Effect of compensatory growth on feed intake and feed conversion efficiency of heavyweight steers

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Compensatory growth is an integral part of New Zealand beef production systems (Nicol and Kitessa, 1997) with restricted winter nutrition followed by good spring and summer feeding enabling a better fit with seasonal pasture production. Purchasers of store cattle (including feedlotters) often prefer animals with a previous history of perturbed growth because they believe they can benefit from higher liveweight gains.

Twenty-eight Angus and twenty-eight Simmental steers were purchased as weaners and allocated to two groups. Group 1 steers, Angus and Simmental, were transferred to a feedlot and adjusted to a concentrate diet of 70% maize grain and 30% pasture silage, fed ***ad libitum.*** Feed was offered daily and feed intakes measured weekly. The Angus steers were fed on this diet for 6 19 d to a weight of 8 10 kg, at which stage daily liveweight gain had plateaued. Similarly, the Simmental steers were fed for 703 d to a weight of 937 kg. Group 2, steers of both breeds, were grazed on pasture for 497 d (557 kg for Angus and 605 kg for Simmental) and then transferred to the feedlot where they were given the same diet ***ad libitum*** until they reached the same liveweights as their Group 1 counterparts.

When compared at the same liveweight (and by inference the same stage of maturity) Group 2 steers had mean monthly feed intakes which were up to 45% greater than Group 1 steers. Liveweight gains and feed conversion efficiencies have been calculated over the period of compensatory growth for Group 2 steers and over a similar weight range for Group 1 steers (Table 1). Steers undergoing compensatory growth had faster liveweight gains and were feedlot fed for a shorter period of time ***than*** their ***ad libitum*** counterparts. Liveweight gains and feed conversion efficiencies in this experiment were poor for all treatment groups (Table 1), presumably because these animals were close to their mature size. However in both breeds, the steers fed ***ad libitum*** were more efficient at converting feed to liveweight gain than the compensating animals with higher growth rates. For the combined breeds, steers fed ***ad libitum*** were approximately 15% more efficient than compensating steers over the same weight range despite taking 49 more days to achieve a similar weight These differences in feed conversion efficiency may be because the compensating animals were significantly leaner ($P < 0.001$), with fatter animals being more efficient than leaner animals because of the energetic inefficiency associated with protein turnover (Webster, 1989). Compensating steers also had heavier viscera weights (e.g. at slaughter, compensating animals had liver weights 30% higher ***than*** the steers fed ***ad libitum)*** which could contribute to large differences in fasting heat production (Baldwin, Calvert and Oberbauer, 199 1). Compensatory growth enables higher growth rates to be achieved but the present results suggest that at heavy weights it may be more expensive in feed terms to achieve the extra weight gain.

References

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Table 1 Weight ranges, liveweight gains (LWG) and feed conversion efficiencies (FCE) of Angus and Simmental steers undergoing compensatory growth at heavy weights.

	Liveweight range (kg)	LWG (kg/day)	FCE (kg feed DM/kg LWG)
Ad lib Angus	573 – 809	0.80 ± 0.026	12.13
Compensating Angus	582 – 812	0.90 ± 0.035	14.23
Ad lib Simmental	632 – 946	0.77 ± 0.024	13.50
Compensating Simmental	629 – 937	0.94 ± 0.045	15.48