FACULTY OF VETERINARY SCIENCE

THE UNIVERSITY OF SYDNEY

DAIRY RESEARCH FOUNDATION

NEWSLETTER

Volume 4 Issue 1

MARCH 2012

WHATS NEWS?

This year the symposium's theme is '**Energising Dairy**' and we promise to have a top-class program once again! Please mark these dates on your diary and help us support the dairy industry and our research with your attendance!

In this issue we also welcome Dr Cameron Clark who has joined the team as a recently appointed Senior Research Fellow. Cameron brings a range of R&D experience from both sides of the Tasman and we look forward to his contributions to the team and the FutureDairy project.

2012 DRF SYMPOSIUM 'ENERGISING DAIRY' 5th and 6th JULY 2012 CAMDEN

DIRECTORS' UPDATE

Welcome to our new issue of the DRF Newsletter!

We have a range of interesting and exciting articles and news this time including information about the oncoming Dairy **Symposium on 5th and 6th July**, with the Dairy NSW and NSW Farmers (dairy) activities taking place on 4th July.

The FutureDairy team is getting busier with the 3rd phase of the project fully up and running under the leadership of Dr Kendra Kerrisk. And don't miss the updates from all our postgrad students, visitors and trainees!

DRF Director, Assoc Prof Yani Garcia

Happy reading and all feedback welcome!

Yani Garcia

FROM THE PRESIDENT

The recently finished Complimentary Forage Systems (CFS) project conducted in the Hunter Valley was one of the best of its type I have ever seen.

The project combined researchers from the University of Sydney, advisory staff from the Department of Primary Industries, private consultants and farmers.

All involved worked very well together and I think it is fair to say that all learnt from each other.

The benefits and lessons from the research in this project are already flowing through the industry.

I'd like to congratulate everyone involved in the project.

Mr Bill Inglis President of the DRF

Bill Inglis

‘ENERGISING DAIRY’
2012 SYMPOSIUM

It is with pleasure that we present to the Australian dairy industry, our **2012 Dairy Research Foundation Symposium**. The Symposium is designed to integrate with the annual meetings of the **Dairy NSW** Regional Development Program and **NSW Farmers’ Association** Dairy Section – which means having all of NSW dairy industry’s major groups meeting at a single point.

The 2012 Symposium has adopted the theme **“Energising Dairy”** – and looks at energy in all its shapes and forms. This theme embraces dairies, feeding systems, reproductive systems as well as people systems and by doing this we offer a very diverse program that is spearheaded by a combination of scientists and farmers.

The program framework begins on Wednesday July 4 with the Dairy NSW and NSW Farmers Association industry meetings , followed by Day 1 of the Symposium (July 5) at the Liz Kernohan Conference Centre on the University Campus.

The second day (July 6) is much less formal, with a focus on participation, interaction and absolutely no powerpoint presentations – and staged at the Robotic Milking Research Farm at Menangle.

Automated Milking Systems – or robots – feature in only a small way this year and the program content of Day 2 is largely ‘non robotic’ – but there is always the opportunity to view the rotary AMS whilst there.

A key philosophy of the Dairy Research Foundation is to nurture and promote young and emerging professionals in the dairy industry and through our program design we have been to integrate youth with experience and to do this in a manner that creates a really inter-personal experience for the delegates.

We know from experience that delegates get very involved in the new work that our students are putting forward and it is simply good for the soul to see and hear youthful enthusiasm and a commitment to working in dairy science via this program.

Meanwhile, the **Annual Symposium Dinner** (sponsored by Dairy Australia) and the announcement of the Dairy Science Award will once again take place at Gledswood Winery – on the evening of July 5. This is sure to be a great night of fellowship.

We look forward to welcoming you to Camden in July.

Assoc Professor Yani Garcia

Chair, Dairy Research Foundation 2012 Symposium

2012 SYMPOSIUM KEYNOTE SPEAKERS

Dr JUDE CAPPER

Jude Capper is an Assistant Professor of Dairy Science in the Department of Animal Sciences at Washington State University (WSU).

Born in the UK, she undertook her undergraduate and graduate degrees at Harper Adams University College (UK) before doing post-doctoral research at Cornell University. Her current position is split between teaching, extension and research, with her research focusing on modelling the environmental impact of livestock production systems.

Current research includes comparisons of historical and modern production practices in dairy and beef industries; and the effect of technology use and management practices upon environmental impact.

JULIAN CRIBB

Julian Cribb is the principal of Julian Cribb & Associates and specialises in science communication.

A journalist since 1969, he was editor of the "*National Farmer*" and "*Sunday Independent*" newspapers, editor-in-chief of the "*Australian Rural Times*", and chief of the Australian Agricultural News Bureau. For ten years he was agriculture correspondent, science and technology correspondent and scientific editor for the national daily "*The Australian*".

His personal published work includes more than 8,000 print articles, 1000 broadcasts, 1000 media releases and 300 speeches as well as "*The Forgotten Country*", six editions of "*Australian Agriculture*", "*The White Death*", "*Sharing Knowledge*" and *"Dry Times" (with Mark Stafford-Smith)*. His book on the global food crisis, *The Coming Famine* was published in August 2010.

2011 ANNUAL GENERAL MEETING

The **Annual General Meeting** of the Dairy Research Foundation is being held on **Tuesday 24th April 2012** at 10.30am in Room 106B, General Teaching Building, Camden Campus.

The DRF Council for 2012/13 will be elected as representatives of the members and industry.

The Dairy Research Foundation Team are the driving force behind the **DRF Annual Symposium** and also projects such as **FutureDairy.**

IN THIS ISSUE:

FUTUREDAIRY'S APPROACH TO PASTURE ALLOCATION

By Yani Garcia

A demand-driven approach to pasture allocation has enabled the FutureDairy team to consistently achieve 18-20t DM/ha pasture utilisation under full irrigation.

This approach involves systematic monitoring of pasture growth and has the potential to achieve higher pasture utilisation than the industry average.

The approach was based on biological principles similar to the 3-leaf stage approach but the demand-driven approach would suit those wishing to increase pasture utilisation even further.

Grazing at the 3-leaf stage is a simple and effective approach that is quite easy to put into practice. For many, it will continue to be the preferred way to make pasture allocation decisions. The demand-driven approach is more intensive but can achieve higher pasture utilisation.

Our approach is based on creating enough demand for pasture and monitoring pasture growth systematically. A cow can eat a maximum of 5-7 tDM/ha/year (pasture + supplements), but we need to create enough demand (stocking rate) to harvest about 20 t DM/ha.

Key decisions about pasture allocation are based on matching demand (ie pasture removal by grazing or harvest) to pasture growth rate.

As long as the basic inputs (water and nutrients) are provided, there's not a lot we can do to change pasture growth rates.

But we can manipulate total effective demand for pasture per hectare to avoid over- and under-grazing. That's the tool we used to balance pasture removal with growth rates in FutureDairy's whole system studies.

The goal is to meet cows' requirements first with pasture, using supplements only to meet real feed gaps, i.e. when pasture quality or quantity is truly limiting.

FutureDairy has identified four basic steps to achieving high pasture utilisation: maximising pasture growth, monitoring pasture cover, allocating pasture according to growth rate and using supplements to cover the true pasture deficit.

Maximising growth

Pasture growth can be maximised by growing more grass and utilising more of it.

As long as the basic inputs (water, nutrients, temperature and sunlight) are not limiting, growing more grass comes down to having enough green leaf area for photosynthesis to occur.

Utilising more grass means minimising decay (i.e. ensuring green leaves are removed by grazing or harvesting before they decay and die).

Grazing management decisions influence the amount of green leaf area available and how many green leaves are removed before they start decaying. That's the basis of the traditional 3-leaf stage approach to pasture allocation.

At FutureDairy, we aim to maintain pasture cover over the whole farm area within a relatively narrow range around a given target (see figure 1). The actual target depends on the pasture species, region and the tools used (eg rising plate meter, rapid pasture meter etc) but the average of the desired levels of pre and post grazing provide a good approximation.For example if the target pre-grazing pasture cover is 2500 kg DM/ha and the target post-grazing cover is 1500kg DM/ha, then the target pasture cover should be somewhere around 2000kg DM/ha.

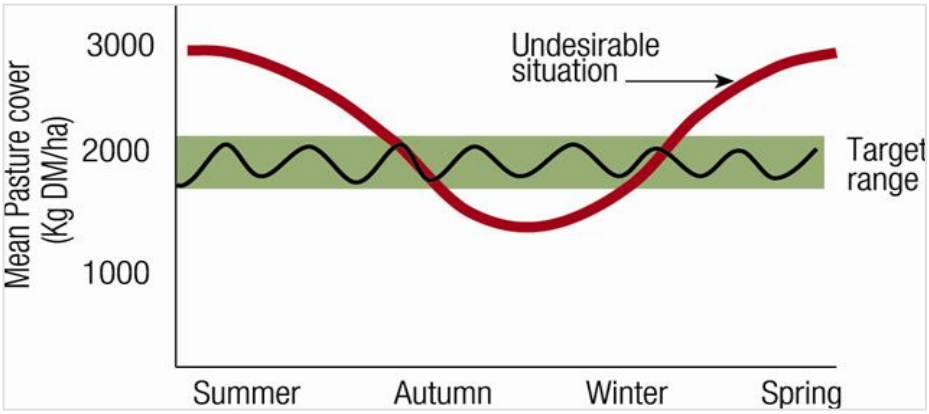


Figure 1: Aim to manage pastures within a narrow range of average pasture cover (narrow line with in the green region) rather than dramatic changes over the season (red line)

The target pasture cover may be a little lower in winter and autumn when pasture growth is slower, and a little higher in spring and summer when growth is faster. For seasonal calving systems it is desirable to deliberately build up pasture cover before calving to 'buffer' the system. Figure 1 shows the contrast between the desirable situation (with pasture cover moving up and down within a narrow range around the target) and what happens if pasture growth gets out of control in spring and summer due to poor pasture allocation (the red line).

We try to maintain pasture cover around a target range by ensuring the amount of pasture removed by grazing or harvesting balances out the amount of pasture grown. This is achieved by adjusting pasture allocation, rotation length and the level of supplements according to pasture growth.

FUTUREDAIRY'S APPROACH TO PASTURE ALLOCATION (cont)

Monitoring pasture cover

Maintaining this balance involves avoiding over-grazing and under -grazing, avoiding grazing too soon and avoiding grazing too late. Monitoring pasture cover allows us to track growth rates and to balance the average rate of pasture removal with average growth rates. Pasture cover should be assessed in some way, preferably using a rising plate meter or an automatic bike pasture meter. Ideally the monitoring should be weekly, particularly during the fast-growing periods in spring and summer.

The difference in pasture covers for each (ungrazed) paddock between two weeks gives an estimate of pasture growth rate.

As all paddocks are measured, the same monitoring of pasture will give a good indication of pre- and post-grazing covers. During the same monitoring leaf stage can also be assessed on those paddocks closer to be grazed to help fine tune the grazing roster for the next week.

Allocating pasture

By measuring pasture growth rate systematically we can predict how much pasture can be removed while maintaining the overall pasture cover target.

For example if daily pasture growth rate is ~30 kg DM/ha on average and we have 100 ha in rotation, the maximum amount of pasture we can allocate to our cows is 30 x 100 = 3,000 kg DM/ day, regardless of how many cows we have!

If the stocking rate was 3 cows/ha for example, the 300-cow herd would require approximately 6 t DM/day of feed. Thus in this example we could only feed ~50% of their total requirements with pasture.

The rest will have to come from supplements until pasture growth rates increases later in the season. Rotation length is just a consequence of a good pasture allocation.

Supplements

The next step is to calculate the difference between the cows' requirements and the pasture available in the allocated area. In spring there may be more pasture available than the cows' require in which case paddocks may be taken out of the rotation for silage.

The same rate of demand-driven pasture intake and pasture growth rate will indicate the size of the area to be shut down for silage.

At other times of the year there will be a shortfall which will be met by increasing supplements.

The level of supplements is adjusted to achieve the balance between pasture growth rates and removal (by grazing or harvest). If we feed less supplementary feed than required, the cows will tend to compensate by grazing harder.

This affects total dry matter intake because the amount of dry matter per bite decreases dramatically with lower post grazing cover.

Overgrazing is the killer of pasture production. Leaving residuals (post-grazing cover) less than 1300 kg DM/ha compared to about 1500 kg DM/ha can reduce average pasture growth by more than 10-12 kg DM/ha per day (see figure 2).

If we overgraze we may lose 3-4 tonnes DM/ha of pasture growth a year.

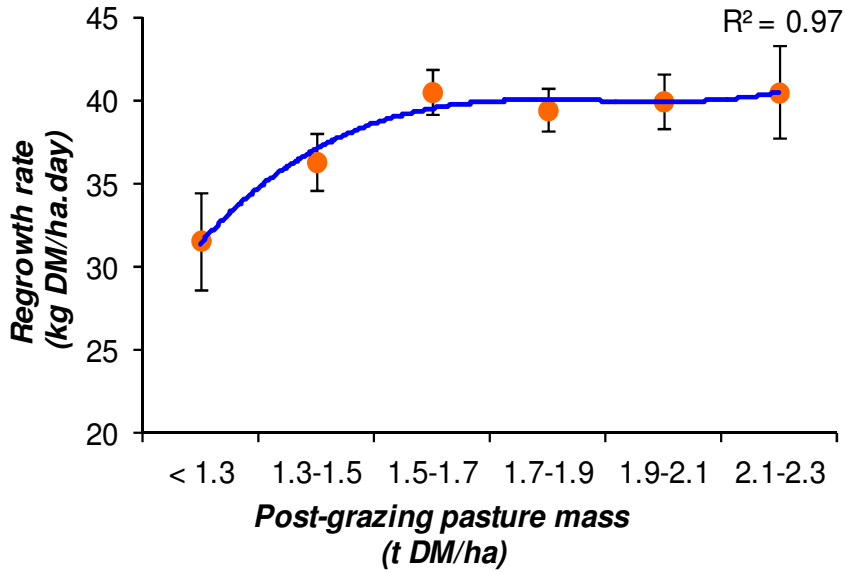
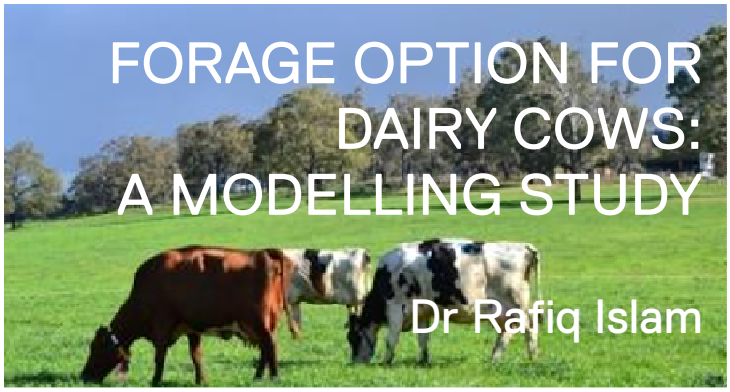


Figure 2. Grazing too hard affects the rate of regrowth of pasture (Garcia and Holmes 2005).

Customise for your farm

The principles outlined here have worked consistently for the FutureDairy team. But if you want to achieve the highest possible pasture utilisation on your farm, consider these principles in the context of your own system and your goals.



One of the challenges to increase milk production in a pasture-based large herd (400 - 800 heads) automatic milking system (AMS) is to grow forages within one km radius as an increase in walking distance increases milking interval and reduces yield.

Therefore, screening forage options which have the potential to grow at a faster rate than traditional pastures is highly important so that an increased proportion of the feed can be grown and supplied within a one km radius of the dairy, thereby minimizing the average walking distances if the volume of grazable forages grown in close vicinity to the dairy is increased.

Incorporation of principles of a complementary forage system may provide an opportunity to grow more feed (40 t DM/ha) in a small area compared to traditional pastures (17 t DM/ha).

Previous research showed that Agricultural Production Systems Simulator (APSIM) can be used effectively to simulate and validate yield and nutrient use efficiencies of an annual cycle of a triple-crop complementary forage rotation of maize (grown for silage), forage rape and field peas.

Thus, a simulation study was carried out with the APSIM model to explore forage options that can supply high amount of *grazable* forages for AMS herds.

Three different major simulation scenarios were carried out using forage crops namely maize, soybean and sorghum sown in simulations in four different sowing dates from spring to summer and then each of these scenarios was followed by forage rape intercropped or over-sown with ryegrass.

Simulated forage yields in maize, soybean and sorghum (each followed by forage rape-ryegrass) based rotations ranged from 25.3 – 28.2, 21.5 – 22.9 and 16.9 – 19.3 t DM/ha, respectively (Table 1 on page 4). Late sowing decrease simulated yields of summer crops and forage rape but increased the ryegrass yields.

The simulation site was Camden (150.70°E, -34.05°S), NSW and simulation covered periods from 1900–2010.

The soil of the site corresponds to brown chromosols and black vertisol.

FORAGE OPTION FOR DAIRY COWS: A MODELLING STUDY (cont)

Table 1. Simulated forage yields (t DM/ha) in rotations of maize, soybean and sorghum sown in summer followed by forage rape (over-sown or intercropped) with ryegrass

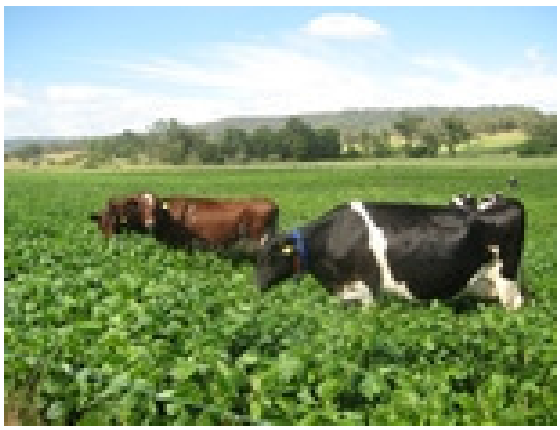
†M, S and Sg represents maize, soybean and sorghum respectively each followed by an intercrop of forage rape-ryegrass rotation; [a]Maize harvested at Zadoks growth stage 8; [b]Forage rape harvested at pre-graze cover of ≥4.5 t DM/ha and ryegrass harvested at pre-graze cover of ≥2 t DM/ha.

Rotations	Simulations†	Simulated forage yields (t DM/ha)				Total simulated forages (t DM/ha/yr.)
		M[a]/S/Sg	[b]Forage rape-ryegrass intercrop			
			Forage rape	Ryegrass	Total	
Maize	M1	12.4	10.0	5.8	15.8	28.2
	M2	12.1	9.5	6.2	15.7	27.8
	M3	11.3	8.5	6.2	14.7	26.0
	M4	10.6	8.2	6.5	14.7	25.3
Soybean	S1	9.5	8.3	5.1	13.4	22.9
	S2	9.4	8.0	5.5	13.5	22.9
	S3	9.0	7.9	5.5	13.4	22.4
	S4	7.6	7.9	6.0	13.9	21.5
Sorghum	Sg1	10.2	4.6	4.5	9.1	19.3
	Sg2	9.7	4.6	4.8	9.4	19.1
	Sg3	9.1	5.0	5.1	10.1	19.2
	Sg4	6.8	4.7	5.4	10.1	16.9

Results showed that the maize and soybean-based rotation was the highest yielding simulation. The critical periods when forage supply may not be available from these rotations were approximately two months immediately after sowing of summer forages (maize, soybean or sorghum) and similarly two months after sowing of forage rape.

The results also suggest that simulation analysis may provide decision support by identifying periods of forage supply for grazing and critical periods when alternatives feed sources would be required.

For further information please contact Rafiq Islam at md.islam@sydney.edu.au



Cows grazing during the soybean trials at EMAI

NEW SENIOR RESEARCH FELLOW FOR FD3

The FutureDairy team is excited to welcome **Dr Cameron Clark** as a Senior Research Fellow.

Cameron has returned to his research home where he completed his PhD supervised by Dr Bill Fulkerson after 5 years as a farm systems scientist at DairyNZ and as a senior policy advisor with NSW Farmers. As a farm systems scientist Cameron has conducted research across a broad range of topics such as:

-Best practice management of chicory and plantain to increase quality and quantity given differing grazing timings and severities

-Ability to reduce urine patch N loading onto pasture by allocating differing timings of pasture allocation.

-The development of a model to increase pasture growth on farm by determining the cause of differences in pasture growth between paddocks

-The management of farmlet and plot trials aiming to grow 25tDM/ha of high quality grazable forage

-Glasshouse trials investigating differences in type and quantity of water soluble carbohydrate in perennial ryegrass associated with defoliation timing.

Given Cameron's experience, he will be heavily involved in research associated with the integration of the farming system and automatic milking.

In particular Cameron's expertise will help to pave the way with research focused on increasing the volume of grazable home grown feed within close vicinity to the dairy and the impacts of the forages on cow traffic and farm system management.

This area of research is of increasing priority as the size of AMS herds grows and with the impending commercialisation of the high throughput robotic rotary.

Cameron will also be working together with commercial farms during the decision making phase and in the early stages of implementing automatic milking to help ensure their success.

POST GRADUATE UPDATES

TORI SCOTT *PhD student*

Soybean grazing trial

In January and February this year, I conducted a study at the Camden AMS farm investigating the potential benefits of grazing a soybean crop in an AMS.

In particular, I focused on voluntary cow traffic. It is hoped that from this study, we will be able to better understand how a forage crop can be used in a voluntary robotic milking system, and any additional benefits that can be generated for cow traffic incentives with highly palatable crops like soybean.

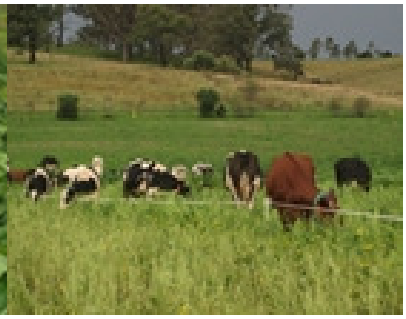
I used GPS collars and IceTags (a small tag strapped to the left rear leg that can be used to record continuous data on steps taken and whether the cow is standing or lying).

In addition, I conducted direct behavioural observations, to collect data to assist in explaining the impact of the soybean crop on cow movement.

To assist with the study, I was fortunate enough to have the help of several undergraduate students; Nicole Olimulder (final year vet student from the Netherlands), Klaas-Willem Niewland (final year agriculture student from the Netherlands), Ashleigh Wildridge (third year animal science student from Charles Sturt University, Wagga), Lauren Oehlers (third year animal science student from Sydney University), and Kay-Lora Tang (third year animal science student from Sydney University).

Tori Scott prepares one of the cows used for the Soybean trial

I also received assistance from students and volunteers in conducting behavioural observations. I very much appreciated their time and perseverance through the poor weather.



TORI SCOTT (cont)

Presentation at the Australian Dairy Conference (ADC) 2012

I was successful in my application for inclusion in the Young Scientists section of the 2012 ADC Conference (Gippsland). It was a fantastic experience, and a very enjoyable and informative conference. I was fortunate enough to spend time with 5 other Young Scientists and Ann Burbrook, our "coach". Ann provided coaching and technique development in the areas of poster, article and oral presentations, and the experience was one that was extremely valuable to me at this stage of my post-graduate studies.

RENE KOLBACH *Masters Student*

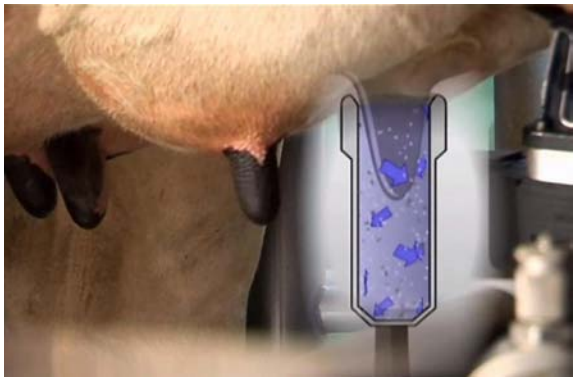
My time as a masters student is drawing to a close – I am now very close to submitting my thesis titled: *"Investigation into the feasibility and throughput capacity of Incorporating a novel prototype Robotic Rotary into a low-input, pasture based Australian dairy farming system"*.

Since the last newsletter, another study has been conducted with the Automatic Milking Rotary (AMR™, DeLaval).

We created an understanding of the impact of pre-milking teat preparation on the incidence of unsuccessful milkings and attachment speed, to ensure that farmers make an informed decision prior to commencement of the RR (as purchase of the teat preparation module will be optional).

It was found that teat cups were attached more successfully and faster when cows were subjected to pre-milking. Cows milked after being exposed to pre-milking, and with a short milking interval (< 8 h), had a higher peak milk flow, however no difference was observed in the average milk flow rate.

***Teat cleaning device**, the teat preparation module (TPM) (Source: DeLaval, Tumba Sweden)*



Nicolas Lyons and I were invited to present at the Australian Dairy Conference held in Gippsland titled: 'Technology is definitely the way to go'. We outlined a whole host of tools and technologies that are readily available to farmers even if they weren't designed specifically for farmers.

RENE KOLBACH *(cont)*

The application of the tools were to help farmers deal with common challenges faced when managing their farm business in the areas of pasture management, milking routines, herd handling and labour.

The tools ranged from apps for smart phones to software packages for PC's, from bench top somatic cell counters to pasture meters, from social media to communication tools and so many more things in between. For us it was a fantastic opportunity and feedback indicates that our Gen Y perspective was fascinating and informative and at times quite entertaining.

I will update you in the next and my 'final' DRF newsletter on post-student life, where I am and what my next "project" in the dairy industry entails.

PhD student
Michael Campbell

MICHAEL CAMPBELL *PhD Student*

Over the last 6 months my PhD project has focused on collating and fitting the real case study farm data to enable it to be used for modelling during this year.

The project is now very desktop based with a focus on modelling the impact on commercial dairies of utilising the complementary forage system principles and how that influences the risk profile of the business.

I am also working with the data collected from the Hunter Valley project to allow me to compare across the two regions and to look for similarities that might drive successful implementation of CFS on commercial farms.

SARANIKA TULAKDAR *PhD Student*

I started my PhD in July 2011 and I am currently arranging statistics from the database of automatic milking system (AMS) research farm at Menangle.

On a pasture-based AMS, milk production might be potentially increased if significantly higher milking frequencies are achieved, particularly in early lactation. Increased milk yield can be associated with a greater negative energy balance during early lactation.

In addition, active oestrus detection on AMS farms may require a more conscious effort as cows have different patterns of movement within the AMS farm when compared to a conventional milking system.

On a conventional system oestrus detection is generally carried out at milking time. We are keen to identify the reproductive performances of dairy cows on the AMS research farm.

Five years retrospective data was collected to identify the association of milk yield, milk frequency, milk composition, age and parity with reproductive traits (calving interval, calving to first AI interval, calving to conception, number of AI per conception, days open, conception rate, pregnancy rate), cow survival rate and culling attributed to reproductive problems, lameness and mastitis through multivariate analysis.

I am now analysing this data and the findings will hopefully provide us with an insight into conducting future research into the topic.

PhD student
Saranika Tulakder

The irrigators at work on Camden Farms

NICOLAS LYONS *Masters Student*

FEED LOCATION CHANGES GRAZING PATTERN FOR AMS COWS

Masters student Nicolas Lyons

Minimizing the frequency of milkings occurring with intervals beyond 16 hours, which have a reduced milk yield (in kg of milk harvested per hour of milking interval), has the potential to increase milk production of cows milked in a pasture-based automatic milking system.

During late 2011 a trial was conducted to compare two different supplementary feed placement strategies with supplements made available to cows at the dairy either prior to milking or immediately after milking (*Pre* and *Post* Feeding Treatments, respectively).

Cows were managed under a two-way grazing system, having access to a day and night paddock. In a first report (previous newsletter issue) we reported that the Pre Feeding group took around an hour less to return to the dairy - but what caused this difference?

Preliminary results indicate that a 2 – 10% higher proportion of Post Feeding cows arrived to each allocation during the active access period (a 12 hour period after which any cow leaving the dairy got access to a new feed allocation). This was true both for day and night paddocks (Figure 1). Not only did more Post Feeding cows get into each allocation, they also arrived earlier. On average it took half an hour less for 50% of post fed cows to get to the day paddock and 2 hours less for 50% to get to the night paddocks in comparison with pre fed cows.

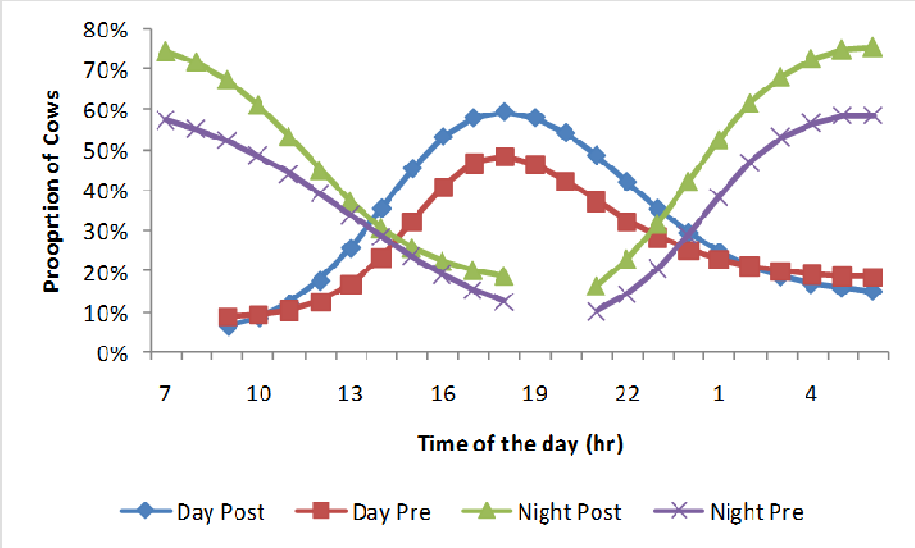


Figure 1: Proportion of cows (%) from Pre Feeding and Post Feeding treatment groups, in Day and Night feed allocations, during a 24-h observation period

The difference above was likely to be related to which cows were being fetched. At fetching time (22 hours since commencement of any active access period - 2 hours prior to opening of next allocation), any cows which had not voluntarily left the paddock were brought to the dairy to get milked, and were then most likely to be amongst the first cows to access the new allocation.

At the start of voluntary exit time (a 10 hour period after the end of the active access period), on average 10% of cows from both treatments had volunteered out towards the dairy.

Whereas at fetching, cow traffic from day paddocks had been very similar for cows in both treatments, and similar to that of post fed cows in night allocations (approximately 34 – 40% had not volunteered out). Yet, the Pre Feeding cows had volunteered much better from night paddocks, with only 14% of them, on average, requiring fetching.

So, what caused the difference during the voluntary exit time between both treatments, especially for night allocations?

Overall, night feed allocations resulted in less cows fetched, in comparison with day paddocks, which is likely to be related to behavioural patterns, with the majority of grazing bouts taking place during daytime. As a consequence of this, it took half the amount of time, 6.25 hr vs. 13-hr for day and night allocations respectively, to graze down half the available pasture.

Within the trial, behaviour analysis was conducted on a group of 30 experimental cows (15 in each treatment), which were observed during four 24-hour observation periods while at pasture, to determine posture and activity every 15 min intervals.

FEED LOCATION CHANGES GRAZING PATTERN FOR AMS COWS (cont)

These 30 cows had the same traffic between treatments and across allocations.

Therefore we could expect their behaviour to be representative of the behaviour of the remainder of the milking herd.

Post Feeding cows had a higher probability of being grazing in the last hours of the night allocation (Figure 2), which could explain why they did not volunteer out.

The difference between treatments increased after 12 hours, which was reflected in the proportion of cows in both groups at pasture.

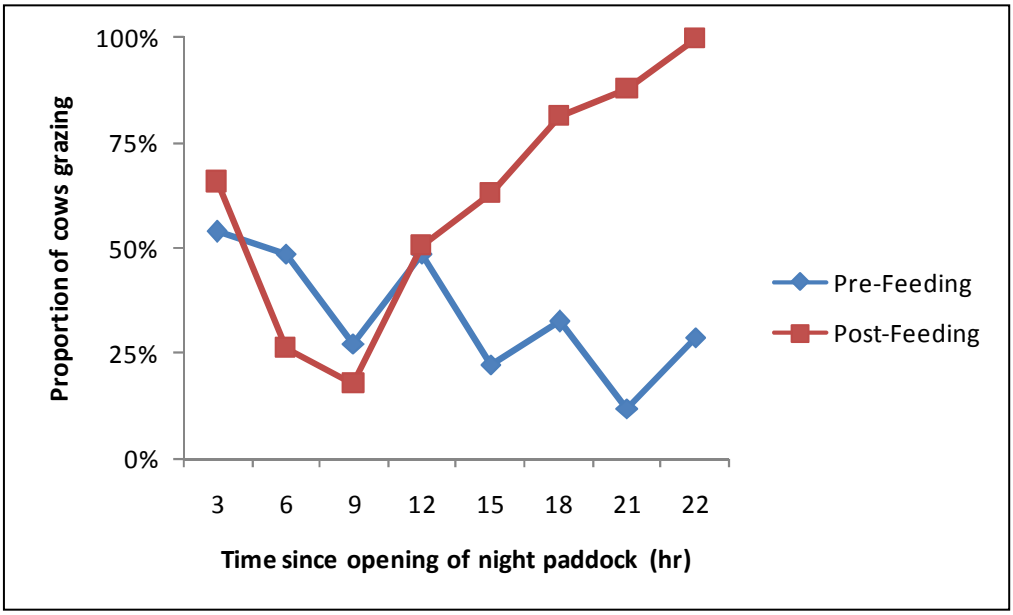


Figure 2: Proportion of cows grazing (%) from Pre Feeding and Post Feeding treatment groups, in Night feed allocations

Further investigation into cow behaviour, will allow a better understanding of cow traffic in relation not only to time since arrival but also pasture disappearance.

Hopefully, this will place us in a better position to recommend strategies to AMS farmers, enabling them to encourage cows to voluntarily traffic from the stale paddock and get milked. The results may also have some application in conventional milking systems where automatic gate releases are used to allow cows to start walking to the dairy prior to milking start time.

HELEN GOLDER *PHD Student*

I am pleased to report that my first full journal article on the '*Effects of grain, fructose and histidine on ruminal pH and fermentation products during an induced subacute acidosis protocol*' will be published in the April edition of the American based journal *'The Journal of Dairy Science'*.

Over the past couple of months I have been investigating how to analyse rumen pH and fermentation data from an earlier acidosis trial involving feeding grain plus one or combinations of the rumen modifiers: monensin, flavomycin, tylosin or fermenten.

These were fed at the recommended commercial dosage.

The aim is to ascertain which of these products or combinations of products is effective at reducing the risk of acidosis.

I have also been working on validating an acidosis model developed by former University of Sydney and SBS*cibus* PhD student, Elizabeth Bramley.

The model classifies cattle into 3 categories: 1) acidotic, 2) sub-optimum rumen function, or 3) normal based on concentrations of rumen pH, volatile fatty acids, ammonia and lactate measures in 800 dairy cattle from 100 herds in Southern Australia.

I am validating the model by running other comparable datasets through the model.

Additionally, I'm looking into using different statistical methods to produce similar acidotic categories as the original model, thus validating it.

We are currently in the process of gathering funding support and preparing project protocols for my next animal trial in which we intend to feed grain, sugar and rumen modifiers (which are yet to be confirmed) to heifers using a subacute acidosis protocol.

CAMDEN FARMS

The final group of first year vet students have just taken their cattle handling exam and all passed with ease.

The farms, like most properties, have been finding it tough with the wet weather but luckily the Nepean River has so far not flooded. As a consequence, the winter planting programs have been delayed as have the maize harvests at Westwood.

Like most of the dairy farmers on the east coast of Australia, Camden Farms has experienced a drop in milk. This is mainly due to the poor quality feed the cows are getting and the fact that most of the time they are up to there hocks in mud.

The Australian Farm Journal featured a full length article in its March edition focussing on the new irrigation system at Corstorphine Farm discussing the benefits on farm labour and savings.

The system has not had a lot of use through the unseasonally wet summer we've experienced but the longterm benefits of having such a system in place are expected to be great.

Kim McKean, Camden Farms Manager

For further information please contact Farms Manager Kim McKean at kim.mckean@sydney.edu.au

BIG GUNS DELIVER BIG SAVINGS FOR UNIVERSITY OF SYDNEY

A complete overhaul of the irrigation system at the University of Sydney's Corstrophine Dairy, near Camden NSW, is expected to realise enormous savings in energy and labour, in addition to reducing water use and improving crop yields.

The dairy, which is part of the University's Camden Campus, is 65km south west of Sydney and occupies 33 hectares of fertile flood plain on the banks of the Nepean River. Half of the site is split into feeding lanes for the cattle while the other half is used to grow Lucerne, kikuyu and maize.

The five travelling irrigators which had been in use at the dairy were well past their used-by dates and had become a burden on operations. Inefficiencies in water and power added to a hefty labour demand and mounting repair bills.

To avoid breakages all five irrigators had to be operated together, regardless of need, in order to minimise the water pressure running through the old and brittle pipes. Running them independently frequently resulted in leaks and breakages. The waste incurred by irrigating in this fashion was compounded further by the fact that the dairy was an odd shape, which required some irrigators to travel further than others.

A combination of skill and experience had taught farm operators the right amount of time to set their pumps running to ensure that the irrigators on longer runs reached their destinations. While this method was developed and learned over time, it was grossly inefficient and unpractical.

With some parts of the dairy considerably shorter than others, several irrigators would sit idly watering one area while waiting for the longer runs to finish. This made it impossible for operators at the dairy to apply any measures of uniformity to their watering, with a trade-off between under and over watering the inevitable consequence.

The inflexibility of the system also impacted on their ability to trial new crops, or trial watering levels suited to the soil profile of particular areas. It was a one-size-fits-all approach and it was costing time, labour, efficiency, and serious dollars.

With funding available through the Nepean-Hawkesbury River Recovery Program, Catchment Management Authority, and the NSW Smart Farms Project, the University sought the expertise of independent consultants Total Irrigation Designers to audit the existing systems and conceive and design a new fully automated and highly efficient irrigation solution.

Total Irrigation Designers sought additional technical support and advice from Nelson Irrigation Australia to develop the design which was then tendered and installed by Hydro Technics Irrigation.

The project involved replacing the five travelling irrigators with a fixed fully automated irrigation system comprised of 104 Nelson Irrigation F100 21 degree Big Guns and 104 2" Nelson 800 Series Control valves spread evenly across the site in a grid of 60m x 40m cells.

The new system is expected to relieve the dairy of countless hours in labour and maintenance, and allows watering of specific areas, at specific times, with just the touch of a button. It can be adjusted to suit soil profiles, crop types, undulations, and areas of high wind.

The real key to the greater efficiencies achieved is the renowned uniformity of the F100 Nelson Big Guns. The Big Guns will deliver an impressive 85% (DU) over their throw radius, meaning the wasted costs associated with under and over watering are now be a thing of the past for the dairy.

One of the 104 F100 Nelson Big Guns used in the project

VISITORS TO CAMDEN

The Dairy Science Group currently has a number of visitors from The Netherlands, Italy, Bangladesh and Iran.

Please enjoy some of the students' journies to Camden with us.

NICOLE OLIMULDER

Universiteit Utrecht

Hello, I am Nicole Olimulder. I am a veterinary student from University Utrecht in the Netherlands.

As part of our fifth year we are expected to conduct a research project to gain experience of the entire research process including writing a proposal, planning and conducting the research, collection, collation and analysis of data and writing a research report.

During the past two months I have been involved in a trial being conducted by PhD student Tori Scott.

The trial was designed to investigate the effect of grazing soybean on voluntary cow traffic and cow behaviour with Automatic Milking Systems.

I have really enjoyed my time on the farm. I didn't grow up on one and don't have much experience with cows, so this was a great opportunity to gain some experience in working with dairy cattle whilst also developing many skills with regard to conducting research.

ANUUNAL GENERAL MEETING
TUESDAY 24th APRIL 2012
CAMDEN

MEHDI TAGHINEJAD

I was born in 1980 in a small city in the north of Iran which called Roudbaneh. I completed my Masters degree in Feeds & Animal Feeding in August 2005 at Tehran University with the thesis topic of "The comparison of performance of lactating dairy cows fed ration formulated by Spartan dairy ration balancer and Cornell Net Carbohydrate and Protein System".

I have also completed my PhD degree in Animal Nutrition in June 2010 at **Islamic Azad University** with the dissertation topic of "Study of the effects of physical processing (g-irradiation, microwaving and roasting) on protein degradability and digestibility of soybean and cottonseed".

Since finishing the PhD, I have been working as a lecturer at the Tabriz Branch, Islamic Azad University in Iran. My field of work is ruminant nutrition & production and also feed processing to improve feed utilization. I am also interested in nutritional interventions to improve dairy cattle production and performance.

Iran is located in a semi drought area and we are struggling to supply our livestock with feed. We import a portion of the grains to feed our livestock but we are not able to import the forage we need for our cattle, so it is very important for us to maximize our forage production.

I arrived on the Camden campus on 12 Mar 2012, and will spend 6 months training to develop a research project in close collaboration with Associate Professor Yani Garcia and other colleagues from the Dairy Science Group in the area of 'forage utilization by grazing animals'. We are particularly interested in maximising the efficiency of production of high forage production systems (combinations of forage crops and pastures).

The Dairy Science Group has been running a project on estimation of yield and nutritive value of soybean forage with different levels of Irrigation and N fertilizer. The group has already grown and harvested a sample of the forage. Now we are preparing the sample for chemical analysis and digestibility trials to determine its nutritional value. This will be done in MC Franklin Lab in Camden.

ZEESHAN IQBAL

I was born in a Pakistan in 1982. I got my B.Sc (Hons) Animal science from the University of Agriculture, Faisalabad in 2005. I started my M.Phil in Livestock Management at the University of Veterinary and Animal Sciences, Lahore. Pakistan.

As a Masters student I worked on shaiwal cattle my dissertation topic was "Performance of Sahiwal cattle kept on different feeding management practices" and was awarded my Masters in 2008.

During 2007 I had opportunity to work as a research associate in **University of Veterinary and Animal Sciences, Lahore** in a Pakistan Agriculture Research Council funded project entitled "Feeding management for optimum growth early maturity and first lactation performance in Sahiwal cattle" on a livestock experiment station in Jahangirabad, Khanewal, Pakistan.

In 2009 I began my PhD course and research work. The topic of my PhD is "Effect of feeding milk replacer and diets with varying levels of concentrate on growth, puberty and first I actation performance in Sahiwal cattle". I work under the supervision of Professor Abdullah.

In April 2011 I was awarded a scholarship from the Higher Education Commission, Islamabad, Pakistan for six months training in the FutureDairy Project, University of Sydney, Australia. I reached Camden in Nov 2011 and started my work on "Effect of irrigation and nitrogen on nutritive value, in vitro gas production, and dry matter digestibility of maize plant fraction". My lab work and in vitro gas production is complete, and I am now looking over the statistical analysis and then will write a paper which will be submitted for publication.

During the first week of April I am going to the AMS farm for field experience to study the feeding patterns, nutrition and milking system.

Many thanks to Higher Education Commission, Islamabad, Pakistan for funding and the Dairy Research Foundation for giving me the opportunity to work with their group. Thanks to my friends I miss all of you. To end I would like say thanks to my Mum and Dad who persuade, encourage and help me a lot.

Zeeshan Iqbal

Snapshot 2012


"Snapshot"-Survey 2012

Changing dairy production - Developments until 2017

Dear participant!

Why this survey?

Dairy farmers worldwide face big challenges. Many producers are wondering:

- How can I profitably produce milk at unsteady milk prices?
- Am I prepared for the future?
- How do farmers react in other countries?

The cooperation of the Australian Dairy Conference and the European Dairy Farmers gives you as farmers the opportunity to compare future strategies across borders and helps to improve farm decisions. The more farmers participate the higher is the value of the survey results for each of you.

How long does it take to fill in the questionnaire?

About 10 to 15 minutes.

Who analyses the data?

The questionnaires are evaluated by the scientists of the European Dairy Farmers (EDF) and agri benchmark with the assistance of Australian dairy experts. All data is made anonymous and treated absolutely confidential. From the results it will not be possible to trace back information to individual farms.

How do I get the results?

The most important results of the survey will be collected in a hands-on report that you will receive by giving your e-mail address at the end of the questionnaire.

Further questions?

Please feel free to contact Michael Wolter (michael.wolter@vti.bund.de) at the vTI in Germany or the Australian Dairy Conference Ltd (shareena.flynn@bigpond.com).

Your participation is of great value!

Thank you very much!

DEVELOPMENTS IN THE AUSTRALIAN DAIRY INDUSTRY – HELP TO SHAPE THE AWARENESS OF OUR FUTURE!

Dairy farmers worldwide face huge challenges. Many producers are wondering:

- How can I produce milk profitably with the current trend of fluctuating milk prices?
- Am I prepared for the future?
- How are farmers reacting in other countries?

Collaboration between the **Australian Dairy Conference** and the **European Dairy Farmers** has produced a **survey** designed to give a snapshot of future developments in the Australian dairy industry in comparison to their Europen counterparts.

Results from the survey will contribute to a better understanding of developments in both Australia and Europe, and will be distributed to all participants.

You will find the survey via the link below or click on the icon to the left:

"Snapshot 2012"
Changing dairy production - Developments until 2017

To ensure the validity of the results we are hoping to obtain input from a large cross-section of farms across Australia.

Please take a few minutes and play a big role in the future of our industry.

Every piece of knowledge counts.

For further information please contact Michael Wolter at **michael.wolter@vti.bund.de** from the vTI in Germany or Shareena Flynn at **shareena.flynn@bigpond.com** from the ADC .

Johann Heinrich von Thünen-Institut

Australian Dairy Conference

THANK YOU
TO ALL THE DRF MEMBERS
FOR YOUR CONTINUING SUPPORT

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MR GREG LINDSAY-OWEN (United Dairies/DairyCorp Ltd)

MR BILL INGLIS (Craigend - The Oaks, NSW)

MR ROWAN MOORE (Glenmore - Camden, NSW)

THE UNIVERSITY OF SYDNEY

DAIRY RESEARCH FOUNDATION

FOR MORE INFORMATION ON BECOMING A MEMBER PLEASE CONTACT

T +61 2 4655 0631
F +61 2 4655 2374
E vetdrf©sydney.edu.au
WWW.VETSCI.EDU.AU/FOUNDATIONS/DRF