Responses to varying inclusion levels of canola meal as a grassfed supplement for weaner calves

E. E. Lynch[A,B,D], *M. A. Campbell*[A,B], *J. W. Piltz* [B,C], *G. L. Krebs*[A,B] *and M. A. Friend*[A,B]

[A] School of Animal and Veterinary Sciences, Charles Sturt University, Wagga Wagga, NSW, 2650
[B] Graham Centre for Agricultural Innovation (Department of Primary Industries and Charles Sturt University) Wagga Wagga, NSW, 2650
[C] Department of Primary Industries, Wagga Agricultural Institute, NSW DPI, Wagga Wagga, NSW, 2650
[D] Email: elynch@csu.edu.au

Managing the variability in pasture quality and quantity is a challenge for beef producers supplying to certified grassfed beef programs. In southern Australia, the quality during the summer-autumn period is often below the maintenance requirements for livestock. Traditionally, many producers supplement livestock with grains or a grain-based pellet to enhance energy and protein supplies for ruminants grazing on low quality pastures (Lee *et al.* 1985; Leng 1990). Canola meal (CM) is one protein supplement that has become more available, cost competitive and is an approved Pasturefed Cattle Assurance System (PCAS) supplement (PCAS 2016). Feeding standard guidelines have indicated the rate of supplementing CM can vary from 0.3 to 3 kg DM/d (Blackwood and Clayton 2007; Mailer 2004) for growing cattle. Therefore, the objective of this experiment is to determine the optimum inclusion rates for supplementing canola meal to weaner calves when offered low quality roughages.

Liveweight (LW) change and dry matter intake (DMI) for weaner calves supplemented with varying levels of CM and offered low quality canola hay *ad libitum* was investigated. Eighty-four weaned Angus calves (5-6 months old; 161 ± 1.6 kg) were randomly stratified across 12 feeding pens (first 6 pens had shade over feeding troughs) for 70 d, including a 14 d adaption. They were offered one of four dietary treatments, with the CM inclusion level of 0.5, 1.0, 1.5 and 2.0 as a percentage of average pen LW. The quality of the diets consumed were; 0.5% CM (8.8 MJ/kg DM,14.6% CP); 1.0% CM (9.6 MJ/kg, 20.4% CP); 1.5% CM (10.4 MJ/kg, 26.3% CP); and 2.0% CM (11.2 MJ/kg, 32.1 % CP). The weaner calves were supplemented CM (11.9 MJ/kg, 42.6% CP) and received *ad libitum* canola hay (7.9 MJ/ kg DM, 8.0% CP) daily. Feed intake on a pen basis was recorded weekly and individual fasted LW were recorded every 2 weeks. Liveweight gains and feed intakes were analysed using the Mixed Model procedure in SAS with treatment as the fixed effect and shade, pen and gender as random effects for liveweight gains and pen as the random effect for DMI. The average CM dietary treatments offered were 0.93 (0.5%), 1.88 (1.0%), 2.77 (1.5%) and 3.66 (2.0%) kg/hd/d. Animals fed at the rate of 2.0% CM had an excess amount of CM which was included in the refusals.

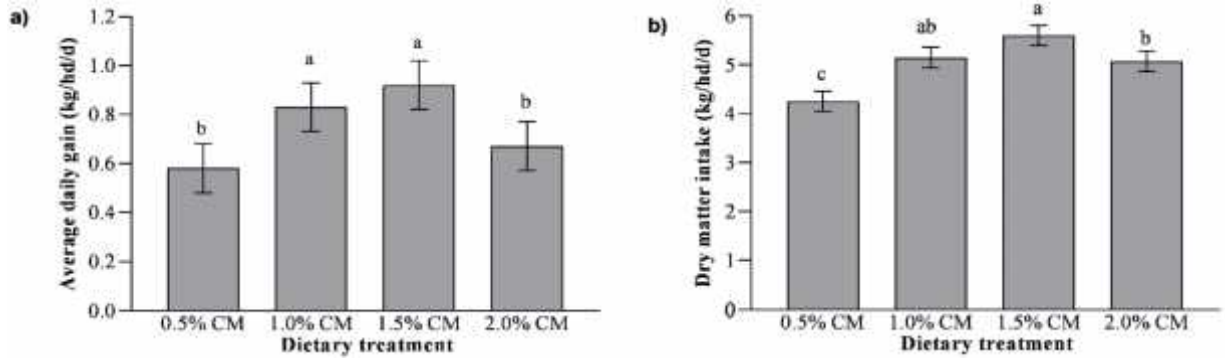

Figure 1. a) Average liveweight gain (kg/hd/d) and b) average daily total DMI consumed (kg DM/hd/d) of the dietary components (canola meal plus canola hay) for weaner calves fed *ad libitum* canola hay and supplemented with varying levels of canola meal (0.5%, 1.0%, 1.5% and 2.0% of average pen liveweight).
*s.e bars for liveweight gain and total DMI consumed.

Average daily LW gain for weaned calves fed 1.0 and 1.5% CM were greater ($p < 0.05$) compared with all other dietary treatments (Fig. 1 a and b). Supplementing CM up to 1.5% in the diet resulted in increased LW gain; however, inclusion levels exceeding 1.5% decreased LW gains. Increasing the inclusion level of CM in the diet also increased total DMI consumed; however, inclusion levels exceeding 1.5% decreased total DMI consumed. This study provides evidence of the optimum inclusion levels of CM for weaner calves fed low quality roughages. Further economic analysis is required before making management decisions.

References

Blackwood, I., and Clayton, E. (2007). Supplementary feeding of cattle. DPI factsheet [Accessed 20 January 2020]
Lee, G., Hennessy, D., Williamson, P., Nolan, J., Kempton, T., and Len, R. (1985). *Australian Journal of Agricultural Research* **36**, 729-741
Leng, R. (1990). *Nutrition research reviews* **3**, 277-303
Mailer, R. (2004). Canola meal; limitations and opportunities. Australian Oilseeds Federation
PCAS (2016). Pasturefed cattle assurance system standards [Accessed 14 January 2020].
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