Optimal Management Strategies for Weaner Cattle in Preparation for the Feedlot

Ian Colditz, Kev Sullivan, Sharon Pettiford

The demand for consistent, high quality beef is driving an increased percentage of Australia's beef production into feedlot production systems, where there is much greater control over operation.

The feedlot sector has a capacity of approximately 893,000 head (April 2003, ALFA news). The quarterly turnoff for the March quarter (2003) was 553,500 head. While 46% of this turnoff is destined for Japan, some 46.6% (270,000 head) of the total production is domestic beef. The demand for domestic feedlot production is growing.

Almost 48% of cattle on feed are in Queensland and together with NSW (37%) account for 85% of the Australian feedlot herd. 50% of feedlot capacity is in feedlots of over 10,000 head, and 20% of feedlot capacity is in herds of less than 1000 head. It is anticipated there will be a trend toward an increase in the proportion of cattle in larger operations as the feedlot sector continues to grow.

A feedlot is a hostile environment for cattle. Animals are placed in unfamiliar surroundings often after experiencing extended transit times from the property of origin. These cattle, often freshly weaned, may have moved through a saleyard system, being loaded and unloaded onto trucks a number of times, co-mingled with cattle from a variety of origins and health status, and transported sometimes vast distances, to the feedlot where they are again handled, processed and placed in confinement often after being re-sorted and mixed with different cattle again. These animals are fed feed that may be unfamiliar, from a bunk and are trough watered. It is not uncommon for the whole process to be extended over a period of 7-10 days.

This tortuous process of getting cattle to the feedlot subjects the animals to a series of stressors. These stressors have been shown to be cumulative. Animals have been shown to be able to cope with one or two stressors, but their ability to cope declines as the number of stressors increases.

It is well known that stress leads to increased cortisol production. Cortisol is an immunosuppressive and persistent high cortisol levels cause depression of the immune system and render the animal less able to mount a defense against a disease challenge.

Why it is important to Prepare Weaner Cattle?

The performance of weaner cattle in feedlots can be greatly improved by following a simple pre-feedlot program involving yard-weaning and respiratory vaccination.

To be healthy and profitable, a feeder steer has to:

1. Get onto feed and water quickly in the feedlot.
2. Have a strong resistance against respiratory disease
3. Adapt easily to the initial social/psychological and metabolic stress involved with getting onto feed in the feedlot.
4. Accept vehicles, people and horses nearby at all times
5. Not suffer from foot abscesses etc.

Yard Weaning – The Research

Two strategies were chosen to investigate and address the problem of animals getting sick upon entry to the feedlot.

1. Better management of feeder steers at the time of weaning
2. Vaccination prior to feedlot entry with new experimental vaccines which protect the cattle against the major pathogens implicated in respiratory disease.

Project Design (DAN.069)

Two types of yard weaning treatment were thoroughly tested with and without vaccination. The objective of this design was to determine the most cost effective combination. The experimental yard weaning procedures were compared with a control group which was paddock weaned according to the common industry practice which still exists for many producers.

Figures 1 and 2 are the research results of the work of Lloyd Fell, NSW Agriculture ARMIDALE. They report the effects of yard weaning management on feedlot gain and of sickness (mainly BRD) in calves run in commercial feedlots over three years. Yard weaning at high density resulted in significant increases in performance when compared to traditionally weaned calves.

The yard-weaned and yard-trained cattle had a higher

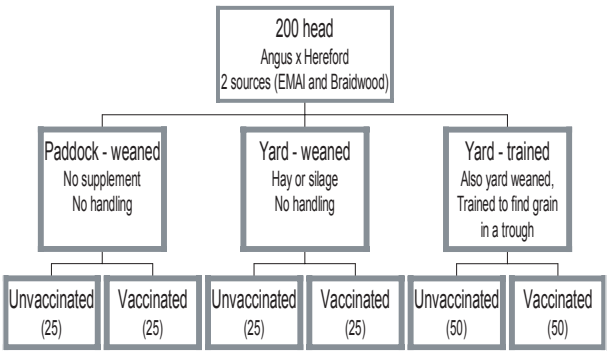

Figure 1. Experimental design

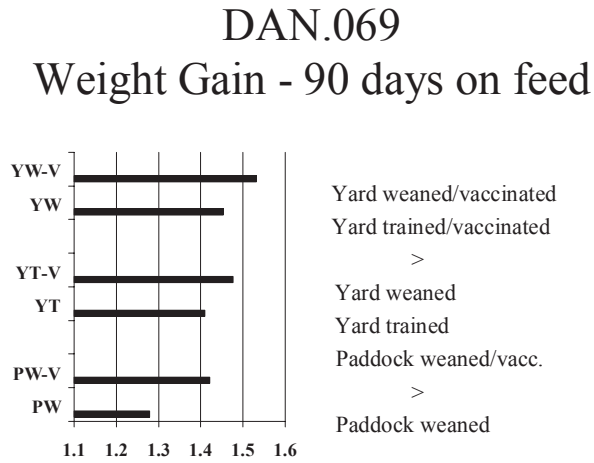

Figure 2. Weight gain - 90 days on feed (Source: L Fell, NSW Agriculture)

weight gain. Weaning is a critical learning time for young cattle. The yard-weaned, vaccinated group gained an average of 1.53kg/day compared to the 1.28kg/day for the paddock-weaned, unvaccinated control group. Best results were achieved by combining yard weaning with pre-feedlot vaccination for BRD. Vaccinated, yard-weaned calves settled onto feed faster, grew faster over the 90 day feeding period than the paddock weaned control groups.

In the third phase of the project the yard weaned vaccinated group grew 60% faster in the first month on feed. Yard weaning and correct vaccination will maximise the chance of calves performing well when fed.

There were consistently lower morbidity rates in the yard weaned groups compared to the paddock-weaned controls. The proportion of yard-weaned animals pulled because of sickness (2.0%, 4.1% and 5.9%) was less than half that of the paddock weaned animals (5.4%, 10.2% and 22.7%).

Guidelines for Yard Weaning

- Well built weaner proof yards with good quality water
- Pen stocking density of 4 m^2/ head for 180-260 kg calves
- Round bale feeder with good quality hay or silage each day
- Kept in the yards for 5-10 days
- Some human presence each day
- Reasonably sloped, non bog surface
- Solid opaque pen sides made for 1.2m rubber belting (optional)

The benefits of the simple procedure of yard weaning are principally realised during the feedlot stage of production due to the learned response at weaning.

The Economic Benefit of Yard Weaning

It was also concluded that these treatments would be cost effective under a range of industry circumstances. Economic analysis showed that, in comparison to the gross margins for control animals, all treatments improved the gross margin per head when compared to the control.

The best in terms of highest improvement in gross margin were the *yard weaned un-vaccinated* and *the yard weaned vaccinated* group.

From the research it is evident that by implementing yard weaning in your on farm weaner management program your cattle will have better weight gain and a reduced incidence of disease when compared to animals weaned using traditional paddock weaned methods. A definite benefit in weight gain and respiratory health resulted from the use of respiratory vaccines 1-2 months prior to feedlot entry. Therefore the combined effect of yard-weaning and vaccination produced the best results in health and performance and was shown to be cost effective.

By preparing your cattle in accordance with the research it is possible to achieve:

- Cattle starting to gain weight sooner in the feedlot
- Lower livestock health costs due to less sick pulls in the feedlot
- A higher proportion of finished stock making the higher priced target market
- Higher growth rates can mean reduced times to finish cattle with big feed cost savings

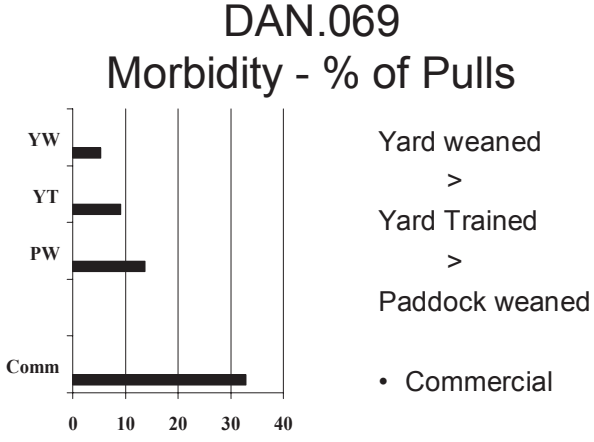

Figure 3. Morbidity - % of pulls

Table 1

Results of economic analysis for final phase of research			
After 90 Days on Feed	**Improved in Gross Margin ($/head)**	**Additional Costs ($/head)**	**Estimate of Added Value ($/head)**
Yard weaning with hay or silage for 10 days	30.50	5.50	25.00
Yard weaning plus pre-feedlot vaccination	33.00	15.00 (estimate only)	18.00

- Higher growth rates also mean increased throughput per annum for the feedlot

A negotiated premium for your superior feeder cattle

The best groups of feeder cattle are those that are socially established at yard-weaning, the worst are those animals that are thrown together from multiple sources.

Vaccine Developments

Following on from the results of the use of experimental respiratory vaccines, the development of commercial vaccines was a logical and necessary next step.

Q-Vax, a Queensland company, in conjunction with Queensland DPI has developed a modified live intranasal IBR vaccine (Rhinogard), which has been shown to be efficacious at controlling IBR in commercial feedlots when administered at arrival as part of the processing program.

The Beef Quality CRC and CSIRO, Geelong was involved in developing an inactivated *Mannheimia haemolytica* vaccine, formulated with adjuvant for administration by injection. This vaccine is based on an Australian isolate of *M.haemolytica* over expressing a major protective antigen (leukotoxin). A whole cell "hot strain", from a commercial feedlot was added to the vaccine. Manufacturing and commercialization of the vaccine has been done by Ausvac (now taken over by Intervet). This vaccine is being used under permit in six (6) commercial feedlots with good results being achieved. Commercially the vaccine has shown to be cost effective. Registration is pending.

An inactivated Pestivirus vaccine based on an Australian isolate has been developed by NSW Agriculture. The vaccine is being manufactured and commercialized by CSL and the registration process has been completed. This vaccine is scheduled for commercial release by CSL in the next month or so.

Conclusions and Implications for Industry:

For technologies to be picked up by producers they must be effective, simple to apply, cost effective and not overly labour intensive.

- Yard weaning is a technology which meets these criteria and can have a major impact on feedlot health and performance.
- Vaccines based on Australian isolates will become available in 2003 for *M.haemolytica* and Pestivirus (BVDV). These will be killed vaccines and will require two doses for maximum efficacy.
- *M.haemolytica* – ideally this vaccine should be used prior to feedlot entry during a back grounding phase, the second dose 2-3 weeks prior to entry. It will be difficult to convince producers to use such a vaccine unless a premium for doing so is paid by the lot-feeder. Its use in integrated systems is highly likely.
- Pestivirus (BVDV) – the high exposure rate of Pestivirus at feedlot entry and the rapid exposure which occurs in the first few weeks means that effective use of this vaccine must occur on the property of origin.

This paper was compiled by Sharon Pettiford using papers by Ian Colditz and Kev Sullivan which were presented to the CRC "Arm The Trainer" Workshop held in April 2003. The work of Dr Llyod Fell, NSW Agriculture and CRC researcher 1993-2000, is also widely quoted.


RANGERS VALLEY
1996 LOT FEEDER OF THE YEAR
1997 LOT FEEDER OF THE YEAR
NATIONAL GRAIN FED BEEF COMPETITION 2000 JAPAN B3 + FEEDLOT CATEGORY WINNER
NATIONAL GRAIN FED BEEF COMPETITION 2000 JAPAN B3 + FEEDLOT CATEGORY RUNNERUP