

Watch Mixer Scale Accuracy
Dean Ross
Regional dairy Agent
MSU Extension

When was the last time you thought about the scales on the farm? Particularly the scales on the mixer wagon. The inaccurate mixer can affect the bottom line of any farm in a hurry. Billions of dollars are spent in the U.S. on ration formulation, feed additives, forage production, nutritional consulting, grain production and purchased feed. Yet ration mixing rests on the ability of the mixer scale to tell us accurately what was fed to the cows. If the scales are out of calibration then all the nutritionists in the world can't deliver the planned milk production from the ration. And the expense put into the ration will be wasted. So what types errors are common for these electronic scales?

There are two basic types of scale errors. The first type of error is signaled by a scale reading that is incorrect by a consistent amount across the range of the scale. An example would be a scale that has an error, which adds an extra 25% to the total regardless of the total weight. It adds 25% to 100lbs and it adds 25% to 3000lbs and 25% to 6000lbs. The second type of error results in a reading that is incorrect, either adding or subtracting weight, yet has no correlation to the correct weight. An example of this is a scale that adds 25lbs to a 100lb-sample measurement adds 150lbs to a 400lb-sample measurement and adds 400lbs to a 6000lb-sample. In either case, the results of these errors means that the amount of feed added to the mixer, as the ration is prepared is not what planned for the cows to get. Something altogether different from the mixture intended or the amount planned is being delivered to the cows. If that is the case why did you spend so much time or energy on planning a nutritional program at all? It is not making any money for you now.

How can the presence of errors be detected? Primarily through testing. For homegrown on-farm testing, known weights (Perhaps tractor weights) can be placed on the mixer and to determine if it is measured correctly. Testing the scale at several different weight levels is usually necessary to see if there is any discrepancy at different weight levels. When testing a larger capacity scale, larger test-weights are needed than when testing a smaller capacity scale. Testing a 4-ton capacity scale system using only a 150lb weight is not going to be effective. The scale needs to be tested up to a weight near the scales capacity to determine if a trend in error exists. An alternate methodology for testing is weighing the entire mixer on a truck scale, both full and empty, and comparing the differences to the mixer scale measurements. This of course means the truck scale needs to be known as accurate as well and that requires regular maintenance by professionally trained and equipped personnel. In either case the goal is to identify whether the scales currently in use are measuring the ration mixture correctly. There are also scales system dealers who will test accuracy for a fee or under a maintenance contract.

Another concern for mixer scales is breakdown or errors related to wear or cleanliness of the scale parts. The simplest preventative measure on most dairy farms is scheduled inspection and cleaning. The construction of some mixers provide opportunities for fouling of the weigh cells with mud, manure or spilled feed to a point where it interferes with the movement and operation of the weigh cell. Similarly, weigh cell wires that have been broken or pulled free are more common for some styles and manufacturers of mixers. The design of some mixers routes the cables from the weight cells in such a way that they are exposed to potential snagging or damage. Again, regularly scheduled inspections, potentially in conjunction with lubrication and cleaning, will help identify any damage or scale errors that could compromise the accuracy of the system and compromise the effectiveness and cost effectiveness of the ration. Because the mixer scales on dairy operations are so important to the management of feed costs it is imperative to consider and control the accuracy of those scales.