

A Tool for the Prediction of Rib Fat Thickness in Beef Cattle

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A minimal set of market specifications for cattle includes age, liveweight/carcass weight and fatness. In practice a grid of these parameters sets the base price of cattle for that day. One challenge for producers is to meet these specifications at least cost to them. Frame size, initial fat score, and implant status along with initial liveweight, rate of weight gain and amount and type of feed interact, therefore these data can be used to produce a prediction of liveweight and fatness of cattle at any time. Models of cattle growth (Oltjen *et al* 1986; Williams 2005) typically are designed to combine biological principles into a rational framework and to develop that framework to answer specific questions, for example by combining different aspects of biology and energetics to predict total body protein and fat gain in cattle. Sainz and Hastings (2000) and McPhee (2006) have developed methods to convert results for total body fatness (output from the models described above) into amounts of different body fat depots with the intent of predicting measures of fatness used in market specification.

We report here a simple computerised calculator of rib fat and rump P8 fat thickness to assist beef producers make critical management decisions in meeting market specifications. The calculator utilises data generated by simulations from the Davis Growth Model (McPhee *et al* 2008) over a range of initial liveweights, frame sizes, condition scores, implant status and metabolisable energy content of feed. The calculator (Figure 1) predicts final liveweight, rib and P8 fat thickness using initial liveweight, frame size, condition score, average daily gain, feed type (grain or pasture), and length of time on feed (months) and implant status (Yes/No) as inputs. It predicts rib fat thickness using the following multiple regression equation developed from the data generated by the DGM simulations:-

$$RFT = iRF + (-1.67 + 2.99 * ADG - 0.63 * FS - 0.046 * CS + 0.007 * iBW - 0.06 * Im) * 0.3 * T$$

where *RFT* is final rib fat thickness (mm); *iRF* is initial rib fat thickness (0.8 to 22.9mm); *ADG* is average daily LW gain (0.25 to 2.2 kg/d); *FS* is frame size (1, 2 or 3); *CS* is condition score (1, 5 or 9); *iBW* is initial liveweight (300 to 500kg); *Im* is implant status (0 or 1) and *T* is length of feeding (months). P8 fat thickness is calculated as *RFT**1.3. This equation accounted for 98.5% of the variance of the simulated data.

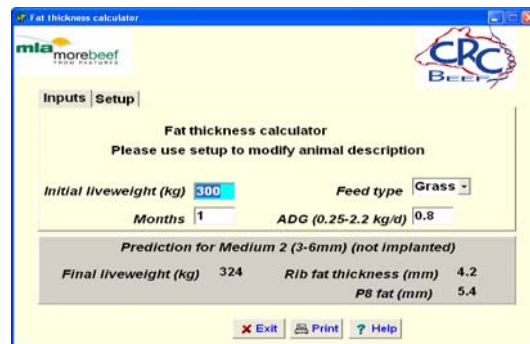


Figure 1. Rib fat thickness calculator interface

The calculator is being tested using data from commercial beef herds to ensure robustness before general use. Initial unpublished results indicate that the rib fat thickness is over-estimated. Further improvements to the Davis Growth Model will help improve the prediction equation used in this calculator.

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