ACCURACY OF WHOLE CARCASS VIASCAN® TO PREDICT RETAIL YIELD IN DOMESTIC BEEF CARCASSES

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To facilitate the meat industry's implementation of valued-based marketing, it is essential that carcass yield is measured accurately and practically. Hot standard carcass weight (HSCW) and fat depth at the P8 site (P8FD) are currently used as predictors of carcass yield. Johnson (1987) has shown that this combination accounts for a reasonable proportion of the variation in saleable beef yield for domestic weight carcasses (R^2 = 40%). However, Ferguson *et al.* (1995) reported that predictive accuracy varied between market categories (R^2 from 0% to 42%,). Video image analysis (VIASCAN®) of the whole carcass offers a new alternative to predict yield of beef carcasses, and has been shown to have a higher level of accuracy across most market categories than the standard carcass measurements (Ferguson *et al.* 1995). The purpose of this study was to investigate the accuracy of VIASCAN® to predict percentage retail beef yield (RBY%) on domestic grain fed carcasses and validate the accuracy on an independent sample of carcasses.

The sample comprised of 198 *Bos taurus* cattle which were fed for 70 days on grain to domestic market specifications. After slaughter, HSCW and P8FD were recorded. The left side of each carcass was scanned using the whole carcass VIASCAN® system and boned out to a standard retail specification (3 mm subcutaneous fat cover on primal cuts) to obtain the RBY%. The calibration and validation data sets comprised 167 and 3 1 domestic steers and heifers respectively, with mean HSCW of 216 and 2 14 kg, P8FD 10.6 and 10.4 mm and RBY% of 68.9±2.3% and 69.1±2.0% respectively. The VIASCAN® colour and dimension parameters were analysed using principal component analysis. Two approaches were then used to develop the prediction equations on the calibration data set. The first involved multiple regression analysis (MR) of the "raw" colour and dimension parameters and the second involved multiple regression analysis of the principal components (PC) of colour and dimension parameters. The best 3 and 5 parameters models from both procedures are shown in Table 1. The accuracy of HSCW and P8FD to predict RBY% was also determined. The accuracy of the equations derived from the calibration data set was defined by the R^2 and Standard Error of Estimate (SEE). Transportability of these equations on the validation data set was quantified by the R^2 and standard residuals between actual and predicted RBY%.

Table 1. The accuracy of VIASCAN® models and standard carcass measurements to predict percentage retail beef yield (RBY %)

	Calibration data (n=167)		Validation data (n=31)	
Models	R^2	SEE	R^2	Std Residuals
3 MR	42.6	1.76	52.1	1.29
5 MR	46.3	1.74	56.2	1.49
3 PC	42.7	1.76	58.0	1.29
5 PC	45.2	1.73	49.4	1.52
HSCW and P8FD	28.5	1.96	21.9	1.71

MR - multiple regression of 3 or 5 "raw" parameters; PC - multiple regression of 3 or 5 principal components.

Within the calibration set, the accuracy of the PC and MR models were similar. All models were transportable across data sets indicating the sex effect was not large, as the R^2 remained moderately high when tested on the validation data set (Table 1). The HSCW and P8FD model was unable to explain the variation in RBY% to the same level of accuracy as the VIASCAN® for either data set, indicating VIASCAN® superiority for predicting RBY% in domestic grain fed carcasses.

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®VIASCAN is the registered trade name of Video Image Analysis systems developed by the Meat Research Corporation, Australia.