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POST-WEANING GROWTH AND CARCASE TRAITS OF COMPOSITE AND PUREBRED CATTLE

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Synthetic or composite breeds of livestock provide an attractive alternative to continuous crossbreeding systems, because they are expected to combine ease of management with the utilization of heterosis and additive genetic differences between breeds. Composites should also respond more rapidly to selection than pure breeds, because of their greater additive genetic variance (Gregory and Cundiff 1980). If this genetic diversity is also reflected in greater phenotypic variance for production traits, however, it may provide a disadvantage in the management and marketing of a non-uniform product. In this paper we test whether there is a greater variance in post-weaning growth and carcase traits in a composite than in a purebred population of beef cattle.

The cattle were purebred Polled Herefords and 5-breed composites, comprising approximately 1/4 Brahman, Charolais and Friesian and 1/8 Angus and Hereford, maintained at Wokalup Research Station in the south west of Western Australia. Seventy one weaner steers (33 composite and 38 Hereford), were grazed on clover and ryegrass pasture from 5 February until 16 October 1991 and weighed monthly. Composite steers were 53 kg heavier at weaning than Hereford steers ($P < 0.001$), and grew 17% more rapidly over spring ($P < 0.001$, both with and without liveweight as a covariate). The growth rate of composite steers was also more variable than that of Herefords (CV 13% vs 10.2%; $P < 0.05$ by Levene's test (Van Valen 1978)).

Thirty one yearling steers (20 composite and 11 Hereford) were housed in individual pens and fed a diet of *47%* wheat, 30% lupin, 20% chaff, 1% urea and 2% proprietary mineral mix *(in vitro* dry matter digestibility 801 g/kg and protein content 142 g/kg DM), to appetite for 63 days. Feed intakes, growth rates and a range of carcase traits were measured (Table 1). Composite steers had greater liveweight ($P < 0.001$), carcase weight ($P < 0.001$) and eye muscle area ($P < 0.05$), and significantly lower feed intake ($P < 0.001$) and fat depth ($P < 0.05$) measured at the P8 site. After adjusting for liveweight, differences in fat depth and eye muscle area were retained ($P < 0.05$), but not the difference in feed intake. There were no significant differences in variance between breeds for any trait.

As expected from their breed composition, composites were faster growing, later maturing animals than Herefords. Composite steers were more phenotypically variable than Herefords in their post-weaning growth on pasture, but not for growth in a feedlot or for carcase traits.

Table 1. Mean (±se) and coefficient of variation for growth, feed intake and carcase traits of composite and Hereford steers in a feedlot

	Composite		Hereford	
	Mean	CV (%)	Mean	CV (%)
Initial liveweight (kg)	364 (7.2)	8.9	303(9.5)	10.4
Growth rate (kg/day)	1.71 (0.074)	19.2	1.51 (0.102)	22.5
Feed intake (kg DM/hd.day)	10.3 (0.24)	10.3	8.4 (0.38)	15.1
Carcase weight (kg)	268.1 (5.43)	9.1	225.8 (8.09)	11.9
Dressing %	52.6 (0.27)	2.3	52.2 (0.48)	3.0
P8 fat depth (mm)	9.6 (1.16)	54.2	14.0 (1.82)	43.2
Eye muscle area (cm^2)	66.6 (1.41)	9.5	53.9 (1.28)	7.9
Muscle:bone	4.28 (0.081)	8.4	4.11 (0.068)	5.5

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