
Recent significant and widespread rains have elevated the chances of a really good winter growing season for 2010 in south-eastern Australia. With the green country comes renewed optimism for the agricultural industries. We need to continue to promote to the metropolitan community our role in the production of high quality food within sustainable farming systems to ensure continual government support for agriculture. In an election year, the spill-over benefits of sustainable practices on human and environmental health must be emphasised.

Well trained staff and students are critical to underpin scientific excellence in the generation of new knowledge. We need to convey to school children that a career in science is a great future, so that we have capacity to maintain productivity and environmental protection while adapting to climate change. Student training is a key role of the Graham Centre.

In this issue we focus on the research undertaken by our students. We also highlight the use of the travel funds we provide for staff and students to attend conferences in Australia and overseas. The ‘global perspective’ and development of international research networks is critical in maintaining high quality in research.

A reminder – a couple of key dates for industry engagement at Wagga Wagga:

- Beef and Sheep Field Days, 19 and 20 August
- Launch and Field Day for the new Graham Centre Field Site, 8 September

I hope you enjoy this issue of the Innovator which has a high content of animal-related projects, reflecting our increasing growth in this area.

Professor Deirdre Lemerle
Director
2010 Seminar Series

The 2010 Seminar Series has now commenced. Local and international speakers will participate. The seminars are generally held fortnightly on Thursday afternoons in the Conference Room at Industry & Investment NSW, Wagga Wagga, however, please always check our website for possible changes to times and venue.

For more information about the Graham Centre Seminar Series, please contact Ms Nicole Hyde nhyde@csu.edu.au or Dr Livinus Emebiri 02 6938 1629, livinus.emebiri@industry.nsw.gov.au

Student activities

Summer Scholarships & Student Internships for undergraduates

The undergraduate scheme in the Graham Centre encourages students to experience research undertaken by the Centre. It enables students to become familiar with the types of projects and potential supervisors available for undertaking a broad range of research activities.

The recipients of the Summer Scholarships are Mia Fehring and Hannah Roe. Mia is currently undertaking an honours year of a Bachelor of Science (Agronomy) degree with the School of Animal and Veterinary Sciences. Hannah is a first year Bachelor of Environmental Science student with the School of Environmental Sciences.

Three Internships have been awarded to the following students: Laura Chisnall (in her second year of a Bachelor of Science degree with School of Agricultural and Wine Sciences); Michael Hopwood (in his second year of a Bachelor of Science degree with the School of Animal and Veterinary Sciences); and Scott Stoll a third year Bachelor of Science (Agriculture) student with the School of Agricultural and Wine Sciences.

PhD Scholarships - Focus on Food Quality

Congratulations to Monisola Alashi and Christina Chin Chiu Lei who have been awarded the Centre's 2010 PhD scholarships.

Monisola Alashi studied Food Science and Nutrition at the Federal University of Technology, in Minna, Nigeria, graduating with a First Class Honours degree. She currently works as a Graduate Assistant in the same university and has two refereed publications to her name. Canola and rice proteins have very low value as they cannot be utilised as ingredients for the manufacture of human food; Monisola will be working on a project to improve their food functional properties through a range of enzymatic modifications. This work will be carried out here and in Canada, in collaboration with the Richardson Centre for Functional Foods and Nutraceuticals, University of Manitoba, Winnipeg, Canada.

Her project is titled “Functional properties of alkali-soluble protein hydrolysates”, and will be supervised by Assoc Prof Samson Agboola and Dr Chris Blanchard (CSU Wagga) and Prof Rotimi Aluko (University of Manitoba, Canada).

Christina Chin Chiu Lei is currently working for Nestle in Malaysia, but previously completed a Food Science degree at CSU, as well as completing an honours project working on the impact of milling on rice quality. Christina's PhD project will assist pulse breeders in selecting varieties that have superior cooking and sensory properties.

Her project is titled “Pulse quality” and will be supervised by Dr Chris Blanchard, Dr Danielle Ryan and Assoc Prof Samson Agboola (CSU Wagga).
PhD Top-Ups

The objective of the Graham Centre’s PhD Top-Up Award is to reward high quality students undertaking PhD studies at Charles Sturt University and to encourage participation in the Centre. The following students have been selected to receive PhD Top-ups in 2010:

- **Susan Armstrong** (Genetic diversity of *F. hepatica* in NSW and Victoria); supervisors Prof Terry Spithill and Prof Nick Sangster (CSU)
- **Andrew Peters** (Dynamics of infectious organisms in migrating bird); supervisor Assoc Prof Shane Raidall (CSU)
- **Xiaocheng Zhu** (Diversity of silverleaf nightshade in Australia); supervisors Dr Hanwen Wu (I&I NSW), Dr Rex Stanton and Prof Deirdre Lemerle (CSU)

First Class Honours for Chloe

The Honours thesis submitted by Chloe Setterfield (partially funded through the Graham Centre scholarship) was graded as H1 – First Class Honours. A great result! Below is an excerpt from her thesis. Chloe was supervised by Dr Scott Norman, Senior Lecturer in Veterinary Reproduction, CSU.

Kisspeptin (KP) is a peptide product of the KiSS-1 gene. KP plays a key role in reproductive function including the regulation of gonadotrophin releasing hormone (GnRH) and luteinising hormone (LH) secretion in many species. In this study, the locations of KP neurons in the brain of the horse mare, their potential interactions with GnRH neurons, and temporal changes in their expression at three different stages of the oestrous cycle are examined.

Mares underwent oestrous synchronisation. At just prior to ovulation, at mid-dioestrus, or at late dioestrus brain tissue was collected and fixed. Each hypothalamus was sectioned into 40μm coronal sections, stained for KP and GnRH and slide mounted. The majority of KP neurons were located in the median eminence, the arcuate nucleus and the periventricular nucleus of the medial basal hypothalamus (MBH). A general trend of increase in KP neuron counts was noted throughout the oestrous cycle possibly indicating a gradual build up of KP protein within the neurons, which is depleted during the GnRH/LH surge just prior to ovulation. Unlike most other species, the highest counts of GnRH neurons were observed in the mid-MBH at all stages of the oestrous cycle but no temporal changes associated with stage of cycle were noted. The majority of interactions between GnRH and KP neurons were located in the arcuate nucleus. The types of interactions observed were KP fibres interacting with GnRH cell bodies, fibre-fibre interactions between KP and GnRH, and GnRH fibres interacting with KP cell bodies. There was no variation in the number of interactions throughout the oestrous cycle, but these findings indicate some form of direct feedback between KP and GnRH. The present study investigated changes in kisspeptin and the interactions with GnRH throughout the oestrous cycle of the mare. Further research could lead to the development of improved oestrus control and a management strategy for the transition period.

Short Honours Project Updates

**Greg Dale, 5th Year Veterinary student**

*Correct diagnosis of animal diseases requires that careful transport to a laboratory for identification.*

The diagnosis of bacterial diseases requires collection of appropriate samples from the host animal and transportation to a diagnostic laboratory in a correct and timely manner to ensure survival of the bacteria for culture and subsequent identification. There are significant difficulties associated with the recovery of bacteria from biological fluids, since there are often small numbers of organisms involved which are further inhibited by the antibacterial properties of the fluid.
Veterinary samples submitted for bacterial culture are collected in a wide range of media and are subjected to a variety of handling conditions, some of which are likely to negatively impact on culture results. There is a need for clear advice on how clinical samples should be handled to ensure the viability of microorganisms on arrival to the laboratory, whilst considering the availability of media and their suitability for the safe transport of biological fluids to laboratory facilities. This project aims to provide sound recommendations for veterinary practitioners regarding the optimal collection and handling of samples for blood culture.

**Kelly Plozza, 5th Year Veterinary student**

Sub-clinical mastitis in NSW dairy farms.

Current prevalence of subclinical mastitis within NSW, and analyses associated risk factors. The project involved the collection of herd recording data as well as sending out questionnaires to participating dairy farmers. Statistical associations were made between farms with low and high prevalence of subclinical mastitis, using their herd recording data for the last 2.5 years, and answers from questionnaires were recorded and analysed for statistical associations with high or low prevalent farms. The results found in this study highlight the continuing importance of subclinical mastitis control on farms and the associated risk factors found in this study reiterate the importance of managerial decisions when developing control programs to prevent and minimise subclinical mastitis on farms.

**New Publication**

**Genotypic analysis of Mucor from the platypus in Australia**

Three Centre researchers recently had their paper on platypus Mucor research published in the *Journal of Wildlife Diseases*. Dr Joanne Connolly, Dr Ben Stodart and A/Prof Gavin Ash have been investigating a possible connection between a fungal disease that is killing Tasmanian platypuses and mainland frogs, by assessing the genetic diversity of platypus and frog isolates of *Mucor amphibiorum*. This fungus is the only infectious agent known to cause serious illness and mortalities in wild platypus populations. Affected platypuses develop large skin ulcers and the fungus may invade deeply into the underlying tissues and muscle, causing leakage of blood and body fluids. Infection can progress to involve internal organs, especially the lungs. Animals with extensive infections may have impaired thermoregulation, mobility and ultimately die from this disease.

**ABSTRACT:** *Mucor amphibiorum* is the only pathogen known to cause significant morbidity and mortality in the free-living platypus (*Ornithorhynchus anatinus*) in Tasmania. Infection has also been reported in free-ranging cane toads (*Bufo marinus*) and green tree frogs (*Litoria caerulea*) from mainland Australia but has not been confirmed in platypuses from the mainland. To date, there has been little genotyping specifically conducted on *M. amphibiorum*. A collection of 21 *Mucor* isolates representing isolates from the platypus, frogs and toads, and environmental samples were obtained for genotypic analysis. Internal transcribed spacer (ITS) region sequencing and GenBank comparison confirmed the identity of most of the isolates. Representative isolates from infected platypuses formed a clade containing the reference isolates of *M. amphibiorum* from the Centraal Bureau voor Schimmelcultures repository. The *M. amphibiorum* isolates showed a close sequence identity with *Mucor indicus* and consisted of two haplotypes, differentiated by single nucleotide polymorphisms within the ITS1 and ITS2 regions. With the exception of isolate 96-4049, all isolates from platypuses were in one haplotype. Multilocus fingerprinting via the use of intersimple sequence repeats polymerase chain reaction identified 19 genotypes. Two major clusters were evident: 1) *M. amphibiorum* and *Mucor racemosus*; and 2) *Mucor circinelloides*, *Mucor ramosissimus*, and *Mucor fragilis*. Seven *M. amphibiorum* isolates from platypuses were present in two subclusters, with isolate 96-4053 appearing genetically distinct from all other isolates. Isolates classified as *M. circinelloides* by sequence analysis formed a separate subcluster, distinct from...
other *Mucor* spp. The combination of sequencing and multilocus fingerprinting has the potential to provide the tools for rapid identification of *M. amphibiorum*. Data presented on the diversity of the pathogen and further work in linking genetic diversity to functional diversity will provide critical information for its management in Tasmanian river systems.

**Reference**


In addition to this scientific paper, a brief story with pictures on platypus research can be found online at the Australian Geographic website http://www.australiangeographic.com.au/journal/tough-environment-no-barrier-for-platypus-population.htm

Further information: Dr Joanne Connolly, jconnolly@csu.edu.au, (02) 6933 2218; Dr Ben Stodart, bstodart@csu.edu.au, (02) 6933 2147; A/Prof Gavin Ash, gash@csu.edu.au, (02) 6933 2765.

**2010 Travel Grants**

Travel Grants, to a total value of $37,000, were recently announced. The purpose of these grants is to assist Centre participants (including students) to attend national and international conferences and/or to develop or participate in significant national and international research projects which are closely linked with the Centre’s objectives and research priorities. A further round of funding for travel will become available in June this year. Ten of the following 28 recipients are students*.

<table>
<thead>
<tr>
<th>Name</th>
<th>Institute/Project Description</th>
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<tr>
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<td>International Rice Research Institute and research on rice pathology</td>
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<td>Agboola, Samson</td>
<td>15th International Union of Food Science and Technology Conference</td>
<td>South Africa</td>
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<td>Brar, Navneet*</td>
<td>19th World Congress of Soil Science</td>
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<td>Burns, Helen</td>
<td>ANU Conference on Resilience</td>
<td>Canberra</td>
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<td>Clayton, Ed</td>
<td>Australian Society of Animal Production Biennial Conference</td>
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<td>19th World Congress of Soil Science</td>
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<td>Cowley, Raymond*</td>
<td>Training course on plant breeding for drought tolerance</td>
<td>Colorado, USA</td>
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<td>Dehaan, Remy</td>
<td>Groundwater Discharge</td>
<td>New Mexico</td>
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<td>Gale, David*</td>
<td>Field evaluation experiments (part of Honours project)</td>
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<td>European Association for Animal Production Conference</td>
<td>Heraklion, Greece</td>
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<td>Australian College of Veterinary Scientists College Meeting</td>
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<td>Adelaide</td>
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<td>Kah, Yaw, Ee*</td>
<td>Public Health Association Australia Conference</td>
<td>Canberra</td>
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<td>Inspect experiments in field Chambers</td>
<td>From Manila to Wagga</td>
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<td>Raidal, Shane</td>
<td>Collaborative field work for project</td>
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*International Organisation for Biological and Integrated Control of noxious animals and Plants/West Palaearctic Region Section
**Travel Report**

**International Conference on Biotechnology, Food and Bioengineering, Emerging Trends and Future Prospects, PRIST University, Thanjavur, India**

Thanjavur is located in the heart of the “rice bowl” of India where much of the region's rice is grown in farm sizes that range between 1 and 100 ha. PRIST University is a newly established institution with courses in a range of areas including biotechnology and engineering.

Dr Chris Blanchard recently had an opportunity to represent the Graham Centre at the above conference, where he presented a paper entitled “Australian grain biotechnology: Progress and Challenges”. During the conference, held 26-27 February 2010, he was approached by many students wishing to pursue further studies in Australia. However, the most common queries were in relation to the safety of Indian students in Australia.

The highlights of the conference were hearing some excellent presentation by some postgraduate students, as well as making some useful contacts for our current research on pulses. Chris also had the opportunity learn more about Indian culture.

Further information: Dr Chris Blanchard, cblanchard@csu.edu.au; (02) 6933 2364.

**Strategic Research Initiatives**

*The Strategic Research Initiatives were established to provide focus for research within the Centre. Here we summarise the activities of the Healthy Food Products Initiative which aims to value add to food products post farm gate.*

**Healthy Foods Products**

**Forage and omega-3 fatty acids in meat**

*Dr Ed Clayton, Livestock Research Officer, I&I NSW*

**Focus:** improve health outcomes by increasing long chain omega-3 polyunsaturated fatty acid intake from meat through manipulation of animal diets.

During 2009 the forage and omega-3 in meat program made steady progress with a number of studies being conducted and ground work laid towards developing larger projects. We conducted two pilot studies examining the levels of omega-3 and omega-6 in fresh forage and silage. The first study at Wagga Wagga involved the analysis of omega-3 and omega-6 levels in an oat/pea and a canola crop. The second study was conducted with the HSR group (Snowy River Seeds) at Orbost in Victoria and involved the analysis of several parent lines of maize and sorghum prior to and following ensiling.

The primary outcomes of these studies were that omega-3 and omega-6 fatty acids were released as free fatty acids following ensiling and this increase in free fatty acids was associated with lower protection from rumen hydrogenation. The result is that the levels of omega-3 and omega-6 from silage available for meat would be lower than fresh forage. However, the effect of ensiling on omega-6 fatty acids was greater than omega-3, resulting in an improved ratio of omega-3 to omega-6 escaping rumen hydrogenation.

In 2010 results of the pilot studies examining levels of omega-3 in silage will be used in funding applications to gain further competitive funding. We are currently in the process of completing an ARC-linkage application with CSU (Prof Peter Wynn) as the lead investigator and I&I NSW as a co-investigator and the HSR group as the industry partner. We are also in the process of establishing a larger project with two leading silage inoculant companies to examine the relationship between silage production methods and omega-3 levels.
Health-promoting components of plants
Assoc Prof Samson Agboola, School of Agricultural & Wines Sciences, CSU

**Focus:** to understand the health-promoting properties such as antioxidant, antimicrobial and anticancer activities of plants with a view to producing bioactive ingredients that can be incorporated in food and/or nutraceutical products.

In 2009 we secured one large external grant ($141,750) from GRDC to study canola meal protein functionality over 3 years and successfully awarded a GRDC tender for up to $600,000 over 3 years to study eating quality of Australian pulses.

We have identified the chemical structure of active components in Australian wattle seed and faba bean varieties. These are mainly phenolic compounds.

In the context of *in vitro* health functional properties of Australian pulses we will investigate the role of antinutritional components in pulses and their effects on bioavailability minerals and proteins. Project specifications are currently being drafted and the project should commence in July 2010. Our current studies on faba beans will also include testing identified fractions (specific phenolics for which chemical structure has been identified – see above) for *in vitro* anticancer (at CSIRO, Sydney) and antihypertensive activities.

Food safety
Dr Jan Lievaart, School of Animal & Veterinary Sciences, CSU

**Focus:** improve the current Hazard Analysis and Critical Control Points (HACCP) programs in the beef and other meat industries, thereby enhancing food safety in the supply chain.

In 2009, a Beef Field Day was organised and conducted with food safety and biosecurity components in the program. This will now be an annual event: Annual Graham Centre Beef Field Day.

We are seeking funds for economical and software development and one for the development of on-farm rapid diagnostic tests of *E Coli O157, Campylobacter and Salmonella spp.*

Project updates

Liver fluke: improving disease control through understanding of parasite diversity, drug resistance and better diagnosis

Prof Terry Spithill, School of Animal & Veterinary Sciences, CSU

**Funding Body:** Australian Research Council Linkage

The ARC Linkage project studying triclabendazole resistance in liver flukes in NSW and N Victoria commenced in July 2009. This is a collaboration with Virbac Australia. Yvette Brockwell is now working to develop the BioX coproantigen ELISA for diagnosis of fluke infections in cattle. She has established links with cattle producers, has established protocols for cattle drenching and has obtained fecal samples for diagnostic testing. Susan Armstrong has started her PhD with scholarship support from the ARC, CSU and the Graham Centre. Susan will establish methods for genetic typing of parasites recovered from untreated cattle and from cattle after treatment with triclabendazole. This work will provide new insights into the population genetics of liver flukes in Australia. An Honours student, Angela Muller, is also now working on the project with a scholarship from the Graham Centre. Angela will work with Susan, establishing the DNA typing techniques using parasites recovered from different abattoirs in NSW and Victoria.

Further information: Prof Terry Spithill, tspithill@csu.edu.au, (02) 6933 2439; Sarah Armstrong, sarmstrong@csu.edu.au (02) 6933 4301.
**Mapping the distribution of hydatid tapeworm infection in rural and semi rural domestic dogs**

*Dr David Jenkins, School of Animal & Veterinary Sciences, CSU*

**Funding Body:** Novartis Animal Healthy Australasia Pty Ltd

The reason for interest in hydatid tapeworms (*Echinococcus granulosus*) is because their eggs are infective for people (as well as animals) leading to major ill health and sometime death of the patient. In this study funded by Novartis Animal Health Australasia P/L two tests have been undertaken on the faeces, the first to find and identify worm eggs in the faeces the second to specifically identify substances released by hydatid tapeworms. Intestinal worms release eggs into the gut of the infected dog and there may be several species of worms living in its gut. From the shape and size of these eggs, most dog worm infections can be easily identified. The types of worm eggs we have found commonly are hookworm, whipworm and roundworm.

Life becomes a little more complicated for identifying hydatid tapeworm eggs in dog faeces. Unfortunately, the eggs of hydatid tapeworms look exactly the same as eggs from four other tapeworm species found in dogs. These other species are of no public health importance, but it is crucial to know if you have a dog infected with hydatid tapeworms because of the public health and veterinary implications. Therefore, we use a method to identify hydatid tapeworms through substances released into dog faeces from the outer layers of the worms, referred to as coproantigens and we “trap” these coproantigens from extracts of dog faeces in a test referred to as an ELISA. So far the faeces from 1,236 dogs have been examined for worm eggs and we are in the process of screening the faeces samples for hydatid tapeworm coproantigens. At the time of writing we have tested 251 samples hydatid tapeworm coproantigens and have found a few positives. As final confirmation, we are also looking for hydatid tapeworm DNA in all the positive samples in our trapping ELISA.

The study is currently running way behind schedule mainly because of the difficulties we have encountered in obtaining dog faeces samples! Therefore, if any readers living on properties, small rural blocks or in small rural communities are interested in seeing if their dogs have intestinal worms, at no cost to themselves, please contact the project leader Dr David Jenkins.

Further information: Dr David Jenkins, djjenkins@csu.edu.au or (02) 6933 4179.
**Discovery of novel compounds as leads for natural herbicides**

Prof Jim Pratley, School of Agricultural & Wine Sciences, CSU

**Funding Body:** Grains Research & Development Corporation

Some weeds, particularly annual ryegrass and to a lesser extent wild radish, have a propensity to evolve resistance to herbicides used for their control. Annual ryegrass, for example, has evolved resistance to most modes of action to which it is subjected and has become the world’s worst example of this phenomenon. There is thus a risk that farmers will lose the ability to control ryegrass chemically as we run out of options.

Research at the EH Graham Centre has focused on the opportunity presented in nature of plants developing their own herbicides or compounds that could be used as herbicides. We have looked at over 250 species for their abilities to produce compounds with phytotoxic potential to annual ryegrass and wild radish. At the 10% extract concentration, we have found extracts from seven species which inhibited the root growth of annual ryegrass by 90% or more. A further 7 were effective against wild radish.

The process followed thereafter is to undertake a chemical analysis of the extracts by gas chromatography/mass spectrometry and liquid chromatography/mass spectrometry to identify the compound or compounds producing the effect. In many cases there are several chemicals involved and many are known allelochemicals. The project is at the analytical stage and the components of the extracts are being gradually identified. However the process is still in the preliminary stages.

In association with this investigation, we are evaluating the chemicals that are exuded by annual ryegrass roots. These may also be useful herbicide candidates. Ryegrass also has an association with an endophyte (a fungus that grows inside the plant) and we are looking at the alkaloids that are produced from that association and their value for weed control.

From this research we hope to have identified chemical compounds that can be synthesised to become new options for control of annual ryegrass and wild radish. It will not be the total answer to herbicide resistance but it may spread the risk of resistance happening.

Further information: Prof Jim Pratley, jpratley@csu.edu.au or (02) 6933 2862.

**Canola Yield Decline Update**

Dr Mark Conyers, Principal Research Scientist, I&I NSW

**Funding Body:** Grains Research & Development Corporation

A third and final year of field trials was conducted in 2009 after a one year extension was granted. Three sites were managed for the additional unfunded year: the saline site at Yuluma (CSIRO) the sodic site at Rand (CSIRO) and the acidic, hard pan site at Morven (Graham Centre). Despite the dry season, we were able to answer the question asked of us by GRDC. At the Graham Centre site we grew barley beside two varieties of canola. During vegetative growth the barley responded to amendments but the canola did not respond at any stage of growth. Whilst canola tap roots appear distorted when challenged by hardpans or acid throttles, there was no impact on final average rooting depth or on grain yield in seasons with little subsoil water. This is good news for growers, as the cost and technical challenge of deep ripping and subsoil liming appear to be unnecessary.

Further information: Dr Mark Conyers, mark.conyers@industry.nsw.gov.au or (02) 6938 1830.
Improving feed conversion efficiency and carcass in barrows

Prof Peter Wynn and Ms Carla Giles, School of Animal & Veterinary Sciences, CSU

Castration of male animals is a time honoured process used in animal production to modify the aggressive behaviour of male animals as they approach puberty. However this is accompanied by an increase in body fat content which to many health conscious consumers is not desirable: it is also associated with a decrease in the conversion of feed to liveweight which is not an attractive proposition for the pig farmer. Castration has an additional advantage in the pig in that it removes the source of the major cause of the unpleasant cooking odour associated with boar taint, androstenone.

The importance of foetal and neonatal experience to the subsequent growth and productivity of animals is just now being recognised through the explosion of information relating to the environmental modification of the animal's genome through epigenetic processes. Subtle changes in the methylation patterns of gene sequences seem to alter the subsequent patterns of gene expression as animals grow to maturity resulting in changes in productivity. Of course the challenge is to identify signals that promote productivity and avoid those that are aversive.

The positive effects that androgens such as testosterone have on growth hormone (GH) secretion are well established: GH secretory patterns in turn are important for promoting the efficiency of conversion of feed to liveweight gain and decreasing carcass fatness. These provide the rationale for the daily injection of finisher pigs with the commercial form of this hormone Reporcin®.

We have explored the efficacy of a single dose of testosterone given on day 1 post farrowing on the growth of male piglets after surgical castration on day 3 through to weaning at day 28. Dose of 8mg/kg liveweight stimulates the growth of piglets to weaning by about 20% resulting in an increase in the circulating levels of the key metabolic hormone Insulin-like Growth Factor 1 (IGF1). Generally IGF1 status provides an integrated measure of the metabolic efficiency of animals.

Having established the principles we now want to see if non-steroidal androgens developed to treat androgen deficiency in humans without causing malignancies in the prostate can be used as a substitute for the steroidal molecules. These molecules, the selective androgen receptor modulators or SARMS will be much more attractive for use in the pig industry as they are non-steroidal and are therefore not going to pose a steroid residue risk for consumers. Of course our method of treating just once immediately post farrowing is going to minimise this risk in any case.

Some of our biggest challenges in animal production lie ahead in identifying the embryonic, foetal and neonatal signals that alter the lifetime productivity of animals. We are taking the first steps here to develop such treatment protocols in an industry where feed conversion efficiency is the primary determinant of the profitability of commercial production.

Further information: Prof Peter Wynn, pwynn@csu.edu.au, 02 6933 2938 or Carla Giles cgiles@csu.edu.au, (02) 6933 2937.
In The Limelight

Matthew Gardner

Position: PhD Student

Supervisors: Dr Jason Condon (CSU), Dr Mark Conyers, Dr Brian Dear and Dr Guangdi Li (I&I NSW)

Thesis Title: How does Chicory influence the nitrogen cycling processes of pasture systems?

Funding Bodies: Future Farm Industries CRC

Relevant Current Employment:
I started the position of Trainee Research Agronomist (Pastures) (Part-Time) in late February with Industry & Investment, NSW at Wagga Wagga.

Career and studies till now
Up until this point I have accumulated very few points in the career column. After finishing school I had a break year working on a mixed farm, and fencing in the Upper Hunter Valley. I completed a Bachelor of Science (Agriculture) at CSU Wagga Wagga (2006) before completing Bachelor of Applied Science (Honours) in 2007. It was the enthusiasm and passion of Jason Condon and Mark Conyers (honours supervisors) for research that has lead me toward what will be hopefully a successful career in research.

Currently studying
I am currently entering the final year of my PhD, which is looking at the influence of chicory on nitrogen cycling processes when it is grown in combination with subterranean clover and lucerne. To date, my PhD has been a very enjoyable experience, which I hope will continue over the next 12 months.

Research Interests
I have developed a keen interest in understanding nutrient cycling under both pasture and cropping systems and how these cycles can be manipulated to maximise the benefit for each systems. In addition, I am interested in the function and increasing the use of legumes in mixed farming systems.

Professional Links
- Australian Soil Science Society Inc

A typical day for me includes … My job and study vary a lot (which is great) so I generally get a good mixture of administrative and writing tasks done in conjunction with either some field or laboratory work each day. In spare time recently, my fiancé and I have been busy organising our wedding, which is coming up soon.

My main project at the moment is … I’m currently working on an exciting experiment that is looking at the direct transfer of N from legumes to chicory through mycorrhiza fungi, which is a part of my PhD.

My favourite part of my studies is … My studies have allowed me the freedom to work in an area that I enjoy and am passionate about. It has also been a wonderful opportunity for learning where I have been able to draw on the knowledge and experience of others while developing my own experiences in research.

When I am not studying I like to … spend time with my fiancé, catch up with family and friends, play golf, go trout fishing.

Current CD in my car is … ACDC.
Catherine Gulliver

Position: PhD Student

Supervisors: Dr Michael Friend, Dr Belinda King, Dr Susan Robertson (CSU), Dr Edward Clayton (I & I NSW), Dr Graeme Martin (UWA).

Thesis Title: Improving reproductive efficiency in ewes: manipulating ewe nutrition to increase ovulation rate and alter the sex ratio of offspring.

Funding Bodies: Australian Postgraduate Award (APA) and top-up from Future Farm Industries CRC (FFI CRC).

Relevant Current Employment: PhD student at Charles Sturt University.

Career and studies till now: My family owns a broadacre cropping and cattle farm near Quirindi on the Liverpool Plains, so I’ve always been interested in agriculture, particularly animals. This interest led me to study a Bachelor of Animal and Veterinary Bioscience at the University of Sydney. My fourth year honours thesis focused on lamb survival in the Sheep Genomics research flock based in Deniliquin, NSW. While studying, I was lucky enough to be chosen to travel to the US as part of the Australian Intercollegiate Meat Judging (ICMJ) team. The trip was a fantastic experience that fostered my interest in livestock production and meat quality. After graduating in 2006, I worked for Meat and Livestock Australia (MLA) in the National Livestock Reporting Service (NLRS) writing livestock reports before moving to Brisbane to work for an animal genetics company, Catapult Genetics. In 2008, I moved to Wagga Wagga and commenced my PhD in sheep reproduction and nutrition and am currently in my third year of research.

Currently studying: My PhD!

Research Interests

- Improving reproductive efficiency in livestock
- Manipulating nutrition to alter the sex ratio of offspring
- Benefits of omega-3 fatty acids in livestock production
- The use of conserved forages to improve livestock productivity

A typical day for me includes … at the moment I am in the middle of a sheep trial, so my days generally consist of feeding 300 sheep in the morning and mixing feed in the afternoon, as well as weighing, ultrasounding, and collecting blood samples on particular days. I also try to squeeze in a bit of lab work if possible.

My main project at the moment is … a sheep trial to determine whether you can alter the sex ratio of offspring by feeding ewes diets that differ in their omega-3 and omega-6 fatty acid concentrations.

My favourite part of my studies is … Learning new things, getting my hands dirty and spending time outside with my sheep!

When I am not studying I like to … Play sport (softball, tennis, hockey, netball, touch football), go water skiing, horse riding, read a book, or have a tinkle on the piano.

Current CD in my car is … a mixture of Taylor Swift, Kings of Leon, and a number of country classics!

Secretariat

Who’s who and how to contact us

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www.grahamcentre.net
the Innovator - Autumn 2010
Recent happenings

The Graham Centre Field Site Steering Committee held a planning meeting in February to discuss the Graham Centre site functions and demonstrations for 2010. The official Site launch and Field Day will be on 8 September 2010 from 9 am until midday.

Committee members pictured, back row L-R: Phil Bowden, Jim Mellor, Terry Edis, Mark Harris (Chair), Greg Condon, Deirdre Lemerle, Neil Durning. Front: Helen Burns, Warwick Nightingale, Ben Hogg, and Peter McInerney. (Absent: Ross Henley and Mike O’Hare). Photo: Sharon Kiss.

Researchers and supporters of platypus research held a morning tea in March to celebrate the publication ‘Genotypic analysis of Mucor from the platypus in Australia’, as well as congratulating Tom Clandige (Environmental Science Honours) for finishing his platypus research and welcome Sarah Cordell (Animal Science Honours) who is starting hers.

Pictured above, are the authors of the publication, from left, Assoc Prof Gavin Ash, Dr Joanne Connolly and Dr Ben Stodart. Joanne’s platypus cake was enjoyed by all.

Professor Len Wade (Graham Centre) left, thanks Dr Tanguy Lafarge from the International Rice Research Institute in the Philippines, for presenting a seminar on climate change and drought to Centre members in February. Photo: Maree Crowley.

Graham Centre member, Dr Mark Stevens (I&I NSW Yanco) discusses rice genotypes with Mr Ronnie Datona and Dr Maia Wamala from the Department of Agriculture of the Papua New Guinea University of Technology. Photo: Deirdre Lemerle.

Recent happenings
International exposure for ‘Sisters’

Professor Deirdre Lemerle, Director of the Graham Centre, will feature in the documentary Sisters, being exhibited in the Australian Pavilion at the Shanghai World Expo from June to October 2010. For more than 20 years Deirdre has been researching methods to produce crops more efficiently and improve weed management practices for a more sustainable future. She is promoting agricultural R&D.

Other NSW ‘Sisters’ featured include New Inventors’ panelist, Professor Veena Sahajwalla, and Dr Marilyn Clarke, Australia’s first Indigenous obstetrician.

Highlighting the people-to-people links shared between Australia and China, Sisters tells the stories of 21 Australian and Chinese women whose work and dedication are making a real difference to their communities. The documentary showcases the achievements of women who are leaders in their chosen fields of science, research and innovation, the environment, the charity world, business, the arts, and culture. Deirdre was nominated by Wagga Wagga Mayor, Councillor Kerry Pascoe, to be on the program.

Air Quality Workshop

The Graham Centre and the Department of Environment, Climate Change and Water (DECCW) hosted an Air Quality Workshop on Monday, April 12, 2010 to discuss with local stakeholders the air pollution problems recorded at Wagga Wagga. Around fifty people, including the NSW Environment Protection Authority (EPA) Board attended the event. The diverse group ranged from environmental, agricultural and health care professionals.

A panel discussion, chaired by Lisa Corbyn, Director General for DECCW, agreed that there is a need to continue to work together in a collaborative way. Also, we need to better understand the sources of air pollution and, subsequent health implications.

The Graham Centre Field Site due to be launched on 8 September 2010 was also visited by the EPA Board where they were shown conservation farming techniques used to enable stubble retention. These techniques have environmental and human health benefits as well as greater water conservation and ground cover.

Graham Centre Director, Professor Deirdre Lemerle said that this Forum will likely become an annual event to keep the community updated and involved with new information as it becomes available.

Winter Edition of The Innovator

The Winter Edition of The Innovator will be released July 2010. Submission of articles for this edition closes on Friday, 18 June 2010. Please email articles to Sharon Kiss.