

See what's on the inside -
can SRUC's new mobile
CT scanner help you or
your clients?



CT Scanning Services at SRUC



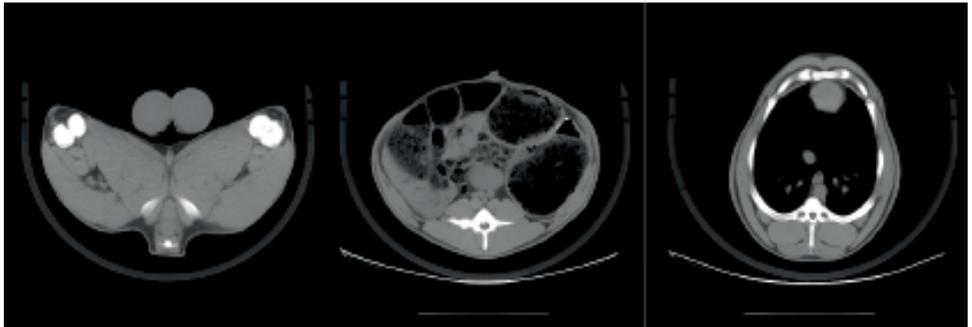
CT is a medical imaging technique which produces images of body cross-sections, using low dose X-rays, without harming the animal. The detailed images produced allow very accurate estimation of body composition and tissue distribution.

Sheep

Why CT scan your sheep?

In combination with on farm back fat scanning, CT can produce:

- More accurate identification of 'elite' individuals with superior carcass composition in a flock.
- Information on additional characteristics that can't be measured by ultrasound eg. killing out %, muscle shape.
- Overall breed/flock benefits, by improving product quality and increasing profits.



Back of pelvis

5th lumbar vertebra

8th rib

Measurements from these 3 images enable accurate predictions of carcass tissue weights (fat 98%, muscle 96%, bone 89%), which allow selection of terminal sires with higher genetic values, within co-ordinated breeding programmes, producing faster genetic gain.

Testimonials

Matt Prince

Texel sheep breeder & butcher

"We use CT scanning for our Texel rams as it gives us a fuller picture of the potential meat yield of the ram and what he will pass onto his progeny. I feel this is vital when we choose our next stock rams each year."

Robert Gregory

Charollais sheep breeder

"I find I am able to make much better and informed breeding decisions with CT scanning because you have the complete picture not just a snapshot."

Scott Brown

Suffolk sheep breeder

"CT scanning provides our customers, who buy our Suffolk Rams at Kelso, with complete transparency into the rams we have on offer. It provides a yard stick for our customers to use when selecting which rams meet their requirements. Last year's Kelso pen toppers were very much down to the CT results. Rams well sought after were those with the highest KO %, the largest proportion of meat in the hind quarters, the highest index and the lamb with the *most amount of marbling in the eye muscle*.

CT scanning is definitely a *value adding product* and the cost of our CT Scanning was paid for in the increased valuation on just one of our lambs alone at Kelso last year!

We could not afford NOT to CT scan our rams now and it helps to build accuracy levels within our Signet recorded flock."

Judith Galbraith

Chair Hampshire Down's Breed Improvement Committee

"Using CT scanning greatly increases the accuracy of carcass EBV's and has been used to great effect in the Hampshire Down breed. We are delighted that a new scanner has come on line increasing the quality and availability of CT scanning for our breeders."

Mary Dunlop

Beltex Breeder

"We have been Performance Recording Beltex now for nearly 20 years and primarily use it as a tool to select which home bred rams we use each year on our pedigree Beltex females. It's very rewarding using these ram lambs and seeing them going on to do well at Pedigree Sales. To date our best trade has been our top Performance Recorded tup."

We pay particular attention to the scanning results as they are the measurement with the least external variables. The back scan is a good indicator of loin muscle and the CT scan accurately shows the gigot muscle and the muscle content of the carcass. We feel the data allows the commercial purchaser to choose a stock sire with potential to achieve the desired top carcass grade."

Sam Boon

Signet breeding services

"CT scanning is a great way to find genetic differences between elite breeding lines, with many of today's leading terminal sires having been identified through the use of CT scans taken on them or their progeny.

The application of CT services need not be confined to the flocks of long term recorders, as many new breeders have used the service to identify new, less well known bloodlines that excel for carcass attributes, as well as providing new information about spine length, muscle density and eye muscling area across the loin. These provide valuable outcrosses in rapidly changing breeds.

In recent years, the use of CT has been shown to add real value to ram sales for animals that excel in terms of their lean meat yield and gigot muscularity.

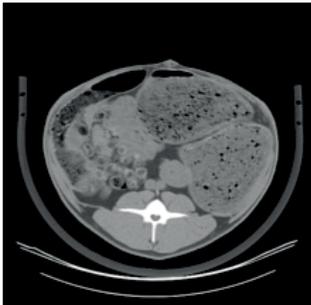
Within the next 2 years the way the sheep industry uses CT data is going to be transformed and those breeders actively involved in using the service stand to benefit most."



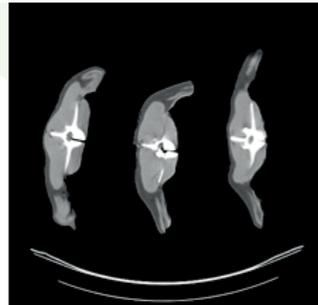
Meat Quality

How can CT measure meat quality?

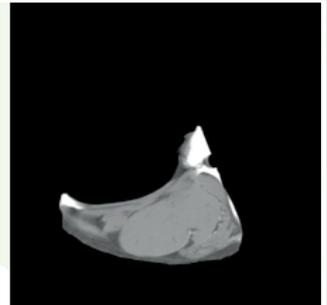
- CT measures changes in the intensity of X-rays as they pass through objects/bodies, thereby measuring the density of the tissues.
- Fat laid down within the muscle reduces the average density of the muscle, which can be measured.
- Fat carries flavour and therefore some level of fat (optimum 3-5% in lamb) within the muscle/meat will enhance the flavour and quality of the meat.



Live lamb loin CT scan



Lamb loin cuts



Sirloin of beef

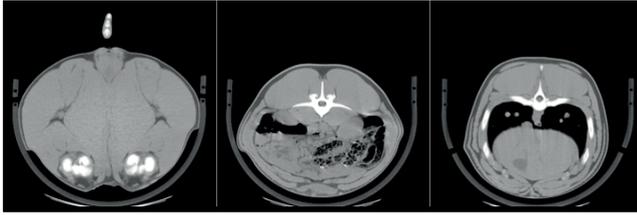
CT information from live lambs can accurately predict intramuscular fat content and therefore is an important aspect of meat quality.

CT measures in butchered meat cuts (lamb / beef etc.) can predict intramuscular fat in a non-destructive and food safe way.

Pigs

- Carcass traits in live pigs can also be measured and utilised in breeding programmes.

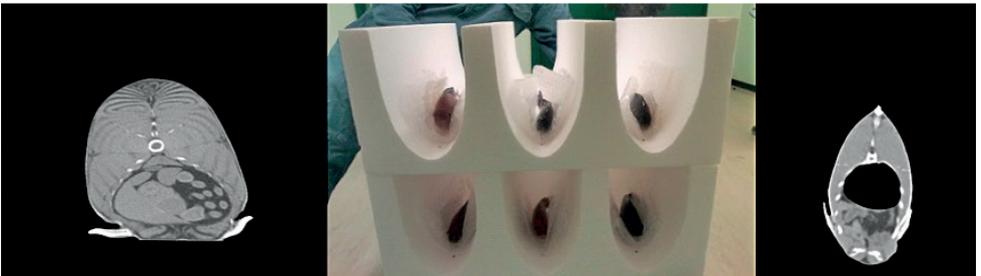
Changes in muscle and fat depots can be measured in the growing pig across time. This has been used at SRUC in trial work examining optimum protein levels in the diet to maximise performance and reduce environmental impacts.



Fish

CT scanning can be used to look at carcass traits in live fish (eg. Salmon / Tilapia), to measure the fillet shape and size and to predict the level of fat.

A novel method of scanning 6 fish at a time, and producing composition measurements for each individual fish, has been developed. This can also be used for other small items eg. lamb loins, mice etc.



Other common measurement examples

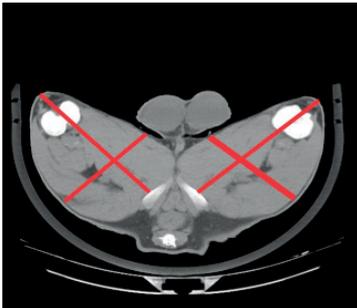
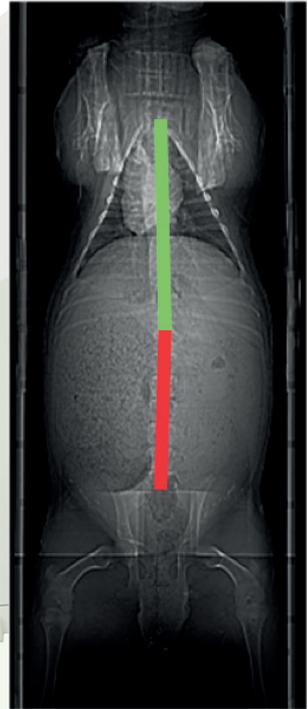
Spine characteristics

Consistent selection for body length in pigs has led to:

- 2-4 more vertebrae in commercial pigs compared to their ancestors
- increase in body length leading to overall increase in meat yields

CT allows length and vertebrae number to be measured in specific regions of the spine (eg **lumbar** or **thoracic**).

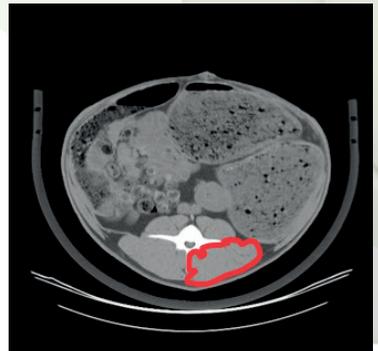
Incorporating this information into selection programmes in sheep could produce economic benefits in terms of increased production



Muscularity measures

Linear measurements of individual muscles and muscle groups from CT images can give an idea of muscle shape.

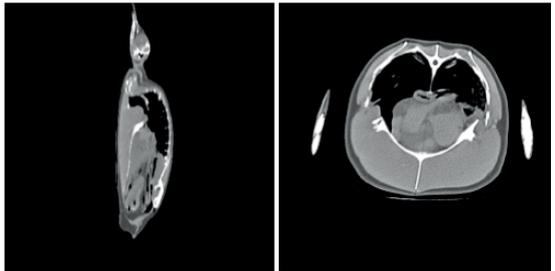
Muscle areas can also be measured to give a better idea of size and shape of specific muscles.



Examples of other possible work incorporating CT

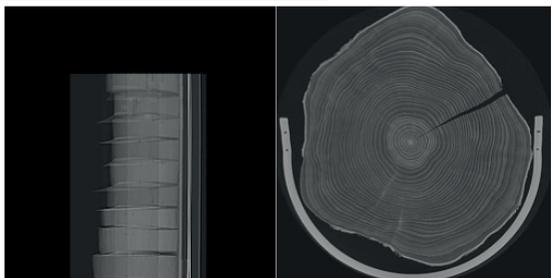
Zoological

eg. to locate external landmarks to fine tune treatment of respiratory problems in captive penguins.



Forestry

eg. wood quality assessment, internal weaknesses highlighted, portable “in field” equipment calibrated.



Also:

Chickens, mice, soil cores, bones, and many other creatures and objects can be investigated in a non-destructive way using CT.

Service offered

The SRUC-BioSS CT scanning service is based near Edinburgh, but through our mobile scanning service, we offer a UK wide service for commercial livestock and research purposes.

CT charges

CT scanning charges are calculated for individual projects, but involve a charge to cover the actual scanning and any image analysis and production of data required.

Contact details

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