Southwest Area

Chairman: Dr. Ben Harrington, Apex, North Carolina
Clinicians: Dr. J. Ramge, College Station, Texas
Dr. K. Braun, Gainesville, Florida

Practitioners: Dr. A. Andrews, Archer City, Texas
Dr. J. Eischen, El Reno, Oklahoma
Subjects: Downer Cow Syndrome, calf respiratory system, abomasal displacement and digestive system.

Chairman: First we will start out with the "Downer Cow" and we will start out with the problems as a practitioner sees it in the field and we will ask Dr. Andrews to give us his ideas.

Dr. Andrews: We are going to talk about some pretty big mysteries in here this afternoon. Probably one of the biggest mysteries we will discuss is why I wound up on this panel to start with! I think that anyone who has fooled around with downer cows as a practitioner will have quite a bit of sympathy for those of us who are up here. I am convinced that there is one big reason that downer cows were put on this earth and that is to keep veterinarians humble, at least in my case it has been very successful.

I would like to start off by giving you three clinical pictures that I saw, or have seen in the last few months, of animals that were down and I will give you them very briefly and two of them will just be downers, the last one you should be able to figure out without any trouble. The first one was a two year old heifer that was about eight months pregnant. She was down in dorsal recumbency, she had her head turned around to one side, and showed some salivation. She seemed to have a disturbance of equilibrium, we could stick a bull lead in her nose and pull her around and she would kind of flop back around and never made a very big effort to get up. She had a normal temperature, normal feces and the tip of her tongue was showing just a little bit. The owner called me on a Sunday morning and the story that I got was that she had not been quite right for about a week and then finally on a Saturday night or Saturday evening some time she had gone down.

The next one was a yearling type, it was down. It had a normal temperature, dorsal recumbency, severe salivation, a terrific diarrhea, grunting some, a little bit of a muscle twitch, the owner had changed his feed to some cotton seed meal and some kind of a range cube and he swore that the cotton seed had not been treated. Finally, we had another cow that was down in dorsal recumbency, she had calved about the day before, she had cleaned up, there was no mastitis, she was fairly alert, no salivation. I did not check it, but I am fairly sure that the rectal temperature was fairly normal.

The first one was a case of rabies that was diagnosed by our state laboratory in Austin. The second one was pretty interesting in that on necropsy of another yearling that had died on this place, I did find some cotton seed in the rumen alright and at the time that I was doing the autopsy, it did not occur to me that the cotton seed I saw in the rumen had been delinted and that I should ask the man about it because he swore that these seeds were untreated. But the story on this was they had been feeding them some untreated cotton seed but these yearlings had somehow knocked the top off a seed box on a cotton seed planter and they had gotten into some treated cotton seed and it turned out that it had been treated with diasyston. So, I was looking with this extreme salivation, terrific diarrhea, and all, at disyston poisoning but I did not figure that out the first time that I ran into this. Of course, the last one is just a case of milk fever which we are all pretty familiar with. The reason that I have bothered you with these three cases is to emphasize the diagnostic dilemma that we as practitioners face when we walk up to one of these things. There is, in my memory, this long list of causes of downer cows that we got in vet school and I think that probably the list has increased in length since I got out. I know of no other syndrome that has so many different causes or demands such a variety of treatments from practitioners, but I feel that with this learned panel here that we are going to solve all these problems this afternoon.

Chairman: Dr. Ken Braun is going to discuss the facts from a clinician's standpoint.

Dr. Braun: I wish that I had a lot of facts. If you thought that I was going to get up here and tell you a lot about facts, you could take these back home in your back pocket. In fact if I told you facts you would think that I was a liar. First off, my definition of a downer cow, and I am used to adjusting all my comments on the most part to students so my orientation is to always try to convince the student, or try to teach a student rather, how to diagnose a downer cow. We all went out to a dairy farm and the dairy owner had a downer cow and the farmer after treating the cow could just not understand why the cow had not gotten up. He said, "Well, doc, you treated her, she looks bright and alert, why does she not get up?" I had an experience just very recently to be involved with a toxicology problem in the southern part of Florida, they had 3,000 cows off feed, 300 cows down and finally lost about 100 of them. It looked like milk fever. In fact it looked so much like milk fever that we treated them for milk fever. It turned out to be a fluoride poisoning that had come through a boxcar and the antidote - calcium gluconate. We did have the only antidote and that was the one that we were using and so what I was saying, you can have downer cows that look just like milk fever and believe you me, they had all the classical signs of milk fever because

the fluoride was tying up the calcium. We got the treatment but they all did not live. They all did not get up either. I think that the big thing first off is the definition of a downer cow to me is an animal that is unable to rise and get up on all four feet unassisted and then that carries a lot of lattitude from there on because many cows that we see fit this sort of bill. History is the most important thing. When we start talking about facts, to me the most important fact that we have to put in the back of our minds, even though it is not truely a fact, is the clinical history and if we do not have that, we don't have too much to go on. We have Jerseys that have milk fever at eight months in gestation. We have had Holsteins that have it a seven months, so history is important to try to put things together. Very quickly, I would like to mention the etiology. I will talk about part of this list. The alert downer, to me, is the most confusing case that we have. When you are called for a milk fever and you arrive there and see the big cow lying down, unable to rise, rather bright and alert, it may even be eating a little bit, I used to like to just want to turn around and leave that farm without treating the cow because 90% of them would not get up. I called that the alert downer; usually a fat cow, up north that would be the fat cow syndrome. The facts on this cow, I have taken a lot of clinical pathology, a lot of blood back for clinical pathology, about the only thing that you would find out is that after a while the cow is down long enough is that she would have a high SGOT level, from muscle degeneration. She would be in below normal calcium, you would treat her and then maybe come back the next day and she would still be below normal as far as calcium was concerned. One of these cows I have followed along behind a frustrated practitioner who has given as many as 16 bottles of calcium to a cow like that and she still did not get up. But, the important thing about this alert downer is that every time you look at her, she must have a physical examination. A physical examination for a downer cow is from the tip of the nose to the tip of the tail because you will miss certain things like trauma. A downer cow that is trying to get up, what does she do? She tears her coxo-femoral out, she ruptures the round ligament, or she tears the gastrocnemius. If you are not palpating this cow every time, you will miss her. As you are running in your fourth bottle of calcium, you probably should have stopped two bottle before, because you knew that she was not going to get up anyway!

Other traumas are with dystocias in first calf heifers. Look at the vulva, is she all torn up, is she all bruised, has this animal had dystocia where someone put a calf puller on her or maybe even a tractor? She had obturator paralysis, is that why she is not getting up? Starvation, from time to time you will find a few people who have a back yard cow and she has starved to death. In Florida, things are a little bit different than they were in New York state where I spent 15 years, in that we do not see fat cows in Florida. They rarely get fat, not because they get too many parasites, but because of the heat there, the cows do not eat as well and most of the big dairies segregate their cows. They have 2,000 cow dairies, it is very simple to segregate dry cows from fresh cows. They do not get overly fat. Septic mastitis, toxic mastitis, are probably the big reason for downer cows and many students will take them out and they think for sure that they have a downer cow and I know for sure that many cows have been killed with calcium, by jugging it in real quick, you are a busy practitioner, you rush in. You have your best client, he calls you up on the phone, he says that he has a milk fever, you rush in and without looking and checking the udder you end up treating her with calcium and you could end up killing that cow. Often times that cow will not get up. She is worse in the p.m. so you will come back and by that time you decide to roll her over and check her udder. I followed what I thought was one of the most outstanding practitioners in the northeast one weekend when I first got out of vet school. We ran into a loose housing system barn where the dry cows were, it was not a loose housing system, it was just an open shed. This cow was down and she looked a little funny to me, but I did not pay any attention to that. The practitioner had four milk fevers that evening, a Saturday night, he treated the cow and when we got back into the truck I said to the practitioner, "We did not check that cow's udder", He said that he nevers checks an udder here. This owner is so astute, I know that he has checked it. The next morning the cow was not even up yet. We went back and when the owner went back to the truck to get another type of treatment he was convinced that it was not just milk fever and maybe something else. I rolled the cow over and squirted her quarters on to my boot, she had a real watery secretion in one quarter. So when he came back, we mentioned to him that this cow had a quarter off and at that point he started treating her for toxic mastitis. That should never happen to us. I mean never. The reason that that client paid us and wanted us to come to that call was to make a diagnosis. We also had perforated abomasal ulcers with the wall of the abomasum blown out. We came there, saw the cow down, and she looked like a milk fever. Many times these things happen within two or three days of calving. I have had on numerous occasions, abomasal ulcers, when they are dying. You give them a bottle of calcium and come back a few hours later and she is dead. You probably do not perform a necropsy. That is a point of fact. Why did this cow die? I went through Cornell and we did very few necropsies. The necropsy service would bring a truck out, except for weekends, free of charge and take the cow back to the college. I was teaching our students how to do necropsies on that farm. I do not know what happened to every animal that died on that farm, that was one way of determining just how accurate your diagnosis is. I know that my diagnosis many times was not too accurate. I don't know, you may be a lot more accurate than I am, but I missed a few times. Maybe you ought to be up here telling me how to do it. We necropsied everything. On this large farms of 2,000 cows, we have about one or two cows a month that are dying of ruptured abomasal ulcers. They look like milk fevers and if I ask my students what that cow had, on a quick glance, they

would say a milk fever. But why would she have other things such as constricted pupils, a very fast heart rate, as far as toxemia is concerned. It is not uncommon up north in the fall of the year, for a wind storm to come up and blow a bunch of apples down, in an apple orchard, which had become defunct and they had fenced it in for a fresh cow lot or a dry cow lot. The apples would blow down and they would go out and eat apples. All you had to do was a rectal and come out with a hand full of apple seed and you had your diagnosis of toxic ingestion! But, they looked like milk fever and could be downer cows. Toxicosis, I mentioned the problem that we had down in the southern part of Florida. Contaminated feed stuff is the biggest threat to the livestock industry, particularly to the large dairies that are now buying things in the carload lots. It scares me, the only reason that this farm of 8,000 cows did not have 8,000 cows down was because when they filled the feed toppers, there was enough residue or enough individual feed in the feed hopper that those cows had not eaten this grain.

As far as the facts are concerned, there are really very few really good facts that we talked about, something as big as the downer cow. I guess that I would be remiss if I did not say that the most important thing is for you to develop the facts on that particular case the best you can while you are there and that starts out with a good, thorough physical examination, that was what we were taught to do in veterinary school and that is the thing that has to be the backbone of the evaluation of downer cows. Everytime you come to treat that cow a good thorough examination to me is to roll that cow over, put your hand on her great Trochanter, and flex that leg slowly, back and forth, front to back. Then, abduct, adduct slowly. If you can feel that coxofemoal joint snapping and cracking, you want to put cull on that cow for the most part. I have had first calf heifers, which are small and I have had Jerseys which have gotten up and formed a false joint. They will get along, they will make it until they get heavily pregnant for the next lactation and then you will have some problems. But I have had 15-20 first calf heifers that have made it.

The other thing is a ruptured gastrocnemius. When a cow tries to get up she gets up on her hind feet first, never on her front feet except with a few exceptions. This cow gets up about half way with a tremendous amount of weight on her hind legs. They were not designed to hold the weight of the beast for much more than about a half a second. They get up there and they are just standing there and quivering and you hit them with a hot shot and the first thing that goes is the gastrocnemius. When it ruptures, usually it separates the muscle bundles, they fill up with blood, and so you must palpate the hind part of her leg to feel for increased hemorrhage, tenderness and firmness. If you do not, you are going to miss finding out what their problem is. If you find either one of those two, the quicker you slaughter that animal usually the better off you are, unless she is an extremely valuable animal because if the cow is down for more than about three days you will discard the entire ventral abdomen and many of the limbs because you have pressure necrosis and the meat really will not bleed out well.

One of the problems that we are going to have with this panel to day is that it is hard to separate fact from fiction so I hope that I have not put anyone else into a bad spot here. I just want to say one other thing and that is in Florida, I don't consider that the southwest, but we have a lot of problems there certainly, I have only been there a year and I think that I have been there long enough to be dangerous. So, maybe some of the things that I have been talking about that might happen in Florida, may not be that way next year. So, I am relying on a little bit on some of the things that I will say are probably tempered a bit from my experiences up north, but I am trying to separate those experiences from those that I have had in the last year working in Florida with about 6,000 dairy cows.

Dr. B. Harrington: Up to now the panel has discussed some of the problems that come up with practitioners out in the field and then some of the facts covering it. I think the intent of this was to present what you would like to hear, but we still have two parts left but I think that this part was kind of set up so that we would hope to get some dialogue on discussion back and forth. If you have some case histories or some problems that you have seen in the field and would like to direct these to some member of the panel, or just like to make a statement of some results that have happened to you with downer cows, we would like to get a little back and forth right now.

(From the floor): Is the SGOT level helpful in prognosis?

Dr. Braun: I do not think that the SGOT level is very good for prognostication for downer cows as far as I am concerned. I think we are trying sometimes to rely on clinical pathology as far as our downer cows are concerned and that is one of the things that I did not get to today, and that is prevention. I think that is where we have to put the emphasis and too many times, I guess being from Cornell, and being our way of teaching veterinary students, it was more on diagnosis and treatment and that is the traditional methodology that we have used for years. My method of teaching veterinary students now is diagnosing the individual animal, what is the treatment, we must save this animal or try to, but the crux the whole problem is prevention. That is where it is really up to in the long haul. They can not really afford to have us come out and have a bunch of downer cows. Up in New York State, it was not unusual for me on a weekend duty, come Monday morning to have six downer cows. It used to just scare me to death. Of course, we have lived through the crisis situation of downer cows in that area through the late 60's and early 70's but then a few clients sneaked back with us. In essence, I have run all kinds of clinical pathology that you could think of on many, many downer cows. About the only thing that I could find that was significant on downer cows and particularly when it first when down was that they had hyperglycemia. The reason for that is that when you have hypocalcemia you have hyperglycemia simply because the cells of the pancreas,

under the lack of the influence of calcium, do not release insulin. That was consistent. The average normal glucose value in cows is between 40 and 60 but it would go to 95 and 185. That instigated me at that time to call up six drug companies and ask them why we have 16% dextrose in a bottle of calcium, when the facts are that already we have cows that are hyperglycemic at the time that they go down with milk fever. Their comment was that veterinarians do not know how to distinguish between ketosis and milk fever.

If there is someone here who has some way that they can go out and see a downer cow and take some blood back for clinical pathology to make a diagnosis, I sure would appreciate it if they would stand up and tell us their secret. I just don't have one.

(From the floor): They are evaluating cattle that are down and that they have a high elevated CPK, hypophosphatemia and normal calcium.

Dr. Brown: Now, is this at the time that the cow first goes down, or is this following treatment?... These downer cows, let's try to restrict it a little bit more, are these animals about the time of calving that may have been milk fevers. There are two types of downer cows, one that will go down about the time or shortly before or shortly after calving or then have a cow down at some other time, when are yours?... I have not had elevated CPK's on cows that have just gone down. They have elevated two or three days later, absolutely. I am really surprised that your milk fever type cows have not been hyperglycemic. Yet, it could be that in your area this does not happen. I have checked in Florida, and New York state, and I have not found hypoglycemia or even normal glycemia.

Let me first say about the calcium and phosphorus that I have run literally 100s of thousands of calcium-phosphorus through our clinical pathology lab and a typical milk fever course is hypocalcemic and hypophosphatemic. They are both low. Often times when you re-treat cows, the calcium will come up to normal and the phosphorus will stay low. If you can get the calcium to eventually get up where it belongs, the phosphorus usually follows along behind it. I have never seen a cow that had a normal calcium level and had hypophosphatemia at the time that we had milk fever cows. I have a sneaking suspision that perhaps you have something different which intrigues me, we are in a different part of the country and my information is from up north and also now from Florida. We have not really had anything quite like what you are talking about. Has anyone else had anything like what the gentlemen in the back is talking about with low phosphorus and high calcium or average calcium.

(Question): We see cows that look like a typical milk fever, we see quite a few of them, and the first clue that something is different is that they are fairly depressed and as you treat them with the standard procedures, probably with two bottles initially, . . . they seem to get progressively more depressed and if we check blood profiles, we are seeing quite a few that are running very high BUN in the area of 60 and 70 . . . we have not had any success with those. I do not know what has happened in those cows.

Answer: Of course one of the treatments of ketosis is insulin. Do you use that at the University of Pennsylvania? I have never heard of using insulin for the treatment of milk fever. I will go along with that, I guess where the standoff here is still why we have problems with low phosphorus.

Question: Did your rabid cow show signs of bellowing etc?

Dr. Andrews: No, she showed no signs of agressiveness, she was not straining and she never did bellow or anything like that. I think that it is probably common all over the country but we have a pretty terrific skunk population in our country and I feel that the greater part of our cases come from them. It is a new ball game nearly every time we have a case of rabies as far as the diagnosis is concerned. I used to think that if they were off feed, straining and salivating a little bit, that would be some of the things that I could depend on but some of these cases that I have seen lately have not strained any. One of the interesting things that some people have told me about young calves is that while they are still up they will tremble quite a bit with rabies. I had not run into that too much before.

Chairman: The next part will be the practitioners' suggestions from a practice approach. Dr. Eischen will handle this and I think that he has some slides that he wants to show also.

Dr. Eischen: The Downer Cow Syndrome; it seems as the veterinary profession, we have been treating the downer cow syndrome for 100 years. I have been a veterinarian for 20 years and it seems with all the modern medicine, treatments, diagnosis, my results have not been any better. I have tried all of the secret remedies and it seems like about as many got up if it got up, most of them went down within about 24-48 hours. Just about a year ago, I got our of private practice, I have since then been a consultant and herd health manager for a 3,000 cow dairy herd. This gives me an opportunity to know the history of these cows, by the records and by observing these cows every day. You need a good history and a good examination of these cows. Also, I get a chance to post every one of these cows. This gives me a running history on this herd. In other words, when the next cow goes down, I have some idea possibly of what is wrong with this herd.

Most of the cattle we see down will be in free stalls, on the cement area. The free stall walker, the guy that drives the cows out, will come running to the treatment barn and tell us that we have another downer and that he needs some help. Normally, if the cow had just slid down, or has a minor thing wrong with it, the cow will get up with a hot shot, or if she does not get up, somebody from the treatment area will go out and try to treat her. I see problems there than I had never seen in a mixed practice type operation. There are numerous stresses on these animals. They are on cement nearly 300 days a year. Last winter we had 65 days of ice. These cows are walking in a wet environment with the cement being wet. They are going to fall, slip, and slide. I went to work for them

in January. The fifth of January we had our first snow and ice storm. During the first seven days we had five downers a day. What was amazing after that was apparently the cows learned to walk on this ice or something. I don't think that we saw another downer the rest of the winter. Of course, another way that you may look at it, those stressed cows might have been those first 25 cows that went down and the rest of them might have been healthy animals. I can say that they are stressed on cement. They get about 60 to 90 days, an average of 45 - 60 days on dirt. When we turned them off cement and on to dirt, they are like a bunch of kids at recess time. When they hit that dirt, they jump, run, buck and they know that they are going to get a 60 days rest off cement. I think that with cement the stress is confinement oriented. I can see that on the cement, they walk through a foot bath, they walk on a slick surface, and the other cows are pushing them all the time. The same thing when they go in to eat. We have room to feed 80 head. The first 80 head to get in there pile up in the hay feeders; they push, pull and knock each other down. How do we handle these downers?

Usually the first thing that we will do is pull a sled in there and try to get them on to dirt. We pull this sled either by hand or put it on the back of a tractor or pickup and pull them out of the stalls and on to dirt. The high percentage of these have just fallen or slipped and they get up and walk off if we can get them on dirt for three or four days and then they will be alright. I have noticed that with treatment, or without treatment in 48 hours 50% of these are going to die. So, I get a chance to autopsy a bunch of them. When I see a downer, I try to make a proper diagnosis. If I treat this cow, especially put antibiotics in her, I have to wait 18 days, withdrawal time. Will this cow go back in the herd as a valuable animal, will she live long enough to get the withdrawal time antibiotics so that I can salvage her, should I try to salvage this cow, or is she going to die on me anyway? So I postmortem all these cows, so that I can get a good idea of what is going on. I would like to state that within the last year I have probably posted at least 50 of these cows and listed some of the things that I have found and it has proven to me that whereas we think that a miracle drug can save these cows, if you post every one of them, you will find out that most of them are untreatable. You make two decisions. You either try to salvage that cow as a cull or she is probably going to go ahead and die in 2, 4, 6, or 7 days anyway. What I found were fractures, spontaneous and traumatic, an acute RDA that died within two or three hours, I found downers which we chronic LDA's, I have had a liver syndrome, ketosis, etc. I have had milk fever relapses, involved with these were metritis, toxic mastitis and peritonitis. Just like Doctor Braun said previously, any time you treat a milk fever you should check those quarters for good milk. A high percentage of these downer cows are going to be toxic or have coliform mastitis. I have found lymphomas in the spinal cord and the brain, omasum, heart and other glands. I have seen obturator paralysis in heifers, some responded and some did not. A high percentage of these had hardware with pericarditis pleuritis, pneumonia, and liver involvement. I found liver abscesses from the high concentrate feed. I have even found liver flukes. I did not think that we had liver flukes on the place. I found nephritis, abscesses around the kidneys and in the urinary bladder. Both of these were associated with a chronic metritis, or trauma at calving. We also had hardware with chronic purulent pneumonia and emphysema. What amazes me is that when you post these cows with chronic purulent pneumonia with emphysema how you did not spot this cow being sick before but find her down and she would die in four hours. I cannot see how a cow like this can walk around three times a day and get milked three times a day without somebody picking her up about 45 to 60 days earlier. But apparently in this mass of cows these things get hidden. She was not a skinny cow when she went down, they all look about the same when they go down. When you cut into them you wonder how this cow lived as long as she did and not have been down 30 days earlier. In a cow with liver fluke we traced the history back and found that the owner had his heifers on pasture in another state. Apparently this is a liver fluke area and we found these fluke livers which eventually killed the animal. With displaced abomasums, we pick up these cows about 35 - 45 days after calving, it is usually on the first postpartum examination of the uterus tract. They are either skinny or poor doers. Apparently in this mass of cows we do not see these cows when they are going off feed for a day or two. Most of them have metritis and mastitis at the same time. I do not do surgery on them. I usually make up my mind at this stage whether this cow is going to live long enough to cull her and get something out of her. I have put a few of them on their back and done the closed stitch method by trying to find the abomasum and suturing it back.

We put a magnet in every cow that is pregnant for hardware.

I came across a new method for handling obturator paralysis in heifers and also maybe for handling some deep fractures in older cows. I ran across this apparatus about a year ago. This thing is being worked on and being invented by an orthopedic surgeon, who was buying a bunch of cows to test it and he put an ad in the paper that he would pay $125 for every downer cow. I should have taken pictures of all his downer cows! He had everytype of downer possible. He had cows that dogs had eaten the rear ends out of, fractures, broken backs and I tried to tell him that this cage was not going to cure this situation! He would have to have a heifer that had a good history and possibly paralysis to make it work. What he is going to do is float her in a four foot tank of water. These heifers will float, they will swim, and keep the tone of the muscle up with the muscle activity. They will have a good bowel movement, they will eat, and it really does help the heifer and he puts them in the water for 30 minutes, twice a day. The rest of the time they are jacked up. He can lower this on a pipe and the heifer will live in this environment until she can stand up and walk out and then you lower it down and let her go.

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3. *Cattle must be ready to breed—they must be estrous cycling and must be healthy;*
4. *Estrus must be detected accurately if timed AI is not employed;*
5. *Semen of high fertility must be used;*
6. *Semen must be inseminated properly.*

A successful A.I. program can employ Lutalyse effectively, but a poor A.I. program will continue to be poor when Lutalyse is employed unless other management deficiencies are remedied first.

USE PROGRAMS ARE:

Program I—Estrus Observation

1. Inject 5 ml Lutalyse intramuscularly (25 mg dinoprost);
2. Repeat the injection 10 to 12 days after the first injection; then,
3. Observe for estrus after the second injection; and
4. Inseminate at the usual time relative to detection of each estrus following the second injection;
5. If the cattle are estrous cycling estrus is expected to occur 2 to 5 days after second injection. Cattle that do not become pregnant to that breeding will be expected to return to estrus between days 21 and 27 after the second injection.

Program II—Timed AI

1. Inject 5 ml Lutalyse (25 mg dinoprost) intramuscularly;
2. Repeat the injection 10 to 12 days after the first injection; then,
3. Inseminate about 80 hours after the second Lutalyse injection without estrus detection or observation;
4. Cattle that do not become pregnant to that breeding will be expected to return to estrus between 21 to 27 days after the second injection.

Experimental data have demonstrated that pregnancy rates at 2 to 5 days after second injection in Program I and Program II, were markedly greater than pregnancy rates for contemporary controls. However, due primarily to the mechanics of Program 2 there was an increase in services per conception.

WARNINGS

Not for human use.
Women of child-bearing age, asthmatics, and persons with bronchial and other respiratory problems should exercise *extreme caution* when handling this product. In the early stages, women may be unaware of their pregnancies. Dinoprost tromethamine is readily absorbed through the skin and can cause abortion and/or bronchiospasms. Direct contact with the skin should, therefore, be avoided. Accidental spillage on the skin should be washed off *immediately* with soap and water.

PRECAUTION

Do not administer to pregnant cows, as abortion may result.

Do not administer intravenously (I.V.), as this route might potentiate adverse reactions.

ADVERSE REACTIONS

1. The most frequently observed side effect is increased rectal temperature at a 5x or 10x overdose. However, rectal temperature change has been transient in all cases observed and has not been detrimental to the animal.
2. Limited salivation has been reported in some instances.
3. Intravenous administration might increase heart rate.

DOSAGE AND ADMINISTRATION

Lutalyse (dinoprost tromethamine) is supplied at a concentration of 5 mg dinoprost per ml. Lutalyse is luteolytic in cattle at 25 mg (5 ml) administered intramuscularly. As with any multidose vial, practice aseptic techniques in withdrawing each dose. Adequately clean and disinfect the vial closure prior to entry with a sterile needle.

HOW SUPPLIED

Lutalyse (dinoprost tromethamine) Sterile Solution is available in 10 ml vials.

CAUTION

Federal (U.S.A.) law restricts this drug to use by or on the order of a licensed veterinarian.

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I asked him one day, "How did you ever figure out or even think about a deal like this?" Well, he is also a rancher and he owned a farm on the side of a river and one Sunday afternoon he found this white faced heifer with a Charolais calf hanging half way out of her. She was rather spooky. When he drove up to her, she fell down on the side of the river, and hit the bottom. As she hit the bottom, the calf popped out and he thought that he would go down and get her. In the mean time, she crawled in the river. He did not have a rope or anything so he went out to get her and she kept crawling into the pool. So, she stayed out in the water for about three weeks and everytime he would go down with a rope or something, she would swim out a little deeper. In three weeks times, this heifer climbed out, walked up the bank and was as normal as possible. So, from this he figured that this would be a way that by floating these heifers and giving them exercise, their nerves would heal and they would finally be alright. It is a basket like arrangement, you can open up the back door and back up to the heifer, put on the winch and the cable, put a halter on her and drag her into it. You can jack it up and haul her off. The winch can be used for multiple purposes. It can be used to drag the heifer in, or to raise the basket for transporting. He has modified this thing somewhat from the first time that he had built one. The first one had a wooden floor with carpet on it. He found out that after two or three weeks his animals got bed sores, and abrasions, abscesses in the joints, and finally die. So, he changed his floor to a steel floor. He tried all types of foam or bedding for the bottom. He finally came up with the one inch, one cell sponge since it was rather soft, he had to coat it with something, he found 1/16 inch rubber to coat it with. The rubber acts like a skirt on the outside of the tank. The heifer is in the cage and then you lower it into the water, it is a four foot tank of water, a double stock tank that is four feet tall and he puts 36 inches of water in it. He found out that the water temperature is critical, about 60-65 degrees, and also when he originally developed it, he thought that he would sell it to the farmers for outside use, but he found that a lot of these heifers, especially his Holstein heifers and cows, went into tetany after about three weeks so he decided that he was going to have to go into a heated room, and so he is now putting it in an insulated room, controlling the outside temperature as well as the water temperature. He has found that the cows are responding a lot better. You can drop this cage down in the tank, let the animal swim, apparently the gas in the rumen is enough to float her, she swims around in this cage for about 30 minutes and then you bring her up and after getting her high enough, you put a double pipe in on both sides and lower the cage down on the pipe and that is where she can live in. If he has only one heifer to treat, he can just let her stay by the tank. If you have a bunch of heifers and you want to use one tank, you can take the cage over to the side, unload her on the ground and then go ahead and get another heifer and jack her up and put her in the same tank again.

He found out that he has got to control the temperature of the water, and possibly control the temperature of the outside. If the heifer or cow comes up and she is soaking wet you can't have a drop in temperature of 20 degrees or a 0° temperature because the shock will get her. So, it would probably mean for a veterinarian in a controlled environment to go out and pick up the farmer's heifer and bring her in and charge him so much a day for floating her. They need to be turned every once in a while. He developed a turning device for this. He gave me one of these to try. I think that we will be able to use it for these down cows in the loafing alley and get them on to a sled. He thinks that the price will probably be about $2,500. If anybody is interested, you can get more information from me after the session.

Chairman: Now Dr. Ramge will summarize the downer cow problem.

Dr. Ramge: It would seem that one way to look at a downer cow is that the cow is down and cannot get up and we do not know why. We have not made a diagnosis. She remains a downer cow until she dies or until we make a diagnosis. Once we make a diagnosis, then she, in a sense, goes out of the downer cow category. The diagnosis may not help her particularly as far as recovery is concerned. I think that several things were pointed out that are of paramount interest to us. It points out the importance of getting the history and the help that this might be. If we are successful in getting a complete history it will help to make a diagnosis. It has been pointed out that the complete physical is necessary and the advantage of making a complete physical at each time that the animal is seen because the situation does change on physical examination. At one time the situation may be such that we are not able to arrive at a diagnosis, while even several hours later it might change so that a diagnosis could be made or simply there is some advantage in redoing what you have already done and maybe you will do it right this time. The importance of necropsies has been pointed out, especially, I presume, on the herd basis. It may be that there is something occurring here that is repetitive. We have heard of the many, many reasons why a cow may be down and it could well be that no pattern would be established, but at least, it would help us in our diagnostic skills, hopefully for the future. Finally we have been given a look at the importance of nursing care, recognizing the fact that even with the best care, the mortality rate on these cows is going to be quite high but perhaps we can obtain some decrease in mortality rate if we can get good nursing care for these animals, physical therapy, so to speak, in some way to help the animal to recover. If we did not know that this was a very complicated situation before, we do know it now and the one thing that it tells us is that the prognosis is not too good once these cows do definitely get in this category. It is a challenge and it calls upon our diagnostic skills. I suppose one of the problems that I see with it from the practical standpoint in a practice is the amount of time that we can spend on these cases individually and if we are thinking only from the standpoint of that individual cow, it may well be fairly obvious that there is a limited expenditure of time that

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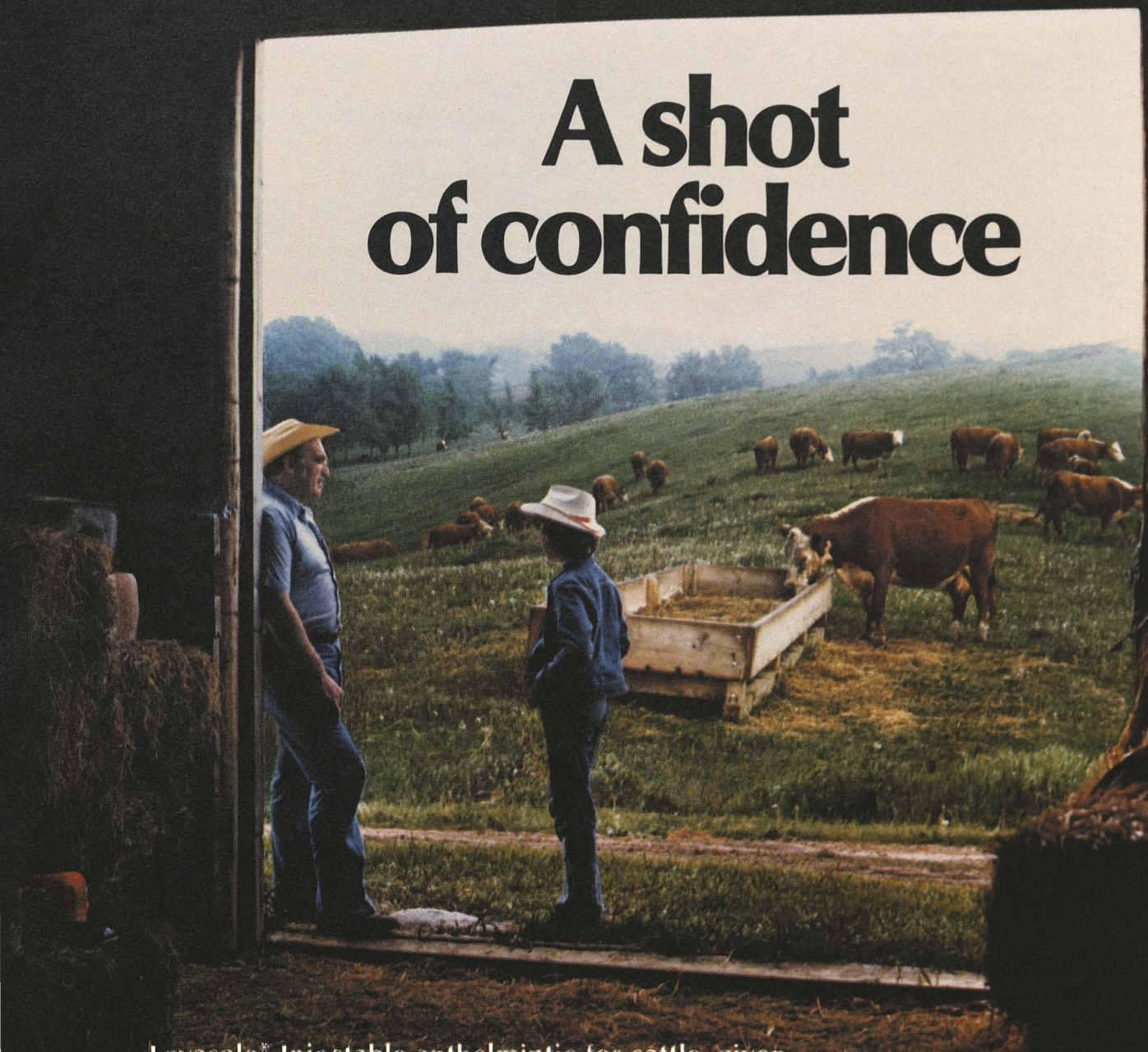

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might be economical. From the standpoint of the herd, and from the standpoint of our own satisfaction, we may be able to go a long way with these animals.

Dr. Braun: First thing that I am going to do before I leave here is find out where Ed Sterner gets that straight calcium. At Cornell we had drug boys that worked in our back room and they made our own calcium solution which I think is far superior for treating a milk fever, that you think is a milk fever the first time, than anything that I have ever seen. The magnesium question . . . There was a period of time, I believe that it was in the very late 60's and early 70's, we could not get any calcium gluconate to form our own calcium preparation. At that time we went to a commercial preparation which had calcium, phosphorus and magnesium in it. The first thing that you will notice when you treat a cow that has magnesium in it, is that the cow becomes more comotosed, if she is not comotosed already. That was a consistent observation that we would make. You run in about half the bottle and instead of the cow being a bright, alert cow, all of a sudden she was half going to sleep on you. We do not like it, that is one of the reasons that I do not like commercial calcium preparations. Magnesium, I do not think that we need it in there. I would say that there are sometimes that we need that solution, I keep it on the back shelf. I come back to treat the cow a second time, maybe I have done some clinical pathology and she may be low on magnesium. When I was at Michigan State for a year on sabbatical leave, I did see the problems there with magnesium. There, I think that their formulation works great, on certain instances. The dextrose, I am like you, I am an individual who likes to give a 500 mls IV and 500 mls subcutaneous and if you have a show cow, unless you put 500 mls in four different sites, and gently you circulate it out around the subcutaneous tissue, you wind up with an indurated mass that the owner is down right discouraged with you, especially for using the neck and the side of the rib cage. So, to your question, I do not like magnesium. I do like magnesium when I need it and in certain areas in the United States we need magnesium.

From the floor: At Michigan State, where I am now, we find a lot of cows that do not have any mannesium or very low levels of magnesium. We use it almost routinely. However, on the dextrose problem, and I apologize, I do not know where we are getting it, but we are getting a personal preparation of straight calcium. We just found it. Where do you get it from Ed?

Dr. Sterner: Well, I did get it from W. A. Butler, but you know that there were some works presented somewhere in England that said that you had about 27% relapse when you used the mixture and only about 10% when you use straight calcium.

I will agree with that. W. A. Butler said that there just was no one demanding it and so they naturally do not produce it. They said that they had to search all over to get it, I believe. I think that it was somewhere out in the southwest, maybe in Kansas, I don't happen to remember where it came from. I only know that they have a pretty good stock on hand. We overloaded our inventory.

From the floor: We use that Cornell formula to fix our own. It is really very cheap. We are selling bottles of that for $1.50 each and this is probably double, or more than double what it costs us to put together. We buy 100 pounds of calcium gluconate at a time. We have had no abscess problems, it is Dr. Udall's formula that we use at Cornell. It is a very good preparation.

Question: How many ml bottle does this calcium come in?

Answer: I think that it is a 250 ml bottle.

Question: What is the concentrate on that?

Answer: The dosage is on the bottle. You use less than 100 ccs on an adult cow.

Question: Why are some of these cows acting like nervous Ketosis?

Answer: I have to admit that if you have a real problem with what I would call the fat cow syndrome, I don't know whether nervous keotsis is incidental to milk fever or whether the milk fever we are seeing in the early stages is the nervous form or the nervous and excitement stage. The textbook case of milk fever has three different stages. The first one is the excitement stage, and I had a client with a registered herd who observed all of his milk fevers very early on. The first sign that he observed was the tongue slightly sticking out. When you walk up to a cow and she is in an early stage of milk fever, many times the earliest sign that you will see, which she normally would not do, is roll her tongue out. This is a good registered herd. This woman taught me more about dairy cows than any other person that I have ever known. She got me out of bed at 2:00 in the morning and to get my body out to the farm it would be another half hour. By the time that I got there, many times these cows would be in the excitement form. You walk in and try to get a halter on them, they might send you into a corner, not because they charge you but because they are trying to get away from you and instead of getting away from you, they are actually coming toward you. It was a little bit dangerous. But yet, I have also had some other cows that were lying down, flat on concrete, and just bucking and thrashing and throwing themselves around. They would have hyperglycemia also. That was about a 100 cow herd and I took many, many samples because there was a real milk fever study going on at that time. This particular farm now had 90% of their first calf heifers being treated for milk fever between October 15 and May 15 but most of the first calf heifers did not calve until they were about 30 months of age. They were big cows. So, what I am saying is that depending on the farm, depending on the area, we have to be very careful about how or what we describe as what is a typical milk fever case. I think that is very critical. If in fact a calcium with dextrose solution is the solution of choice for you, I would certainly use it. I am talking about observations I have made though, on what looked like a typical milk fever alright, not one that was a nervous disorder so to speak.

Before I forget, I just want to bring up one thing. Jim and I

were at the Milk Quality Control Seminar and Dr. Jim Jarrett showed me the greatest thing that I think has ever happened to the north country with free stalls. They have a free stall now which has a brisket board. The total stall is eight foot long and the cow has about four feet in front of her where she has room to get up. The biggest boom I had to decreasing downer cows in New York State was that I refused to treat a cow for milk fever in a free stall barn on concrete, or in the stall. Because may cows would literally tear their legs up when they are down in a free stall and there is nothing absolutely in front of them except their head and nose is stuck in the front of the stall and we have a concrete area behind them to help keep the bedding in. When the cow tries to get up she has one of two choices. Either she cannot get up, or else when she tries to get up, she takes her hind legs and forces herself underneath another stall. When they take their hind legs and force themselves forward, they tear their legs up and that is what ruptures the gastrocnemius. It just tears up her leg or she subluxates her hip. By giving them the room to try to get up, the cow will not destroy herself. In every farm in upstate New York, there is a lot of rocks and sooner or later a dairyman will find what we call a stone boat. You could roll a big stone onto it and get it off the field. We had those on the farms. When I got there that stone boat was ready to go and we would get the students out and we would roll the cow onto the stone boat, get her off like Jim said, off onto good footing, and in the winter time, get her out into the snow. It was beautiful, it was good footing, as long as there was not ice underneath it. Treat the cow and then try to make her get up. That saved me a lot of frustration. I have been in the veterinary business long enough now to know, and I have treated as many downer cows now for the life of my career as most people because I have treated a bunch of them. You can hear of a new treatment every year and as we have mentioned here, I know of no good treatment. I know of no good way to evaluate a downer cow. The thing that we have to do is to try to prevent it. I know that this is difficult to do on a small farm if a fellow has 50 - 60 cows, he only has one downer cow a year, maybe one every two years. If you get enough of these herds, you will be having a large problem with downer cows. If somehow we could explain to these individuals that nutrition is so very, very important during the dry cow period and good housing, I think that we could prevent 90% of our frustrations.

Question: Is anybody using an electronic thermometer which takes about three to five seconds to get an animals temperature as a monitor in a dairy commercial dairy, to maybe help evaluation or to help diagnose pending problems?

Dr. Eischen: You can't do it while they are milking, I don't think. Possibly we could do it in our operation where they are in a free stall feed alley for one hour three times a day. That is possibly where it could be done. I know that Dr. Benny Norman did some work on a feed lot where you point this sensor towards the animal and you can get a differentiation of temperature.

Dr. Eischen: This man is an M.D. and when I went out and talked to him about a year ago, he knew very little about the downer cow. I think it is only good for obturator paralysis in heifers. Possibly, a deep fracture of the femur. He put an ad in the paper, he wanted to buy downer cows for $125. He got every piece of junk in the world out there. He did not have an obturator paralysis but he had everything else. He was trying to test his tank on downer cows. I went out there and told him that he had no way of proving this thing since he did not have one obturator paralysis. He had 30 head of cows out there. I think that when he goes ahead to do some research, he will pick the right cow. He has this heifer in a basket. He did not have to put anything on her or under her or anything to get her up and down. He just takes that tank and goes up and down with it. He would put a hip sling on her, belts under her and that is going to take a lot of manual labor. We see very few obturator paralysis in our Holstein animals. We do not put them on cement and bring them into the operation. We leave them on the dirt, maybe three or four days. Most Holsteins you can leave lying in the dirt. I don't think that two or three days out in the dirt or grass is going to hurt them. It is the long term paralysis that you need some therapy for.

In our area, instead of a low level of calcium, we will see what we call wheat tetany or grass tetany, which is a hypomagnesemia. Sometimes you have low calcium with this too. On wheat pasture, I think a high percent of those would be hypomagnesemia. I think that you need magnesium in that cow to get her up.

Dr. Braun: We stayed right with the treatment of calcium gluconate IV. We bought every bottle of calcium probably in the state of Florida, Alabama and Louisiana and a lot of the cows that went down did not get up. They became true downer cows for various reasons. However, they were out on sand, but, I think that they lost about 120 cows, you mean this particular herd that we are talking about in southern Florida. I think that they totally lost about 120 - 150 cows. They destroyed others that did not get up. When I got the phone call at 5:00 on a Thursday evening, they had 300 cows down and that puts the fear of God into you. It is just hard to imagine that many cows down. The guy has 8,000 and so you don't know where you are going from there. It is late at night, it was like walking out into a bunch of wolves that have knives but everybody kept their cool and tried to isolate exactly what their problem was. This was probably the best case of epidemiology that I ever went through, the best exercise because about every half hour or every 20 minutes I would think of something else to figure out or something that we should interrogate them about. This whole thing went on for about a 24 hour period, trying to get all the neighbors who may have sprayed. In Florida they spray a lot of things by airplane and so we kept trying to get people on ranches adjacent to this big farm to tell us what they had sprayed with in recent weeks. It turned out to be like looking for a needle in a haystack. The whole thing that we have to

realize is that we talked about the many reasons why cows are down, and the whole rationale is here that we first must try to find out what we are dealing with. So many times we are so apt to classify downer cows as one single cause that is, a cow that goes down with milk fever. Because, many cows at the time they calve, due to the influence of estrogens, will have round ligaments relax, they will have other ligaments relax and so if a cow gets caught someplace and she cannot get away from a cow that is in estrous and she mounts her down she goes, and she could split her pelvis. You come in and start to treat these cows for milk fever and then you call her a downer cow. Sure, she is down, but you ought to go a lot farther too or she is never going to get up!

Jim, would you please give us the dimensions of those stalls that you have that you suggested that has that brisket board.

Dr. Jarrett: Housing is something that is talked about a lot and there are a lot of different ideas on it and I think that these cattle need to be housed in an area that first of all, they are comfortable enough that they are going to lie down and are motivated them to lie down as much of the time that you can get them to do it. One particular set of free stalls that Ken is asking about is a set that has been in about 2½ years to 3. I did not talk about them too much until I could be sure that they were going to work over a long period of time. You know that you all have a lot of good ideas and we go out and spend $15,000 to build a calf barn and they work real good for about a year until they get contaminated and then you all know how that story goes. These stalls do have cement bottoms. I fought cement bottom free stalls for years because I think that it borders on cruelty to animals to force a dairy cow to be exposed to concrete 24 hours aday. They do have cement bottoms, however, the bottom is dropped down about five inches and bedding is placed on top of it. This gives you a good, resilient bed for these cattle to lie on. I think a lot of free stalls are too short for the average Holstein cow. I like to see them about eight feet deep, but they will not work without a brisket board. In this case the board needs to be put about 5 foot six inches from the outside edge of the curb into the board, it is usually a 2 x 6 or a 2 x 6 sitting there at about a 30° angle. Big Holstein, west coast cattle probably should be up to about 5'8" or 5'10". For most cattle in the east, a 5'6" measurement works well and we have about four or five operations that I am personally familiar with and this measure has worked well. The cement in the bottom of the stall prevents long term maintence problems and they have to be maintained. They have got to be bedded. This does two or three things anyway. It is a comfortable stall, the cow lies in the back part of the stall. When the cattle go into the stalls you can almost pull a string down the rump where they are lying. Everyone of them lying down with that rump right out at the curb. If they defecate lying down, it falls out into the alley rather than into the stalls. There is no bar on the top of these stalls, the owner and I have talked about this two or three times, the possibility of putting something over the top to stop them from walking in too far when they are standing and he says that they are working so good that I will trade the responsibility of raking them out everyday. When they go through each day they just carry a rake with them. Any feces that is in the stall is just raked out as they go to get each string twice a day. They are bedded about once a week. The overall bedding usage according to the owner is down at least 30 or 40% from what he had before in conventional stalls as most of us know them....It is right on the floor, flush with the floor. In fact, we have had a couple of operations that have used a 2 x 10 as a front form for the cement and then left it extended up 6, 8 inches. It has got to be right on the floor with no holes underneath to get legs under and get hung up.

Chairman: The next area that we would like to get into is calf respiratory problems and to start this section out from the problems of the practitioner's standpoint, we would like to ask Dr. Eischen to discuss this first.

Dr. Eischen: As I told you before I am working with the large confinement type dairy, also we have a confinement type calf rearing opeation. We have 900 calves in one barn under one roof. These stay in little individual stalls that are separated by plywood boards. They have a grate under them with a flush system to flush the manure away from them every hour or two. The type of operation that I saw in California we had too much trouble with them, I would recommend to the guy that he would be better off burning the barn down and starting over again. It was the type of thing that, after a year or two, you wonder how you can ever raise a calf in them. We have told the owner that it might be best to do it in this barn, you have got several maybe $100,000 barns, you can't do that. We have got to use this barn as best we can. Also, the labor and the labor efficiency of it is a whole lot better in a barn like this than in individual stalls with hutches outside. You can imagine feeding 900 calves in hutches, how much labor it would take, how much maintenance it would take to keep them going. We have got to live with this farm. What is surprising about this barn, at one time when I was in consultation work with the dairy, we had about a 40-50% death loss and today we are down to less than 5% and we still have a lot of problems. We see a major respiratory problem in these calves about 3½ to 5 weeks old. We can get them over this, wean them out of this barn and into a weaning barn where they are more in the outdoors in groups of 100 and approximately 400 calves in one of these barns, these calves will stay in a weaning barn for about 10 days. They will do pretty good in this weaning barn. Maybe towards the end we will start getting another respiratory break. Where we see our second respiratory break is when we take them out of this weaning barn and put them on a line bunker feedlot type system and they are approximately 8-9 weeks old at this stage. They weigh about 150 pounds to 300; we see intermittent outbreaks of respiratory problems. I have tried all types of vaccination programs and antibiotics in the feed. We have good nutrition and still we get this break at 150 to 300 pounds. Also, at this time we see a pink eye type syndrome. It is not a true pink eye that I can identify. To me it looks like a cross between the old IBR pink eye or red eye

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syndrome or distemper dog eye syndrome. You see a conjunctivitis, in a day or two you see a corneal ulcer, then two or three days with out treatment or help you see a ruptured cornea. Then within a week you see a protruding iris and a lost eye. At one time a year ago last summer, we saw as many as 99% of these calves with one or both eyes involved.

Dr. Braun: Pneumonia in calves is just about as bad as downer cows with the exception of one thing. I am now thoroughly convinced that vaccines are not the way to manage calf-hood pneumonia. There is no question in my mind about that now, I guess everyone has told me that for a long time. You try to come up with facts, this is difficult too. Let me just list a few things. I am working in a 2,000 dairy, they had a mortality rate of about 30%. I took the farm over a year ago October and with the graces of God, this summer we had 480 calves born and we only lost 2. We are running summers around a 6-7% mortality up until the time they leave the farm, about six months of age. These are calves born alive. We are having 34-40 calves born a day and this winter, last February, we had 780 calves in hutches all on milk at one time. This fellow raises his bull calves as well as his heifer calves and they are castrated and go to the feed lot. This owner also has the feedlot as well as a beef cow enterprise. I have to give credit here to Dr. Paul Blackburn and the people out in California for at least telling me how to prevent pneumonia. So, my facts are not going to be truly facts, they are going to be documented, but for one year they have stood the test of time. One is colostral management. We did not get any place with our calf mortality until I started to pull serum samples and I have used a refractometer for 15 years. You rarely see anybody talk about using a refractometer for total protein; most of them use zinc sulfate test. All I am saying is that the total protein with the refractometer works fine if the calves are not clinically ill. If they are dehydrated, of course you are going to have an erroneous read out on your refractometer. They will have high levels of total protein in effect or not. What I am getting to in this total protein here is that on this particular herd, we ran for a long period with 40% of our calves colostrum deprived. Now you wonder how that could happen, but most of the data show that if you do not do anything at all, just let the cows calve, leave the calf with the cow for 24 hours, you will run about a 25% deprivation of colostrum. But, in this herd for a long period of time, we were running 40%. I think part of the reason was that sometimes in really hot weather or in the winter time when it would rain, these calves just do not want to get up when they are outside. This is what this means to me anyway. If we have 30% of our calves colostrum deprived, what kind of colostral protection or passive antibodies do we have to protect this calf until the experts tell us to vaccinate our calves for IBR PI3 BVD at five or six months of age? We have nothing. They are totally susceptible to illness. So, what I am asking is let us get a handle on an individual herd and what is happening with colostral management. It might determine when you want to vaccinate your calves. Last week we had about 110 calves born. We bled everyone of them, brought the serum back, spinned it down, and what I am going to do is that I am going to run this all through the winter and I am going to check antibody titers for these diseases we talked about. At the time that we bleed them, we only do it once a week, granted, some calves will be 24 hours old, some will be six days, 6½ days, I am going to take and analyze that colostrum, or that serum, for serology. At five months of age when we vaccinate them intramuscularly for IBR PI3, BVD, we will hit them again and look at the serology and then do it three weeks later. I feel that I have to do this on the farm in order to find out what I should be vaccinating for and when. I have looked at some of these calves, and the colostrum deprived calves are in fact serologically negative IBR, BVD, not PI3, I have not checked that. Some of these calves are converting at about a month of age for BVD.

There is a good practitioner up in Monticello, Florida. His name is Doctor Love. He works in an excellent dairy, they have 1500 cows. What he did, everytime he had a sick calf or a respiratory disease, he took a serum sample and then took one two weeks later and found out that many times he had to do a conversion of BVD. Now it was not a BVD pneumonia, it was a pasteurella pneumonia, I would have you know. He thought that might be the stressing agent on that farm. He vaccinates all his calves at one month of age. I have not done that yet. I will wait until I get all my data in until I do anything. Basically, the things that we have to worry about again are colostral management, and feeding regimen. One of the terrible things that happened on this farm is that they were feeding out of nurse buckets. I think that you all have seen and heard of nurse buckets. They have a big, hard nipple. I only wish that when I was milking cows as a boy, that all of our cows had these long nipples, but they need management because the nipples are hard and the calf when he gets nursing, he is a bright eyed calf and he is nursing like crazy and he hangs on to the nipple and he tears the end off. You can pretty well put your finger into the nipple. I witnessed with my own eyes, I know that this is a fact, four or five calves, nursing like crazy. They have to get a breath some place, they can't drink two quarts without taking a breath. Some pretty near do it. All of the sudden they take a breath, in goes the milk, they flop down. One day I sat down there and watched them feed the calves. Sure enough. The next day I came out, I necropsied these calves. Halfway up the lung there was tremendous hyperemia. If you let them go for three or four days or maybe for five days and necropsy them, you will have typical pastuerella pneumonia, and culture pasteurella out of it. How do you feed these calves? You can use a nurse bottle. I think that is the best thing that there is. A nice soft rubber nipple. The other thing, of course, is that we are all worrying about how quick to wean these calves. I think that now many times too many of our calves are being weaned too early. We are trying to get them on grain. We say that if they can eat a pound or a pound and a half of grain a day, wean them. Many times that is the biggest

stress that calf has is at weaning. Many times I think that is the predisposing factor for a lot of pneumonia. My recommendation is that you wean the calf at about six weeks of age. Do not move them out of their individual hutches. If you are going to go to individual hutches keep them until they are at least eight weeks of age, and when you move them, and this to me is one of the most critical things, never move more than ten calves at a time. If you can get away with two that is better yet. Never more than ten. This owner was moving 30 to a pen. You get one calf sick, all 30 are going to get sick. They are drinking out of the same water supply. It is tough to break the chain. But, if you put ten in a pen, there is less bucking and jumping around. These animals are resocializing and you can break it if one gets sick. I can't think of anything that we have done more on that farm than to limit the size of our pens. We have a fair bit of space because all of our animals are outdoors. The pens we have now would measure 30' wide and they go back about 100'. So they are about 30' x 100' and they are putting calves in there. They are just little guys, just weaned. We are using that same size pen. Then, we sort of made this space factor and then we put these 30 calves into a huge pen but the thing is that they all came to the same watering tanks. The big thing is that the number of animals that you have in the pen. There is too much of a pecking order. You will probably find out that the calves, the young calves anyway, are not going to eat all at one time when you have 30 calves in there. They are going to be banged around and they stay back and they never start to eat. So, we got colostral management, feeding regimen, the time of weaning is extremely important, group pens, and then the vaccination program.

The only vaccine that I am using right now is IBR intranasally during the first week of life. I know that I am running about 15-25% of my calves constantly. They are colostral deprived, I feel that I have to give this IBR to prevent the stress of that virus, you know that is all over the farm, lowering that calf's resistance. I guess that is about the only fact that I can come up with. I wish that I had something more. This particular owner, before I went on the farm, spent $30,000 for vaccines for the year before. When I went there, we stopped every vaccine, did not use any until a calf started to die and after the necropsy comes in. I necropsy calves. When I found that I had a problem, then we instituted a vaccination program. Don't go out and just slam a guy with a vaccination program because some people might be doing an excellent job. The extremes is another farm which has 96% of its calves all receiving colostrum. It is unbelievable. That is the best that they have ever had. Up in New York, I had some herds that would get 90. I never had a 96%. This guy has 200 cows too, when you are doing that and you are vaccinating, dry cows are what you have, then these animals will have passive antibodies. So, for gosh sakes, use individual herds, find out what their management is, and try to start some place with a rational methodology of vaccinating calves or running a program for respiratory disease.

From the floor: We have what they call a positive air ventilation, the air is blown in from the top and it is supposed to diffuse...one of these like in hog barns where it is supposed to come out evenly, made of 4 x 4 plywood. A box that goes from one end of the barn to the other and is open about one inch. We know that this is not adequate. We have him convinced that this is not adequate. We have an ag. engineer studying it and he is supposed to show up some time this week while I am down here and we are going to try to correct the ventillation problem. I am sure that this adds to our problems, we have pnuemonia built in there. The humidity built up. It is either too cold or too hot. I am sure that is a major part of our problem and we recognize it.

Panelist: The one that I like is Honasko. Hoards' Dairyman has Honasko, it is a measured plastic bottle with a nice soft rubber nipple. You can buy one that has a black nipple, this one is not as soft and they are bigger around than the average cow's teat. Get the one that is a little bigger around than your thumb, and little longer than your thumb, it is a red nipple, it is easy to take off, easy to clean. It is a measured bottle. The bad thing is that there are so many things involved with this respiratory problem. Up northeast, I used to walk in calf pens and hear a calf cough. Before I came here, I walked through the calf hutches and we had about 400 calves in the calf hutches and we have probably about 2,000 animals in what we call the lane which are individual pens. These are animals which have been weaned. I did not hear one calf cough. When I went out there last fall you could not hear yourself think because of the animals coughing. Again, this is effective treatment, but this particular owner, this particular calf man that I have, sees these calves early in the morning. The first thing that he does is walk in and see the calves get up. If it coughs more than three times, he takes its temperature. That is something he and I worked out on that particular farm. I am not saying that this is for every farm, but on this particular farm, you get the calves up and if they cough and every time I have been there, the time that they are going to cough the most is when they first get up. But, back to the question of the nurse bottle. You understand what I am talking about the nurse pail, right? They are difficult to clean, it is very, very difficult to get a brush into that nipple and get it clean like it should be. The big thing is the measured amount of milk. That is another big stress on calves. If you get people feeding calves and they come by and one day they get two quarts, but when you have people feeding calves who are not the owner they will just start pouring milk in there and they do not care if they get two quarts one time and three quarts another time. Usually they overfeed, they rarely underfeed. These calves are stressed by the different types of feeding levels. I think that it is pretty important to make sure that they get the same amount of milk.

From the floor: How do you handle those hutches between calves, do you move them?

Answer: These hutches, have to be the cheapest, simplest ever known to the human being. I mean, these hutches stand

about that high, they are made out of, pine and they are very easy to move. The whole crate, I think, is about 6 foot long and about 4 foot wide and has tin over one side, just a regular piece of tin that they put on the top for a roof, it could be about two foot wide across the top and a couple across the sides. The way that we set the hutches up though, and I think this is important, is that we take the hutches and we start in the middle of the field. In the summer time, we are fortunate enough to have a bunch of big live oaks and put them under these shade trees in this big open field which is about an 80 acre field. We start in the middle of the field, in October we come out of the woods, so to speak, we need some sun now and move toward a fence rail. The prevailing winds there in Florida would be out of the northwest. Each hutch is set up so that it can be moved twice. In the row that it is in, it can be moved twice. It can also be moved to the left once and to the right once. So we have nine different positions that we can move that hutch in for each calf. The calf is weaned and then that hutch is moved. Last year we did not have a chance to have these hutches really cleaned up well, but this summer we had fewer calves and so therefore, the good old elements cleaned those hutches up pretty good. They are outside all the time. It is amazing how clean these hutches really stay. Hutches are a lot of work. There is no doubt about it. It is a lot better than having a lot of dead calves.

From the floor: Do you put anything in the bottom, or is it just dirt?

Answer: No sir. They are on costal bermuda grass and we put nothing down. Right after rain, many times what we will do is, when it rains hard, those calves will turn this thing up pretty quickly and we will leave it about a half a day and these hutches being as small as they are, one person can take them and drag them along. This makes it nice and they will just leave them there about a half of day, if it has rained hard and just dragging them and leaving them there another half a day, and then the next morning drag them back again. We can stay in that same spot a lot longer that way because once we turn the whole thing up, then it gets really muddy and water just sits there in pockets. So, hutch management is important, but it does not make a lot of effort with these hutches to move them. I think that is one advantage of the hutch.

I think that one of the biggest problems with pneumonia, as I look back in the northeast, is that we are going to go more and more to cool housing for calves instead of trying to warm them up. The best client I had up in Ithaca, New York, was a dairy herd that had about 150 cows and the name was Stevenson. They did not lose a calf there for eight years in a row. They finally lost their first calf and I thought that there was a death in the family. Mrs. Stevenson is in her early 70's now, actually cried and called me up, but what she had was a converted a cow barn and they went to loose housing. They did not do anything with it except just close up about half the windows. You walk in there and you could freeze but those calves are bright eyed and bushy tailed. The ceiling was high enough in a conventional dairy barn to have enough turnover of air in that barn with just a very few windows open. No fans running, just windows open. They took each one of the cow stalls and made it into a calf area and then they fed the calves from hanging buckets up in the manger area. That was the best calf raising arrangement I had ever seen up there in the Ithaca area. She was the most successful. She did a lot of things right, don't get me wrong there, but when it got warm she would open up barn doors and so on. The worse calf facilities that I have seen were the ones that try to go with environmental housing where they have tried to temper the air with heaters. You cannot do it. I don't know of any system that has ever worked successfully for more than one year. A lot of people thought that it worked successfully but it just won't work. We can't seem to get the air turnover and get it to the temperature we want it for good calf survival and good calf health. If someone can invent one, that would be great, but I think that the oil crunch is going to take care of that. I don't think that anyone will be able to afford them, I really don't. So, I guess for some of you fellows up north, it is out into the snow banks. Those calves did great. When I was out in Michigan, with the University herd, they had the hutches and I never saw healthier calves in my life.

Chairman: We would like to hear how Doctor Andrews handles respiratory problems.

Dr. Andrews: I seem to have a considerably different practice situation than described so far regarding these calves in that I live close to an area where there are a lot of good German folks and we have about 70 little family dairies. They do not run over probably 200 cows at the most and some of them do not milk anymore than about 30 cows. So, we do not have the big calf barn situation. It is more of an individual calf situation and in some cases they have 19. I think one of the interesting things that I have been involved in since working in this area is, when I first started out in practice, I was a kind of a purist in that I thought that I could do it all with a syringe and a bottle of some kind of drugs. I have been clobbered over the head enough that I have learned that management is probably where it really is and not so much the treatment part of it. I think that is just as true as it can be. This fall we have had some pretty odd weather. We nearly always do. I am from up close to Wichita Falls, up here in northcentral Texas. We have had some very warm days, getting up to the 100's or maybe a little over and then we would have at least a 40 degree fluctuation between the warm part of the day and the cool part of the night and this seemed to stimulate our respiratory problems even more than usual. I had one dairyman, especially, that had several groups of calves. I think that he had six different pens of calves, of different sizes and ages, and they were in open pens with a shed around the track somewhere. Eventually, he got respiratory problems in just about every one of these pens of calves. They were not lined up right side by side. They were kind of scattered all over his dairy. This is a pretty good operator. He is not the marginal operator that we might think of. He had from 10 to 20 of these calves per pen. They

were, to me, in pretty poor condition for this efficient of an operator. He later confessed that he had used some kind of a cheap milk replacer and maybe weaned them a little early or something, but anyway conditions were just right for him to get into this problem and he did. He had quite a few chronics and that we were not able to do very much with and it seemed nearly every calf in nearly every pen eventually would come down with this thing. I don't routinely do a lot of necropsies and lab work on these calves because I feel it is not going to change what I am going to do anyway. We started out treating the calves, I don't go for too many of these high powered treatment programs. We started out treating them with a pretty heavy dose of penicillin and I think some sulfa drugs, and I recommended that he gave the calves some vitamin A. I tried to improve the plane of nutrition. I was concerned about some other possibilities that might have weakened the calves and we looked at the possibility of parasitism and some other infectious situations. We did not have too much success with our penicillin program and we changed over and went to Osburn's polymicine, which is of course, supposed to be a scour treatment, a combination of neomicin and polymixin B and he said that it pretty well baled him out on the calves that still had a chance. In case one antibiotic does not work we do believe in chloramphenicol and have used it pretty successfully. I think the main interest here as far as I was concerned was that it was a salvage situation as far as the calves were sick were concerned and we were just trying to get out of there with whatever we could. My primary interest was in what was going to happen to the calves that were born after we got into this storm and I recommended that he leave the sick calves pretty much where they were. All the calves that were born subsequently he moved to a completely different area on his place. We have more dry weather than they do in Florida, and in the summer the rains are generally pretty warm and frequently I tell my people to get a ten foot piece of chain and stake these calves under a shade tree somewhere or whatever place they have where they can get a little shade and out of the bad heat. I feel I have been fairly successful in getting a lot of my dairymen to do this and in the winter I don't think that there is any substitute for the hutch system. Usually when you get into such a controversial thing as pneumonia in calves, you can get into some pretty good arguments.

Although there is this increased labor problem, there is just no comparison with any other system as far as I am concerned with baby calves. We do not use as large a hutch as you were talking about. Usually the dairyman will rig up something out of some old junk tin or something like that that he can move around easily and they might even have in the winter time a couple of bales of hay on the north side of the thing to insolate it from the north wind. I have one dairyman that just has a square c-shaped frame. It has about a 24 inch width piece of tin fixed on it, and then he puts two bales of hay in the back of this thing on the north side and this is it. He does not have much money tied up in it and he stakes his calves out on a chain or a rope or whatever is handy. They have a very high rate of survival. If I am going to emphasize anything here, it would be that I am a thorough convert to using calf hutches. Not only in respiratory problems, but scours and all else.

Chairman: At this time we would like to ask Dr. Ramge to summarize calf respiratory problems and then maybe we could take a couple more questions.

Dr. Ramge: I think that we have managed to outline at least fairly well what we hopefully think of as the basic task of raising calves and we have certainly started at the right place by talking about what was termed colostral mangement and that certainly is a good term. I think that we are all recognizing more and more as the years go by that first of all, as we know, colostrum is really important in the life of the calf and in raising the calf. But, we are learning that it is not as simple a thing as we had perhaps thought about in the past. Leaving the cow and calf together for 24 hours used to be considered the solution to the problem and if we could get people to do that, it would take care of things. We have statistics given to us to say that 25% of the calves are still colostral deprived under that sort of a system so it would look to us as though there is a real necessity to do something to further insure that the calf does get a good meal of colostrum early in life. Perhaps we need to know more about the fact that they actually ingest colostrum, but something has gone wrong with the mechanism. But, I do think that we, in general, know that if we get a sufficient amount of colostrum in the calf, in a matter of hours, the number of calves that will be deprived from the standpoint of immunoglobulins will be greatly reduced. Then, second in the calf's life is the matter of feeding. Getting colostrum is part of it, but here we are thinking primarily of nutrition. I think several good things were brought out that are important from the feeding standpoint. (1) Using proper equipment so that the calf can nurse and nurse properly without killing himself trying to do it. This is really important. A little later the importance of good milk replacement was mentioned. We need to remember work that has been available for a long time that many milk replacers, quite often the cheaper ones, have a lot of materials such as oat flour and various cereal products and that the calf is so constituted that he does not have the proper enzyme system to digest these things before three weeks of age or so roughly. Some of these replacers are designed to hopefully keep the calf alive until he gets old enough to eat what is in them. Having just enough milk to perhaps keep him alive and they cut it fairly close sometimes. I have seen some dramatic things happen in raising calves. Simply using a different milk replacer and reading the label rather closely before we use it did solve a lot of the problems. Weaning at six weeks as sort of a minimum has been suggested and then also not removing the calves from the hutches if that is what is used. Everyone is in agreement that maybe hutches are the way to raise calves. Perhaps we can somehow work out a way that we can keep calves in hutches and still have a reasonably labor-efficient

sort of set up. I suspect that is going to be a problem. I have not worked with dairies that are large, but I do work with some dairies that do use hutches. Everything goes fine but we can see that it does take more time to handle them that way.

Vaccination programs are going to have to vary probably from herd to herd. I like the idea of backing off from giving them everything that is available commercially and maybe a few that are not as a vaccination procedure early in the calf's life and being able to vaccinate for those things that it appears there is a need for. In the one instance that was mentioned here, IBR vaccine given intranasally the first week and at the present time seems to be sufficient from the standpoint of this subject. Of course in this southern region, we would be thinking of black leg at a later date.

Finally, treatment has been brought up and with the idea of several types of treatment, but with the emphasis being on the fact that treatment is hopefully the last thing that we would have to do. The whole emphasis on raising calves is raising them in such a way that you do not have to treat them for these diseases, especially respiratory complexes. Eventually we recognize that we occasionally do need to treat a calf and we will probably just have to go with the treatment that would work. Several treatments were suggested as possibilities. There are a lot of them available and what works on one place does not necessarily work on the other.

Right across from the calf barn we have 20 maternity hutches and we try to calve all the heifers in these maternity hutches. They have a cement floor and straw on the bottom. Talking about colostrum, we almost fire the man if he does not get colostrum in these calves in 30 minutes to one hour after birth. We have a record and mark the time that the calf is born and the time that it gets colostrum. We check on it, if they are lying or they do not do it, we fire some people over it. We have decided that this calf does not get colostrum, we might as well hit that calf in the head and bring him into the barn. That calf is going to die. It has to get colostrum and it has to get it early. Has anybody seen this eye syndrome that I recognize in a calf approximately three to four months. It is like distemper in dogs. It is not as bad now, we are seeing about a 10-15% of it in these calves, but a year ago 99% of these calves caught it in one or both eyes and I have never seen an eye problem like that before. I have talked with some people about calves in California. They think that maybe they have a blue tongue or a BVD virus in them, they do not know what they have either.

I will tell you what I have done, it helped, I don't see the 99% anymore, I still see about 10-15%. We have gone to vaccinating these calves once a month with BVD vaccine. We give anywhere from three drops to ½ a cc in each eye. We can see improvement in about three or four days in these eyes. We are vaccinating all the dry cows at six months or later with BVD and a killed IBR vaccine and these calves are being born healthier and doing a lot better.

From the floor: I wish I knew, I think that that is a hopeless situation. I worked with veal calves for 10 years and I guess the time that you know the most about raising those particular calves is the first month you are in operation. From there on you know less and less. When you talk to these people that first go into the business, they have all the answers, they know how to do it. I have seen a lot of mailboxes where the names on the mailboxes change at the end of the road. Over the last 15 years, people have tried to raise calves like you are talking about. A few might survive but I would not recommend that method of raising young stock to my worst enemy. I do not see how they can do it successfully. There is nothing worse than accumulating a bunch of young bovines in a commission sale barn. You can come out of that thing with every disease known to the bovine and then where do you go from there? You don't know anything about colostrum management, you don't have any idea whether they have absorbed any colostrum and these people have given every bacterin and every antibiotic that is salable and maybe a few autogenous bacterins made up in someone's bathtub. They have all had that before they arrive on the scene. Where do you start? It is a hopeless situation. I have nothing. The only thing that I guess I could say in desparation would be, do not put them inside a barn. If you can, make a lean-to shed and put them in small groups and let them have the advantage of what we are talking about here. Something like a calf hutch where they will at least have good ventilation. The state of the art in both poultry and swine have caught up with the state of the science. In the bovine we have not done that yet. I don't know when we will ever get to it. I think that the big thing, but I do not know how to stress this enough, is nutrition. Most people cannot formulate as good a calf starter ration that you can buy commercially, but if you buy a poor one, of course, you have a bad one. The thing that we have done with these calf hutches is that at about four weeks of age, these calves get some long hay and some of the grass that they have in Florida could not keep a rabbit alive. It does stimulate the rumen in these little calves and they eat more grain but the important thing is the hutches is that it is not a good thing to give hay in the hutches. I do not recommend it. They pull it out, they stomp on it, but yet it has worked well for us. They were pulling them from the hutches and moving them to the group housing and they have a big round bale of hay in there. I spend too much time on this farm, but I spent a lot of time there just observing what the calves do when they move them. They always moved on a Saturday, unfortunately when they had a bunch of high school kids around. One of the things that they would also do was raise the hutch up and let the calf take off and run and then they would try to tackle the calf. It was big fun for these high school boys. They bank these calves all up and get them all nervous and excited. They stopped that but they would move these calves over to the group housing area where we now have 10 calves to a pen. They would run around that pen four or five times and get all hot and excited and take a drink of water and then they would go to the hay bale, or to

this big round bale. I observed a lot of calves eating hay for the first time and they would not consume any grain for four or five days. This was tremendous strain on these calves because this hay is not worth a whole lot. They were not getting the proper TDN and that was a big stress on them. What we did, every calf gets hay in the hutch and from the time they are moved, they have exactly the same feed in that group pen for the next three to four weeks that they have had in the hutch. No difference except that they are off milk now. So, when we move these animals, I think that it is important to keep stress at the minimum level. The other critical thing that I did not mention is that we took a tractor, one of these little tractors, and we put a set of gates on this thing so that we could open up a gate, drive into this pen, and put it into a corner and have a catch pen. Because, the secret is early identification and treatment. If you have to chase the calf around in a pen of 30 and it is a big pen, you cannot catch it until that calf is about 2/3 dead. You are treating her way too late. The other thing is that we feed calves twice a day. The fellow who is feeding the calves has to observe whether the calves come up to eat or not. If they don't that is the first warning sign that someone will have to catch that heifer or bull calf up and see what is wrong with it. Take its temperature. To me that is critical. Secondly, that it is caught up. It has to be so that you can catch it up. I think that too many times when you have too big a pen, you cannot observe this. Nobody knows what is going on. Automatic feeders, they are alright, but I do not like them. The simple reason is because the calves can eat anytime they want to. No one ever observes when you have a sick calf.

From the floor: Are you collecting data as far as sensitivity, resistance of say, pasteurella organisms, over the last couple of years?

Answer: We do it all the time. This farm is big enough that when an animal dies it is necropsied. We culture the lungs at least once a month. One of the things that scares me to death is that on this particular farm, we have used chloramphenicol for about a year for pasteurella pneumonia. We had an outbreak of salmonellosis about three weeks ago and it was resistant to it. Tribrisson was sensitive for her, but I think, chloramphenicol is a wonderful drug for us. We are not treating sick calves with antimicrobial agents. For the first two days that the calf gets sick with diarrhea disease, it gets peptobismol and it gets oral electrolytes. Then we try to start it back on milk and it is not until it looks like we cannot turn this calf around or that it is going to die on us that it gets any antimicrobial agents. When you have farms this big, the organism gets resistant practically over night. I am convinced that we are not going to fight disease in the bovine with antibiotics or bacterins, or vaccines. They have their place, yes. Also, for respiratory disease. If you have a client and he is doing a good job with colostral management and he is taking good care of vaccinating cows, then probably this individual does not have to have his calves vaccinated early. He has plenty of passive antibody protection. Yet, you can have another client down the road who does not do anything with his dry cows. He never vaccines the adult animals. He does not get colostrum in those calves as well as he should and yet you are going to try to recommend the same vaccination program for both of them. I say no. You should not do it. You should know it should be designed for each farm.

From the floor: What do you think about a good blood transfusion on these valuable calves?

Answer: As far as antibodies are concerned we have brought calves in that were colostral deprived. We have taken it from the dam, if we could but it does not matter, take it from any animal. We have taken two liters of blood, harvest the serum and we have raised the total protein significantly. What I do not know, though, is how much of that anitbody acutally is active in the blood stream. In other words, we can raise the total solids, they absorb the solids, but what happens to the immunoglobulins? I don't know. I have not done that work but I think that should be done.

From the floor: You were talking about the calves with diarrhea, that you gave them peptobismol, and then try to get them back on milk. I found out that it helps a whole lot if we go back to buttermilk and then milk.

Answer: I think that is probably true. Particularly if you are using milk replacers. I do not recommend milk replacers, I know that there are good ones out and I would not want to run them down, but if you have a client that is having problems, he should definitely go to whole milk. Why I like peptobismol? For two reasons. One is Keopectate; they will not drink when you just put it into their milk pail. Peptobismol is very palatable. Secondly, Peptobismol has bismuth subsalicylate which is a prostaglandin inhibitor. It seems to work very well as far as endotoxin release or colonization first off. But, in our hands, it has worked better than Keopectate. I have nothing against Keopectate. It is just that it is a lot better for the calves to drink it. Beecham puts out a product which is a corrective mixture, it is peptobismol with paragoric and we probably are going to use some. They have contacted me and I have not used it so I do not want to comment on it. How did you like it?

From the floor: It is a good product.

Chairman: **The next subject, as I mentioned earlier is listed as abomasal displacement and then we have also the subjuct of digestive problems and I don't think that I mentioned this earlier, but these topics were taken by the Continuing Educations Committee from a survey, so these were what people wanted in this southwest area and we are going to try to combine these last two so that you will get out of here in time to go to the next meeting. To start it off, I would like Doctor Andrews to give us the problem approach as he sees it on both of these conditions out in the field from a practitioner's side of view.**

Dr. Andrews: I think that with the digestive problems, probably the diagnostic nightmares are not as bad as they are with the downer cow! I still miss my share of them. It is interesting that you people from the north and the east have come in here to the southwest, because I believe that our

problems are a little different in some cases due to the differences in management from what you see. In this area, or in my area, our people, as far as the roughage is concerned, try to have some kind of grazing wheat or oats, or something like that in the way of winter pasture if they can get it. Always, as a standby, and usually in addition to the grazing, they will have some type of long stem hay in the dairies that I work for with only two feeding any silage. As a result of this, we do not see very much in the way of displaced abomasal problems that I recognize and I am certainly not going to stand up here and try to pose with any authority on abomasal problems because I really don't think that we have too many of them. One of the more common things that we run into, of course, as a result of all this hay baling is hard ware. And one of the most distressing things about the hard ware cases that we see is that so many of them don't read the book and we will have a situation like I had several years ago. One of my dairyman was milking and one of the old cows just backed out of her stanchion and stood there. It was in the morning, and they finally had to push her out of the barn. By that afternoon she was down and he finally called me over there and I gave her a little of everything that I had in the truck and she died that night and I went back the next day to a necropsy and sure enough, there was the usual piece of baling wire stuck in the liver. The hardware cases that we see are caused by baling wire. I feel there is a problem with the folks that bale this good alfalfa hay up in Oklahoma. That is where we need to be working on it in that probably the man driving the tractor, when he winds up the hay patch, goes back over, picks up all the broken bales, but he does not bother to get up and throw the wires off them as a result, a lot of wire is baled up and a lot of pieces are cut up and possible this is one of the reasons that we have so much hardware. I have more problems diagnosing the hardware case if the wire is in the liver or the diaphragm than I do if it has already gotten into the pericardial sac and we see the typical syndrome. It is a terrific loss as far as the dairyman in our area is concerned.

Along with some of the other digestive disturbances that we see, we have the fetid diarrhea from the retained placenta or the breech calf that has been lying in there three or four days and the owner was not aware of this. And incidentally, I see some cases, or at least hear about cases, of severe diarrhea just after the cow has calved. I wonder what you think about this. One of the things that I would again theorize on here would be that the cow has come in and maybe has grain overload the first few times that she has come into the barn or something like that. I don't really have the answer to this because they usually will have cleaned up alright and no mastitis. We do see those situations occasionally. Another problem that we see is vagus indigestion where the cow generally is getting along pretty far in pregnancy and the owner usually thinks that she is bloated. He will bring her in and her old belly, over the last few days has just gotten larger and larger, and it is not bloat. It has just filled up. Blood and Henderson talk like these usually are on old hardware and some type of abscess that has interfered with the vagus nerve and I have never had any luck trying to treat them. There is some idea that possibly if they were close enough to calving and would go ahead and calf that they would improve. I do not achieve very much with these. We do see the occasional abomasal ulcer. One interesting thing that I saw a few years ago was in a range cow that was brought in and it turned out that she had one. When I opened up the abomasum, there were all these little pellets. As usual, up in north Texas, we had about a 40 mile wind blowing that day, and I noticed that these things were real light. At first I thought that it was some type of fertilizer but it looked too light. Eventually, what I found this to be was that the rancher had some country leased up around the lake. Someone had taken some of these styrofoam flotation blocks and put them out in their pasture and these cows were eating it and I have not been able to find anybody else that has seen this situation or that has known of cows eating styrofoam. But, I thought that this was a little unusual. We do see some bloat generally on new alfalfa in the spring. A lot of my dairymen will have a cow down that will be bloated and they think that this is their problem, when it is really a milk fever and you can treat the milk fever and they get alright. How many of you have ever necropsied a cow that died of starvation of water? I was caught in that trap one time and I did not know that the tank was dry in the pasture where these cattle were and that is the only think that I could see in putting it all together. The cow had died right in the corner of the pasture where you could not even open the gate to get in there. There was this trail right inside the fence where they had all been walking the fence. The only thing that I could see on this cow was that there wasn't any fluid in the rumen. The mucosal surface of the abomasal was a real dark red. So, I would say, when we find something like this, look around a little bit because there is the possibility that the rancher has not been watching his water supply closely enough and they may have some cattle out of water. This is the only time that I can remember ever running into this. As usual, it caught me off base. I thought that I would mention it to you because I am sure more of this goes on than we are aware of.

Chairman: Dr. Ramge, would you like to give us a few facts on abomasal displacement first and then maybe a little on digestive problems.

Dr. Ramge: I will try to talk a little bit on the facts of abomasal displacement. I suppose in a sense, one of the unfortunate things about a group like this, or session like this is that the topics were selected by the people from the area and apparently were selected because they were things they were not quite as familiar with. They had been hearing about these. But, coming from this area, I am also somewhat unfamiliar with the subject. I think that we are in better shape as far as Doctor Braun is concerned. He is from this area now but he has been in the past from an area where he has seen a lot of these digestive diseases. The LDA's have, or all abomasal displacements, probably, have an interesting

history to me in that long ago when I went to school, nobody ever mentioned them or even knew anything about them, I accidentally heard of one in 1943, I believe it probably was about a year after I graduated from college. I was in the artifical insemination business and one of our clients had a cow in which his veterinarian, who also was a good friend of mine, suspected hardware. About 40 or 50 miles away there happened to be a place pretty well know that specialized in large animal surgery, rather unique for that particular time. So, the owner asked if it would be alright if he would take the animal over there. His veterinarian agreed and when he brought her back, he reported that this man had said that he had found a highly unusual thing. When he did a laparotomy, with the idea of doing a rumenotomy, he found that the abomasum was over on that side, saying that he had only seen that, I think, one time before. He tried to get it pushed over, but did not quite know how to approach the problem. He thought that he got it over and then gave a grave prognosis. He was right. The cow promptly died within a day or so. For a long time after that, my friend and I had this discussion about what this fellow was trying to pull on us. But, we assumed that he had a good reputation and that this actually had happened and we wondered about it. Of course, we know for a good many years now they have been very much a fact of like in the way that we are handling our cattle but the interesting thing is, I just said that we don't see that many down in this part of the country. Where I am, around College Station, they are rather unusual. We talk about the various types of causes, but it boils down to the fact that these cows have probably been getting quite a bit of grain and quite often a lot of silage. Usually corn silage and that they are getting very little hay and this has probably gone back into the dry period time where in certain parts of the country it is feasible, economically and logically, to feed a lot of silage and not feed hay or just feed very little. You often hear of these cows during the dry period not getting any hay at all. They are not getting very much, mabe practically none as they go back in the milking line after calving. We know that it affects the highest producing cows in the herd. Usually the older and the bigger cows. Of course, the older and the bigger cows are apt to be high producing cows and the highest producing cows are apt to be high producing cows and the highest producing cows are probably getting the most concentrate and less roughage or at least less than the rest of the herd. There have been some thoughts that perhaps this is due to reduced motility of the abomasum, that there is a high concentration of volatile fatty acids escaping from the rumen into the abomasum. We also know that hydrochloric acid is pouring in and it is not going out and we get into that syndrome. Maybe it starts back in the last part of pregnancy with a heavily pregnant cow which has displaced the rumen quite a bit with the pregnant uterus and there is the opportunity for the abomasum, as the rumen is elevated, to slip on over. These are mostly theories and we do not really know where we are perhaps. Hypocalcemia may well be occuring at calving time. It might also be a factor that would increase the possibilities. Many people have reported that as cows have their first estrous activity this increases the number of cases that are happening at that particular time and at any rate, at least 91% of the cases we have some figures on, occur within six weeks after parturition. Of course, the majority of them are occuring sooner. As far as lesions that we find, other than the fact that the abomasum has been displaced over between the left body wall and the lateral wall of the rumen, quite often in this process there is a rupture or tearing of the attachment of the greater omentum to the abomasum. There is some interference with rumen movements, with the question of interference with the functioning of the esophageal groove by this displacement. There is some obstruction of injesta going on through and as the injesta is being held back, there is the increased secretion HCl that is not getting into the duodenum where it has the possibility of being taken back up and completing the cycle so that the animal's depleting the hydrochloric acid out and pouring it into the gut and getting a systemic alkalosis. Chloride and potassium are going at the same time. The typical sign is general inappetance. They are not eating at all but sometimes they are eating some. Decreased milk production, and some will have mild keotosis, maybe temporarily. There may be some pain when this happens. It may or may not be noticed. There may be this bulging on the left side before very long in paralumbar and possibility down lower. Possibly in acute situations there will be an increased heart rate, increased temperature but most of these cows will not be having this. They will have decreased amounts of so called pasty type of feces. Finally the thing that everyone is looking for is the characteristic ting, the characteristic noise of the gas on the left side in the left displacement that we hope to find if we are going to make a diagnosis. We can, by paracentesis go into the abomasum that is over on the left side and get the typical very acid secretion or material fluid that is in there at that time as compared to the rumen that has a pH of 6.7 if everything is going alright. The pH of 2 we might find in the abomasum. Along with this there is what we call the possibility of the right side displacements which are much less frequent, with the situation being that usually we have a dilatation of the abomasum more than anything else and this causes some change in placement which occurs several weeks after calving. Maybe not so early after calving, but they occur roughly at the same time and we get the usual signs — the inappetance, depression, dehydration. We are getting into a more severe syndrome generally speaking. There is some distention of the right side and along with this we may have torsion. Did the torsion occur because of the dilatation of the abomasum or did it occur possibly before? In this case, we do know that there is an obstruction, physiologically, of the pylorus, which is interfering with the outflow into the duodenum again. It is felt that quite often there is atony of the abomasal musculature. Again, this might have to do with excessive acidity. Diagnosis in the right side would be just generally from the signs that we see

with the possibility of rectal palpation playing a greater role in diagnosis. Again, we can get a "ping" of the gas pockets on the right side. If there is a torsion there are more signs of pain. This sort of thing is fairly much in the picture as far as diagnosis is concerned. The prognosis is pretty grave with the right side as compared with the left and most of them don't turn out too well and it is generally recommended that you might try to stabilize things with electrolytes and probably have to do surgery, but it has a pretty high mortality rate.

Chairman: Ken, do you want to give us some information on digestive problems.

Dr. Braun: Rumenitis is a big problem with us in dry cows, when you have 100 of them in the fresh up pens, that are going to calve within the next couple of weeks. They are supposed to be on a similar type of feeding program as when they freshen, but, then what happens with the cows that calve three weeks early? Sometimes they have just not read the book and they calve before you think that they are going to! We have a tremendous rumenitis problem with these cows. They are brought into the fresh cow pen and this is a big corn salvage farm, fed just like they feed cattle up north. The fellow has 6,000 acres of corn silage in this year, in his big bunker silos. They are feeding just like they would in the northeast. They go on full feed very suddenly. So, we have grain overload, in this condition where they are not used to the grain. We also have a problem with the self feeder wagons. They have two of these monsters and on occasion they will break down and some days both are broken down. Often times they are very very complicated and it will take them 12-18 hours to get them repaired. So, just the cows are out of feed for that long of time and then back into the feed bunk. Some are very aggressive eaters and it does not take too many, and you wind up with a rumenitis. I just take my stomach tube and stick it into the rumen. I carry a pH paper with me and it has quite a range and it gives me a feel for what is wrong with that cow early on. If it is down below 5.6 on this particular farm it is significant to me and I start to worry about it. But, sometimes the cows have to be off feed for two days before it will get that low.

Traumatic reticulitis is a big problem. We give magnets to all heifers, 60 days before they are going to be bred. But, they have magnets on these feeder wagons and we had an animal die the other day. I did a necropsy and it had the wire like Archie talked about, but it had so much metalic objects around the magnets that there was no room for that little piece of wire. Others I have had where high school boys or someone would throw their aluminum beer cans out the window and they get into the chopper and they do not stick to the magnet. When I see a case of so called vagus indigestion like Arch talked about, there is a little diagnostic aid that I use and that is atropine. Most of these cows have bradycardia, if you get them early enough. They have decreased heart rates and I give them 35 milligrams of atropine subcutaneously. This was written up by Dirksen a few years ago. If you have about a 16% increase in heart rate from the monitor rate before you give the atropine at about 15 to 30 minutes later, and this takes quite a bit of time if you are a busy practitioner, but we can do it as an exercise, then it is pretty specific for vagus indigestion. Reasoning being that is the vagus nerve is 90% sensory and 10% motor. The intestines slow up, it fires up the vagus and it says give me some more juice down here to get my old tummy going and what it does it fires back down again and since the heart preceeds the viscera, it has a modifying effect of slowing the heart down so that you get a bradycardia, It will be over ridden late in the disease when the abdomen is greatly distended and full of fluids then manytimes they won't have the bradycardoa. It does not change the course of the disease but it helps me with the diagnosis.

Another digestive problem that we have is diarrhea with toxemia. Toxic mastitis and metritis can be quite a problem. I think what we are getting to here is that when I try to tell the students when we have an animal that we think has a digestive problem, we have to determine whether we have a detectable change in the appetite, in the viscera as we monitor them by palpation as in the consistency of the feces.

Central Area

Chairman: Dr. Robert Keith, Monroe, Wisconsin
Practitioners: Dr. Stanley Held, Buffalo, Minnesota
Dr. Leland Allenstein, Whitewater, Wisconsin
(Substituting for Dr. E. Dahlquist, Fayette, Iowa)
Clinicians: Dr. Terry Olson, Fort Collins, Colorado
Dr. Lawrence Heider, Columbus, Ohio
Subjects: Mastitis, Respiratory Disease; Implementation of Herd Health.

Chairman: Dr. Held and Dr. Allenstein will present a problem; Dr. Heider and Dr. Olson will present ideas and known things, then we will open up the subject for discussion.

Respiratory diseases:

Dr. Held — Problems based on Minnesota area (climate, etc. affecting) and on age-old "traditions" (something done for no real reason, just because someone else did it).