed.

Turn to page 8 to read more about the clinical trial and for details on how to take part.

*For more information, contact Barbara Meurer-Grimes on (03) 9974 8710 or Maxine Bonham or Amy Larsen at Deakin University on (03) 9251 7256*

## Dairy Innovation Australia in print

Three papers based on projects funded by Dairy Innovation Australia have recently been published.

'A numerical model for the particle deposition on industrial milk dryers' by Yan Jin and Xiao Dong Chen was published in *Drying Technology* (volume 27, issue 3). It is based on the findings of the Smart Drying Project.

'Volatile sulphur compounds in milk' by Zahir Al-Attabi, Bruce D'Arcy and Hilton Deeth has been published in *Critical Reviews in Food Science and Nutrition* (January 2009). The paper is based on the results of the University

of Queensland's Thermal Processing Project.

The outcomes of a collaborative project with RMIT University led by Dairy Innovation's Christopher Pillidge, Lucy Sheehy, Amal Shihata and Ian Powell have recently been published as 'Intragenomic 16S rRNA gene heterogeneity in *Lactococcus lactis* subsp. *cremoris*' in the *International Dairy Journal* (volume 19, issue 4).

*For more information, contact Karen Manaszczuk on (03) 9974 8700*

## Symposium report – Environment and economy drive innovation in dairy powder manufacture

*Climate change, dairy processing's 'carbon footprint' and higher energy costs are driving dairy innovation. This was a hot topic at the 4th International Symposium on Spray Dried Dairy Products held in Melbourne in April.*

Hosted by Dairy Innovation Australia, the Spray Dried Dairy Products Symposium heard from more than 50 presenters from around the world and attracted 200 delegates representing all sectors of the Australian dairy industry.

Dairy Innovation Australia's CEO, Lesley Macleod, said she was delighted with the outcome of the three-day symposium.

"This event has offered the local dairy industry a rare opportunity to discuss global advances in dairy manufacturing, technology and industry development with peers," she said.

"It's also given Australian researchers the chance to share ideas with international leaders in the field."

### Energy savings on the factory floor

Fonterra's principal research engineer, Alan Baldwin, said that even though the main challenge for the dairy



Alan Baldwin

*"The challenges at the factory level will be reducing energy consumption, reducing carbon footprint and improving utilisation of plant by improved turn-around or longer runs"*

industry was emissions from the farm, factory contributions could not be ignored.

"The challenges at the factory level will be reducing energy consumption, reducing carbon footprint and improving utilisation of plant by improved turn-around or longer runs," Mr Baldwin said.

"The difficulty is the move to renewable energy. In New Zealand, a lot of our electricity is based on renewable energy, traditionally hydro and increasingly wind.

"However, we don't want to shift the factories to where the renewable energy is. We must survive on whatever renewable energy we have. Progress will come from both plant innovation and selection of energy sources."

The development of eco-friendly production will be an extension of process-driven improvements elsewhere in the industry, according to Mr Baldwin.

"Buildings have been designed for ease of cleaning, the scale of operation has been greatly increased and all processes have been highly automated.

"Measurement of actual performance and optimisation of equipment have been keys to improving processes. A degree of supervision is still required by laboratory tests, particularly in the control of the characteristics of consumer milk powders," he said.

### Dairy must face-up to climate change

Dr Peter de Jong, of NIZO Food Research in The Netherlands, agreed that the industry was facing a growing attention to climate change.

"Recent studies show that dairy products account for 5% of global warming potential," Dr de Jong said.

"We need to examine how dairy products can be manufactured in a future world without oil. Sustainable food production and process technology must join forces to develop and implement breakthrough technologies at the same time as having a 20-50% reduction in cost."

Low-cost, sustainable food production could only be achieved by developing technologies such as self-cleaning equipment, optimised

*Selected papers from this symposium will be published as a special issue of Dairy Science and Technology. For more information about the symposium, contact Martin Palmer on (03) 9974 8700.*

## The many faces of the Symposium



*Dr Peter de Jong*

falling-film evaporator and dryer operation by model-based control, and optimisation of pre-treatment processing steps to lower bacterial load, Dr de Jong said.

The pre-treatment of raw materials could play an important role in saving energy, but preheating milk to a high temperature could also have negative effects, such as reduced powder solubility and sedimentation on recombining.

“For milk powders, the challenge is to find an optimal heat treatment of liquid milk before evaporation that will give the opportunity to increase the inlet air temperature of the spray dryer without negative effects on powder functionality,” Dr de Jong said.

Energy costs could be further reduced by increasing the solids content of the concentrate leaving the evaporator.

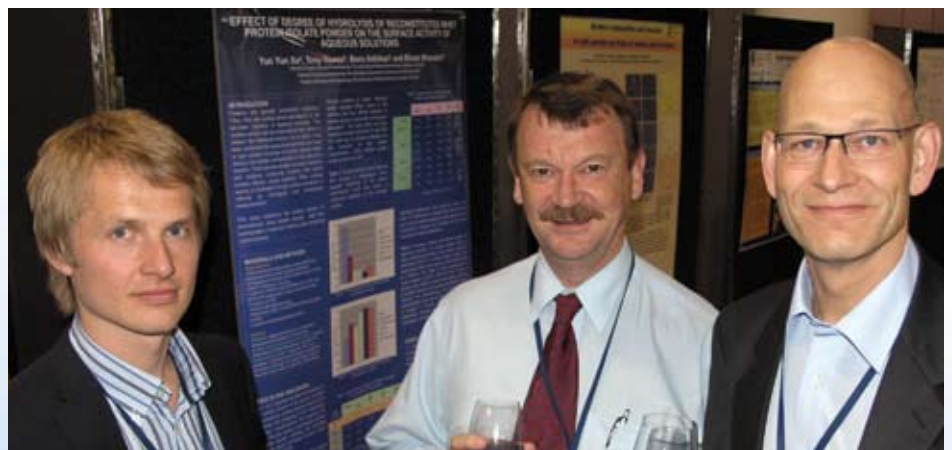
“Several opportunities exist to lower viscosity of the concentrate – reducing the degree of denatured whey proteins, homogenising the concentrate, improving the liquid distribution at the top of the evaporator tubes, better liquid coverage of the evaporator tubes and reducing the intensity of bubble formation inside the tubes.”



*Martijn Fox, Maykel Verschueren and Wei Zhang*



*Su Ann, Mithila Jayasundera, Yun Yun Xu and Kim Fyfe*



*Thorvald Ullum, Wayne Whiting and Johnny Bonke*

## Changes to the Board

***Dairy Innovation Australia is saying goodbye to several long-standing Board members.***

***Paul Ford, chief executive of the Geoffrey Gardiner Foundation, is stepping down having fulfilled his role on the Board. The Foundation helped fund the start-up phase of Dairy Innovation, which is now complete. The Foundation will continue to support Dairy Innovation by contributing to individual projects.***

***Tony McKenna left Dairy Innovation's Board after stepping down as Tatura's general manager technical and nutritionals. He has moved to New Zealand to take up a senior management position with Synlait. Tatura, and its parent company Bega Cheese, are about to announce their new Board appointment.***

***The third director to leave the Board recently was Jo Davey. Her role on the Board was to represent portfolio members, companies that did not have a full membership with Dairy Innovation. These included Burra Foods, National Foods, Parmalat and, recently, Challenge Dairy. The companies will announce their Board representative in the next few weeks.***

***The current Board members are:***

- ***Peter Boyden, independent chair***
- ***Isabel MacNeill, group manager, Dairy Australia***
- ***Peter Hobman, general manager, MG Nutritionals***
- ***Richard Wallace, general manager operations, Warrnambool Cheese and Butter***

***The new members of the Dairy Innovation Australia Board will be announced in the next issue of Dairy Planet.***

## Spore-forming bacteria in food

Spore-forming bacteria are widely recognised as a potential problem in the food industry. Food poisoning may occur when spore levels are high enough or when bacterial strains are pathogenic. For dairy products, the presence of bacterial spores normally doesn't cause a food safety concern but can result in economic losses due to product downgrades or spoilage.

The latest research on bacterial spore-formers in food was presented at a three-day international conference in June in Quimper, a small town in Brittany, in the north-west of France.

The conference was attended by 130 delegates from 27 countries, with about one third of the delegates coming from the food industry sector. Dairy Innovation Australia was represented by Christopher Pillidge, senior research scientist from the Cultures Division.

There were 14 keynote speakers and nine conference sessions, with speakers coming from INRA, Unilever, NIZO and various universities. About 30 detailed scientific posters were also presented.

While it offered no 'magic bullet' solution, the conference highlighted the latest scientific developments



*Spores in various stages of development within Bacillus cells.*

in understanding spore diversity, modelling spore growth and survival during heating, spore physiology and methods for the detection of spore formers in foods.

In Australia, spore numbers are routinely monitored to ensure they are below conservative thresholds. Even so, there is a need to better understand spore formers in dairy foods, and Dairy Innovation is continuing dialogue with its members in this area.

*For more information, contact Christopher Pillidge on (03) 9974 8902*

## Two ARC Linkage grants awarded

Dairy Innovation Australia has been awarded two new Australian Research Council Linkage Grants for collaborative dairy research projects.

Linkage Grants support collaborative research and development projects between industry and higher education organisations to enable the application of advanced knowledge to industrial problems.

The first project, with the University of Melbourne, will examine ultrasonics

as a new platform technology in dairy processing. It was awarded \$365,000 over three years and will be led by Associate Professor Muthupandian Ashokkumar.

The second project, with Victoria University, focuses on innovative zero-energy membrane technologies to reduce water consumption in the dairy industry. It was awarded \$78,000 over three years and will be led by Associate Professor Mikel Duke.



## Hands-on work for tangible benefits

Peter Hobman has seen real benefits flow from his company's involvement with Dairy Innovation Australia and his role on the organisation's Board.

Mr Hobman is general manager of MG Nutritionals, a division of Murray Goulburn, Australia's largest dairy co-operative and a full member of Dairy Innovation.

"We participate in almost all of Dairy Innovation's portfolios, programs and projects. Our investment is significant, and we're definitely seeing results," Mr Hobman said.

These results include fully commercialising the outcomes of several major research projects.

"Dairy Innovation provides research that underpins our company's development activities. We have in-house capability, but we need leading-edge research to help us clear roadblocks and identify new opportunities."

As a member of Dairy Innovation's Board, Mr Hobman helps set the organisation's strategic direction. He is uniquely qualified for the task, with more than three decades of experience in dairy, food and nutritional science, R&D and business management.



*Peter Hobman, general manager of MG Nutritionals and a member of Dairy Innovation Australia's Board.*

*"The Australian dairy industry needs to build advanced capability in dairy science and technology, and Dairy Innovation Australia is the right structure to provide that."*

"I'd like to think I bring a balanced perspective to the Board," Mr Hobman said.

"It's a mix of in-depth scientific and technical understanding of food science and technology and, even more importantly, many years of experience running business units."

Mr Hobman was instrumental in bringing together the five research centres that formed Dairy Innovation, and he has worked hard to help the organisation become better integrated with the industry.

"Dairy Innovation now offers a comprehensive portfolio of projects addressing the specific needs and interests of the Australian dairy industry," Mr Hobman said.

"Its research directions have been targeted to address the needs of the industry, and its communication with industry has improved enormously.

"To progress, the Australian dairy industry needs to build advanced capability in dairy science and technology, and Dairy Innovation is absolutely the right structure to provide that.

"The open innovation model currently used by Dairy Innovation has many benefits, but there's also the potential to build internal capability in critical areas required by the industry. I see that kind of expertise developing in the future."

## DAIRY INDUSTRY CALENDAR

### September 7-10, 2009

Fine Food Australia  
Sydney, NSW

### September 20-24, 2009

IDF World Dairy Summit  
Berlin, Germany

### September 29-October 3, 2009

World Dairy Expo  
Madison, US

### September 30-October 2, 2009

NIZO Dairy Ingredients Conference  
Papendal, The Netherlands

### October 4-9, 2009

19th International Congress on Nutrition  
Bangkok, Thailand

### October 10-14, 2009

Anuga Fine Food and Dairy  
Köln, Germany

### May 17-21, 2010

IDF/ISO Analytical Week  
Montreal, Canada

### June 7-9, 2010

IDF Symposium on Science and  
Technology of Fermented Milk  
Tromsø, Norway

### June 9-11, 2010

IDF Symposium on Microstructure  
of Dairy Products  
Tromsø, Norway

### June 28-July 1, 2010

11th International Symposium on the  
Genetics of Industrial Microorganisms  
Melbourne, Vic



**DEAKIN**  
UNIVERSITY AUSTRALIA

## DIET AND *health* STUDY

Nutritionists at Deakin University are seeking male volunteers (40 – 60 years) to participate in a study investigating the impact of food consumption on heart health.

**For information email**  
**maxine.bonham@deakin.edu.au**  
**or amyl@deakin.edu.au**  
**or call 03 9251 7256.**

**deakin.edu.au**

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#### OUR MEMBERS:

