Ultrasound Scanning Beef Cattle

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What is ultrasound scanning? Ultrasound scanning is a technique that uses high frequency sound waves to "see inside" a living person or animal. The use of ultrasound scanning to measure carcass traits of economic importance in live beef cattle has become widely accepted. Carcass traits most commonly measured by ultrasound scanning are:

**Rump Fat (P8):** The P8 site is located at the intersection of the line from the high bone (third sacral vertebrae) with a line from the inside of the pin bone (Fig 1). P8 Fat will be reported to the nearest mm (eg 10 mm).

**Fat Depth 12/13th rib:** The site to be assessed is located on the longissimus dorsi muscle (eye muscle) between the 12 and 13th rib. Rib fat thickness will also be reported to the nearest mm (eg 7 mm).

**Eye Muscle Area:** Eye Muscle Area is measured as the cross sectional area of the longissimus dorsi muscle between the 12 and 13th rib (Fig 2). EMA is reported to the nearest cm² (eg.110 cm²)

**Intra-muscular fat (IMF):** The carcass benchmark for intra-muscular fat is the chemical extraction of all fat from a meat sample taken as a slice off the longissimus dorsi between the 12th and 13th ribs. Ultrasound for IMF uses a longitudinal image of the longissimus dorsi muscle in the region of the 11th, 12th and 13th ribs. IMF is reported as a percentage (eg 3.5%)  

How can scan measurements help me in my selection decisions? EMA, fat thickness and IMF% are three traits that are highly related to the retail yield of a beef carcass and they can be measured with a high degree of accuracy by an ultrasound scanning technician.
That is, in general terms, if two animals (e.g., steers) have similar fat thicknesses over the ribs and P8 site but one has a significantly larger EMA then you would assume that animal to have a higher beef yield.

Additionally, these traits are moderately to highly heritable, suggesting that a proportion of the differences found between animals would be expected to be passed on to their offspring. Ultrasound data is therefore useful in identifying animals that are superior or inferior for carcass traits of economic importance.

But please note that while any information is useful it must be fully understood that “raw” measurements, be it scans or weights take no account for differences such as age, nutrition or environment and therefore may be quite misleading in the selection of seedstock.

Therefore when looking at ultrasound scan measurements for selection of seedstock animals (e.g., sale bulls) you must understand the limitations to the “raw” scan measurements. That is, the older and/or better fed animals will generally have larger EMA and thicker fat measurements.

For more beneficial selection information on carcass traits TBTS would recommend using carcass estimated breeding values (EBV) which are generated by BREEDPLAN. EBVs are more beneficial in the selection of seedstock animals as they remove the environmental factors (i.e., focus on genetic component). BREEDPLAN uses ultrasound scan measurements to calculate carcass EBVs.

Fig 3. – Ultrasound scanning technician measuring EMA.

Contact Christian Duff - Technical Officer, TBTS (07 4927 6066) for further information on ultrasound scanning of beef cattle.