Use of visual image analysis for the description of pig body composition

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Introduction Visual image analysis (VIA) provides daily plan (overhead) measurements of pigs. These offer the possibility for monitoring and controlling pig growth, as is essential to production efficiency. Prerequisite for using VIA shape measures as criteria for growth control is the proof that VIA provides reliable information about the pig's body composition. This report examines the relationship between observed body shapes of living pigs and body compositions of their dissected carcasses.

Materials and methods VIA shape measurements and dissected carcass measurements were analysed for a total of 102 pigs of 3 different commercial types ("1/2 Landrace", "1/4 Meishan" and "1/2 Pietrain") representing meaty, fatty and blocky body conformation, respectively. The pigs were fed *ad libitum* and slaughtered at five approximately equally distant weights through the live weight range of 20 to 125 kg. Information about body fat and muscle weight was obtained from full carcass dissection of 44 of the 102 pigs, and from the fat and muscle weights of the fully dissected pelvic limbs for the remaining pigs. For the assessment of the relationship between body shape and carcass composition, VIA and dissection measures were standardised relative to the A4 body surface area and the carcass weight, respectively, and logarithmic transformations were applied to the standardised measures.

Results Table 1 shows that there is a significant relationship between VIA shape measures and body fat weight standardised relative to the carcass weight. Respective relationships for relative body muscle weight are still significant, but weaker. The shape measures that relate strongest to relative body fat and muscle weights differ between the pig types. For example, the best estimates for relative body muscle weight is the surface of the pelvic limb area for "1/2 Landrace" pigs, the shoulder width and shoulder surface area for "1/4 Meishan" pigs and a combination of measurements from the shoulders, abdomen and pelvic limbs for "1/2 Pietrain" pigs.

Figure1
Linear shape and area measurements from the VIA system

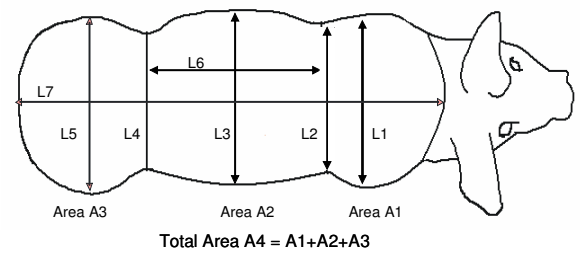

Table 1 Relationship between standardised shape measures in living pigs and standardised weights (wt) of their dissected components.

Composition trait (Standardised logs)	Pig Type	Dependent Mean	Shape measures (Standardised logs)	Adj. r^2	RMSE
Carcass fat wt/ Carcass wt	"1/2 Landrace"	-0.77	A1, A2, L3, L4	0.73	0.06
	"1/4 Meishan"	-0.74	A2, L1, L4, L5	0.78	0.06
	"1/2 Pietrain"	-0.81	A2, L6, L7	0.67	0.05
Carcass muscle wt/ Carcass wt	"1/2 Landrace"	-0.29	A3	0.30	0.02
	"1/4 Meishan"	-0.32	L1, A1	0.34	0.02
	"1/2 Pietrain"	-0.26	L1, A2 L5	0.58	0.01

Conclusions Visual image analysis (VIA) would appear to promise the means for adequate description of pig body composition. These dimensions may add significantly to measurement of P2 backfat depth and muscle depth alone in terms of potential carcass valuation.

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