

THE ACCURACY OF THE TOLAND PROBE IN MEASURING HOT FAT DEPTH

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In Victoria, the Toland probe (Toland 1978) is used to measure hot carcase fat depth in manual beef carcase classification. This paper describes some aspects of accuracy and precision in its operation.

Data were collected in three studies in 1979, 1980 and 1981 using a variety of breeds which varied in carcase weight (128-414 kg) and fat depth (1-19 mm). Prior to measurement of fat depth, the measuring position (between the 12th and 13th ribs over the 1. dorsi at about 0.75 its width) was marked on each side of the carcase.

While correlations were high (0.91, 0.91 and 0.96) and RSD's low (1.18, 0.99 and 0.97 mm) between hot fat depth measurements on undamaged left and right sides made by an experienced operator (TP1) in each year (n = 63, 50, 140), respectively, co-efficients of residual variation were still quite large (17.7, 16.2 and 14.9%).

Linear relationships between operators (TP1, TP2 - experienced; TP3 - inexperienced) had regression co-efficients significantly different from 1.00 (Table 1) as did the relationships between TP1 and a fourth operator (CM) using the cut and measure technique (Table 1). TP2 and CM tended to have higher measurements than TP1 above 4.4 and 3.9 mm respectively, but TP3 had higher measurements than TP1 on all carcasses.

TABLE 1 Relationships between operators' hot fat depths (H-mm) taken on the left half carcase and cold fat depth (CFD-mm) taken on the right half carcase

Year	Dependent variable Y (Y)	Independent variable X (X)	Regression constant a	Regression co-efficient b (SE)	r	RSD	n
1979	TP1,H(6.7)	TP2,H(7.0)	0.57	0.87* (0.05)	0.90	1.22	70
1980	TP1,H(5.9)	TP3,H(7.2)	-0.33	0.86* (0.06)	0.85	1.18	80
1981	TP1,H(6.4)	CM,H (7.5)	1.16	0.70* (0.03)	0.88	1.52	192
1981	CFD (7.0)	TP1,H(6.7)	0.17	1.02 (0.04)	0.92	1.49	139
1981	CFD (7.0)	CM,H (7.9)	1.03	0.76* (0.04)	0.86	1.86	139

* $P < 0.05$ that b different to 1.00

In the 1981 study, TP1 hot fat depths were more closely related to cold measurements on opposite half carcasses than were CM fat depths (Table 1).

It is concluded that experienced Toland probe operators can have a high degree of repeatability in measuring hot fat depth but significant variation between operators is likely to exist. The 1981 study suggests that the Toland probe may be more accurate than cut and measure, but further trials are required to eliminate the possibility of specific operator effects in our data.

TOLAND, P. (1978). Provisional patent PD No. 5618, Aust. Patents Act 1952-1969.

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