



Beeftalk

Taking stock of your future

Prime news and views for beef producers of south-east Queensland

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Issue 25 Autumn/Winter 2008

editorial

It is great to be writing an editorial for *Beeftalk* without the doom and gloom of a failed wet season hanging over our heads!

With most of south-east Queensland getting at least average rainfall over the summer, we have more grass than we've had for many years. While we can relax a little, it is a good time to look at how we handled the dry seasons and to record our successes and things that weren't quite as successful. Time has a habit of clouding our memory so it is best to make notes in a diary for future reference.

The good season presents many opportunities to implement all those management changes, such as spelling paddocks, that we had promised to implement when the drought broke.

While it is good to have a lot of grass, experience tells us the feed value of this grass will be very low once it matures. Breeders and weaners will need a protein supplement if they are to maintain weight during the dry season.

In this issue, articles on stocking rates and pasture degradation provide information on how we can better manage our pastures. Weeds and their management are featured in articles on annual ragweed and lantana.

A good season is not the time to relax our breeder management. Weaning is a critical time in a calf's life. Correct training at weaning will ensure these animals are easier to handle for the rest of their lives. An article on weaner management outlines the best techniques for training weaners.

We hear a lot in the media about global warming and the part carbon plays in climate change. The article on carbon outlines what this is all about and may help save you from being caught out in the game of carbon trading.

Our Beeftalk team continues to change – this time Felicity McIntosh is on maternity leave. She and husband Stu now have a daughter, Stephanie Rose, born on Easter Sunday. According to reports both mother and baby are doing well.

The Ed



Stocking rates, productivity and profitability

We often hear the saying, 'more cattle means more money'. But is this always the case? At Grazing Land Management and Nutrition EDGE workshops many producers have described how they have improved profitability by using conservative stocking rates.

This article uses three sets of data which explores this balance of stocking rates, productivity and profit. The first set of data from *Galloway Plains* shows the relationship between stocking rate and production. The next two data sets, from the coastal and inland Burnett, add the finances to this relationship and show greater profit with less stock compared with heavy stocking.

Impact of stocking rate on beef production

Figure 1, from the long running *Galloways Plains* grazing trial, demonstrates the relationship between stocking rate and animal production. Animal production can be measured in terms of individual animal production (kilograms per head) and production per unit area (kilograms per hectare).

From the graph we can see that at the ridiculously high stocking rate (for this type of country) of a beast to one hectare, the individual animal production is very low at 59 kg/hd/yr but the production per hectare is high (59 kg/ha/yr).

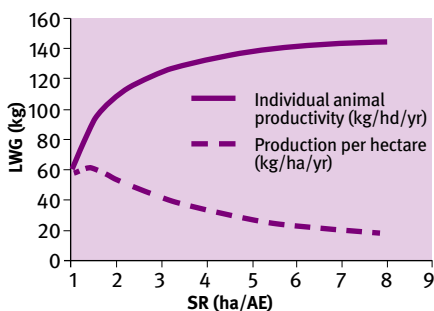


Figure 1. Impact of stocking rate on annual liveweight gain

Table 1. Gross margin for first draft of steers

1st Draft: Dec 1998 – Dec 2000	Couch	Speargrass	Speargrass premium #
Paddock area (ha)	65.5	69.5	69.5
Start no. (head)	30	15	15
End no. (head)	23	13	13
Mean SR (ha/hd) *	2.5	5.0	5.0
Start weight (av.)	317.5	327.3	327.3
Finished weight (av.)	537.1	599.5	599.5
Accumulated gain (kg/ha) **	87.3	58.8	58.8
Value of gain/ha (at \$1.30/kg or \$1.45/kg #)	\$113.5	\$76.4	\$85.3
Total purchase cost per ha (at \$1.30/kg)	\$167.0	\$85.7	\$85.7
Interest on purchase cost per ha (at 10%/yr)	\$33.3	\$17.1	\$17.1
Variable costs per ha (at \$25/hd) ***	\$14.2	\$7.1	\$7.1
Gross Margin \$/ha	\$66.1	\$52.3	\$61.1

Notes for Tables 1 and 2:

* The stock numbers in the paddocks varied during the trials.

** The accumulated gain is taken from each weighing and takes into account the changes in stock numbers.

*** Variable costs include \$20.00 freight, \$3.50 levy, \$1.50 tags, \$10.00 husbandry.

All of the speargrass paddock steers graded Jap Ox, therefore the \$0.15 premium.

If we halve the stocking rate (i.e. from a beast to one hectare to a beast to two hectares), individual weight gain increases by 49 kg/hd/yr (59 kg/hd/yr to 108 kg/hd/yr). At the same time, gross production has dropped only 5 kg/ha/yr (from 59 kg/ha/yr to 54 kg/ha/yr).

If you reduce the stocking rate by half again (from 2 ha per beast to 4 ha per beast), your individual animal performance increases a further 25 kg/hd/yr from 108 to 133 kg/hd/yr while the production per hectare reduces by 21 kg/ha/yr from 54 to 33 kg/ha/yr.

Notice though that halving the stocking rate hasn't halved production. There are fewer animals but they are growing faster. This effect is more pronounced when you reduce from a very high stocking rate.

Generally speaking, you produce more beef at heavier relative stocking rates. But does this mean you are making more money? What effect is a heavy stocking

rate having on the long term health of your pasture?

Less cattle is more profitable – coastal Burnett

From 1999 to 2002, a grazing trial was conducted on a commercial property in the coastal Burnett. The aim of this trial was to investigate the impact stocking rate has on the density of desirable native grasses in paddocks that have become dominated by blue couch. In this trial we split a commercial paddock (dominated by blue couch) into two paddocks of roughly equal size. One paddock (called the couch paddock) was managed at a stocking rate typical for the area. In the other (called the speargrass paddock) we reduced the stocking rate by up to half. We weighed the steers four times per year.

In Table 1, we can see that with the first draft, there was a better return per hectare for the heavier stocked paddock. However, as all the steers in the speargrass paddock graded Jap Ox, you could expect a 15 cents/kg premium for these steers. When this is taken into account, there wasn't a great deal of difference in the returns per hectare (about \$5.00 per ha or \$330.00 for the paddock).

Table 2. Gross margin for second draft of steers

2nd Draft: Dec 1998 – Dec 2000	Couch	Speargrass	Speargrass premium #
Paddock area (ha)	65.5	69.5	69.5
Start no. (head)	30	20	20
End no. (head)	13	15	15
Mean SR (ha/hd) *	3.0	4.0	4.0
Start weight (av.)	246.0	244.7	244.7
Finished weight (av.)	476.3	551.7	551.7
Accumulated gain (kg/ha) **	81.2	78.5	78.5
Value of gain/ha (at \$1.30/kg or \$1.45/kg #)	\$105.6	\$102.1	\$113.8
Total purchase cost per ha (at \$1.30/kg)	\$105.0	\$80.1	\$80.1
Interest on purchase cost per ha (at 10%/yr)	\$17.1	\$13.0	\$13.0
Variable costs per ha (at \$25/hd) ***	\$11.5	\$8.8	\$13.0
Gross margin \$/ha	\$77.0	\$80.2	\$92.0

However, by the time the second draft of steers went through, the heavily stocked paddock was starting to loose condition. This required numbers to be reduced in the heavily stocked paddock. Even without a price premium, it is obvious that the lighter stocked paddock resulted in a better gross margin.

Fewer breeders – better pastures for the same money

A grazing trial during the mid to late 1990s investigated the impact of burning and spelling on pasture composition (increasing the palatable speargrass while decreasing wiregrass). To achieve this change, the stocking rate was reduced by a third in the demonstration paddock.

As you can see from the comparison below, you obviously produce less weaners when you cut your breeder numbers. But the reduction is not as great as you might expect. The weaning rate improved by 10% and the average weaning weight increased by 10 kg. When variable costs for the breeders and weaners are taken into account, there is not a large difference in the gross margin.

When you take into account the money you have invested in your cattle and account for the interest on money tied up in these animals, then the gross margin is higher for

the lighter stocked paddock.

In summary, heavier stocking rates can maximise returns in the short term. However, the net return may not be so high when the capital tied up in livestock and variable costs are taken into account.

Table 3. Gross Margins for a breeder

Parameters		Heavier SR	Lighter SR
Paddock area (ha)		400	400
Production parameters			
Number of breeders		100	66
Weaning rate (%)		65	75
No. of weaners		65	50
Weaning weight (av.) (kg/hd)		190	200
Weaning weight (total) (kg)		12,350	9,900
Weaning value (total) (\$/kg)	at \$1.80/ kg	\$22,230	\$17,820
Weaner variable costs			
5-in-1 vaccination (\$/hd)	at \$0.60	\$39.00	\$29.70
Tick fever vaccination (\$/hd)	at \$2.93	\$190.45	\$145.04
Weaning costs (\$/hd)	at \$20	\$1,300.00	\$990.00
Husbandry (\$/paddock)		\$300.00	\$300.00
Breeder variable costs			
Health (\$/hd)	at \$12	\$1,200	\$792
Supplements (\$/hd)	at \$20	\$2,000	\$1,320
Husbandry (\$/paddock)		\$300	\$300
		\$3,500	\$2,412
Cow value (\$/hd)	at \$750	\$75,000	\$49,500
Interest on cows (\$/paddock)	at 10%	\$7,500	\$4,950
Bull costs			
No. of bulls		3	2
Bull purchase value (\$)	at \$3,000	\$9,000	\$6,000
Bull residual value (\$)	at \$1,000	\$3,000	\$2,000
No. of years used		4	4
Annual bull costs		\$1,500	\$1,000
Interest on bulls (\$)		\$150	\$100
GM before interest		\$15,400.55	\$12,943.27
GM after interest		\$7,750.55	\$7,893.27
GM per breeder		\$77.51	\$119.59
GM per ha		\$19.38	\$19.73

The ultimate risk of pushing the stocking rate is that the country is exposed to degradation. Country that looses condition has a reduced carrying capacity. The result of this is a direct loss of production, higher maintenance costs (supplementation, weeds etc.), rehabilitation costs (improving land condition costs money) or a combination of all three.

The quote from a grazier 'I look after my pastures, the pastures look after my cattle and my cattle look after me' seems to hold true for grazing enterprises.

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Weaning and educating calves

Weaning is far more than separating the calf from the cow until they both stop bellowing. Correct management and training of calves at weaning sets their pattern of behaviour for the rest of their lives.

Before weaning

For the first few days after weaning, calves try to get back to their mothers and can manage to do the seemingly impossible. To avoid injuries and escapes, check all equipment ahead of time that will be used at weaning, including yards, hay feeders and water troughs.

It is best to assume a 'belt and braces' approach. Calves get bored and will often manage to open a catch by playing with it, so put another chain or wire around gate catches.

Broken weldmesh in round bale feeders can catch calves' hooves. There is nothing worse than finding a good calf crippled because he spent the night with a leg caught in the hay feeder.

At weaning

Muster your cows and calves. After doing whatever is needed to the cows, such as pregnancy testing and vaccinating, let them out into a paddock close to the yards with access to a larger grass paddock.

Cows find weaning very stressful too. Many cows will break fences and jump grids to get back to their calves if they are moved too far apart on the first day of weaning. After three to five days the cows will have forgotten about their calves and will be much easier to move further out.

Make sure the water troughs are clean and the hay feeders full before putting the first of the calves into the weaning yard. Then leave them overnight. There will be a lot of bellowing from both the cows and the calves, but this is quite normal.

Training begins

For the first two days, spend time walking quietly through the calves. Move them slowly and calmly into

another yard while you fill the hay racks. This teaches the calves to walk through gateways and move at your direction.

On the third day, run the calves into the working yards and teach them to draft and walk up the race. Do this by letting ten or so go past and stopping the rest. Work the first group of ten through the race and crush without stopping them. Then go back and get another group. By doing this, even the most nervous calves will learn what is required of them. Do this every day as you fill the hay racks.

Weaning is a good time to teach weaners to eat from a trough. While they are locked in the yard and bored, they will try new things they wouldn't touch in the paddock.

Once the calves work well through the yards it is time to take them out and introduce them to whatever you use on your property, such as dogs, horses and bikes. Open the gates from the yards and stand by to slow them up if they start to run. Work them around the paddock, letting them graze as you do this. A laneway is ideal for this work but any small well-fenced paddock will do.

Once you are happy with the way they are working while you are handling them, let them have the full day out in the paddock and just yard them at night. Weaners will often rush at night when they can be frightened by stray dogs or dingoes. Yard the weaners for three or four days until they just walk along in front of the bike or horse.

Then they can go out into another paddock to grow up. Running some older steers with weaners in the paddock will help settle the weaners down and also help protect them from dog attacks.

While working the weaners, make a note of any calves that do not settle down. If a calf does not respond to the constant handling at weaning, it will always be difficult to handle and should be identified for culling.

Health

All calves in ticky country should be vaccinated against tick fever at weaning. Once you know how many weaners you have, order the 3-germ blood. Give the weaners their second 5-in-1 (or 7-in-1) vaccination. If they haven't had any 5-in-1 vaccinations, give them their first injection and the second 4 to 6 weeks later.

The stress of weaning tends to lower the calves' defences, making them more susceptible to internal parasites. If you suspect internal parasites are a problem, check worm burdens in the calves with the WormCheck kit and drench if appropriate.

Coccidiosis is caused by organisms that live in the calves' gut and on the ground. The stress of weaning often allows these parasites to multiply and cause problems. The most common symptom is scouring and general ill health. In severe cases the calf can die. Animals less severely affected take a long time to recover because the organism damages the lining of the gut. Feeding calves in racks and troughs will help prevent them picking up the coccidian organism from the ground.

Benefits

The time and cost put into training weaners is recouped many times over as the animals grow and enter the adult herd. Well-trained weaners are a pleasure to work with, whereas cattle that have not been trained well at weaning cause many problems.

If you buy in cattle, particularly cattle that you don't know, try giving them a few days 'weaner training' before you let them out. Steers going into the finishing paddock and replacement heifers that are to go into the breeder herd will all benefit from a few days 're-education'.

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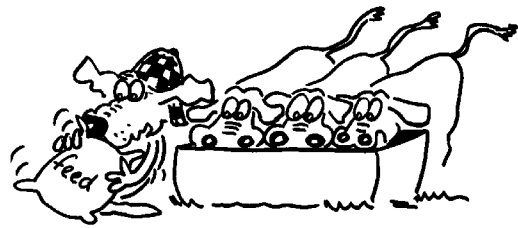
What is new in dry season management?

Unfortunately the short answer to this question is – NOTHING. But experience has shown that no two seasons are the same so we have to assess our situation each year, using experience from the past to make plans for the future.

The big difference this year is that south-east Queensland has had a 'good' wet season. In most areas there is more grass than there has been for many years. This could lull us into a false sense of security thinking that this much grass now means the cattle will do well over winter. However, past experience shows that in years where there is a good body of feed going into the dry season the feed value can be very low. The result is cattle losing weight while in grass up to their bellies.

On the positive side, if we use what we have learnt from the past, the pastures, cattle and our hip pocket will all benefit:

- Do a feed budget at the end of the growing season (usually April or May). The aim of feed budgeting is to match the number of grazing animals to the feed available with the aim of coming out of the dry season with good ground cover.
- Estimate when you believe the season will break. This is usually October or November. Rainfall records show that while useful rain can fall in August or September, the probability of receiving this rain is very low.
- Budget on only using 30 per cent of the feed on offer. Use this amount of pasture to calculate how many animals you can carry until the break in the season. If animals are forced to eat more than 30 per cent of the feed on offer, the nutritional value of that feed is very low.
- If you are carrying more cattle than your feed budget says is safe, plan a selling strategy. Keep in mind the cost of supplementing each group and the long term productivity of the herd.
- Plan to burn some of your pasture following 50 mm of rain in spring. Fire will help promote the better grasses such as spear grass and the blue grasses while reducing the population of some of the less desirable grasses.
- Plan your supplementary feeding program. Protein in the pasture will be limiting once the pasture plants mature in late summer.
- Decide which supplement to purchase, giving



consideration to the cost per unit of protein, long-term availability of the product, ease of feeding, and palatability. (We have a simple spreadsheet that will calculate the cost of protein, phosphorus and energy in a supplement. Please contact me if you would like a copy.)

Well-managed cattle and pasture will respond more quickly when the season breaks. Remember in a grazing enterprise the most important tools you have to manage the nutrition of your animals are

- Adjusting stock numbers to the feed available and
- Weaning to conserve cow condition and thus reducing the need for supplementary feeding.

Further information:



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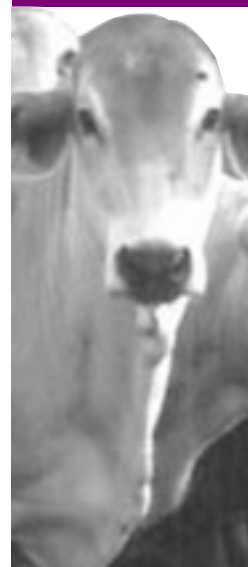
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'Beeftalk provides good honest advice and the latest in products and services, we read it from cover to cover and it sits on the kitchen table for several months until the next one arrives. We have kept every edition for future reference.'

John McConnel 'Mt Brisbane' Esk

Risk and returns of selling trees for carbon credits



If you are interested in selling trees for carbon credits, you need to do your own research, identify possible opportunities, and tread carefully. If you are still interested, read on!

Increasing evidence now points to the earth warming as a result of increases in greenhouse gases. These greenhouse gases are water vapour, carbon dioxide (CO₂), methane, nitrous oxide, and ozone. Greenhouse gases come from natural sources and human activity. The different gases have different levels of greenhouse impact so emissions are standardised to carbon dioxide equivalents (CO₂-e) to ensure they are comparable.

The release of carbon from burning fossil fuels is one of the main contributors to greenhouse gas emissions. In a list of 207 countries burning fossil fuels, Australia ranks 19th from the top, producing 1.2 per cent of the world's carbon emissions. In contrast the USA is responsible for 22 per cent and China 18 per cent of the world's carbon emissions. As a result of increasing population and affluence there has been a rapid yearly increase in the amount of CO₂-e being released into the atmosphere, with agriculture contributing significantly through past land clearing practises, nitrous oxide emissions from fertiliser usage, and methane emissions from livestock.

Agreements like the Kyoto protocol attempt to cap the amount of CO₂-e being released by signatory countries. To meet the Kyoto protocol, countries can use carbon sinks whereby they can continue to produce CO₂-e, for example in power generation, but offset this emission using a carbon sink. A carbon sink is where CO₂ is removed from the atmosphere and stored for a period of time.

Planting trees for forestry is currently the main carbon sink used in Australia. Trees absorb carbon. About 50 per cent of the dry weight of tree roots, branches, trunks and leaves is carbon.

The carbon trading system involves the issuing of carbon credits for afforestation and reforestation activities that meet a set of strict guidelines. Credits are issued to individuals or companies growing compliant forests and these credits can be sold to a carbon emitter such as a power company, using them to 'offset' a power station's CO₂-e emissions. Common guidelines that must be met to generate carbon credits with forestry include:

- One carbon credit represents one tonne of CO₂ stored for at least 100 years.
- The trees must have been 'planted' since 1990. Areas with regrowth following past clearing events are not considered to be 'planted'.
- The trees must not have been planted on land that has had old growth forest cleared from it since 1990.
- Should the carbon be lost within 100 years from a plantation for which a carbon credit is claimed (by fire, disease, logging or another event), that lost carbon credit will have to be replaced immediately by purchasing from another source.

As you can see from this, many landholders may find it difficult to lock up land for this period of time (equivalent to four generations) and guarantee all of the above. Currently Forests NSW are selling carbon credits and complying with the above requirements.

An additional complexity is generated by the existence of various 'qualities' and prices of carbon credits based on the level of verification. A power station facing the possibility of having its emissions capped is likely to purchase only high quality verified carbon credits to ensure they are accepted as offsets by a regulatory authority.

So how much is a carbon credit worth?

Already there are over 17 companies selling carbon credits in Australia. For example if you fly from Brisbane to London by plane the flight emissions would be 5.2 tonnes of CO₂-e. To buy carbon credits from one particular company using trees to sequester (store) the carbon emitted would cost (@\$23/tonne) \$119.60 to eliminate your carbon travel debt. Another site has been selling carbon credits for \$16.50 a tonne.

How much carbon is there in a tree? What could I earn per hectare?

The amount of carbon in a tree of a particular size can be estimated using a tree carbon calculator (e.g. <http://www.greenhouse.crc.org.au/tools/calculators/treecarbon/>). For example, a hardwood eucalypt tree with a circumference of 100 cm measured at a height of 130 cm above the ground represents 322 kg of carbon or 1182 kg CO₂-e.

Studies in the Kingaroy area have found a substantial carbon sink in both trees and soil which varies considerably with the type of vegetation. In a four year old plantation of spotted gum planted on ex-pasture land, there was estimated to be approximately 11.1 t C/ha (40.7 t CO₂-e/ha) in the trees and 178.3 t C/ha (654.4 t CO₂-e/ha) in the soil

Table 1: Amount of carbon in the soil under various vegetation types at Kingaroy.*

Soil depth (cm)	Tonnes of carbon per hectare (t CO ₂ -e/ha)			
	Crop	Pasture	4 year old plantation	Native vine scrub
0-110	78.2 (287)	154.9 (568.5)	178.3 (654.4)	218.4 (801.5)

Note *: Table 1 is from Mathers N, Dalal R, Moody P and Mareseni T (2006) Carbon sequestration: a case study from the South Burnett. Proceedings of 'Managing the Carbon Cycle', Kingaroy Forum, 25-26 Oct 2006.

organic matter (Table 1).

In the four year period after trees were planted on ex-pasture soil, the trees fixed carbon in the soil of:

$$\begin{aligned}
 &= \text{plantation soil C less pasture soil C} \\
 &= 178.3 - 154.9 \\
 &= 23.4 \text{ t C/ha}
 \end{aligned}$$

In addition to this is the carbon fixed by the trees themselves of 11.1 t C/ha. Hence the total carbon sequestered in the spotted gum plantation over four years is:

$$\begin{aligned}
 &= 23.4 + 11.1 \\
 &= 34.5 \text{ t C/ha or } 126.6 \text{ t CO}_2\text{-e/ha.}
 \end{aligned}$$

With a purchase price of \$23 per tonne of carbon credits, the sale price could be estimated at \$20 a tonne (allowing for sale commission), giving an income of:

$$\begin{aligned}
 &= 126.6 \text{ t CO}_2\text{-e/ha at } \$20/\text{tonne} \\
 &= \$2534 /\text{ha at year 4}
 \end{aligned}$$

However, schemes trading in soil carbon are only now being developed and it is unclear how they will be considered in the future. Additionally, most schemes allow only a percentage of the carbon sequestered to be sold and have payments staged over a number of years. There may also be significant measurement and verification costs. Planting trees on pasture land and foregoing grazing income to achieve this result may not be economical, especially as the carbon needs to be locked up for a guaranteed 100 years.

Over the 25 year rotation of a hardwood plantation, total carbon stocks may build up to 414 t CO₂e/ha in the trees and 881 t CO₂-e/ha in the soil. However tree harvesting and decline in carbon stocks between tree rotations need to be taken into account.

Planting trees onto cropping areas also has potential to sequester large amount of carbon, particularly as the soil carbon is starting from a low base.

What other alternatives are there?

Some producers in south-west Queensland have benefited from carbon trading already without planting trees, by selling their rights to clear timber and emit carbon. Rio Tinto, who purchased these carbon credits, wanted to reduce its carbon footprint. Six landowners with a total of 12,060 ha and permits to clear agreed to give up their permits

in exchange for Rio Tinto's investment.

The trees are legally protected by a binding agreement attached to the title of the land (known as a profit-a-prendre), which means that even if the land is sold the trees must stand for 121 years.

The amount of carbon in the area was measured by surveying the height and density of the timber and estimating its carbon holding capacity. For one landholder this resulted in a payment of one million dollars. However due to changes in legislation regarding tree clearing permits this is no longer an option for landholders and investors.

In the future there may be options for using regrowth to generate carbon credits.

Where to now?

In short, there is still a long way to go to reduce the risks for landholders. Some people have already been paid for trees on farm and there are possibilities for other opportunities. But carbon trading is a complex subject and there are still issues around how we measure carbon, whether soil carbon is recognised, and whether all or only some land types and regions have potential to sequester carbon.

A National Carbon trading scheme is still some time away. The Federal Government is developing a national emissions trading scheme with the detailed design due to be finalised by the end of 2008 and the scheme starting no later than 2010.

Thanks to Steven Bray at DPI&F Rockhampton for editing this article.

Websites for thought:

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- www.carbonplanet.com
- www.amazingcarbon.com
- www.greenhouse.gov.au/



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Leucaena toxicity – can be prevented

Leucaena (*Leucaena leucocephala*) is a valuable legume fodder tree used for beef cattle production in northern Australia. Leucaena-grass pastures are extremely productive, long-lived, drought tolerant and sustainable. Weight gains of 0.8 kg/hd/day and annual weight gains of 250 kg/hd/yr are common. The leaves and small stems of leucaena are very palatable, highly digestible (60% dry weight), and contain 20 to 30 per cent protein.

Unfortunately, the leaves, pods and seeds of all commercial varieties of leucaena (Peru, Cunningham and Tarramba) contain up to 12 per cent of dry weight of a rare and unusual toxic amino acid (protein-like compound) called mimosine. Young, lush leucaena forage contains very high mimosine concentrations. Mimosine is a chemical that stops cell division and therefore is severely toxic and often fatal.

However mimosine toxicity rarely occurs because bacteria in the rumen of cattle usually rapidly convert mimosine to a chemical called DHP. This is not a detoxification process as DHP is also toxic! DHP is a potent goitrogen that stops the thyroid gland from functioning normally. DHP toxicity tends to be cumulative and builds up in animals over time. Although rarely fatal, it can significantly limit animal production.

Cattle are at greatest risk of mimosine or severe DHP toxicity when their diet consists of 100 per cent lush leucaena or when unaccustomed, hungry cattle are given open access to lush leucaena.

Occurrences of severe DHP and mimosine toxicity are rare and easily identified and can be fixed by immediately removing leucaena from the animal's diet.

Leucaena toxicity can describe three basic conditions:

Mild (hidden DHP toxicity)

- difficult to detect because animals appear healthy and do not show symptoms
- prevalence unknown
- occurs when animals consume low (<30% of feed intake) leucaena diets or high leucaena diets for short periods of time (<3 to 4 months)
- reduces liveweight gain by 30 to 40 per cent by suppressing appetite and reducing feed intake.

DHP toxicity

- is more common than acute mimosine toxicity
- is rarely fatal

- occurs when a diet of >30% leucaena is eaten for long periods of time
- symptoms can take a long time to appear (several months)
- symptoms include lethargy, hair loss (from pizzle and switch of tail), sores on skin, excessive salivation, goitres, cataracts, low blood thyroxine levels, depressed appetite and growth, poor breeder fertility (abortion), and cows giving birth to weak goitrous calves.

Acute mimosine toxicity

- occurs very rarely as rumen microbes break mimosine down to DHP under normal conditions
- kills quickly (within 3 to 10 days of consuming leucaena)
- symptoms include sudden hair loss, loss of appetite, sores/ulcers on tongue and in mouth and throat, badly damaged liver and kidney tissue.

Preventing toxicity

In the early 1980s CSIRO researchers isolated a rumen bacterium that is capable of degrading both mimosine and DHP to harmless by-products. The bacterium, called *Synergistes jonesii* (or the leucaena 'bug'), was found in goats fed leucaena in Hawaii.

This bacterium can now be purchased through the DPI&F for inoculation into cattle grazing leucaena. Inoculating cattle with the leucaena bug and maintaining a balance of grass and leucaena in the diet are the best ways to prevent toxicity.

The inoculum will not protect against acute mimosine toxicity. Cases of toxicity have been recorded in animals that are known to have the bug but which have been switched rapidly from a diet low in leucaena to a diet with limited grass and high levels of leucaena. It is thought that in these situations the bug is overwhelmed by the amount of mimosine and DHP in the diet and cannot detoxify it quickly enough.

If stock are likely to be at risk, careful management of leucaena intake is required to build up populations of normal rumen microbes.

Horses should not be allowed to graze leucaena. Horses cannot break down mimosine and will quickly loose tail, mane and body hair grazing leucaena.

Further information:

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My life as a spotted gum — 650 years and counting

I am a spotted gum *Corymbia citriodora* in open woodland to the west of Dalby, on the Darling Downs. When I began life here about 650 years ago, this country was grassy and open, with regular burning being carried out by the Indigenous peoples. My nearby sibling germinated about 150 years later.

In the 1930s the area in which I live became State Forest Braemar. Fires were deliberately excluded to encourage the development of the native white cypress pine *Callitris glaucophylla*, a valuable but fire-sensitive timber tree. A Forest Ranger was so impressed by our size that he photographed us and declared we should be protected from logging. At the time my diameter (at 1.3 m above ground level) was a majestic 145.5 cm whilst my sibling's was 118.9 cm. Both of us had just lost major limbs during a severe windstorm.

Slowly but surely I noticed the invasion of the cypress pine. The grass cover disappeared too, as the cypress pines competed with it for light and water.

In 1988 another Forest Ranger visited me. He photographed and measured us again. This time, however, my sibling was struggling to get enough water; the cypress pines, with their strong network of roots, were intercepting the water from the intermittent rainfall events. The Ranger noted that my windstorm damage had healed nicely, and that the damage to my sibling had resulted in a wonderful tree hollow that was being used by breeding birds.

Ten years later my sibling died, leaving me to tower alone over the landscape. Fortunately several other spotted gums have managed to germinate to replace my lost sibling. They may need to carry on the family tree themselves soon; in late 2006 I was struck by lightning and am struggling to regain my full health.

In 2007 the Ranger returned and once more measured my diameter, now 161.9 cm (an increase of 16.4 cm since I was first measured in the 1930s and showing a growth rate of 2.3 mm per year since then). From this my age can be calculated at around 650 years, given that I grew faster when I was younger.

Another photograph was taken from the same spot and it is clear that the understorey has altered



enormously. I guess that Ranger in the 1930s had no idea of the long term effects on the local ecology of his decision to stop burning. Perhaps he should have established some sort of system to monitor the changes over time. Regrettably, the now dense mid-storey of cypress pine and the sparse grass cover means it is practically impossible to carry out controlled burning, as in historic times.

I know the new Rangers have learnt from the past and are more concerned about maintaining the natural ecosystem in balance. Rangers retire and get transferred, so I do hope they set up a system for monitoring the forest dynamics and the impact of human actions on me and my surroundings. With good management (and a bit of luck) I may continue to watch over them and my forest for at least another 70 years.

Further information:



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NLIS rebate on scanners – ends in June

Up to 30 June 2008, a rebate on the cost of purchasing NLIS tag readers is available for scanners purchased after 1 February 2005.

Tag-reading scanners facilitate efficient electronic identification of individual cattle. The NLIS number can be downloaded into a commercial herd recording package or spreadsheet for recording and analysis purposes. An increasing number of producers are linking the scanner to their cattle scales for automatic identification and weight recording and analysis.

It may even be a consideration to share the purchase between a few friends (with some good operating rules so you stay friends).

Rebate rates

A rebate of 50 per cent of the purchase price of NLIS reading equipment, up to a maximum of \$1200 plus GST, is available to cattle producers, lot feeders and live cattle exporters.

Non-profit sporting organisations can apply for an infrastructure grant and reader rebate of 66 per cent, capped at \$1320.

Rebates for slaughterhouses and abattoirs are 100 per cent of the purchase price of NLIS readers but capped at a maximum of \$1200 plus GST.

More information on the rebate:

Website: www.dpi.qld.gov.au and look under NLIS Information

Ph: DPI&F on 13 25 23

Doug McNaught

Ph: 0427 582 113

Michael Lancaster

Ph: 0427 580 027



NLIS – a producers view

Grant and Carly Burnham, in a family partnership with Bruce and Barbara Burnham and Mark and Amanda Salisbury run a commercial and stud operation west of Monto in the north Burnett. They are EU accredited and so have been using NLIS as a management tool for many years.

We run an EU accredited breeding and fattening enterprise which also includes a Brangus stud and Composite breeding program which produces seed stock genetics to producers all over Queensland and interstate. Our priority is to produce steers to slaughter between 280-340 kg dressed at 2-2½ years old with around 12 mm fat. Also of high importance or possibly higher is to maintain a highly fertile breeder herd through tough seasons, with heifers mated as yearlings. Mating for all age groups is three month maximum with cows culled for age at 10 yr old. We are achieving 90%+ preg testing across the board and no unproductive female is given a second chance. This gives us the flexibility to select a smaller number of high quality heifers as replacements and grow a larger number of heifers through to our EU slaughter target of 240 kg+ dressed weight at 2-2½ years old.

NLIS has enabled us to more accurately gather data with less effort. We can make better 'crush side' decisions when weighing cattle in relation to their weight gains and relative performance, and quickly collect information for stud recording without having paperwork going everywhere. We use a Tru Test XR3000 indicator for weighing and data collection with an Allflex wand reader and race reader. Some uses for NLIS since implementing on Bimbadeen are as follows;

Weighing

- Weights for stud EBVs
- Slaughter targets
- Weight gains and comparisons
- Draft ranges
- Accurate crush side management decisions.

Preg testing

- Individual animal performance
- Individual paddock performance
- Vaccination and treatment recording.

Calf recording

- Enter animal details at branding
- Correlate NLIS and management tag
- Download data to office computer.

Traceability

- Transferring cattle on and off the property
- Keeping track of seed stock sold and client list
- Archiving animals which have departed
- Uploading kill sheets from abattoir to monitor performance of particular genetics.

We have found NLIS to be a great management tool, with the potential to further utilise new technology applicable to our operation as it becomes available.

Further information

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NLIS in management

Success with tagging young calves

As part of the CRC project at Brian Pastures Research Station, all calves are mothered-up and tagged at birth.

In 2005 we put the management tag in the left ear at birth and the NLIS tag in the same ear at branding. This procedure presented problems: if the management tag was positioned too deep (close to the head) it was difficult to put the NLIS tag in the correct position later on.

To overcome this problem, both tags were attached at birth during the 2006 and 2007 drops. Of the approximately 600 calves tagged in this way, several have lost management tags between birth and weaning, but only one has lost a NLIS tag (on a wire netting fence).

This is good news for people wanting to use NLIS to individually identify very young calves.



Further Information

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Annual ragweed – a cause of asthma and allergies

Annual ragweed, also known as ambrosia, horseweed and asthma plant, flourishes in late summer and autumn throughout south-east Queensland and northern New South Wales. Infestations also occur near Stanthorpe, Inglewood and Atherton. The pollen from annual ragweed is a serious health hazard for asthma and allergy sufferers.

Annual ragweed has rough fern-like leaves and grows up to two metres high. Its small, greenish flowers grow together in upright spikes in the upper part of the plant. Like many weeds, annual ragweed grows well on bare areas and where pasture is weak. It also invades roadsides, creek banks and gardens.

Flowering begins around late December and usually continues until mid to late March. The flowers shed enormous quantities of fine, yellow pollen. Small

amounts of the pollen can affect susceptible people.

It is important for landholders to check all areas where annual ragweed may grow, particularly areas where the weed has been present in the past.

Anyone who finds annual ragweed on their property should act early to control the plants before they have the chance to flower and seed.

Landholders should follow correct weed hygiene procedures when moving animals, vehicles and machinery through annual ragweed-infested areas.

Further information:

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Ragweed flower



Ragweed plant

Degradation – gradual process or event driven?

Grazing trials have shown the impact of stocking rate (SR) to be variable in terms of profitability and sustainability. The impact of management on land condition, both positive and negative, appears to be episodic. Management therefore needs to be adaptable to avoid the risks associated with prolonged drought and to exploit the opportunities that consecutive good years present.

During the past two decades a number of mid to long-term grazing trials have been conducted in various regions across northern Australia. Some common themes have emerged from the results of these trials.

One of these themes is that degradation (loss of land condition) tends to be event driven. High stocking rates and high annual pasture utilisation rates are considered to be unsustainable as they lead to a loss of land condition. However, under good seasonal conditions or a string of good seasons, high stocking rates may not cause much degradation.

Real degradation is often associated with a very poor season or a string of poor seasons.

Show me the money

The Ecograzing project conducted near Charters Towers during the mid 1990s clearly showed that high utilisation rates (>50%) in the absence of strategic spelling led to a loss of land condition. However, the Aristida-Bothriochloa (AB) project, conducted over the relatively better seasons of the mid to late 1990s, showed that moderate to heavy stocking rates may have placed the country at risk but did not really lead to degradation.

A trial at 'Wambiana' south-west of Charters Towers had fair to good seasons for the first half (1997–2001) but very poor seasons for the second half (2002–2006). Under the high stocking treatment,

there was a significant loss of land condition in the dry years.

Economic analyses from 'Wambiana' show that a light to moderate stocking rate was profitable and sustainable. The heavy stocking rate was neither sustainable, due to loss of land condition, nor profitable because feeding costs were high, animal production (especially in kg/hd) was inefficient, and animals of lower value were produced.

Economics from the 'Wambiana' trial

Economic analyses from other studies (e.g. GLASS and 'Galloway Plains') indicated that returns were maximised at moderate to high stocking rates but that these rates were probably unsustainable (although no major loss of land condition was seen in either trial). These analyses didn't fully take into account the long term impact of lost land condition which either reduces carrying capacity or increases management and rehabilitation costs. The other aspect of these two trials was that they incorporated an exotic legume which may have masked the impact of stocking rate on individual animal performance.

'Wambiana' Light SR

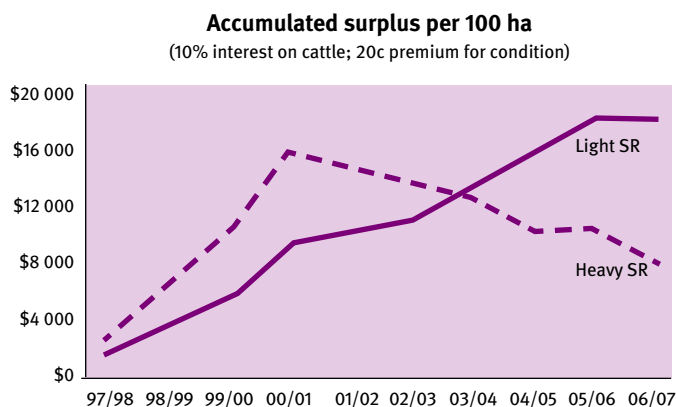


March 2000



April 2007

Tougher seasons but still fair condition



'Wambiana' Heavy SR



April 1998



Dec 2006

Tougher seasons and loss of land condition

Degradation causes and rehabilitation

High stocking pressure during the critical early phase of growth in perennial grasses is detrimental to pasture health. During dry years you often get some rain but it is not enough to sustain pasture growth for more than a couple of weeks. In these situations, even moderate stocking rates lead to high grazing pressure on individual tussocks. This effect is compounded if there are several poor seasons in a row.

If degradation is episodic, then pasture recovery probably is as well. Pasture spelling, reduced stocking rate, strategic use of fire, sown pastures and weed management are all useful tools to improve land condition. However, you may need a couple of fair to good seasons in a row to see the full benefit. Conversely, these strategies may not work at all during periods of prolonged drought (although reducing the stocking rate has benefits from an animal management perspective).

Country that is in good condition is better able to handle episodic events and is more stable than country that has already lost condition.

Management principles

Grazing land management needs to be adaptive. It can have taken many years for a problem to become evident, when it often seems to have done so in a short period of time. Just because a paddock could run 100 breeders during the 1970s and 1980s

doesn't mean it can still run that number. In fact, it is the paddocks where producers have attempted to maintain the higher stocking rates through the last 20 years that now aren't responding to rainfall – they have lost condition. Reducing stock numbers during dry years helps prevent degradation.

You need to be adaptive when the better seasons present themselves to take full advantage of them. This may include planning to use fire, stocking up to take advantage of increased pasture growth, spelling paddocks to allow better grasses to establish and set seed, managing timber regrowth, sowing pastures for a specific reason, and treating weeds.

Grazing lands are complex systems and highly variable. Hard and fast rules don't apply!

Stocking to safe carrying capacity, varying stock numbers in response to seasonal conditions (where practical to do so) and spelling paddocks during the growing season (either each paddock once every three to five years or all paddocks each year in a rotational system) are useful principles.



Always come out of a dry spell, no matter how prolonged, with stubble on the ground

Land condition is the ability of grazing land to produce useful forage and is a relative measure of the health of grazing lands. It has three components:

Soil condition High levels of organic matter and good soil structure are key indicators of soil condition. Erosion indicates a loss of soil condition.

Pasture condition The density and coverage of 3P grasses (perennial, productive, palatable) determines pasture condition. Weeds indicate a loss of pasture condition.

Woodland condition Woody plants compete with pasture for water and nutrients. Increasing tree density indicates a loss of land condition.

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Timely tips Autumn/Winter 2008

April – May

Dry season management

- Assess pasture quantity and quality in each paddock. Is there sufficient feed to run your cattle until the break in the season?
- Assess pasture condition in each paddock and develop a management plan for recovery if condition is poor.
- Review and implement your dry season management plan that was developed earlier. Is your program cost effective?
- Make sure you have supplements on hand to meet your dry season management requirements.

Bulls

- Remove from breeders.
- Check for physical problems (e.g. sheaths, leg injuries) and cull as necessary.
- Bull fertility decreases with age. Cull bulls older than 7 years.
- Start dry season supplement program.

Breeders

- Draft cows according to pregnancy status and body condition for tailored management and possible supplementation.
- Start dry season supplementation.

Weaners

- Wean, weigh and identify mothers of poor calves.
- Draft off any small weaners (less than 150 kg) for special care.
- Feed weaners supplements in yards to train them to eat from a trough.
- Consider coccidia control measures especially for young weaners.
- Educate weaners through yards and by tailing them out every day.
- Vaccinate with booster 5-in-1 or 7-in-1.
- In tick-infested areas, vaccinate for tick fever. As a general rule, administer tick fever vaccine at least 2 weeks after any other vaccine.

- Run weaners in the best paddock available.

Mating and marketing programs

- Reassess market options considering market specifications and the genetics of your animals. Remember that the highest priced market may not always give the best net return.

Parasites

- Start strategic dipping for pre-winter treatments.
- If resistance is a problem have ticks assessed for resistance using DPI&F's Tick Resistance Survey Kit available from DPI&F offices or call DPI&F on 13 25 23.
- Check worm burdens in weaners (WormCheck). Treat if necessary.
- Treat for buffalo fly to reduce numbers that can over-winter.

Business plan

- Conduct tax planning meeting with accountant.
- Assess success of previous year's business plan.
- Plan management strategies for next 12 months (budget, property maintenance and development, marketing etc).
- Are your on-farm Livestock Production Assurance (LPA) records up to date? Would you pass a random audit?

Sown pastures

- Start preparing land for sowing improved pastures in spring.

June – July

Dry season management

- Re-assess pasture quantity and quality:
 - If quantity and quality will not sustain desired animal performance, consider the factors and where your planning needs to be improved.
 - If quantity is below requirements, implement your selling strategy.

- If quality will not sustain desired animal performance, how can diet quality be improved?

Breeders

- Pregnancy test 6–8 weeks after bull removal.
- Cull breeders on temperament, age, defects and non-pregnancy.
- Access maiden heifers – are they going to be heavy enough to mate?
- Vaccinate breeders (e.g. for leptospirosis).
- Review mating program and plan changes if necessary. Consider options for breeding programs, e.g. crossbreeding.
- Maintain check on pregnant breeders, especially maiden heifers and first calf heifers.
- Order NLIS tags.

August – September

Dry season management

- Re-evaluate dry season management plan.
- If season has not broken, assess breeder and weaner condition and consider all options.
- Draft cattle according to nutritional requirements.

Bulls

- Check bulls for soundness and determine numbers for next breeding season.
- Consider type of bull that will produce the type of calves best suited for your potential markets.
- Source and evaluate potential bull suppliers.
- Check young home-grown bulls as potential sires.
- Vaccinate with annual vibriosis and 3-day booster at least 4 weeks prior to joining.

Breeders

- Obtain advice on breeder vaccination programs e.g. pestivirus vaccination program.
- Access your first calf cows. Are they in good enough condition to

get back in calf?

- Check early calving heifers.

Parasites

- Plan tick control for summer. Check for resistance if control is a problem.
- Check late winter calves for scrub ticks.

Pastures

- Consider burning native pastures every 2 to 3 years in late winter or early spring after 50 mm of rain to maintain good pasture condition and control woody weed growth.
- If pasture condition needs to improve, remove stock from paddocks that have been burnt until pasture is at least 15 cm high.
- Watch SOI and other long range

forecasts for suitable time to plant pasture.

- To maintain or improve pasture composition, ensure paddocks get at least one late spring or summer spell every fourth year.

Property maintenance

- Check fences and water facilities in breeding paddocks.
- Check river and creek crossings before next wet season.
- Maintain fire fighting equipment, extinguishers etc and ensure that fire breaks are maintained and serviceable.
- Clean around buildings and check that gutters are free of leaves.
- Ensure all personnel know what to do in case of fire. Do they know who to call? Review and discuss

property evacuation plan.

- Conduct workplace health and safety audit of property. Has everybody been trained to use and maintain the farm equipment in a safe, correct and competent manner? Consider your legal liability.
- Do annual electrical safety check on all household and farm equipment.

Personal

- It is not just the animals and property that need maintenance. You and your family are the most important assets on your property. Make sure you go for your annual health checks and ensure you have quality family time together.

Black speargrass



Black speargrass is one of the most productive species of native grass in the coastal beef areas of Queensland. This grass is native to southern Africa, southern Asia and Australia. In Australia it grows from New South Wales north through Queensland to Western Australia. It is widespread in the Queensland south-east and grows on a wide variety of mainly lighter soils.

This important summer-growing perennial reaches 1.5 m in height. The wide leaves often have a bluish tinge although late in the growing season, after the grass has dried off, patches of speargrass often have a reddish tinge. The cross-section of the lower stems is oval rather than round as in most other grasses.

Black speargrass's distinctive feature is the long black twisted awns (tails) on the seeds. These awns are hygroscopic, which means they take up moisture. When rain falls, wetting the seeds, the awns twist around as they absorb the moisture and this action buries the seed heads in the soil. The seed is then in place, ready to germinate and protected from fire.

In research it was found that 50 per cent of seed stored under air-dry conditions remained viable after three years, but less than 5 per cent was viable after four years.

Black speargrass is very palatable to cattle when young and green. It has crude protein levels of 3.3 to 5.2 per cent.

Early graziers in the coastal south-east found beautiful lush pastures of kangaroo grass, perfectly suited to grazing sheep. As grazing management reduced the number of fires, grasses such as black speargrass, which is more resilient to grazing, came to predominate. Sheep's wool very effectively picks up black speargrass seed heads and after rain the awn twists the sharp seed head through the wool and into the skin of the sheep. This not only affects wool quality but also makes life very uncomfortable for the sheep, which fail to thrive. As a result, most sheep were moved out of coastal areas by the 1880s and replaced with cattle.

Research carried out at Brian Pastures Research Station has found that burning and pasture spelling can increase the amount of black speargrass in pastures. In many pastures it can appear as if cattle have grazed out the black speargrass. However careful inspection may reveal individual plants with stems flat to the ground. Where these are present, the amount of this productive grass species can be increased by spelling the pasture through a summer.

Further Information:

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MSA – guaranteed high quality grass-fed beef

Meat Standards Australia (MSA) offers meat processors and retailers the opportunity to identify and pay for quality grass-fed beef.

MSA grading standards were developed following more than half a million consumer taste tests to determine the factors that affect eating quality. These factors are now set as minimum requirements for MSA.

The ultimate challenge for the producer is to have the quality of pasture and cattle genetics to turn off grass-fed milk and two-tooth cattle at optimum weight for age.

Producers who wish to supply to an MSA market should check they can meet the requirements, which are for animals that:

- are continually grazed or fed rations to a level that is adequate for growth for a minimum period of one month prior to dispatch
- have no more than two permanent teeth
- are handled and mustered quietly to reduce stress
- have free access to water until dispatch
- have free access to feed until dispatch, other than for a minimum period required for preparation through the cattle yards.

To ensure you meet these requirements, it is advisable to:

- load cattle quietly, preferably without using goads or electric prodders
- load cattle at the recommended densities set out in the trucking industry code of practice
- not consign any cattle of poor temperament or with signs of severe stress
- not consign sick cattle or cattle within a withholding period for any treatment
- not mix cattle from different mobs or pens on the property within two weeks of dispatch
- not dispatch cattle purchased or moved from another property/saleyard within one month of arrival.

An MSA Vendor Declaration and a National Vendor Declaration must accompany the cattle to the MSA-licensed abattoir (see list below). The MSA Vendor Declaration confirms that MSA guidelines for cattle handling and trucking have been followed and that

tropical breed content is recorded.

MSA feedback is provided on cattle consigned for MSA grading.

To register as an MSA producer

The registration form can be downloaded from the MSA website or ordered by phone (contact details below). After submitting your registration form, you will be sent your MSA registration number, MSA Vendor Declaration book, and information pack.

MSA-licensed abattoirs (Queensland)

Australian Country Choice
Biggenden Meatworks
Gradrum Pty Ltd
Greenmountain Food Processing
John Dee Warwick
Kilcoy Pastoral Company
Killarney Abattoir
Nolan Meats
Stanbroke Beef
Tamview Pty Ltd
Teys Bros (Beenleigh)
Teys Bros (Biloela)



For further information, a form to register as an MSA producer, and contact details for MSA-licensed meatworks:

Website: www.msagrading.com

Ph: 1800 111 672

Farm Biosecurity News – Animal Health Australia

Australian livestock owners need up to date information about biosecurity risks posed by various pests and diseases, as highlighted by the recent outbreak of Equine Influenza.

Farm Biosecurity News is a free monthly e-newsletter all about on-farm biosecurity, produced by Animal Health Australia. The newsletter presents current issues, case studies and insights into the Australian and overseas livestock industries. Each edition examines a top farm biosecurity issue and highlights organisations that are leading the way.

Farm Biosecurity News is a handy resource for livestock producers, extension officers, and vets.

You can subscribe by emailing feedback@farmbiosecurity.com.au

For further information, and to view the most recent edition of Farm Biosecurity News, go to www.farmbiosecurity.com.au

What is a native forest practice?

On freehold land, owners can practice forestry in non-remnant native vegetation without any requirements under the *Vegetation Management Act*. (VMA)

However in remnant native vegetation, forestry is subject to the VMA and may be undertaken as a native forest practice.

Landholders who intend to undertake a native forest practice must notify the Department of Natural Resources and Water.

A native forest practice means:

- planting trees or managing, felling and removing standing trees
- on freehold land or indigenous land (where the State has not reserved the rights to forest products)
- for an ongoing forestry business in a native forest. This means a business that is planned to provide recurring income from growing and harvesting trees over a long time (measured in years or decades). Operators undertaking a native forest practice must be able to demonstrate that they are managing the forest in a way that will generate income from harvesting on an on-going, cyclic basis.

All the activities must be conducted in a way that is consistent with a code applying to a native forest practice, which was developed by the Department of Natural Resources and Water. This code covers activities including limited associated work, for example, drainage, road construction and maintenance, and other necessary engineering works.

The clearing of vegetation must only be for purposes directly associated with the production of value-added forest products other than wood chips for export. Timber or value-added products includes those that attract a market price such as sawn timber, plywood, veneer, poles, fence posts, landscaping timbers, materials for handicraft or another value-added product other than wood chips for export.



A native forest practice does not include clearing native vegetation for the establishment of a plantation.

Code applying to native forest practice on freehold land

The code developed by NRW under the *Vegetation Management Act 1999* provides for selective harvesting and silviculture of remnant native vegetation.

The code sets down the requirements to

- properly manage remnant native forests
- produce value-added products
- avoid land degradation
- protect wildlife
- protect wetlands and watercourses
- ensure the native forest maintains its remnant status in the long term.

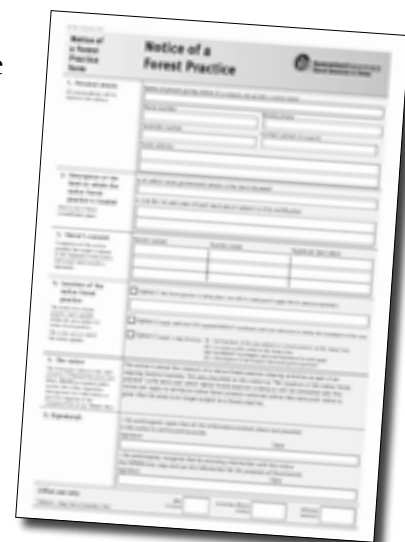
The operation of a native forest practice is conditional upon landholders:

- Abiding by the Code
- Notifying, once only, the department of the intentions to undertake a forest practice.

When NRW is notified that forest practices are planned for a particular property, the area is identified on its database so the area can be monitored over time.

Landholders are responsible for conducting operations in accordance with the code. The department will investigate any alleged breaches of the code.

NRW has prepared a **Field Guide** to explain the intent and requirements for conducting a forest practice. This is available from www.nrw.qld.gov.au/vegetation/clearing/pdf/forest_field_guide



Information on a native forest practice can also be obtained from various forestry organisations including AgForward, Private Forest Southern Queensland, Central Queensland Forestry Association and Private Forestry North Queensland.

Grazing land management in the Burnett Mary Region

Four groups of producers in the Burnett Mary Region are currently involved with a Grazing Land Management project funded by the Burnett Mary Regional Group (BMRG). This project aims to assist landholders to develop grazing land management plans and projects to address specific production and natural resource management (NRM) issues. Throughout this process participants have developed a sound understanding of the relationship between various tools for managing grazing land and the impact these tools have on productivity and sustainability. These activities link with BMRG's activities to ensure sustainable natural resource management.

To date the producers have completed the MLA EDGenetwork Grazing Land Management workshop. The workshop was run for four days spread over several weeks to allow extra time in the field and the opportunity to complete additional modules.

During the workshop participants commenced a grazing land management plan for their enterprises that integrates grazing management, fire management, pasture development, woodland management and weed management aspects. The final

phase of the project will focus on completing the grazing land management plans and associated property project planning, ensuring close links with the BMRG regional NRM plan.

Over the next four months each of the groups will participate in follow-up activities to address specific topics identified by the participants. Some of the topics are:

- Property visits – to assess land condition and identify management options to address production and NRM issues
- Leucaena – establishment, management and economics
- Pasture – establishing legumes in pasture, new cultivars, sown pasture options for old cultivation, and economic assessment of development options
- Soil microbiology – importance of soil health and how this can be measured and managed
- Erosion – control and rehabilitation options
- Spelling and grazing methods – options for specific situations, implications and benefits of various methods
- Native forests – managing for timber production and grazing
- Managing for climate.

A final regional forum will be offered to all participants. The forum will enable participants from each of the groups to outline their grazing land management plans incorporating specific NRM issues and identified management actions to address those issues, whole of enterprise impacts, and ongoing monitoring and evaluation. These forums will provide participants with the opportunity to compare and contrast various approaches to natural resource management. The forums will also provide participants with an ideal networking opportunity and a region-wide perspective on grazing land management.

Negotiations are currently underway to extend these activities into the future. If these negotiations are successful, more landholders within the region will be offered the same opportunities.

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Controlling lantana – landholders' experiences

The Lantana Weeds of National Significance (WoNS) Team is proud to report the release of a new DVD, *Battling lantana: learning from the experiences of others*.

This DVD aims to reduce the uncertainty that land managers face when it comes to controlling lantana (*Lantana camara*).

In the DVD, landholders and public land managers provide insights into their battles with this weed to help others avoid

making costly mistakes. Their successes in reclaiming valuable land shows that the invasive spread of lantana can be beaten.

For your complementary copy of the DVD:

Phone: 07 3406 2511

Email: LantanaWoNS@dpi.qld.gov.au

Further information and other free lantana publications are available through:

Website: www.weeds.org.au/WoNS/lantana

LPA accreditation for selling cattle – records to keep



Livestock Production Assurance (LPA) is an on-farm food safety program which aims to ensure that meat from your livestock is fit for human consumption.

When LPA was first introduced all producers were granted provisional accreditation. Over time most have moved to full accreditation.

As from 1 March 2008 all producers have to have full accreditation. If you are not fully accredited you will not be permitted to use LPA National Vendor Declarations (NVD) when selling livestock. Without full accreditation the markets for your livestock will be significantly reduced because all processors and most store buyers require an NVD Waybill with any cattle they purchase.

You can check and upgrade your LPA status online or by phone (contact details at end of this article).

Once you are fully accredited, you are eligible for an LPA random audit. This audit requires you to be able to show records of how you comply with the following five elements of the LPA food safety standard.

LPA food safety standard elements

1. Property risk assessment – making sure your livestock are not exposed to areas on your property that may be contaminated with persistent chemicals.
2. Safe and responsible animal treatments – making sure the livestock you sell do not contain unacceptable chemical residues or physical hazards.
3. Stock foods, fodder crops, grain and pasture treatments – making sure your livestock are not exposed to feeds that contain unacceptable contamination, specifically feeds containing animal products and/or unacceptable chemical residues.
4. Preparation for dispatch of livestock – making sure your livestock to be transported are fit for the journey and not unduly stressed, and that contamination is minimised during on-farm assembly and transport to the destination.
5. Livestock transactions and movements – making sure the movement of livestock can be traced if required, and that the chemical residue or food safety status of livestock accompanies their movement.

There is no set standard for how the records are to be kept, as long as you can demonstrate that you comply with what you have signed on NVD Waybills. However Meat and Livestock Australia (MLA) do provide template record sheets (which can be saved to your computer) and worked examples through their website (see below).

This information is also in a booklet 'Guide to the NVD waybill' which can be purchased by phoning MLA or downloaded for free from the MLA website.

Types of records that you need to keep include:

1. Property risk assessment
2. Livestock treatment record
3. Paddock, crop and grain treatment record
4. Purchased feedstuff inventory
5. Feeding record for purchased feeds
6. Record of purchased or introduced livestock (you can use your copy of the NVD)
7. Records of livestock sold (you can use your copy of the NVD).

Further information:

Meat & Livestock Australia (MLA)

Website: www.mla.com.au/lqs

Ph: 1800 683 111

Farm financial counselling – a free service

Farm financial counsellors provide a free service to Queensland primary producers.

We can assist you with understanding your real financial position and your options for improving that position. Analysis tools can include statements of position, cash flow budgets, livestock and cropping schedules, and reviews of production, yields and prices.

We can also help with negotiating with financial institutions, mediation, and referrals to other service providers such as legal, accounting, social and welfare authorities.

Farm financial counsellors can also assist you with developing your plans for implementing improvements, investigating alternative production options, or in more serious circumstances, moving toward non-agricultural sources of income.

Contact DPI&F on 13 25 23 for the location of the contact details of the Farm financial counsellors who services your area.

Further information:

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Farm financial counsellors, DPI&F, Bundaberg

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Email: veronica.chapman@dpi.qld.gov.au

New light on tenderness and the calpain system

While much has been learned about the practical factors affecting tenderness of meat, investigations continue into what happens inside the cells. Scientists in the Beef CRC for Genetic Technologies are aiming for a deeper understanding of body chemistry and its genetic controls in the hope this knowledge will lead to new ways to produce more tender beef.

This article explains some of the body chemistry and the current theory on why factors

such as *Bos indicus* content and hormonal growth promotants (HGP) affect tenderness.

Protein turnover

In the live animal, muscle is being synthesized and broken down in a continuous cycle referred to as protein turnover. When the animal is growing, synthesis is faster than breakdown, resulting in increasing muscle weight.

The calpains (calpain-1 and calpain-2) are the principal enzymes responsible for protein breakdown. Calpastatin is a specific natural inhibitor of calpains and the balance between calpain and calpastatin helps determine the animal's rate of muscle growth.

HGP are thought to act by boosting the proportion of calpastatin. A relatively high proportion of calpastatin means lower rates of protein breakdown and faster growth.

Bos indicus cattle also have naturally higher levels of calpastatin.

Calpains and tenderness

In the few hours after slaughter, the calpains continue their task of breaking down the protein bonds within the muscle fibres, helping to produce tender meat. If higher amounts of calpastatin are present, they reduce the ability of the calpains to break these proteins down and meat is likely to be less tender.

As rigor mortis takes place and the pH (acidity) drops from around 7.0 to about 5.5, the activity of calpastatin is restricted. When beef is further aged after slaughter, the calpains slowly break down the protein bonds in muscle and make it more tender. This is thought to be the main mechanism by which beef improves with ageing.

It follows that muscles with higher levels of calpastatin will initially be less tender, but with ageing will improve substantially.

Muscles age differently

Meat from the loin muscles (cube roll and striploin, including cuts such as scotch fillet, T-bone and porterhouse) will improve significantly with ageing. These cuts have low levels of connective tissue and are known to have low levels of calpastatin, allowing the calpains to quickly break down and tenderize the meat.

Other cuts such as the oyster blade for example hardly improve at all with ageing.

This is probably because their lower level of tenderness is due to more natural connective tissue, and connective tissue is not affected by the action of calpains.



At this stage there has been limited study of calpain/calpastatin levels in other cuts and muscles.

Effect of hormonal growth promotants (HGP)

A CRC experiment in Western Australia examined both steers and heifers to study the effects of an appropriate growth implant. There were positive growth rate responses, as expected, but the study also looked closely at meat quality effects in a number of different muscles.

When the striploin was aged for five days and cooked, MSA taste panels reported a very significant 10-point reduction in MSA tenderness score in the HGP-treated steers and heifers. The treated animals also had a significantly lower ratio of calpain to calpastatin in the striploin at slaughter.

Samples of oyster blade from the same animals showed almost no HGP effect on tenderness, and had no difference in their calpain to calpastatin ratio.

This suggests that HGPs cause a change in the calpain to calpastatin ratio in some muscles, causing the live cattle to grow faster, but reducing the ability of the meat to tenderize after slaughter. This effect is likely to be different for different types of HGPs.

When the striploin samples were aged for 21 days, the differences were much smaller. The extra 16 days of ageing improved the striploin from HGP-treated cattle by 13 tenderness points while the more tender controls improved by only three points. This effectively eliminated the large HGP-induced eating quality difference present at five days.

It is thought that calpastatin activity stops during post-mortem ageing and the calpains are allowed to get on with the job of improving the tenderness.

Commercially, this means that extra ageing can be used to offset the toughening of prime cuts caused by the use of some types of HGPs in live cattle production.

These effects have recently been incorporated into the MSA grading model which now adjusts the estimated eating quality of each cut according to whether the animal has been treated with HGP.

Bos indicus effect and temperament

Research in CRCI showed that cattle with high *Bos indicus* content often produce beef that is less tender, with the toughening affecting some cuts more than others, particularly the high priced cuts along the back. The striploin and cube roll (scotch fillet) are high-value cuts and are the most affected.

The MSA grading model has for some time adjusted the eating quality of each cut by the appropriate



Trimming fat off carcass

amount according to the animal's *Bos indicus* content.

The research also revealed a strong genetic correlation between tenderness and flight time (a measure of temperament – see CRC fact sheet). This suggests there is a common factor in the underlying genetics of both temperament and tenderness.

This intriguing concept is being explored further in CRCIII. *Bos indicus* carcasses also respond differently to processing and a number of theories have been advanced to help explain these differences. Tropical breeds are more sensitive to having the optimum amount of electrical stimulation. With tenderstretch hanging, their tenderness is improved more than British breed types.

To be eligible for grading, MSA now requires processors to follow best practice in electrical stimulation and chilling to minimize detrimental effects.

Links between HGPs, Bos indicus content and ageing

Cattle with a higher *Bos indicus* content are known to have a higher proportion of calpastatin. Eating quality studies have revealed that the cuts affected by *Bos indicus* content are essentially the same

ones affected by treatment of the animal with HGPS. That these are the same cuts that improve most with extended ageing.

This has led to the theory that all three phenomena are primarily caused by changes to the calpain/calpastatin mechanism in muscle.

Possible links with net feed intake

Selection to improve NFI (net feed intake, a measure of feed efficiency) is already progressing in some breeds, following studies that showed substantial genetic variation exists between animals in feed efficiency. Feed intake measurement is now being used by breeders to identify feed-efficient sires.

Calpain and calpastatin have recently emerged as playing some role in NFI. It seems that more efficient cattle may also have slightly higher natural levels of calpastatin.

This suggests there will be genetic connections between meat quality and feed efficiency, and that selection for NFI could lead to tougher beef.

Fortunately the correlation looks very small at this stage, and meat quality differences have not been detected in experimental cattle selected for improved feed efficiency.

DNA tests for tenderness

DNA markers for tenderness have recently been commercialised. These have been identified by screening the data from CRC's cattle experiments to find genes that are associated with differences in tenderness. The key genes that emerged were the calpain (CAPN1) and calpastatin (CAST) genes. These now form the basis of the commercial DNA marker tests.

Current research

The interactions between genetics, behaviour,

biology and meat quality continue to unfold. Two large experiments underway in CRCIII have been designed to enlighten us on all these issues.

The experiments include *Bos indicus* and British breed types carrying known tenderness genes. They have been divided into groups to compare HGP/non-HGP effects, differences in temperament and stress response and tenderstretch or normal carcass hanging.

In addition to providing definitive measures of these effects, tissue and meat samples will provide a huge resource for further studies on the underlying mechanisms controlling tenderness.

Meat scientists are looking at other ways to offset the meat quality effects in cattle that are profitable to produce, but have high calpastatin levels. They may find a way to inactivate calpastatin at or shortly before slaughter, to allow the calpains to tenderize the meat.

Other breeding experiments are checking for any positive or negative genetic associations between tenderness genes and the breeding efficiency of females. This work is vital to ensure a profitable balance in genetic improvement of our production systems into the future.

Further information

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and **Bob Gaden**

How to prepare for kids...



1 Women: To prepare for maternity, put on a dressing gown and stick a beanbag chair down the front. Leave it there for nine months. After nine months, remove 10% of the beans.

Men: To prepare for paternity, go the local chemist, tip the contents of your wallet on the counter, and tell the pharmacist to help himself. Next, go to the supermarket. Arrange to have your salary paid directly to its head office. Go home. Pick up the paper and read it for the last time.

2 Before you finally go ahead and have children, find a couple who are already parents and berate them about their methods of discipline, lack of patience, appallingly low tolerance levels, and how they have allowed their children to run wild. Suggest ways in which they might improve their child's sleeping habits, toilet training, table manners, and overall behaviour. Enjoy it -- it's the last time in your life that you will have all the answers.

3 To discover how the nights feel, walk around the living room from 5 pm until 10 pm carrying a wet bag weighing approximately 4-5 kg. At 10 pm put the bag down, set the alarm for midnight, and go to sleep. Get up at 12 am and walk around the living room again with the bag until 1 am. Put the alarm on for 3 am. Since you can't go back to sleep, get up at 2 am and make a pot of tea. Go to bed at 2:45 am. Get up again at 3 am when the alarm goes off, sing songs in the dark until 4 am. Put the alarm on for 5 am. Get up. Make breakfast. Keep this up for 5 years. Look cheerful.



Centre for Advanced Animal Science

The Centre for Advanced Animal Science (CAAS), at the University of Queensland Gatton campus, is available to researchers from all Queensland universities, CSIRO, and industry. This resource is provided through a partnership between DPI&F and the University of Queensland (UQ).

The facility is designed to support research, training and extension, with particular emphasis on the tropics and subtropics, that

- underpins the sustainable management of agricultural and natural systems, and/or
- promotes animal health and welfare and the ethical production of healthy foods.

Stage one of the CAAS facility is finished and in use. Stage two is due for completion in July 2008. The total cost of the venture is \$33 million, consisting of \$11.8 million from DPI&F, \$11.7 million from

University of Queensland and \$9.5 million from the Smart State Research Facility Fund.

The facility is designed to be flexible so that it can be configured to accommodate a wide range of contemporary and future research in all areas of animal production and food safety and quality. There will be standard laboratories and high containment rooms for disease research and studies on genetically modified organisms.

CAAS will provide a critical mass of staff in strategic areas in order to drive interdisciplinary approaches and innovation and attract large scale national and international investment. Collaboration with industry will ensure a rapid path to commercialisation and the delivery of economic and social benefits.

CAAS is staffed by a full-time manager and animal attendant staff from the collaborating institutions. Scientists will be able to work remotely from the facility using the latest IT software.

Further information

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4 Can you stand the mess children make? To find out, smear peanut butter onto the sofa and jam onto the curtains. Hide a fish finger behind the stereo and leave it there all summer. Stick your fingers in the flowerbeds then rub them on the clean walls. Cover the stains with crayons. How does that look?

5 Dressing small children is not as easy as it seems: first buy an octopus and a string bag. Attempt to put the octopus into the string bag so that none of the

arms hang out. Time allowed for this – all morning.

6 Get an egg carton. Using a pair of scissors and a can of paint, turn it into an crocodile. Now get a toilet paper tube. Using only scotch tape and a piece of foil, turn it into a Christmas tree. Last, take a milk container, a ping pong ball, and an empty packet of CoCo Pops and make an exact replica of the Eiffel Tower. Congratulations, you have just qualified for a place on the play group committee.

7 Forget the Audi and buy the mini-van. And don't think you can leave it out in the driveway spotless and shining. Family cars don't look like that. Buy a chocolate ice cream bar and put it in the glove compartment. Leave it there. Get 20 cents. Stick it in the cassette player. Take a family-size bag of chocolate biscuits. Mash them down the back seats. Run a garden rake along both sides of the car. There! Perfect!



If you would like a copy of *BeefTalk* mailed to you, please complete the following form and send to Editor, BeefTalk, DPI&F, PO Box 118, Gayndah, Qld 4625 or Email russ.tyler@dpi.qld.gov.au

Name:

Address:

Postcode: Shire: Property Number: No. of cattle:

Phone: Fax: Email:

Which of the following best describes you?

Beef producer Agribusiness outlet Education Other (please state)

Export Slaughter Intervals (ESI) and Withholding Periods (WHP) for cattle

Valid at 12 February 2008

An Export Slaughter Interval (ESI) is the time which should elapse between administration of a veterinary chemical to animals and their slaughter for export. The Withholding Period (WHP) is the minimum period which must elapse between last administration or application of a veterinary chemical product, including treated feed, and the slaughter, collection, harvesting or use of the animal commodity for human consumption. WHPs are mandatory for domestic slaughter and are on the label of every registered product.

APVMA registered product name	WHP (days)	ESI (days)	APVMA registered product name	WHP (days)	ESI (days)	APVMA registered product name	WHP (days)	ESI (days)
Acatak Duostar Pour-On	42	42	Duotin	30	42	Rycozole RV Plus Selenium Oral	3	7
Acatak Pour-On	42	42	Elanco AH0487 Demize Pour-On	14	28	Selovin LA Long Acting Selenium Inj	0	0
Alamycin LA 300 Solution	35	35	Farnam Worma	8	14T	Selpor Selenium Pour-On	0	0
Alternate Pour-on	21	21	Fasicare 120	21	56	Spike Insecticidal Ear Tags	0*	0*
Amitraz Ec Spray	0	0	Fasimec Cattle Oral	21	56	Stampepe Pour On	21	21
Arrest Easy-Dose Pour-On	0	21	Fasimec Cattle Pour-On	49	140	Strategik Mini-Dose	10	10
Aseptol Germicide,	0	0	Fasinex 100 Oral	21	56	Sumifly	0	0
Ausmectin Cattle Pour-on	42	42	Fasinex 120	21	56	Supona (when used as a backrubber)	0	10
Avomec Injection Cattle	30	42	Fasinex 240	21	56	Supona Buffalo Fly Insecticide (when used as a backspray)	0	0
Barricade 'S' Cattle Dip and Spray	8	21	Fasinex 50	21	56	Taktic EC Spray	0	0
Bayticol Cattle Dip and Spray	0	0	Ficam Gold	0	0	Taktik WP Spray	0	0
Bombard Pour-On	0	21	Flukare C	21	56	Terminator Ear Tag	0*	0*
Bomectin Injection Cattle	28	42	Flukare S	21	56	Tiguvon Spot-	10	21
Bovicare Pour On Louse Treatment	0	0	Flutik Pour-On	42	42	Tremacide 120	21	56
Bovimectin Plus Injection Cattle	28	42	Genesis Injection	42	42	Tremacide 50	21	56
Bovimectin Pour-on Cattle	42	42	Genesis Pour-On	21	21	Trodax Injectable	28	28T
Cattlemax Pour-on Cattle	28	28	Genesis Ultra Injection	28	42	Ultrapen LA Procaine	21	21
Cevamec Cattle	28	42	Genesis Ultra Pour-On	49	140	Valbazen	1	10
Chlortet 200	10	42	Imax CD Pour-On	42	42	Veanavite Veanalyte Electroguard	0	0
Citarin Pour-On Cattle	3	7	Ivermectin Baymec Pour-On	42	42	Vetmec	30	42
Coopers Amitik Cattle Dip & Spray	0	0	Ivomec (Ivermectin) Pour-On	42	42	Vetmec F	28	42
Coopers Amitik EC Cattle Spray	0	0	Ivomec Injection	28	42	Virbac Beefmec Pour-On	42	42
Coopers Blockade 'S' Cattle Dip & Spray	8	21	Ivomec Eprinex	0	0	Virbac Dairytec Pour-On	21	21
Coopers Coopafly Pour-On	0	21	Ivomec Plus	28	42	Virbac Deltamethrin Pour-On	0	21
Coopers Diazinon Cattle, Spray (when used as backrubber)	3	10	Levamisole Gold L.V.	3	7	Virbac Fencare 100	21	21
Coopers Diazinon Cattle, Spray (when used as backspray)	3	3	Levamisole Gold Mixadrum Concentrate Oral Anthelmintic for Sheep and Cattle	3	7	Virbac Fencare 25	21	21
Coopers Di-Jet Cattle Spray (when used as backrubber)	3	10	Levamisole Gold Oral	3	7	Virbac Kleen-dok With Diazinon	14	21
Coopers Di-Jet Cattle Spray (when used as backspray)	3	3	Levipor Pour-On Anthelmintic for Cattle	3	7	Virbac Mineralised Levamisole Mini Dose Oral	3	7
Coopers Easy-Dose Pour-on	0	21	Mineralised Fencare	21	21	Virbac Oxfen C	8	14
Coopers Fly Strike Powder	3	3	Mineralised Levamisole Mini Dose Oral	3	7	Virbac Virbamax Pour-On	21	21
Coopers Nilverm Injection	3	7	Neguvon Soluble Powder	5	5T	Virbac Virbamec LA	42	42
Coopers Nilverm LV Oral Drench	3	7	Noromectin	42	42	Virbac Virbamec LV Pour-On	21	21
Coopers Nilverm Oral Drench	3	7	Noromectin Plus	28	42	Virbac Virbamec Plus Injection	28	42
Coopers Nilverm Pour-On	3	7	Noromectin Pour-On	42	42	Virbac Virbamec Pour-On	35	42
Coopers Nilzan LV Oral Drench	14	14	Nucidol 200 EC (when used as a buckrubber)	3	10	Virbamec Antiparasitic	30	42
Coopers Paramax Pour-	28	28	Nucidol 200 EC (when used as a backspray)	3	3	Virbamec Pour-On	35	42
Coopers Sovereign Pour-on	28	70	Nulev Lv Oral	3	7	Wintex Pour-On	42	42
Coopers Systemex Anthelmintic Drench Oral	8	14	Nuwhite CC	10	10	WSD Albendazole Mini Drench	10	10
Coopers Systemex Concentrated Drench	8	14	Opticlox Eye Ointment	0	0	WSD Diazinon (when used as a backrubber)	3	10
Coopers Systemex Rumen Injection	8	14	Oxazole	8	14	WSD Diazinon (when used as a backspray)	3	3
Coopers Tixafly Spray	0	21	Oxfen LV	10	14	WSD Fenbendazole 100 Oral	14	14
Coopers Warbex	14	14	Oztik Pour-On	42	42	WSD Fenbendazole Oral	14	14
Cydetin Injection (single treatment)	14	28	Panacur 100 Oral	14	14	WSD Fly Strike Powder	3	3
Cydetin Injection (if multiple treatments are given)	14	40	Panacur 25 Oral	14	14	WSD Levamisole Oral	3	7
Cydetin Pour-On	0	0	Parafend LV	8	14	Young's Flutik Pour-On	42	42
Cypafly (ESI based on a re-treatment interval of 21 days or more)	3	3	Paramectin Injection	30	42	Young's Triclamec	49	140
Dectomax Injectable	42	42	Paramectin Pour-On	35	42	Y-TEX Brute Pour-On	7	14
Dectomax Pour-On	42	42	Patriot Insecticide Ear Tag	0	0*	Y-TEX Optimizer Ear Tags	0	0*
Defiance S	3	14	Poron	0	10	Y-TEX Python Ear Tags	0	0*
Deltafly Easy-Dose Pour-On	0	21	Rural West Bovimec Pour-On	21	21	Y-TEX Python Maxima Ear Tags	0	0*
Draxxin Injectable Solution	35	35	Rycomectin	30	42	Y-TEX Warrior Ear Tags	0	0*
			Rycozole Oral	3	7			
			Rycozole RV Oral	3	7			

Notes: T: ESI is under review and final ESI may be longer.
 *: Removal of ear tag prior to slaughter is recommended to prevent possible contamination.

Editorial Committee

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