Mixer Management

Feeding your cattle a total mixed ration with accurately weighed ingredients has been shown to improve daily gain, feed efficiency, and lower the cost of gain with a benefit value in the $30-50/head range. Feeding a poorly mixed diet will negate the advantages of feeding a TMR.

Mixing

1. Mixing times - start with the manufacturers recommended times, and then check your mix using one or more of the testing methods listed below. In general, figure on 3-4 minutes after the last ingredient for reel type mixers, 4-5 minutes for 4 auger mixers, and 5-7 minutes for vertical mixers mixing high concentrate rations.
2. Make sure the mixer is level so that the load cells weigh accurately.
3. Do not overload the mixer, proper mixing depends on feed being lifted and falling. If you can't see the top of the augers or reel the ration will not be mixed properly.
4. Don't use ingredients with too small of an inclusion rate. The guideline is that inclusions should be at least 5 times the scale accuracy, so if the scale works on 10 pound breaks the smallest inclusion should be 50 pounds of any ingredient.
5. Check your PTO speed for proper mixing - a general recommendation is to run the mixer at ¾ PTO speed. Mixer augers should rotate at least 5 to 6 RPM and reels should turn at 4-6 RPM depending on the size of the reel.

Sequence and Loading - the loading sequence will vary with mixer design. These recommendations are specific to feeding beef cattle and using QLF, so they may not be the same as from other sources.

In general, horizontal mixers work best for higher concentrate rations and in this order:

1. Grain	2. QLF	3. Co-Products	4. Silage	5. Ground Hay

Vertical mixers work better with high roughage diets, and they need some weight on the hay for it to mix properly so the recommended order is:

1. Hay	2. Silage	3. Grain	4. QLF	5. Co-Products

While loading, be sure that the smaller inclusion ingredients land on the feed and not on the mixer sides or augers to ensure that it all gets mixed through the ration. A distributer T for liquids is recommended to distribute the liquid over a wider area of the mixer.

Testing – you can test the mix of your wagon in several different ways. Testing the mix at different mixing times can verify for you what the proper mixing time should be.

1. Shaker Box – use of the Penn State Shaker box can help determine particle size distribution in the ration. Take at least 5 equally spaced samples from a full mix and compare the results on each screen; the co-efficient of variation should be less than 5%.
2. Lab samples -take at least 5 equally spaced samples from a full mix and test each of the samples for dry matter, protein, NDF, calcium, sodium, zinc, and/or Rumensin. The variance should be less than 5% for major nutrients (Dry Matter, Protein, NDF, etc) and less than 10% for lower level nutrients (calcium, sodium, zinc, Rumensin, etc).
3. Markers -food grade dies, candy corn, red hots candy, small carrots and packing peanuts have all been used as markers to test for thorough mixing. This would be the least accurate, but also the least costly and time consuming of the three methods. You would need to add enough so that you can measure significant differences from sample to sample. Again take at least 5 equally spaced samples from a full mix and count the number of markers in each sample to check for uniformity of the ration across the bunk.

Hay Processing

1. Vertical mixers are designed with the ability to process hay, and hay kits can sometimes be added to horizontal mixers.
2. While it is convenient to be able to process and mix with one piece of equipment, there are downsides to this as well.
3. Mixers designed to act as processors as well as mixers normally require greater PTO horsepower and weigh more than mixers without processing capability.
4. The time and fuel required to process one bale in a vertical mixer is often greater that the expense of having your hay custom ground ahead of time and does not process the hay as consistently for particle size.
5. If you process a whole bale for the ration, your ration size is now determined by the weight of the bale instead of by the weight needed to feed the cattle.

Maintenance

1. Be sure to follow the recommended lubrication schedule.
2. Clean twine and bale wrap from the augers regularly.
3. Check your load cells and scale at least once a year with a full load – using your body weight or bags of feed is not enough weight to check for inaccuracy.
4. If the mixer is also used for processing hay be sure to keep the knives sharp and replace worn kicker plates.

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