



FGC News

Newsletter for the ARC Industrial Transformation Training Centre for Functional Grains

Winter 2016



From the FGC Director

It's been a busy few months for the FGC. We now have a full complement of students and I would like to welcome Rachael Wood and Stephen Cork to the centre who have taken up our final two scholarships. I'd also like to welcome Erica McIntyre who has recently commenced in a postdoctoral position working on the GRDC funded Pulse Market Intelligence project.

Welcome also to Dr Anwar Shad who is a visiting Endeavour scholar from Pakistan and also to our new visiting scientist Dr Azim Ataollahi Oshkour from Iran.

Attending the FGC Retreat in Canberra recently has been the highlight of my time as Director of the FGC. It was great to spend time with FGC members completing teamwork activities, visiting funding bodies and also have lots of fun. We have such a great bunch of people in the FGC and it was a privilege to get to know everyone better. Thanks to our hosts ARC, GRDC, ACIAR and CSIRO for welcoming us to your organisations.

I've had the opportunity to attend a number of meetings and conferences in recent months including the Australian Grain Industry Conference, AIFST convention, a Sorghum Workshop and various rice industry meetings and workshops. I had the opportunity to establish new collaborations at the Sorghum workshop which will be useful for our new GRDC funded Sorghum quality project.

Congratulations to Michelle Toutounji for winning best student presentation at the Faculty postgraduate symposium. This is becoming a FGC tradition. Well done also to Neeta Karve and Saira Hussain for reaching the AIFST student product development competition.

This was a great achievement and Neeta also did a great job with the various media interviews that this achievement generated.

Speaking of media, Prof. Anthony Saliba starred in a recent episode of Landline talking about the market perception of

pulses. I'd encourage you to watch that story as it gives an excellent overview of the opportunity we have to improve the value of Australian pulses.

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Annual AIFST Convention 2016

By Thiru Vanniasinkham

The annual Australian Institute of Food Science and Technology (AIFST) convention was held in Brisbane from 26 -28 June 2016. The theme of this event was entitled "Pulse of the Industry". FGC members who participated in this convention included Asgar Farahnaky who was on the organising committee, Neeta Karve, Saira Hussain, Chris Blanchard and Thiru Vanniasinkham. The conference was well organised with speakers from both research and industry giving talks on various topics of relevance to the future of food technology.

The conference had an impressive trade event organised by FoodTech Qld with numerous stalls showcasing the latest technology in food processing equipment through to state of the art technology in testing for allergens and microbial contamination in food. A breakfast for young professionals was an opportunity for PhD students to listen to a panel discussion by experts from organisations such as CSIRO on topics that related to their future careers.



Thiru speaking at AIFST Conference - 26-28 June 2016



The conference was attended by over 800 delegates and was a great opportunity to meet researchers and industry representatives to discuss research collaborations as well as have discussions on topics such as food safety regulation.

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ARC Director's Forum

By Marianne Graham

The ARC Director's Forum is a two day conference for the ARC's funded organisations and projects which Prof. Chris Blanchard and I attended. The objective of the forum was to present and stimulate discussions on all of the aspects of setting up an ARC funded Centre – whether a very large Centre of Excellence with hundreds of researchers or the smaller ARC Training Centres with between 10 and 20 PhD Students and Postdocs – the FGC falling into the latter category, with the ultimate aim being the success of the Centre's overall research vision.

The main themes of the forum were industry collaboration, maintaining strong communications with the ARC (particularly if things are not going to plan), the management of Intellectual Property and the importance of marketing and communications.

Being a non-scientist with a background in commercial business, I found the idea of institutions needing to communicate and "market" their results and outcomes a new and fascinating idea worth some contemplation. I was involved in a small group discussion with one particularly stimulating person, Alvin Stone, who is the Media and Communications Manager for the ARC Centre of Excellence for Climate System Science at UNSW.

His dialogue on the value of communicating research to the community (both scientific and general) was captivating and included such commentary as research that is picked up by traditional media (newspapers, radio, TV etc.) has an increase of 70% more citations with the first 6 months! Marketing and communications is important for several reasons: the overall success of the project; continuation or renewal of funding; enhancing collaboration with other relevant academic or industry sectors; and career ambitions of the researchers themselves.

I had the realisation that scientific research is a "product" – like any other – in need of promotion of its "value proposition" to the community, government, and the politicians who decide policy, to ensure the growth of this "product". One speaker showed graphically, the relatively low level of research funding provided by the Australian Government and again, the point was illuminated that it is very important for the "man on the street", as well as government bodies and politicians to be alerted to the benefits that bodies like the ARC and its financed organisations contribute to our

everyday lives. It was an interesting and illuminating forum which was run extremely well by the ARC.

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FGC Canberra Retreat

By Robert Taylor

Students and staff from the FGC attended a three day session of training activities in Canberra in July 2016. Travel from Wagga Wagga to Canberra on the Friday evening allowed for some general discussion before a short casual dinner where an outline of the tasks to come was provided by Chris Blanchard.

Saturday was a formal group training session conducted by a professional team-building organisation. It turned out to be a thoughtful, considered and useful series of tasks – as individuals and in mixed groups – conducted in a structured process that stimulated an understanding of just how one operates in a range of social and work situations. A relaxing meal was had thereafter at the iconic Kingston Hotel. Sunday commenced with a seminar at which the participants offered a brief introduction to aspects of their life outside of the workplace.

With such a diverse mix of personalities and backgrounds, there were some surprises! The rest of the day was spent touring the National Museum and Art Gallery and finished with a stunning display of sporting mayhem at a ten-pin bowling establishment. The final day had visits to the ARC, ACIAR and GRDC. Each organisation was seen to function under different philosophical and operational drivers. These organisations are important in the areas of research undertaken at the FGC and to gain some understanding about the way they work and expectations of researchers was invaluable.

A final visit to CSIRO Plant Industries covered aspects of plant-based genetic research and how it is tied in with marketing outcomes. In all, this was a valuable training



FGC Canberra Retreat



exercise and was arranged by FGC management with care and insight into the needs of post-graduate and early-career researchers.

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FGC Retreat - Visiting Collaborative Institutions

By Chris Florides

What better way to conclude yet another successful post graduate symposium, than an FGC group retreat in nearby Canberra. Having had lots of fun and games during the retreat, the Monday was dedicated to visiting some of the collaborative institutions relevant to our research. The group visited the ARC, ACIAR, CSIRO and GRDC and were well received and given presentations regarding each body's function in agricultural research.

The highlight of the day for me was the visit to the Australian Centre for International Agricultural Research - ACIAR. I for one, didn't know this organisation existed. We were warmly welcomed with tea and coffee in a lovely conference room, where several members of this organisation gave talks to explain the organisation's function. They are an Australian Government statutory authority under the umbrella of the Dept. of Trade and Foreign Affairs. The main task of these agricultural scientists is to devise solutions to agricultural problems and improve agricultural sustainability in developing countries. They are part of the government's overseas aid programme and their research projects focus around helping rural communities increase incomes and improve their quality of life.

After a few presentations on their research projects in exotic areas of the globe, we were treated to a scrumptious lunch where more members of ACIAR joined and mingled with us. The session finished with a discussion of our group's function. They showed interest in our projects and asked many questions. After a few group photos we departed and



FGC Canberra Retreat Saturday night dinner

I was left with a true appreciation of what an important and meaningful role these scientists play in the life of so many underprivileged people in need across the world.

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AGC Conference

By Professor Anthony Saliba

I had the pleasure of presenting on global consumer trends at AGIC in Melbourne. It was my first AGIC conference and I enjoyed meeting such a broad range of people. There was an excellent mix between business, innovation/product development and science talks, and that was captured in a thoroughly researched piece on Landline: <http://www.abc.net.au/landline/content/2016/s4519094.htm>. If you missed my talk but are interested in what I had to say you can watch the entire session at: <https://www.youtube.com/watch?v=O6omxcd5im4>. A good deal of the conference can be streamed (check out <http://www.ausgrainsconf.com/australia/presentations>) and while there was plenty of material you might be interested in, I'd recommend you take a look at Session 8: Globally competitive value chain for the grains industry - what are the drivers? (<https://www.youtube.com/watch?v=8DoROvgYlk>). Take home message from the conference for me? I was surprised how so many attendees were solely focused on wheat, despite the focus on pulses at the conference.

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Professor Anthony Saliba speaking on Landline

AIFST Student Product Development Competition

By Neeta Karve

As part of the AIFST continuing career development program I had a unique opportunity to participate in the 2016 AIFST SPDC. The theme of the competition was to develop new products by incorporation of pulse ingredients or whole pulses, 2016 being declared by the United



Nations as 'International Year of Pulses'. I formed a team with my colleague Saira Hussain, who had just completed her PhD from CSU. After a few brainstorming sessions and background research we decided to develop 'pasta' based on germinated peas as our new product. As we moved through the competition we learnt various aspects of product development from the stage of concept to commercialization. We were amazed to find out that our product was chosen as a finalist in the competition. We had a great opportunity to present our product to the judges at the AIFST annual convention in Brisbane. Our product gained a lot of media attention after the convention. The AIFST student product development competition gave us great practical experience and we were able to demonstrate how research can be applied to develop new mainstream consumer friendly products by incorporation of functional pulse based ingredients. We hope that these initiatives will help grow the utilization and consumption of pulses in Australia and across the world.

RIRDC - Rice R&D Workshop - Thursday 18 August 2016

By Dr Philip G. Kerr

This is an annual event which was held this year on 18th August 2016. It is hosted at Yanco Agricultural Institute and brings together a host of rice growers, breeders and researchers from across NSW and some of the borderlands, both to our north and south. For the CSU crew of the Functional Grains Centre this a substantial day trip, and this year was no exception. For me it started at 5.30am. The weather was crisp but bright sunshine enlivened our conversation on the trip along the Sturt Highway. It was a very congenial group (Vito, Anwar & Kishor, with Bushra & Steve on the way back) in the bus – but we avoided singing endless choruses of ten green bottles! We arrived slightly later than hoped for, but after finding seats and making a coffee or tea, we settled in for the morning program which included many presentations on a multitude of topics

- What's new in rice weed management
- New rice herbicide registrations



RIRD Workshop Back Row L-R Bushra, Chris, Phil Kerr, Kishor, Dr Aziz, Anwar, Vito. Front Row L-R Shiwangni, Michelle, Rachael, Stephen

- Biosecurity in the Australian rice industry
- Social factors influencing technology adoption
- Modernising rice data collection
- Variety agronomy, remote sensing, plant populations
- PA in rice - implementation and grower insights
- Maximising irrigation efficiency
- Tools for measuring and managing variability
- Queensland industry development
- International Temperate Rice Conference
- Rice breeding and grain quality update
- Rice blast characterisation
- Cold tolerance traits and QTLs
- Microwave based weed management
- Nitrogen uptake and losses
- Greenhouse emissions in rice
- Functional Grains Centre (FGC) projects
- Grain protein profiles and quality

A very 'full-on' program involving a very diverse range of topics! After a big photo shoot for the FGC members in attendance, we went our various ways with several members staying on overnight for meetings the following day. This bus driver had a wonderful time and on the way home we stopped for more photos of visiting fellows and a fantastic full moon just on the rise above the highway. All in all, it was a very tiring but satisfying way of spending a day learning of what's happening in the world of rice. Many thanks to our hosts at Yanco.

Profiles

Rachael Wood



I began my PhD candidacy in August 2016 with the Functional Grains Centre (FGC) at CSU. I graduated from La Trobe University in 2013, with an honours degree in animal science and agriculture. After completing my degree, I moved to Yanco in the NSW Riverina to research pests of stored grain with the Department of Primary Industries' Biosecurity group. There, I was introduced to Chris Blanchard who encouraged me to undertake a PhD with FGC. Based at the Yanco Agricultural Institute, my project aims to determine the impact of farmer practice on rice quality and milling yield throughout Australia's southern rice growing region. I am excited to be involved in a research project that will have real world applications for rice growers.

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Erica McIntyre

My name is Erica and I'm an early career researcher, having recently completed a PhD in Psychology. I have two undergraduate degrees, one in psychology and the other in health science. I currently work part-time as a postdoctoral researcher in the FGC on a project looking at pulses market intelligence. The first stage of the research is exploring the consumption behaviour of chickpea consumers in India.



My second part-time position at CSU is as a Research Associate in the School of Psychology, where I am conducting research in health and consumer behaviour. My primary research interests relate to integrative approaches to mental health, which incorporates lifestyle changes, complementary therapies, psychological therapies, and pharmacotherapies. Diet is a lifestyle factor now well recognised as being critical to maintaining good mental and physical health. The unique nutritional profile of pulses means they are an important food to include in a healthy diet. I'm hoping that my research may assist to raise awareness of the healthiness of pulses and inspire more people to eat them. The outcomes of the current FGC project will assist producers of chickpeas in Australia understand what consumers want in the chickpea products they prepare and eat.

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Stephen Cork

Living in the Riverina for the last 15 years I have had the opportunity to be part of some of the exciting agricultural product processing success stories in the Riverina such as grain fed beef, rice, wine, citrus, and canola oil.



I am passionate about seeing Australia value add to its world class agricultural products and see the good solid application of scientific principles as a key factor in achieving this. To this end I have started my PhD with the Functional Grains centre in August with Industry partner Woods Grains looking at processing properties of Chickpeas and other Pulses.

Previously I have worked at Riverina Oils and Bio Energy as Quality Manager, Riverina TAFE teaching Laboratory operations at the Food and Wine Centre at Griffith, and was the Laboratory Manager at Rockdale Beefs NATA certified lab. I originally studied Science majoring in Chemistry at Macquarie University and am looking forward to learning a lot about developing food technology for pulse the industry.

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Visitors

Dr Anwar Ali Shad

It is a privilege to be part of CSU and the FGC group in particular. I am a visiting research fellow from Pakistan where I work as an Associate Professor at The University of Agriculture, Peshawar, Khyber Pakhtunkhwa.

Being blessed with arable land and a robust irrigation system, Pakistan's agriculture is the key sector of our economy. It contributes about 24% of GDP and employs about 43% of the labour force. Approximately 27% of Pakistan's total land area is under cultivation comprising 18.63 million hectares of irrigation and 3.41 million hectares of rain-fed agriculture. We are the largest producer of Chickpea (3rd), Mangoes/Rice(4th), Sugarcane/Date (5th), Apricot (6th), Onion (7th), mandarin (6th). The key focus of our research is to increase the per hectare yield to feed our massive population (199.1 M).

Two years back, during a routine research study, I became aware that NSW is the agriculture hub of Australia and the researchers and farmers often rely only on rain for their crops. I was told that there was a researcher here - Prof Dr Chris Blanchard - working as cereal specialist whose motto is "Think Differently". He and his team focus on the promotion of bioactive cereals and agriculture produce and production of higher yields. His research theme persuaded me to visit CSU, Wagga Wagga.

I heartily acknowledge Prof Dr Chris Blanchard for accepting my request to be an Endeavour Research Fellow-2016 in the FGC as without his approval it would not have been possible. The Endeavour Research Scholarship is one of the most internationally competitive, and prestigious merit-based scholarships supported by the Australian Government.

I also visited the University of Bristol as a research fellow in the UK for about one year. I worked on the biodiversity of phytochemicals/nutraceuticals within cereals and wild natural flora.

Bearing in mind my previous research, Chris inspired me to devise a project on the nutraceutical potential of cereals especially rice, in relation to various food processing. I am excited about the outcome of my research.

The great academic opportunity, enthusiastic research atmosphere and amazing researchers were my decision factors for the selection of an institute to work with and I found all of these in the FGC at Wagga Wagga. I am optimistic this research visit will strengthen both my own and the FGC's research capabilities. I

am confident that this opportunity will increase support for need-based research on functional grains through collaboration between FGC-CSU and the University of Agriculture, Peshawar. I am hopeful of signing of an MOU between the two universities.



Dr Azim Ataollahi Oshkour

Azim Ataollahi Oshkour is from Iran and a PhD holder in Mechanical Engineering from University of Malaya, Malaysia. His field of study is Biomechanics and Biomaterials.



At the moment, he is working on biopolymers. His main scope of research is to develop a degradable bio-composite polymer from starch with higher mechanical properties for packaging and tissue engineering purposes.

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of getting higher protein recovery rate in canola protein extraction for obvious commercial benefit. Feedback from the delegates was received for improvement and further idea generation purposes.

Other activities at the Congress such as presentations by young scientist award winners, and young scientists' workshop were planned by the organiser and fit into the already packed programs. Programs such as flash presentations, student product development award presentations, sponsor pitches, and industrial award pitches were carried out concurrent to all sessions at the main exhibition area. The exhibition area was also the meeting place for networking, catering, and sponsors' booths. On top of that, competition entries from the finalists of the Global Student New Product Development competition were also presented there. It showcased the creative work of food innovators from around the world.

Siong had the opportunity to catch up with previous colleagues, to say hi to current colleagues, and to build the network with future colleagues working in similar and compatible research areas. Additionally, Siong also had the opportunity to have a meeting with Megan Bell (Elsevier, Acquisitions Editor, Food Science) to discuss the possibility of contributing to a book chapter. Another discussion over coffee also created a possible opportunity for Siong to join the editorial board of a journal.

Other than constructive feedback on the current project, the Congress undoubtedly opened doors to possible collaborations with several entities. Besides the trip to Ireland for the World Food Congress, Siong had the opportunity to visit Pilot Pflanzenöltechnologie Magdeburg e. V. (PPM) in Germany. PPM runs Germany's first and unique experimental pilot plant, research into oils and proteins. He was hosted by Dr Ralf-Peter Tressel, the head of the protein department along with Jesus Palomino Oviedo. They had a meeting for formal introductions to PPM and FGC, as well as discussion on the current issues faced by the commercialisation of canola proteins.

Siong was then given a tour to the pilot scale setup of protein extraction facility. This includes the facility to process oilseeds to produce an oil free meal for protein extraction. PPM had developed a milder toasting process to remove the solvent from the meal using a fluidized bed system. A pilot scale fluidised bed desolventiser system was developed to enable gentle desolventising process at lower temperature and shorter time, to preserve the protein quality hence better functionality. It was an eye opening tour to the PPM lab. The well-designed pilot plant could produce data that better represents large scale protein extraction at commercial level. That could be the missing puzzle of the current FGC lab-based research of a commercial project.

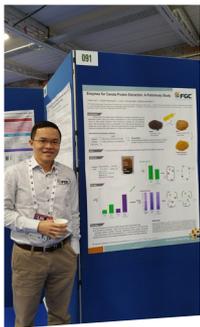
Siong would like to acknowledge the financial support from FGC and Graham Centre.

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18th IUFOST World Congress Food Science and Technology

By Siong Tan



The 18th IUFOST World Congress of Food Science and Technology was held successfully in Dublin, Ireland (21 - 25 of August). The theme was Greening

the Global Food Supply Chain. The World Food Congress began with the inaugural Global Food Summit. The summit brought together experts from the food industry who influence policies worldwide to enable a sustainable food supply for all countries. The outcomes included tangible and actionable items towards achievable goals by focusing and collaborating on strategies regarding food sustainability.

The Congress was then followed by full on programmes for four days. Besides the exceptional talks in plenary sessions by experts in food, the congress put together over 80 sessions of various themes for the delegates to share their latest research findings. Many presentations coincidentally pointed out two crucial inclinations in food research - the necessity to collaborate between industry, government and academia; and the necessity to have a sustainable food system.

Dr Siong Tan presented a talk at the congress (Protein Sources of the Future). He talked about the residual anti-nutritional components in the Australian canola and non-canola grade meal proteins. His talk has attracted the attention of several research scientists on the spot. The discussion came to an agreement that not only is it that the content of intact glucosinolates that needs to be studied, but the content of their breakdown products as well.

At the Congress, IUFOST Food Security Panel conducted forums on various topics relevant to food industry. The panel discussed issues such as sustainable and healthy food systems, filling the production gap, improving the efficiency of the food production system, and influencing the demand for food. More than 200 posters were presented each day according to specific themes. Siong presented a poster in Future Foods Session. His work on using enzymes to assist canola protein extraction shed some light on the possibility



Winning the HDR Symposium Award

By Michelle Toutounji

The CSU 2016 Faculty of Science Higher Degree Research and Honours Symposium was held on 30th June and 1st July at the Convention Centre on the Wagga Wagga campus. A variety of research was showcased, ranging from food and water to human health and environment. Well-attended by staff and students, the conference setting also became an ideal ground for networking. Engaging conversations extended all the way to the final workshop held by Chris Scott and Peter Spooner called 'Writing a Thesis vs Publishing a Paper', which I found to be particularly interesting.

On the last session of the last day of the symposium, I represented the School of Biomedical Science and showcased my research in an oral presentation titled 'Factors affecting the starch digestibility of rice'. Slightly nervous and worried about whether I had put in enough practice, I just went out there and did my best. About 20 days later, an email arrived in my inbox informing me that I had received the prize for outstanding presentation at the symposium, tied for first place with Cara Wilson (School of Animal and Veterinary Science). One word: stoked!

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Rice GI Taskforce Meeting

By Michelle Toutounji

Born from the public's desire for a healthier, more slowly digestible rice, the Australian Government formed a special alliance between the food industry and a small number of universities who have dedicated their efforts towards understanding the digestibility of rice. The alliance includes the NSW Department of Primary Industries (DPI), SunRice, Charles Sturt University, Western Sydney University, and Southern Cross University. They call themselves the Glycaemic Index (GI) Taskforce.

On the 19th August, the 3rd GI Taskforce Meeting was held at the NSW Department of Primary Industries (DPI) at the Yanco Agricultural Institute. Laura Pallas, Rachel Ward and Peter Snell from the DPI gave updates on GI trial plots and sample requests. The newest researcher to join the force, Vito Butardo, a newly appointed post-doc at CSU, spoke of his varied and rich experience at IRRRI and CSIRO and the direction he would like to move toward in the future. Further presentations were given by students and staff from each university. As a representative of CSU, I presented my findings on the optimal cooking method before in vitro digestibility analysis. The importance of standardizing the cooking technique and associated parameters is paramount as it has a significant effect on the subsequent assays.

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