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## Panel Discussion

Dr. James Jarrett, *Chairman*  
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*Question:* What about the feeding of 2% baking soda to reduce acidity and raise fat content?

*Dr. Troutt:* I don't know. We tried it—incorporating some baking soda in boxes as well as in limited ration and I do not think it stays long enough in the rumen to act as an adequate buffer. Perhaps we will have clearance on bentonite. This may act as a greater buffer. There is no question that you can depress rumen pH with the addition of baking soda but that depression does not persist long enough to be of value. I have tried it, but I would not recommend it.

*Dr. Morrison:* I have had experience with baking soda and the combinations with magnesium oxide and the results are poor. Same thing can be said of sodium betonite—it takes 5% approximately to have any effect. You might as well cut back on the grain in my opinion and get the same effect. Five percent bentonite is of no nutritional value.

*Question:* Do you prefer a roughage, particularly a corn silage, that has a high grain content or a lower protein content?

*Dr. Jarrett:* Before protein supplements went as high as they are at the present time, I would certainly take the high grain yielding silage.

*Question:* Without including any hay in the diet for a blended total ration, is the dairyman creating more problems than he can financially solve?

*Dr. Jarrett:* On our total silage programs we are now recommending that cows be taken off silage in the dry period and go to a rough, permanent type pasture with a good, coarse grass or be put on a hay program during the dry period.

*Question:* What percentage of crude fat limits do you recommend on total ration basis (based on 100% dry matter) and what fats are more digestible—for example, cottonseed, etc.?

*Dr. Bath:* We really do not build in a crude fat minimum because any ration you can come up with will exceed what the cow really needs. Two percent would be adequate for crude fat. The important thing fat adds to the ration is the energy that comes from it. Energy is one of the main nutrients that is needed and you can get more energy in the ration by adding things like whole cottonseed. We very successfully feed whole cottonseed under our conditions and it is excellent feed. It adds things other than the fat content however. It does have a fairly high fiber content and it is high in energy because of the fat. It is very digestible and because of this it helps to maintain the fat test and still get the energy up for high milk production. As far as minimum fat, you do not have to worry about it. You will fulfill it with almost any normal ration.

*Question:* What is your opinion of the multiple mineral feeding boxes for supplying adequate amounts of minerals to dairy cows?

*Dr. Morrison:* This is a good question and one that is not easily answered because trace mineral deficiencies vary from one section of the country to another. We better define the question a little better because in some places we have cobalt deficiencies and in other places we are liable to run into other trace mineral deficiencies. In some places we are running into problems with selenium, zinc problems and others. My general recommendation to my clients is that we do include all mineral supplements. I think they need to be in the feed or in the herd mix that is to be fed with a specific roughage. We analyze roughages for minerals and then we calculate what is necessary. I do not approve, frankly, of feeding cows their mineral requirements on a free-choice basis except

range animals. Personally, I put the trace mineral needs in the complete ration or in the herd mix. Therefore, I would not rely on a free-choice basis.

*Dr. Jarrett:* This has also been our attitude for most of the minor elements as well as the major elements. If one is deficient, we put it in. We do not rely on the self-feeder.

*Dr. Bath:* I agree also. This is very important. This is one of the big advantages of a blended complete ration. We know what a cow should have in the way of minerals and put it in the ration. Don't put it out free-choice—I do not think they will eat it right. There is no evidence to indicate that they will and we get into more trouble by putting it out free-choice than if we did not have it out at all.

*Question:* What is the best way to get enough hay into these cows since they prefer grain or a blended ration? What is the feeding schedule, technique, etc.?

*Dr. Bath:* Again, I would say the best way to get the amount of hay or any other roughage that you have in this ration into the cow is to put it all together in a complete ration. Then you know what is going on in there. If you know you have 60-70% hay in the ration, you're mixing it together, you weigh it out and you know that is what they are eating—it is mixed up. If you are feeding all the concentrates in the milking barn and then feeding hay free-choice you can be assured the cows are going to eat adequate amounts of hay that way because they do not have any choice except eating hay outside.

*Question:* Don't you lose the benefit of your long-stemmed roughage if you chop it up?

*Dr. Bath:* You don't have to. That does happen sometimes. We had about 40% roughage in our rations but it was put through a hammermill. If you need about 3" fiber, there are choppers and shredders that can chop it this length.

*Question:* What about cubes?

*Dr. Bath:* We probably use more cubes than chopped hay in these complete rations too. The cubes are about two to four inches long so we do have the fibers in the cubes that are this long also. Most of the people who are feeding a blended ration with the cubes also have some silage along with the grain and the cubes however. This tends to work out better because you can't separate the rations so much if you feed just the cubes. Some eat more grain and less cubes. The idea was that maybe we could put everything in the cube together but this does not seem to be working out too well. We've had some experiments at Davis that are just being published now and also some from

Washington that indicate that even though you have the roughage and the grain together the fat test is depressed for some reason. I don't really know why.

*Dr. Morrison:* There is a very basic reason behind this for chopped forages, for pelleted forages and for cubes. Any time you increase the rate of digestive passage through the rumen you are going to have a lowered fat test.

*Question:* Should blended rations be fed at the same level of all the lactation? Should optimum rations be closer to 16% crude protein for your highest producing milk production?

*Dr. Bath:* If you have a very high milk production herd, I think you can probably get away with this, and if you have a small herd it is not possible to divide them up into production level strings. This is the case in most of the country. In our situation, we recommend that they do change the ration at different stages of lactation. I think you will get a better efficiency utilization if you start out with a ration that is somewhat higher in concentrates. We do not recommend extremely high levels of concentrates until you get into the problems Dr. Troutt was talking about. A cow in her early lactation does need more energy in her ration and we would like to reduce the concentrates and increase the forages in the total ration as the lactation goes along, but not to the point that she would not gain back some weight at the end of lactation. We do like to reduce the concentrates somewhat. You can do that when you have an average herd size of 250 or 300 cows. If you're going to have cows in different corrals or strings anyway, this can be done quite successfully.

The other extreme is done in Southern California also. A lot of herds for a long time have been fed the same ration and rather than feed according to production, they'll cull according to production. A cow has to meet a certain minimum level; if she doesn't, she goes to the butcher! This works! If you have a high enough level of production and a high enough price for your milk, it works quite successfully. I think it depends on your situation.

*Dr. Morrison:* I agree very strongly with this except in a very small herd or where you have very average production. I'm very much in favor of segregating your cows according to production stages of lactation and feeding different rations. I think now with the interest in urea, as I pointed out in my talk, we're going to have to do this, at least for part of the herd. You're going to have to have two definite rations. And also, frankly, I believe in dry cow rations. Some people may not

be with me on that. Not much was said about dry cow rations. This is a very, very important subject in determining dairy cattle health.

*Dr. Jarrett:* From a technical standpoint—amen! My comment from a clinical standpoint on this total ration concept in nutrition is that in my experience you've got to have a good reproductive health program and get that calving interval down. You get it down around 14 months, then you are going to run into the "fat cow" problem as well, because cattle are staying in the milking line too long and are not going through the cycle at the rate they should.

*Question:* Would you discuss the browning effect of feed in harvest storage.

*Dr. Morrison:* The browning effect refers to the destruction of protein by heat. I question whether there is much of this occurring in harvestores. I think more of this would occur in tall silos where you have inadequate moisture in the forage to be ensiled, or for instance in trench or pit silos. If you have inadequate moisture you will have brown hay. Actually, the result with brown hay is that it is very high in dry matter and apparently low in moisture. The animals like it very much and they seem to do very well. I frankly feel that this type of thing is over-emphasized.

*Question:* What abomasal changes did you see in the cows with fatty liver?

*Dr. Troutt:* On one cow when we had complete necropsy materials available we saw inflammation of the abomasal mucosa. We did not see any ulcerations or evidence of erosion.

*Question:* What is your treatment for left displacement?

*Answer:* I don't really have a standard way of treating. I prefer the right flank approach. Obviously, that is surgical correction. I have not had extensive experience with the so-called blind approach to correction of abomasal displacement. I think I will continue to use either the right flank or the abomasolpexial approaches. There is an association between abomasal displacement and ulceration of the abomasum. So we do administer magnesium hydroxide. We treat these animals intravenously as well, checking the electrolyte status. We administer 300 cc of calcium solution intravenously. I like to use a lot of dextrose. On large Holstein cows I try to give perhaps 750 cc 50% dextrose in the fluids. I like to hold those cows off grain and feed them hay about two or three days post-surgery and then gradually re-introduce them to their grain ration.

*Question:* Are cows moved from one pen to another when production changes?

*Dr. Bath:* Sometimes. About half of the dairymen are trying to feed according to production strings and say it works fine. The other half say you cannot do it. The obvious problem is that when you move cows from one pen to the other, you have to reestablish pecking order—there is some fighting between cows and sometimes the cows that are moved tend to drop excessively in production. This is a problem. However, there are some very high-producing herds that routinely move cows every month after the DHIA test. They will move groups of cows though, not just one cow at a time. They might move half a dozen or so cows from one pen to another. This seems to minimize that problem. I think it is much better if you have enough corrals and enough strings within a herd just to change the ration of the total string as it moves through lactation. But in many cases, we do not have adequate corrals to do this and then it is necessary to move cows between strings.

*Dr. Morrison:* I agreed with you once and now I am going to disagree because conditions in California (I taught out at Davis for about a year, so I am familiar with conditions) are entirely different than in many dairy sections. Where you have herds that are kept in confinement, more or less the year around, usually in stall barns, I do not feel that milking strings ought to be changed. I have run into quite a few problems in various areas of the country where they have tried to switch cows from one string to another and you run into all kinds of problems, particularly through the milking arrangement. This has been my observation in close confinement. I think in California you have larger lots, better climate, etc.

*Question:* Can animal or vegetable fat be effectively used to add energy to rations for extremely high producing cows?

*Dr. Bath:* Yes, it can be, but I think in very small amounts, not to the extent that you can in fattening rations for beef cattle. If you get very much fat, particularly unsaturated fat, added in the dairy ration you are going to have the depressed fat test. It effects the metabolism in the rumen, the bugs that Dr. Troutt was talking about are affected adversely. We do not get a normal fermentation. There is one possibility that is being looked into to try to get around the problem with the abnormal ruminal fermentation. When we add fat, because obviously we need the higher energy we could get from the fat, we should use the coated fats. I believe they are using formaldehyde casing. There is some work being done right now which indicates that you cannot bypass the rumen with this kind of addition to the ration. The USDA has reported

it and now there is some work in California being done along this line. It is mainly to increase the polyunsaturated fat content of the milk products that they are doing this, but it is possible that they may use these to increase the total energy intake of the dairy cow. But it is in the experimental stage right now.

*Dr. Morrison:* Frankly, I feel that added fat is a benefit in dairy diet lots of times, but you should not put more than 2% added fats over the amount that is in the ration which is normally around 3% or thereabouts. I think any time you go much over 5% in total fats there will be trouble.

*Question:* Does steam heating of the ration improve the value?

*Dr. Bath:* Again, this is prognostic in the beef work. The steam process of the grain does increase the digestibility and the gain of beef cattle, but again it causes depression in fat tests. Many of these things that are good for beef cattle are not good for dairy cattle, because what is good for the dairy cattle is to increase that protein. You need the acetate for the milk fat production and for normal ruminal fermentation. She's going to be around, hopefully, for many years rather than in the case of a beef animal which will probably be

slaughtered in two years. We do not worry so much about what is happening to them. But for the dairy cow, if we have the complete ration that way, I think we would have a fat test problem.

*Question:* When you get your calcium level at 0.7%, do you believe you supply the high producing cows with enough calcium?

*Dr. Jarrett:* I am certain that this cow with high level milk production which receives a total ration with .7% calcium would receive enough calcium to produce up to 80 to 90 lbs. of milk a day. I cannot be specific on grams without knowing more about the requirements.

*Question:* How much phosphorous should be put in the ration?

*Dr. Morrison:* We run pretty close to the NCR requirements but we have increased them slightly. Usually our ration will run between—well, it depends on what level of production you want to realize—but usually about a minimum of about 45 grams to around 90 grams of phosphorous per head per day. But some good cows will run over that.

*Question:* Do you use the same ratio even if you feed a lot of alfalfa?

*Dr. Morrison:* Absolutely!