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Calf Note #153 – Know your additives!

Introduction

I recently completed a “tour” of calf raising operations in several parts of the U.S. – West, Central and South. I was surprised at the variation in how people feed calves and how waste milk is used in various programs.

Some producers use waste milk for their youngest calves, arguing that the greater nutrient content (milk is about 26% protein and 28% fat on a DM basis) is better for calves less than three weeks than milk replacer. Others fed waste milk only to their older calves, arguing that the variation in nutrients and presence of antibiotics was too difficult for the youngest calves to deal with. Still others mixed waste milk with fresh milk, milk replacer or various combinations. Interestingly, each was convinced that their approach was the best and other approaches wouldn't work on their operation.

Amazing additives

But the most surprising observations I made at these operations was the wide range of additives being added to waste milk (and even milk replacer). And how some producers actually understood little about why they used their additives. I don't want to implicate every producer – some were very knowledgeable regarding their nutrition. However, some producers made elementary mistakes in how products were fed and why. A couple of examples follow.

Double medication. We arrived at one operation in the early morning to observe milk feeding. Waste milk from the dairy had arrived about a couple of hours earlier and had just finished pasteurization and was being mixed with “a couple of products” to make the milk more nutritionally complete and keep scours down (according to the calf manager). I took a look at the first product – a neomycin/oxytetracycline blend from the local veterinary supplier. It contained a full dose of antibiotics to control scours. The calf manager said that it helped control diarrhea, especially in the young calves. We looked at the second product – a vitamin/mineral mix to supplement whole milk. It provided high levels of vitamin A, D, E, iron, selenium and a couple of other minerals. It also contained a full dose of neomycin and oxytetracycline. These calves were getting TWO doses of antibiotics in their milk every day! When I pointed this out to the calf raiser, he said that he had purchased the supplement product from the feed rep. The calf manager assumed that the feed rep knew they were feeding the neo/oxy product. However, the rep never looked at the feeding operation and didn't know they were feeding it.

So what of the calves? They seemed OK. Scours were under control and calves appeared healthy. However, they were feeding violative levels of antibiotics and the calves' health could be at risk. High feeding of antibiotics can kill off the normal intestinal (and potentially ruminal) bacteria, upsetting digestion and making calves MORE susceptible to diarrhea. The risk of calves retaining antibiotics in their tissues was also much greater. I recommended that they immediately stop feeding the first product (the neo/oxy) and the entire milk feeding program should be reviewed to look at duplication and – incidentally – cost savings.

Medicated CMR. We know that waste milk can vary in solids content (for more information, see [Calf Note #148](#)). More and more producers use a refractometer to monitor CMR solids and add additional solids to standardize solids content.

Joe raised about 1,000 hutch calves for several dairies in the Southwest U.S. His waste milk came in from these dairies and ranged from about 9% solids to about 13%. The variation didn't seem to be consistent (though he didn't record the solids content to analyze that variation). His calf feeders measured solids daily and then added different amounts of CMR depending on that day's solids in the milk. The CMR was a 20/20 product that contained neomycin and oxytetracycline. I asked him about the CMR as I didn't realize that manufacturers still made many CMR formulas with medication. He told me he asked for it specifically as the medication "helped the calves with the scours". I told Joe that the addition of the relatively small amount of CMR he added daily per calf (about 240 grams to raise the 6 L of milk he fed from 9 to 13%) wasn't providing an effective dose of antibiotic. Adding the CMR was only going to increase the risk of developing antibacterial resistance and minimize the effectiveness of antibiotics when he really needed them. I recommended that he replace the medicated CMR with a non-medicated variety.

Probiotics and antibiotics. One producer I visited in California was a big believer in using probiotic bacteria to help his calves maintain healthy digestion. He had read the research (including [Calf Note #91](#)) and had conducted an on-farm trial with a probiotic product several months before my visit.

Recently, however, the cost of CMR forced the producer to switch from using only CMR to a combination of waste milk and CMR. The waste milk came from the home dairy farm (this producer raised calves for the 3,000 cow dairy) and was a combination of hospital milk and excess colostrum. I asked him what the chance that the waste milk contained antibiotics. "Pretty good" he said "That's why we can't sell the stuff". I pointed out that probiotics are bacteria and susceptible to the antibiotics in the waste milk he was feeding. Although the amount of antibiotic in the waste milk varied from day to day, there was still the potential that levels would be high enough to inactivate the bacteria he was trying to feed. I suggested that perhaps the probiotic approach wouldn't be effective if he blended with antibiotic-containing waste milk.

Heat and protein. The final example came from a dairy using egg protein as a source of “functional proteins” (i.e., antibodies) to help deal with a salmonella challenge on the farm. The calf manager (Jose) heard from a colleague that egg proteins can contain specific antibodies against organisms and wanted to try them. Jose used waste milk from the dairy that was pasteurized prior to feeding. It was more efficient for him to add the egg powder to the waste milk before pasteurization. The mix was then pasteurized using high temperature, short time pasteurization.

It's clear that some proteins will be denatured at high temperatures. I'm not 100% sure that egg antibodies will survive pasteurization – perhaps they will. Perhaps they won't. I suggested to Jose that he could minimize the risk of protein denaturation (and loss of effectiveness) of the egg powder if he added it **AFTER** pasteurization. Presumably, the product didn't contain large amounts of bacteria, so there was no need to pasteurize the egg powder. Jose thought this was a prudent step and said he would alter the protocol to add the egg powder after pasteurization.

Summary

It's important to know what you're feeding to your calves. Take a look at the entire program in total. Consider not only the nutrients, but also the additives you feed. As our feeding programs become more complex and sophisticated, it's easy to overlook duplication of nutrients or even antibiotics. Understand, too, how your management can interfere with the intended purpose of the additives you use. And, remember, we haven't found anything to put into a bag that can replace good management. Careful attention to detail and an eagle eye on your calves will help you be most effective when you choose to use a feed additive.

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