

x-ray is not exposed with him standing there. He backs out of the picture totally before we expose the x-ray. Again we just slide the cassette over and get the other half of it. He comes back and infuses the radio opaque dye and we expose it again. It is not only educational but it is fun as well.

What we have to do with every track is infuse approximately 120 ccs of air into the reproductive tract before the dairyman goes to work on it. If we don't do that, we have no contrast to show him where the lumen of the track is located. Dairymen, if nothing else, are surprised because many of them have forgotten just how small the body of the uterus is and what a small area they have to work in!

When the rod has been placed perfectly, the tip of that insemination rod is right exactly at the internal ring of the cervix and if he can put the rod there and keep it there while he infuses the dye, there is no way that it can go anywhere but in the body of the uterus. Now we've found that with some people as they would infuse the dye they would pull the rod back and most of the dye would end up in the cervix or even back in the vagina. But if they keep the rod there as they do the infusion, the dye and presumably the semen will go where it is supposed to go.

We have seen the rod in the left horn. We've seen it half way through the cervix. We've seen it half way through the vagina. We've seen a number of people who really did not know what they were doing as they were doing this and we think we were able to help them through this project.

As I said before, our county agent worked closely with me on this project. He built the device and on the days that we do this he goes to the slaughter house, collects all the uteruses, brings them back, cleans them up, and gets them ready. And that involves usually on his part three to four hours worth of work. As far as fees, we charge enough that we think we have enough to pay for the uteruses. We have to

give \$2.00 a piece for the uteruses. To cover the cost of the x-ray film and to pay our technician for the time she spends developing them. We usually get together with about four dairymen in the evening and what we'll do is two of them will work with me. One of them will infuse a tract and we'll expose the film and while our technician develops it we'll have the other dairyman go up and try it. We'll alternate that until each of them has done it with four tracks. As the x-rays are developed we'll look at them with them and show them what they did right and what they did wrong and try to explain to them what is involved. While those two gentlemen are working with me the other two will spend some time with the county agent and he will sit down with them. They will go through their DHIA receipts, look at their calving interval, their services per conception, days to first service, and all that kind of stuff. So they get some education during that time, too. Then at the end, it usually takes us about an hour to go through four tracks with two dairymen, at the end of the hour we'll switch off and I'll work with the other two and the county agent will work with the other two who worked with me. Sometime during the course of the evening we'll just look at some reproductive tracts. We'll show them what a CL is and usually we'll get some early pregnancies in these tracks, even though we try not to. We'll review the structure of the reproductive tract and just try to educate them a little bit about it. The dairymen we've worked with so far have really been appreciative. They thought they learned some things they just didn't know. They were usually surprised, almost all of them were surprised at how small a body the uterus is, even though they've been through AI school. We certainly don't make any money on it but I think it is a good client relations tool and it shows them that we're interested in their overall reproductive program and it perhaps opens up some opportunities later on.

## Miscellaneous Practice Tips

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First, a point of technique: A newborn calf is an excellent source of blood for mastitis culture plates.

We pour our own plates because in our experience fresh plates show hemolysis better and have fewer problems with contamination. Most commonly we use a split plate with MacConkey's on one side and blood agar on the other. For a batch of 40 plates we make a 500 cc bottle of blood-agar base and add 20 cc of blood to it just before pouring. Blood from a precolostral calf will contain no antibodies to the common mastitis pathogens.

A brand-new syringe and needle are heparinized and taken along on a calving call at which assistance is required without too much internal manipulation. When the live calf hits the ground it will be soaked in sterile amniotic fluid. The jugular vein can be held off and 20 cc of blood obtained

easily. The point is that the site requires no prep whatever.

With plates being prepared within 24 hours of the blood being obtained, the occurrence of contamination is low. We routinely incubate a blank plate to test the batch, and have had no problems with contaminated blood. (Most problems result from errors in handling.)

Next, a few gadgets:

We like to keep hoof knives and dehorning instruments as sharp as possible, using a hand-held miniature grinder for which a variety of bits are available. A Weller tool, for example, or a Dremel tool (Dremel, Division of Emerson Electric, 4915 21st Street, Racine, Wisconsin 53406) can power a silicon carbide bit that fits nicely into the nooks and crannies of a hoof knife. Diamond bits last much longer than silicon carbide, and are also available from a variety of

companies. One manufacturer is Diamond-Pro, Box 25, 1600 Combrero Drive, Monterey Park, CA 91754. Their bits are sintered; that is, the diamond dust is dispersed throughout the bit, not just plated on the surface.

Uterine infusion mixture can be easily carried in a used IV bag, from which a length of tubing runs to a small, disposable automatic syringe. (Cooper Animal Health makes one such syringe.) To refill the bag remove the syringe, disconnect the tubing, and roll up the bag. Siphon infusion mixture from a jug through the tube into the bag.

Disposable shavers are useful for preparing a cow for surgery. They give a closer shave than electric clippers, and are also faster, more lightweight, handier, cheaper, and more quiet. Cleaning the clippers and sharpening blades becomes unnecessary. The shaver must be modified for use by removal of the ventral plastic bar. Only the blade is exposed on the ventral surface of the shaver. Several modified shavers fit easily into a surgery grip.

A case for infusion pipettes is easily made from a section of 2 inch PVC pipe. A cap is glued to the bottom, while an

unglued cap fits snugly for the top.

A piece of mountain-climbing equipment makes an excellent bearing surface for a foot rope—the last sort of rope that should be allowed to become worn or frayed. The actual bearing surface is a carabiner, which is itself attached to an 18" section of stout plastic rope spliced into a small permanent loop at each end. The rope section can be passed over a beam or around a vertical post (in the manner of a clove hitch), and the carabiner then snapped through both loops. The foot rope is then passed through the carabiner. Carabiners are commonly rated for 2,000 kilograms; despite their light weight and elegant appearance, they do a tough job well.

Two blunt eye hooks can be strung permanently on a spliced loop on the end of nylon cord used for obstetrical manipulations. It's a bit more work putting in that second eye hook on a calf with its head back. But they are more likely to stay in instead of falling out under tension. Remember to string the hooks into the loop facing each other.

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