be rubbing the seal off.

About two weeks later we go back, usually on the next herd check, and remove the sutures. If you leave them in there a month, it doesn't really hurt to leave them in there that long. Normally we don't have any recalls on them. We do need to mention to the client that he probably will need to open that vulva up before the cow calves and he can use a pair of scissors or a razor blade and just open that very easily. We usually check that cow before she is bred the second time around and many of these we have operated on three and four times.

In conclusion, I feel it is an economical procedure that works. It's a procedure that will preserve a cow in the herd for a few more calves. It is something the client can see you're doing and he can appreciate it. I don't know about Iowa, but in Minnesota we are in a financial crunch and our out-of-pocket expense is not extremely great so it is not an expensive procedure to perform.

Question: How long do you leave the prolapse pins in? Answer: I usually ask them to take them out in about a week. If you leave them in too long they will cause some pressure necrosis if you have a lot of pressure on them. In a week's time the other sutures are holding pretty well and they will maintain themselves. But the client can just screw the block off the end of that prolapse pin and throw them away with no problem.

Question: What do you charge? Answer: We normally charge $35 for the surgery, plus the call and the medications that we use plus the prolapse pins. You have maybe $5 out of pocket expenses. You can do the whole procedure in probably 20 minutes.

Question: How long do you leave the sutures in? Answer: We usually leave them in a month so we can pull them out on the next herd check. We like to leave them in until we are sure we have a good closure.

Question: Where do you get the latex rubber? Answer: It is seal tight, formerly a teat dip that is used straight, but now it is used with chlorohexadene in with it. It's a different brand and I think that one would work equally well. This original one has more rubber in it I believe. This one is from Veterinary Concepts, Inc., Spring Valley, WI. I don't know if they have it in those quarts any more. Most of what we have now is in gallon jugs.

Practitioner's Role in the Diagnosis of *Haemophilus somnus*

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Many of you have had some questions in the past years about *Haemophilus* and I am sure I have talked with some of you. It seems in the past year or so there have been many questions about the meaning of the titers as any one particular category. So that is what we will key on. Very briefly the category of signs on *Haemophilus* so you can break it down by categories. Respiratory disease, septicemia, and primarily we talk about TEME more than anything else, and reproductive. When we search the literature we can find quite a bit of information on all three of these really. There has been a lot of more recent information on the reproductive aspects and probably that is the one we don't know quite as much about as we do the other forms of *Haemophilus*. As far as diagnosis of *Haemophilus* as well as many other microbial organisms, we utilize the culture technique quite a little bit and it is a very good means. It is an opportunist so you can recover it from even healthy animals. But in cases of pathology, like on a lung or something, if you get a pure heavy culture, it certainly points in the right direction for diagnosis. But as in many other diseases, we try to establish some serological method of diagnosis. We worked on this trying to interpret the meaning of titers. There are some draw backs to, say the specimen diagnosis, sending it to a laboratory, if there are any antibiotics in the animal that tend to really prohibit the growth especially of *Haemophilus*. If you are several hours from the lab, you can get some false negatives. I've tried to make some meaning out of the serological work on *Haemophilus*.

Many of you that have had titers work done may recognize some of these ranges here. We tried to identify some ranges...and I might add before we go into these, we use the micro titers agglutination test. These titers are indicative of that test. 1:32 to 1:128 would be in the range of minor to heavy exposure to *Haemophilus*. We know from taking a susceptible animal and vaccinating that animal we will get a titer of 1:64, 1:128. 1:256 is kind of a break off point above which we strongly consider that animal as being in an active disease state. Current thinking is that perhaps that break off point might be a little closer to 1:512. I really don't have any problem with that at all. Somewhere in that range is the break off point between heavy exposure to the organism and active infection. Some of you may have had titers run for *Haemophilus* in which the complement fixation test was done and what you will end up with is a lot lower titers. They are still meaningful but you can't use these criteria to interpret titers you get from complement fixation. The micro

titer agglutination test measures IgG and the complement fixation measures IgM antibody. Some of you have seen these data in different forms. We have had some mailings on it. From Jan. '82 to May 31, 1983 we had quite a few samples sent in from practitioners in the field. Some of these states represent quite a few mailings of serum samples. We were getting them mostly from the states that were not doing the serology. There are 3,356 samples represented during this period of time that we got in. I might remind you as we look at these data that this was from cases in which there was some disease suspected in which they were trying to identify a cause for it or identify, say, *Haemophilus.*

The percentage of active infection based on our criteria here, 1:256 and above. New York only had eight samples brought in so the 100% there is a little inaccurate in that particular state. Some of the states that had quite a number of samples, Utah, Oklahoma, Missouri, Wisconsin, Ohio, had some pretty significant infection rates. When we added all of this up and looked at all 3,356 samples, we found that about 30% showed titers that indicated active infection. Keep in mind that this was a run of samples through animals that did show some signs of disease. People asked about paired serum samples and I think they are very important. We tend not to be able to make a lot of sense out of paired samples when it comes to *Haemophilus.* If someone can, I would like to hear what they have to say about it. We followed 104 head and got 40% or so falling, 35% or so rising. We don't have a good pattern set. Speaking with some other people working with this serology, we tend to find that regarding results on paired samples, we are not that good yet at interpreting what they mean.

We'll get into a little bit later why we think serology is still important.

This is some data on some calves that were assembled in about three southeastern states and transported to Texas. When they left out of the salebarn in the southeast the blood was drawn and we can see a titer here of about 1:130. The next couple of weeks it went up a little bit and after a month it was down. This is a pretty clean set of cattle for *Haemophilus.* It seems like exposure, confinement, and grouping tends to make the titers to go up. During the summer months, when the cattle are out on the range and spread out, you bring them in the fall and do some work and the titers tend to be on the low side, and relative to the spring titers in which the cattle have been grouped fairly close together, the titers tend to go up again. Maybe no particular disease signs but the organism is there and is being passed among that group. I think you can see some rise in titers. Of course in the feedlot situation and in the dairy when animals are grouped together all the time and under constant pressure from the organism, that is when we can see some of the high titers and some of the disease problems that we see in whole herds.

This is again much the same type of study in which we have been able to obtain some blood samples. We don't have a control group here necessarily but just look at the total group in which Dr. Morter in Purdue had brought in some cattle and stocker calves and we see here on the acute sample, you see less than 1:32, then the 1:32, 1:64 range, 1:128, and so on. The biggest group there was fairly low exposure range. We had about 3 of them that were fairly elevated and about 3 weeks or a month later we see a rise in titers as these animals are grouped, mingle. We have a similar study in Utah in which the cattle were unvaccinated, took half of them and vaccinated them, and we got a little over a dilution increase in titers from the vaccinated group, whereas the unvaccinated group even fell a little bit. We consistently get a rise in titer upon vaccination.

So the thing I want to leave you with in terms of titers, what your role is. . . It is much like the use of any other titer work that you might be doing. You still have to have some knowledge of what the herd health situation is in that particular herd. You can use the titers very well, you can look at what the clinical signs are, get a history. I guess what I am saying is, I've seen a little bit too much reliance placed on titer work in regard to *Haemophilus.* What I encourage practitioners to do is get a good random sampling of the suspect herd and let's take a look at those samples in total and see what the total exposure is. So you've got a hundred head of cattle, you have ten head for a random sample, and that will give us a good idea of what that exposure is. If it is running pretty high, if those titers are up toward the infection level, that gives you some idea that there is some heavy *Haemophilus* exposure. And then if you're seeing some of the signs of pneumonia, calf pneumonia, reproductive problems, you might then suspect *Haemophilus.* Of course you will be utilizing other tests and diagnostic procedures and your own diagnostic ability to try to identify that. It may very well be *Haemophilus.* But you must not place total reliance on the titers. They are very, very good, very useful for you, the practitioner, to establish the level of *Haemophilus* in the herd. But as far as one particular animal, that one animal that aborted, and you are wondering what the cause is, maybe you're doing paired serum samples, or whatever. I find it is very difficult to establish that that abortion was caused by *Haemophilus* by looking at the titer.

Question: regarding vaccination of calves. Answer: If you have a significant amount of exposure, you feel like you can seroconvert, at least in a dull animal, if you've had some significant previous exposure, sometimes you see a rise in titers, but not necessarily true seroconversion. So here again it's hard. In an animal that has already been exposed as far as established seroconversion after vaccination, just based on looking at titers, it is very difficult. We find that these animals may need to be vaccinated several different times. Maybe even 3 times to get them to seroconvert. When monitoring the clinical signs you can see an improvement. It's very hard to follow that by the use of a titer.