Scanning Technique

Scanning an animal for body composition traits is best achieved when a technician utilizes a systematic method of preparing the animal and collecting the images. This includes all steps of the process; from removing the debris from the animal's hide, to the order the images are collected, to the landmarks identified on the images. The location to scan the rump, ribeye, and longitudinal images are mapped out in Figure 1 and will be referred to in future sections. Each of these areas needs to be cleaned prior to scanning for optimal penetration of the ultrasound waves.

It is important for the field technician to take images in a consistent, repeatable manner, displaying important areas or landmarks identifiable to the interpreting technician. These landmarks promote consistent, repeatable measurements during the image interpretation process.

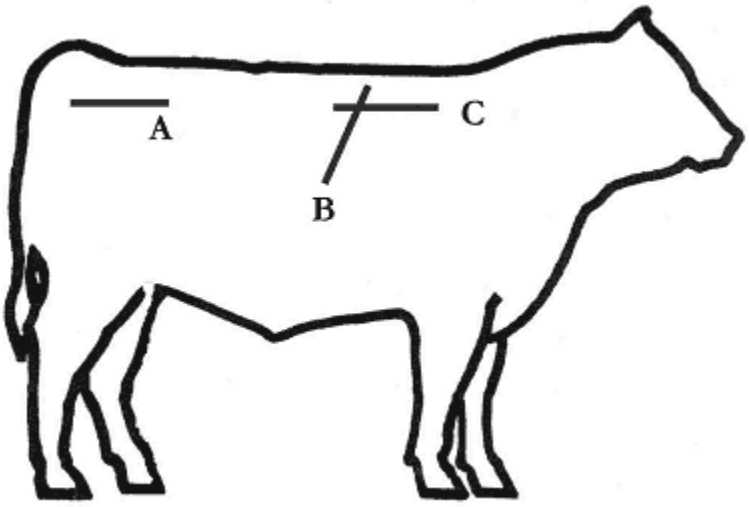


Figure 1 - Areas of interest for ultrasound evaluation of body composition characteristics.
A - Rump fat image
B - Cross-sectional image for ribeye area and 12th-13th rib fat thickness
C - Longitudinal image for intramuscular fat

Collecting the Rump Fat Image

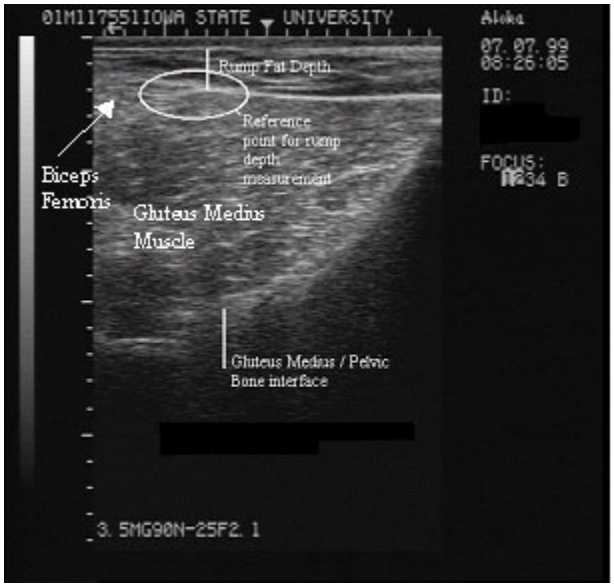
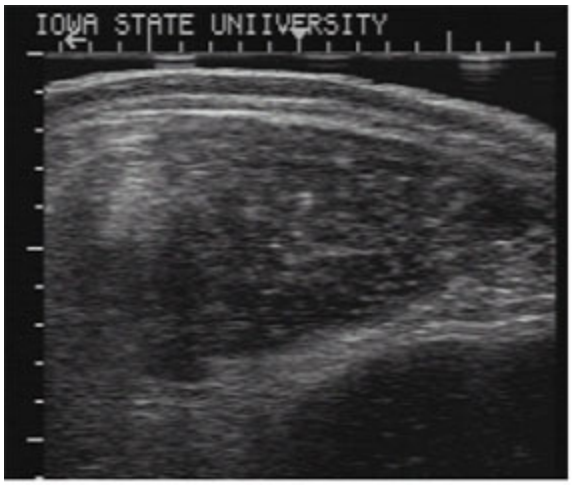


Figure 2.
Ultrasound rump fat image with typical landmarks identified. Notice how the point of *biceps femoris* is near the 2/3 position of the image, and the fat lines are very defined and not blurred. Additionally, the pelvic bone is absorbing the ultrasound waves on the lower right portion of the image. The transducer is placed above a straight line between the hooks and the pins to obtain this image. The animal's head is to the right side of the image, and the tail is to the left of the image.

Collecting the Cross-Sectional Ribeye Image



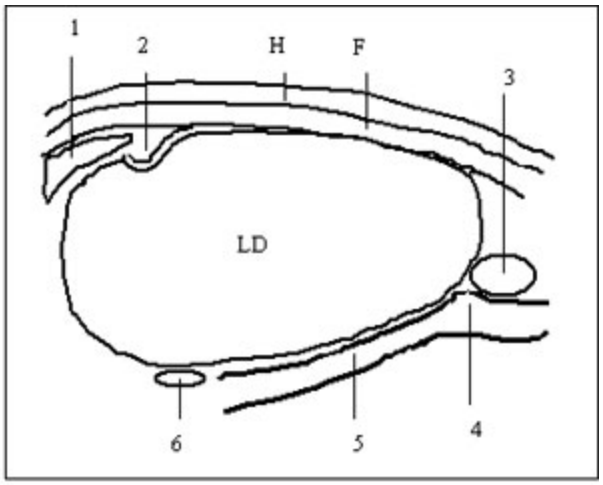


Figure 3 –Cross-sectional ultrasound image and outline of important landmarks @ 12-13 rib, where a carcass would be broken into quarters.
1 – *Spinalis Dorsi*
2 – Acorn Fat or the "Hook" of the ribeye
3 – *Longissimus Costarum*
4 – "Break" in the intercostals
5 – Intercostal muscle boundaries or "Railroad Tracks"
6 – *Quadratus Lumborum*
H – Layer of the animal's hide
F – Layer of the animal's subcutaneous fat, measured at ¾ the width of the ribeye
LD – *Longissimus Dorsi* or "Ribeye"

Figure 4.
This image shows a rib cage superimposed onto a beef steer to demonstrate the angle the ribs typically run. Notice the *longissimus dorsi*, the major muscle of interest, sits on top of the rib cage and beside the processes protruding up from the backbone. Also notice the pelvic bone sitting over the rear quarter of the animal, with the hook bone at the anterior end.

Collecting the Longitudinal Images

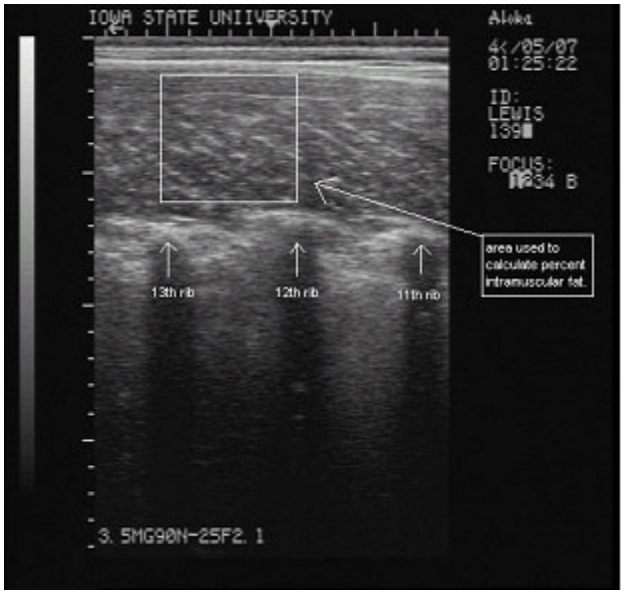


Figure 5.
Longitudinal ultrasound image taken over the 13th, 12th, and 11th ribs. The first uniform layer is the hide of the animal. The second layer is the subcutaneous fat layer. Notice also the triangular shaped section of *spinalis dorsi* under the fat layer above the 11th rib, and the added brightness of the image under the *spinalis dorsi*.

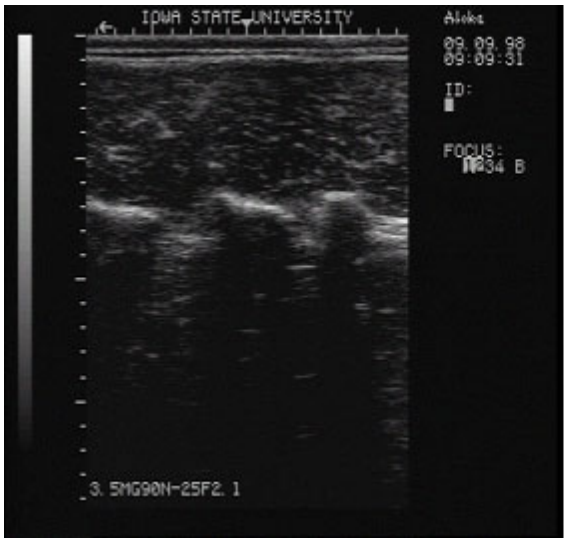


Figure 6.
Longitudinal ultrasound image that is taken over the 2nd lumbar, 1st lumbar, and the 13th rib. This image has been collected too far back on the animal, and should not be used to calculate intramuscular fat values for this animal. Notice how the two lumbar vertebrae on the left portion of the image are wider and flatter topped than the rib on the right part of the image.