Are we feeding what we formulate? (part 2)

by Steve Martin

WHEN I hear the word "compliance" and the phrase "procedural drift" in a dairy production environment, I can nearly guarantee the subject is either reproduction or milking. As technology on dairies has become more complex, the need to build systems and protocols to be sure of success has become paramount.

When dealing with getting cows pregnant, it is a must that the human effort and technology used are coordinated to impact the biologically rigid reproduction system of a cow. Though we can "restart" her monthly clock, the uterus and ovaries are still in charge. The intended result is a confirmed pregnancy.

Similarly, in the milking parlor there is a confluence of people, machines, pulsation, vacuum, and a clock that are all coordinated to harvest milk the way the cow's udder is designed to work. Success is measured by milk flow, somatic cell count and the health of the udder.

In both instances, while considering the cow's reproductive organs and hormones along with more hormones and the mammary system, we build very specific protocols to work along with biological systems to achieve the intended results: a pregnancy and high quality milk. So compliance in these areas is necessary to obtain the desired goals, and it involves training and re-training. The reality of procedural drift and employee turnover result in a nearly constant state of perpetual schooling.

I don't think we've taken this same level of effort and attention to detail into the feeding center. Sure, we talk about loading errors and mixing time and we have feeder schools, but have we really respected the mixer wagon as an instrument of dairy production on the same level as we have the uterus and the udder?

Instead of details related to follicles, CLs, milk letdown and pulsation, the mixing effort relates to knives, augers, kickers, RPMs and capacity. There is no less effort involved in making a near-perfect TMR load than there is to get a cow pregnant or to milk her out correctly. Feed-mixing details and protocols need just as much attention and training.

Loading order and size of the desired mix may top the list of details. At what volume was the mixer designed to mix well? It is likely **not** the level at which feed starts falling over the edge. Exceeding the desired amount reduces the chance of a well-blended TMR. This **must** be checked just as regularly as pen counts, intakes and ration density changes. Just because it was right when you set up the load in your software doesn't mean it will be right a month from now.

There are two goals at work here and the issue of mixer fill relates to both. We first need the mixer to completely blend the added ingredients so each bite is uniform. Usually, but not always, some particle size reduction is required. If we have the correct amount of space filled inside the mixer, no matter the pounds, then these two things can happen successfully.

One challenge is that some ingredients need more particle size reduction than others. So, intuitively, we put the longer ingredients in earlier to give them more time for cutting. But this is where the mixer differs from the uterus or udder. Whereas every cow has the same rules related to breeding and milking, every TMR mixer is different. And every mixer is even different from itself over time. Metal wears and must be taken into account. So mixing time, loading order, and total load size are all moving targets!

My early years of formulating dairy diets were spent in and around Stephenville, Texas. In the early 1990s this was a growing dairy market where the local cow count had far outpaced local forage production. The result was trucked-in alfalfa hay, and lots of it. Whereas most of my current diet formulations contain 0 to 10 pounds of hay, those early-90s Stephenville rations contained as much as 20 pounds.

Understanding newer technology now about things like uNDF and eNDF, I now see how both diet types work. But the mixing approach then compared to the mixing approach now couldn't be more different. Likewise, the desired shaker box results are quite different.

We used horizontal mixer boxes to nicely blend and precisely cut this high quality alfalfa hay to build a nice, but hairy, TMR that kept cows healthy and supported good milk production. Now, some 25 years later, I don't run into many horizontal mixers. The ability of vertical mixers and their more aggressive cutting ability has allowed for a variety of long roughages to be easily processed and nicely blended for better consumption. But at what cost? Is there a downside to these aggressive, high-RPM cutting blenders?

I recently added a new client and at my first visit to the farm I was surprised to see a horizontal mixer wagon. I must admit I was a little disappointed. It had been quite some time since I had seen one at a large dairy. I also saw the mixer before I saw the TMR in the bunk, and I wasn't sure what to expect. As I turned the corner toward the first feed lane I must say I was quite surprised.

In the bunk was a nice, bulky ration. I stood and contemplated this. My first impression had less to do with the ration I was looking at and more about other rations I see every day that are built using aggressive vertical mixers with knives and kickers all around. It made me ask myself, "Are we overprocessing corn silage in most if not all rations?" When looking at that nice bulked-up (but not too much), fluffy (but not too fluffy) and really nice TMR, I became convinced that the aggressive mixing being done with most vertical mixers is beating up the corn silage.

In shaker box lingo, vertical mixers take corn silage roughage and move it from the second shelf to the third. This horizontal TMR mixer that blends but doesn't cut leaves the ¾ inch theoretical length of cut pretty much unchanged from the chopper in the field all the way to the cow's mouth. And these particles stay in the second shelf of the shaker box.

This really made an impression on me. No matter if it is corn silage, sorghum silage, or small grain silage, the chop length at harvest is likely the correct length in the bunk. It is nearly perfect for maintaining cow health and supporting high intake for high milk production.

So what am I to do with all of the revelations from that day? Well, I am not suggesting everyone run to the dealership and trade in their vertical mixer. But what can we learn from my observation? Sure, vertical mixers complete with knives are necessary for bulkier dry cow and heifer rations. And these same mixers are used to make lactation loads. So the more logical question is how can we minimize over-processing but still take advantage of the mixing power of verticals?

The answer is to go back to the basics of loading order, load size, mixing time, and use of knives. In nearly every case it is advisable to put high-inclusion silage as late in the order as possible to preserve particle length. In addition, mixing even one minute past complete blending means over-processing begins and should be avoided. Knife management is also driven by the goal of chopping just enough to get the material completely blended and taking great care to not over-cut.

Knife replacement is also a point of potential failure in providing a healthy TMR. They should be changed on a strict schedule, with the goal to maintain a certain "cutting ability" that matches the type of roughages used at the dairy. Be sure to never change out all knives at once. The cows will likely let you know after making such a mistake.

The "edgy" recommendation that could be made here is every dairy needs to have two types of mixers. One would be for mixing high-silage, high quality alfalfa lactation rations that just need blending with little or no cutting. Another mixer could look like a cutlery convention on the inside that can easily transform the roughest forges into nice, palatable dry cow or heifer rations.

But since this two-wagon approach would be a hard sell even on the largest dairies, a better recommendation is to use techniques that insure the wagon used for milk cows is not over-processing roughages.

We often wonder why we have some gut issues in cows even on very well managed dairies. Some of the answer may be in this discussion. Cows were designed to eat roughage that hangs out of both sides of their mouths when being eaten. This long material does what was recently described to me by a dairy herdsman as, "it keeps the rumen busy".

What a great description by a guy who has had to stay late before doing DA surgeries or pumping pink pills into cows. We can't forget that these cows need roughage first and nutrient density second.

The next time you meet with the breeders to discuss and implement a new shot protocol, or when you are designing a detailed milking procedure poster for the breakroom, ask yourself this question: "Have I gone to the same amount of effort designing protocols and picking the correct equipment to build, mix and deliver the best rations to my cows?" Making real improvements in this key area of the dairy will insure that you are feeding for the bottom line. *WEST*

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