

MLA R&D update

Woodchip bedding for feedlot cattle

Meat & Livestock Australia funded project B.FLT.0244 in consultation with the Australian Lot Feeders' Association to determine the effects of graded levels of woodchip during wet feedlot conditions on cattle performance and welfare

Location

- Research was conducted at University of New England Tullimba feedlot
 - Implanted *Bos taurus* steers (378 kg) were fed a tempered barley diet for 109 days on feed
 - Stocking density of 12.5 m²/hd
 - Natural rainfall was supplemented with irrigation
 - Target of 74 mm precipitation over 16 events in a 30 day period
 - Temperatures ranged from 0 to 18 °C

Treatments

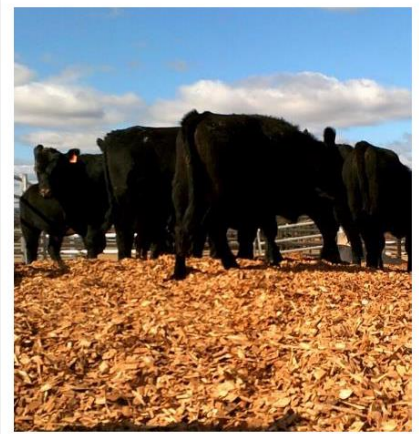
- There were three experimental treatments:
 - **Control** - no bedding
 - **W30** - bedding provided at 54 kg/m² – equivalent to a bedding cost of 30c/head/day
 - **W60** - bedding provided at 108 kg/m² – equivalent to a bedding cost of 60c/head/day
- Eucalypt woodchip (50x30x5mm) was applied across entire pen: 15cm in W30 and 30cm in W60



Control – no bedding



W30 – 15 cm woodchip



W60 – 30 cm woodchip

Results

Treatment	Control	W30	W60	P-value
Pens, n	10	10	10	
Initial Body Weight, kg	374.8	380.4	378.1	0.380
Adj Final Body Weight, kg	626.3 ^a	644.2 ^b	646.6 ^b	0.0002
Days on feed	109	109	109	
Adj Average Daily Gain, kg/d	2.27 ^a	2.42 ^b	2.46 ^b	0.003
Dry Matter Intake, kg/d	11.30	11.79	11.47	0.056
Adj Gain:Feed ratio	0.20 ^a	0.20 ^a	0.21 ^b	0.004
HSCW (kg)	328.8 ^a	338.1 ^b	339.6 ^b	0.001
Eye Muscle Area (cm ²)	77.8 ^a	80.3 ^{ab}	81.3 ^b	0.041
Muscle Glycogen (%)	1.29 ^b	1.32 ^a	1.26 ^b	0.047
Relative Adrenal Weight (g/100 kg HSCW)	4.18	4.09	3.91	0.077
Grid Price (\$/kg HSCW)	5.67 ^a	5.73 ^b	5.71 ^b	0.015
Carcase Value (\$/hd)	1864 ^a	1938 ^b	1939 ^b	0.002

^{ab}Means with different superscripts differ (P < 0.05). Adjusted BW was calculated from HCW divided by the average dressing percent (52.48 %) of all steers, after which adjusted ADG and adjusted G:F were recalculated using the adjusted BW.

Economics

- Optimal performance and economic response obtained at W30 (15 cm of woodchip)
 - 9.3 kg increase in HSCW (2.8%)
 - 6 c/kg grid premium (due to less underweight carcasses)
 - Dry matter intake however increased (0.49 kg/d)
- No additional benefit to applying 30 cm of woodchip
- Feedlots should apply their own values for carcass revenue, feed, woodchip, application cost, pen cleaning costs, manure value, mortality and morbidity to determine site-specific economics.

Animal Welfare

- No health responses detected under small pen research conditions.
- A trend (P = 0.07) for a treatment effect on adrenal gland weight (g/100 kg HSCW) was reported.
- Adrenal glands produce cortisol a 'stress hormone' and were lighter in bedded cattle, indicating animal welfare was objectively improved.
- Muscle glycogen was also greater for cattle bedded on 15 cm of woodchip.

Conclusions

- Woodchip bedding is beneficial for animal performance and welfare.
- Simulating a wet southern Australian winter, the addition of 15 cm of woodchip had a moderate weight lead to a \$74 increase in carcass value.
- Lot feeders should apply site-specific values for manure revenue and input costs to determine economic feasibility.
- Commercial-scale research is necessary to determine the economic benefits of woodchip bedding particularly for animal health.