

## New CT traits for sheep



Over the last 20 years, more than 10,000 lambs have been scanned using Computed Tomography (CT).

To date, CT scans have determined the following:

- Weight of muscle in the carcass – lean weight EBV
- Weight of fat in the carcass – fat weight EBV
- Gigot muscularity – gigot EBV

These breeding values have greatly enhanced the potential for ram breeders to produce sheep with superior carcasses, increasing carcass weights, conformation grades, muscle yields and reducing days to slaughter.

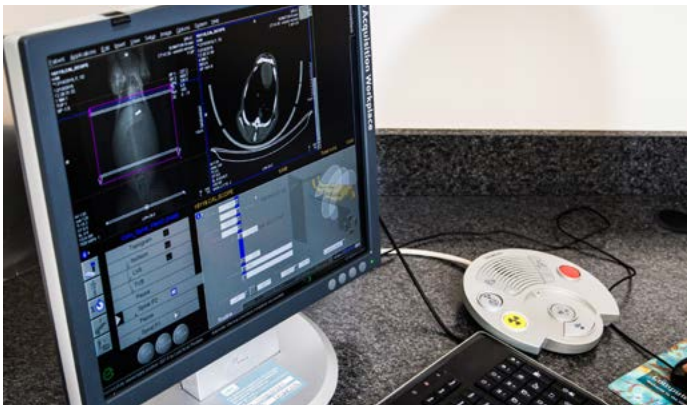


Figure 1. Measuring CT traits

### New traits

In recent years, additional measurements have been taken and through AHDB-funded research, these can now be routinely evaluated.

Table 1. New EBVs and their heritability

	Heritability
Thoracic spine length	32%
Thoracic vertebra number	24%
Lumbar spine length	23%
Lumbar vertebra number	14%
Total spine length	18%
Total vertebra number	20%
Predicted intramuscular fat percentage	40%
CT eye muscle area	41%

## Spinal traits

Spinal traits tend to have a low to moderate heritability, with levels of genetic variation differing between breeds. It is thought enhancing spinal characteristics could markedly increase the proportion of saleable meat in high value areas within the carcass.

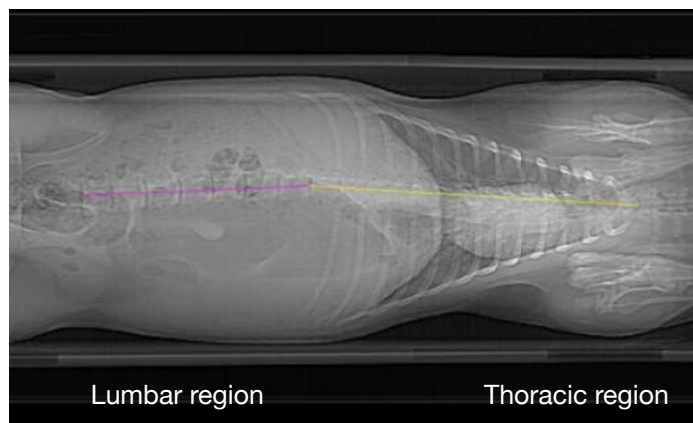


Figure 2. CT scan

## Intramuscular fat percentage (IMF%)

Computed tomography predicts intramuscular fat (IMF) by measuring the density variation in different muscle and fat depots. Fat has a lower density than muscle. This variation is a good predictor of IMF level in the loin and can have an impact on meat eating quality.

While the sheep industry has made substantial progress in reducing carcass fat levels in terminal sire breeds, there is concern that breeding for increased lean growth and reduced fatness may compromise meat eating quality (eg flavour, juiciness, tenderness), partly because it is linked to IMF levels.

Work by Dr Neil Clelland and colleagues at Scotland's Rural College (SRUC) has shown this new predictor of IMF% is heritable and expressed semi-independently of overall fatness, meaning producers could select for this trait without detriment to other breeding objectives and enhance attributes influencing meat eating quality.

## Eye muscle area

For years, breeders have selected for superior muscle depth across the loin, using measurements taken by ultrasound scanning their lambs.

For various reasons, it is difficult to reliably measure muscle area across the loin using ultrasound, but an assessment can be taken of muscle depth, width and area using CT scanning.

Research has shown these measures to be highly correlated, so we know that selecting for improved eye muscle depth will increase area. However, the availability of a new EBV for CT-derived eye muscle area will assist breeders to make even faster progress in enhancing this trait.

Remember, the new carcass traits are all weight adjusted, rather than age adjusted. Therefore, the new EBV will express the amount of additional eye muscle area, relative to its weight.

## Cost of CT scanning

The SRUC CT unit offers services from its Edinburgh headquarters and from locations across the UK, using a mobile CT scanner.

The cost of using the service (2018) is:

- Edinburgh £65\*/head
- Mobile sites £94\*/head

AHDB provides funding of £55\* per lamb towards the use of the CT scanner. The net cost to English breeders using these sites is £10\* and £39\*, respectively. Further terms and conditions apply regarding eligible numbers and breeds.

\*subject to change

## Further information

If you would like to CT scan your lambs, contact [CTUnit@sruc.ac.uk](mailto:CTUnit@sruc.ac.uk), Tel: 0131 535 3251.

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