

# TMR mixer checkups do matter

We can't put our blinders on and only look at a diet's input costs. We must evaluate all factors that affect what ends up in the feedbunk.

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**T**HE total mixed ration (TMR) is an efficient and effective method to feed high-producing dairy cows and has been universally adopted on today's dairy operations.

Yet, many factors can lead to significant TMR inconsistency, resulting in suboptimal milk production, components and potential herd health issues. Potential variances at each step of the feeding process can cumulatively add up, resulting in a TMR at the cow level that is very different than we expected.

## Errors are costly

Since feed costs comprise the highest percentage of total production costs, this is a critical area that needs regular scrutiny and discussion. Minimizing input costs is certainly important, but what about the opportunity cost of a poorly mixed and inconsistent TMR?

Let's put this into perspective by looking at an example of a 500-cow dairy where we could potentially save 10 cents per cow and theoretically maintain the same production,

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components and herd health. This adds up to a significant savings of around \$18,250 per year.

On the flip side, what about the effects of an inconsistent TMR? A diet might seem low cost on paper, but a 2-pound milk drop due to inconsistency would add up to \$65,700 per year of lost income using \$18 per hundredweight milk. This example shows the financial opportunity of improving TMR consistency.

## Bunks rarely match paper

As nutritionists, our goal is to provide a well-balanced TMR formula that will maximize production, components and health at the lowest cost possible.

Nutritionists spend an exceptional amount of time evaluating different combinations of homegrown feedstuffs, by-products, proteins, minerals, vitamins and various additives. We use sophisticated ration formulation and modeling programs that predict nutrient intakes to the fourth decimal point. This is all great technology, but it needs to come together consistently in the TMR.

So, how do we know that we are achieving a consistent and nutrient-balanced diet at the cow level? What about the mechanics and

maintenance of TMR mixers?

Like the milking parlor, the TMR mixer is used 365 days a year and is a critical machine that needs to be well maintained. Most dairies have a milking equipment maintenance plan to check, repair and recalibrate equipment on a regular basis. When lacking, issues such as poor milk let-down, teat end damage and higher mastitis rates will occur.

This same thought process should also apply to our TMR equipment.

Even though your nutritionist can provide a nutritionally sound ration on paper, your goals will not be met without a finely tuned TMR mixer. Recognizing TMR equipment issues is not easy since the majority of the actual mixing hardware is not visible to the feeder. Many TMR audits conducted in the last few years have uncovered poorly maintained equipment as one of the main issues. Work with your nutritionist and your equipment consultant to make sure your TMR mixer has regular checkups and is working at peak performance to ensure a consistent and profitable diet.

With that in mind, the top five issues with vertical, horizontal reel and horizontal auger mixers are highlighted in the boxes below:

### COMMON VERTICAL MIXER ISSUES

**1. Incomplete mixing or "dead spots" in the mixer:** This is due to worn or improperly adjusted auger lead-edge scrapers. Scrapers pull the feed from the sidewall onto the auger to ensure the mixing process. Adjust or replace scrapers as needed.

**2. Overprocessing (excessive particle length destruction):** Reduce loading time while the unit is running, shut off the PTO (power take-off) for a portion of the loading period, or shift the gearbox to a slower mixing speed while loading preprocessed ingredients.

**3. Too much feed left in mixer following cleanout:** Operate the mixer in high speed at rated PTO speed during final cleanout, adjust scrapers and kickers, and allow enough running time for final cleanout.

**4. When processing bales, large wafers of the bale float to the top of the mix and are not broken up as additional ingredients are added:** Full bales should be added first for breakup and processing, and the complete bale should be broken up, including the center core of round bales, before adding heavier ingredients such as silage, haylage and so forth.

**5. Excessive use of horsepower/fuel:** Long loading periods, use of the vertical mixer when processing is not needed, and worn augers or knives result in extended mixing periods that burn extra fuel.

### COMMON REEL MIXER ISSUES

**1. Overfilling:** Allow enough free space in the mixer for material to tumble within the reel.

**2. Minerals/fine ingredients not mixing in properly:** Replace wipers on reel arms. Replace reel springs (standard reel) to maintain reel-arm-to-mixer-floor contact. Add fine ingredients early in the loading order, not at the end of the batch.

**3. Long-stem hay "surfing" on top of ration and not being broken up:** Add hay early in the ration, and allow processing to occur before adding other ingredients. Use hay processing kit to enhance the processing capability of the mixer.

**4. Unwanted particle length destruction:** This could be due to excessive mixing time. Inspect augers for wear. If the auger fighting is worn and razor-sharp, reflight or replace the augers. If augers are not worn, consider removing knives if processing is not needed.

**5. Long-stem hay not processing or mixing into the ration or too much long hay (greater than 20 percent):** This is caused by too slow of a PTO speed during processing. Run the mixer at full speed while processing long hay. Utilize preprocessed hay from balers with knives and cutters when possible. Use hay processing kit and full set of upper auger knives to help process long hay.

### COMMON HORIZONTAL AUGER ISSUES

**1. Unwanted particle length destruction:** This also could be due to excessive mixing time. Inspect augers for wear. If the auger fighting is worn and razor-sharp, reflight or replace the augers. If augers are not worn, consider removing knives if processing is not needed.

**2. Dead spots on top and in corners:** If dead spots are present on top or in the corners, the batch size should be reduced to prevent overfilling of the mixer.

**3. Mixer not cleaning out properly:** Elevate PTO speed during the TMR mixer's final cleanout. Inspect for auger fighting wear; a worn auger fighting will not sweep the feed materials along the floor properly. Reflight or replace augers as needed for better mix consistency.

**4. Long hay not mixing into ration properly or too much long hay (greater than 20 percent):** Reduce the volume of long hay that is being used in the ration. Use preprocessed hay when possible. Add long hay first, and allow sufficient time for the mixer to process hay before adding additional ingredients.

**5. Improper or slow mixing:** Run mixer at rated PTO speed.

To achieve production, health and profitability goals, your TMR mixer needs to be in tip-top shape.