

Observations on the effect of % abnormal sperm on conception described by Wiltbank (1963) and on the phenotypic correlations among semen traits described by Brinks (1972) were used to assign qualitative values to the index viz:

>5 = satisfactory; 4-5 = marginal; ≤3 = unsatisfactory.

These values were first assigned subjectively and then cross checked with bulls of known reproductive performance. 16 bulls with score ≤5 had conception rates <60% and 6 bulls with semen score ≤3 had recorded conception rates of <35% whilst 45 bulls with semen score >5 all had recorded conception rates >60%.

When used for qualitative assessment, the index placed bulls in similar categories to the score system recommended by the Society for Theriogenology.

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TECHNIQUES FOR ASSESSMENT OF CARCASS COMPOSITION

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Carcass acceptability is an important aspect of any breeding program or genotype evaluation aimed at improving meat production. The acceptability of a carcass may be largely described in terms of the total amounts and distribution of fat, muscle and bone in the carcass. Depending upon the specific aims of the study a number of techniques are available for evaluating the carcass, which differ in the accuracy and type of information provided and the resources (in terms of labour, facilities and expertise) required.

Anatomical half carcass dissections provide detailed information on gross carcass composition and the distribution of muscle and bone, but only limited information on fat distribution. This technique requires a detailed knowledge of anatomy, specialised facilities and approximately 25 man hours per half carcass. Breakdown of the carcass into commercial joints prior to dissection will provide information on fat distribution, but care is required in the standardization of the jointing procedure. Joint dissection still requires specialised facilities but dissection time can be reduced to approximately 12 man hours per half carcass.

In studies where the total amount and distribution of subcutaneous fat is the most important aspect of the carcass evaluation (e.g., vealer evaluation) a further modification of the half carcass dissection technique is to separate joints into only subcutaneous fat, soft tissue and bone. Specialised facilities are still required but dissection time is reduced to 6 - 8 man hours per half carcass.

Where less accurate information on carcass composition is required and/or facilities and labour are limiting, sample joint dissections may be used. Sample joints should be selected on accuracy, dissection time, ease and accuracy of separation in the abattoir, the carcass damage resulting from joint removal and the storage facilities required. The analysis of data from half carcass dissections on 67 crossbred steers showed the butt/rump and brisket joints, in combination with carcass weight, were the best predictors of carcass composition. Residual standard deviations (RSD's) for the prediction of fat, muscle and bone weight in the carcass were 1.34, 1.21 and 0.64 for the butt/rump joint + carcass weight, and 1.33, 1.18 and 0.96 for the brisket joint + carcass weight. The brisket joint had disadvantages in that the prediction of bone was affected by genotype and the accurate separation of the joint was difficult. Disadvantages of the butt/rump joint were its expense and storage space required. Dissection time was approximately 1.5 man hours for the brisket and 4 man hours for the butt/rump joint. The shin joint which is a commonly used sample joint, was a less accurate predictor of carcass composition (RSD's = 2.45, 2.47 and 0.81 for fat muscle and bone) and was affected by genotype.

Carcass measurements are less accurate predictors of carcass composition than sample joint dissection, but are non-destructive and do not require specialised facilities or a large labour input. After correction for carcass weight, measurements of carcass size (e.g. length) have little relationship with carcass composition. Fat depth at the 12-13th rib in combination with carcass weight is a good indicator of carcass fat (RSD = 3.176) although it takes no account of variation in fat distribution over the carcass. A measurement technique is presently being developed to more accurately describe the overall level and distribution of subcutaneous fat over the carcass. Using canonical variate analysis 17 fat depth measurements, recorded on 83 crossbred steer carcasses, were reduced to the 9 measurements which best discriminated between genotype and environment. In other experiments the 9 measurements gave rise to a similar ranking and significance of genotype effects on subcutaneous fat development when compared to dissection results. Use of the technique requires some expertise in location of the sites and takes only 0.25 man hours per carcass.

A number of techniques to evaluate aspects of carcass composition are available to the researcher. The choice of technique will depend upon the specific aims of the study, the accuracy required and the facilities and labour which are available.

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