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INCORPORATING ULTRASOUND INTO BOVINE PRACTICE

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WHAT TO LOOK FOR IN AN ULTRASOUND UNIT

Transducers (probes)

A 5MHz or 7.5 MHz linear transducer is best for reproductive work. Spector or curvilinear transducers are awkward for rectal exams due to their shape. Resolution differences are discussed below.

Resolution

Resolution refers to size and clarity of objects that can be visualized. Resolution is a function of probe type and machine settings. A 3.5 MHz probe can penetrate deeper tissues, but will not pick up smaller objects in great detail. A 7.5 MHz probe provides excellent detail, but may not penetrate enough to visualize some pregnancies, sexing, or large uteri. For large animal reproductive work, many vets find a 5MHz probe most versatile.

The unit itself should have gain controls, which can be used to adjust resolution. Resolution controls usually include near field (top few centimeters of the screen), far field (bottom of the screen) and overall image (whole screen) adjustments. The near field adjustment is of greatest importance since most of the images we are interested in will be in the top third of the screen. Take some time to play with these adjustments until you feel comfortable with the image quality.

Some units also have focal point adjustments that pinpoint the best resolution to a certain place on the screen. I usually place these "pointers" in the top third of the screen unless doing sexing on larger (and deeper) feti.

Contrast

Contrast refers to how black and white, or how gray the image is. Changing the contrast settings will not change resolution, but can give you a more readable image. The more shades of gray your unit has, the more minutely you will be able to adjust the contrast. Again, try several settings until you find the one you like best.

Other Settings

Most good units also have the ability to do the following:

Change image direction

Magnify image

Measurements, including fetal age

Print clinic name, patient ID and other comments on the screen

Attach to printer and VCR

Save images for later printing or evaluation

Portability

Most units weigh about 22 pounds (without battery) and are designed to be transported on a cart. Self-contained "back-pack" and monocular units exist, but image quality is poorer than with standard units. Look for improvements in the ultra-portable units over the next few years.

Durability

A good quality unit is remarkably durable when given common-sense care.

Warranty

Look for a one or two-year warranty. Beyond that, extended warranties or service contracts are an option. These contracts should include all service needed, an annual maintenance check-up and replacement of probe if not reparable. These contracts probably will not cover damage due to accident so have other insurance for that.

Service

The company should be able to have a service rep or loaner unit to you within two business days if your unit malfunctions. Depending on your warranty or service contract terms they may pay all shipping if you need to send your unit in for repairs. When your unit is returned after repair or maintenance be sure to check that it is operating perfectly before sending the loaner back.

Price

Like other computer-based technology, the price of ultrasound units has gotten more reasonable in the past few years. A good unit can be purchased for between \$10,000 and \$14,000 today. This is about the same price as five years ago, but the units are better and have more useful functions. Beware of "bargain basement" units that cost less – resolution, image quality, durability, and service may be compromised.

References:

Various authors, Large Animal Ultrasound, University of Wisconsin-Madison School of Veterinary Medicine, 1995.

Ginther, O.J., Ultrasonic Imaging and Animal Reproduction: Fundamentals, Equiservices Publishing, 1995.

TIPS FOR USING ULTRASOUND IN THE FIELD

Have a good cart

Carts sold specifically for ultrasound units work well but many are heavy and expensive. We use a light-weight metal utility cart, but an even better option may be a tall plastic audiovisual cart. This cart has multiple uses: surgery table, to carry herd blood testing supplies, etc. Make sure the cart you select is high enough to see the unit well.

Pad the unit to avoid jarring

We use a piece of bubble wrap with a plastic garbage bag slipped over it to keep it clean.

Stabilize the unit

Use a bungee cord to hold the unit on your cart.

Consider running the unit off a battery

To avoid dragging a cord and to allow us to use the unit anywhere, use a dc/ac inverter (available at battery stores, Radio Shack, larger auto supply stores) that allows you to run off a marine deep cycle battery. Other kinds of batteries do not work as well since they require continual recharging if they are to last more than a few months.

We recharge our battery after about 15 hours of use. This system also comes in handy when we need clippers in an area without electricity nearby.

Some units have optional batteries specifically designed for use with the unit. These usually only provide 30 to 60 minutes of running time and tend to be expensive, but they are quite small and light.

Set the unit correctly

Turn all controls all the way down (black). Adjust brightness until just before the screen starts to turn gray. Next turn up contrast until all the bars of the grayscale are visible. Then turn up the gains until the viewing field is light gray. Finally, place the probe over a structure you want to view and adjust the gains until the image is pleasing.

TIPS FOR MARKETING ULTRASOUND

Start with your most easy-going clients and give them a reduced rate on ultrasound services. This allows you practice without feeling rushed. Point out to clients what's on the screen. My clients were thrilled not to have to take my word on blind faith anymore!

Once you're proficient, offer free or reduced price demos of just a few cows for your clients who may be less easy to convince. Many clients will like it so much they will pay to have you do some more.

Don't assume only the most progressive herds will be interested. Our bull-bred herds were especially happy with the technology, feeling it gave them more accurate due dates.

Consider advertising. Breed publications are especially useful for letting good clients know you have technology they want.

For cheap advertising offer to do demonstrations for FFA, 4-H, high school or tech ag classes, etc. Even Dairy Breakfasts are a good place to get positive exposure.

Keep track of your results with sexing. Eventually you will have an accuracy rate in the 90's and can mention this to clients.

Be creative. The same unit you use for cattle can be used for small ruminants, horses, small animal abdomens, etc.

Above all, be enthusiastic!