

VARIATION IN LIVEWEIGHT AND CARCASS PERFORMANCE OF FEEDLOT STEERS IN SOUTHERN QUEENSLAND

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Non-genetic variation in performance of animals in a feedlot can arise from events both prior to and subsequent to entering the feedlot. Ascertaining the prime causes of this variation could contribute to increased performance in the feedlot.

So that the causes of variation in a commercial operation could be studied, a feedlot in southern Queensland with direct links to a breeding and growing operation supplied records of feedlot growth and carcass data for cattle entering the feedlot between April and November 1995. At induction, animals had been drafted into lots on the basis of property of origin, backgrounding status, date of entry and general condition. For the purposes of, for example, rations and movement between pens, each lot was managed as a unit.

Records from 4423 steers (53 lots) were used for the analysis. At entry, animals were mainly two to three years of age. Days fed ranged from 50 to 245 (median 109). Days from first to last feedlot weighing ranged from 31 to 188 (median 105). Regression models taking account of between-lot variation and within-lot variation were fitted to determine the presence or otherwise of relationships between overall average daily gain (ADG) and the following terms: lot, property of origin, season (autumn, winter, spring), backgrounding (depastured in paddocks on arrival at the feedlot), weighing (number of times weighed while on feed), and feedlot induction weight. Similar models were run for marbling but with an additional term for ADG. In all cases, a model consisting of main effects and 2-factor interaction terms was fitted, with the least significant terms sequentially deleted until all remaining terms were statistically significant.

Steer feedlot ADG ranged from -0.60 to 3.94 (average 1.76 kg/day). Mean differences between lots accounted for 26% of the total variation. ADG of steers inducted in autumn (1.57 kg/day) was significantly less ($P < 0.001$) than for those inducted in winter (1.82 kg/day) and spring (1.76 kg/day). Generally, higher ADG was weakly though statistically significantly associated with lower induction weights, with the relationship varying with lot factors. Higher ADG was also associated with fewer weighings ($P < 0.001$); steers weighed 2, 3, 4 and 5 times gained 2.06, 1.63, 1.41 and 1.38 kg/day respectively. However, lot, induction weight and weighing only accounted for 33% of total variation.

Marbling score (scale 1 to 12), ranged from 1 to 6, with mean 1.45; 61% had score 1. Marbling score for animals inducted in autumn (1.29) was significantly less ($P < 0.01$) than for winter (1.53) and spring (1.50). However, lot, ADG and other terms accounted for only 10% of total variation indicating the predominance of other influences on marbling.

Explanations of these relationships require information about the animals before, as well as after, entering the feedlot. There was insufficient information to suggest that compensatory growth may have contributed to the higher growth rates from animals with lower induction weights. Compensatory growth may have contributed to the higher growth rates of animals entering the feedlot in winter and spring because these animals were in poorer condition than autumn inductions. The relationship of ADG with weighing could be due to better performing animals reaching market specifications sooner than poorer performers and so being weighed fewer times; average days between first and last weighing for animals weighed twice was significantly less (20 days, $P < 0.001$) than for those with more weighings. The small effect of property of origin was probably due to most steers being bred on the same property and being of the same genotype ($\leq 50\%$ Brahman).

A large number of records were rejected for the analysis. Quality of data recorded in feedlots is a problem (J. Thompson, pers. comm.). Inconsistency in reporting systems used in the processing sector contributes to problems in matching carcass and feedlot data. However, it is important that management ensures record keeping software is appropriate for feedlot needs, and that staff who operate it are adequately trained and are aware of the importance of keeping good records.

We thank the feedlot for their cooperation and supplying data.