

Effect of rumen modifier management on feedlot performance and carcass attributes of steers

A.J. Nortrup^{A,B}, R.S. Hegarty^A and F.C. Cowley^A

^A School of Environmental and Rural Science, University of New England, NSW 2351 Australia.

^B Email: abby.nortrup@gmail.com

Antibiotic rumen modifiers (ARMs) have been routinely included in feedlot rations to improve rumen function and nitrogen retention (Elsasser, 1984), but, with the exception of laidlomycin, no new ARMs are being registered. Alternative management strategies for existing ARMs in feedlot finisher rations have been studied to improve productivity and efficiency. Advantages in average daily gain (ADG) and gain to feed of 4.8% and 2.7%, respectively, have been found in Canada with the daily rotation of monensin and lasalocid compared to monensin alone in steers on finisher rations (Shreck et al., 2016). However, few studies have examined the effect of ARM strategies from feedlot arrival to exit, or compared individual ARM with multiple ARMs in daily rotation over the full feeding period. This study sought to quantify how changes in ARM management might deliver growth, and carcass advantages to the Australian feedlot industry.

Four hundred and fifty (n=450) yearling *Bos taurus* based steers with an initial liveweight (LW) of 353kg were blocked by LW, sorted into 45 pens of 10 head, and fed for 109 d. All cattle were adapted to a tempered-barley feedlot ration through 3 transition rations over 21 d. From d 0 to 109, pens were provided with one of three treatments: monensin alone (25mg/kg DM; MON), lasalocid alone (20mg/kg DM; LAS), or a daily rotation of the two (same individual dosage rates; M/L). Liveweight and orts were collected on d 0, 27, 55, 83 and 109, rumen fluid collected on d 0, 27, 53 and 83, and manure samples were collected on d 14, 28, 42 and 56. Upon trial end, all cattle received a full MSA carcass assessment. Means were separated using a linear mixed effects model and significance was declared at $P < 0.05$.

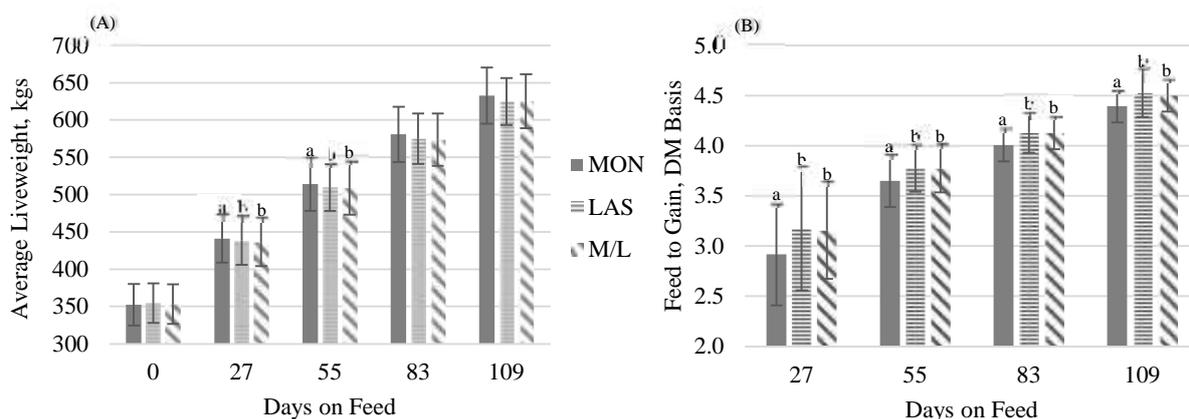


Figure 1. Rumen modifier treatment and days on feed interactions for Average Liveweight (A) and Feed to Gain (B) in Australian feedlot steers. Raw means are displayed with \pm sd and different subscripts within grouped columns are significantly different ($P < 0.05$). MON = continuous feeding of 25mg/kg DM Monensin; LAS = continuous feeding of 30mg/kg DM Lasalocid; M/L = daily rotation of 25 mg/kg DM Monensin or 30 mg/kg of diet DM Lasalocid.

Average daily gain (ADG) of MON cattle tended ($P < 0.1$) to be greater than of LAS and M/L cattle for the entire 109d, but overall ADG and feed:gain (F:G) for all treatments were exceptional (mean ADG = 2.5kg/hd/d; mean F:G = 4.5 on DM basis) and above average for typical feedlot cattle. Gut fill and compensatory growth could have been an influencing factor. Significant advantages (Figure 1; $P < 0.05$) were seen in F:G (-2.6%) throughout the entire trial with continuous inclusion of MON compared to LAS or M/L. Monensin-only cattle also tended ($P < 0.1$) to have improved average liveweight on d109 (+1.2%), as well as greater ADG (+3.1%) over the whole period. Modifier treatment had no effect on intake, morbidity, faecal starch, ruminal parameters, or carcass characteristics. Net economic benefit was the same for all treatments, but cost of gain was significantly lower for MON cattle (-2.7%; $P < 0.05$) compared to LAS and M/L. Rotating ARMs, or inclusion of lasalocid alone continuously, did not improve feedlot performance or economics compared to feeding monensin alone continuously.

References

- Elsasser, T. H. (1984). *Journal of Animal Science*, **59**(3), 845-853.
Shreck, A. L., Behlke, E. J., Paddock, Z. D., Burciaga-Robles, L. O., Parr, S. L., Booker, C. W., ... & Quinn, M. J. (2016). *The Professional Animal Scientist*, **32**(5), 561-569.

This project was funded by Meat and Livestock Australia in consultation with the Australian Lot Feeders' Association.