IMPROVED FEED EFFICIENCY
Through Compact TMR

Practical experience shows that cows on a total/partial mixed ration (TMR/PMR) too often sort their feed. Feed sorting can have major negative impact on herd health, performance and efficiency. It results in an increased standing time at the feed bunk, and high ranking cows often get more of the concentrates, leaving straw and other less palatable components to the low ranking cows.

Compact TMR addresses this problem, and ensures that all cows in a feeding group have unlimited access to a feed mix that cannot be sorted. All cows eat the planned ration, in a stress free environment, in a minimum of time, resulting in higher precision in feeding and more time for resting.

Compact TMR achieves this through two main principles:

- Access to sufficient feed for all cows, including the low ranking cows, is guaranteed by working with a feed stuff surplus of minimum 2% of the amount fed (approx. 1 kg/cow per day).
- Feed sorting is avoided by ensuring that all feed components are mixed so thoroughly that all individual feed components have disappeared and the mix to the cows is one feedstuff in a uniform mass.

FARMER CASE

André Katers was one of the first farmers in Denmark to adopt the Compact TMR feeding concept for his 300 cow herd of Holsteins milked with four Lely AMS at the time. With Compact TMR, André has increased the energy concentration in the mix and reduced the amount of concentrate fed in milking robots. By combining good cowmanship and robust feeding, André has increased production with 2000 kg of energy corrected milk per cow per year in the period with Compact TMR. It is however important to note that this increase cannot be attributed solely to the use of Compact TMR, since some other elements in the feeding also changed. The herd has consistently been in good health and many heifers and young cows have been sold. Culling caused by health problems has been reduced. For André, Compact TMR has been the most profitable initiative taken within 20 years of continuous optimization of his dairy production system.

However, changing to Compact TMR was not easy. The mixer wagon had to be optimized with auger shears to ensure a proper flow in the mixer wagon. The cutting length of both grass and maize silage had

to be reduced to achieve a more compact mix with a vertical auger mixer. Also, André still needs to inspect the mixer wagon to ensure that the feed is moving. However, André plans several tasks during the time it takes for mixing (structuring and finishing), to avoid that this time is being wasted. It can be moving hay to the calves, preparing rolled barley, moving cover from the silage silos and cleaning the feed bunk.

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Mixing Compact TMR step-by-step

Mixing is done in standard vertical- and horizontal auger mixers, and is done in three main steps. During the soaking phase the dry components of the ration (pelleted feedstuffs and commodities) are soaked in water for at least 1 hour (or overnight). During the structuring phase (middle-mix), grass silage and other fibrous feedstuffs are loaded and mixed (15-20 min). These components will act as the 'skeleton' of the mix. This is then followed by the finishing phase (final-mix), where maize silage is loaded into the mixer and mixed (15-20 min).

How much water should be added?

The amount of water needed to soak commodities and pelleted feedstuffs depends on the ration and on the DM content of silages added to the mix. Start by using equal amounts of water and dry feedstuffs. Adding too little water is a much more common problem than adding too much water. DM content of the final

mix should be 35-37% for vertical auger mixers and 39-40% for horizontal auger mixers. With tumble and paddle mixers a DM content of approx. 35% is recommended.

Evaluating the mix

Check the mix

The mix has to be a homogenous mass. No particles should fall out, and there should be no visible lumps of grass in the mix. Particles have to stick to the grass 'skeleton'. No particles should be found under the pile of feed in the feed bunk, to avoid cows sorting on the floor.

Check leftover mix

Leftovers are crucial to test if the ration has been sorted by the cows. They have to appear as identical to the mix that was fed. Leftover mix should also be tested for deterioration. If leftover mix tends to warm, this indicates that the feed mix is not stable. Unstable ingredients need to be replaced or the mix has to be preserved with acids (2 - 3 L of propionic acid per ton of mix).

Check the mixer wagon

It is important to inspect the flow during mixing. The feed has to move in the mixer. If not, the mixer has to be adjusted. Typical adjustments of vertical auger mixers are mounting of auger shears / shoes / plates on the base of the augers, to ensure that the mix does not build up along the sides of the mixing chamber. A mixer will wear out during use and the flow in a worn-out mixer can change. That's why the mixer has to be inspected regularly.

Check how the cows react on the ration

Cows used to compact TMR, with a surplus of feed mix, won't rush to the feed bunk when new feed is distributed or pushed in. When eating, the cows will eat from the top of the pile without making 'birds nests' from eating on the floor.

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