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Prepared by: **Tim Emery and Roger Sneath**
Department of Employment, Economic Development and Innovation

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PDS Bollon and Chinchilla

Demonstrating the management benefits of using NLIS technology

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Abstract

A Producer Demonstration Site project involving 22 beef businesses from Bollon and Chinchilla examined how NLIS technology could provide both management and financial benefits to their businesses. The technology was found to be able to collect accurate, objective data at speed to assist producers identify non-performers, meet market specifications, maintain auditable health records, link carcase feedback data, measure a paddock's production capability via cattle live weight gains, assist with production management decisions and save time. A co-operator from each of the producer groups trialled the use of a herd recording software package and later shared their experiences with other members as part of the information exchange in this PDS. Through a number of activities, participants learnt about equipment, software, key profit drivers and the importance of NLIS in the beef supply chain. The time saving and financial benefits from investing in necessary equipment increased with the scale of operation. Conversely the benefits did not outweigh the costs for small operators (~200 head). As a result, uptake of the technology by the Chinchilla group was minimal in comparison to the larger scale Bollon enterprises (~1500 head). It is recommended that producers assess their business objectives and identify key profit drivers so that only relevant livestock performance data is collected and the necessary NLIS equipment purchased.

Executive Summary

Since the introduction of the National Livestock Identification System (NLIS) in July 2005, for traceability reasons, all cattle are required to have an electronic identification tag (or bolus) prior to moving off the property of origin. These tags represent a great opportunity for efficient electronic herd recording for Australian beef producers, that to date is not being embraced to its full potential by the broader beef industry. Accurate, objective records are essential for businesses to measure animal performance and improve management. However, the ease, the problems and the cost benefits of using NLIS tags for recording and the information collected for management benefits was not clearly evident. These questions were specifically addressed in this PDS.

Since 2008, 22 beef businesses from Bollon and Chinchilla examined how NLIS technology may have provided both management and financial benefits to their businesses. The Bollon group were larger scale operations (~1500 head; 22,000 hectares on average) and the Chinchilla group mostly smaller (~200 head; 1,500 hectares). The groups undertook a series of learning activities which included talking with hardware and software representatives, visiting producers successfully using the technology and taking a supply chain tour viewing the use of NLIS from paddock to plate. As part of the overall information exchange a co-operator from each group trialled the use of herd recording software to relate their experiences to others within the groups.

During the course of the project there was significant adoption of the technology amongst the Bollon group, with four businesses purchasing new equipment. Some Bollon group members had existing NLIS equipment and were using it to varying levels within their cattle or sheep enterprises. The Chinchilla co-operator also made a significant upgrade in equipment, buying the latest in weigh scale indicator technology to enable increased crush side data analysis. Due to small scale of operation however, other Chinchilla group members did not invest due to the high cost for the relatively little benefit for small cattle numbers.

Most benefits that were derived from adopting the technology were realized by being able to monitor weights and weight gains, identification of non performers, better targeting market specifications and gauging the production capability of paddocks. The ability to compare the performance of particular breeds and vendors cattle was also considered to be useful.

The larger the scale of operation, the greater the benefits from automating data capture. Feedlotters, backgrounders and traders are well positioned to capitalise on the opportunity since cattle come to the property already with an NLIS tag. When processing large numbers, automatic electronic capture of individual stock identification can considerably speed up operations whilst also dramatically increasing accuracy by removing transcription errors. ‘Smart’ weigh scale indicators, which can store and process livestock data and additional records, such as health treatments, can meet many of the needs of the feedlotter, backgrounder or trader. Moderate to large breeding operations will also benefit, although lost tags create issues with data loss. The chances of tag losses increase with breeder age. It is more difficult for small operations to benefit from this technology economically. Lower entry costs, such as less expensive NLIS readers and data management software would help smaller producers to invest in using NLIS tags for recording. Some small operations obtain a few benefits without the need of NLIS readers by buying management tags matching the NLIS tags and by using NLIS database records, they can then identify individual stock in carcase feedback.

For producers thinking of investing in NLIS equipment, it is worthwhile talking with others already using the technology, comparing commercial suppliers' services and considering obtaining professional advice when establishing a system. A useful reference is "Better beef with NLIS" written by the Western Australian NLIS Implementation Working Group, Department of Agriculture, Fisheries and Forestry, WA. The key message is for producers to analyse their needs and potential benefits as economies of scale will determine level of investment. Key profit drivers must also be taken into consideration when deciding what performance data is necessary to collect.

As a result of this PDS, the benefit to industry is that 22 businesses from Bollon and Chinchilla, along with other participating producers, company representatives and agency staff, now have a greater understanding of how NLIS technology once adopted can provide substantial benefits. But more importantly, all players along the beef supply chain will benefit as more businesses begin to capture and analyse animal performance information, improving quality of product and efficiency of operations.

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1 Background

While the biosecurity benefits of the National Livestock Identification System to the national beef industry are undisputed, at an average price of $3.50 for tags and $4.00 for boluses, the immediate cost to producers has been quite significant. Therefore it is crucial that producers get as much value for money from NLIS devices as possible. From 1 July 2005, all cattle must carry an NLIS device when moving off-property.

Tags (or boluses) applied at branding or weaning, represent an excellent opportunity to collect individual animal and/or herd information electronically for use in improving business management and consequently financial returns. By using 'smart'* scale indicators, spreadsheets and/or tailored software systems, performance information can be recorded, retrieved and analysed with greater speed and accuracy. This enables significant gains in key beef industry production parameters, such as growth rates, weaning rates, reproductive performance and meeting market specifications.

(*'Smart" is technology terminology to describe a device that can store, process, import and export information and link data from several sources)

2 Project Objectives

By 30 May 2010, in conjunction with the members of the Bollon and Chinchilla Value in Beef (VIB) groups, aimed to:

- Demonstrate the management and financial benefits of using NLIS to record and retrieve individual animal and/or herd production data quickly and accurately at appropriate intervals.
- Evaluate
  - Key production parameters (key profit drivers) for each demonstration property
  - Appropriate methods/software for electronically recording production information on demonstration properties
  - NLIS tag retention and read rates on demonstration properties. This information will be given to MLA's NLIS program.
  - Compliance obligations under Livestock Production Assurance (LPA) are being met by participating businesses
- Identify relevant data and production parameters that can then be analysed to assist/improve business.

In addition to the contractual objectives, the project principally aimed to provide learning opportunities for participants to evaluate the value of adopting the use of NLIS tags for management benefits for their businesses.

3 Methodology

To explore the trials and tribulations of using NLIS tags for management benefits two PDS groups were established in late 2007 (See Appendix 1), one representing larger scale operations (Bollon: ~1500 head; 22,000 hectares on average) and the other mostly smaller operations (Chinchilla: ~200 head; 1,500 hectares). Over three years, the groups undertook a range of learning activities to explore opportunities to make better use of NLIS tags for management. Learning activities included discussion with software and hardware specialists, visiting properties using NLIS tags successfully, days to analyse profit drivers in the beef business and a tour viewing the use of NLIS along the entire supply chain from seedstock producer to the abattoir and their links to Japanese customers. Table 1 shows the schedule of activities undertaken by the groups and the number of participants at each activity.

From these activities and personal research, participants chose their own course of action on how to capitalise on NLIS tags or otherwise. A co-operator for each group trialled the herd recording software 'Stockbook' and later reported their experiences. Final field days to discuss project outcomes and recommendations were held on property at the respective districts in mid 2010.

Table 1. Group activities by date

Date	Activity	Participants
Oct 07	Bollon group meeting	12
Oct 07	Chinchilla group meeting	7
Nov 07	Transferring data on the NLIS database - Training day, Chinchilla	13
June 08	Herd Software Day (Practical Systems) – "Little Meadows", Chinchilla	14
June 08	Herd Software Day (Practical Systems) – Bollon	10
Aug 08	Getting the most from your Ruddweigh scale indicator – "Marango", Bollon	18
May 09	Analysing the Profit Drivers Day - Bollon	8
July 09	NLIS Supply Chain Tour – Darling Downs (combined PDS's: Bollon, Chinchilla, Kingaroy)	31
Oct 09	Bollon Property visits	10
Nov 09	Chinchilla Property visits	3
Feb 10	NLIS/Yards tour – Roma Saleyards, Nolans, NAPCO	25
March 10	NLIS/ Yards/ Profit Drivers/ Final field day – "Little Meadows", Chinchilla	18
April 10	NLIS / Yards Day – "Wonga Hills", Chinchilla	13
May 10	Bollon Pasture Recovery / NLIS final field day	40

4 Results and Discussion

4.1 Demonstrated management and financial benefits

From the start of the project it was decided that the best way to demonstrate the management and financial benefits of using NLIS was to visit people already using the technology successfully, hear from specialists in the field, as well as trial the technology. Each of these approaches was used throughout the project. Both groups held a day with a software specialist to see how herd recording software can retrieve animal and herd production data quickly and accurately. A co-operator for each group volunteered to trial herd recording software. Both groups also heard from scale indicator representatives.

4.1.1 On-farm demonstrations

On our visit to 'Marango' at Bollon, the owner demonstrated how he used his race reader and smart scales to monitor weight gains. He also used the herd data for forwarding to buyers to show stock on offer. The scales representative was able to show producers how to get the most from the scale indicators such as recording information using meaningful session names, which makes data retrieval easier (See Appendix 2). He also showed how to download and analyse data with the scales software on computer, and define drafting rules. At the yards he demonstrated how to use the scales including how to overcome problems such as those caused when two stock enter the crush at once.

Additional visits to properties owned by the Nolans (Roma district), NAPCO (Roma district) and the Carlyles (Chinchilla district) showed NLIS tags being efficiently scanned with race readers to link

individual identification together with animal performance records. The smart indicator enabled crush side data to be viewed. Example data demonstrated included weights, health records and average daily gains, from which management and automatic drafting decisions could be instantly made.

At the NAPCO backgrounding property, the scale indicator was enough to guide appropriate management for sorting thousands of stock into weight peer groups, selection for feedlot entry and culling of poor performers. In using the technology, 150 head could be processed in an hour. Live weight performance was also used to benchmark pasture and forage crop performance capabilities as well as trialled protein supplementation options. The benefit of NLIS tags to this business was the ability to collect data for many thousands of head with ease and accuracy of collection. The data collected is also of tremendous value in drafting stock into appropriate groups and paddock allocation to achieve target weight gains and turnover.

The Carlyles were very keen to use NLIS tags for data capture and management. Despite their enthusiasm, they still had times of great frustration mainly due to lost NLIS tags in breeders and associated herd record losses. The frustrations led them to tattooing their breeders for reliable identification. They use a race reader and smart indicator (Tru-test XR 3000) to collect data. Their indicator displays several pieces of information (e.g. tag number, breed, sex, weight) and is automatically able to specify the direction for a 5-way draft according to weight ranges, meaning that the operator only needs to simply move the lever and open the head bail, a task which can be completed by almost anyone (See Appendix 3). By drafting on precise specifications, including a break down on just under or over specifications, it makes it easy to know which yard to go to if needing extra stock to fill the truck, thus saving additional time consuming processing. Using NLIS tags also speeds up weighing, allowing 500 steers to be processed in a morning. The main crush side benefits of the scales indicators were for growing stock. The Carlyles also have extensive breeder records which they keep in a separate computer software package.

At the final field day for the Chinchilla group, Stephen Bock was able to demonstrate the use of his Gallagher Smart TSi and its capabilities to analyse stock performance data crush side, for example, breaking down performance on breed and vendor (See Appendix 4). Similarly at the final field day for the Bollon group, the TSi was demonstrated at the Winks' property by both the owner and sales representative. Andrew Winks was impressed with the ease of efficient data collection without the need to go back to the office for further data management. This represents a welcome saving in time especially when running the operation with a young family.

4.1.2 Financial savings

Through the activities associated with this project it was discovered that as scale of operation increases, the potential benefits of using NLIS tags for management increases for a number of reasons (and *vice versa*). In larger herds the set up costs are spread across more cattle. Also time savings and accuracy benefits are amplified. With large numbers such as witnessed with our visit to Grassdale Feedlot (~ 30,000 head), there can be great time savings and data recording benefits from automatic electronic data capture. For example if the electronic data collection system saves 5 seconds per head at induction, for 1000 head this is over 1½ hours time savings. For 100,000 head this is 139 hours or 17 eight hour working days.

The direct financial benefits of using NLIS technology was assessed by examining the performance data of 85 heifers of mixed breeds owned by Stephen Bock, grown for 163 days and sold to the meatworks. The data (see Appendix 5) showed that the best average daily weight gain was 1.51 kg and the worst 0.27 kg, with the average being 0.775 kg per day. On a gross dollars per head gain basis, this results in a range from $66 to $368 and an average of $152 per head for the period. After deducting costs, the percentage return on the livestock capital invested ranged from 26% to 1.6%

and averaging 9%. For this particular lot, if 6% was the target minimum performance, then this equates to an overall weight gain of 90 kg or an average daily gain of 0.55 kg per head per day.

With the data sorted on average daily gain it was easy to identify the stock performing below this gain. The animals that were below the threshold are highlighted in yellow in Appendix 5. If complete vendor information was present, it would have also been easy to compare vendor performance.

4.2 Business overview and NLIS benefits

Table 2 and 3 provide a summary of most of the businesses involved in the PDS, detailing their enterprise, profit drivers, equipment used, data collected and benefits gained from using NLIS technology. More generalised benefits of NLIS technology can be found in Appendix 6.

Table 2. Summary of Bollon producers' enterprises and benefits from NLIS technology

Business	Enterprise	Profit Drivers	Hardware	Data	Specific Benefits
1 (Co-operator)	Trading	Weight gain Carrying Capacity	Ruddweigh 700 Aleis wand Allflex panel reader *Stockbook*	• Beast RFID Number • Management tag • Vendor PIC • Weight gain • Use of HGP • Property currently grazing • Paddock grazing (where recorded)	• Monitor weight gain (identify non performers and pull them out; compare breed and vendor; determine if supplementation required) • Record of treatments (HGP use) • Stockbook (purchase price entered ; know what assets are in the paddock)
2	Breeding	Calving percentage Weaner weights	Ruddweigh 500 Scales in weigh box	• Weight	• Monitor weight gain (mob based averages compared on a spreadsheet ; helps matching cattle to market specifications)
3	Trading/Breeding	Weight gain Carrying Capacity	Ruddweigh 800 Smart TSi Aleis wand	• Beast RFID Number • Management tag • Vendor PIC • Weight gain • Breed	• Monitor weight gain (compare breed and vendor ; identify non performers)
4	Agistment	Carrying Capacity	Allflex wand	• Read cattle on/off the property	• Upload tags onto the database
5	Trading/Breeding	Weight for age	Ruddweigh indicator Allflex wand	• Beast RFID Number	• Weight (helps matching cattle to market specifications)
6	Breeding/Fattening	Weight for age	Ruddweigh 800 Allflex panel reader	• Beast RFID Number • Weight gain • Dentition	• Monitor weight gain (identify when cattle need shifting or supplementing) • Easy to identify how many cattle of each vendor are being sent to the buyer (helps filling out the waybill) • Ability to email files to potential buyers so they can see the average weight and dentition of a mob
7	Breeding	Calving percentage Weaner weights Carrying Capacity	Ruddweigh 700 Gallagher reader	• Beast RFID Number • Weight gain	• Monitor weight gain (identify non performers ; paddock production capability)
8	Trading	Calving percentage Weaner weights	Aleis wand	• Read cattle on/off the property	• Upload tags onto the database
9	Backgrounding (cattle) Sheep	Weight gain (cattle)	XR 3000 Allflex panel reader Prattley autodrafter	• Weight (cattle) • Fleece weight • Body Weight • Sire • Breech and wrinkle score	• Weight (helps matching cattle to market specifications) • Several measurements (identify non performers ; alter breeding decisions) • Ability to identify individual fleeces using barcodes
10	Trading	Weight gain	Aleis wand	• Read cattle on/off the property	• Upload tags onto the database
11	Trading	Weight gain	Ruddweigh 700 Gallagher race reader	• Beast RFID Number • Starting weight • Breed • Paddock they're entering	• Monitor weight gain (helps matching cattle to market specifications ; paddock production capability)

Table 3. Summary of Chinchilla producers' enterprises and benefits from NLIS technology

Enterprise	Benefits from NLIS tags?	Equipment	Profit drivers
Backgrounding, fattening	**Yes:** Upgraded equipment for greater crush side functionality. NLIS tags are capitalised on by automatically recording individual identification with a race reader along with weights, treatments and other records in a 'smart' scale indicator. The system reduces labour requirements and increases efficiency of processing stock including crush side analysis of performance and automatic drafting. Manually reading tags is time consuming and fraught with transcription errors. Abattoir feedback used to monitor compliance.	Scales, Race reader, Touch screen scales indicator, excel, air draft & crush	Live weight gain, market specs (weight, fat, dentition, sex).
Breeding bullocks	**Small benefit:** NLIS tags are bought with matching management tag numbers. Although he has no scanner he links the NLIS tag feedback from the meat works to his management tags so as to monitor market compliance and performance. Retention in older breeders can become a problem. Scales are used to match stock to specifications. Weights are recorded manually and breeder, growing stock and health records are recorded in a spreadsheet. This spreadsheet was demonstrated at the database training day. One of the main benefits of NLIS tags is return of lost stock and knowing when your stock are sold by a neighbour. Is impressed to see the benefits that Stephen Bock has achieved using NLIS technology and recognises there is much scope in industry to do more. He feels not enough people took advantage of the subsidy for readers and perhaps more time was needed both for people to get a handle on the technology, and also for small hand held readers to improve in quality. He thinks if cheaper scanners were available, more people with smaller operations would start to use them as long as cattle weights can be easily linked to the NLIS tag from the wand.	Scales, NLIS tags with matching management tags, excel spreadsheet	Breeder fertility, steer & heifer growth rates, carcase specifications (e.g. > 270kg HSCW)
Trading & some breeders	**No:** NLIS tags are matched to management tags and weight data recorded on paper and into a spreadsheet. Would like to have a scanner and more efficient system for collecting and analysing the data, perhaps home made database, but for small cattle numbers the cost of a scanner and software are prohibitive.	Scales, spreadsheet	Fertility, growth, paddock performance
Breeding vealers	**No:** A cost if tags don't read at the yards – for this reason alone would like to have access to a scanner to check tags before sale. Has very good paper records and no desire to own computer.	Paper based records	Breeder fertility, milking ability, calf growth
Backgrounding heifers	**No** direct benefits or complaints about NLIS tags. Analogue scales used to ensure cattle meet feedlot entry specifications or if going onto crop, otherwise performance is visually assessed. The main selection criteria are breed content, condition and price. NLIS tag loss was a bit of a problem but now it is no problem. When seasons improve and turnover increases, consideration will be given to purchasing a scanner for database transfers for agistment. Will otherwise leave the automatic electronic data technology to the younger generation.	Scales	Breed content, condition score, purchase price, matching entry specifications
Trade cows	**No** direct benefits or complaints about NLIS tags. Tag losses are low and not deemed a problem. Calves born on the property are tagged. Recently 1 calf out of 30 lost a tag and it was obvious that it got caught on something as there was a rip mark in the ear. Losses are low and not deemed a problem. Cattle are visually assessed for performance and market suitability for fat and weight to the meat works. On the whole compliance rates are satisfactory. Indicators of potential performance and profit include district of origin, frame size and purchase price. It is recognised that NLIS tags could be used effectively for management purposes for larger scale operations but sees no need for them for this operation.		District of origin, frame size, purchase price, market specifications (e.g. 300kg HSCW, ~12 – 17 mm P8 fat).
Breeds weaners	**No:** NLIS tags are deemed nothing but a problem due to loses before sale. Recently they sold 18 weaners requiring three new tags. The calves were tagged properly at branding at around three months of age. Any feeding included hay on the ground or cotton seed in open troughs. Expensive technology is unattractive and they are able to monitor performance satisfactorily without it. Computer and printer breakdowns are also a costly deterrent. They use scales to monitor live weights and sell weaners straight off the cows. They also receive weight data from sales dockets and verbal feedback on sales from their agent. They do not buy cattle so do not need to transfer NLIS tags on the database. They have been LPA audited which was a straight forward exercise. Apart from treating for worms and buffalo fly, they do not use other chemicals. They concentrate on maintaining a high quality, fertile herd through heifer selection and buying good bulls.	Scales Excel spreadsheet	Breeder fertility, weaner growth rates, bull & heifer selection

At the start of the project the Reader Rebate Scheme which ended in late 2008 was still available, providing producers with the opportunity to purchase a reader at a reduced cost. This scheme was brought to the attention of the Bollon members and as a result, most of them took advantage of it. Over the course of the project however, the majority of Bollon members encountered some sort of hardware malfunction which could only be fixed by technical experts off farm. In most incidences, members were given the opportunity to use a replacement device in the meantime.

One business in particular from the Bollon group, along with others, used NLIS technology to monitor and evaluate weight gains so as to gauge the production capabilities of certain paddocks. Once determined, paddocks were allocated to different classes of stock throughout the year to optimise the use of pastures and to ensure cattle meet market specifications. This same business initially had set their scales up underneath a weigh box, although they've recently decided to shift them under the crush, enabling them to better document treatments given to the animal and add additional comments.

A particular business in the Bollon group used NLIS technology more to capture vital information about their sheep rather than cattle. The findings within their sheep enterprise were that using a Tru-test XR3000, Allflex panel reader and Prattley autodrafter allows one man to process ~800 sheep in two hours, is estimated to save 80c every time a sheep's data is recorded and prevents an error rate of 10-12% from hand recording data. An extensive range of information has currently being recorded and trends have begun to appear that wouldn't have otherwise been picked up.

4.3 Problems

Throughout the duration of the project, a series of problems were identified by a range of players along the beef supply chain. These problems are listed under several topic areas in Table 4.

Table 4. Problems identified throughout the project

NLIS tags

- Tag losses

- Faulty devices (problem with the manufacturing)
- Suspected reasons for loss include cows licking calves ears and boredom on long trips
- Cost incurred by the producer if they don't have a tag at the saleyards
- Time spent applying new tag and updating information in the indicator
- A particular brand was identified to have more lost tags

- Non-readers

- Companies are not reimbursing the producer
- Time and labour to identify faulty tags

- Incorrect positioning of the tag in bought cattle – sometimes in the wrong ear; manually have to adjust the beast's head position to read the tag

RFID readers

- Unreliability of panel readers when loading/unloading cattle at speed
- Older panel readers need to be tuned if they are placed directly onto the side of a crush (one of the reasons why it's recommended to mount them onto a piece of ply)
- Remembering to delete entries off their wand – become full and sometimes accidentally retransfer cattle (if a new session is not set up)

Indicators

- Numbers on the indicator can be too small to read (it's possible to have only the relevant figures on the screen and this counteracts the problem)
- Worn keys
- Direct sunlight on the screen makes reading the numbers difficult
- With particular models, it's not possible in the yards to get the average weight of the first mob weighed once a second mob has finished weighing

Cost and time

- High cost to set up for small operator
- When the saleyards used to use panel readers and a beast was missed, substantial manpower and time was required to identify the animal and retrieve it
- Help desks sometimes can't offer solutions on the spot which means having to wait 30 minutes to an hour for a return phone call

Software

- Malfunctions
- One business found that the third piece of data (weight) wasn't showing up in the life history of individual animals, however the data was stored in the session CSV file.

Processing

- Two animals entering the crush at once – incorrect weights; disrupts the functioning of the indicator
- For those that have their scales under a weigh box, it's difficult to later enter in information, for example, if a treatment is given in the crush
- Set up of equipment i.e. crush not secure, load bars not even (data is not accurate).

User experience and training

- Need to be on top of things all the time or otherwise can forget how to use the equipment.
- Computer glitches can sometimes frustrate producers to the point where they avoid the technology for good
- Producers trying to collect too much information (can get frustrated and it creates extra work)
- Producers not reading the provided manual (sometimes the problem is very simple to fix)

Other

- Difficulty in using the database
- Compatibility issues with equipment
- The 9 pin serial cables are not heavy duty and can be damaged by wildlife/weather
- Electrical noise from the 240 volt mains circuit i.e. switching florescent lights, motors and pumps (Must install Line filter in series with instrumentation)
- Electro-magnetic interference i.e. induction through cables with high current running in parallel, radio frequency noise from UHF or CB transmitters or from the RFID panel or wand (Run signal cabling separate to power cabling and cross at 90 degrees)

4.4 Producer experience with software

The Bollon group co-operators, Danny and Fiona Borello, were already using Practical Systems Cash book for financial records prior to the project commencing, although for this project they trialled Practical Systems Stockbook and uploaded over 5,000 head of cattle into the program. Mentioned below is a small summary of their feedback, with full details contained in Appendix 6.

Things we liked about the program

- Having all the information available in an easily accessible format.
    - Purchase price / date / vendor details
    - Being able to include information such as HGPs or any vaccination or medication details
    - As markets fluctuate & new orders become available, you are able to see what you should have in the paddock rather than muster them just to see if they suit.
- The Prac Systems help desk staff were friendly and knowledgeable.

What we didn't like about the program

- Would have been good to actually get basic training in it. However, generally after doing things the long way for a period, we usually found a better way of doing it.
- Generally when calling the help desk, someone would call you back 30 mins to an hour later. Sometimes when you just need to know something now, we found this a little frustrating.
- Uploading files from Ruddweigh was another time consuming job to do

Whilst they recognised that the program has excellent features, they felt these would be better capitalised on for a breeder operation as a smart indicator can efficiently do the basics for a trading operation. The program does offer an extensive range of features if so desired for the extra time and dollars.

The Chinchilla group co-operator, Stephen Bock, was already using Phoenix for financial records though wanted software to help record livestock performance data for his backgrounding operation. As part of the project he trialled the use of herd recording software, Stockbook, however found it a bit difficult to use. He thought it was a very good tool but more advanced than what he was looking for. The other issue was that the software would not interface with his weigh scale indicator and so he could not use it at the yards. This meant writing lots of information and bringing it back to the computer. It would have been possible to send the scale indicator away and have it updated so that it would work crush side, however as the software was not really what he was after he did not proceed with that option. Instead, Stephen purchased the latest weigh scale technology, a Touch Screen Indicator which allowed him to easily record and analyse stock performance data crush side. It allows him to easily draft his cattle on weights, see average daily gains, make cull decisions crush side, immediately see the statistics on stock processed, know exactly what is in each yard and assists with NLIS data transfer. Previously he used to have to determine the drafting at home and run the cattle around a second time. He no longer needs to write anything down and readjust the data in the home computer, all of which saves him time and transcription errors. The indicator can also be used for his paddock records.

4.5 Tag retention and read rates

When asked about NLIS tags, both groups reported they'd experienced problems with tag losses and/or non-readers.

Responses from Bollon participants in regards to tags were:

- 560 tags – 43 either lost tags or non-readers (7.7%)
- 265 – 14 non-readers (5.3%)
- Approximately 1% non-readers
- 4% lost tags (one brand)
- 10% lost tags

Responses from Chinchilla participants in regards to tags were:

- 18 tags – 3 lost tags (17%)
- 30 tags – 1 lost tag (3%)

4.6 Additional learnings

Additional learnings as cited by group participants:

- In addition to time savings, automatic tag ID capture removes human transcription error. Otherwise it is quite possible for an animal to be inducted as one number, exit as a different tag number and be recorded differently again at slaughter. NLIS scanning is accurate, as people say "you know you have the right animal".

- A valuable learning from the co-operators trialling the herd recording software, as well as the property visits, was that for growing and backgrounding operations, the scale indicator can very simply do what is required for monitoring performance and health records. As such, the software was more than what was needed for each of the co-operators, however the same software received good reports from breeder herd producers who attended the Beef Supply Chain Tour and from the Carlyles. It is important to determine what your recording needs are first and then to decide the most appropriate options that meet those needs.

- Even though the Chinchilla co-operator runs a smaller operation, NLIS tags still provide labour savings and improved accuracy in recording the data, as well as instant crush side analysis. Decisions can be made there and then without having to analyse data in the office and return to reprocess stock. The data is also readily formatted for NLIS database transfers.

- During the Beef Supply Chain Tour (See Appendix 11), many producers remarked on the benefit of NLIS identification accuracy in retrieving lost animals from neighbours and knowing when someone sells your cattle.

- Like with any technology, over time it becomes outdated, and there are manufacturers whose products do very similar jobs although they'll have additional features suited to special needs. Throughout the duration of project, participants were exposed to a range of equipment manufactured by Gallagher, Tru-test and Aleis, most of whose products are now compatible with one another.

- It is not necessary to have two pieces of 'smart' equipment, as one can sufficiently store, process, import and export information and link data from several sources.

- It was interesting to discover that the properties of a particular company's top of the range indicator were downloadable on the internet. This gives producers who are using more middle

of the road equipment the opportunity to upload their data into a top of the range system without incurring the additional software costs.

- For those producers with limited computer experience, simplicity of collecting/using data was still a challenge.

- Seedstock producers benefit significantly from NLIS technology as accurate, objective data can be used for identifying and selecting superior genetics, along with generating EBVs.

- When processing cattle, the capacity of the forcing pen can be the limiting factor when NLIS equipment is working efficiently.

5 Success in Achieving Objectives

In this PDS, all of the objectives were met, along with an additional objective, with details contained below.

5.1 Demonstrated management and financial benefits of using NLIS to record and retrieve individual animal and /or herd production data quickly and accurately at appropriate intervals

Over the course of three years, ten activities involving 200 participants were run, all of which demonstrated how NLIS technology was benefiting businesses from a management and financial perspective due to the ability to record and retrieve animal performance data. Participants went to a range of properties to witness how the technology was already being utilised effectively and also listened to company sales representatives give a detailed insight into how herd production data can be collected using certain equipment.

5.2 Evaluated

5.2.1 Key production parameters (key profit drivers) for each demonstration property

Days were held for both groups to evaluate key profit drivers for their enterprises. For all businesses, carrying capacity (as influenced by land type, condition, rainfall and rainfall use efficiency) was the overriding profit driver. At a livestock enterprise level, the key profit drivers varied with the type of operation, for example, fertility was highly important for breeder enterprises, live weight gains for backgrounders / traders and weight gains and carcase characteristics for those finishing cattle. More specific profit drivers are listed for each business in Table 2 and 3.

From the economics days run as part of this PDS project, producers received spreadsheets which let them easily model the profit drivers for a range of production scenarios. An important part of these days was getting a better ‘big picture’ understanding of the factors which influence business performance and also the crucial need for accurate objective data (resources, livestock, human, financial) in monitoring trends. It emphasises the saying “if you can’t measure it you can’t manage it”. In terms of having accurate livestock data it helps demonstrate the role that NLIS tags can play in efficient individual livestock data collection. The aim of the days was to motivate people to want to keep better records. Indeed as a result of the Bollon day, with the desire to learn more about business management, one of the members organised funding for a “Grazing for Profit” workshop to be run in Bollon for approximately thirty producers in the district. This is a very good outcome for the district and will have benefits for years to come.

Profit drivers were further investigated by analysing some production data of the Chinchilla co-operator. For the particular lot of cattle assessed, it was estimated that weight gains below 0.55 kg per head per day was generating less than 6% return. It also highlighted performance differences between breeds, a finding which may be taken into consideration when making future management decisions (see Appendix 5).

5.2.2 Appropriate methods/software for electronically recording production information on demonstration properties

The project conducted learning activities to increase participants' exposure to hardware/software options for recording production information. During the course of the project, several producers purchased equipment which on the whole met their needs. More detail on what equipment and methods of recording information used by the group members is listed in Tables 2 and 3.

Two very important learnings came from the project, namely that:

- for small operators, adopting the use of NLIS recording data may not be worthwhile at the current cost of equipment
- comprehensive herd recording software is not necessarily required to gain many benefits from electronic use of NLIS tags for data collection and analysis. In many cases a 'smart' scale indicator may be sufficient.

At the beginning of the project, one producer from each group was given the opportunity to trial the herd recording software 'Stockbook' in order to later share their experiences with the group. The group took on board the key learnings from these co-operators and as such realised that unless the software was going to be specific to their needs, it was unnecessary to use.

Also, a couple of participants who were interested in finding out more about spread sheeting and its ability to store and sort information, were provided with training by staff either by phone or face to face.

5.2.3 NLIS tag retention and read rates on demonstration properties. This information will be given to MLA's NLIS program.

All participants were asked about their experience with lost and non-reading tags. Responses were varied, with some people able to provide exact numbers and others more targeted towards bad batches they've encountered (mainly faulty male pins). There were also reports of brand differences in regards to retention/ readability of tags.

5.2.4 Compliance obligations under Livestock Production Assurance (LPA) are being met by participating businesses

During the NLIS Supply Chain Tour, a seminar session was run regarding LPA and EU auditing to provide producers with some auditing insights. Amongst the Chinchilla group only one business has been LPA audited and it was considered a straight forward exercise. They do not use NLIS tags for data recording. From the various learning activities with the software and scale indicator representatives and property visits, it was shown how easily the necessary information (e.g. treatments and their date of administration) can be recorded and retrieved. NLIS tags, in conjunction with smart indicators or software, provide an efficient, accurate way to link, manage and retrieve this data for individual animals either crush side or in the office.

One producer in the Chinchilla group also performs LPA and EU audits as a QA consultant. As a result of being involved in the project, he realised that NLIS tags represent no great savings for

producers with small cattle numbers which are only handled a few times. He mentioned that people just need to keep good records and be more accountable. In contrast to the small producer, he is very impressed with the speed at which feedlot contract inductors can process cattle into feedlots (e.g. as fast as 10 seconds) and realised that this would not be possible without NLIS tags and equipment for recording data.

On the EU front, some audits are very difficult. Many people are not used to reconciling PIC numbers. There are lots of cows that have not been removed from the database between 2002 and 2005. It would be good practice for people to learn to tidy up the database (e.g. dead and replaced tags and placing inactive tags in an inactive file). For example say for 1000 cattle, if 10 die and 10 lost per year, after 10 years that is 200 wrong tags and lost life time traceability records.

5.3 Identified relevant data and production parameters that can then be analysed to assist/improve business

Live weight records is the main data being used to identify non-performers, draft cattle into weight groups according to market specifications and determine the production capability of paddocks. Feedback data is received by some to analyse compliance for carcase weight, fat and dentition and to identify areas for improvement. During the course of the project, little was seen in the way of breeder records, although participants who attended the Carlyle's property were made aware how breeder performance data could be analysed to improve the profitability of the business.

5.4 Provide learning opportunities for participants to evaluate the value of adopting the use of NLIS tags for management benefits for their businesses

Overall, there was an impressive uptake of the new technology amongst the Bollon producers (4 businesses) and by the co-operator of the Chinchilla group over the three years. This reflects how the ten learning activities were able to demonstrate the potential benefits the technology could have on their businesses and justify cost involved in establishing a system on farm.

6 Impact on Meat and Livestock Industry

Animal performance has a major impact on the profitability of beef businesses and thus being able to measure it accurately, objectively and at speed is highly desirable. This is where NLIS tags have come into their own, both as a tool for traceability and management purposes.

This PDS provided group members, along with other participants (landholders and Agri-service providers), the opportunity to take part in a series of activities to learn how NLIS tags can be used as a management tool. These activities provided technical advice and encouraged the sharing of ideas, and it is envisaged that the knowledge gained has extended through the beef industry. As such, those involved have benefited directly for several reasons (some mentioned below), whilst others indirectly benefited via formal communication (e.g. media releases) (See Appendix 8-11) and informal methods (e.g. looking over the fence, personal and electronic networks).

NLIS technology has provided many businesses with the ability to identify non-performing animals (e.g. low average daily gain, empty cows) so they can be removed from the herd. By doing this, their herd has become more efficient and available pasture can be reserved for productive animals.

By participants monitoring and evaluating weight gains in different paddocks, the paddocks' production capability have been determined. This allows allocation of paddocks to different classes

of stock throughout the year to optimise the use of pastures and to ensure cattle meet market specifications. This management strategy optimises both profitability and sustainability of businesses.

Producers such as Stephen Bock and Reg Carlyle have benefited from carcase feedback sheets containing RFID numbers as they're able to simply download this information and identify which individual animals haven't met market specifications. With this information, there's the ability to then determine the reason why the animal may not have graded, for example, bull influence or age of the animal. Pinpointing where the problem lies is very important because if it's a bull influence, potentially a person's business could be affected for the next 10-15 years.

It is anticipated that producers who have adopted the technology, will overtime fine tune their herd recording systems and progress innovations for further time and labour savings, inevitably improving profitability. These efficiencies will undoubtedly feed back up through the supply chain to have a positive impact on the meat and livestock industry.

7 Conclusions and Recommendations

7.1 Conclusions

Through the course of the project, producer participants determined that using NLIS tags for data collection can improve accuracy of data collection, save time and labour in their enterprise. It was also clear that there can be many and varied obstacles when establishing a NLIS management system on farm, including setting up load bars, weigh scale indicators, RFID readers and associated software and making it all work smoothly together. Some people had systems working effectively from the beginning whereas others had to endure the frustration of several glitches in their system. It became clear that there are greater benefits for larger scale operations. It is not clear however where the threshold is for economic use for smaller scale operation. This would obviously vary depending on management circumstances, financial position and personal goals.

It is important for producers to consider their needs for NLIS equipment as a management tool. In doing this, it pays to see what other people are doing, preferably seeing a range of different equipment in use and learn from others' experiences. A useful reference with various case studies is 'Better beef with NLIS', Western Australian NLIS Implementation Working Group, Department of Agriculture & Food, WA. It was discovered that smart indicators are capable of doing a lot of what people want, though there is also very good software available that will do more. Free trials are often available from the internet and it is advisable to talk with people using different systems.

Principally this project was about adoption and acceptance of the technology. It was aimed at investigating just how easy it is for producers to collect and utilise data using NLIS technology. After having spoken to the participants at the end of the project, it seems that those who have invested in equipment intend on continuing to adopt the technology, with some looking to further investigate the potential benefits of NLIS devices. It would be beneficial in the future (3-5 years) to liaise with those who've invested in the technology and see how they're reaping both management and financial benefits.

7.2 Recommendations

It remains evident that there's still a need to further investigate how to cater for small, low cost operations. Suggestions include manufacturing more inexpensive RFID readers, making simple

herd recording spreadsheets available on the web with instructions and having equipment available in a central location that can be shared by a group.

Manufacturing companies must also continue to be understanding of producer's issues with the technology and act on them. Some issues identified from the PDS include:

- QA for tag quality (improve retention and reading rates)
- Ease of updating lost tags in software packages
- Inclusion of extra economic analysis in software packages
- Better protection for indicators e.g. sun visor
- Cost effective indicators that better cater for breeder records
- Simple pamphlet explaining the do's and don'ts when getting equipment set up at the crush site

Also deemed important is the continued extension on how to use the NLIS database, the importance of completing property to property transfers and the correct placement of tags.

Finally, it's recommended that more opportunities become available for producers to participate in beef supply chain trips, as this gives them an excellent understanding of the importance of NLIS from paddock to plate and the benefits which can be gained from adopting the technology.

8 Further Reading

Better beef with NLIS. Western Australian NLIS Implementation Working Group.

Research Report: NLIS Equipment. Kondinin Group, from Farming Ahead Dec 2007 No.191 P.45

NLIS equipment and software compatibility. Kondinin Group publication.

Livestock Production Assurance: audit checklist. MLA www.mla.com.au

NLIS case study: Warrawagine Cattle Co family run pastoral station. Department of Agriculture & Food, WA.

9 Acknowledgments

The project team wishes to acknowledge the hard work and enthusiasm of group members involved in this project. Alistair Brown submitted the project proposal and organised activities in the first year of the project. Producers, sales representatives and agri-service providers who either hosted or attended activities shared their valuable industry knowledge and experiences with NLIS technology. Finally, the project has only been possible with the financial support from MLA and Department of Employment, Economic Development and Innovation.

10 Appendices

10.1 Appendix 1: Participant list for the two PDS groups

Bollon Group

Danny & Fiona Borello
Peter & Tiki North
Andrew & Lauren Winks
Ken Murchison
Di & John Mesner
Ernie & Leigh Blayden
Dougald & Fiona Cameron
Steve Bolam
Stuart Mitchell
Bob Brown
Greg & Robyn Bryant
Doug & Sue Bryant
Jason & Sonja Jennison

Chinchilla Group

Don & Lorraine Bell
Brian & Shirley Gilligan
David Walsh
David & Lois Hubbard
Stephen Bock
Leonard Raftery
Mark & Carol Schmidt
Tony Pascoe
Terry Elliott

10.2 Appendix 2: David Clothier (Gallagher) discussing NLIS equipment at Bollon

10.3 Appendix 3: Carlyle's indicator with recorded information and draft direction

10.4 Appendix 4: Stephen Bock demonstrating how he utilises his indicator

10.5 Appendix 5: Stephen Bock's carcase feedback data

Tag Number	Electronic ID	Overall ADG	Current ADG	Live Weight (kg)	Original PIC	Breed	Colour	Dent	Fat	L hot kg	R hot kg	Kg Dressed	Price / Kg	Value	Dressing %	$/Kg Live	Kill No.
A0833	982000086527018	0.61	0.41	528		Santa	Red	6	18	153.5 GH	155.0 GH	308.5	2.80	863.80	58%	1.64	830
A0839	982000090996953	0.51	0.70	472		Santa	Red	0	15	120.5 Y	121.0 Y	241.5	2.85	688.28	51%	1.46	813
A0875	982000109204074	0.42	0.74	494	67%	Santa	Red	2	15	131.5 Y	133.0 Y	264.5	2.90	767.05	54%	1.55	812
A2283	982000103013057	1.51	1.55	482		Charolais X	Ginger	0	6	113.0 Y	114.5 Y	227.5	2.85	648.38	47%	1.35	794
A2284	982000042916664	1.40	1.31	484		Charolais X	Ginger	0	8	123.5 Y	124.0 Y	247.5	2.90	717.75	51%	1.48	784
A2271	982000102579958	1.31	1.15	483		Charolais X	Ginger	0	5	126.0 Y	125.0 Y	251.0	2.90	727.90	52%	1.51	838
A2282	982000102880732	1.22	1.35	486		Charolais X	Ginger	0	12	112.0 3 Y	115.5 Y	227.5	2.81	638.30	47%	1.31	776
A2281	982000122911422	1.18	1.25	465		Charolais X	Ginger	0	8	120.0 Y	120.5 Y	240.5	2.90	697.45	52%	1.50	833
A2266	982000102881326	1.01	0.91	446		Charolais X	Grey	0	10	108.5 Y	109.5 Y	218.0	2.80	610.40	49%	1.37	845
A1245	982000083122852	0.97	1.02	482		Charolais X	Ginger	2	8	119.5 Y	119.0 Y	238.5	2.85	679.73	49%	1.41	809
A2031	982000104243526	0.89	0.69	472		Charolais X	Cream	0	10	129.5 Y	129.0 Y	258.5	2.90	749.65	55%	1.59	840
A2061	982000104244121	0.85	0.88	456		Charolais X	Ginger	2	15	116.0 Y	114.5 Y	230.5	2.80	645.40	51%	1.42	811
A2033	982000090084297	0.82	0.88	456		Charolais X	Cream	2	14	119.0 Y	120.0 Y	239.0	2.80	669.20	52%	1.47	768
A2046	982000098169930	0.81	0.92	480		Charolais X	Ginger	4	12	124.5 FH	122.0 FH	246.5	2.50	616.25	51%	1.28	825
A2086	982000097495430	0.78	0.91	444		Charolais X	Cream	2	12	119.5 Y	120.0 Y	239.5	2.85	682.58	54%	1.54	791
A2010	982000090254579	0.68	0.55	465		Charolais X	Grey	2	10	125.0 Y	126.0 Y	251.0	2.90	727.90	54%	1.57	816
A1230	982000054480143	0.66	0.67	459		Charolais X	Ginger	2	10	120.5 Y	121.0 Y	241.5	2.90	700.35	53%	1.53	818
A2030	982000098169909	0.64	0.42	467		Charolais X	White	4	12	127.0 FH	130.0 FH	257.0	2.50	642.50	55%	1.38	817
A0824	982000099577684	0.55	0.37	469		Charolais X	Grey	2	10	124.5 Y	123.5 Y	248.0	2.90	719.20	53%	1.53	810
A2268	982000102899498	1.35	1.14	500		Charolais	White	0	6	128.5 Y	127.5 Y	256.0	2.90	742.40	51%	1.48	837
A2269	982000102880661	1.27	1.22	484		Charolais	Ginger	0	8	116.5 Y	117.0 Y	233.5	2.85	665.48	48%	1.37	841
A2276	982000102880912	1.02	1.03	445		Charolais	Cream	0	10	115.5 Y	115.5 Y	231.0	2.85	658.36	52%	1.48	797
A2032	982000097495924	0.90	1.15	482		Charolais	White	0	18	126.5 Y	127.0 Y	253.5	2.85	722.48	53%	1.50	826
A2075	982000093403160	0.83	0.57	461		Charolais	Cream	0	8	124.0 Y	124.5 Y	248.5	2.90	720.65	54%	1.56	765
A2081	982000079492498	0.80	0.86	449		Charolais	Cream	2	12	115.5 Y	117.0 Y	232.5	2.85	662.63	52%	1.48	781
A2024	982000090081485	0.79	0.74	483		Charolais	White	4	18	119.5 FH	121.5 FH	241.0	2.50	602.50	50%	1.25	803
A1227	951000010456737	0.66	0.39	504		Charolais	Ginger	0	14	138.5 Y	139.5 Y	278.0	2.90	806.20	55%	1.60	807
A1235	982000055937971	0.51	0.64	479	4.0%	Charolais	Cream	0	14	128.5 Y	128.5 Y	257.0	2.85	732.46	54%	1.53	769
A0686	982000102423745	0.82	1.02	447	QKBI0413	Brangus	Black	0	5	115.5 Y	114.5 Y	230.0	2.85	655.51	51%	1.47	839
A0655	982000102429072	0.81	1.17	486	QKBI0413	Brangus	Black	0	9	129.5 Y	128.5 Y	258.0	2.90	748.20	53%	1.54	798
A0684	982000102424132	0.80	1.45	489	QKBI0413	Brangus	Black	0	5	134.5 Y	134.5 Y	269.0	2.95	793.56	55%	1.62	831
A0665	982000056073319	0.76	1.09	473	QKBI0413	Brangus	Black	0	6	127.0 Y	128.5 Y	255.5	2.90	740.95	54%	1.57	801
A0657	982000102424305	0.76	1.00	473	QKBI0413	Brangus	Black	0	12	124.5 Y	124.5 Y	249.0	2.90	722.10	53%	1.53	789
A0641	982000102424048	0.75	1.13	481	QKBI0413	Brangus	Black	0	12	125.5 Y	127.5 Y	253.0	2.90	733.70	53%	1.53	785

Tag Number	Electronic ID	Overall ADG	Current ADG	Live Weight (kg)	Original PIC	Breed	Colour	Dent	Fat	L hot kg	R hot kg	Kg Dressed	Price / Kg	Value	Dressing %	$/Kg Live	Kill No.
A0644	982000102423621	0.71	0.91	471	QKBI0413	Brangus	Black	0	12	113.0 3 Y	117.0 Y	230.0	2.81	645.33	49%	1.37	800
A0645	982000086608955	0.71	0.72	473	QKBI0413	Brangus	Black	0	16	119.5 Y	121.0 Y	240.5	2.85	685.43	51%	1.45	793
A0659	982000102428614	0.69	1.04	456	QKBI0413	Brangus	Black	0	12	120.0 Y	118.5 Y	238.5	2.85	679.73	52%	1.49	832
A0658	982000102423722	0.64	1.06	455	QKBI0413	Brangus	Black	0	10	121.5 Y	122.5 Y	244.0	2.90	707.60	54%	1.56	802
A0648	982000055742008	0.64	0.83	490	QKBI0413	Brangus	Black	0	6	129.5 Y	131.5 Y	261.0	2.95	769.96	53%	1.57	771
A0663	982000102428414	0.64	0.72	459	QKBI0413	Brangus	Black	0	14	119.5 Y	122.0 Y	241.5	2.85	688.28	53%	1.50	820
A0685	982000102428876	0.62	0.83	448	QKBI0413	Brangus	Black	0	10	116.5 Y	118.5 Y	235.0	2.85	669.76	52%	1.50	835
A0651	982000102428415	0.62	0.77	444	QKBI0413	Brangus	Black	0	15	117.5 Y	118.5 Y	236.0	2.80	660.80	53%	1.49	775
A0675	982000117126904	0.61	0.80	457	QKBI0413	Brangus	Black	0	12	124.0 Y	122.0 Y	246.0	2.90	713.40	54%	1.56	790
A0672	982000102423867	0.59	0.85	444	QKBI0413	Brangus	Black	0	8	117.0 Y	115.0 Y	232.0	2.85	661.20	52%	1.49	828
A0676	982000102428608	0.56	1.09	436	QKBI0413	Brangus	Black	0	8	119.0 Y	117.5 Y	236.5	2.85	674.03	54%	1.55	766
A0674	982000056073534	0.53	0.79	447	QKBI0413	Brangus	Black	2	10	120.5 Y	122.5 Y	243.0	2.90	704.70	54%	1.58	819
A0662	982000086608615	0.51	0.96	477	QKBI0413	Brangus	Black	0	12	125.0 Y	125.5 Y	250.5	2.90	726.45	53%	1.52	799
A0680	982000102423736	0.27	1.28	471	QKBI0413	Brangus	Black	0	10	122.0 Y	124.5 Y	246.5	2.90	714.85	52%	1.52	827
A1223	951000010457046	0.75	0.99	491	15.0%	Brahman X	Brindle	0	12	133.5 Y	135.5 Y	269.0	2.95	793.56	55%	1.62	796
A2008	982000097495373	0.69	0.45	430		Brahman X	Cream	4	7	116.0 FH	116.5 FH	232.5	2.45	569.63	54%	1.32	779
A1269	982000102423569	0.62	0.88	491		Brahman X	Brindle	0	15	127.5 Y	130.0 Y	257.5	2.85	733.88	52%	1.49	767
A1232	951000010667859	0.61	0.55	480		Brahman X	Grey	0	15	124.5 Y	126.5 Y	251.0	2.85	715.36	52%	1.49	783
A0965	982000109212079	0.60	0.88	526		Brahman X	Brindle	0	15	133.0 Y	135.0 Y	268.0	2.90	777.20	51%	1.48	774
A1219	982000083122069	0.50	0.52	479		Brahman X	Grey	0	7	132.5 Y	135.5 Y	268.0	2.95	790.61	56%	1.65	764
A1221	951000010669422	0.64	0.86	460		Brahman	Brindle	0	8	122.5 Y	126.0 Y	248.5	2.90	720.65	54%	1.57	792
A1238	982000097382898	0.64	0.77	490		Brahman	Black	0	20	134.0 Y	133.5 Y	267.5	2.90	775.75	55%	1.58	762
A1220	982000083122860	0.53	0.68	467		Brahman	Red	2	12	122.0 Y	122.0 Y	244.0	2.90	707.60	52%	1.52	843
A0939	982000107966847	0.49	0.64	472		Brahman	Red	0	10	125.5 Y	126.5 Y	252.0	2.90	730.80	53%	1.55	770
A0950	982000107956356	0.48	0.71	434		Brahman	Red	2	12	112.5 Y	113.5 Y	226.0	2.85	644.11	52%	1.48	780
A1203	951000010454344	0.47	0.59	460	42%	Brahman	Grey	0	6	132.0 Y	132.5 Y	264.5	2.95	780.28	58%	1.70	788
A1253	982000044751420	0.96	0.90	506		Angus X	Black	2	18	129.0 Y	129.0 Y	258.0	2.85	735.30	51%	1.45	824
A1224	982000058149102	0.98	1.14	487		Angus	Red	0	7	127.0 Y	129.0 Y	256.0	2.90	742.40	53%	1.52	805
A1246	982000103316423	0.67	0.92	444		Angus	Black	2	15	116.0 Y	118.5 Y	234.5	2.80	656.60	53%	1.48	773
A1254	982000103316690	0.62	0.78	476		Angus	Black	0	8	114.0 Y	115.5 Y	229.5	2.85	654.08	48%	1.37	821
A1261	982000103315852	0.60	0.88	462		Angus	Black	0	14	124.0 Y	123.5 Y	247.5	2.85	705.38	54%	1.53	844
A2280	982000102899160	1.13	1.20	452				0	8	114.0 Y	117.0 Y	231.0	2.85	658.35	51%	1.46	777
A2272	982000102899447	1.10	1.02	455				0	8	116.0 Y	115.5 Y	231.5	2.85	659.78	51%	1.45	795
A2045	982000098170074	0.99	0.97	516				0	10	135.5 Y	135.0 Y	270.5	2.95	797.98	52%	1.55	806
A2057	982000097495555	0.94	1.09	465				2	6	126.5 Y	127.0 Y	253.5	2.90	735.15	55%	1.58	814
A2026	982000104243411	0.93	0.88	473				0	8	129.0 Y	130.0 Y	259.0	2.90	751.10	55%	1.59	808

Tag Number	Electronic ID	Overall ADG	Current ADG	Live Weight (kg)	Original PIC	Breed	Colour	Dent	Fat	L hot kg	R hot kg	Kg Dressed	Price / Kg	Value	Dressing %	$/Kg Live	Kill No.
A2060	982000104243259	0.92	0.84	499				0	4	130.0 FH	129.5 FH	259.5	2.50	648.75	52%	1.30	763
A2080	982000091663071	0.89	1.04	510				2	8	134.0 Y	135.0 Y	269.0	2.95	793.55	53%	1.56	778
A1247	982000039782239	0.89	0.98	490				2	8	121.5 Y	122.0 Y	243.5	2.90	706.15	50%	1.44	823
A2059	982000098169901	0.86	0.91	512				2	14	137.5 Y	136.5 Y	274.0	2.90	794.60	54%	1.55	842
A2036	982000097495878	0.86	0.86	477				2	14	129.0 Y	129.5 Y	258.5	2.85	736.73	54%	1.54	782
A2018	982000078713456	0.83	1.11	520				2	8	133.5 Y	135.0 Y	268.5	2.95	792.08	52%	1.52	822
A2085	982000090255047	0.80	0.76	510				2	8	132.0 Y	134.0 Y	266.0	2.95	784.70	52%	1.54	772
A1998	982000079491822	0.80	0.54	491				2	5	135.5 Y	138.0 Y	273.5	2.95	806.83	56%	1.64	787
A2048	982000090084376	0.78	0.65	455				2	16	116.0 Y	117.0 Y	233.0	2.80	652.40	51%	1.43	834
A2015	982000091659058	0.73	0.94	473				2	5	129.0 Y	131.0 Y	260.0	2.95	767.00	55%	1.62	815
A2050	982000104244732	0.72	0.67	482				2	4	128.5 FH	127.0 FH	255.5	2.50	638.75	53%	1.33	786
A2027	982000098169949	0.72	0.61	448				2	15	124.0 Y	123.0 3 Y	247.0	2.81	692.88	55%	1.55	829
A2028	982000079492210	0.72	0.61	499				4	10	137.5 FH	138.5 FH	276.0	2.55	703.81	55%	1.41	804
A2034	982000078713535	0.65	0.33	452				4	8	123.0 FH	123.5 FH	246.5	2.50	616.25	55%	1.36	836
	Average	0.7750	0.8700	473.67			Average	1.0	10.6		Average	249.4	2.84	709.18	53%	1.50	
	Max	1.51	1.55	528			Max	6	20		Max	309	2.95	864	58%	1.70	
	Min	0.27	0.33	430			Min	0	4		Min	218	2.45	570	47%	1.25	

84 head heifers over 163 days, mix of breeds

		L.Wght (kg)	$ / Head	$ / Kg
Purchased	5-May-09	346	557	1.61
Sold	15-Oct-09	474	709	1.50
Gross change	163 days	128	152	

No of head	
2 out of 3	67% of santas below 0.55 kg/d ADG
5 out of 12	42% of brahmans below 0.55 kg/d ADG
3 out of 20	15% of brangus below 0.55 kg/d ADG
1 out of 25	4% of charolais below 0.55 kg/d ADG
0 out of 5	0% of angus below 0.55 kg/d ADG
19 unidentified	

10.6 Appendix 6: Generalised benefits of NLIS technology and associated costs

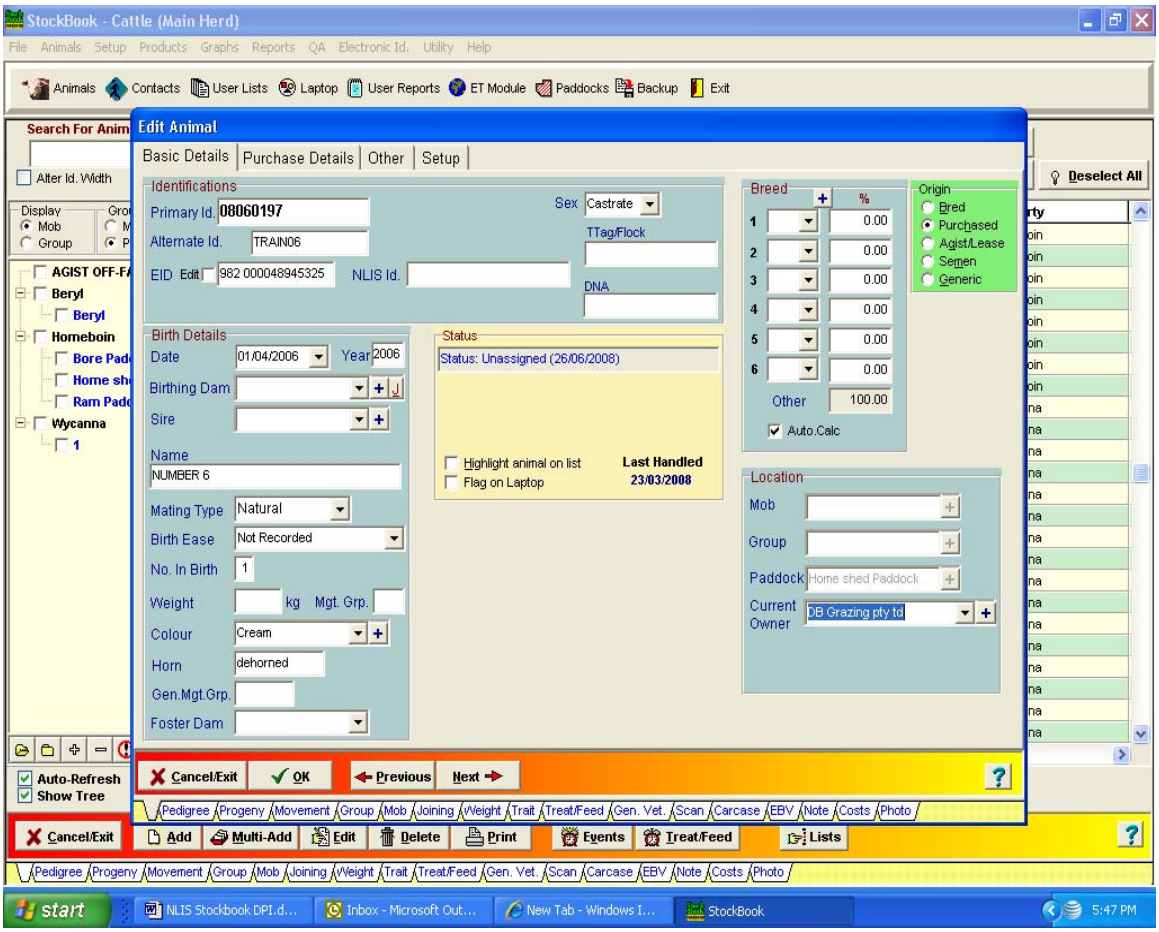
Benefits	Costs
1. Common direct benefits in the yards (which increase with increasing cattle numbers) include: Fast accurate data collection • know it is the right animal • large time savings for large numbers • reduced labour • Less stress/risk for people and stock Crush side data, analysis and decisions • saves time if no need to go and analyse data and reprocess cattle • automatic drafting – easier, faster • efficient data entry e.g. treatments, QA 2. Potential benefits with remote management: • paddock weights, drafting, weaning, targeted supplements, mothering up… 3. Flow on benefits from better records: Performance data for management and marketing decisions • cull non performers, more feed for better performers • better market compliance & income • data as marketing tool to customers • measure paddock performance Better records • know what stock are where and value • run budgets and income projections • QA data eg for LPA • historical benchmarking data The flow on benefits can be gained irrespective of NLIS tags, however the main benefits from the tags is fast accurate data and the management benefits from time savings, accuracy, instant crush side data analysis, cattle handling and labour savings.	Lost / non reading tags and loss of associated records Cost to set up and maintain • equipment – readers, scales, draft gates, computer, software and repairs • getting it right, learning curve, time and costs overcoming problems and malfunctions, consultancy • time lost in yards with lost tags, systems failures • opportunity costs of investment For small cattle numbers the costs become proportionally very high (and vice versa) Associated costs include lost data if not backed up however this is a risk irrespective of if NLIS tags are used for collecting data.

10.7 Appendix 7: Experience with Stockbook Software – Danny & Fiona Borello (Bollon)

We uploaded over 5,000 head of cattle through the Stock book program from data that we obtained from processing the cattle as they arrived on the property or in some cases from an emailed file (.csv format) from the transferring property that contained an NLIS number and a weight. We also entered any other info that we had on the cattle for example what property (PIC) they came from and when they last received a HGP etc.

We found Practical System's Stockbook program beneficial when used with cattle that were processed through the yards on a regular basis, providing us with a clear guide to the varying weight gains enabling management decisions to be made based on known data & cattle to be sold at optimum times. The other standout feature of the program is the ability to track cattle easily that were sourced from different vendors / herds and gain some great results as to how they responded to the Bollon, Roma & Torwood properties that the cattle were being grazed on.

A negative we found was that with the rotational grazing system in place at Bollon we had relatively large numbers of cattle in one mob and we found it too time consuming to process the cattle through the yards every time they were moved to a new paddock, so we were unable to make the most of the software's features. However, with some of the smaller mobs that we traded and handled more frequently we were able to enter a lot more data and thus gained much more useful results from all of the features in the program.

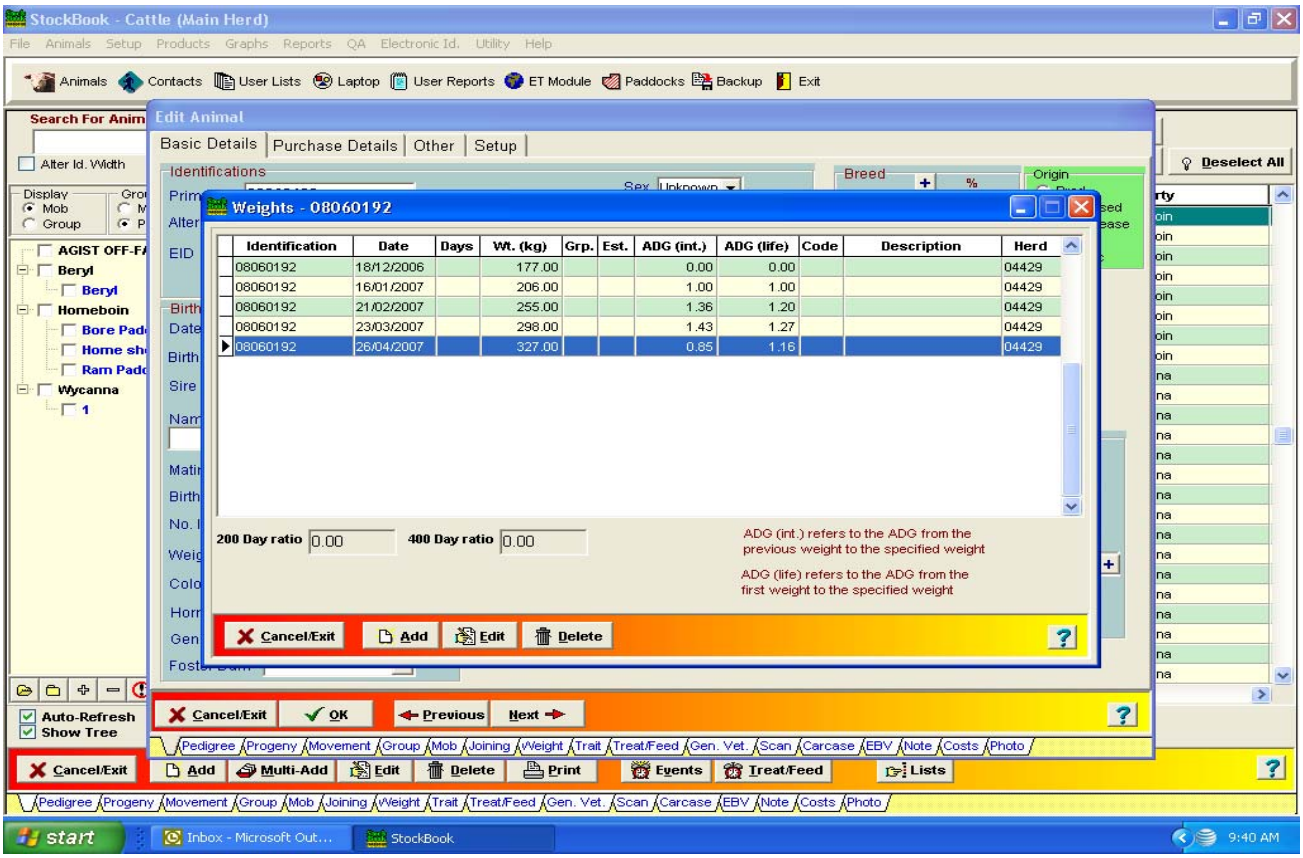


When we traded cattle on a small scale we found the programs features to be excellent. These cattle were held in smaller paddocks and processed through the yards regularly. Some of the information captured from our trading herd included:

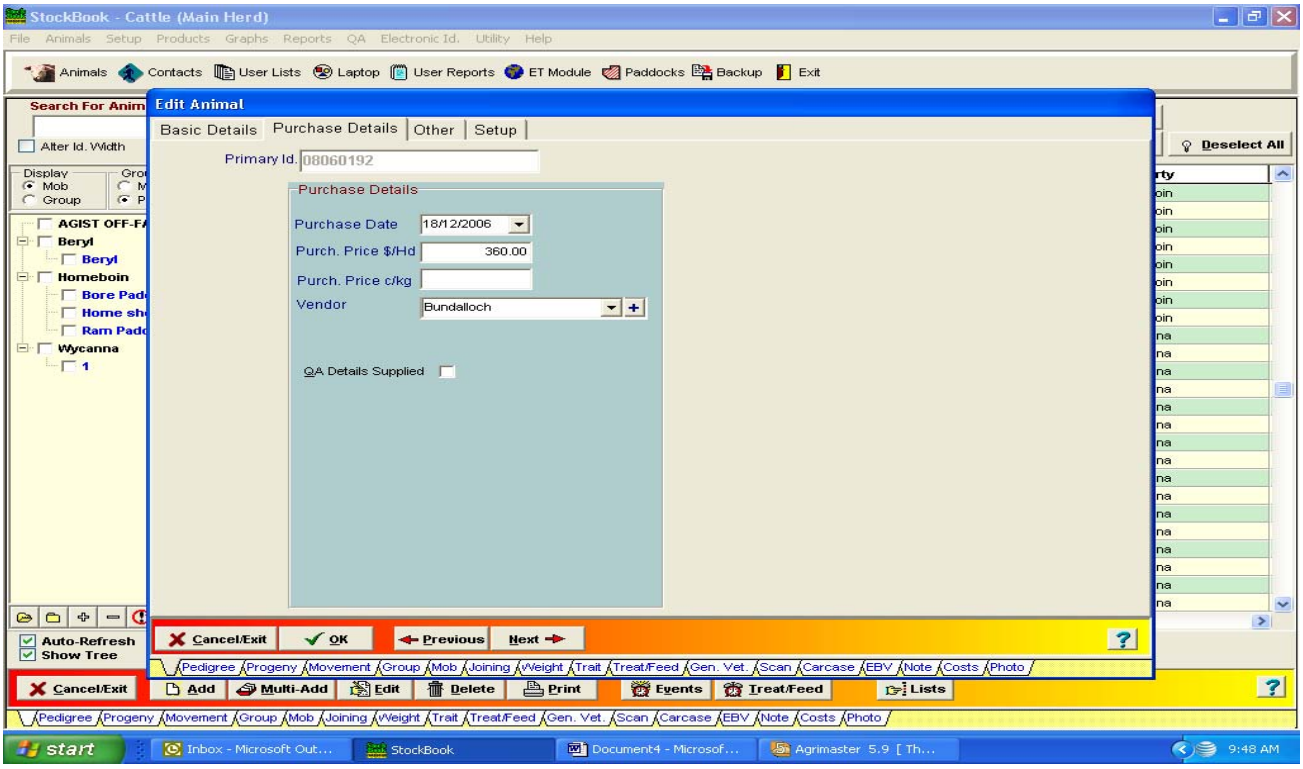
- Beast EID Number & Visual ID tag
- Vendor PIC
- Property currently grazing
- Paddock grazing (where recorded)

We were able to enter the purchase prices, weights history and track the weight gains of the cattle over the period, sell non-performers, supplement as soon as we noticed a fall in daily weight gain coming into winter and know details of exactly what assets we had walking around the paddock. We could also relate that back to current market values to know what our cattle were valued at every day.

We weighed them to gain knowledge of weight gains that were being experienced in that season. For the first month this beast put on 1 kg/hd day and then it's weight gain peaked in March at 1.43 kg/day to give an average daily gain of 1.16 kg/day during the trial period.



We also liked the ease at which you could enter other information including purchase price, vendor



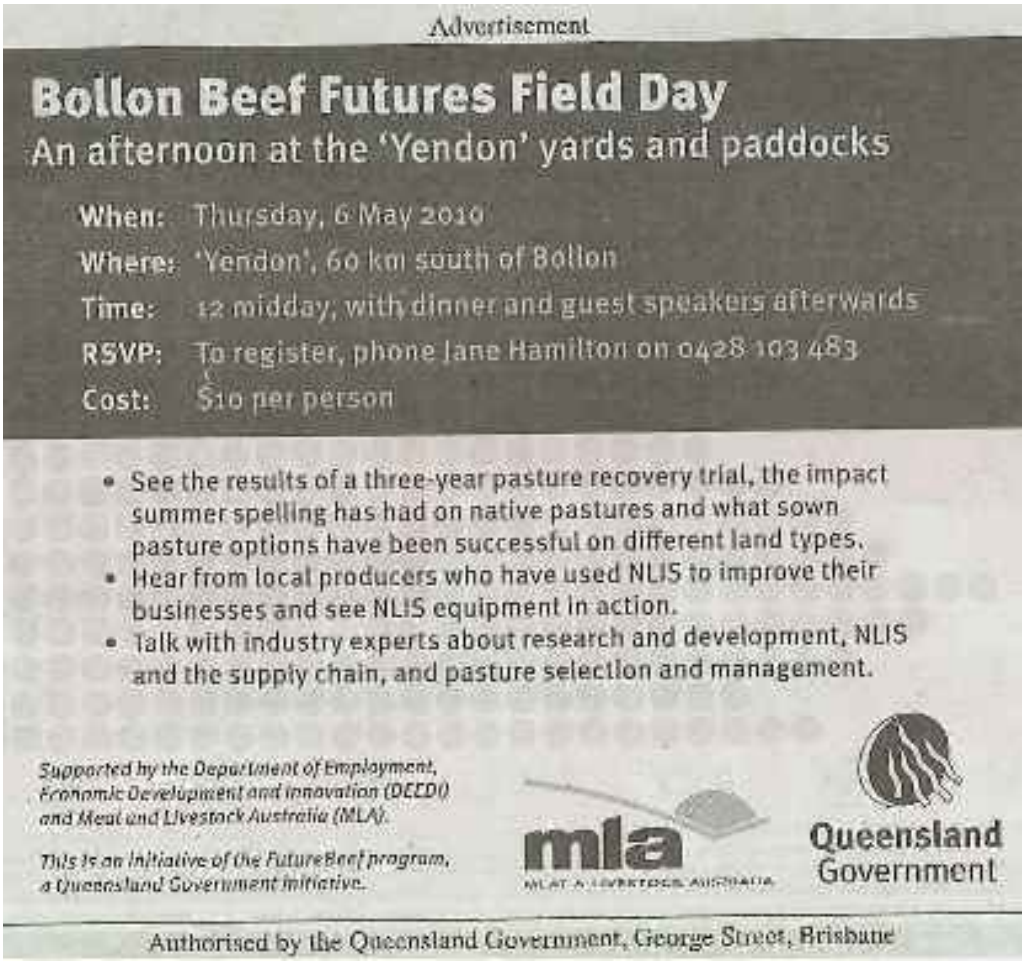
Things we liked about the program

- Having all the information available in an easily accessible format.
  - Purchase price / date / vendor details
  - Being able to include information such as HGPs or any vaccination or medication details
  - As markets fluctuate & new orders become available, you are able to see what you should have in the paddock rather than muster them just to see if they suit.
- The Prac Systems help desk staff were friendly and knowledgeable.

What we didn't like about the program

- Would have been good to actually get basic training in it. However, generally after doing things the long way for a period, we usually found a better way of doing it.
- Generally when calling the help desk, someone would call you back 30mins to an hour later. Sometimes when you just need to know something now, we found this a little frustrating.
- Uploading files from Ruddweigh was another time consuming job to do

10.8 Appendix 8: Media article that appeared in Rural Weekly 23/04/2010



Advertisement

Bollon Beef Futures Field Day

An afternoon at the 'Yendon' yards and paddocks

When: Thursday, 6 May 2010
Where: 'Yendon', 60 km south of Bollon
Time: 12 midday, with dinner and guest speakers afterwards
RSVP: To register, phone Jane Hamilton on 0428 103 483
Cost: $10 per person

- See the results of a three-year pasture recovery trial, the impact summer spelling has had on native pastures and what sown pasture options have been successful on different land types.
- Hear from local producers who have used NLIS to improve their businesses and see NLIS equipment in action.
- Talk with industry experts about research and development, NLIS and the supply chain, and pasture selection and management.

Supported by the Department of Employment, Economic Development and Innovation (DEEDI) and Meat and Livestock Australia (MLA).

This is an initiative of the FutureBeef program, a Queensland Government initiative.

mla MEAT & LIVESTOCK AUSTRALIA

Queensland Government

Authorised by the Queensland Government, George Street, Brisbane

10.9 Appendix 9: Media article that appeared in Maranoa Mail 31/03/2010

RURAL ROUND-UP

Producers drive Beef Futures

Andrew Winks and daughter Charlotte monitoring one of two pasture recovery sites at Yendon.

Graziers and consultants will have the chance to see first hand how cattle data collection systems, spelling pastures and sowing grasses and legumes might work for them at the Bollon Beef Futures Field Day on Thursday May 6.

An initiative of the Queensland Government FutureBeef program, the field day will be hosted by Andrew and Lauren Winks on their property, Yendon, on May 6.

The day was initially scheduled for March 25 but has been postponed due to the wet conditions in the region.

The field day will mark the completion of two, three-year producer demonstration projects, supported by the Department of Employment, Economic Development and Innovation (DEEDI) and Meat and Livestock Australia (MLA).

Jane Hamilton, FutureBeef extension officer with DEEDI, said the Pasture Recovery Producer Demonstration Site Project was based around four on-farm demonstration sites, across three properties near Bollon in south west Queensland.

"The Blayden, Winks and North families have been driving this project, taking a really proactive approach towards managing their resources and improving their productivity and sustainability," she said.

Producer, Andrew Winks, said he was looking forward to the chance to show other producers what he had learned.

"Resting our paddocks over summer has really lifted land condition, with an improvement in pasture composition and productivity," Mr Winks said.

"We've had some good success with different species combinations on two different soil types across the property, which will lift our overall carrying capacity.

"We'll be showing people both sites during the field day and discussing what species worked, what didn't, and why.

"We'll be demonstrating NLIS in action in our cattle yards, too, which I hope will be really interesting to other producers."

The Beef Futures Field Day will start at 12pm and producers need to register in advance to attend. To register, phone Jane Hamilton on 0428 103 483.

MAR 'A TOWN & COUNTRY MAIL | 30 | 31 MARCH, 2010

10.10 Appendix 10: Media article that appeared in Northern Downs News 10/09/2009

Producers see benefits of NLIS first hand

Southern Queensland producers who participated in a recent tour of the Dalby region are convinced of the importance of the National Livestock Identification System (NLIS), according to a local Queensland Primary Industries and Fisheries (QPIF) extension officer.

Senior extension officer Damien O'Sullivan said the three-day tour showed 32 producers how NLIS was being used in all facets of the beef supply chain.

"The trip gave producers an insight into how NLIS is a valuable tool for traceability and how it is ensuring safety of our beef markets," he said.

"The group visited suppliers along the chain, including producers, sale yards, NLIS service providers, a feedlot and an abattoir.

"This included a trip to Dalby Agricultural College which detailed how NLIS aided in the tracking of beef for Meat Standards Australia (MSA) meat-grading systems and how MSA operates for the meat seller."

Upon visiting the Japanese-owned Oakey Abattoir, the group saw how a cryovaced and bar-coded cut of meat from one of the 1000-plus head processed daily could be traced back to the individual animal and its property of origin.

Mr O'Sullivan said from visiting the abattoir, the producers became aware of the effectiveness of NLIS as a marketing tool for the Japanese market.

"We export 65 per cent of our beef and Japan is the biggest importer of Australian beef, so this market is very valuable to us," he said.

"Japanese are fastidious about food safety and this aspect is vitally important to consumer purchase choices.

"We viewed a Japanese television advertisement that focused entirely on the importance of NLIS in the use of 100 per cent Australian beef in their beef patties.

"This advertisement, which focuses on NLIS in Australia, shows how important it is to them and us."

Mr O'Sullivan said the trip offered a fantastic platform for producers to come together, learn and share their experiences in using the tag system.

"Having a group of producers and staff together to learn from each other and find out how other people are gaining management benefits from NLIS was great," he said.

"It was enjoyable to hear other people are having such success with recording systems and finding they want to collect more objective data for managing their herd.

"The producers have a better appreciation of the value of NLIS to individuals within the beef supply chain.

Similarly, he said, the benefits of NLIS were large.

"NLIS can save a lot of time and remove lots of human errors," he said.

"On large-scale properties and feedlots, time savings can add up to many days saved over a year.

"Several producers mentioned another benefit of NLIS was just getting more of their own cattle home after they had strayed."

The trip was part of three NLIS projects funded by Meat and Livestock Australia and lead by QPIF.

It will now be up to the producers involved with these projects, with assistance from QPIF extension staff, to see how they can further integrate the technology as part of normal on-property management.

For more information on NLIS, visit www.dpi.qld.gov.au

Mort and Co Grassdale feedlot livestock supervisor Rick Young shows participants the importance of NLIS tags in the management and handling of large numbers of cattle.

10.11 Appendix 11: NLIS/Beef Supply Chain Trip Overview 2009

Bollon, Chinchilla & Kingaroy project groups

Tuesday evening 28 July – AACC Dalby

- **MSA**- Kelly Payne, MLA
- **Auditing insights** - Terry Elliot, Quality Ag Systems
- **NLIS at the saleyards** - Joe Walsh, Livestock Link

Wednesday 29 July

- **"Rosevale" Jandowae** - David & Sonya Greenup
- **ALEIS** - John Finlayson
- **Grassdale Feedlot** - Rick Young, Mort & Co

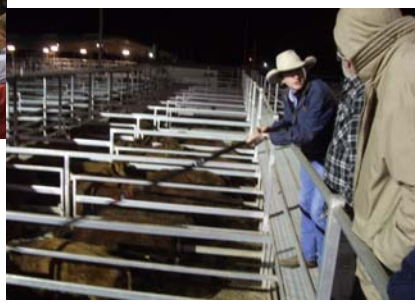
Thursday morning 30 July

- **Oakey Abattoir**

Tuesday evening 28 July – AACC Dalby

1. Explanation of MSA
- producing high eating quality Australian beef

2. Auditing insights



3. Dalby saleyards
- NLIS scanning & data management

Wednesday 29 July – "Rosevale"

"Rosevale"
Weight & flight speed records. Trutest indicator, ALEIS wand.

Accurate objective data for identifying and selecting superior genetics

Wednesday 29 July – "Grassdale"

"Grassdale Feedlot" 35,000 head - fast, accurate objective data, massive time savings

Thursday 30th July – Oakey Abattoir

NLIS traceability vitally important to Japanese customers

Some conclusions from participants

- NLIS is a tool the majority of us do not use, not only to its capacity but at all, tag to sell is the main use. We need more trips like this to see it as a very useful tool.
- There is a lot of scope in the industry to adopt the use of NLIS tags for many different management & operational tasks.
- NLIS can be used for management & probably can be done easily.
- We need to make better use of RFID tags in a management role on farm and a reader, program & scales will be purchased in the next three months.
- Reinforced the thinking that there needs to be a succinct reason/goal to collect and maintain livestock performance data.
- Excellent opportunity to see NLIS from paddock to plate