



## From the FGC Director

By Professor Chris Blanchard

In this issue of our newsletter you will hear about some of the great interactions that our members are having with each other, as well as with stakeholders outside the Centre. This year's retreat provided members with an opportunity to continue to build their teamwork skills and get to know other Centre members. Team Building Australia again provided an excellent program that was both challenging and enjoyable. Thanks to Steve Cork who took the initiative to run a post workshop session that gave us an opportunity to reflect on what we had learned at the retreat.

I'd like to express my gratitude to the team who participated in the MyScience program this year. This program has become an FGC tradition where our PhD students mentor primary school students to develop a science project. I'm not sure if it is the primary school students or the PhD students who learn the most from this experience however we see it as an important role to mentor the next generation of scientists.

The FGC was proud to host the first ever rice quality symposium in collaboration with RIRDC (now AgriFutures Australia) and the NSW Department of Primary Industries (DPI). Rice quality is often a minor component of a scientific conference so it was exciting to have a whole day devoted to this topic.

We were honoured to have invited guests such as Richard Heath from the Australian Farm Institute talk about the importance of quality in driving the profitability of the rice industry. Among the 50 participants were researchers and industry stakeholders who travelled from as far away as Canberra, Sydney and Malaysia.

We are very pleased to welcome some new members to the Centre. Dr Kirsty McKenzie has joined as a postdoctoral researcher in the GRDC Sorghum project. Jenny Locker has

joined as an administration officer in the ACIAR pulse project. Nancy Saji along with her supervisors James Crane and Andrew Delaney have joined to work on a SunRice sponsored project measuring the impact of rice bran consumption on cognition.

FGC student, Shiwangni Rao, continues to be a shining star. Her excellent performance in the three minute thesis (3MT) competition saw her receive second prize as well as the people's choice award.

Shiwangni also had the honour of receiving a scholarship from the Crawford Fund to attend a rice production course at IRRI in the Philippines. For a great summary of her trip and some excellent photos I recommend you have a look at Shiwangni's twitter feed at @ShiwangniRao.

## Rice quality on the menu at symposium

*Rice quality from paddock to plate was on the menu at a research symposium hosted by the Functional Grains Centre (FGC) on Wednesday 19 July.*

*The Australian Rice Quality Symposium was organised by the FGC in collaboration with the Rural Industries Research and Development Corporation (RIRDC) now known as AgriFutures Australia, and NSW Department of Primary Industries (DPI).*



Australian Rice Quality Symposium



## FGC members reflect on the Australian Rice Quality Symposium

### Postdoctoral research fellow, Dr Vito Butardo Jr.

The inaugural Australian Rice Quality Symposium focused on the Australian rice industry and brought together a range of stakeholders from the rice supply chain including growers, researchers and processors to develop a plan for future research investment.

Four sessions were conducted where speakers discussed breeding, marketing, health and factors affecting rice grain quality.

### FGC PhD student, Mr James Lee

The symposium was very interesting and I learnt quite a lot from the presentations from people with different backgrounds involved in the rice industry. There were many interesting topics such as the trend towards marketing high-quality grains as premium products and how the global origin of rice is northern Queensland.

Overall, this was a wonderful symposium and I look forward to attending and seeing more of in the future.



Professor Chris Blanchard with PhD students Ms Michelle Toutounji, Ms Esther Callcott and Ms Shiwangni Rao (photo CSU Media)



Professor Chris Blanchard, Professor John Mawson, Professor Anthony Saliba FGC with Mr Richard Heath of the Farm Institute (photo CSU Media)

## Spotlight on sorghum research

The Australian sorghum workshop in Brisbane in July saw presentations from 20 researchers and industry experts about genetics and innovative uses for the grain. Sorghum is 'lucky' in that it receives this attention and boasts a number of experienced researchers, despite being used mostly for animal feed in Australia. Future opportunities for sorghum included extracts, use in the Chinese spirit Baijiu and as a human food source. The Functional Grains Centre (FGC) was represented by Professor Anthony Saliba who presented our work on the use of Australian sorghum in the production of Baijiu.

Professor Saliba presented the first phase of the results, the demand characteristics described by Chinese producers. The next phase of that project is to examine consumer sentiment around Australian sorghum for use in Baijiu production. If Australian sorghum can be used by some producers in China an exciting new market opportunity would open up that is large in volume and potentially a more premium segment than sorghum's traditional use within Australia.

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## International training for FGC student

Functional Grains Centre (FGC) student Ms Shiwangni Rao has just returned from a training program through the International Rice Research Institute (IRRI) in the Philippines.

"The International Rice Research Institute's training programs are designed to build the next generation of rice scientists to reduce poverty and hunger, improve the health of rice farmers and consumers, and ensure environmental sustainability of rice farming," Ms Rao said.

"It was a wonderful opportunity to learn more about the various rice varieties and their production in Southeast Asia, to meet other emerging scientists in this field and pick up some new skills that I can put into practice in my own research."

"I learnt a lot about new innovations in rice research, such as production of golden rice with enriched beta carotene, zinc enriched rice, climate ready rice and C4 rice.

"I was also able to step out of the lab and gain an understanding of some of the difficulties of a small holder farmer in Southeast Asia.

"The course also broadened my understanding of why grain handling is as important as getting a higher yield, as poor post-harvest handling costs these farmers nearly 50 per cent of their profits.

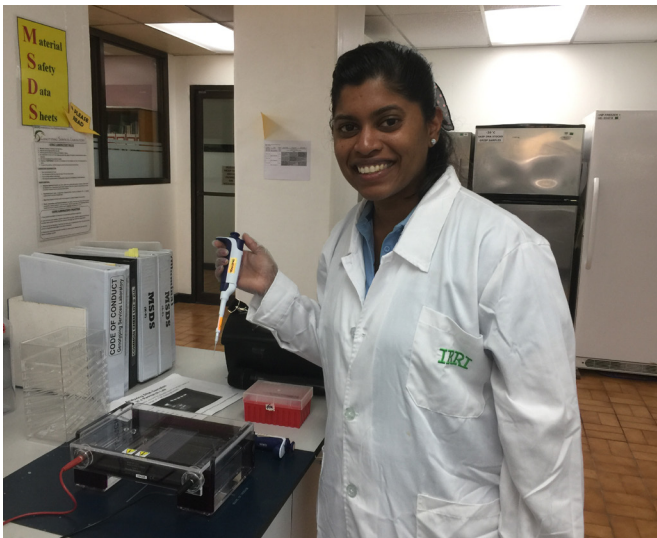




"It was amazing to see the contribution of Australian origin wild rice in the germplasm at the International Rice Research Institute and to learn of the Australian Government's contribution towards facilities for research in drought tolerant rice.

"Furthermore, my research is focused on the potential health benefits of coloured rice, so I was intrigued by the presence and taste of the coloured heirloom rice from the rice terraces of the Philippines, which has been listed as the eighth wonder of the world."

Ms Rao was awarded a scholarship by the NSW Crawford Fund to attend the three-week IRRI Rice Production to Research Course.



Ms Shiwangni Rao took part in the three-week IRRI training program in Philippines



Ms Rao says one of the best things was getting out of the lab to see rice production in the Philippines

## Mentoring program to foster young scientists

Charles Sturt University (CSU) PhD students have taken a break from their own research to mentor primary school students from Wagga Wagga in a science education program.

The students from the ARC Industrial Transformation Training Centre for Functional Grains ( FGC) worked with Year 5 students from Mater Dei Primary School as part of the MyScience program.

Over three weeks the FGC students worked with groups of primary school children to design and carry out an experiment related to energy.

PhD student Mr Stephen Cork said, "The MyScience program does a great job at hands on teaching core scientific principles of seeing a problem, defining a hypothesis, testing the hypothesis by changing one variable and controlling other variables, then measuring and reporting the findings. It is also a privilege to be able to give students real life exposure to people who have chosen science as a career."

The program culminated in an expo at the School on Tuesday 12 September where the students showcased their experimental results.

Mater Dei Year 5 classroom teacher Mr David Enever said, "Most students have loved taking charge of their own investigations, under the watchful eyes of their Functional Grains Centre mentors. Some have come up with some really creative investigation ideas linked to improving the production of renewable energy."

PhD student Ms Michelle Toutounji has enjoyed her role as mentor.

"I hope that I have planted seeds of imagination and enthusiasm for scientific investigation. The future of the next generation of scientists looks bright," Ms Toutounji said.



FGC students Ms Esther Callcott and Ms Michelle Toutounji with Mater Dei Primary School students Claudia Hamilton, Elisa Cook, Lilly McGowan and Charlotte Simpson with their experiments



## Success at 3MT

Functional Grains Centre (FGC) researcher Ms Shiwangni Rao (left, pictured with other Graham Centre finalists Yuchi Chen and Cara Wilson) was named runner-up and claimed the people's choice award at the Charles Sturt University Three-Minute Thesis competition (3MT).

It's an annual competition where research candidates have just three minutes to present their research, using only one slide.

Ms Rao impressed the judges with her presentation about research investigating the potential for anti-oxidants found in coloured rice bran to kill cancer cells.

"My research focusses on the antioxidants found in whole grain coloured rice and other grains," Ms Rao said.

"It involves extracting the concentrated bioactive chemical compounds found in the bran layer of whole grain rice then applying them to gut cancer cells in the laboratory. So far the coloured varieties of whole grain rice have shown promising anti-cancer potential."

The final was won by Ms Cara Wilson, who spoke about her PhD research to reduce wastage in the beef industry caused by the hydatid tapeworm.



Ms Shiwangni Rao with Ms Cara Wilson and Mr Yuchi Chen at the 3MT competition.

## New Postdoctoral researcher Kirsty McKenzie

The Functional Grains Centre (FGC) welcomes new postdoctoral researcher Dr Kirsty McKenzie who is conducting research on the beliefs, preferences, purchasing and consumption behaviour of lentil consumers in India, as part of the Market Intelligence for Pulses project. This is a mixed methods study involving interviews with lentil consumers, and a large scale online survey (2000 participants) to be conducted later in the year.

My previous research experience has been in psychology and public health, with a focus on assessing the beliefs and preferences of consumers of mental health and other health services to explore how these services might be improved," Dr McKenzie said.

"This has involved conducting in-depth interviews with consumers and other stakeholders and managing large online surveys. I am looking forward to being able to apply these skills in a new field through my work at the Functional Grains Centre.

"I live in the Blue Mountains with my husband and two children. We are just about to move to a ten-acre property in Hartley, near Lithgow, and get a few goats and the odd chicken or two," Dr McKenzie said.



Kristy McKenzie

## Welcome to new FGC team member

Ms Jenny Locker has joined the team at the Functional Grains Centre (FGC) as an administration officer on the Australian Centre for International Agricultural Research (ACIAR) funded project.

The project through the Graham Centre for Agricultural Innovation is aimed at developing pulse production in Pakistan. Her part-time role includes management of the project's budget, coordinating travel and meetings, communication and dissemination of information, and supporting the project team.

Ms Locker said, "I'm looking forward to bringing my range of skills and experience to the project, and to seeing the many long-term benefits the team can bring to the Pakistani farmers."

Jenny also works one day per week at the Graham Centre for Agricultural Innovation, where she looks after membership and staffing.





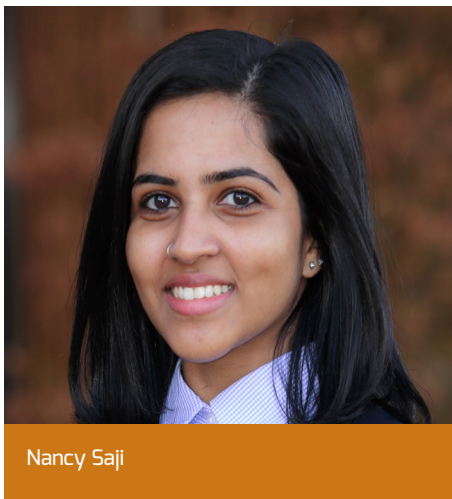
## PhD to study the effect of rice bran supplementation on cognition, behaviour and health

Ms Nancy Saji began her PhD at the Functional Grains Centre (FGC) in July. She completed an undergraduate degree in Biomedical Science from Swinburne University of Technology in 2015 before studying an honours degree in cardiovascular research at Federation University in 2016.

Ms Saji's research at the FGC aims to examine the effect of rice bran supplementation on cognition, behavior and health using a rodent model. The underpinning research hypothesis of the program is that different rice bran varieties, that are rich in many bioactive phytochemicals, can be beneficial to cognitive function, behaviour and health in humans.

"I am pleased to be given this opportunity and very excited to be involved in a research project that ultimately targets enhancing human health through diet," Ms Saji said.

Ms Saji is supervised by Dr James Crane, Professor Chris Blanchard, Dr Andrew Delaney and Dr Lachlan Schwarz.



Nancy Saji

## Functional Grains Centre retreat

The Functional Grains Centre (FGC) retreat from Saturday 12 to Monday 14 August was a chance for our researchers to step away from the laboratory for some team building, networking, communication-and a little bit of fun. Here's what some of our members had to say.

### PhD student Ms Kyah Hester

The first stop for the team of FGC students and supervisors was Borambola Sports and Recreation Centre near Wagga Wagga. Expectations were high following the last FGC retreat, which was enjoyed by all in 2016. This year we had several new faces, showing the diversity that is being built within the FGC team. Although the weather was cold the competition

heated up quickly as small groups went head to head in a variety of strategic challenges. After each task we reflected on how the learnings could be applied to the research sphere and the projects that we are working on.

We all learnt the importance of working in collaboration with others, developed the flexibility to adapt when plans aren't successful, and observed first-hand the disaster that ensues after an unplanned merger. After a few failures and many more successes the retreat ended with a period of reflection. With the help of LEGO each member projected what he or she felt the FGC represented to them. Everyone agreed that the FGC utilises a 'paddock to plate' philosophy, allowing us to achieve a fluid interaction with industry and consumers alike. Everybody left the day feeling more connected with each other and more confident in our ability to navigate the research opportunities of the future.

### Postdoctoral researcher Dr Daniel Skylas

The Retreat program included an action packed day full of activities lead by Team Building Australia. Some of us were a little wiser, knowing what to expect from a previous experience last year, but a range of new activities kept us all on our toes for the entire day. The activities included lots of Lego blocks and even buckets of water with ropes and hooks. Each team had to work together to complete specific tasks in a competitive and friendly atmosphere, well mostly.



PhD student Mr Stephen Cork takes part in the 'Balloon Tower activity'

### Postdoctoral researcher Dr Robert Taylor

Sunday morning saw FGC members visit the Australian Academy of Science (AAS) in Canberra at what is now known as the Shine Dome, built in 1959. A series of invited talks covered the methodology and politics of scientific research funding including how research projects may be considered



and actively promoted within the public service and industry representative bodies. Two new members of the FGC talked about grain-based studies of changes in brain function and behaviour using a rat model.

Post-graduate students and post-doctoral members of the FGC then took part in an exercise in research communication with outside adjudication by the two new FGC members. Three minute research project talks, based around a single slide or picture from the work, were assessed for relevance and the degree to which a rounded summary of the work was presented. The students particularly, presented clearly and effectively, highlighting the range of research areas within the FGC. The Canberra retreat showed the necessity for each researcher to consider carefully how they must convey the results of their studies or projects to technical and/or lay audiences and to tailor the important messages to industry and research funding bodies.

### PhD student Ms Kiara Thompson

On Monday Mr Tom Parnell from the Department of Agriculture and Water Resources discussed government policy within the grains industry. Grain Growers Commercial Manager Mr Nick Bryant spoke to us about the impact of government policy on the grain industry and the organisation's role as a peak body within the industry. The last presentation from Director of science policy and projects at the Australian Academy of Science, Dr Chris Hatherley focused on the advocacy roles of the organisation. We then travelled to CSIRO where we heard from Dr Crispin Howett, team leader of the CSIRO cereal quality group, who gave us a very thorough talk on their research programs and the impact their research has on the grains industry. Our last stop before leaving Canberra was at Grains Research and Development Corporation (GRDC) where we each gave a one minute presentation of our research to the GRDC's Dr Francis Ogbonnaya and Ms Clare Johnson. They gave us great insight on how to collaborate with the industry and how to project our ideas to obtain funding for our research. This

retreat was extremely informative, fun and allowed us to become closer as a team by getting to know one another and our research focuses.

### Dr Philip Kerr

The weather was glorious, the food was excellent and the team members of the FGC were fabulous. It was the first FGC team building day for me, so much fun and mind-challenging problem solving. During the day, the teams changed and I felt privileged to be part of the winners on a couple of occasions, including in the balloon tower. It was interesting doing the feedback analysis for that exercise as it mirrored somewhat the impacts of company mergers in the real world. In many cases the merger ends in disaster which was not predicted. Some of the fun things for me involved intellectual discussions over morning tea, lunch and afternoon tea.

## FGC students present their research at CSU HDR symposium

The Charles Sturt University (CSU) Faculty of Science Higher Degree Research (HDR) and Honours symposium was held over two days in August. Functional Grains Centre PhD students presented their work.

Some of the students reflect on the experience below.

### PhD student Mr Andrew Portman

Do you need to attend conferences in order to be a good scientist?

The answer is yes and here is why. For months I have been working on the incorporation of lentil flour with wheat flour in order to make healthy bread alternative. In some ways I feel like I am stuck in a vacuum of my own thoughts when it comes to my project. Is this real science? Can my research really make a difference to people? Am I going crazy?

Several of my fellow PhD research students have answered these questions for me through their presentations at the HDR symposium. Stephen Cork presented some of his amazing work characterising the production of flakes using pulses. I think Stephen and I share a passion, even in novel form we feel compelled to make something useful. I was able to see many parallels in my work when Neeta Karve spoke about the impact of germination on starch and protein fractions of yellow peas and PhD student Annie Riaz spoke about the quality of Australian wheat varieties over the last century. Esther Callcott's research in anti-obesity through rice phenolic compounds, Kiara Thompson's work on cardio protective effects of bioactive compounds found in grains and pulses and Michelle Toutounji's research into the factors effecting starch digestion of rice are indeed very exciting.



the FGC team at Parliament House



Some more interesting lines of inquiry adding to the mix when Rachael Wood spoke about her work on the effects of farming practices and rice quality and Shiwangni Rao presented her findings on the effects that growing location had on the composition of Australian cereal crops. Last but not least, James Lee's presentation described in great detail his work using capillary electrophoresis online to monitor in vitro digestion of rice.

It was great catching up with everyone over morning tea, lunch and the dinner. What really came through to me from the symposium was the diversity of our projects and how they all fit so well with the aims of the Functional Grains Centre.

### PhD student Mr Stephen Cork

The CSU Faculty of Science HDR and Honours symposium was a great opportunity to learn about current research occurring from over 50 of CSU PhD and Honours candidates. Check out the twitter feed #FoSSymposium.

A key note workshop on managing unconscious bias was presented by Nikki Roche Director, BlueZenith Leadership and Coaching Solutions. She highlighted how we naturally have unconscious bias towards others based on our fast thinking neural networks that we use to filter and react to our environment like emotion on faces, presence of danger. This is great in situations where we need to make quick decisions

but can prevent objectivity which is important for decisions that have impacts on others. Especially with the selection of positions or air-time people receive in discussions, where we naturally will bias people like us, or give more air-time to males.

This ultimately deteriorates diversity of innovation required to succeed. Ms Roche believes that these biases can be overcome by consciously activating our slower problem solving neural systems that are great at solving problems like 12x16. A great tool is C.O.S.T where we identify risk of bias decision:

Corner cutting - do we have all of the information to make a decision? Objectivity Bias - Seek an alternate point of view to test your objectivity. Self-protection - Are we selecting from in group who we are comfortable with and excluding valid options in the out groups? Temporal discounting - It is natural to select the immediate gain over a better larger long term gain.

The Symposium dinner was great time of networking and to hear Acting Director of the Graham Centre for Agricultural Innovation Dr Marta Hernandez-Jover's research journey to become an independent researcher in a competitive environment while facing challenges of work life balance. Marta highlighting how stepping out of your comfort zone into world can lead you to amazing places, so take opportunities as they arise.

## Functional Grain Centre partners and collaborators



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