them on a bit to make them stay and incubate this overnight and the next morning you must read the diameter of zone. Different antibiotics diffuse different widths and every antibiotic has a little different zone. This shows you why you must measure zones, the zone size diameter; the wide zone is indicative of an antibiotic that will reach therapeutic concentrations at between 8 and 16 microliters per milliliter and if you have a narrower zone than say in this case between 16 and 18, you are going to have resistance. If you are not using a system like this and just looking on a plate, eyeballing it, you are going to make mistakes because some antibiotics do not diffuse as well as others. For example, penicillin with *S. aureus* has a zone of 30 millimeters whereas polymixin has around 12 millimeters. There is a big difference. You will read them as resistant when they are sensitive and sensitive when they are resistant. Using this method you should use specified media and your results will then highly correlate with the clinical situation. I want to show you some media that we have developed in the last year and we are going to publish this in the Journal of American Veterinary Medical Association, but this is a media that we use for mastitis, rather quick in identifying organisms. This is *E. coli* showing a yellow growth that is rather a large colony. *Staph epididymis,* which is a non-pathogen, you will see a lot of this in mastitis, it is a white colony with red zone; *S. aureus,* a white colony with yellow zones around it. *Strep uberis* is a very tiny colony with yellow zones around it and *Strep. agalactial* are very tiny colonies, very translucent with red zones. You can make identification with this media very quickly.

Dr. Ward has submitted another paper for the 1980 Bovine Practitioner.

Autogenous Bacterins
Ned Brown, *D.V.M.*
Amarillo, Texas

I am supposed to talk about atuogenous bacterins and I can understand what an autogenous bacterin can be in a bunch of ten or 12 calves or a dairy herd of 100 or 150 cows, but I do not know where an autogenous bacterin begins and an autogenous bacterin ends in a feedlot with about 30,000 head. It is autogenous from one pen or autogenous this week, or autogenous next month or what does constitute a population from which an organism is isolated and becomes an autogenous bacterin.[1] The problem is already with definitions. Last week we had a call from a practitioner in a little town in northwest Texas because one of his clients was having difficulties. He had lost a couple of calves, the owner of the calves called the newspaper editor and the county sheriff to investigate the situation. It looked like the calves had been mutilated. They called the Texas Rangers and they called the people from the Air Force base in New Mexico and they came out and checked for radio-activity and looked for flying saucer imprints or triangular spaced and burns and so forth. They did not find any of the mysterious white powder which otherwise is known as buzzard feces in the area! But, after 18 calves had died, he finally got round to calling in his local veterinarian. This is unusual, this does not happen very frequently. But the point being that a simple diagnosis was made once an animal was approached by someone who knew what he was looking for! He diagnosed black leg on the basis of lesions and went ahead and initiated vaccination and antibiotic therapy and referred samples to the laboratory for histopathology and fluorescent antibody tests which did confirm his diagnosis and phoned it back the same day. He is out of trouble and he has not lost any more calves. The point of this study is that there are immunizing agents that are effective and there are immunizing agents that are necessary and they are bacterins and toxiod combinations that we know are useful and helpful and work well when we need them. But it has taken one commercial company about five years and too many dollars to come on the market with a bacterial antigen called *Hemophilus somnus* that is one of the last, new bacterial antigens commerically available and it is also one of the first new antigens available for use in the bovine for quite sometime or new class of antigens. We still do not know if it works or not. We think it might. There are some reasons to believe it should not. We look at other antigens that are available commercially in cattle, like pasteurella antigens. There are those who swear by them and those who swear at them. And there is most concern as to the value of using them. I am making these points only to say that there are good antigens and there are some that are questionable, perhaps or difficult to prove that they are effective and this is certainly true of any autogenous bacterin that we can brew up and produce quickly from an isolate from an individual herd and take back into that herd and demonstrate beyond a shadow of a doubt that we did any good. It is useful, is it helpful? We hope so; we do not know. One word of caution about autogenous bacterins in starting out. Certainly, if one is going to use an autogenous bacterin in the control or treatment of a disease condition, we ought to know what the disease condition is and we ought to know that it is caused by a bacterial organism and it should be the organism that we isolate. It should be in pure culture and it should be properly identified. It should be from the herd of origin that we are going to use it in. Let us take an example of a scouring calf in which we isolate *E coli.* Is *E. coli* the cause of the scouring or is it not? I do not know. I cannot tell from the laboratory as a bacteriologist whether I did any good or not by reporting back the isolation of *E. coli* and I certainly would hesitate to prepare an autogenous bacterin for a veterinarian on every *E. Coli* that I isolated from every case of calf scours. I think that in establishing a diagnosis and making a differential diagnosis that it certainly behooves us to look at management factors that might be related to the diarrhea in that calf. Is the calf getting good milk replacement or is it getting too big a dose of antibiotics?

I think some environmental factors and potential viral agents should be considered before we go out on a limb and

produce an autogenous bacterin. If you go to a licensed producer of veterinary biologics who is experienced in producing bacterins for sale in livestock populations and ask him to produce an autogenous bacterin for you, the chances are he will say "I don't want to." Why is that? It might be that the producer is in another state; it might be that the bacterin would have to come back across the stateline thus possibly entering into interstate commerce. Because they are licensed producers of veterinary biologics they would have to fulfill certain criteria of safety and sterility checking of that product in order to get it back to you. They would probably need to interrupt a full production schedule for the other licensed commercially available products that they are producing in order to fulfill your request. So it is becoming a very difficult problem to find the producer of veterinary biologics that will respond to your request at short notice for a bacterin. Suppose you go to a local laboratory within your state, a diagnostic facility, a private laboratory, or a private diagnostic laboratory. There are some inherent problems here and I have seen some abuses of these types of situations where a laboratory is eager and willing to meet your request for the production of autogenous bacterins. In some cases it becomes a business of the laboratory to produce and sell autogenous bacterins rather than to really help you with the diagnosis. You have that case of calf scours and you send some intestinal contests to the laboratory and they isolate *E. coli* and they are in the business of producing autogenous bacterins. They will probably sell you one whether you need it or not. So be careful of that type of assistance regarding autogenous bacterins. There are some bacterins that are produced within several of the states, supposedly for sale only in the state in which they are produced and not to enter into interstate commerce which can be done without fulfilling all of the requirements of a federally licensed product. This is perfectly legal.

Until recently there was very little if any effort to look at the quality of these products and decide if they are good, bad, or indifferent. If you are looking at a bacterin, if it is produced properly, chances are it is not dangerous, and will not induce a disease process, and is not going to cause you any harm. You are very safe in that respect. It is very difficult to ascertain if it is going to do you any good. But there are good, reputable local laboratories and local producers of bacterins within states and there are those that might not be so good but since there are not test requirements or there is very little testing done it is very difficult, if not impossible, to tell which is which. There are some local products that achieve the impossible; there are some products that are produced for sale within a state, for example, that are not licensed or are not tested that can achieve wonderful things, like putting eight antigens or more into a 2cc dose. Now the best commercial antigens that are tested and that do pass inspection have five-way clostridial antigens or five-way lepto antigens in maybe a 5cc dose. I think that there are a lot of producers of licensed biologics that would like to know the secret of this one producer that can get 8 antigens in 2cc doses.

All negative comments up to this point are words of caution and I think that once those precautions are met and once you have diagnosed the disease as a bacterial infection, once you have exhausted management changes, nutrition changes, environmental recommendations, and rule out other infectious agents and rule our antibiotic therapy as a means of control, and have not achieved success, then consider antogenous bacterins.

Malpractice

Jack R. Dinsmore, *D.V.M.*
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I want to thank you for the opportunity to be here this evening as a representative of the AVMA Professional Liability Insurance Trust. I have to say that it is the desire of the Trust to present information to various specialty groups and to point out claims that are both repetitious and costly. I am happy to see that Dr. Woelffer is in the audience. Elmer just recently left his duties with the Trust and he was chairman for many years and I know in speaking with him that some of the subjects we are going to talk about this evening if you care to proceed later on a more detailed basis, that Elmer can fill you in on some of the details that we certainly won't have time to clarify this evening. To pursue the subject that was just mentioned about the attorneys, we have a chap who does some defense work for us, his name is Mike Kochea who is a very outspoken chap and he is a tremendous speaker. We have had him on several national AVMA programs and the point that he makes, and I would just add to this, about the physician in which he says that there was a time when the physician floated down hospital corridors on gossimare wings, meaning of course, they felt that no one could touch their little empire and that no one could establish a problem for them related to malpractice. I would like to say to you that these days have changed and all professionals, regardless of their involvement, are now susceptible to malpractice claims. The physician, of course, within the last few years, has been as hard hit as any. I think we are tarred with the same brush, and as Kochea has said, the problems that the medical profession has been faced with have related themselves also to the veterinary medical profession. It is just a matter of degree and a matter of the involvement of the attorneys which you have said are now in great numbers as to how much. Sometimes the problems are multiplied. There is also a statement that goes "to consult an attorney about small matters is like watering plants, it only makes them grow." So I think you have to bear that in mind too if you are going to get involved with an attorney. One has to be careful as to the extent that situation might carry you. I have to say that this is true in our malpractice situation as much as it might be in some other type of situations. So in