was the goal figure, the second 8 days he hit 27 which was one short of the goal figure so he's doing a pretty good job and then we started into July. In Arizona it is 110-115 degrees and it gets a little hard to catch cows in heat so he didn't do as well. In another 24 day trial in the fall, we used a dairy breed at 30 days and I set up their goal figures 12 days, 24 and 36. Twelve cows, 24 and 36. This fellow caught all the cows on this trial in 24 days. This sets an example for my other clients that this can be done. The second heat detection monitor that I use is post-service heat detection monitor and all cows that are presented for pregnancy, we checked 30-60 days once a month. We examine for pregnancy. 85% of these cows should be pregnant. I figured that approximately 15% of the cows would have an early embryonic death and would not return to service in 18-24 days. Just to show you that it can't be done. I used it on five of our herds in the month of July which again is a difficult month for heat detection. And I use it as a competitive stimulus to people so they can try to be at the top of the list. One person did hit 85%. The third thing that we do is calculate first service conception by month, by technician and by bull. This way there is competition between technicians and dairies. By calculating it by month we can eliminate the environmental factors, in other words, it's hotter in the summer so the conception is going to be a little lower and so we have a better comparison on how the first service conception actually is. A record system so that we can get this information consists of a system where we list the cows in consecutive order of freshening and then we have a column in this particular dairy which also included the heats before breeding and then we indicate the date of the first service and the bull. One dairy had only one technician doing the breeding but otherwise that would indicate the technician. So if I wanted to set up a 24 day trial I can use this chart, go back whatever number of days he is starting to breed. Most of my dairies are starting to breed at 45 days, so I go back 45 days, list all the cows that have not been bred yet and put them on the trial to figure first service conception. I figure all the cows that are bred in whatever month I want to do the conception on and I indicate which cows are pregnant after the pregnancy exam and get first service conception pretty easily. Another system that I use is the card file system with the tabs on the month of freshening and a tab on the month of first service conception that is not moved when they are bred second or third service. I can go down through these tabs on that month and find out what the first service conception is for that month. We also have DHIA records that give us days open to breeding, total days open and calving interval. These are good monitors except that they are not as quick as these other monitors because there is a little lag time. The calving interval indicates what you did last year and days open indicates what you are doing right now. For about 18 months I've been keeping records on how my herds have been doing. I give each herd an individual number so that when I show this card to people they can't say that "Well, Joe Blow did that bad," they just can see how well some people are doing and it motivates people when they can see that somebody can do a good job. If they see somebody that can hit 90%, they want to hit 90%. We now have a two-man practice so I've set up a system so that we can communicate between the two of us. We both work for all the clients and this doesn't get shown to the clients, it just communicates between the two of us. We have also added the number of cystic cows and the number of abortions which are other factors for which we want to get some data. The 24-day trial results for the month of October on five of our herds, just selected at random, showed how well people can do. The top one was 97% and that is really excellent. We started work on another herd in June. They did not use a veterinarian to do their pregnancy exams before we started doing their work. Their pregnancy check was 72% on their first exam and it worked up to 88% in October. The last two exams last November and December were 91%. So I think this system helped to motivate them to do a better job.

Spaying Technique

Richard L. Johnson, *D.V.M.*
Torrington, Wyoming

A new heifer spaying technique is a kind of a misnomer. It was introduced to me by Doctors Gates and Kline in Lewistown, Montana, about 10 years ago.

This procedure is aimed at two basic things, one is a rapid recovery from surgery so as to lose as few days of gain as possible plus acquiring some degree of speed so that you can get through 200 heifers in a day without traumatizing the heifer any more than you have to. There are other procedures, one is the older cowboy type that is still being done in Wyoming and with success, that's heading and heeling the heifer, often times just heeling the heifer and then wrestling her like you would a baby calf at branding time. It is fast and efficient. I think this is possibly a cleaner technique and less traumatic on the heifer. The other is a new technique which I must admit I haven't tried and that is with the new spaying instrument that was developed at Colorado where you go through the vaginal wall with the instrument to remove the ovaries. To accomplish the things necessary we use two in-line chutes. We prefer at least in the lead chute, the front chute, a stanchion type head catch. The other chute should be a squeeze chute with a front delivery. The other thing, probably the most valuable thing, is to use one employee of your own to run the chute that you are going to be doing the surgery in. This fellow can increase the speed plus keep your surgical technique very good. A good working set of corrals is essential and both you and your helper need practice which you only get by doing it. Now in the first chute, the heifer is trapped. In the chute behind the lead chute, we clip an area in the paralumbar fossa. We use a sheep head on a pair of Sunbeam clippers. The clippers seem to last longer and they stay sharper with the sheep shears than with the regular type clipper. Also in this chute the heifer is washed with Novalsan solution and with a point being made to get the entire area wet plus the hair that is not clipped around the clipped area, you want it wet too, so that as she flies up into the front chute (and they are wild sometimes) she is not scattering hair any farther than she absolutely has to. Also we give an injection of penicillin. We started using paper towels with Novalsan solution to wash these heifers. We have now gone to various assortments of cloth rags in the bucket. It seems to work a little better. The fellow in the lead chute is ready to catch her and he is an ambidextrous fellow, and has one leg up in the chute. He actually has just got his foot up in a hole where he has left the bars down so she does not jump out. He is able to facilitate and speed the procedure. A bar that is behind the heifer holds her up as far anteriorly up into the chute as possible and that stops this motion which is important. The incision is made and we hand a curved pair of scissors with handles approximately 14 inches long to our assistant as we make our incision. He holds nothing but the handles with this hand which never reaches inside the heifer. We go in through the skin and fascia and sometimes the sheath of the external abdominal oblique with the knife and that is as deep as we go with the knife. From there on it is a simple incision, kind of a stab method, with your hand and after a season your hand gets rather tough. Once we reach the inside of the abdomen through the peritoneum, the assistant releases the squeeze, enough to take some pressure off the abdomen. As we pick up the near ovary which in this case would be the left ovary, we slide the scissors through the incision along our wrist and we apply a little bit of pressure right along the edge of the incision and this allows some air to escape into the abdomen breaking somewhat of a vaccuum and it's almost dramatic on these heifers that you have starved well. The intestines will just drop right out of your way, and so all you have left is the uterus and the ovary and the rectum. So there is very little confusion once you've felt an ovary. There is nothing else quite like it and so you've got a hold of the near ovary, you cut it off, keep it in your hand, reach under the rectum, pick up the other ovary, which would be the far ovary, the right ovary, draw it to you somewhat and cut it off and then you've got both ovaries in your hand and you come on out with them. You don't particularly need sharp scissors. I like them kind of dull. You get kind of a rip tear method out of it but it is also kind of an emasculation technique where you don't have to worry about any hemorrhage from the stumps. The assistant squirts some antibiotic powder into the incision and we're ready to suture. I use linen most of the time that we get from the local shoemaker and it is inexpensive, and it is relatively easy to use once you get used to it and you can leave it in there and this fall when those heifers come through

the sale barn you are not going to see it or it has already come out. The type of suture we put in depends on the season and the fly problem. Normally, we just put in two simple interrupted sutures and let them out. That will leave a little bit of a gap which doesn't seem to be any problem. If the flies are beginning to bother us a little bit, we will make somewhat of a cruciate suture. So you've got an X over the top of your incision and that seals it pretty well and the fly problem isn't as great. If you do not starve these heifers for 24 to 36 hours, that is both feed and water, you are going to have some problems with the rumen trying to pop up into your face or possibly as you make your incision with your fresh blade the heifer jumps and you incise into the rumen or possibly even catch an intestine with your scissors. One more thing that I didn't mention is that the person that is doing the surgery, between times when he is not doing surgery, is back at the table with his arm and his hand, the left one that is doing the manipulating inside the abdomen, soaking in a bucket of water. We use Novalsan plus one of these things that your wives use to soften the water in the dishwater. It makes it a little slicker plus a lubricating antiseptic type solution. If you keep lubed up it really helps and it eases the pain on the skin and the fingers. From where we go to a bucket that has cotton balls soaked in tamed iodine. I like the scrub tamed iodine rather than the solution because of the lubricating quality. I don't think what you use matters other than the lubricating quality is nice. You reach in, grab a cotton ball with tamed iodine, wipe where we are going to make the incision a couple of times and throw it away. You never go from the heifer back to the buckets with anything but the actual instruments that we are using on her.

Wooden Shoes for Cattle

John B. Herrick, *D.V.M.*
Ames, Iowa

Veterinarians are frequently confronted with the cow or bull with necrotic pododermatitis or any form of necrotizing infection of the tissues within and surrounding the hoof caused by infective organisms penetrating through surface injuries. In many cases only one claw is involved, determined after a thorough cleaning and trimming of the hoof. When the infected claw is identified and a supportative arthritis is present, the infected claw may be amputated. If the claw continues to bear weight, recovery is slow or the infection may extend into the phalanx.

A practice that has been successful in many cases is to provide a means by which the weight is taken off the infected claw. The other claw is thoroughly cleaned and the sole is rasped until all debris is removed and the contact portion is level. An electric sander makes the task easier and faster. A piece of hardwood shaped like the claw, approximately 1/2-inch thick, is then placed on the hoof cemented with acrylic. This takes the weight off the infected claw and related articular areas, permitting rapid healing.

The wooden shoe can be left on until removed by use. In most cases, with normal wear, the affected claw will be able to bear weight by the time the wooden shoe is worn down.

Testosterone Treatment in Cattle for Use in Estrus Detection

Estrus detection is one of the important phases in obtaining maximum reproductive efficiency when artificial insemination is used in a beef or dairy herd. Various devices have been used to "mark" the animal in estrus and many different surgical procedures have been devised to create teaser bulls so that they maintained their aggressiveness and libido but could not copulate with the female. These surgical procedures were time-consuming and some techniques required surgical skill. Consequently, another method to create a teaser animal was needed that would be quicker and less costly.

The need was to induce mounting behavior in females or steers. The best candidates are agile dairy steers or heifers weighing from 600 to 700 pounds. Older cows weighing around 1,000 to 1,400 pounds also have been used. Testosterone propionate in oil is used, injecting subcutaneously 500 mg in five different sites and repeating the dosage and procedure in 5 days. A booster injection of 500 mg is given 15 days later. Each animal is equipped with a chin marker.

Thirty steers, 20 heifers and 10 cows have been so treated and their mounting behavior observed. The steers out-performed the heifers and the heifers out-performed the older cows. The older cows had trouble mounting and fatigued easily.

Twenty-five of the 30 steers responded with 6 needing a booster injection within the 28-day period observed. Fifteen of the heifers responded and 9 of the 10 cows responded and needed no booster injection.

The above technique using testosterone propionate gave satisfactory results when compared to the use of testosterone enanthate and required less injections during the breeding season.

Drainage of Ovarian Cysts via the Vaginal Wall

Frequently ovarian cysts are palpated that possess such thick walls that rupture by digital pressure per rectum provides trauma to the ovary proper, resulting in adhesions. Clinical evidence also reveals that removal of the ovarian fluid (possibly relief from internal pressure) facilitates restoration of the estrous cycle.

A 12-gauge 1-1/2 to 2-inch needle, cupped in the hand, is introduced into the vaginal vault. The other hand in the rectum positions the ovary near the vaginal wall. The needle is then introduced through the vaginal wall into the ovarian cysts providing complete drainage.

If the cyst is of the follicular type, appropriate hormone therapy is indicated along with the drainage of the cyst.

Nitroglycerin for Milk Fever Cases

Warren Wilson, *D.V.M.*
Plain, Wisconsin

I am an estrus observer from Wisconsin. A true estrus observer from Wisconsin. I have to do a little boasting since I'm up here because we just had twins about six weeks ago and so my wife and I are really enjoying the trip. So that's also reason for coming out here. About a year ago I was in the office of our local M.D. in town and we were discussing some problems that we had in common. Earlier that morning I had had the misfortune of losing a cow to milk fever. As I look back I thought I was not administering the calcium too fast, but maybe I was. Anyway we discussed this problem and Dr. Galarnek said, "You know, Warren, how much nitroglycerin do you use in those cows?" And I said, "We don't use any nitroglycerin in the cows." Or at least I'm not familiar with it. He said, "You know you ought to try it on your next patient." So what do you think I should try. Well he said, "If a little bit is good, a lot is better." I did a little research on this subject. I called Dr. Richard Adams from Texas and we discussed the problem somewhat and he told me that to his knowledge there was really no research done on this problem and so I started out on my own. I went to the pharmacist and we discussed the problem a little bit and he said, "Why don't you take 15-20 nitrostats which are 0.4 mg USP nitroglycerin tablets and insert them in the cow's mouth. And I said, well, how about if you put them in the vagina since that is a mucosal surface and he said to go ahead. So then I was off and running, I was all psyched up. My partner thought I was crazy, but the next time I had a cow that was down and comatosed, had milk fever and had been laying in the gutter all night, I thought for sure I was going to kill her but immediately I started the IV with a slow calcium drip and with close cardiac monitoring I administered 15-20 tablets in the vagina of this cow and the results are hard to believe. You almost have to do it yourself, but it will do several things. No. 1, it will stimulate respiration and it will increase the heart rate and cause a real pounding of the heart rate, but the cow will appear more alert. Now in the research that I have done on nitroglycerin, it is not toxic *per se* at that dosage level. I have found no indications of the dosage in the bovine animal, but I'm just going on some literature. They did an experiment in Michigan whereby they used what was called a cross-clamping technique where they clamped the arteries of some surgery dogs and they found out that when they gave nitroglycerin continuously IV they had better profusion times, they had better cardiac oxygen demand ratios and they had a better livability of their patients. They