

Ultrasound scanning to assess muscle and fat depth

A key element of performance recording of cattle through the Signet Beefbreeder Service is the collection of accurate measurements of muscle and fat using ultrasound scanning machines. This technical note explains the procedure used to collect muscle and fat data using an ultrasound scanning machine to the standard required when using the Beefbreeder Service.

Scanning ages

Cattle are scanned at between 300 and 500 days of age.

The most important factor when scanning cattle is to ensure that there is sufficient variation in the muscle and fat depth measurements. This usually requires animals to be in reasonable body condition. In situations where cattle are growing more slowly it is perfectly acceptable to scan them at the older end of the age range to ensure that sufficient levels of variation can be detected.

A weight on the scanning day should also be recorded. Ideally, cattle should have been managed as one group to ensure the largest contemporary comparison groups. Where management has been different, appropriate management codes must be allocated to the animals to record which animals are treated in the same way.

Scanning procedure

The animal needs to be restrained using a cattle crush or weigh scale ensuring that there is access to the middle of the animal's back. The animal must stand upright with all four legs on the ground and care must be taken not to have pressure on the sides or back areas in such a way that may distort the muscle area.

The scanning technique involves parting the hair if necessary and then applying liquid paraffin oil to achieve good contact. Scanning takes place at both the last rib and the third lumbar vertebra at 90 degrees to the backbone.

The transducer is placed on the prepared site and adjusted until a clear image of the rib/transverse process, the eye muscle, and the fat layers can be seen on the machine's screen.





It is very important to identify all the fat layers and have a clear muscle depth. The picture is then frozen and linear measurements of muscle and fat depths taken on the screen using a cursor.

At the last rib, four measures of fat depth are taken at 2cm intervals. At the third lumbar, a single measurement is taken of muscle depth at the deepest point and four measures of fat depth are taken at 2cm intervals. The first fat depth measurement, at both sites, is taken above the muscle deepest point and the following three measurements taken at 2cm intervals from this point further from the backbone.

Measurements are taken in millimetres to the nearest whole number. A typical range of fat depths would be between 1 and 14 mm. Eye muscle depths would typically fall within the range 60 and 100 mm, but is greatly affected by the level of feeding and body condition of the animals.

Recording of data

Scanning data is recorded on paper-based submission forms that enable the UK number to be recorded together with the individual measurements of weight, fat and muscle and the allocation of an appropriate management code.

In addition, bull scrotum circumference measurements can be recorded where these are measured by the breeder at the same time scanning takes place. The forms are submitted to the Signet bureau in Stoneleigh where the data is processed onto the BASCO database for analysis.

Training and accuracy of scanning technicians

All scanning technicians providing scanning information for Signet Beefbreeder recording are trained by Signet staff and are required to pass AHDB tests for accuracy and repeatability through the scanning of live cattle and the measurement of the deadweight carcasses within 24 hours.





Recommendations for UK clients using the ultrasound back-fat and muscle depth scanning service as part of the Signet Beefbreeder recording

Ultrasound scanning of fat and muscle depth is a valuable tool used in Beefbreeder herds to help predict carcass fat and muscle. It is carried out usually when the calves are between 300 and 500 days of age.

In order to ensure that the most efficient use is made of the technician time available on farm, please take note of the following points.

1. All eligible cattle (bulls, heifers and steers) should be presented for scanning as the analysis involves comparisons with contemporaries. Only animals in poor health should be excluded
2. Weighing should take place on the same day as scanning
3. A suitable crush/weigh scale is required to restrain cattle and allow access to the middle of the animal's back
4. Ideally, handling should take place undercover, preferably in a place without direct sunlight so the scans can be easily seen and to comply with electrical safety regulations
5. Mains power is necessary at the scanning point. Generators can only be used if fitted with a voltage regulator and surge protector
6. A suitable surface (e.g. table, bales or a 50-gallon drum with a board on top) is required for the scanning equipment and must be protected from cattle
7. Handling facilities must be adequate and cattle efficiently presented at the scanning point. Ensure adequate help is available to handle cattle safely
8. There is no need to clip the cattle but it is necessary to apply liquid paraffin to the scanning site to give acoustic contact
9. A minimum of paraffin is used but the amount needed is affected by temperature, ability to achieve good images, and site conditions.

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