

Optimizing feeding management of dairy cows

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The problem is...

- There is more than one ration found on every farm!
 - There is the one formulated by the nutritionist

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- There is more than one ration found on every farm!
 - There is the one formulated by the nutritionist
 - **There is the one that is delivered to the cows**

Is the feed delivered the same as what was formulated?

In a study of herds in Canada the average TMR fed...

- Exceeded TMR formulation for
 - NE_L (+0.05 Mcal/kg)
 - NFC (+1.5%)
 - ADF (+0.5%)
 - Ca (+0.1%)
- Underfed TMR formulation for:
 - CP (-0.4%)
 - NDF (-0.7%)
 - Na (-0.2%)

Sawyer et al., 2014, J. Dairy Sci. 97:562-571

First step in ensuring cows eat the right ration:

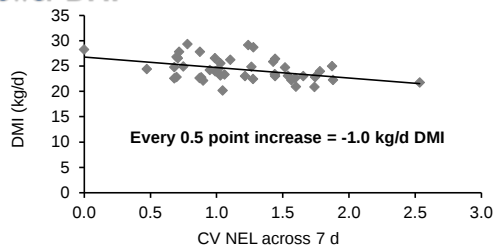
- Ensure that feed delivered mixed matches that which was formulated

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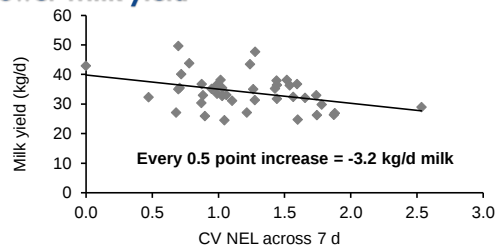
- Ensure that feed delivered mixed matches that which was formulated
 - How often is feed DM checked?
 - How often are feed components analysed and rations re-formulated?
 - Are mixing protocols in place?
 - Are you able to track what is mixed?

How precisely (consistent) are the rations being delivered?

More variability in ration energy content = lower DMI



More variability in ration energy content = lower milk yield



More variability in ration particle size = lower milk yield

- Variability in % long particles
 - Every 5 point increase
 - -1.2 kg/d milk yield
 - 2.6% reduction in efficiency

Soya et al., 2014, J. Dairy Sci. 97:562-571

Cows love consistency!!!

Another step in ensuring cows eat their feed consistently...

- Make sure feed is mixed and delivered the same way each day

Ensure cows are delivered their ration consistently

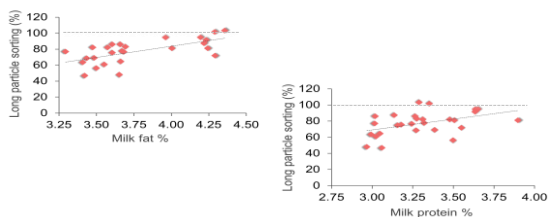
- Tools?
 - SOPs and training
 - TMR management programs!
 - Automated feeding systems

The problem is...

- There is more than one ration found on every farm!
 - There is the one formulated by the nutritionist
 - There is the one that is delivered to the cows
 - **There is the one that is consumed by the cows**

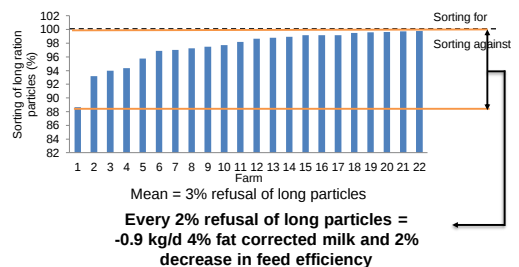
Cows do not always eat what is put in-front of them!

More sorting at a cow level = lower milk components



Miller-Cushon and DeVries. 2017. J. Dairy Sci. 100:2213-2218

More sorting at a herd level....



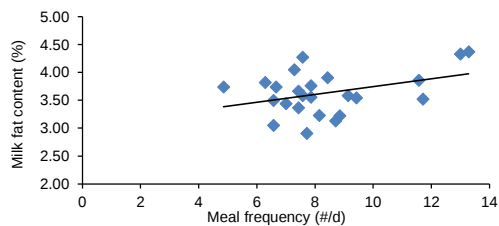
Sorensen et al. 2013. J. Dairy Sci. 96:4769-4770

The problem is...

- There is more than one ration found on every farm!
 - There is the one formulated by the nutritionist
 - There is the one that is delivered to the cows
 - There is the one that is consumed by the cows
 - **There is the one that is digested by the cows**

How the cow eats her feed has an impact on how she digests it...

More meals = greater milk fat %



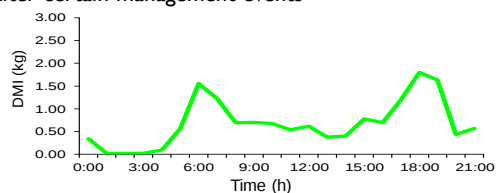
Data from DeVries and Cheveau, 2014, J. Dairy Sci. 97:6499-6510

What does this mean from a feeding management standpoint?

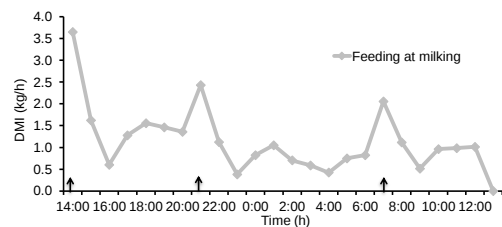
- Manage feeding to ensure cattle are stimulated to access their feed throughout the day

When does a cow go and eat at the feed bunk?

- When she is hungry
- After certain management events



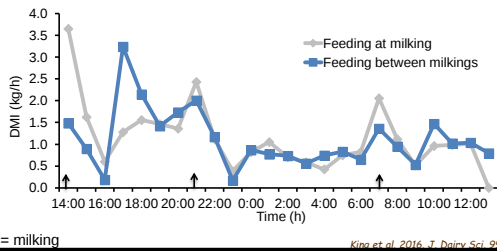
What stimulates cows the most to attend the bunk?



↑ = milking

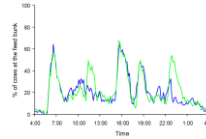
Kinn et al. 2016, J. Dairy Sci. 99:1471-1482

What stimulates cows the most to attend the bunk?



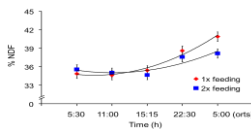
How do we stimulate cows to access their feed throughout the day?

- Deliver feed more often...
 - More time at the bunk
 - More meals per day



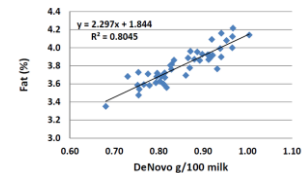
How do we stimulate cows to access their feed throughout the day?

- Deliver feed more often...
 - Less feed sorting



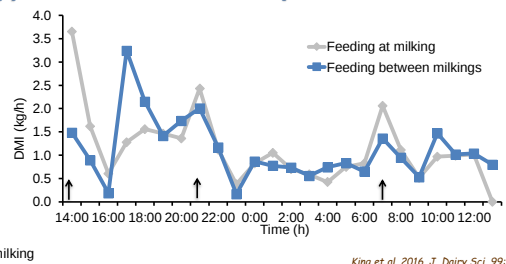
More frequent feed delivery = more consistent consumption = improved rumen health

- High de-novo free-stall herds tended to be 5x more likely to feed 2x vs 1x per day



Delivering feed multiple times per day may not always be practical...

Regardless of method...are we maximizing eating opportunities across the day?



Need to ensure feed is present when cows go to the bunk!

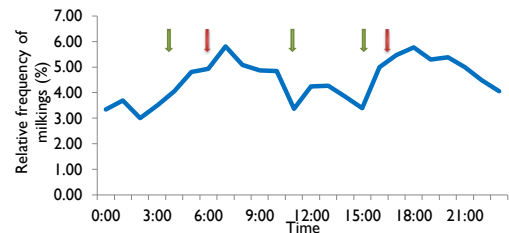
Ensuring feed is available allows cows to use their time efficiently!

- 41 robotic milked herds in Canada
 - Frequency of feed push ups (average = 8x/d; range= 2 to 24)
 - + 0.1 h/d lying duration per extra 2 push-ups per day

King et al. 2016, J. Dairy Sci. 99:9069-9079

Why is good feeding management even more important for robotic milking herds?

Milking times are often linked to period of feeding activity...



Data adapted from Demina et al. 2013, Can. J. Anim. Sci. 93:427-43

Ensuring feed is available allows cows to use their time efficiently!

- 33 robotic milked farms in USA Midwest
 - +4.9 kg/d of milk for farms with an automated feed pusher vs manual

Siewart et al. 2018, J. Dairy Sci. 101:8327-8334

Automation may minimize problems related to human variability....

We want to minimize the amount of time cows are without feed...

Impact of reduced feed access time increased with overcrowding

- Overcrowding and feed restriction (0100 to 0600 h):
 - Up to 9 h/d greater subacute rumen acidosis (pH < 5.8)
 - Reduces NDF digestion rate by up to 50%

Campbell and Grant, 2016

Take home messages:

- Allow cows to eat consistently!
 - Ensure feed is delivered as formulated and precisely!
 - Ensure feed is consumed as delivered and in a healthy manner
 - Keep feed in front of cows!
 - Feed multiple times per day
 - Push up feed frequently

Questions???



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