

QAAFI NEWS

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Research ties renewed for biofuel partnership

An international alliance to produce an economically viable, low-emission biofuel is moving into the scientific fast lane at The University of Queensland.

Scientists at the Queensland Alliance for Agriculture and Food Innovation (QAAFI) and their counterparts at South Carolina's Clemson University (CU) are focussing on plans to develop a large-scale biofuel (ethanol and biodiesel) research and commercialisation project.

Recent top-level meetings between QAAFI Director, Professor Robert Henry and CU Director of Commercialisation and Technology Incubation, Mr Karl Kelly, have already captured the interest of UQ's research commercialisation specialist UniQuest.

Professor Henry said the potential of QAAFI's new biofuel partnership should not be underestimated in terms of the new carbon-economy.

"QAAFI is ideally positioned to work with our partners at Clemson University to develop a biofuel

technology that suits Queensland conditions and supports sustainable agriculture," he said.

"The Clemson technology has already overcome many of the traditional hurdles facing biofuel alternatives.

"It's a low-cost process that doesn't consume grain or bean food-crops; so it won't be taking food from anyone's table – and that's important in today's global economy.

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"For many years to come, clean liquid biofuels will be essential for agricultural machinery and heavy transport ..."

BELOW: QAAFI Director, Professor Robert Henry (right) and Clemson University's Mr Karl Kelly discuss the merits of a biofuel process that turns crops such as sugarcane into ethanol.



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P Centre for Plant Science

A Centre for Animal Science

F Centre for Nutrition & Food Sciences

Working together with the



Queensland Government



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“For many years to come, clean liquid biofuels will be essential for agricultural machinery and heavy transport if we expect the world’s growing population to be able to feed itself.

“Queensland has an outstanding record of biofuel research and our partnership with Clemson University is poised to commercialise an exciting, low-cost method of creating biofuel.”

Professor Henry said that while the Clemson University technology could be applied to a wide range of agricultural produce, the most promising local crop to date was sugarcane.

According to CU’s Karl Kelly, development of cellulosic bioenergy will be a game-changer because it can be used as a “transitional” fuel to power existing infrastructure and technology.

“World markets are looking for a cheap low-emission fuel to run existing engine technologies,” Mr Kelly said.

“We have a technology that converts plant cellulose into ethanol at a price we think will not only be economically competitive, but it stands to decrease our dependence on imported fossil fuel.

“Clemson University has been working with Savannah River National Laboratory (SRNL) to bring cellulosic bioenergy technologies to the ‘proof-of-concept’ stage and our discussions with QAAFI represent a significant ‘next step’ in the development process,” he said.

UQ signed a memorandum of understanding with Clemson University at the BIO Convention in Washington on 27 June 2011.

Note: Cellulosic biofuel technology targets the structural part of the plant (cell walls) to develop biofuels, such as ethanol and biodiesel. The process takes advantage of the untapped energy in the largely non-edible parts of plants (i.e. sugarcane or sorghum), and uses this to produce fuel.



PROFESSOR STEPHEN MOORE (above) has taken up his role as Director of QAAFI’s Centre for Animal Science (CAS).

Professor Moore is a highly regarded scientist who, before taking up his appointment with QAAFI, worked for the cattle industry in Alberta, Canada.

He has more than 20 years’ experience in bovine genomics, including his role as Chair in Bovine Genomics at the University of Alberta since 1999.

As CEO for Livestock Gentec at the University of Alberta, Professor Moore led many successful projects to identify genes that underlie production and quality traits in cattle.

The expertise he brings to CAS reflects the centre’s capacity to embark on research to help Australian and international livestock industries flourish now and into the future.

QAAFI Director Professor Robert Henry welcomed Professor Moore’s arrival at QAAFI and paid tribute to Dr Mary Fletcher for her interim role as acting CAS Director.

To contact Professor Moore call (07) 3346 6525.

Climate-change models underestimating farm profits

A QAAFI RESEARCH SCIENTIST has warned that climate change could have a significantly greater impact on farming profits than on the yield of individual crops.

Dr Daniel Rodriguez (pictured right), from QAAFI’s Centre for Plant Science, is internationally recognised for his work on the design of more productive and resilient farming systems.

According to Dr Rodriguez, studies that calculate climate-change impact on the farming sector have tended to look at predicted crop yields as an indicator of future performance.

He said, however, that farm managers and policy makers routinely make planning decisions based on information derived from a combination of other inputs such as farm business profits, risks, and cost-benefit analyses between alternative options or scenarios.

“By analysing the impacts and options for farmers to adapt to climate change, we’ve found that expected climate change could have higher impacts on farm profits than on the yield of individual crops,” Dr Rodriguez said.

“This could be explained because changes to when and how it rains can affect the capacity of farmers to plant crops, and therefore the number of crops harvested per year, and the annual cash flow.”



“However, it is still possible to identify opportunities to increase profits or reduce risks,” he said.

“For example, adaptation options to increase profits for irrigated farm businesses would involve changes in the allocation of water and land across alternative enterprises.

“For the rainfed farm businesses, changes in soil water thresholds for sowing crops could be used to achieve higher profits at similar levels of economic risk.”

Dr Rodriguez said that in more marginal regions, such as the western Downs, options to maintain profits or risks in a climate-changed environment seem to be more limited.

This means that adaptation responses to climate change might need to consider more drastic transformational changes.



International visitors attracted to QAAFI's research expertise



A HIGH-LEVEL DELEGATION of food and agricultural sector administrators from China's Hunan province visited QAAFI on 22 September.

The twelve-member delegation was provided an overview of QAAFI operations by the institute's Director, Professor Robert Henry, followed by introductions to QAAFI's expertise in plant, animal, food and nutrition science by each centre director or representative.

The delegates were particularly interested in QAAFI's ability to take on new research projects and QAAFI's growing and successful relationship with the Queensland Government.

Hunan has a population of about 64.5 million and lies on the south bank of the Yangtze River (about half way along), some 1000 km from Shanghai.

REPRESENTATIVES from the Brazilian Agricultural Research Corporation (EMBRAPA) visited QAAFI in late September to discuss a range of possible research collaborations.

The University of Queensland signed a memorandum of understanding with EMBRAPA in 2002 to encourage joint-research projects.

With the emergence of QAAFI as dedicated research institute and rising global awareness of the challenges of food and energy security, all parties have renewed their willingness to increase ties and collaboration.

All in good taste

Introducing QAAFI scientist, Dr Heather Smyth

By Julie Lloyd

If you invite scientist Dr Heather Smyth to dinner and ask her for an opinion on the meal, prepare yourself for a lengthy and technical answer.

A PhD trained flavour chemist, Dr Smyth spends her day analysing the flavour and texture of food to determine what causes people to enjoy it, and subsequently buy it. Her job also uses science to improve the quality and taste of food.

The outcomes of Dr Smyth's work are therefore invaluable to the fast-developing boutique (and not so boutique) Queensland food industries.

Dr Smyth has joined QAAFI to expand upon her work in flavour and sensory science, a career she chose after entering the science world as a synthetic organic chemist.

"I fell into the flavour area when I applied to do a PhD in wine flavour chemistry - who would have thought chemistry could be so delicious?" Dr Smyth said.

So when Dr Smyth describes the flavour of food, prepare yourself, because she truly loves her work and her passion for flavours says it all.

"We use gas chromatograph/mass spectrometers and olfactometers which enable us to separate food into identifiable and measurable chemicals," she said.

"By doing this we can describe foods in meaningful ways, which helps chefs and others in the food industry.

"For example we might say it 'smells like lemons with a low intensity, or buttery and a medium intensity'.

"Or a chocolate might be described as having a smoky, coconut and raisin taste."

Dr Smyth also manages projects working closely with tasting panels of about 12 people to articulate and rate food quality.



... our analysis of prawns and vegetables identified all sorts of interesting drivers and barriers of food choice – not just sensory properties

"To map flavour preferences, I ask consumers to rate how much they like specific products, on a simple hedonic scale.

"I can then cross over the sensory and consumer data, to scientifically track the type of consumer that likes particular flavours and foods," she said.

"This information helps the industry market particular products to particular groups, or work towards developing the flavours and products to match the taste and product preferences of certain consumer groups.

"We can also define the consumer groups according to demographic or other psychographic information.

"For instance, our analysis of prawns and vegetables identified all sorts of interesting drivers and barriers of food choice – not just sensory properties, but motivations towards sustainability and Australian made, cost and convenience, as well as health and beauty drivers."

Dr Smyth is a valuable addition to the QAAFI team — not to mention a great dinner-party guest as well.

CNAFS Lecture Series

The Centre for Nutrition and Food Sciences (CNAFS) holds a regular lecture series at UQ.

These seminars are open to the broader scientific community, as well as interested members of the public.

The series aims to promote excellence in food and nutrition science through the exchange of ideas, establishing new collaborations and augmenting existing partnerships.

Recent topics have included food safety; small-scale satiety trials, and the creation of modified starches.

Unless advised otherwise, all lectures take place in UQ's Hartley Teakle Building 83, seminar room S-429.

For more information, check the events section of QAAFI's website or contact Barbara Williams on 3345 2987.



How to find QAAFI's main office ...

IF YOU'RE LOOKING FOR short-term parking near QAAFI, try the parking area beside the Forgan Smith building, on University Drive.

To get to QAAFI from there, enter Forgan Smith and walk across the Great Court, making your way to Alumni Court, located on the south-western side.

Follow the ramp into Mansfield Place, where you'll find the John Hines building. The lift entry is on the left-hand side of the building (between buildings 62 and 69).

QAAFI's closest long-term parking is in UQ's Mill Road car park.

NEED A TAXI?

The nearest taxi rank to QAAFI is at the end of Chancellor's Place roundabout, before Slip Road. From there, walk along Mansfield Place and turn right, between buildings 62 and 69, to access the lift lobby on the right-hand side.

Once at the John Hines building, take the lift to level five. After exiting the lift, turn right,

making your way through the two small doors and into the adjacent corridor.

QAAFI's administration office is straight ahead, on the right-hand side ☺



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