# Ultrasound Guidelines Council
# Field Technician Study Guide
2012 Edition

# Chapter VI – Ultrasound Image Quality
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## Introduction

All images submitted by UGC-certified technicians for which the interpretation data is sent to a breed association are evaluated for UGC image quality by UGC-certified lab technicians. Images are evaluated by a lab technician and deemed acceptable, marginal or rejected. Definitions and examples are presented below. Examples of all possible image deficiencies are not presented here.

Associated with this chapter is the following file:
- UGC Image Quality Scoring System
    - This document presents the UGC Image Quality Scoring categories and lists the potential defects and flaws in ultrasound images that are considered in UGC Image Quality Scoring.

## Definitions

**Acceptable**—landmarks are present, image is in the correct location, animal is properly prepped. Images are interpreted.

**Marginal**—the image has deficiencies or is missing landmarks making interpretation more difficult. Marginal images are more tedious to interpret and require more judgment on behalf of the lab technician. Could be contact problems, positioning slightly off, blurring, or only 3 interpretable images for IMF (i.e., pfat). Images are interpreted and should be cross-checked by a second lab tech.

**Rejected**—the image has characteristics that deem it un-interpretable. Common reasons are incorrect positioning, poor contact, or wrong ultrasound machine settings. Images are NOT interpreted, with exception that fat thickness may be measured on some rejected ribeye images.

**Example Ribeye Images**



Transverse
Process

Break in the
intercostals
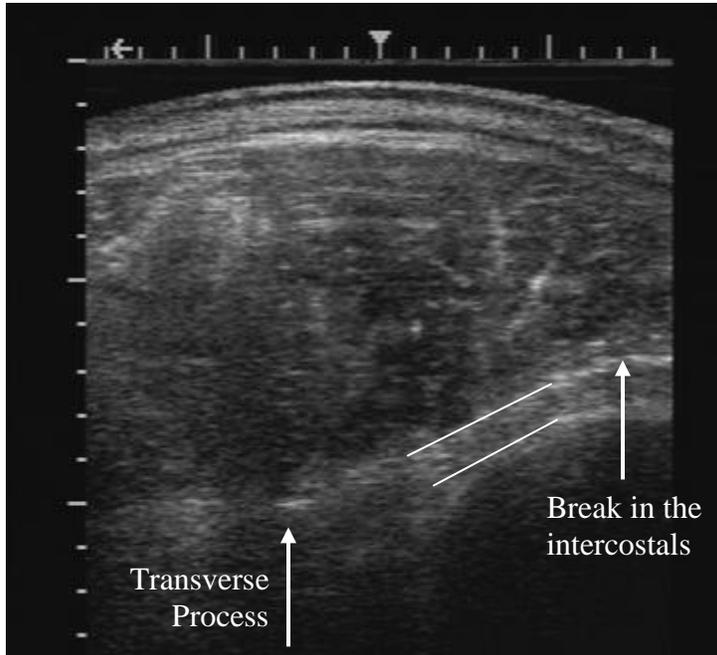
**Acceptable**—The image has both the medial and lateral end on the screen. The intercostals are clear and parallel. The break in the intercostals is clear and show where the lateral end is. There is good contact throughout the image. The transverse process shows the medial end is collected between the 12-13th ribs.
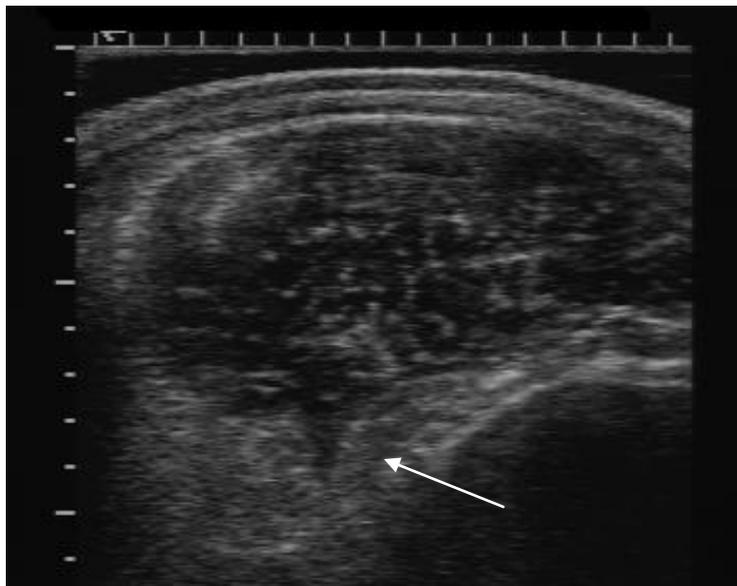


**Marginal**—The intercostals are running together and the image is collected slightly too straight. The image would be interpreted and should be cross-checked by a second lab tech to verify.

Notice the "V" at the bottom medial of the ribeye. This image is creating a false bottom medial. It is collected with the medial end close to, but not across the 13th rib.

Lack of spinalis
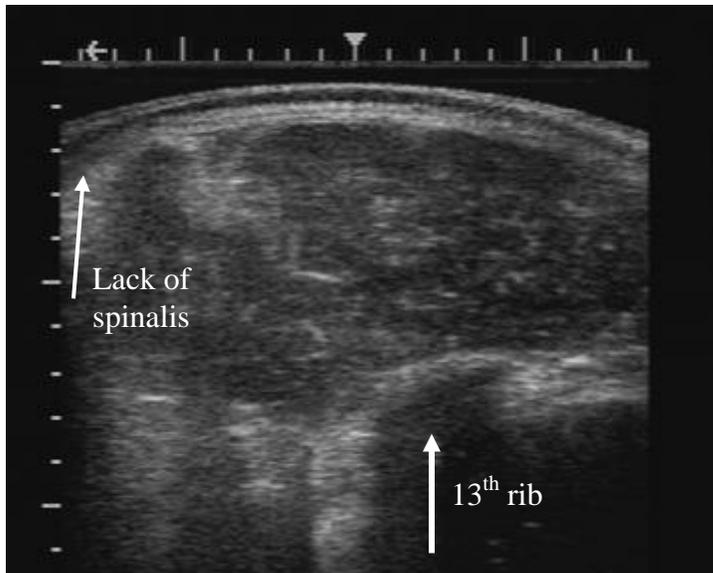
13<sup>th</sup> rib

**Rejected**—fat thickness can be measured, but the ribeye area will not be reported.

This image is collected across the 13$^{th}$ rib (see arrow). The lack of spinalis shows the medial end of the ribeye is behind the 13$^{th}$ rib. In this example, the transducer is too straight. Correct by removing the probe, use your fingers to find the angle of the ribs and

## Example IMF (i.e., Pfat) Images
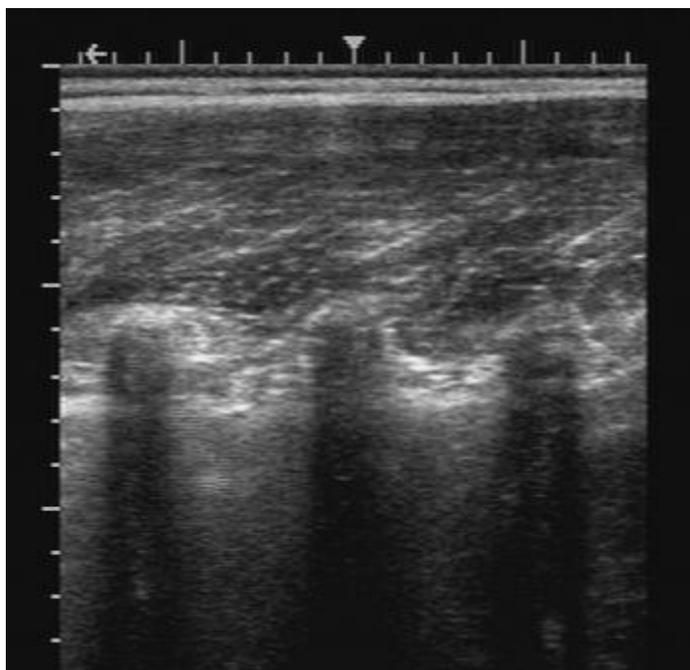


**Acceptable Image**—with pfats, it takes 4 data points to be an acceptable *animal.* In other words, the quality of each image is factored into the overall score of the animal. Within an animal, if all images are acceptable, the animal is acceptable. If 3 of the 4 images are acceptable (3 data points), the animal is marginal. If 2 or more of the 4 images are rejected (2 or fewer data points), the animal is rejected.

This image shows the correct location, good contact throughout, and the correct distance from the midline.
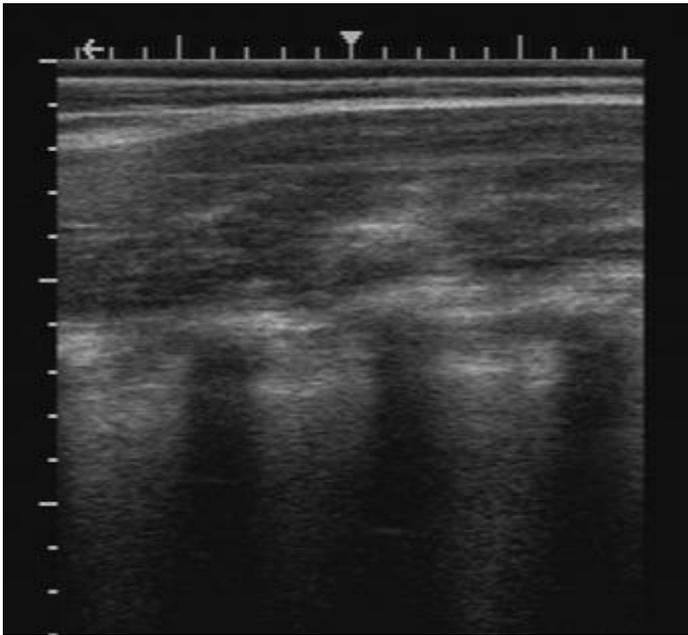
**Rejected image/marginal Image**—This image is blurred and not interpreted.  Movement in the chute, an animal breathing hard, or a technician's hand movement can cause blurring.   If in doubt, take an extra image.

If only three images for the animal are acceptable, the animal will be marginal.  If less than three images for the animal are acceptable, the animal will be rejected.
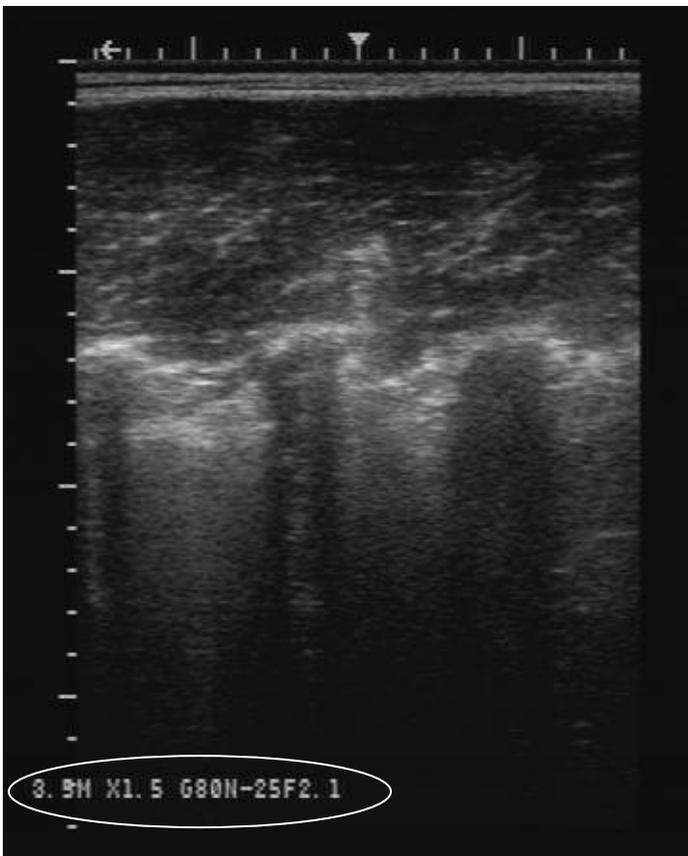


**Rejected**—Incorrect *overall gain* setting.  If a scan session is collected with these settings, rump and ribeye images can be interpreted, but no %IMF data will be available.  Check settings before, during and at the end of scanning.

**Example Rump Images**
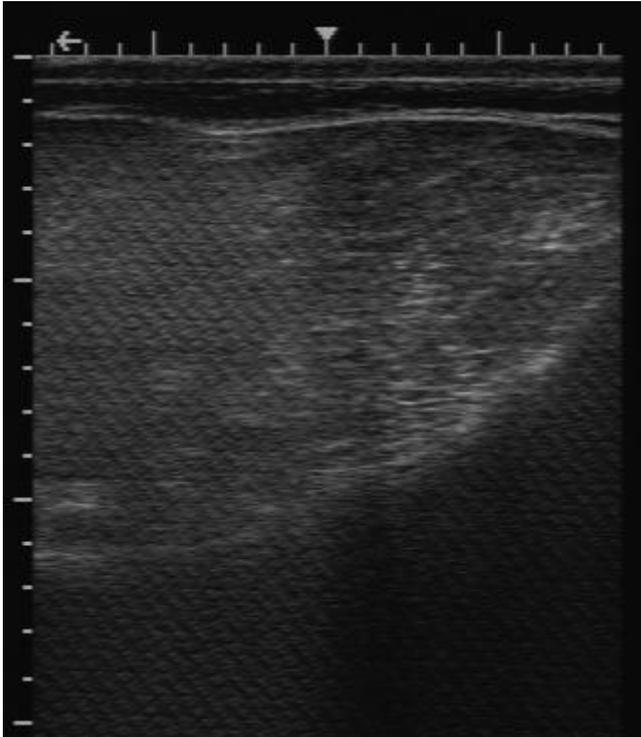


Reference
Point

Hook Bone
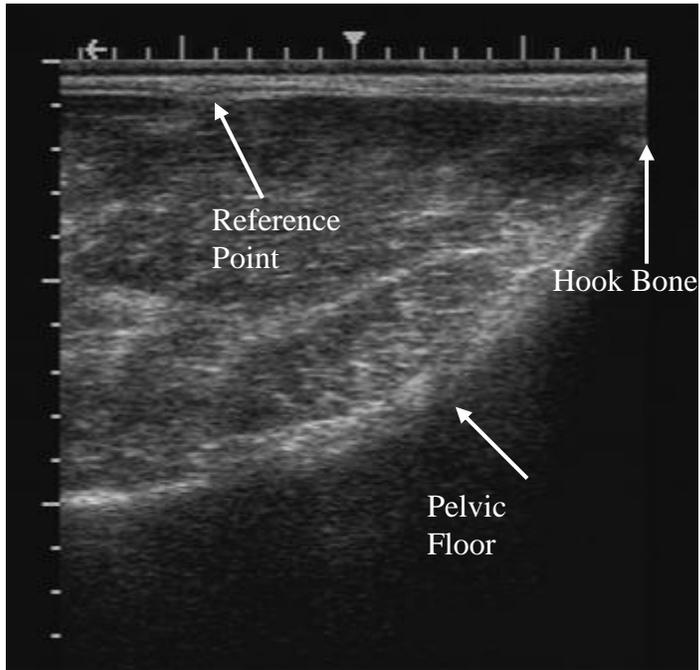
Pelvic
Floor

**Acceptable—**This image is collected in the correct location between the hooks and pins. The solid line of the pelvic floor shows the image is at the right position vertically. Contact is good throughout. The reference point is clear.
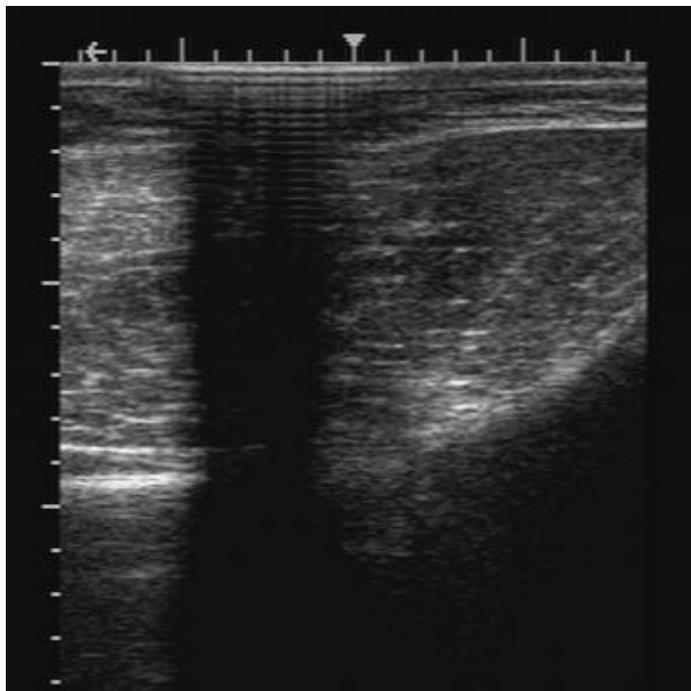


**Rejected—**Poor contact in reference area. The image cannot be accurately interpreted. This can be caused by a brand, a scab, or poor prepping (dirt and hair not removed or insufficient oil).

**Common Image Quality Deficiencies**



**Interference**—this image has interference throughout.  The rump fat thickness can still be measured.

Though the %IMF images for this animal would be rejected for interference, the rump image gives the best indication of interference.  The black area below the floor of the pelvis shows that the interference is all across the screen and in the upper half of the images.

Techniques to reduce/remove interference are a ground wire from the ultrasound machine to a ground rod, unplugging the device causing interference (fencer, clippers, feed mill, etc.), a bad video cable, radio interference when stations switch towers, etc.

**Large ribeye**—If a ribeye is too large to fit on the screen, take one image with the medial end completely on the screen, but up to the edge.  This will display as much of the lateral end as possible on the screen.  Take a second image with the lateral end of the ribeye completely on the screen, but up to the edge, with as much of the medial end as possible on the screen.

**Standoff pad does not fit**—If an animal has a flat side and the standoff pad does not fit properly, a second image can be collected without a standoff pad.  One ribeye image MUST be collected with the standoff pad in order to trace a fat thickness.  But, a ribeye measurement can be collected from the image without the standoff pad.

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