

# THE CHENRY CHRONICLE

By Christopher and Heather Henry

## Bundaberg



On top of Hummond lookout the view of the cane fields. Note small fields.

We drove up to Bundaberg for the weekend which is a five hour drive north of Toowoomba. Our first stop was at the Fairy Mead Sugar Museum where we learned all about the history of Sugar Cane production in Bundaberg. Life was rough when sugar was manually picked from the fields. Things improved greatly after the Tuft brothers invented hydraulic machinery.



The Tuft brothers designed the cane harvester.

There are sugar cane fields everywhere here like there are corn fields in Nebraska and Kansas. Sugarcane field are divided up into small blocks, usually about 5 hectares for management reasons. We stopped by the field

and took our picture to show the height of the crop. Queensland has the most effective cane handing system in the world. The bulk storage area at the mill holds over 2 million tonnes. We rode the sugar cane steam train around the park for a 10 minute ride. There are many tracks around the area that move the cane to the factory. Once the cane has been cut it needs to be processed within 16 hours.



The steam train which no longer moves sugar it now is an attraction ride for passengers.



The sugar cane crop towers over Chris.

## Bundaberg Rum



Heather and Chris pose next to the famous bottle Bundaberg rum.

When the white man began to cultivate sugar cane in the Bundaberg area, the primary market was export. When sugar cane is processed at a mill there are several products, most mills process cane into raw sugar which is a brown large granule sugar, you can usually buy in the store. This product is further processed into white sugar by a refinery. Another product of sugar is molasses. There are three grades of molasses depending upon how many times it is pressed. Sugar cane is a stick of fibrous material with liquid impregnated. When you press the cane you can extract the sugar juice. The juice is boiled, and centrifuged, and you get sugar and the by-product molasses. The farmers exported the raw sugar to overseas refineries, but molasses, is usually used for livestock feed and some for human consumption. Instead, they decided to make rum from the molasses as a value added product in the late 1800's.

The molasses from the Bundaberg area go directly to the Bundaberg Rum distillery to

make Rum. Molasses is poured from the truck through a pipe that falls into a huge warehouse building. The smell of molasses is very nice to the nose. We were given a taste of molasses during the tour. We saw the machines that turn the molasses into alcohol and then the huge barrels where the rum is aged. Rum is clear but when the English received rum back in the 1880's it was stored in sherry barrels which gave the rum a light brown color, because there was a shortage of new oak barrels. Once the rum was put into new vats it arrived in England as clear rum. The British sent back the rum saying it was off (bad). So they colored the rum with burnt sugar water, hence that is why rum is a brown color. A practice that is still used today to color rum.

Only 4% of production is exported; 3% goes to New Zealand and 1% to other countries. Bundaberg rum cannot be purchased in the United States. Out of the country of Australia, mainly Queenslanders are big rum drinkers. In 1964 the polar bear was introduced as a marketing icon to show that rum can be drunk in the winter too since it warms you up.



Chris stands with the famous Bundaberg Rum Polar Bear.

The rum commercials stand out like the Budweiser commercials in the US. They are also big advertisers at the sporting events especially the Wallaby's a rugby team.

On our way back to Toowoomba... We drove through Nanango where we happened to find Henry Street.



Henry Street in Nanango, Queensland is named after Henry Stewart Russell who was an explorer in 1842.

### Gold Coast

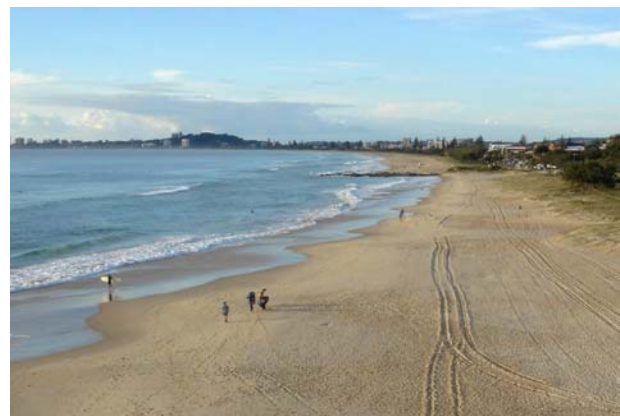
Some colleagues in Brisbane had us come down to the Gold Coast for a weekend. We watched the sunrise, and we took a day trip to Byron Bay to watch the surfers and whales. Byron Bay is a cove that has become very popular for visitors. It was a well kept secret for a long time. The most Easterly point of the Australian Continent is located at Byron Bay.



Heather at Byron Bay where we watched whales.



Watching the sunrise on the beach was so beautiful.



Viewing the Cumburrin beach from the lookout rock.

### Farm Fest

The farm fest is held every year here outside of Toowoomba on an open field. It is winter here so many people are available to attend. Not much different than the Farm Show that is held at Kemper Arena in Kansas City, MO except it is held outside. We thought we would only be there for a few hours but ended up spending the whole day there walking around looking at product. Chris had to check out all the tractors that weren't available in the US.



Heather on a Lamborghini tractor.

### Sheep Shearing World Championship

The Sheep Shearing World championship is held every year in Toowoomba at the show grounds. It was very interesting to watch blokes from all countries come to shear six sheep as fast as they can with electric shearers. The American one in the race we happened to watch that afternoon. We also watched those who shear four sheep as fast as they can with hand shearers. You would have thought their hands would get cramps by the time they are finished.

We watched some as they spun the wool by hand and then knitted it into a hat. There were many who had looms who wove the wool into ties or fabric. One lady has been doing this for 30 years. After weaving her fabric she makes jackets out of them. They cost about \$200 AU.



The contestants all over the world shearing the sheep by hand.

### Bob and Janis come for a Visit.

Bob and Janis (Chris's folks) came for a visit in June. They went to Sydney first for five days and then met us in Brisbane to spend a couple days on North Stradbroke Island, Toowoomba, and Narrabri.



We picked up Bob and Janis from the Brisbane airport and they were wearing their Aussie hats.

We spent 3 days on North Stradbroke Island in a holiday house. The island was once one big island but was separated by a storm in 1896. North Stradbroke Island is 38 km long and 11 km wide. We took our car over in the ferry which was a 45 minute trip. North Stradbroke, or Straddie, is also a sand island like Fraser, if you recall we went to Fraser island with Zac and Janelle in April, but is much more built up, about a quarter of the size, and is not a World Heritage area. Stradbroke is very accessible and has paved roads, so 4wd vehicles are not needed to holiday here.



Chris, Heather, Janis and Bob on the ferry to North Stradbroke Island.

It was beautiful the first day. We walked along the cylinder beach and to Point lookout.

Acetylene gas (a flammable compressed gas) was used to illuminate the light in the light house light, hence cylinder beach, because of all the cylinders needed to keep the lighthouse going. It was brought in by boats and stored in a shed by the light house. We watched for whales and saw a few with the binoculars.



**Cylinder Beach at Point Lookout**

The second day was partly cloudy. We drove to Brown Lake, a freshwater lake where you can go swimming. We went to the Dunwich Cemetery which is the 2<sup>nd</sup> oldest cemetery in Queensland. The oldest grave site is dated 1850. There are about 800-900 people buried here. We bought fresh prawns at Amity point which we grilled that evening. They were so good that they didn't need any cocktail sauce. It is probably the freshest prawns any of us have eaten.



**Chris and Heather near the Brown Lake.**

It was rainy on the 3<sup>rd</sup> day so we visited the Dunwich museum where we learned about the history of Stradbroke Island. An Asylum was built on Stradbroke where the aged who didn't have any money or family to take care of them

lived. They made mattresses at the asylum. Many men and women lived a long time, some in their 90's. After the museum we rented a 4WD, a small Suzuki for a half day. We drove on the beach but it was raining and the sand wasn't as hard. It was nerve racking for Chris to drive. We had a great time anyways.

There is still a considerable amount of sand mining still taking place on Straddie, and the roads are obviously there for the truck traffic and mining industry.



**Chris, Janis and Bob 4 wheel driving on the beach.**



**Koala posed for us during its four waking hours a day.**

In Brisbane, we had a great time holding the koalas and feeding the kangaroos at the Lone Pine Koala Sanctuary. They have over 120 koalas in the park. Koalas sleep over 20 hours. The koala can only be held for 30 minutes at a time. An adult can weigh up to 30 lbs. Feeding the hungry kangaroos was quite an experience. They will eat out of your hand but you must be careful as they would grab the paper sack of food and eat from that too. We

saw many other animals here including the sheep show where collie dogs muster the sheep. We even fed the rainbow parakeets some nectar juice from a bowl. They sure are messy eaters and you have juice dribbles all over your clothes when you are finished.



**Bob and Janis feed the male kangaroos that could not get enough food. Everyone forgets about them since they are on the other side of the fence.**

Next, we drove to Narrabri, to see our friends, the Findlays (you can read up about our earlier visit to the Findlays in the second Chronicles). It was raining so we did not get a farm tour, but it was nice for my parents to see them again, as it has been ten years since they came to visit us in the US. Bob and Janis went to the cotton center and we stopped by the Australia Telescope.



**Five out of six telescopes are seen here with the track.**

If you recall we visited the Parkes radio telescope in February, the Parkes telescope had a major role in the landing on the moon. The Australia telescope is a very recently constructed telescope, and is an array of 5 small

telescopes that act as one large one. See one of the telescopes below. Each telescope is situated on a track that is perfectly level, and they had to use special survey gear to take into account the curvature of the earth. The telescopes can be moved along the track to any position along the track say for example to maximize the capture of a particular frequency. Using them together to make a bigger telescope and with satellites in orbit. The Australian government has put so much money into the development of radio astronomy.

### **Another Feedlot Tour**

Chris spent a day tagging along on a “life cycle” analysis of an Australian feedlot. Currently the AU feedlot industry is battling a “unsustainable” perception. Again this is an example of how the industry is proactive in dealing with up and coming issues, rather than playing defense with the policy makers.

This particular feedlot, is what I would consider to be more forward thinking than the status quo. The first words out of the owners mouth when we started our meeting was, “Our number one priority is odour, because if we don’t manage our odour we won’t be in business, our number two priority is our customer, because if we don’t have a customer we don’t have any reason to have a business.” Another interesting fact is that this particular feedlot exports a small percentage of its production to the United States.



Peter Watts (left), FSA Consulting and the feedlot owner describe the layout and management of the Feedlot. Note the very purple colors of the second and third stage holding ponds.



Debris Basin, typical outlet structure used on AU feedlots is a flume or porous dam outlet structure.



Shade structures, a different structure than typically seen, they are sheets of tin, instead of shadecloth, less susceptible to wind damage.



Holding Pond, recent rainfall has turned this basin black and it was very odorous.



Feed mixture, mostly barley and wheat, in this ration there was some corn, the only time I have seen corn used in a AU feedlot diet.

Bore water, or wells, are 350-400 meters deep, (or well over a 1,000 feet, no pun intended) in this area, they test for chemical residues in their groundwater. All pens are sloped between 3-4%, while this is a relatively arid climate, when it does rain they receive very intense events. When they land apply effluent they blend it 1/3 effluent to 2/3 water because of the high salt content of the effluent and the bore water. The feedlot sets on 1800 acres and no surface water leaves the property, it is all collected by a series of ring tanks and pumping stations.



**Pumping Station, transfers runoff from a drainage canal (ditch) to a ring tank for storage.**

They land apply approximately 20,000 metric tonnes of manure annually to 4,000 acres of cropland at a rate of 5 metric tonnes per acre (sometimes spread as 15 t/a on a 3 yr rotation).

Typical crops are lucerne (alfalfa) and forage sorghum. No crops are sold all are used as feedstuffs on the enterprise. Although I haven't quite figured out how, the owner claims that no commercial fertilizer is used on the cropland. The feedlot markets between 50-60,000 head of cattle per year (carcass weights between 320 and 340 kg) and their cost of gain is \$2.20-2.30. This particular operation uses reconstitution of grain instead of steam flaking, which has an energy savings of about \$8.50 per tonne but is more skilled process for preparing grain for cattle feed. Twenty percent of the feedlot production is for the domestic market the rest is exported. Australia ships 25,000 tonne of grain fed beef to the United States, some of which comes from this feedlot. Stocking density is 15 sq meters per animal and this particular feedlot uses manure mounding not for creature comfort but for manure management.

Being an export provider, nearly every producer has commented to me about the color of the fat that is demanded by the customer. For those of you who don't know, you can change the color of the fat by what is fed to the animal, especially in the last several weeks before slaughter. The Japanese market demands pure white fat and a lot of it on their

beef. A Japanese buyer once said, "fat not so good for health, but very good for jiggy-jig." What the customer wants the customer gets, and the Aussies are so very willing to bend over backwards for them.

### **Poultry Barn Sampling**

Chris spent a couple of days assisting the Department of Primary Industries (DPI&F) with emissions sampling from poultry barns. Poultry odours are regulated by local townships or shires, and the industry is being proactive by funding some research to developing odour and dust source emissions.

Chris went with the group to sample the dust and odour emissions from a barn. On these days we were doing an odour decay experiment and collecting samples for determining barn emissions. In the US we typically use a 10 L Tedlar bag, while here they use a 90 L Melenix bag (the Aussies think there is a residual in tedlar that react with odours over time).



**Odor Sampling**

Instead of the small suitcases we use in the US, they use large drums (everything is bigger in Australia). They are trying to develop a relationship between dust and odours from this research, so they were analyzing dust and odours the day I was there to help.





**Chris using an anemometer to determine barn air flow rates. It's not all a holiday!**

As a general rule, chook sheds aren't owned by individual farmers, they are owned by a large company, what appears to me to be similar to Smithfield Foods, Tyson, etc. The barns are all operated by contractors, although I am told there are still a handful of owner operators. Contractors are paid \$0.20 per bird (feed and buildings are provided) and owner operators are paid \$050 per bird. The last chicken we purchased at the grocery store set me back \$20. Barns here appear to be similar to US sheds, tunnel ventilated, dry litter systems, with side curtains and evaporative coolers.

The samples were taken back to the olfactometry lab and analyzed by a panel. The olfactometer DPI&F uses is one they designed and constructed. They meet both the Australian and European Standards for olfactometers. They determine both DT and intensity, however intensity measurement is not done in the same fashion as in America. The Aussies use a 1-6 scale, based on the german standard for olfactometry.



**Panelists taking a sniff of some poultry odour.**

After the olfactometry lab, the samples are analyzed by the electronic e-nose, DPI&F are building their own e-nose for assessing odours. Data from the e-nose looks promising, but it still appears to have a long ways to go to replace olfactometry.



**DPI&F E-nose.**

### **Update on Chris's Progress**

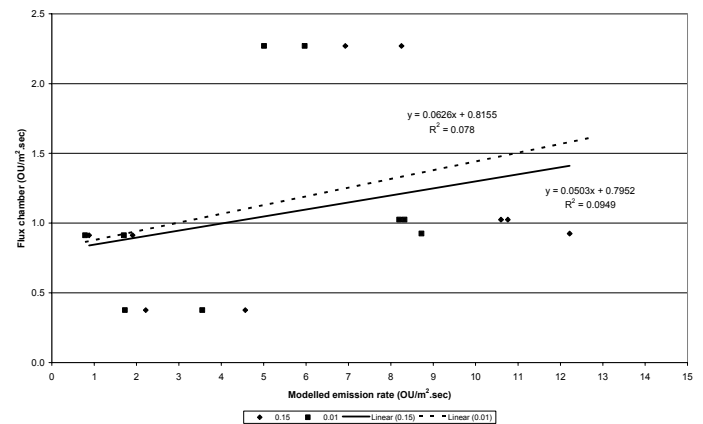
I have developed 4 papers during my time here. The first paper compares the regulatory differences between the countries, and I have learned that there is much the same but a few things are different. Regulators here can write

a fine on the spot for breaking their license conditions. While each state does their own thing, they do seem to have some commonalities. Regulators in Australia tend to be more prescriptive and evaluate each application and determine conditions based on the size, site sensitivity, proximity to water, sustainability, and other factors before issuing license conditions. This leads to large discrepancies between license requirements for similar operations, because of the subjectivity.

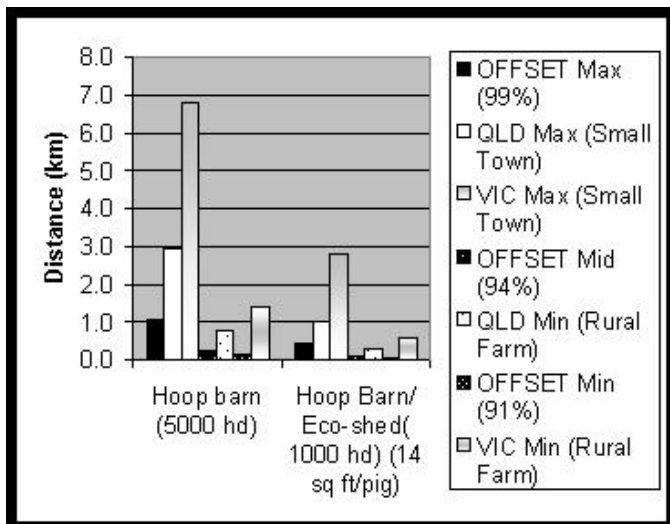
I have done some comparing of separation distances, the graph below shows the separation distances for a hoop barn in three states in Australia, and for OFFSET or the OFT. I have concluded that the Aussies need more (not just a little, but a lot) distance between them and their hoop barns than the yanks do. This work drives home the point that we still have a long ways to go to finding the perfect equation for separation distances. Because of the involvement with my Victorian co-author, I am being accused of being responsible for the formation of an odour coupe. It has lead to the request for the formation of "The state of knowledge for odour policy in Victoria." Seems this paper has stirred the pot down south.

go much further into this until the results can become public.

Lastly I have finished a paper with Geordie Galvin concerning the differences between Windtrax and Ausplume and the correlation between these models and flux hood measurements. As you can see below, there isn't much of a correlation between emissions measured using a flux hood and those predicted with a model using downwind ambient samples. This paper provides supporting evidence that wind tunnels are preferable to flux hoods for measuring odors from area sources.



Graph of Flux Hood Versus Model Results



Graph of Separation distances for Swine Hoop Barns for Victoria, Queensland, and OFFSET/OFT

The other project I have been working involves new odour criteria for AU feedlots. I will not