



A COLLABORATIVE PROJECT SPANNING MULTIPLE INDUSTRIES AND ORGANISATIONS IS LOOKING TO ADD VALUE TO A RANGE OF AGRICULTURAL BY-PRODUCTS, AND BAGASSE IS A MAJOR FOCUS.

Feeding bagasse to livestock is not new. The concept has been experimented with for decades and usually attracts a lot of attention during drought.

However, feeding bagasse to livestock has always faced challenges: bagasse is very high in fibre and livestock can't extract much energy from raw bagasse. Anything more than a few percent of raw bagasse in livestock feed starts to reduce daily weight gains. Even if bagasse is treated with existing technology, it remains a high-fibre product.

And bagasse is by-product; not a waste product. Even though it has higher commercial value in some mills than others, all projects on bagasse value-adding have had to ensure that any new use for bagasse makes economic sense.

A current research project builds on previous SRA investments and is taking the existing value of bagasse into account. It is also exploring the challenges and opportunities to present practical outcomes for adoption by the industry. Importantly, the project is developing ways to improve the digestibility of bagasse and make it into a more complete feed for a wide range of livestock.

COLLABORATION AND DELIVERY

Queensland University of Technology (QUT) Senior Research Fellow Dr Mark Harrison is leading one component of the project and he said that the entire project was focused on delivering practical outcomes.

"Assuming the technical challenges are overcome, we are very interested in where in Queensland and NSW it makes sense to make animal feed from bagasse," Dr Harrison said. "Obviously there is heightened awareness during drought, but long-term development has to align with where livestock are concentrated."

"For example, there could be an opportunity for southern sugar mills to target cattle feedlots on the Darling Downs."



Putting bagasse on the feed menu for livestock

As well as understanding potential markets, Dr Harrison also said the project had been working closely with the fodder industry through the Australian Fodder Industry Association and Feed Central, one of Australia's largest online buying and selling platform for hay, straw, silage, and grain.

"These relationships have been pivotal to the project and over the last 12 months have improved our understanding of where bagasse sits among other fodder sources," he said.

"We started the project benchmarking bagasse against high quality forages like vetch and lucerne, but we now understand that it's difficult for bagasse – raw or treated – to compete against those fodders when there's enough rain to keep fodder production at normal levels.

"So, we are benchmarking against lower quality forages like straw and stubble and looking at the potential role for treated bagasse during drought."

However, one part of the project is taking steps to turn bagasse into a product with similar feed value to high-quality forages.

IMPROVING THE VALUE

Growing microbes on the bagasse is one way to increase its nutritional value as a stockfeed.

"Even when bagasse is pretreated, it is still only adding fibre to the ration," explained QUT Associate Professor, Robert Speight. "But we are looking at using the bagasse as a food-source for microbes such as fungi and bacteria, and then they do the work of converting that fibre into 'themselves'.

"For livestock, these microbes are a great source of protein and can also add essential nutrients to the bagasse. This can help make the bagasse a more complete feed.

"If we can boost the protein content, then that adds a lot of commercial value to the bagasse."

This part of the project is also investigating the potential of providing the animals with probiotics, which could help them better digest the fermented bagasse, and has already identified several potentially valuable probiotics by searching through the microbes that live in bagasse piles.

It is hoped that these probiotics will work with the existing microbes in the gut of the animal to improve digestion.

The project has begun feeding trials with chickens to assess whether the pro-

biotics are safe. The second feeding trial, which was due to get underway at the time of writing of *CaneConnection*, will add bagasse to the ration to determine the impact of these probiotics on digestion and growth. The long-term goal is to move into sheep, pig, and cattle feeding trials.

UNDERSTANDING THE ANIMAL

Dr Harrison said that this worked linked with another crucial component of the project; establishing a clear picture of bagasse digestion inside animals. Ms Mahsa Abbasabadi, a QUT PhD student, is working closely with the University of Queensland to undertake animal feeding and rumen fluid fermentation trials.

"The project is using cutting-edge genetic technology to identify the way the microbes in the gut change when the animal eats raw, treated, or fermented bagasse. Then, we can look how to grow the right microbes on bagasse so that they work in partnership with the existing gut microbes to extract more energy from the fibre," Dr Harrison said.

FUTURES FORUM

The topic of industry diversification drew significant attention at the industry's Future Forum held in April through facilitation by SRA.

The key message from the forum was that the sugar will remain a core output of our industry, but that diversification is critical to future profitability and sustainability with diversification of revenue streams across food, fuel, energy, and fibre products.

Mackay grower Joe Muscat attended the Futures Forum and was also interviewed by ABC Landline on a segment specific to the research project led by QUT.

Mr Muscat told Landline that the Australian industry needs to look at different end products.

"Relying on one product is hard," Mr Muscat said. "85 percent of what we produce in sugar goes into the world market and that is a very volatile market.

"We need to do more work on adding value to our commodity. With our input costs always increasing, we have to find ways to manage that and keep a profitable business. I see value adding as an opportunity going forward." ■

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To view the Landline segment on this project visit www.abc.net.au/news/2018-07-29/sugar-spinoff:-sugarcane-growers-take-on-their-own/10049548



Australian Government
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(Over page top) QUT Senior Research Fellow Dr Mark Harrison is investigating ways of using bagasse to create higher-value animal feeds. (Over page bottom) SRA CEO Mr Neil Fisher discusses industry value-add opportunities with Mackay district growers Joe and Stephen Muscat.