PREDICTING THE PERFORMANCE AND CARCASE CHARACTERISTICS OF FEEDLOT HEIFERS USING BASELINE ANIMAL MEASUREMENTS

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Optimising cost of production inputs particularly influences the profitability of the cattle feedlot industry. One area of potential financial gain and cost-effectiveness would be the ability to select and sort cattle into optimum feed programs and marketing groups, with such animal selection at initial feedlot entry requiring the use of prediction systems for animal performance and carcase parameters (Perry and Fox 1997). Data collation from domestic trade heifer feedlot programs, conducted at a research facility in Central Queensland, provided a dataset to investigate the suitability of measurements at feedlot induction to predict animal performance and achieve desired carcase market compliance. This paper provides preliminary observations using the measurements at induction into feedlot of hip height (HH; visual, measured in 25 mm increments) and body condition score (BCS; assessed as 1 thin to 9 fat).

Predominantly *Bos indicus* crossbred heifers (average initial liveweight (LW) of 350 kg) were fed in pen lots (23 to 28 animals per pen) for 61 to 73 days on grain based feedlot diets (13.5 MJ metabolisable energy/kg DM, 14% crude protein) comprising (as-fed basis) 70% dry rolled sorghum and wheat, 2.5% molasses, 12% protein and energy supplement source, 9% sorghum silage, 2% wheaten straw and 4.5% pre-mix supplement (including rumen modifier). The research feedlot program used commercial practice feed management protocols, and included the application of hormonal growth promotant (HGP). Both HH and BCS were assessed at feedlot induction, final LW was recorded prior to transit and slaughter, and carcasses weighed (HSCW) and assessed for fat depth at the P8 site.

The dataset comprised of individual animals, fed in pen lots in calendar years 2000 and 2001, evaluated for both BCS (n=709) and HH relationships (n=555). Ranges collated from the dataset for pen lot mean values for induction HH, induction BCS, final LW, HSCW and P8 fat depth were 1285 to 1334 mm, 4.0 to 6.0 units, 405 to 475 kg, 206 to 244 kg and 9.1 to 14.9 mm, respectively. Regression modelling was used to investigate the relationships between baseline measurements (induction HH and BCS) and final measurements (final LW, HSCW and P8 fat depth) as shown in Table 1.

Table 1. Univariate regression analysis of animal (heifer) and carcase attributes.

Response (Y)	Fitted (X)	Regression (F-Test)	R^2
Final liveweight	Induction hip height	P<0.001	0.16
Final liveweight	Induction body condition	n.s.	-
Carcase weight	Induction hip height	P<0.001	0.13
Carcase weight	Induction body condition	P<0.001	0.05
P8 Fat depth	Induction body condition	P<0.001	0.02

With the exception of the non-significant relationship between induction BCS and final LW, remaining univariate regressions were significant, albeit accounting for low proportions of variance. The results suggest that induction HH appears to have practical importance in determining final LW and HSCW. Heifers with HH>1250 mm at induction were observed to have significantly heavier final LW and HSCW than heifers with HH<1250 mm (P<0.001). Conversely, BCS at induction did not appear to be important in determining final LW, HSCW or P8 fat depth. The dataset in this study has also been used to develop prediction equations for both final LW and HSCW using input variables of initial LW, induction HH, induction BCS, genotype and HGP. Subsequent feedlot program datasets will be evaluated using the criteria from this study to assist in determining baseline animal measurements of practical significance to the cattle feedlot industry.

PERRY, T.C. and FOX, D.G. (1997). *J. Anim. Sci.* **75**, 300-307.

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