

Dairy Section

General Format for each group:

- Chairman opens session, introductions.**
- 5 Min. Practitioner outlines the problem.**
- 10 Min. Clinician briefly states known facts.**
- 25 Min. Chairman directs audience questions, and comments.**
- 10 Min. Practitioner suggests practice approach.**
- 10 Min. Clinician summarizes and comments (some of the above may be reversed as appropriate)**

Northwest Area:

- Chairman:** Dr. Neil Anderson, Cheltenham, Ontario.
- Practitioners:** Dr. George Washington, Purcellville, Virginia.
Dr. Keith Sterner, Ionia, Michigan.
- Clinicians:** Dr. R. Ormsbee, Bridgewater, Mass.
Dr. Jack Cote, Rockwood, Ontario.
- Subjects:** Mastitis
Calf diseases.
Metabolic diseases.

Dr. Keith Sterner: I am in a six man practice which my father founded about 36 years ago. We cover a fairly large geographic area and like any practice it goes further in some directions than others, depending on the type of livestock in the area and the services that the clientele desire. Grosswise, our practice derives about 56% of its income from large animal practice and majority of that is dairy cattle but there are very few beef operations. There probably are not over a dozen feedlots in about a five county area that we get into. We have some hog producers, but not that many and they are mostly small farrowing operations and a little pleasure horse work. We do not go ahead and take anything that comes through the door and we do not have any specialty although, with some clients, some individuals in the practice tend to go to one farm more than others but we try not to, so that no favors are shown. Talking about calf mortality, probably the two calf hood diseases that comprise 95-98% of the mortality are scours and respiratory problems. Usually there are two types, one at or near birth, usually the 72 hour period, seems to be the most common one encountered and then also later on in the still nursing period we see scours in calves. The respiratory problems that we see in calves take two forms as well, one is a sequel to a postscour situation and the other is when calves are moved from perhaps

individual housing into the larger groups and the multitude of problems that go from there. The catch-all phrase that influences, in my opinion, both of these diseases is management and the management situation starts with the cow as she goes dry and the situation under which she is kept. We tend to see in less intensively managed farms problems with metabolic diseases which then result in less healthy calves being born. And that probably is one, and the other is environment which I think plays one of the bigger roles in healthy calves. If a cow is expected to go ahead and freshen in a free stall alley or in an extension barn where they clean only every other day, the first thing that calf gets is a mouthful of manure rather than colostrum. This certainly very heavily influences the calf's survivability. In our practice area most farms have milking parlors where there happen to be one or two usual maternity stalls that are quite intensively used. All our farms are family farms, even the largest unit that we work for milks about two hundred-two hundred twenty cows but they are all family farms so there are no commercial business enterprises. They are all businesses but, at any rate the problems that we encounter stem from this cow and what kind of shape she comes in. If you have a big, heavy cow coming in that has milk fever and the calf never gets anything when it is born, we usually see very high mortality rates on these farms. The other most important thing, and I am sure you have all heard this time and time again, is whether or not the calf is allowed to ingest any colostrum. Quantity and quality is very important and these are some things that we usually try to stress with our farmers when going over a problem. After ingesting a good colostrum meal, which does not always happen in our situation, these calves then are usually placed in pens. We see a lot of individual pens but some are kept in groups in a barn, it is usually in extension barns and they are kept down in the wettest, lowest corner of the barn where there are no ventilation fans and there are no other means of assuring the calf's survival. In the free stalls, many times the farmer will find them 12 to 18 hours after birth and they are allowed to wander in some instances, in other instances they are put in some kind of holding area.

We also have farmers who have much better levels of management and we see the calves there usually born in a clean, dry stall area, well ventilated, well lit. In the summer months, they try and freshen them on pasture and leave the calf with the cow for 12 to 24 hours which I feel is very, very

important in insuring the calf's survivability. Probably the single, biggest environmental factor in our practice which has decreased calf mortality at least until they get to be 2 to 3 months of age is the calf hutch. I cannot think of one single thing that probably is simpler, cheaper for a farmer to do than to build some hutches and I cannot give you nice statistics to say, well, on this farm we switched from multiple calf housing to a hutch situation that we diminished the mortality by x percent, or 10 or 15, but I can say my clinical impression and the farmer's comment is that they are raising many, many more replacement heifers. General procedures with the hutch, the calf is born and whatever area it happens to be, try and insure a colostrum meal and go ahead and put the calf in the hutch. In our area we usually recommend a bale of straw be broken and placed at the bottom and have them facing south and put them on as high a geographic location as possible so that when the snow melts in the winter time, and we get lots of it, the water does not all run down. These hutches are not foolproof but the calves do much, much better.

From the floor: I have had a chap build hutches and it cost him \$100 each for 10 of them and the calves kept on dying in there with respiratory type problems. He said to me, "Doc, how come it worked for the neighbor down the road, why don't mine work?"

Dr. Sterner: We have run into that situation as well, and I have a little philosophical treatment regimen that I go ahead and use and that is when we deal with scours in a new born calf, if the management level is what I consider to be good, in other words, I have been able to convince the farmer the importance of colostrum ingestion and getting the calf born in a clean dry area and then moving the calf to a clean dry environment, if those factors are there and we are still dealing with scours, then we go ahead and work with antibiotic therapy as well. If chloromycetin capsules, at one to two gram level, depending on the size of the calf, BI or TID, do not work or gentamycin, at 50 milligrams diluted with some saline, squirted down the mouth orally, does not work, probably we are dealing with a viral situation. When a fellow is having a scour problem we post these calves. It is surprising what sometimes you come up with. Many times you can make sense to the farmer why you have been stressing iodining navels if you can show a good omphalophetitis as a result of his careless management, I think that really will help. I do not post and send in tissues on every calf but if we have not gotten results with those two drugs then I will usually go ahead and submit samples to the laboratory for virology. In most cases, we will get either a rota or a corona virus result. Now, to address why are calves still dying in the hutches, particularly with respiratory problems and if anybody out here has any good ideas on it, that is fine, we have used situations where we tried to immunize cows in the dry period with different types of pasteurized bacterins. We tried to insure that they had good titers using nasal vaccines and it does not matter whose brand name we use we still run into problems. My

impression is that probably where we have run into situations like this, there may be something even the farmer may not be aware of in his management regimen, in other words, he may not be the one responsible for taking care of these calves so the calves may not be getting what he thinks they are getting. And if that is the case, there can be a very serious breakdown in his calf raising program. Secondly, there may be other environmental factors which come into play. They may be fed all out of the same bottle, the same nipple, and there may be other problems which come to bear on this as well. Anybody know why?

From the floor: Putting in sick calves. The bottom was still wet.

Why was the bottom still wet? . . . They were on this last piece of ground but it was still wet. What are you going to tell them to do? . . . Crushed stone and gravel. These calves he lost because of poor hutch management is what it boils down to. He should have had a nice crushed sand in the hutch. How many places have you gone to that had hutches and they did not work? They do not work because they did not buy a load of sand and gravel. We have a farm that has turned around for us. They are always good clients but to look at them you would think they did not know the time of day. They always looked just as poor as church mice but they are the kind that when they invested a little bit they would buy 500 shares of GM — they are good, smart money managers. To watch the fellow when he writes a check to you, it takes him fifteen minutes to hand you a check when you have done work for him. He will say, "Now Doc, I want to see that is right," and he will almost hand it to you and pull it back. He has just got to check to see that amount is right. . . . it's a brother situation and a couple of kids and they have more hired men than any farm I have ever seen in all my life, all of whom do not have above room temperature IQ's. They are good men and good people to work for. I am talking about the hired men now. These men had an old barn and they had built a new one — went to a free stall situation where they moved the cows to go in and milk. They were losing at least 25 and in the winter 35 and 40% of their calves — every year. When they built this set-up the fellow wanted to remodel his barn. And I think in disease situations from my experience when a fellow is going ahead to remodel, if you want to end a lot of just tear out your hair problems, get in on the ground floor when he is remodeling. Be sure he builds facilities that are suitable for survivability plus suitable for you to go ahead and work in. I cannot stress enough. Whether it is mastitis management or whether it is respiratory problems, if you know a fellow is remodeling, say, "Can I have a few minutes with you — a few hours is what it usually ends up being — going over some design problems I have seen in some other set-up?" You can expect some very, very positive influence on the man's set-up so that it might not be destined to failure to begin with. I know I have gotten a lot — in our dairy practice — of farmers who never ever thought about handling calves, yet they handle them twice a day 365 days a year. We have gotten a few of

them to build some headgates that are in inconspicuous places in pens that utilize the concept of a kill pen. Just a little cattle psychology if you will, not trying to run them straight into a pen but using them so they will go around like a kill floor works. If you can catch these cows so one man can catch and one can treat them and they find the benefits of being able to take a magnet off or put one on if they happen to be on that type of situation, put tags on, breed cows, that is the big thing of course. They say, "Doc, I cannot imagine how I got along without it" and you will be amazed yourself how much time you save on a farm. You all get along better.

The same thing goes with calf raising. You can influence in a very positive way this man's success or failure in his new venture. To get back to these farmers — this particular farm — this fellow wanted to remodel his barn because everybody in Michigan moans in the wintertime about having to go out and feed these calves, but "Doc, what about the weather, how am I going to feed these calves?" I always come back and say just go ahead with these nipple bottles that you can hang on the fence outside and all you have to do is mix up your milk or your milk replacer or whatever you happen to feel is good in your situation. Go out with two bucketfulls and put them on one, two, three, four, right down the line, let them suck and if they have not eaten then take the time to look at this calf. The calf tells you then whether or not he is feeling well just by his appetite. And they get on these disease problems much, much earlier than they would if they were in a pen of calves. He is much older and I do not know sometimes if he values my advice as much as I think he should. But at any rate he tried a few. They built a dozen of these hutches. By the end of this winter he will have 87 hutches. He has got about 53 of them right now and they are just a real success story. He still loses calves, his highest mortality was this summer — he put these hutches along the road. The calves were worth a little more money — a guy came along and stole four calves one night — they were just ready to go ahead and wean! That is the truth!! He started out, as I said with less and he was so impressed with the decrease in his cattle mortality that he built another and he will go to 87. At first he tied the calves out . . . They take a lot of pride in this setup . . . If you as veterinarians cannot offer encouragement — you would be surprised what a little bit of pride will do . . . You can see this calf is dry . . . we have a number of farmers that are experiencing high calf mortality rates which have offered warm housing because of the cost of their energy but to have a warm place to keep their calves to the hutch situation and say they will never go back, it costs between \$800 and \$1,000 in the winter to keep this barn. . . .

Question: How often do you bed them?

Dr. Sterner: One bale will last pretty close to four weeks. It depends again on drainage and if they are up on a hill and have good gravel drainage you don't need bedding near so frequently as if they are kept in a lower lying area. It seemed to work very well in either situation. The same thing with keeping them clean. If they are dirty get it out of there and clean it. Usually just tipping that hutch on its back and if

they have got enough hutches, leaving them open for two week period is what we like to have them do.

Question: You just throw in a bale of straw and leave it there for four weeks?

Dr. Sterner: Yes, take it in, take a fork and shake it up and you have a nice layer in there.

Question: You do not change it for four weeks?

Dr. Sterner: It is not necessary. Some of them that are well drained will go six weeks.

Question: What size is the interior?

Dr. Sterner: The dimensions of the hutch are 4' x 8' x 4'. That is one other thing that I do to get these fellows to build. I xeroxed from the February 1, 1976 issue of Hoard's Dairyman, the calf hutch plans so we could send to Hoard's and get copies of this. I carry them right in my truck with me and when they start talking about a better way to raise my calves, I give them a copy. And I keep bugging them every time I go back. Where are your new hutches? And you know it is surprising that — after two or three visits, they will say we really are building some and it has worked very, very well. But you have to be a broken record on this. It is like Mrs. Porter said last night. She asked how many of us had formal inventory controls and bawled us out for expecting our clients to pay attention! I think that is a very good point. You just have to go again and again and again.

From the floor: I have a client that is worse than yours. He won't even get the check that far! So he had a special calf barn and all kinds of problems and I gave him the plans for the calf hutch too from our veterinary services branch. They have little fact sheets. He did not want to use all that expensive plywood and he built them out of pieces of steel roofing — he would tack them together, are there any drawbacks?

Dr. Sterner: They get a little hotter in the summer. Wood has excellent insulating values and they can be like a little tin oven in the summer months. In the cold you may get some condensation problems. I am not familiar with any wood ones. I might add, building material wise, I have a fellow who is just building some now. Some new ideas — there is always somebody that has got a better or chaper way of doing things. I do not know if any of you have ever seen this plastic cardboard, it is a plastic palamer. He has built these out of just one inch stripping, the frame, and put this plastic cardboard over the top with no wood in it whatsoever other than the frame and you can actually stand on this cardboard right in the middle and it won't bow down. Now I don't know if they will stand the test of time exposed to UV rays or not. If you have a calf kept in the hutch by collar method these plastic ones in wind could be very detrimental to the calf's health. They would need to be staked down on the corners so they would not be blown away. I have seen calf hutches made out of packing crates, that these moving companies have, they don't need to be fancy. These fellows went out and they started building them and they just went crazy. They are painting them and they are really taking pride in them. And I might add one other thing that he complains about now. We

do his dehorning and vaccinating for him and in the fall he complains it costs him so much more money, he has had fully twenty percent more calves to go ahead and do. So his veterinary bill is higher because he had so many more calves. There is another type of housing situation. I only have two of them. And that is another plan from Hoard's Dairyman of this Virginia style open pen type housing. They house about 90 animals. According to the Hoard's specifications, they are divided into pens according to size. The building is basically open. There is a feed bunker across in the alleyway and it has enough slope to it that it does not retain moisture well, and the feed bunker is across the way and you can pen the cattle up in these and it is an open housing situation. A number of our farmers have regular free stalls setups, small free stalls to put these calves in after they are weaned. There is a big problem with usage on these things. The calves tend not to use these as well and then others just go ahead and throw them in whatever pen they can and that is where we many times run into problems because the ventilation is very substandard.

Question: Do you do any vaccinations?

Dr. Sterner: Generally not. I am not one to really go in with a vaccination program. I believe a disease problem is preventable by management. If we have a practice situation where the management factors are up to par then we will sometimes go ahead and try things like pasteurized bacterin or the nasal vaccines where we feel we will get a fast response, just prior to the time, 10 days or two weeks, they are moved out of this individual housing situation. On some of our herds we get into quite a respiratory problem once they leave the hutch. They have done a beautiful job raising them. So I do use a vaccination program, a pasteurized bacterin and on all my vaccination programs I try to make it as simple as possible. I think records are good but if you get too complicated a system they won't do it. Every calf that is on milk gets the bacterin and every few weeks as long as he is on milk he will get a booster. So they will get three or four injections of pasteurized. The one I have been using for several years and like it is Bovibac I which has pasteurized and corona in it. It is made by Fort Dodge. This along with the calf hutches have helped a whole lot in our practice in reducing the death from pasteurized pneumonia in these dairy calves. What am I going to do when the weather is bad? Many farmers refuse to go to them even though they recognize it as a superior method. Last year at Baltimore, Bill Bickert spoke on different types of housing. A very viable alternative is a machinery shed or hay storage barn that is not being used for whatever reason. They are excellent. To address the drainage problem directly, in most instances these are well gravelled for the machinery and it works well. I have not seen any kept on concrete or asphalt. Anybody here have any experience with them to comment on how they work?

From the floor: We have one on concrete and it works pretty well. They are filled with straw. Two other ideas that you incorporated in these calf hutches is one to put a ring right in the center. A metal ring, when he wants to move it he

just drops a chain over his tractor, picks it up and hauls it wherever he wants it. He moves it every so often. Yes, almost all these have some provisions for moving which we do by the way have them moved. Another idea I liked very well is where a fellow puts his hay rack in his feed box where he has got it on hinges and just tips it out. He does not have to go crawling into the pen. If we can get off a little bit on these hutches. I have found that these calf hutches in New York get some pretty wicked wind through them on bitter cold days. The guys that have the hutches and take care of them properly make sure that there is enough fat in the calf's diet and for that reason do not recommend any milk replacer at all. They try to stay on a whole milk program if possible. They seem to do much better with the energy derived from fat. And a couple of other things I have found as far as treatment; once in a while after chloramphenicol long term therapy add yogurt, about ½ cup each feeding, or lactobacillus. Add that right to it. The calves seem to take off and do much better.

Dr. Sterner: Well, if you keep in mind after a bout with scours, these calves have a diminished ability for lactase. The lactase enzyme is not there for up to three to four weeks postscour problem. And so even though you may be giving him adequate groceries, he is still going to be in a negative energy balance. And your point on fat is well taken. I try to have them on sour colostrum. I am really sold on that. It works and it works well if properly managed. If a fellow does not do a good job of taking care and managing his colostrum it does not work well. With milk replacers I try to specify a minimum 20% fat if possible and I have seen guys raise calves on 10% and the one with "the license to kill" 8% fat and they looked as good as any calves you have ever seen! These are the ones that Grandma usually takes care of! Pay attention who is feeding these calves. If the grandmother will take care of them, in my opinion, she is absolutely the best calf raiser on the farm and probably mother is the second, and maybe daughter third, depending on how old she is and how many boy friends she has!

From the floor: You were talking about using a replacer, you have to watch out and make sure the proper iron is available in a diet . . . a lot of these have very low or absolutely no iron in them. One farmer did that and had an awful lot of anemic calves. So it is something you have to watch for. One other thing I have found in treatment that I think saved a lot of calves is Banamine. I do not know, of course, if the guys are here that were selling it, they would tell me to hush up a little bit. But I use Banamine two or three cc initial treatment sometimes repeated in 12 hours and saved an awful lot of calves which I think would have died otherwise.

Dr. Sterner: If you want to get a little bit into therapy, I have not used much Banamine. I will throw this out for your information, the opinion first and then something for you to consider. As far as I am concerned when a calf has scours and we are trying to save him there is no substitute for IV fluids, particularly if they are down and semi-comatosed.

You won't save them any other way. That calf is like a potato chip and until you rehydrate him there is not any drug that comes out of the barrel of a syringe that is going to save him. Secondly, these calves have a lot of histamine release, they are in shock. We have had a couple of clients try this as a preventative. There are a lot of prostaglandin products released that evidently create problems in this shock situation. A very simple and cheap drug is aspirin which has excellent antiprostaglandin properties. Some other work would indicate that after the calf has developed scours it is probably worthless. But perhaps in a place that is experiencing problems right along or routinely use aspirin at 100 milligrams/kilo body weight which works out, if you are using a 240 grain bolus, they will do about 330 pounds of animal, or you can adjust it downward, and you can use a bottle of human aspirin for that matter, as a preventative given orally with blood levels in about 12 hours. If you are feeding a calf about twice a day you can include it in the milk. In a couple of places, management was so bad I really can not say the aspirin did it, but it helped. It was my clinical impression and I have nothing to support it except my clinical impression. We have two types of herds. One may be a purebred and has real valuable calves and we are starting to get quite a few embryo calves around, fellows who are interested in embryo transfer and in those situations we just give it to them whether they have it or not. There has been some argument as to whether or not, because of the corona virus, it should be used routinely, but as far as I am concerned if those calves are worth saving then they are worth giving it to. Usually we try to hit the dry cows with some vitamin E - selenium even though they may have selenium in their salt. Go ahead. We hit them at birth...and also go ahead and give them the calf guard and see to it that they get colostrum from all four quarters of that cow. If it is an embryo transfer heifer that they are going to go ahead and let nurse, there we also try and use colostrum from a frozen bank from an older cow that has been in the herd for a while that may have antibodies to specific problems in that herd. I think that is very important. Sometimes if they will just suck out of one quarter they may have very low antibody levels there in a single quarter sample. We have not used it in the injectable form in a dry cow. We have used it at birth. We have not been in any situations yet where I felt it was warranted. Anybody else comment, have they used it in dry cows?

From the floor: We have done 2,000/year for the last three years, using nasalgen and MLBVD.

Dr. Sterner: You are using modified live virus in springing cows?

From the floor: Up to 90 days from coming fresh. We just go through the dry ones about every 60 days.

Dr. Sterner: You never have any problems with cerebellar hypoplasia or abortions?

From the floor: No abortions, as a matter of fact the reason we did them, was about 1970, the time of this Hungariann report where they did the same thing and they

had about a 40% increase in antibody content in the colostrum. And that was the consequence of this treatment.

Dr. Sterner: Dr. Ormsbee has indicated that there was a Hungarian report that indicated a 17-fold increase in the antibody level in colostrum.

Dr. Ormsbee: I do not recall whether the report specified specific antibodies or not, but nevertheless this was the figure they were using as I recall, 17-fold. With no complications. They published it with a little bit of fear I think just from the tone of it. But we had so many calf losses which appeared to be associated with BVD that we just did not see any other way of getting that many antibodies to them so we started and we have had no trouble. As a matter of fact it has rather solved this situation, we think.

Question: Exactly what are you doing? Are you using IBR or BVD or both?

Dr. Ormsbee: We are using Nasalgen, that is PI3-IBR and an intramuscular modified live virus BVD. In the case of the calf losses we think that some of the untreatable, some of the cases that just would not respond to treatment in our nursery, no longer required treatment. The dry cows are all separate from the milking herd. Essentially there is no comingling, but I do not think it would make any difference because we believe, through our previous vaccination program we probably have a totally vaccinated herd anyway. Unless you have cows that have been previously exposed, I think you would have a chance of problems. But I think with a sufficient immune herd, and this is a herd that has a lot of traffic, in other words, there is a lot of buying and selling, and everything that comes in gets it, we have few problems. As I understand it, if they have not been immunized you do not get an anamnestic reaction.

Question: What was the primary cause of death in the calves?

Dr. Ormsbee: In the calves, it was a combination. It always started with scours and ended up with pneumonia. So the usual pair.

Dr. Sterner: I think the important thing to remember that Dr. Ormsbee said is that you are talking about vaccinated cows. Cows that have been previously vaccinated. And do not anybody leave here not remembering that these were not cows that had no history of previous BVD immunization. I know Dr. Kahrs last year made a comment that nobody finds any BVD if you do not look for it and nobody that deals with dairy cattle probably, if you don't go out and seek it out you never will see it. But it is sure a lot more prevalent than we give it credit for.

Question: Do you have any problems with abortions at all unrelated to this?

Dr. Sterner: It depends on how early you want to go but on 35 day pregnancy we expect 6% failure per year. Embryo failure. And I do not think we have exceeded that. But they just do not get excited about single abortions. If we had half a dozen in a couple of months' period or something like that it would be a different item.

When I come out they usually get chloramphenicol or genomycin, and I personally prefer genomycin, for the simple fact it is an aminoglycoside. Given orally, there is almost no intestinal absorption. Therefore, I do not have him tied up with a unidentifiable residue for a long, long period of time. Usually a calf that I am called to treat is comatose, or down at least, and cannot hold his head up and I have very strong feelings what I use on him. I use Tasker's solution: 13½ grams of bicarb, 68 grams of dextrose, and I just use liquid dextrose, 50% dextrose, so give them 136 cc and I carry the bicarb, (I weigh it out on a good scale in the clinic) and carry it in an empty 12 cc syringe case and have an empty liter bottle in the truck and use hot water, and that is something I want to comment on. When you are treating this acutely ill calf, if you have not done it yourself, take it from me, if you give cold fluids to an animal in shock you might as well just take a gun and hold it to their head because there is no difference. I just did that to about a 350 pound calf a few weeks ago. I had some fluids I was giving, it was cold outside and I ran the fluids and you could see it. And I realized the foul up in my treatment at the time. I had not driven very far and the water was not hot in the truck and I had only to walk to the milk house and heat the fluids up. You could just see the calf go down hill and die. Before 10 minutes had elapsed, she was dead. I have seen them so bad before running in Tasker's solution that I could physically touch their cornea and not get a blink reflex. By the time I had given a liter of fluid it could hold up its head and be making an effort to stand up. Not every case, but a few. You can see the life giving qualities in the solution. The reason I say Tasker's solution is, because it does not contain potassium. I can run it through a 14 gauge needle and since we are all interested in being able to deliver a certain amount to work in the time of day I do not have to run it slowly. I hold it up just as high as the simplex will go and run it just as fast as it will go. I included no corticosteroids, no antibiotic of any kind. Occasionally I will give a B complex injection, because it makes me feel better! Or I may have a more valuable calf and I think I should be giving it with more things. I have them go ahead with this type of calf, say 80 lb. Holstein calf we will have them give them four more liters or four more quarts that day through the esophagus feeder. It just works super. Most of our farmers are starting to recognize scours and realize that they respond well to fluid therapy and the cases I am called on to treat usually are very small operation where they just do not use veterinary services that often. To make Tasker's solution, take 13½ grams sodium bicarbonate, Arm & Hammer baking soda from the supermarket. We have a gram scale in the clinic which is a little dial scale. Weigh it out and put it in a 12 cc plastic syringe case and I usually carry half a dozen or a dozen of these cases with me and I just seal up the top with autoclave tape or adhesive tape so I can carry it with me. take 60 - 136 cc of 50% dextrose and add that to it in a liter bottle when you combine these ingredients. Then q-s it to a liter with warm tap water. And I suppose you could argue

whether or not to use tap water, but it does not matter, it is wet and that is what the calf needs. The reason I like dextrose is, if you go into the theory behind fluid therapy, this calf is hyperkalemic. You know his blood levels are hyperkalemic even though his total body mass is low potassium wise. You give a potassium containing solution to this downer calf which already has myocardio-irritability and you give him a high potassium containing solution and you can kick him off. I know because I have done it! And it is just simpler, the dextrose drives the potassium back intracellular again and the hydrogen ions come out. If you look at the blood pH of these calves, they will actually become more acidotic because they have hydrogen ion in the blood stream and that is why I like the bicarb. And I know we can get into a real argument over whether we should use lactate, acetate, or bicarb. This is cheap, I do not imagine it costs me 25¢ to treat this calf and I saved a \$100 calf. If the farmer will continue then with the therapy, one liter is not enough. They really go flat in a hurry if the fluid therapy is not continued. I like it at a minimum of 100°. You can run 100, I would not run more than 110, but you know so it feels like the bucket, I just set the bottle mildly hot. If it is not warm it just does not work the same miracle that it does any other way....they have recommended against dextrose in these calves intravenously. You have to use dextrose by way of mouth...I would totally disagree with that. The calf is hypoglycemic, he is in shock and he just needs a dextrose source. I suppose that you could talk just strictly electrolytic therapy but they need an energy source. He cannot even stand up and the dextrose is very much indicated.

From the floor: I agree with him over there. I think the dextrose is not indicated. And I use sodium chloride and I heat it like you do, good and hot...and I can hold the bottle just as high and let it run in. I think that gives rapid rehydration, the sodium chloride does it for me and I use the bicarbonate orally. Anybody else care to comment?

Dr. Sterner: When you are talking about strictly a fluid requirements of this calf, no, but usually it gets him back where he can at least suck a bottle or it brings him around. If we have a real valuable calf we use the solution bags that Haver Lockhart sells. You can put in any number of good catheters that you can use temporarily, in these calves and we will go ahead and hook them up to a 2500 cc bag and have the farmer go ahead with more solution to run in. If the farmer wants to save a calf, he can bring him in. Or if he lives way out and it is in the early evening and I just do not drive there, I try and encourage him to come in. I prefer the calf to stay on the farm, because if he responds generally then he goes ahead and feeds him. Our clinic is basically out-patient only, we bring a lot of our surgeries into the clinic but it is really a hassle to keep animals there. We have on occasion kept calves overnight on a 24-hour basis. But as soon as that calf is looking better, able to stand, back home he goes. I have seen farmers that would fight you tooth and nail for a \$1 increase in the trip charge but would not object for anything you want to charge him for examining his animal.

So that is where the difference comes in. I must profess great ignorance. Last year they had a seminar on bovine respiratory disease and after coming out I was really depressed because looking at the physiology and anatomy and pathology that goes on in the bovine lung I do not see how any of them ever get better. I would make one comment about the hutches and that is if possible, build them taller.

The calf hutch provides the one magic ingredient. The same thing we try to do in a human hospital, it provides magnificent isolation if they are properly used. And the whole purpose behind anything we do keeping these calves isolated, I do not remember who said it at some meeting, but said that you have got a solution problem here and the solution to pollution is dilution. You know, if you have a bacterial problem wash it away. Keep it diluted. You have got these animals isolated. We get into the problems when we start concentrating these animals together. And it is one thing for me to stand up here and say, well we are going to change the management factor, but it is another thing to get that farmer motivated enough. He either has not suffered enough financial loss or whatever to go ahead and implement some of these things. In some farm situations and I will be the first one to admit it, I fell badly when I walk in there, the rain clouds over my head and the lightening bolts coming down because I never save anything there and probably never will because the management tools are just not being employed and the farmer refuses to. He evidently considers those losses acceptable even though he is being weeded out financially. It really is a problem too when these animals move out of the hutch and it is like weaning calves or foals or whatever. You have got to do it sometime. And the idea is to make that as unstressful or the least stressful situation as possible.

Dr. Cote: I think most of these points have been well made already. But the format is to have a kind of discussion of each of these problems and I think the first point we should be sure of, or make clear, is calf survival is a large index of our health management programs that we have on any of our dairy farms, because I think that is primarily what we have been talking about. Beef farm the same. There is no substitute for good management if that calf survival percentage is going to be up high where it should be. And certainly the calves have to start out with half a chance. They cannot be calved in an unsanitary environment or it is just like delivering them before they are 2 hours of age. The other thing is, just a small point that I learned a few years ago from one of our clients who was an excellent operator and still having an occasional calf die in that first 48 to 72 hours period after birth. He is the kind that got to the point where he is very critical of your veterinary service. And he said that I think that I have discovered what has happened and why we are still getting an occasional calf death. It is a 35 cow herd hopefully with 30-35 calves a year being born and one calf maternity pen and going into a calf nursery. He puts teat dip on the navel before a calf is two minutes of age and gets colostrum from the cow even before the calf has had a

chance to get up and suck. He does not take any risk, he milks the cow and bottles the colostrum into the calf right now. He said "I think that some of these calves that I am helping to deliver in my anxiety I try to clear the mucous out of the throat." And he said "I do it with my hand." And he said "I am not really sure where that hand was before it went into the calf's mouth. I may be inoculating these calves with E. coli infection that happens to be on my hands." He said he had stopped. He did not tell me until he had stopped this practice and there had been a period of a few months without a calf loss and he was pretty sure they maybe that had an influence. The point had been well made that the first thing into a calf's mouth should be colostrum. And that point about making it a composite sample of colostrum is a good one. Most people just take it out of one quarter and let it go at that but they may be missing a few antibodies from another part of the udder. I think from the time they are dropped the calves should be placed in isolation after they have had colostrum. The hutch is a modern day answer for this. I mean I have seen agricultural engineers go through ventilating dairy barns and so on, heifer barns and so on, and then they come to the calf barn and all they flash on is a 4 x 8 x 4 plywood building, and that is their calf nursery. They say, there, if you want to raise you calves to the best of their potential ability that is where you put them. And they make no bones about telling this at farmer meetings, but owners can be told this as many times as they like by the engineer and the dairy specialists and the veterinarian but they just drag their feet when it comes to doing anything that is going to inconvenience them. If they have to go outside the barn to feed the calf, it is an inconvenience. So getting them motivated is one of the biggest obstacles, and we have made a good point of that. But if people will isolate their calves, whether it is out in a hutch or upstairs in a converted henhouse or a granary, get them out of the same environment with the adult cows, because there are two things you are providing, safety from infection. It is the older cows that are immune from these enzootic agents that provide the source of infection for the calves and if you rear the calves in the same environment with the cows there is just no way that they are not going to be affected by enzootic pneumonia. Maybe they won't get to a real clinical level but they are going to be stunted to some degree if they are in the same building with the cows. Any why some people get along with calves in this kind of environment with the cows I don't know. Maybe it is just the wind currents blow in that building and the infectious agents are being drawn away from the calf area or something. But sooner or later if they persist with this type of environment, with calves in with the cows, they are going to lose a good calf and it usually is a good heifer calf out of their only good cow in the herd to make then say, "gee, we better do something, we better take the advice we have been hearing for the last five years and get these calves out of here and protect them from this cesspool of infection that they are in as far as the environment is concerned."

The other thing that you are accomplishing is, the first two or three months of age the calf is becoming immunologically competent. And so after three months or six months if you can keep them that long it is safe then to put them with the adult population and they will be able to fight their own battles. The point has been made that these calves get a respiratory episode when they are put back with the cows but it is usually a very minor thing that does not even require treatment. They will run at the nose and eyes for a few days but maybe no even go off feed, cough, and snort, but they are immunologically competent so they then are undergoing a natural immunization process against these agents the same way their mothers, aunts, and sisters have done. I think the fact that people are willing to go to an isolation setup makes them do a better job of everything. Nor just providing a more disease free environment, but they do a better job of feeding, they do a better job of washing their feeding utensils and just the whole operation is improved. I think all these points have been made. Regarding treatment of calf scours, our specialist in calf scour treatment made the point that calves die of dehydration and acidosis. Bacterial infection is certainly a factor but they certainly do not recommend oral treatment with antibiotics. I know it is not a popular thing but the first thing the calf with scours gets is an antibiotic whether it is by the owner or by the veterinarian and we can not really knock it, but to the purist it is not the recommended way to handle it. Certainly the proper fluids intravenously and followed up orally is the way to save the sick calf. You may need intensive care if they are going to survive. I question whether a liter intravenously is really enough, even half a gallon, two liters, or preferably three or four liters in the first couple of hours and I know this is not convenient in practice conditions. It is not so bad if you have a clinic and an animal health technician or somebody to run this kind of set up.

I hope that is in a way a bit of a summary. I think the immunization agents with pasteurilla vaccine or whatever may have a place in some situations if you have got real evidence, and diagnostic evidence, that pasteurilla pneumonia is what you are dealing with and the immunization then may be of value. The corona virus is certainly something that has been recovered much more frequently lately in problem calf scours and my information is that you have to have an early, untreated fecal sample that this agent is recovered from, in order to really have a significant diagnostic results.

Question: How do you get the mucous out?

Dr. Cote: You should have an alternative to get the mucous out of there somehow. What I do is hang them up by their heels and a lot of times it drains out right away and the other thing is to put your fingers in their nose, or a piece of stiff straw and they will just snort and cough and start to breathe and the stuff pours out. If you let them hang for five minutes I think you accomplish something far safer than putting your hand in there. Use the hose as an alternative if you want.

Dr. Sterner: It seems I get two kinds of calves when they are born. One that is alive and I never can make breathe and one if you work on them they just seem to have the will to live. A lot of this seems to depend on the delivery. I get the impression that when these calves come through a very difficult dystocia that there is some kind of compression that takes place in the chest and you can almost see it because at the costochondral junction they will overlap almost like a pair of sliding blades and those calves I almost never have any luck making them breathe no matter what I do. Other calves seem to have a lot of fluid, I hang them up the same way Dr. Cote does. One of the fellows in our practice uses Dopram in the jugular vein, he will give 1-2 ccs depending on the size of the calf. He claims great success with it. I must only pick those calves that have the crushed chest because I have had very little success with it. It will make them try to breathe, you just do not want them aspirating a lot of embryonic fluid.

From the floor: I have been using that for five or six years and if they have any respiration left at all they usually start. The calves that I see die usually come out bellowing and kicking and I have never seen one of those live. They will gasp once or twice with a puller and sometimes not. I have tried it in the tongue and was never satisfied with it. But my colleague claims great success using it in the jugular. And it really is easier; this calf is slick and all greasy, you can pick up the jugular very, very readily on a new born calf. It is no trick at all. That is one other thing I might mention, a little tip - sometimes on treating scouring calves. A lot of times these calves are dry and it is very difficult to pick up a vein because they are hypovolemic anyhow, so pick up a calf by the hind legs and if you do not have anybody to help you set him on a bale so his rear end is up in the air, plus you can wet down the neck a bit. Very rarely do I ever have to shave a neck. You can use a 14 gauge 1½ disposable needle to pickup those veins very readily. And on a newborn calf where you are first trying them it is very easy with a 20 or 18 gauge. There are as many ways of respirating calves I think as there are for people. The drug is Dopram, 20 milligrams/cc and usually 20-40 milligrams, which would be 60 to 80 milligrams to a standard Holstein calf. And that is about all we have in our area.

We have seen a lot of calves born with either fully contracted or partially contracted tendons this fall. They do not follow any pattern. One herd we had just recently, three out of the last four calves were born this way; the herd's average is 61 lbs. milk on two times a day milking. They milk about 80 cows. Obviously they are not hurting too much nutritionally. They are probably our best managers, but their calves are being born not exceptionally large with front legs that are contracted. Anybody have any sure cures or know what causes it: Different bulls or different blood lines — no consistent pattern could be found. Jim? My explanation is that they are noted to be always in a group in a herd...Was this the only symptom with manganese deficiency or low margin?...Were you doing this on

metabolic profiling or did you pick this up on nutritional analysis? More or less as an after thought, and a metabolic profile. Did it correct the problem? Has not had the problem since. The reason I asked that is because, like Jim, I have observed you get three or four of them and the next group you know is no problem and it may go on and it is not a consistent thing so I could change one thing in the diet and have it corrected. There is definite and conclusive evidence that two calves given equal colostrum at birth, one being left with the dam for the first 24 hours will have significantly higher antibody levels than the other. It is just this mothering effect — so these are all very much considerations. The warm barn certainly for me has great advantages on these cold winter days and I did not mean to sound critical if I did. I really like them, particularly for medical problems. Dystocias and prolapses and things like that are certainly more pleasant in those barns. I think you can do a better job of managing the cows.

From the floor: I transfuse from the dam to the calf. If we had an older cow we would get it out of her, about 50 ccs. Anybody care to comment? Had any experience?.... You say you do it sometimes. In problem herd situations? Soon after birth . . . or as soon as the calf is noticed. Yes . . . 60 cc intravenously at birth or when noticed and we have had decent results with it in cases of emergency c-sections where the cow is 8 months pregnant and she splits herself, cracks a leg or something like that and the owner wants to take the calf and get rid of the cow. She has no colostrum for 48 hours and there is not a frozen bank handy so I will take 200-300 cc whole blood and inject it subcutaneously into the calf. Well they absorb the red cells...Colostrum has two effects, I am sure you all are aware, in the oral cavity. One of which is to go ahead and destroy bacteria, as well as the globulin function plus sealing off intestinal porosity. If you are trying to immunize or give these calves the same dose, and the figure is 68 grams sticks in my head and I do not know why, it requires a very, very large quantity of globulin to go ahead and attain any kind of protective level in these calves... There has been some work done in at least three institutions recently that shows that circulating leucocytes in the blood of colostrum fed calves have greater phagocytic capabilities than those from colostrum deprived calves and if you look at these leucocytes in colostrum deprived calves they respond differently from leucocytes from colostrum fed calves. There may be some other unknown factor in colostrum that is helping that calf ward off infections other than just gammaglobulin. I am sure that the school is still out on colostrum and it will be a long, long time to come before we are able to explain all of its magic curative and protective powers.

Dr. Cote: Metabolic profile is like saying an animal has lead poisoning because you find lead in the gut. These were the things that were treated for in blood: glucose, protein, albumin and globulin levels, H6 PCV, Ca and P. The mean calcium level was 8.58 in the fresh cows, 8:25 phosphorus, what the reason was I am not sure. In the later milkers we

still had almost a 1:1 calcium/phosphorus ratio and it persisted at a very close ratio even in the dry cows; nine to seven. So this was the first thing that appeared to be out of order. Magnesium levels we felt in the normal 2-4 mg range right across the board. Glucose levels, these are plasma glucose levels and 50 mg is considered to be the low normal level in plasma glucose. So these cows even the fresh cows appeared to be getting enough energy although it was border line. We say border line as far as glucose levels are concerned. Later milkers were better than dry cows. Total protein seemed to be in the normal range as far as the means are concerned. 6.9 milligrams to 7.5 and 6.9. Quite normal maybe even high normal levels. The albumin/globulin ratio however should be .8 to 1.2 and in the fresh cows it was .8, .9, .6, .7, .7 for a mean of 0.74 which was really below the normal .8 to 1.2 level. Lower still in the later milkers and still lower in the dry cows. Albumin levels were below 3 with a mean of 3.0 and below 3 with a mean of 2.8 and still below three with a mean of 2.5. So globulin levels were high with means of 4.0, 4.5 and 4.1 as should be expected with that a/g ratio. Hemoglobins were 9.7, 9.7, and 10.7. I think in this case below normal. I think they should be higher than that. Hematocrits 25.5, 25.6, and 27.5, again quite low. We generally see them closer to 33 average or 33-35 level hematocrit. Our erythrocyte levels were on the low side 5.9 million 6. million and 6 million. Now it seems alright to put this data on a graph that or on a table but unless you sort of graph them out you maybe don't get the trends that are occurring between your fresh and your dry cows. Now with regard to calcium if we take nine to twelve cows as the normal range and maybe 9.5 as a mean. The fresh cows were all below the mean. The medium milkers weren't so bad and the dry cows were in the normal range, as far as calcium is concerned. Phosphorus was high right across the board. Magnesiums varied with a mean or an average of 2.4; they were a low normal range. Hemoglobin, maybe 12 is a little bit high for a mean, but these were taken from some of the tables that some of these people who have worked with metabolic profiles have given us and in this case the levels were all slightly below normal. Albumin levels were low and glucose levels, as we said, were below normal. Those were the facts as far as the metabolic profiles are concerned. Does anybody have conclusions or suggestions with regard to those findings?

Question: Have you tried giving any vitamin shots?

Answer: Not to my knowledge. If they were getting anything they would be A D & E. It is not our client, they are in there on a consultation. We thought we got quite a bit, but there were things that we obviously omitted.

Question: What about the feed that you saw? Did it look good or was there any chance of molding especially in high moisture corn or corn silage?

Answer: I would say no. It was a good quality feed. The guy was doing a good job of cropping, in fact he was putting hay in when we were there and it was an excellent crop and excellent quality. Yes it was alfalfa. A mixture of alfalfa and

Brome grasshay, not completely alfalfa.

Question: What about any evidence of any renal disease? Did you run any urinalyses?

Answer: It seems to me that we did on those cows that we were checking the metabolic profiles. We took urine counts on them. There was nothing abnormal.

Dr. Cote: In one other herd that we investigated with a similar mineral feeding program the complaint was that the cows were running around drinking each other's urine. We don't know how many of these were reported. A cow would stop to urinate and her neighbors would gather around and try to drink her urine before it hit the ground and then they would lick the ground where the urine was spilled. Does anybody have a possible explanation for that?

Dr. Sterner says it is a protein deficiency. Anybody else?

They did have free choice salts, is that correct? Yes.

They had potassium free choice, I should have the list with me. Yes, each in a separate dish. Each of these minerals, potassium, bicarbonate, sodium chloride, calcium phosphate, everything was spread out but individually. This was a mineral feeding program being sold by a urea peddler and it went along with a urea feeding program.

Dr. Cote: The thing about that urine I consulted with an animal scientist and asked him if he had ever heard of this. He said it was a competition or an antagonism between potassium and sodium in the animal. Green leafy plant material has all the potassium that any animal could ever one if you work on them they just seem to have the will to live. A lot of this seems to depend on the delivery. I get the require and that it is not necessary to supplement them. The fact was the potassium product that they had out there was very palatable and that was what the cows were eating most of in this selection of minerals and so it was tying up the sodium in the body and they were really developing a depraved appetite because they wanted to get more sodium. As soon as that mineral feeding program was cut out his problem stopped because they no longer consumed these large amounts of potassium that they were already getting. So if you ever run across that you might investigate it. I think in the blood picture the key thing there is the calcium - phosphorus ratio and the low levels of albumin, the low albumin - globulin ratio and the low hemoglobin. We didn't do BUN tests but I think if we had, we might also have found low BUN levels and these are indicative of protein deficiencies.

Question: Are you suggesting that as a reason for the low hemoglobin?

Answer: There is a lot of non-protein nitrogen in that ration, they may not be utilizing it or able to utilize it.

Dr. Cote: First of all in any feed analysis, we have to know what are the requirements. So we set up the requirements for a cow, 1400 lb. weight, producing 80 lbs. of 3½ % milk which is what this owner really expected of these fresh cows. The second group we thought should be producing about 60 lbs. of 3.75 % milk. So the requirements are 7.6 lbs. of protein for top levels, 6.25 for group 2, 34.6 lbs. TDN group 1, 29.25 for

group 2 and so on, 142, 116, 106, 187 for calcium. The requirements of magnesium were 64 and 52 for the 2 groups, potassium 212, 174; manganese 30 ppm, copper 10 ppm, zinc 70 ppm. We analyzed each of the feed stuffs on a dry matter basis so that at 100% dry matter it was providing 0.97 lbs. of protein because by analysis it was 13½ % protein. Similarly the corn silage on a dry matter basis was 10.87 lbs. protein and we got .79. The totals then of protein of 5.47 lbs. This was what the cattle were getting, because there wasn't that much difference in the feeding program of group one and group two, so they were about 2 lbs. per day short of protein in group one and about ½ pound short in group two. Similarly with TDN. TDN was what we found to be the closest to meeting the requirements 33.6 lbs. of energy that was sufficient for group two but not quite sufficient for group one. But these cows were not producing anything like 80 lbs. of milk or 60 lbs. of milk, they were 57 and I forgot what the other group was. But they weren't producing enough milk to develop ketosis due to this slight underfeeding of energy because they were getting plenty for the amount of milk they were producing. Calcium, they were short. They got 100 hundred grams a day as opposed to 142. This did not take into consideration what they were eating free choice. It was strictly on the known amounts that these cows were getting. We had told this man that he would have to scrap that sophisticated mineral feeding program and then go on to a force feeding of minerals. 79 grams of phosphorus, they required more than that, so that even though we had a one to one calcium-phosphorus ratio we had a deficient situation as far as calcium and phosphorus were concerned in the ration. Now again how much they were eating out there in the calcium phosphate bins we don't really know. 40 grams of magnesium as opposed to the requirements, 12 of manganese, 12 ppm as opposed to 30 and so on. In other words they were deficient in everything and potassium was not analyzed because it was ample. That is the one thing that we knew was ample in terms of nutrients in those feedstuffs.

Question: You say he was short of energy, and he was short of protein and he is feeding or trying to feed, for 80 to 60 lbs. of milk to be produced and he has only a 14,000 lb. herd average and I don't see how he is going to have such a low herd average on that kind of production?

Answer: He had the 14,000 lb. herd average three years ago, and so with the minerals he is not getting a 14,000 lb. herd average and therefore doesn't need this much energy or this much protein as you are showing at the top of your chart. In other words the standards you laid out across the top of your chart is far in excess of what they are producing, he says what are these cows capable of, what do you expect of them. He says the fresh cows should be milking about 80 lbs. and the next group about 60. So if we were basing on a low level we may have been getting excess compared to what they were producing.

Dr. Cote: A dairy extension man did the calculation as far as the ration was concerned. I don't feel I'm a nutritionist but

I think I can understand what he did and I realize there are other ways of doing it. Our first suggestion was to get him off free choice minerals. I think the point he is making there is you can put up the requirements for production he was getting at that time. The point is that according to their 57 pounds of production what they were getting should have supported that without any trouble except for the calcium-phosphate ratio. In the first group, we had group one averaging about 57 pounds and he has up here what 60 pounds production takes and these cows are still producing at the lower levels of 60 lbs.

The requirements are for x number of pounds of protein per day and we have to figure that out on a dry matter basis. First of all he put it down both ways instead of figuring it out on the dry matter basis. What do we do with this herd then? What are our conclusions with the investigations we have done and what other investigations should we have done if we really thoroughly checked out this situation? They made the point about the porosis check with the vertebrae from the tail. Maybe we can't rule out the possibility because there were suggested signs of fluorosis poisoning both from the eruption of the incisors and the shifting lameness that was going on in these cows. The high incidence of infectious diseases and the poor production, short lactation and so on was the guy's biggest complaint.

Dr. Sterner: I was just looking at the calcium-phosphorus ratio. Kansas State has done some work on abnormal calcium-phosphorus ratios and I don't remember exactly what his study included now but when there were other than say a 1:5:1 overall total calcium-phosphorus ratio they were experiencing many of the symptoms that in Michigan were attributing to PBB such as lameness and abnormal hoof growth. I don't remember what he had to say about reproductive performance but the problems attributed were the overall calcium-phosphorus ratio. I didn't count it up but it looked like about 1.2 to 1.

That was only on the ration not on the free choice.

It was a 10:8 calcium-phosphorus ratio in the ration, but in the blood it was very abnormal which would lead you to be suspicious that these cows were getting some very high source or absorbing a lot of calcium.

Dr. Cote: I think that we can sum it up with what we did in this area. I appreciate that it may have not been as complete as it should have been but I thought that it was interesting to illustrate a herd problem where we did use a metabolic profile and it was backed up by a feeding evaluation of the herd and with the mineral program a little bit of an unknown. We did the metabolic profile. We recorded the feeding program for each group of cows. With the help of the dairy extension specialist of the Ontario Ministry of Agriculture and Food we calculated the feeding program and based on analysis of feedstuffs which had been done previously for the owner by a feed service corporation. Based on requirements for 80 lb. production and 60 lb. in group two it was felt that the cows which were capable of producing, which the owner felt were capable of, the feeding

program was deficient in protein, calcium, phosphorus, magnesium, manganese, copper and zinc. In addition, the ratio of calcium to phosphorus in the total ration was about 9 to 8 instead of 1.5 to 1. The metabolic profile revealed an average calcium-phosphorus ratio of 1 to 1 in fresh cows to 9 to 7 in dry cows instead of the normal 2 to 1. The imbalance of the calcium-phosphorus ratio and the deficiencies in calcium and phosphorus in the diet can cause osteodystrophies and account for the stiffness and shifting lameness which these cows were showing. This was my letter to the veterinarian. The total plasma protein levels were in normal range while the albumin-globulin ratio in all three groups was low perhaps reflecting the protein deficiencies in the ration. Normal plasma protein levels are necessary for normal milk production and disease resistance. I feel that this herd has been susceptible to infectious diseases and has gradually declined in milk production over the past few years because of protein deficiency as detected by a metabolic profile and ration analysis. A protein deficient diet will also cause cows to thin, listless and to be dry in the coat which these cows were showing. The hemoglobin and hematocrit levels were low in all groups possibly due to the copper deficiency in the ration although blood levels of copper were normal in two cows and iron levels were normal in three cows, which were checked, one from each group. The depraved appetite and the recurrent diarrhea were probably related to the dietary deficiencies of trace minerals and the owner reported that the pail of copper sulfate solution used in treating feet of the milk cows had spilled and it was licked up immediately by the cows which were being milked. The federal veterinarian was of the opinion that the cows which are on a deficient diet of protein and trace elements over a long period suffer deterioration of the epithelium of the intestinal tract which predisposes to pathogenic activity of organisms such as Johne's bacillus and this could explain the apparent incidence of Johne's disease in the herd. Chlorine levels as mentioned, were normal in the blood of the cows that were sampled and the water samples that were taken. We obviously made suggestions regarding correction of the ration and that is the completion of our handling of the case.

Question: What did you change in the ration?

Answer: We went out to the herd with the dairy extension man and we had a meeting with the owner and outlined to him the results of the conclusions of the investigation of the metabolic profile and the ration evaluation. In addition the dairy extension man worked out a feeding program for the early lactation cows consisting of 10 lbs. of hay, 20 lbs. of oatlage, 30 lbs. of corn silage. What he did was not really change the amount of hay that was being fed, increased the corn silage by 10 lbs. and increased the oatlage by 5 lbs. He put them on 25 lbs. of high-moisture corn which was 5 more lbs. than they had been getting and instead of a half pound of soy bean meal he added 6 lbs. of soy bean oil meal to the ration, 7 ozs. of mineral instead of a 4 oz. mixture and 2 ozs. of lime.

Here's the suggested ration. This was for group 2, 80 lbs. of milk: 10 lbs. of hay, 20 lbs. oatlage, 30 lbs. of corn silage, 25 lbs. of high moisture corn, 6 lbs. of soy bean meal, 7 ozs. of a mineral which the owner had on hand and he had a ton or so that he wanted to feed up so this was mixed with the mineral and in addition 2 ozs. of limestone, 3 ozs. of quartermix mineral and they were getting 50 lbs. of dry matter on that basis. But the protein was meeting the requirements, the TDN was meeting the requirements, calcium and phosphorus were meeting the requirements, manganese and so on.

Question: What was their average weight?

Answer: 1400 lbs., that was an average weight, I'm sure there were cows heavier than that and I'm sure that they weren't all giving 80 lbs. of milk a day. We were talking averages.

Question: What happened to them?

Answer: The results were not real dramatic. There was some improvement and a lot of these cows that had been on this deficient dry ration for long enough still had a lot of problems and he ended up dispersing the herd. This is a follow-up of a report of Dr. Davis who was involved in this before I was.

This guy was not easy to deal with. I'm not really that short with people but we had done a pyramid of investigation work between the blood labs, feed labs and the work we did on our first visit and when we got all this material and went back to the guy with our results to try to

help him out after he had talked to several other people for two or three years, and I'm not saying we were going to be the saviour or anything, but we did discover a few things that weren't quite right and so I started by giving him the results of the metabolic profile and when we were there on the first visit I said you have a lot of good quality feed here why don't you use more of that good hay and so on. Clinically I think we have a protein deficit here by clinical appraisal and he said they can't do that because it makes them scour more. If I increase the hay to them they just get looser and looser and then it is simply a mess. But anyway we got through the metabolic profile results and when that was over and the first thing he said was protein. And the guy says "Now I want to argue that with you for a minute" and I said, "Look if you want to argue you are not going to argue with us because we're going to be down the road and you are going to be arguing with that dumper". Sometimes you have to do that, maybe we don't do that enough.

Question: These cows were slightly anemic at least a little bit and were low on protein, but this gentlemen didn't report any increased incidence of anestrus cows or reproductive problems. That surprises me, because usually real anemic cows will, or herds that have this will have a much higher incidence of unobserved estrus.

Answer: I am sure he did not report any reproductive problems. He was happy or at least satisfied. This man did not seem to be overburdened with managerial expertise so maybe he had anestrus as well.

