OPERATOR EFFECT UPON THE PREDICTION OF ABDOMINAL FAT IN LIVE BROILERS USING A CALIPER MEASUREMENT TECHNIQUE

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Excessive abdominal fat in broiler chickens is now recognised as a major problem world wide. Such fat is not only undesirable from the viewpoint of the consumer, but also represents a considerable cost in production. Until recently there has been no technique for accurately measuring abdominal fat in the live bird which has meant that, despite the high heritability for the trait (Becker 1978; Leclercq et al.1980), there has been effectively no selection for reduced fat in commercial broiler breeding programs.

We have recently designed a set of calipers which gives an accurate prediction of abdominal fat in live broilers. Details of the calipers and of the technique are given by Pym and Thompson (1980). In the study described in that report, the correlation coefficient between caliper measure and abdominal fat weight expressed as a percentage of body weight, was +0.80 and +0.79 in males and females respectively. Subsequent studies by some commercial organisations with calipers of similar design, however, have yielded quite widely varying results.

It was considered that operator may have an important effect upon the correlation and a study to test whether this was so was undertaken at the Poultry Research Station, Seven Hills in August,1980.

THE STUDY

There were three operators, two caliper types and each operator measured each of the 32 birds used in the study, three times with each of the two calipers. The two caliper types were (1) similar in design to those described by Pym and Thompson (1980) and (2) basically similar to (1) but included a spring to give a constant closing pressure and a dial gauge to increase the accuracy of the measurement. Since each bird was to be measured a total of 18 times, it was necessary to restrict the number of birds to 32 (16 of each sex). Birds were sampled from the control line of the selection experiment described by Pym and Nicholls (1979).

Repeatability of caliper measure and the correlation between mean caliper reading and % abdominal fat were calculated within operator and caliper type. Results are summarised below:-

Sex	Operator	Correlation coefficient (r) Mean caliper reading x % abdominal fat		Repeatability of caliper reading (R)	
		Caliper 1	Caliper 2	Caliper 1	Caliper 2
Males	1	0.88	0.87	0.81	0.85
	2	0.80	0.82	0.57	0.73
	3	0.55	0.65	0.29	0.17
Females	1	0.78	0.65	0.77	0.73
	2	0.46	0.59	0.42	0.27
	3	0.11	0.08	0.01	0.14

It is suggested that the large sex difference in the correlation coefficients and repeatabilities is due to the considerably lower coefficient of variation in females which is most likely due to sampling error, a function of the relatively few birds used, rather than to a real sex difference.

Operator 1 was the author who was experienced in the use of the calipers, whereas operators 2 and 3 had relatively little experience with the technique prior to the study. Both were given a similar amount of instruction and practice with both types of calipers some days before the study and appeared to do equally well under instruction. The reason for the large difference in the results between these two has not yet been determined.

The study highlights the need to clarify the factors responsible for the discrepancy between operators and, in the meantime, for organisations proposing to use the technique, to test a number of operators to find those with the necessary, if undefined, skills.

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