University Of Sydney

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Dairy Research Foundation

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Special points of interest:

- Full report on the 2009 DRF Symposium
- Update on FutureDairy 2
- University to revitalise brand
- Dairy Science Group becomes base for occupational trainees from worlwide

Inside this issue:

Foreword

Welcome to our latest edition of the DRF Newsletter!

As usual, in this issue you will find information updates on the Foundation activities and the research and teaching activities of the dairy science group at Camden.

We had a very successful Annual Symposium last month with over 160 people attending each day to listen to a total of 12 overseas and local speakers, plus our traditional young scientist competition. The success of this event was the result of a terrific team work and I would like to extend my thanks to Dr Pietro Celi, Sherry Catt and Michelle Heward and the whole dairy science group for their excellent work.

Our research through the FutureDairy 2 project continues to deliver in the areas of precision farming and feedbase. Take a few moments and read inside about topics such as the performance of our automatic milking farm; cows' forage preferences; the interaction between nitrogen and water in forage crops; and how our intensified systems can help reduce carbon emission per litre of milk!

Assoc. Prof. Yani Garcia
Director

YG

From the President

Recently I was invited to attend a function at the Universities Great Hall. The function was held to celebrate the contribution of the Foundations to the University. Both the Chancellor Professor Marie Bashir and the Vice Chancellor Dr Michael Spence addressed the gathering and special mention of the DRF was made as one of the first Foundations formed.

Mr Bill Inglis, President

It is extremely pleasing to have this recognition and also the assistance of the University in overseeing our meeting procedures and the Management of our finances.

I would also like to take this opportunity to thank Professor Leo Jeffcott. Leo steps down from his role as the Dean of The Faculty of Veterinary Science soon and I wish him well for the future. The close Relationship between the Dean, the Faculty and the DRF over the last couple of years has been especially pleasing and Leo has been central to that.

BI

2009 Dairy Research Foundation Symposium Report

For a full report on the symposium go to:
www.vetsci.usyd.edu.au/foundations/drf/DRFNewsletterOctober2009.pdf

The Dairy Research Foundation held a very successful Symposium at the new Liz Kerkohan Conference Centre on 16th and 17th September.

The theme this year was Feeding for the Future, and the symposium was officially opened by Prof. Leo Jeffcott after welcome words by the President of the DRF, Mr Bill Inglis.

The Symposium was attended by a record audience of over 160 people each day, the majority of them dairy farmers and service providers. A highlight was the number of young farmers and advisors who came from as far as South Australia, Victoria, Tasmania South East Queensland and even Far North Queensland!

Dr Roy Kellaway, former Director of the DRF, received the 2009 Dairy Science Award at the Gala Dinner, which was attended by 171 people! The award was sponsored by Milk Marketing NSW.

A key for the success of this Symposium was the excellent presentations by a range of high quality speakers including researchers, consultants and farmers.

Eight postgraduate students and young scientists, impressed the audience with their research and presentation skills.

The winners of the Dairy Australia prize were Sebastian Bowman and FutureDairy PhD student Ravneet Kaur.

The Annual Symposium is the main fundraising activity of the DRF and a successful event like this one means that we will be able to continue supporting dairy science research and students at Camden. The event was sponsored by 20 organisations and companies. We have already received a lot of positive feedback from many people attending the Symposium and hopefully we will receive more comments as people 'ruminate' many of the concepts and ideas exposed during the presentations and discussion.

The Symposium concluded with a visit to the huge dairy operation Leppington Pastoral Co at Bringelly, kindly hosted by owner Mr Michael Perich and his family.

The Dairy Research Foundation Newsletter is published in February, June and October

Dr Fernando Bargo of Elanco, South America addressing the audience in the new Liz Kernohan Conference Centre (left)

2009 Dairy Science Award is presented to Dr Roy Kellaway at the Symposium Dinner (left)

Micahel Perich of Leppington Pastoral Company during farm visit on Day 2 and photos of their operations (below)

Dr Pietro Celi, of the Symposium organising committee

Farmer Mark Billing during question time on Day 2

FutureDairy 2 update

Precision Farming

FutureDairy2 has successfully completed its first year in June. Research continues as planned with the new concept robotic system being tested at Industry & Investments NSW, EMAI. The new concept has been designed to cater for large herds as those typical of Australian dairying. The automatic milking system farm remains closed to visitors while the system is being tested.

AMS Progress

Two seasons of stable performance data have now been generated on the AMS research farm proving that high levels of pasture utilisation can be achieved despite the fact that cows are never locked in a paddock.

The AMS is designed so that cows can freely choose when to leave a depleted paddock to traffic around the system in search of more feed. Over the 2 years of data collated the herd size was increased to result in a higher utilisation of the automated milk harvesting equipment.

As a result a slight reduction in production per cows was seen (350 litres, 14 kg milksolids/cow) but a dramatic improvement in the milk harvested per AMS was achieved.

Farm system performance of AMS research farm two seasons

	2007/08 Performance	2008/09 Performance
Average cows in milk	124	143
Total Litres/cow	7,836	7,486
Total Kg MS/cow	553	539
Total Kg MS/ha	1,559 (a)	1,482 (b)
Total Litres/AMS	485,880	535,245
Total Kg MS/AMS	34,303	38,538
Pasture Utilisation (total farm) kg DM/ha/year	12,788	12,600
Pasture Utilisation (irrigated area only) kg DM/ha/year	14,937	15,647
Concentrate consumed (tonne/cow/year)	1.182	1.213

Over the two years the systems research has proven that even with low levels of concentrate, high levels of production and pasture utilisation are achievable.

The results generated from this research have undoubtedly had some contribution to the acceptance of feasibility of AMS in pasture-based systems that has now resulted in 9 commercial farms making the commitment (over the past 12 months) to adopting AMS into their operations.

New concept research

The cost of the infrastructure and the modular nature of the AMS technology has led to the development of a new concept AMS which will be targeted at larger farms.

The new Concept AMS has been developed in Sweden by DeLaval and is being tested in Australia at the AMS research farm.

FutureDairy 2 update

Precision Farming (cont')

It is anticipated that the new concept will be more suited to larger herds with an ability to milk in the order of 240 cows per AMS unit (rather than the 60-80 cows capacity of the current AMS technology) at a cost that is much more comparable with conventional milk harvesting equipment.

At this stage testing and development will continue through into early-mid 2010 before information will be released regarding the function, capability and potential of the new concept. For more information contact Dr Kendra Kerrisk, FutureDairy (kendrad@usyd.edu.au).

Dr Kendra Kerrisk

Aussie update on AMS

Over the past year, the Australian dairy industry has seen a marked increase in interest in robotic or automatic milking systems (AMS).

Dr Kendra Kerrisk who leads FutureDairy's AMS research at Camden, NSW said that people are still showing interest despite the current difficult financial times.

"Like any new dairy, AMS is a major investment so dairyfarmers plan well ahead. Some of the current interest in AMS may be from farmers looking several years ahead," she said.

Dr Kerrisk said there are currently eight Australian farms and two New Zealand farms with AMS up and running.

Another two Australian dairy farms have either signed up for AMS or are in the installation phase. Commercial farms now spread from Victoria, Queensland, South Australia and Tasmania.

"By the end of the year there will be at least 46 machines operating across Australasia. Most Australian AMS farms have two to four robotic units."

Two companies currently sell automatic milking machines in Australia – DeLaval and Lely.

AMS has been used commercially in overseas countries for many years. About 15,000 robots are in operation worldwide, installed on 10,000 farms in around 32 countries. These farms are predominantly indoor systems with cows housed for all or most of the year.

"While the automatic units are well proven, a challenge for Australian pasture-based farms has been to implement a farming system that maintains pasture utilisation. Our research at Camden has demonstrated that this is indeed achievable under commercial conditions"

FutureDairy is producing management guidelines for automatic milking systems which will be published in the coming months.

FutureDairy has an online discussion group for dairy farmers with a keen interest in automatic milking. To subscribe go to http://groups.google.com.au/group/futuredairy.

For more information contact Dr Kendra Kerrisk, FutureDairy kendrad@usyd.edu.au.

Change is coming to the University of Sydney

In 2010, you will see an exciting change to how the University of Sydney presents and promotes itself.

We are revitalising the University's brand to create a distinct, defined and cohesive message that will help separate us from other institutions. Building on the belief that ideas make a difference, we will focus on the quality of our people and the impact they make on the community and the world.

The change starts in January.

FutureDairy Google Group

People interested in joining the AMS discussion group should send a request for registration to the by email to Darold Klindworth at or Kendra Kerrisk at the following email addresses.

darold.klindworth@dpi.vic.gov.au

kendrad@usyd.edu.au

FutureDairy 2 update

Feedbase

The Feedbase area of FutureDairy 2 continues making progress with several component research trials completed at Mayfarm and the whole system at Corstorphine achieving nearly 30,000 L milk/ha from home grown feed.

Mayfarm component research

We have just completed the first cycle of Nitrogen (N) use efficiency in a triple-crop complementary forage rotation (CFR). Preliminary results of maize yield have been presented in previous issues of this newsletter.

The main objective of this trial was to investigate how much N is needed to maximize yield and nutritive value of maize grown for silage and when this N needs to be applied to maximize yield and whole plant nutritive value. The second aim was to quantify the residual effect of N on the production of forage rape with (230 kg/ha) or without N. After the forage rape, all plots were sown with field peas to complete the annual cycle.

For maize, the study evaluated 2 rates (0 v. 135 kg/ha) of pre-sowing nitrogen (PSN), 2 sowing dates (mid October or early November) and 3 rates (0, 79 and 150 kg/ha) of post-sowing N applied at six leaf stage (V6N). The experiment was replicated 4 times.

Application of both PSN and V6N increased total biomass yield, metabolisable energy (ME) yield, nitrogen use efficiency, irrigation and total water use efficiency, and crude protein yield of maize. However, N did not affect the nutritive value of the whole plant, or proportion of plant fractions. Late sown maize had more tillers and yielded more total biomass than early sown maize, which was mainly due to the increased stover yield rather than grain yield in the former. A total of 288 kg N/ha (both PSN and V6N) was required to achieve maximum biomass yield (32. 6 t DM/ha). In summary both PSN and V6N are necessary to achieve maximum maize biomass and ME yield, but in a situation where a single application can be applied, application at V6 rather than pre-sowing would be more beneficial.

Forage rape yields ranged from 4.8 t DM/ha without N fertilizer to ~13 t DM/ha with 230 kg N/ha in 3 harvests. Residual effect of N from previous maize crop was minimal on the production of forage rape. In total, 0.6-0.7 t additional forage rape DM produced from the residual N of maize.

Field peas were drilled immediately after the last harvest of forage rape in late July and harvested in early October with yields ranging from 3 to almost 6 t DM/ha. Overall total forage yield of the 3 crops ranged from 31.6 t DM/ha (22, 4.8 and 4.8 for maize, forage rape and field peas, respectively) for the control with 0 N to over 50 t DM/ha (32.5, 12.8 and 4.5 t DM/ha for the same crops, respectively) when 523 kg N/ha were applied. That means a total response to N of 36 kg DM/kg N applied!

It should be noted that the site had been used previously for an intensive study in which large quantities of N had been applied, thus the relatively high performance of the control plots.

This research is led by Dr Rafiq Islam.

We welcome your feedback before the next Newsletter which is due to be distributed in February 2010

Dr Rafiq Islam

Investors in FutureDairy 2

FutureDairy 2 update

Feedbase (cont')

On-farm activities

FutureDairy has just initiated another project in conjunction with I&I NSW extension staff. The "Hunter" project involves the participation of 6 farmers from the lower and upper Hunter Valley who will be using basic principles developed by FutureDairy to increase milk production from home grown feed. The project involves an intensive physical and economic monitoring of the farms.

This project is about farmers working together with the researchers at FutureDairy and the local DPI dairy extension officers to achieve increased productivity and profitability through implementation of the Complementary Forage Rotations/Systems (CFR/CFS) principles.

Complementary Forage Rotations/Systems are highly intensive and productive forage systems which have been shown to be economically viable; soil/environment friendly;

and very efficient in the use of nutrients.

The CFS are alternatives for farmers who have achieved relatively high levels of pasture utilisation and are constrained (to grow further) due to limited availability of land and/or water.

Hunter Valley Farmer George Allen with Yani Garcia and David Deane

Working with commercial farms will allow the FutureDairy2 project to:

- Provide commercial application proof
- Allow factors of success (management) to be identified
- Provide case studies to evaluate risk (physical risks, scale of the system, economic including capital costs) of CFR/CFS.
- Provide a clear linkage with Extension networks and the national Feedbase Integration project.

Farmer David Williams with Yani Garcia and David Deane

The farmers already working with us are George Allen, Ross McDarmont, Rodney Richardson, Ian Simpson, and David Williams. More details on this project will be featured in the February issue of this newsletter.

Field research: Mayfarm

Cows have a sweet tooth

FutureDairy research has shown that dairy cows prefer forages that are sweet.

Dairy cows' preferences for a range of grasses, legumes and herbs were investigated through a series of trials, each conducted over two years at the University of Sydney's Camden research farm.

FutureDairy researcher Ajantha Horadogoda conducted the trials, ensuring all species were grown at the same site, under the same climatic conditions and with soil moisture and nutrient availability being non-limiting to plant growth.

FutureDairy project leader Associate Professor Yani Garcia said the 'sweeter' forages contained higher levels of water soluble carbohydrates, while the less palatable forages were higher in nitrate which is associated with a bitter flavour.

The first trial included eight grasses, four legumes and two herbs which were grazed year round for two years.

The most preferred species over the whole year was prarie grass,

followed by kikuyu, and then white clover despite the fact that the kikuyu was not available during the winter (see graph below).

"Cows' preferences varied with time of the year in line with changes in the growth pattern of different species.

For example, Kikuyu and phalaris were preferred in summer while prairie grass was preferred above all other species during the winter months," said Assoc Professor Garcia.

Unexpectedly, perennial ryegrass had a moderate preference even when it was in its vegetative growth state, from autumn to spring.

Dr Ajantha Horadogoda

FutureDairy 2 update

Feedbase (cont')

Field research- Corstorphine

Less carbon emission from intense dairy systems

FutureDairy studies are challenging the common believe that intensifying a dairy system leads to more greenhouse gas emissions. Researchers Santiago Farina* and Yani Garcia* explain why focusing on improving productivity is an effective strategy to manage carbon emissions per unit of milk product.

Australian dairyfarmers are understandably concerned about the expected inclusion of agriculture in the Carbon Pollution Reduction Scheme (CRPS) from 2015, and the likely impact on their farming systems and business viability.

The fact is that world demand for food will continue to increase as the total population increases, so a key issue will be to manage the amount of greenhouse gas emitted per unit of food (eg milk) produced.

The total production of greenhouse gas (GHG) will normally increase with the intensification of a system. However, if farm productivity (output per unit of input) improves with intensification, there could be a reduction in greenhouse gas emission per litre of milk.

We analysed data from two years of FutureDairy's whole-farm studies to calculate the potential greenhouse emissions from three different intensification strategies:

1. Increasing stocking rate
2. increasing milk production per cow
3. using a complementary forage system (CFS).

To do this analysis we used the model developed by K. Christie, R. Ranwsley and D. Donaghy in Tasmania.

The CFS is an intensive crop rotation system that involves growing pasture on 65% of the farm area, with the remaining 35% being used to grow three crops per year on all of the area – a legume, a high yielding crop such as maize and a brassica (forage rape).

Compared with an 'industry average' farm, each of the more intensified systems produced less greenhouse gas per unit of milk solids (see table). The 'industry average' farm produced about 14 tonnes of carbon dioxide per tonne of milk solids, compared with around 10 for each of the intensified systems – that's about 30% less.

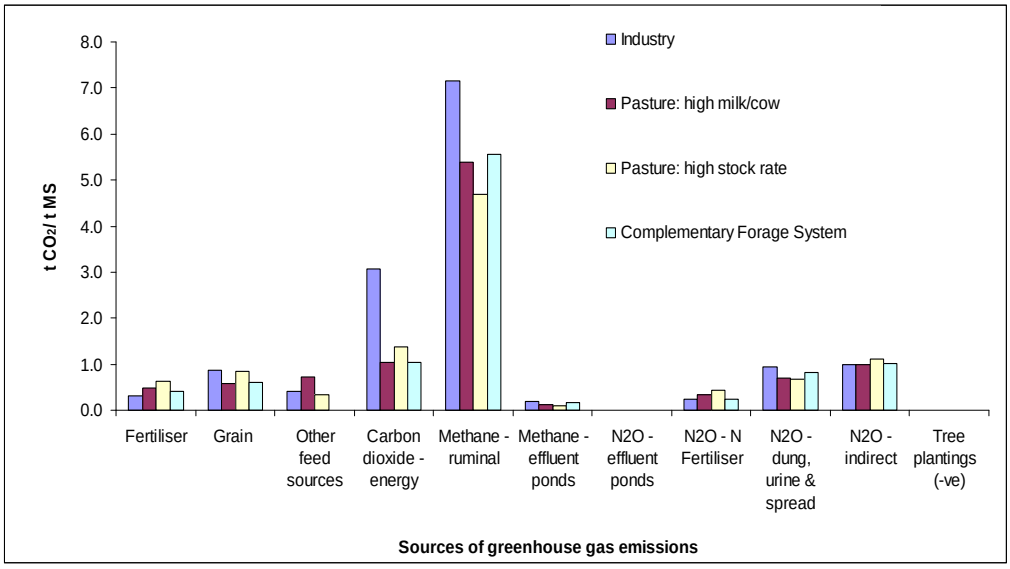
There are three reasons for the reduction in carbon emission per unit of milk produced.

First, in the intensified systems, cows were fed to produce more milk, therefore 'diluting' the cost of methane production at maintenance. Methane production from the rumen fermentation process is by far the largest contributor of greenhouse gas from any dairy system (see graph 1).

Second, the improved quality (digestibility) of the diet of the more intense systems helped reduce methane production. This is because high digestibility diets shift the balance of rumen fermentation towards propionic acid (and relatively less acetate). More propionic acid means more glucose in the liver, more milk in the mammary gland and less methane into the environment.

Third, as farm milk production increases, the amount of carbon dioxide from dairy electricity and fuel use was diluted into a higher volume of milk in the intensified farms.

The complementary forage rotation system had the highest proportion of milk coming from home-grown feed and the lowest greenhouse gas emission per unit of milk produced (see Table 1).



Graph 1: Sources of greenhouse gas for the different dairy farm systems evaluated.

FutureDairy 2 update
Feedbase (cont')

Field research- Corstorphine

Less carbon emission from intense dairy systems (cont)

To simplify our calculations, the greenhouse gas emissions were calculated for the milking area and milking herd only. Carbon emission (per unit of milk produced) increases when dry cows and replacement stock are included. Young and dry stock don't produce milk but still produce methane (up to 60% of the methane produced by a milking cow).

This means that delaying the time to first mating beyond the ideal of 15 months will increase a farm's carbon emission per unit of milk produced.

Improving feeding management of heifers and the overall reproductive performance of the herd, will reduce the system's carbon emissions.

Under Australia's pasture-based dairy system, focussing on improving productivity will be an effective strategy to manage greenhouse gas emissions per litre of milk.

For further information on the above please contact Santiago Farina (sfarina@camden.usyd.edu.au) or Yani Garcia (s.garcia@usyd.edu.au).

	Industry average farm	Pasture High milk/cow	Pasture High stocking rate	Complementary Forage System
Stocking rate (cows/ha)	1.77	2.5	3.8	3.7
Milk/cow (L/305-day lactation)	5115	7,759	6,895	7,738
Milk/ha (L/ha/year)	9,053	22,975	31,143	34,499
Grain (t/lactation)	1.2	2.0	1.1	1.0
Home grown feed (% of diet)	62%	60%	50%	82%
Greenhouse gas emitted per unit of food produced (t CO2/t milk solids)	**14.2**	**10.0**	**10.6**	**9.9**

Table 1. Greenhouse gas emission (expressed as tonnes of carbon dioxide equivalent) for dairy farm systems with different levels of intensification[t]

FutureDairy 2 update

Feedbase (cont')

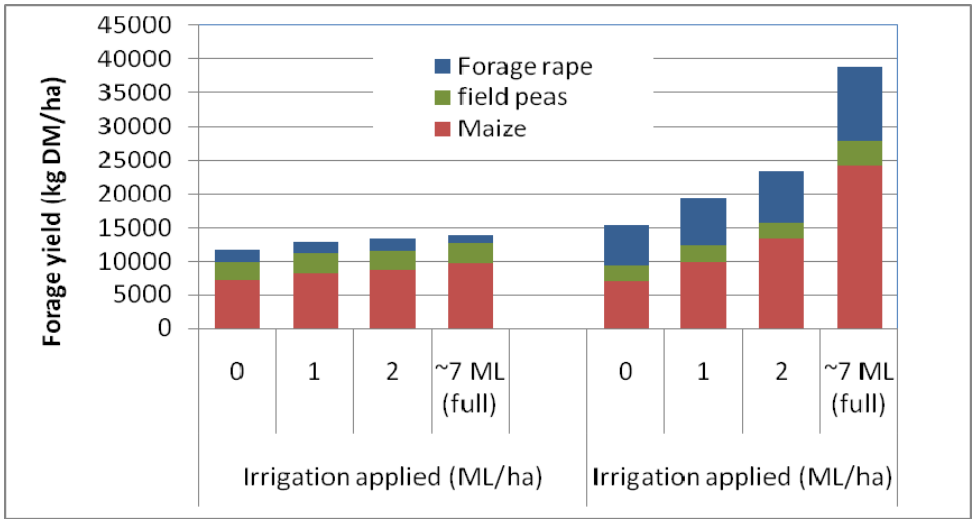
Modelling update

FutureDairy 2 is investigating the use of limited irrigation water on the productivity efficiency of a triple crop Complementary Forage Rotation (CFR) comprising maize, forage rape and field peas.

Research Fellow Dr Rafiq Islam has conducted a comprehensive modelling exercise using the APSIM model. Tested treatments included: 2 pre-sown nitrogen (N; 0, 135 kg N/ha), 3 post-sowing N (0, 79, 158 kg N/ha), 2 N rate for forage rape (0, 230 kg N/ha) and 4 water levels. Irrigation water treatments ranged from 0 to all crops, 1 or 2 ML/ha only for the maize crop only; or full irrigation for all 3 crops). These treatments were selected in an attempt to address the question: "what can I do if I only have 1 or 2 ML of water due to allocation restrictions?"

The graph shows the impact of N and water altogether. Key points to highlight are:

- Full irrigation (~7 ML/ha) and over 500 kg N/ha are needed to produce 40 t DM/ha. This is very consistent with all our previous Forage trials at EMAI.
- Using lots of water without applying N is a waste of water! Nitrogen is required to maximise the efficiency of use of water.
- If water availability is limited (1 or 2 ML/ha), there is little gain in using it to grow maize. On average, this will increase maize production from ~7 to only ~10 t DM/ha. The crop will still be one of low grain and quality even if high rates of N were used. Farmers should consider saving the water to supplement the autumn-winter crops or concentrate more water into a smaller area.



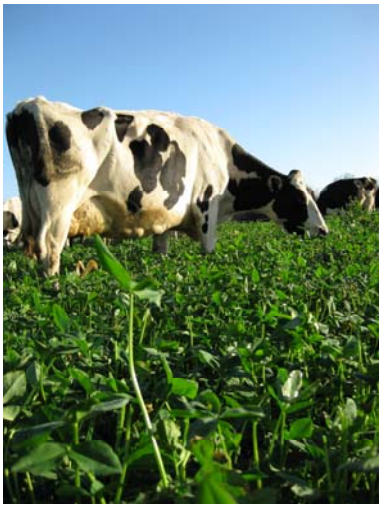


Figure 1 The interaction between Nitrogen (N) and Irrigation water (W) using the simulation model APSIM. The efficiency of use of limited resources like N or W is maximised when no other limitations are present.

Summer School in Dairy Science

Dairy science is a multidisciplinary area of scientific investigation and PhD students aiming to do research in the field of animal and veterinary sciences must be aware of this. When we glance over the index of the Journal of Dairy Science, the top-ranked journal in the Dairy and Animal Science category, it is easy to realise that articles are grouped into the following categories: Dairy Foods, Physiology and Management, Nutrition, Feeding and Calves, Genetics and Breeding, Our Industry Today. In other words, dairy science is a very complex but integrated area of scientific investigation, which PhD students aiming to do research in the field of animal and/or veterinary sciences cannot ignore.

PhD students often have vast spectra of research interests, and it is quite challenging to satisfy the expectation of all of them. The professional expectations of the dairy industry require advanced skills from those who will work in it both now and in the foreseeable future.

Summer School in Dairy Science (cont')

Also it is important that veterinarian and animal scientist acquire the required competencies to work across several disciplines in order to offer the dairy industry leadership and guidance in meeting its goals.

Thanks to the 2009 International Program Development Fund (University of Sydney) I have had the possibility to organise a PhD Summer School in Dairy Science in collaboration with Prof Gianfranco Gabai (University of Padua, Italy). Three University of Sydney PhD Students (Shelley Underwood, Santiago Farina and Sebastian Bowman) attended a 2 week residential in Padua.

The students had a great time and of course learnt a lot in Italy!

Shelley, Sebastian and Santiago joined a group of about 40 PhD students enrolled in the PhD School in Veterinary Science and Animal Science (University of Padua).

The participants were exposed to leaders in the field of dairy science. Additionally they had the opportunity to interact with each other. This was achieved not only during the several activities of the Summer School but also during the coffee and meals breaks. Evening meals were also organised on 3-4 occasions to provide additional socialization and interaction opportunities. We intended to provide PhD students and top dairy scientists opportunities to create friendships and networks of colleagues to the benefit of the profession and the industry. Therefore we designed a program that encompassed seminars, workshops, laboratory practical sessions, and farm visits. The modules were presented by experts in the field and covered the following topics: dairy production systems in Italy, Argentina and Australia; stem cells in animal science and veterinary medicine; milk quality; alternative use of milk and milk by-products; fertility and sources of reproductive wastage in dairy cows; health management of the dairy herd; new approach to the evaluation of feed and diets of dairy cows; ecology of farming systems.

The outcomes of the PhD Summer School in Dairy Science are diverse and far-reaching. An important outcome is the formation of an international network of dairy scientists and PhD students. Close contact between participants and scientists is developing. Two PhD students from the University of Padova have attended the annual Dairy Research Foundation Symposium (16-17th September 2009). The two students presented a paper during the Young Scientist sessions and they also had the possibility to visit the state of the art labs and dairy farm that we have in place at the University of Sydney. The exchange of PhD students between the University of Sydney and the University of Padova is continuing and we are currently exploring the possibility of setting up a PhD in Cotutelle programme. We hope that the increased internationalization of postgraduate programs like the Summer School in Dairy Science would promote the submission of international grant applications, facilitate the recruitment of new staff and would provide the dairy industry with true international leaders.

Shelley, Santiago and Sebastian in Italy

Pietro Celi

Senior Lecturer in Ruminant Production and Health

Cheese making prac at University of Padua

Visitors to the Dairy Science Group

At the moment we have a number of international students at the MC Franklin Lab doing traineeships as part of their degrees.

They have all fitted in with the staff and students at the lab remarkably well and claim to be enjoying heir taste of the Australian lifestyle!

On the following page the students have each has given us a bit of an insight into their lives at home and goals, as well as what they are researching here at the University of Sydney!

Visitors to the Dairy Science Group (cont')

Arne van Schot

I am a fourth-year student from the University of 'van Hall Larenstein' in Leeuwarden, Netherlands, a branch of the Wageningen University. I am attached to the Applied Science Department and my specialty is dairy cattle husbandry. I am completing my undergraduate degree basing my research on dairy farming.

As part of the course I am completing a 20-week traineeship at the University of Sydney.

I am studying the differences between spring and autumn calved cows of the FutureDairy's Complementary Forage Rotation (CFR) project. I've just commenced my research and the evident problem is that the average milk production during the summer drops by 4 litre.

My parents have a dairy farm at Oude Pekela in the north of the Netherlands. At present they have 200 dairy cows, 90 heifers and 90 calves and are planning to expand the farm to milk 300 cows in 2011.

When I am at home I help my parents with the daily farm work. I am responsible for the breeding of the herd and take part in the daily decision making on the dairy.

After finishing university I plan to become a dairy farmer on my parents property.

Jacoline Hamming

I am a fourth-year student of applied science and my specialty is animal healthcare. My University is "van Hall Larenstein" in Leeuwarden in the Netherlands. It is a part of the Wageningen University. My undergraduate (bachelor) degree is based on farm animal production, mainly dairy cattle. The fourth year of my study consists of a 20-weeks of traineeship and another 20-weeks of thesis preparation. I am doing my traineeship at the University of Sydney with the FutureDairy project. My research is an observation study (cow behaviour) into the new concept AMS ((DeLaval) to improve the voluntary cow traffic.

Up till my twelfth year my parents had a farm, with 75 dairy cows.

Unfortunately my father wanted to change jobs, and I still regret that decision. At this moment I still live with my parents, we live in a small farm with hobby horses. I ride my own horse professionally and I get lot of pleasure from doing this. Fortunately my uncle also has a dairy farm and I often help him. He milks 70 cows, he uses a milk robot (VMS 2007, DeLaval) on his farm. I enjoy working in his farm. I enjoy also studying animal behaviour, nutrition, welfare and also the fertility and breeding of dairy cows.

I hope to learn and see a lot in Australia, so far my time here in Australia is great!

Visiting students Jacoline, Arne, Marceline and Fabian (L-R) enjoying work and a bit of the Aussie lifestyle!

Fabian Pyra

I was raised on a crop farm in France's Champagne country where we grow crops, such as asparagus, wheat and barley.

I am in my second year at ISAB (institut supérieur d'agriculture de Beauvais), a university specializing in Agriculture in a 5 year course leading to a Masters Degree in Engineering.

In France, I'm a student so I don`t work on a research project yet but have completed many on-farm training periods working with both dairy cows and crops. At the MC Franklin lab, I have completed a project to compare Pasture Measurement between Sonic Meter and Plate and I'm now working on a Project about Peas (nodulation). Soon I will begin to work on a modelling project with APSIM.

Marceline Peglion

I am from France where I'm studying agronomy at Montpellier Supagro.

Next year is my last year, in order to obtain a masters degree, but this year, I have taken a year off to complete several internships all over the world.

After three months spent in Cameroon, I've arrived at the MC Franklin Lab two weeks ago and I'm here for a five month internship.

I grew up on a dairy farm and I would like to specialize in breeding.

I'm working with Kendra on the AMS, observing cow's behavior, and also with Rafiq Islam and Fabian Pyra on the forage plots.

Postgraduate Student updates

Santiago Farina

I am currently working on the analysis of the results of a whole farm study aimed at maximizing milk production from home grown forage.

This 2-year study was carried out at the Sydney University Corstorphine farm and finalized on April 2009. It was set to evaluate the on-farm implementation of an innovative system known as the Complementary Forage System (CFS). This system involves sowing a portion of an intensively managed pasture based farm to a forage crop rotation (35% of the area in this case) in order to boost the production of home grown quality forage.

PhD student Santiago Farina

We obtained and analysed detailed daily data of forage utilization and quality of each individual paddock, and animal responses for each individual cow throughout the 2 years.

In a nutshell, the CFS achieved over 25 t DM/ha.year of home grown feed over the whole farm, which allowed a production of 28 t/ha of milk from home grown forage. This was achieved feeding cows only 1 t DM concentrates/lactation, and reaching a yield of 7,740 L/cow (in 305 days).

The forages grown on the forage crop rotation area yielded an average of 33 t DM/ha.year and played a key role providing feed during the autumn-winter period, both as grazeable crops and maize silage. However, the factor that explained the major part of changes in milk production/day (45%) was the amount of ryegrass on the diet.

This results are very encouraging, considering there is no evidence of such high levels of milk from home grown feed in pasture based studies around the world, and we hope it will be an option for diary farmers in the future.

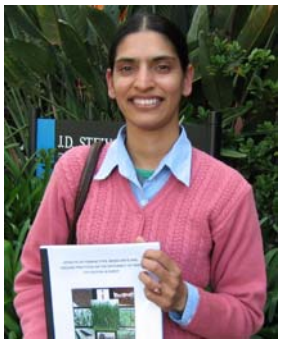
The next step of my work will be to assess the sustainability of this production system in terms of:

- Economic performance and risk analysis.
- Environmental impact (greenhouse gas emissions and nutrients balance)

For further details of this research please contact Santiago at sfarina@camden.usyd.edu.au.

Ravneet Jhajj

Ravneet has recently completed and submitted her PhD thesis 'Effects of forage type, mixed diets and feeding practices on the efficiency of feed utilisation in sheep' under the supervision of Assoc. Prof. Yani Garcia.



PhD student Ravneet Kaur Jhajj

For further details of this research please contact Ravneet at ravn8442@usyd.edu.au.

Daniel Dickeson

I am in the final stages of my Masters Thesis, writing up that is!!

The results have shown some positive outcomes for Accurate pasture allocation within an Automatic milking system. We have a slight increase for milk production, less variation for daily milkings and cows having too be fetched also shows less daily variation.

Masters student Daniel Dickeson

There was no significant difference for Milk Harvesting Efficiency and milking interval.

Through Accurate pasture allocation rather than Inaccurate allocation we can control what the cows eat. This is important so that a paddock grazing strip is depleted to a relative post grazing residual so cows move off it in search of fresh feed and milked in the dairy by default. Therefore reduces pasture wastage and maintains a productive and sustainable system.

For further details of this research please contact Daniel at daniel.d@usyd.edu.au.

Michael Campbell

New PhD student Michael Campbell

Michael begins his PhD in February 2010 which will focus on the adoption and adaptattion of complementary forage principles in Northern Victoria.

Michael has already started with the project as a Technical Officer .