



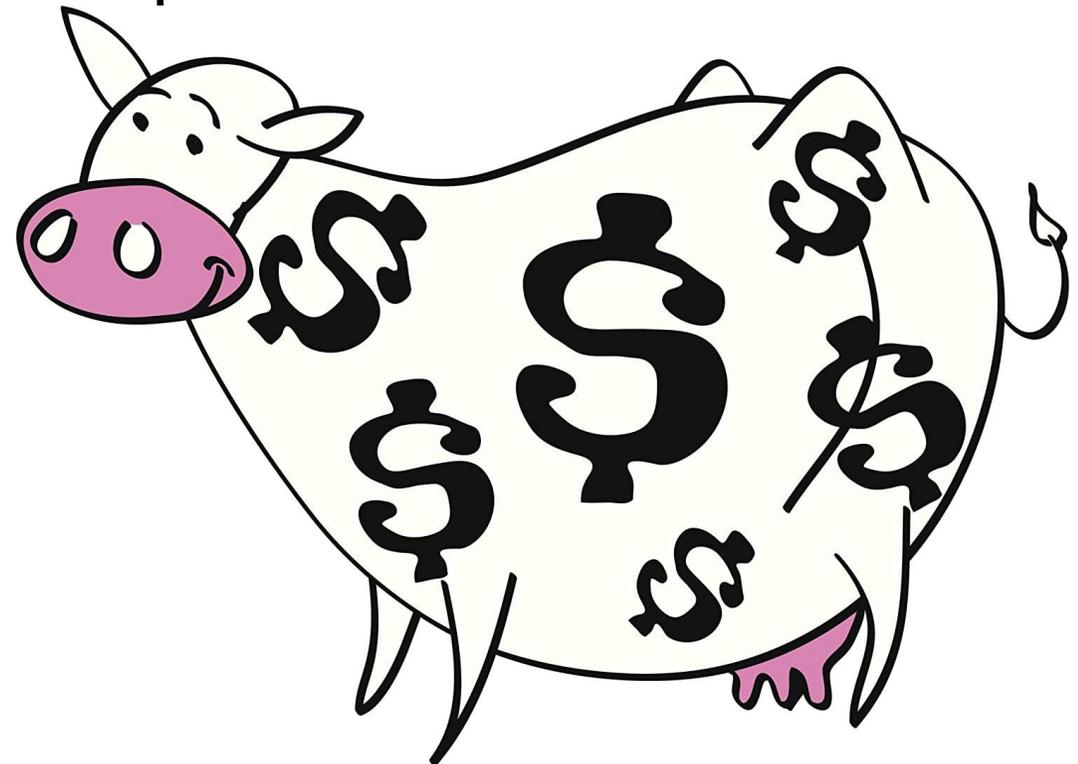
# Managing the Feed Center on Dairy Farms

Sam Mosley, PhD



# Why does this matter?

- ◆ Feed costs make up 55% of dairy expenses (Hutjens, 2022)
- ◆ DM intake drives milk production
  - ◆ FE ranges between 1.4 – 1.7 lbs milk/lb DM
- ◆ Feed losses – shrink – is the #4 or #5 expense on dairies (Bethard)



# Topics

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- ◆ Forage management
- ◆ Grain Storage/Shrink
- ◆ Efficiency
- ◆ Feed Delivery
  - ◆ Delivery
  - ◆ Sorting
  - ◆ Push Ups
- ◆ Feeder Performance

# Manage Forages

- ◆ It starts with selecting the proper hybrid
- ◆ Manage all aspects of getting the forage grown properly
- ◆ Harvest at the optimum time and length
- ◆ Get it in storage properly (packed & covered quickly)
- ◆ Manage the feed out phase

# Manage Forages

- ◆ This is a big area where safety has to be addressed
- ◆ Consistent dry matter checks are critical to keep the ration consistent

*Forage is the base of the ration,  
It has to be managed as such!!*

# Silage Face Management Steps

- ◆ Cut back plastic and place extra tires on leading edge
- ◆ Remove spoiled silage as needed
- ◆ Make silage face smooth and vertical
- ◆ Blend faced silage into a pile to minimize variation in the silage and in the TMRs
- ◆ Minimize the amount of loose silage at end of feeding
- ◆ **Sample from the blended pile, not from the face**



# Silage bunk management

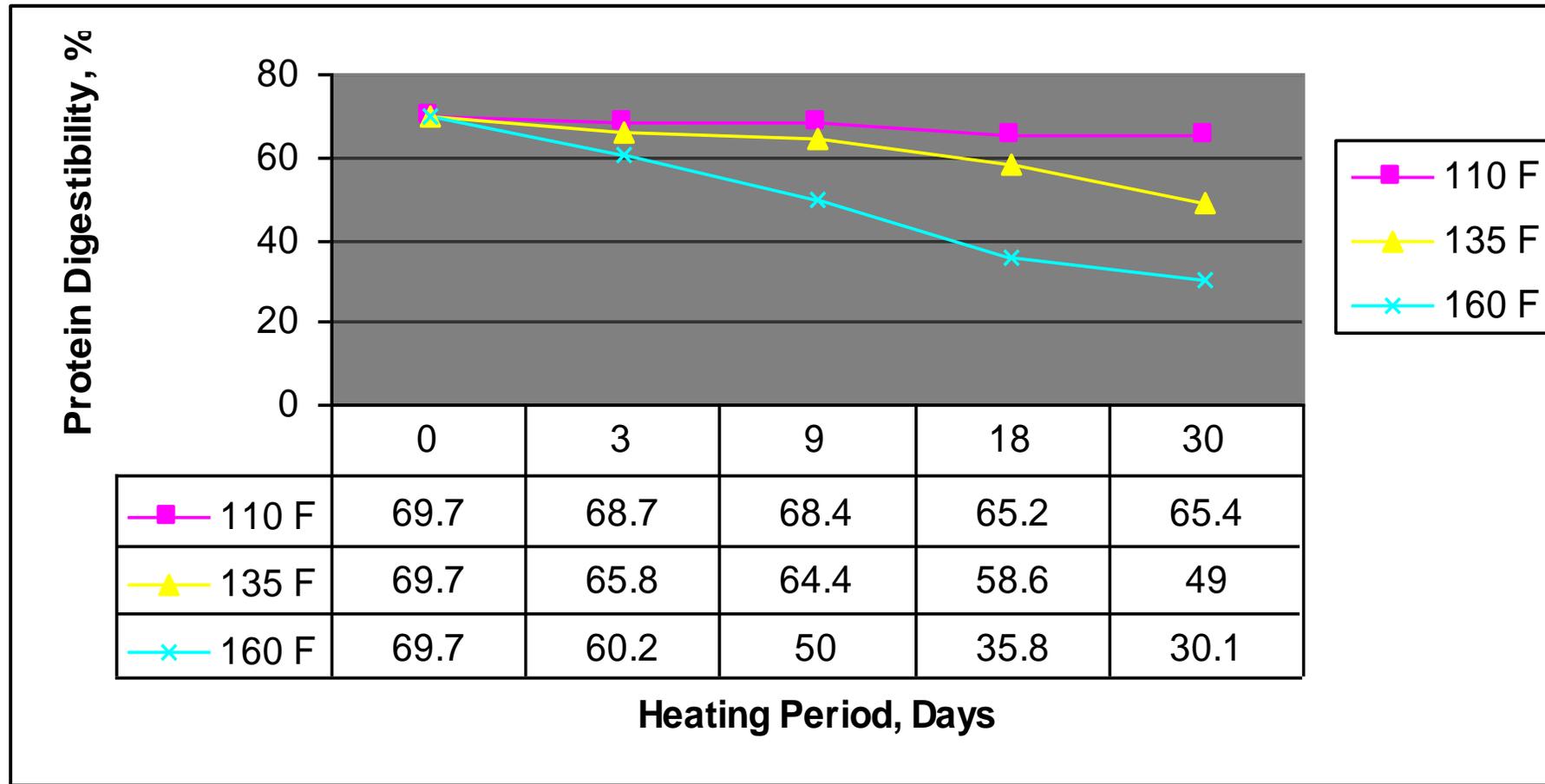
- ◆ Silage losses estimated to be between 5-40% (Brouk, 2018)



# Rough face heats up/spoils quickly

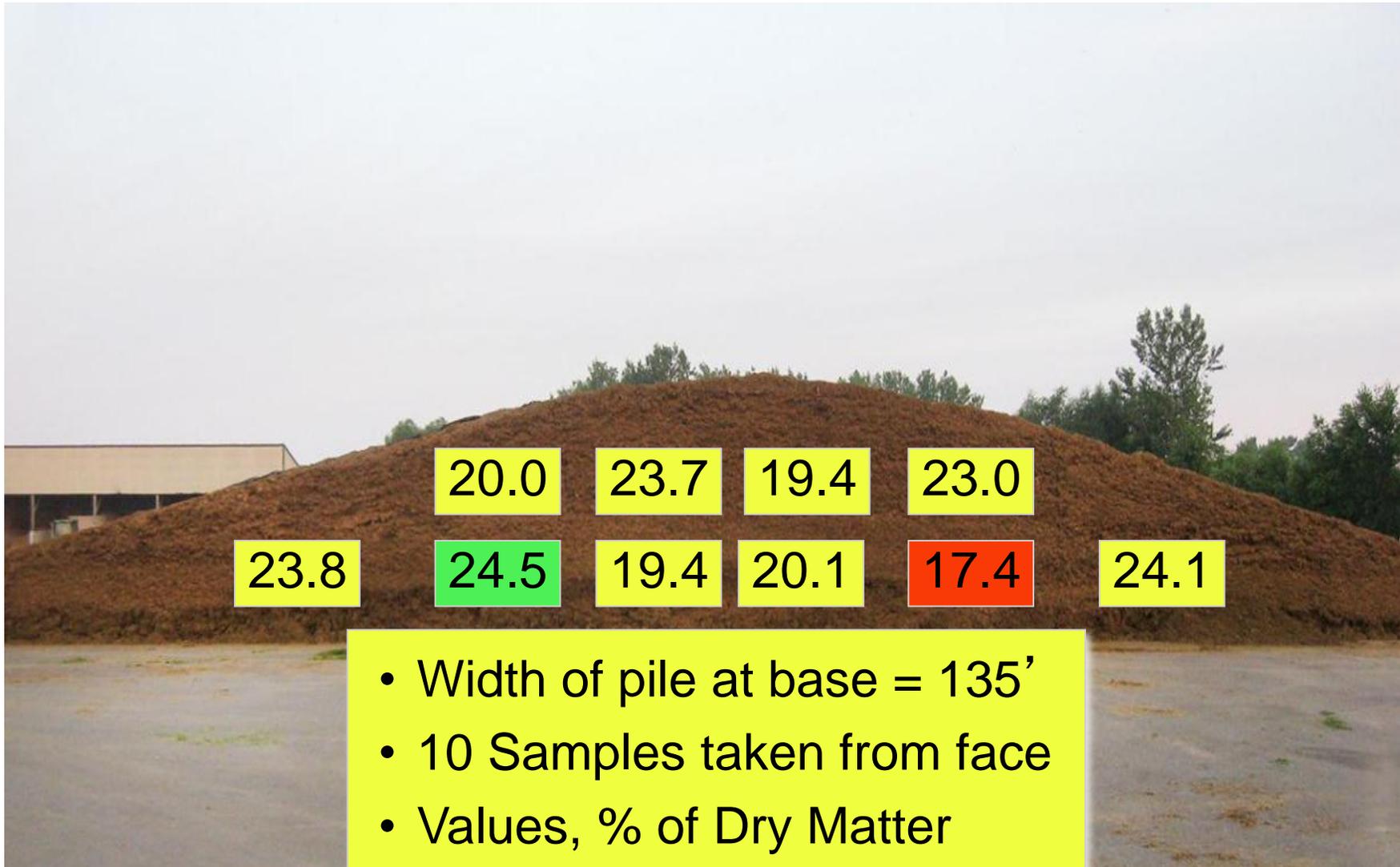


# Haylage Heating and Protein Digestibility



Gallagher. 1976.

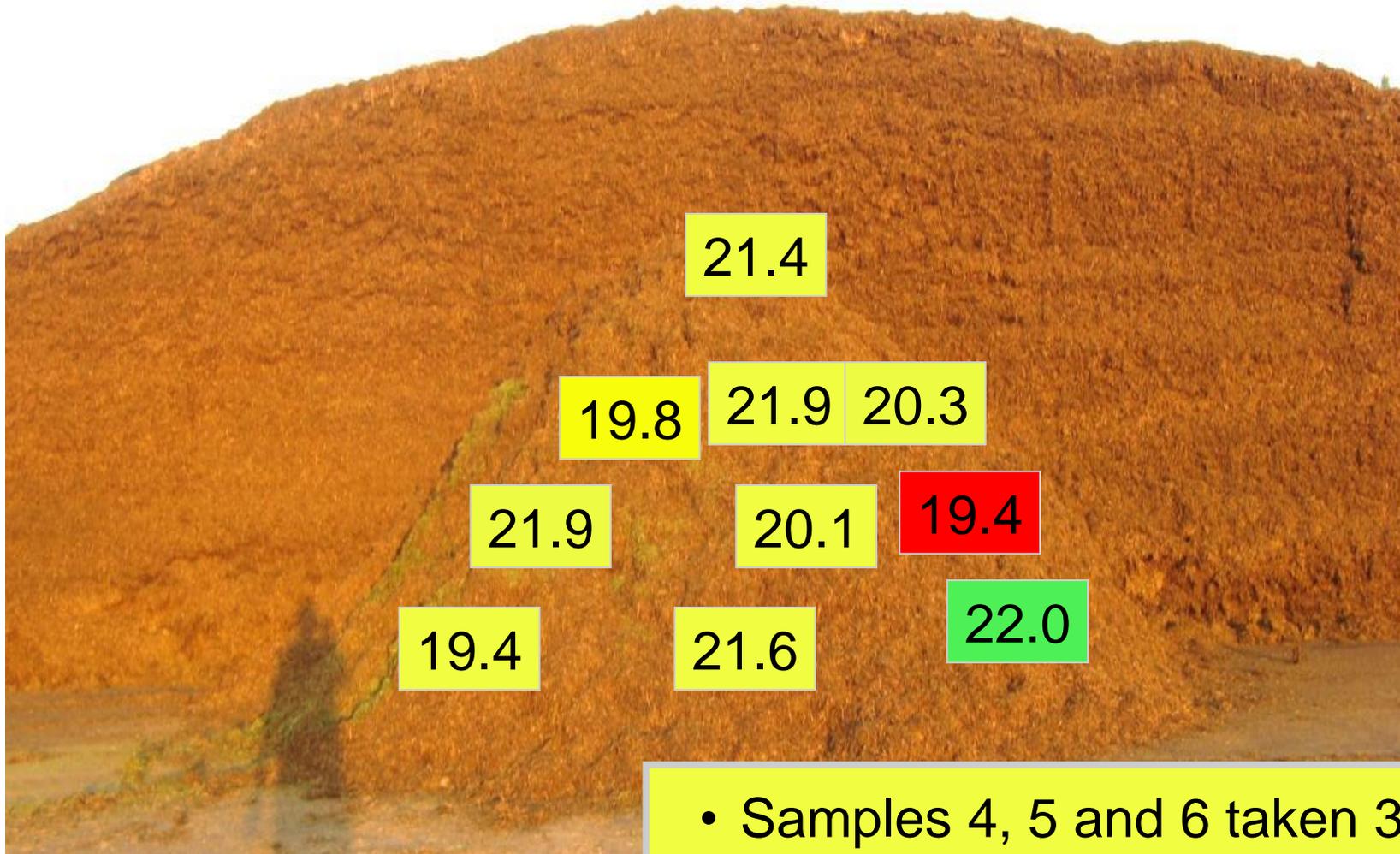
# Managing Variation at Feed Out



Pushing  
and  
Lifting  
Alfalfa Haylage  
into a Pile

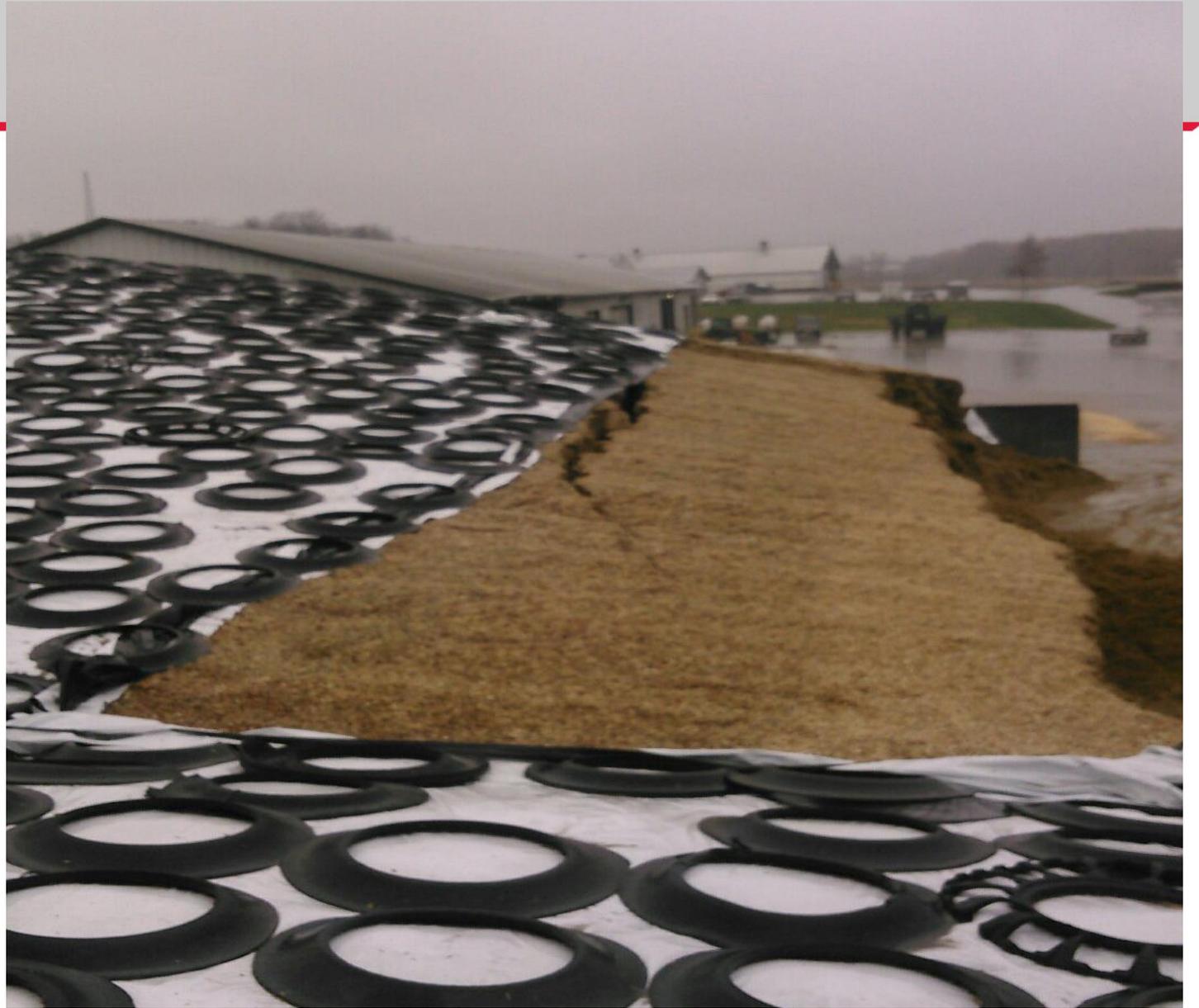


# Crude Protein Levels In Haylage Pile



- Samples 4, 5 and 6 taken 3' under surface
- All other samples taken at surface
- Values, % of dry matter

# Silage Face Crack





**Manage to prevent disasters!**

# Shrink By Storage Type

Table 1 Percent loss of different ingredients based on type of storage facility

Ingredient	Uncovered Open Piles	Covered 3-sided Bay	Closed Bin
Whole Cottonseed	10 – 20 %	5 -15 %	-----
Dry Meal	5 – 10 %	3 – 8 %	2 – 4 %
Soybean Hulls	12 – 20 %	5 – 10 %	2 – 5 %
Dry Distillers	15 -22 %	7 – 10 %	3 – 5 %
Wet Distillers	15 – 40 %	15 – 40 %	-----

Kertz, 1998

# Impact of Shrink

Ingredient	Current Price \$/T	1%	5%	7%	9%	11%
Ground Corn	\$240	\$242	\$252	\$257	\$262	\$266
SBM 48%	\$425	\$429	\$446	\$455	\$463	\$472
DDG	\$200	\$202	\$210	\$214	\$218	\$222
WCS	\$300	\$303	\$315	\$321	\$327	\$333
Mineral Mix	\$700	\$707	\$735	\$749	\$763	\$777

# Another Way to Look at Shrink Cost

- ◆ If feed cost is \$9.50/cow/day and you have a 8% shrink
  - ◆ That is \$277,400.00 of annual loss on a 1000 cow herd  
(\$0.76/hd/day)
  - ◆ If you cut shrink to 4%, the annual loss would be \$138,700.00  
(\$0.38/hd/day)
- \*\* We can potentially save \$0.38/hd/day
- \*\* Actual feed cost at 4% shrink is \$9.88

# Organized Feed Center





**Is there shrink here?**



**What about here?**



**Mineral premix**

**Heat treated soybean mill**



# This is the Diamond V Facility!

- ◆ Ingredient disappearance is 0.9%
- ◆ Total shrink for the facility is 2.2%

**\*\*How does this compare to your operation?**

# Good inventory management



**Total Cost per Ton: Feed-Out Activities**  
**42 Farms, Sorted by Cost per Ton, Same Farms per column**  
 Summer 2017

	Average	Percent of Total	1st Quarter	2nd Quarter	3rd Quarter	4th Quarter
<b>Tons Fed per day</b>	78.6		97.8	96.2	78.0	40.6
Labor	\$2.47	43%	\$1.76	\$2.18	\$2.47	\$3.50
Fuel & Utilities	\$0.90	16%	\$0.58	\$0.84	\$0.81	\$1.37
Repairs	\$0.64	11%	\$0.36	\$0.50	\$0.70	\$0.99
<b>Total Operating Expense</b>	\$4.01	70%	\$2.71	\$3.52	\$3.98	\$5.86
Depreciation	\$1.12	20%	\$0.73	\$0.88	\$1.41	\$1.45
Interest	\$0.55	10%	\$0.38	\$0.36	\$0.67	\$0.78
Insurance	\$0.03	0%	\$0.02	\$0.02	\$0.03	\$0.04
<b>Total Ownership Expense</b>	\$1.69	30%	\$1.14	\$1.26	\$2.11	\$2.27
<b>Total Cost, Feed-Out Activities</b>	\$5.70		\$3.85	\$4.78	\$6.09	\$8.13

Karszes, J., Howlett, A, Richards, A, Un-Published

Q1 vs Q4 = \$124,000/yr

# Understanding Owning and Operating Costs

Tractor Owning and Operating Calculator			
<u>Owning Costs</u>		<u>Operating Costs</u>	
Delivered Price	\$ 200,000.00	Hourly Fuel consumption	3.00
Cost of Tires	\$ 4,000.00	Fuel price per gallon	\$ 3.00
Delivered Price less tires	\$ 196,000.00	Lube, oil, filters, and Labor	\$ 3.00
Years of Ownership	8	Repairs and Labor	\$ 3.00
Annual Hours	2,000	Expected Tire life	4,000
Residual Value	\$ 20,000.00	Tire costs per hour	\$ 1.00
Adjusted price	\$ 176,000.00	Operator Cost	\$ 20.00
Hourly Replacement Cost	\$ 11.00	Annual Damages/Vandalism	\$ 2,000.00
Interest Rate	5.00%		
Insurance Rate	0.40%		
Property Tax	0%		
Total I,I & T	\$ 5.40		
Total Owning Costs	\$ 16.40	Total Operating Cost	\$ 37.00
Total Owning and Operating Cost of Tractor		\$ 53.40	

# Sizing Equipment



- ◆ Bucket size, loader capacity, dump clearance

Bonthuis, Farming Lean

# Common Wastes on Feed Pad

Equipment that is the wrong size



Right



Wrong

Wastes of resources, waste of time.

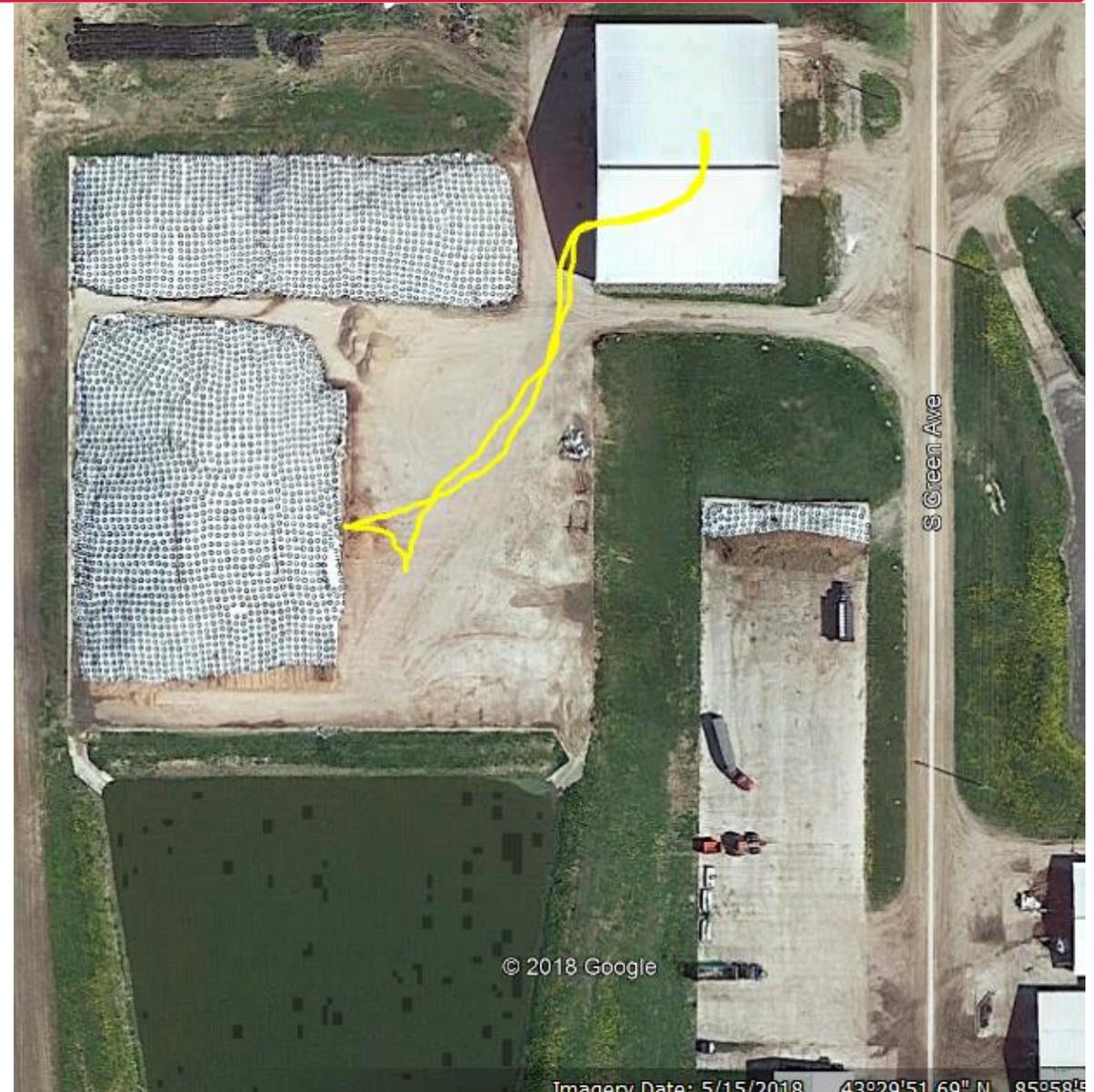
# Maximizing Your Feed Equipment

## Motion is waste

740 feet per bucket  
round trip.

4955 hours/16076  
miles x \$50/hour x  
1 mile/5280 feet x  
100 ft = \$.29

\$.29 x 7.4 = \$2.15

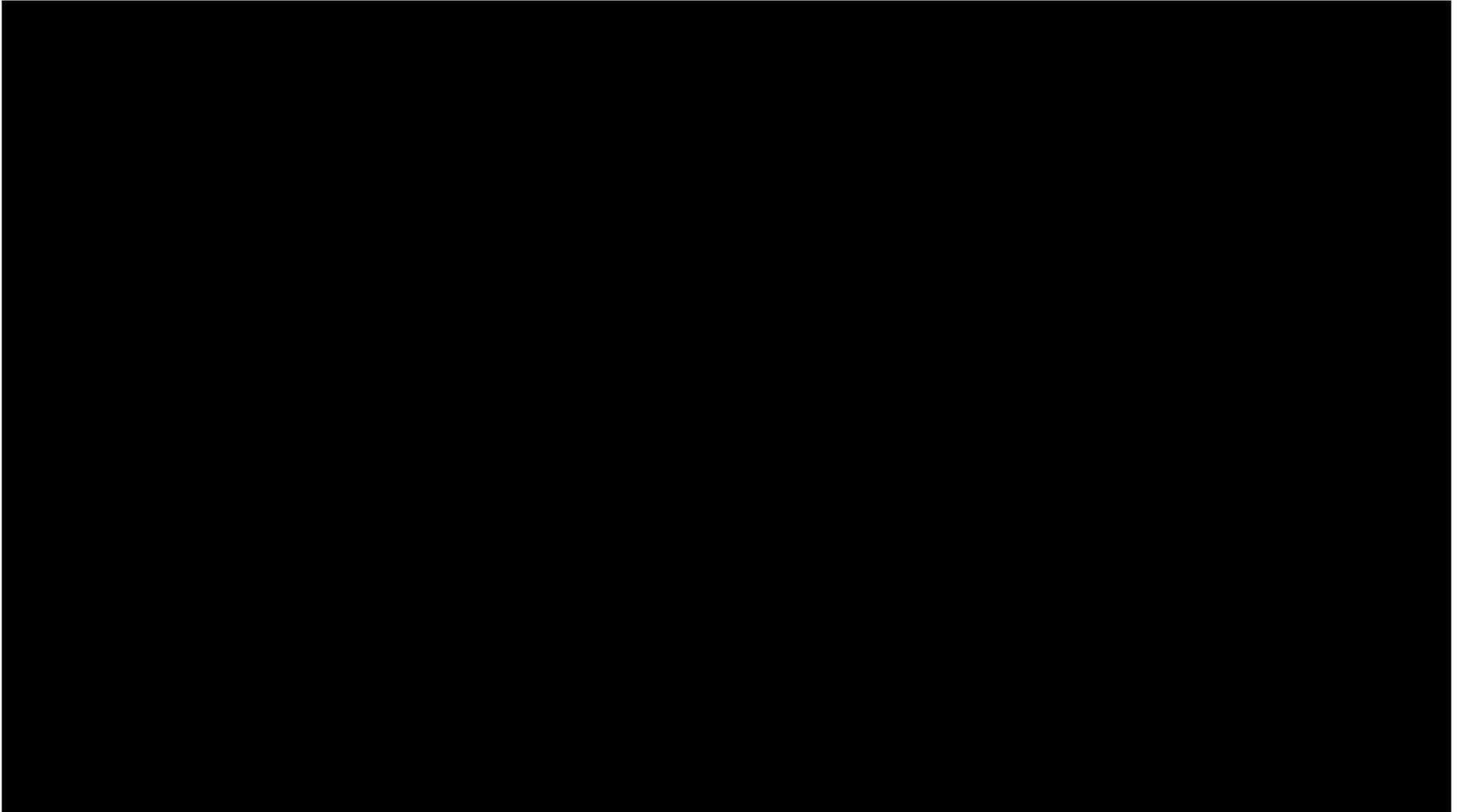


# Feed Bunk - Feed Distribution

Goal 24"-30" of bunk space/ hd



# Cows return to an empty bunk





← Refusal?

**Cows are locked up with no feed**

# Stop Sorting

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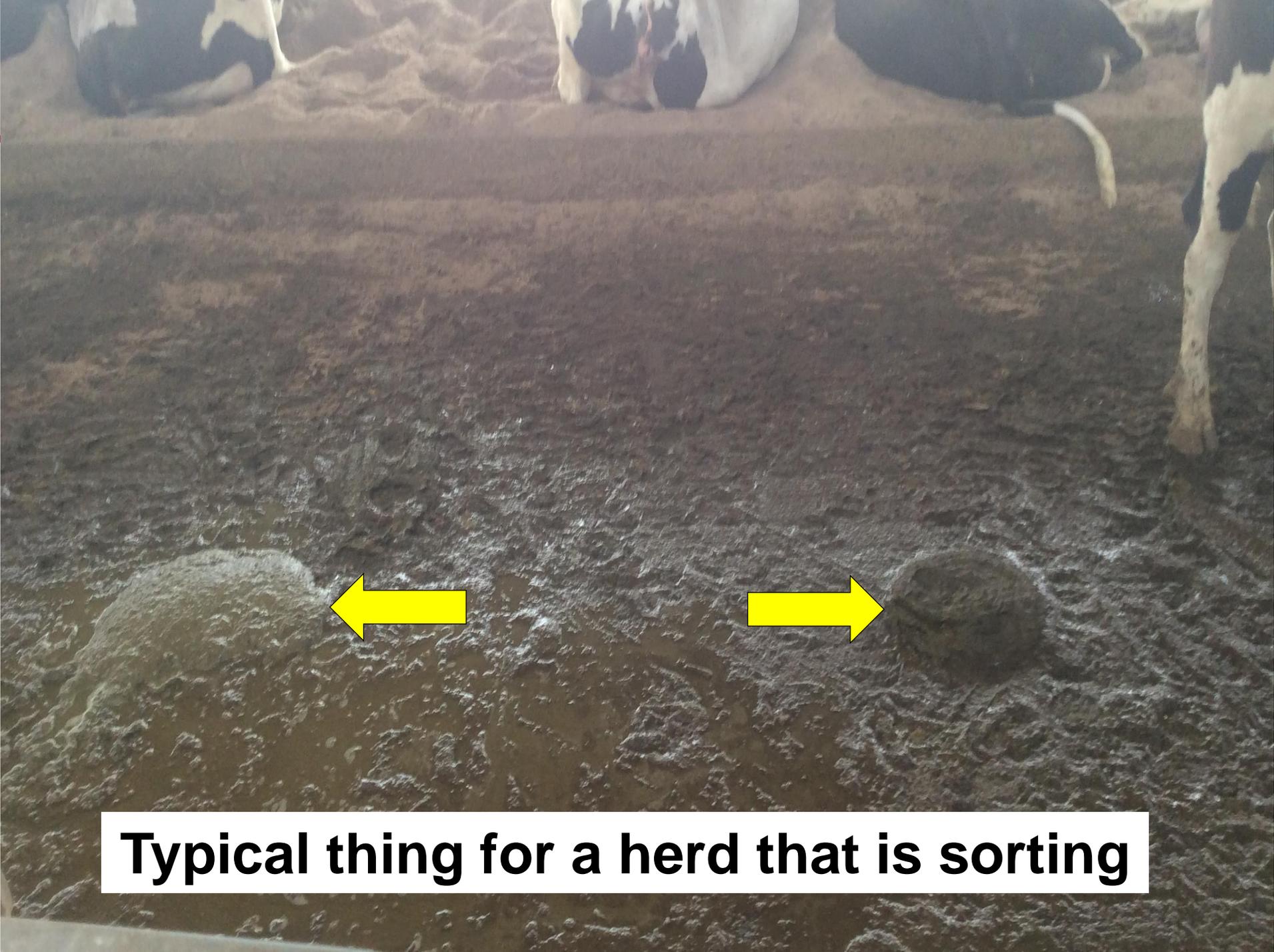
- ◆ If cows sort, we never know what the cows are eating
- ◆ How do you balance a diet when you are guessing what the cows eat
- ◆ Can cause cow health issues
- ◆ Can be a big factor in fresh cow metabolic challenges

# Typical Sorting





# Close-up Diet



**Typical thing for a herd that is sorting**

# Ways to Reduce Sorting

- ◆ Particle length needs to be shorter and all similar in size
- ◆ Ration dry matter needs to be lower
  - ◆ Molasses
  - ◆ Whey
  - ◆ Water
  - ◆ Wet by-products

# Manage Push-ups

- ◆ Feed should be pushed up prior to every delivery
- ◆ Every 1 – 1.5 hours
- ◆ Push-up quick after initial feed drop
- ◆ Feed should be pushed and rolled not just pushed up
- ◆ In many herds this can be the easiest 2 – 3 lbs of milk you can get



**Does this need  
pushing up?**



©

mond V

# Importance of Feed Push-up

- 1 to 2 hours post-feeding is the most competitive; most displacements
- Push up each ½ hour for the first 2 hours versus once per hour

	2X in 2 hours	4X in 2 hours
<i>DMI, lb/d</i>	<i>41.4</i>	<i>40.1</i>
<i>Milk, lb/d</i>	<i>61.3</i>	<i>65.3</i>
<i>Milk/DMI, lb/lb</i>	<i>1.48</i>	<i>1.63</i>

Armstrong et al.

# Push-up Frequency Study

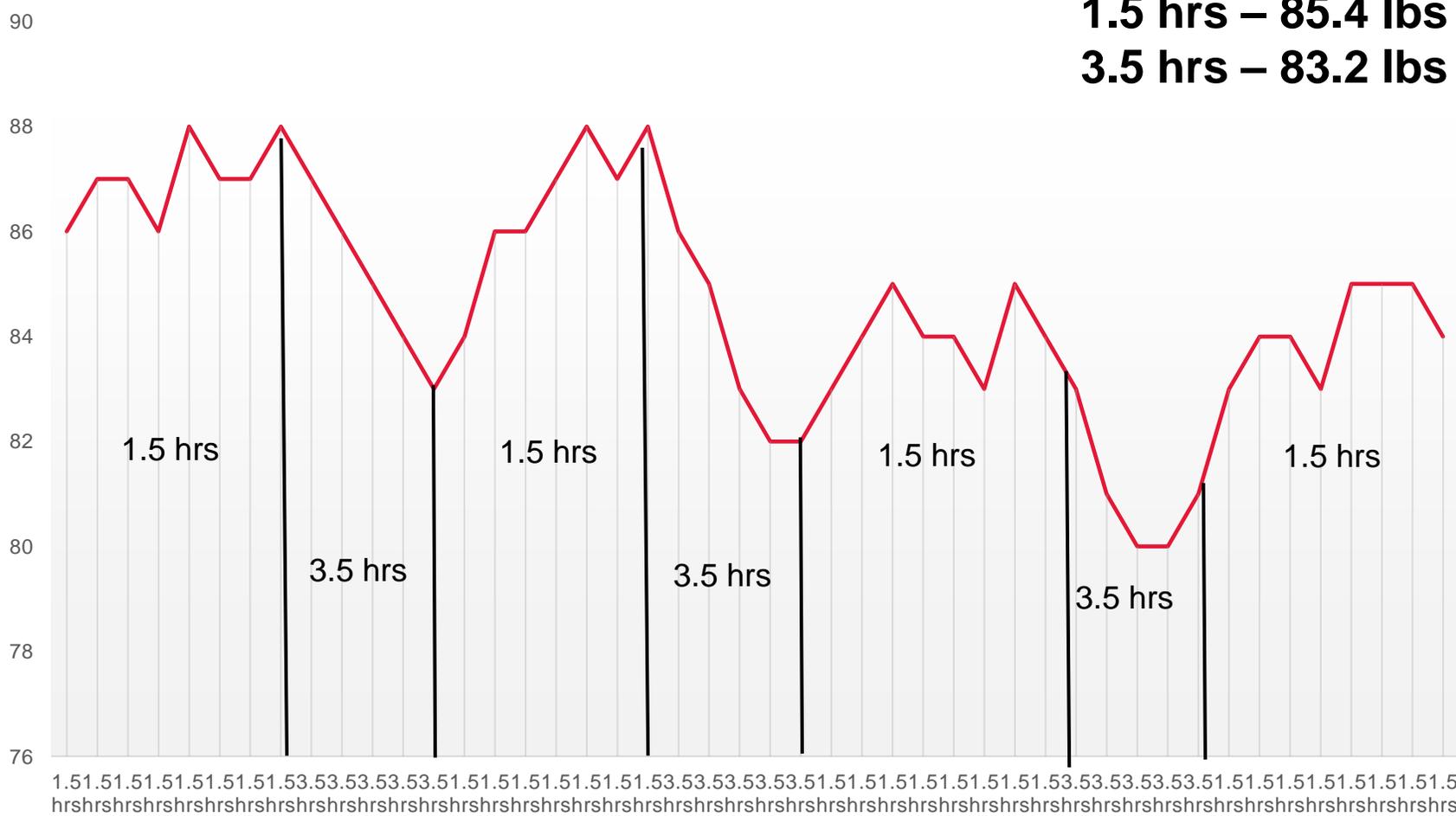
- ◆ Dates were from 7/28/17 – 9/11/17
- ◆ 2X feeding group
- ◆ Producer pushed up feed to one group for 1.5 hour and 3.5 hour intervals
- ◆ Group cow numbers varied from 211 to 216 during the time period

# Push-up Frequency vs Milk Production

7/28/17 – 9/11/17

Milk lbs. vs Push up Frequency

**1.5 hrs – 85.4 lbs**  
**3.5 hrs – 83.2 lbs**



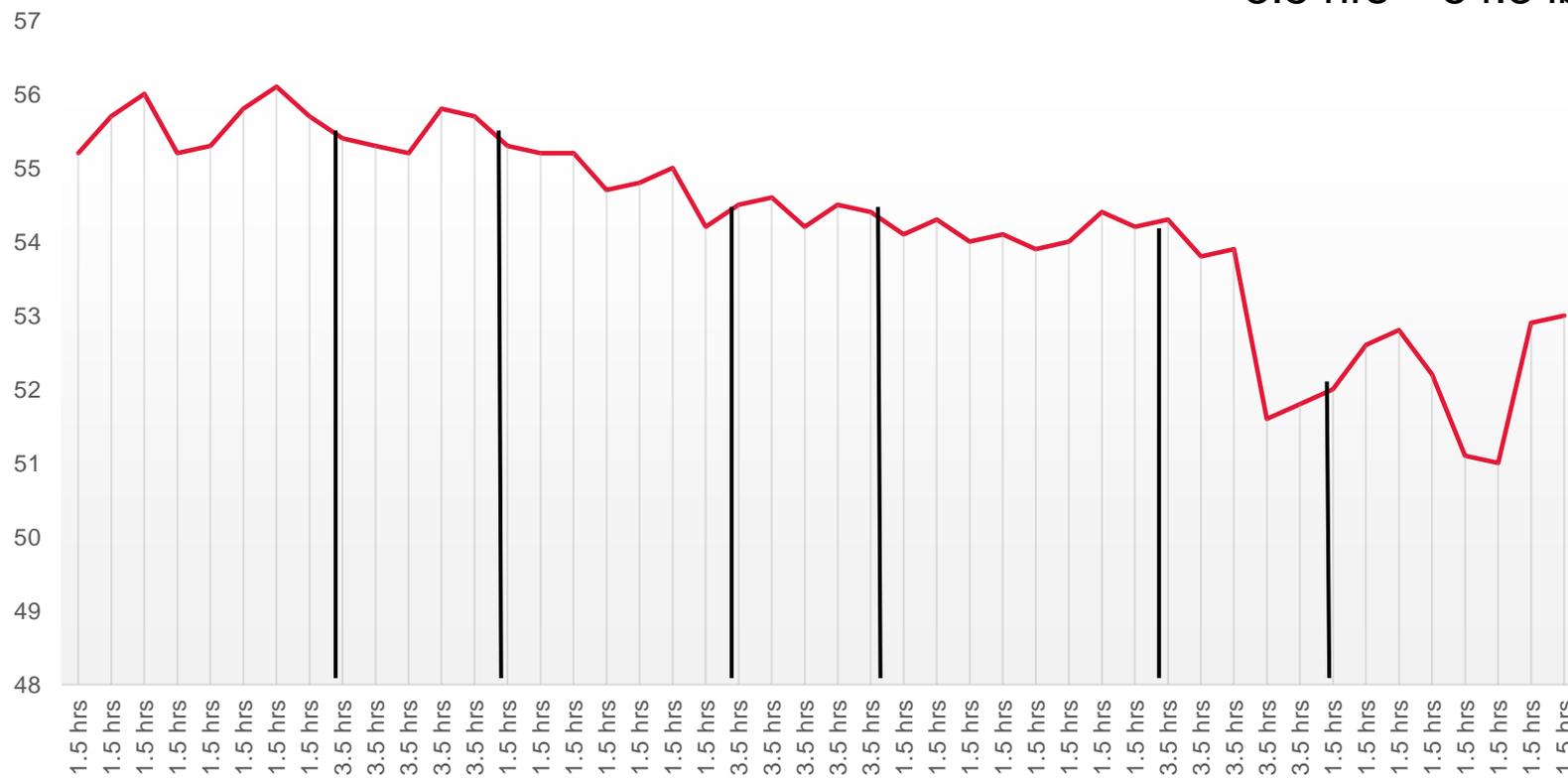
Greene 2017



# DMI vs Push-up Frequency

DMI lbs vs Push-up Frequency

1.5 hrs – 54.2 lbs  
3.5 hrs – 54.3 lbs



Greene 2017

# What does this tell us?

- ◆ More frequent push-ups will increase production in 1.5 hr vs 3.5 hr intervals
- ◆ Push-up frequency may be directly related to feed efficiency
- ◆ More frequent smaller meals allows a cow to be more efficient
- ◆ Milk production was increased 2.2 lbs in the 1.5 hr group over the 3.5 hr group
- ◆ Dry Matter Intake was basically no different for the two groups

# Get cows fed accurately and on time without running out of feed

- ◆ Get the proper ration and amount to the cows
- ◆ Have the ration mixed properly
- ◆ Get it to them on time to meet your management style
- ◆ Cows can't run out of feed, trying to feed to low or no refusal usually doesn't work well

# 4 Rations...Are They the Same?



- ◆ Ration formulated
- ◆ Ration that is mixed
- ◆ Ration that is pushed out
- ◆ Ration the cow consumes



# Feeding Errors $\$33 \times 15 \times 365 = \$180,675$

Load		Call Wt.		Loaded Wt.		Deviation		Price			
Ingredien	Time	Actual	Dry	Actual	Dry	Deviation	%	Planned	Actual	Error	Name
14CSIL	12/3/2015 10:29:00 AM	9154	3295	9080	3269	74	0.8%	\$174.00	\$173.00	\$1.00	chino
prmix	12/3/2015 10:31:00 AM	3981	3520	4000	3537	19	0.5%	\$367.00	\$369.00	\$2.00	chino
FAT	12/3/2015 10:31:00 AM	83	82	160	158	77	92.8%	\$57.00	\$110.00	\$53.00	chino
GLUTEN	12/3/2015 10:32:00 AM	2273	966	2230	948	43	1.9%	\$85.00	\$84.00	\$1.00	chino
WBEETP	12/3/2015 10:33:00 AM	2280	524	2260	520	20	0.9%	\$35.00	\$35.00	\$0.00	chino
Mix Time Call = 03:00 Actual = 03:00 Error = 0.00%											
		17771	8388	17730	8431	233	19.4%	\$718.00	\$771.00	\$57.00	

Load		Call Wt.		Loaded Wt.		Deviation		Price			
Ingredien	Time	Actual	Dry	Actual	Dry	Deviation	%	Planned	Actual	Error	Name
14CSIL	11/30/2015 7:38:00 AM	8447	3041	8430	3035	17	0.2%	\$160.00	\$160.00	\$0.00	chino
prmix	11/30/2015 7:39:00 AM	3676	3248	3720	3287	44	1.2%	\$339.00	\$343.00	\$4.00	chino
FAT	11/30/2015 7:40:00 AM	77	76	70	69	7	9.1%	\$53.00	\$48.00	\$5.00	chino
GLUTEN	11/30/2015 7:41:00 AM	2098	892	2070	880	28	1.3%	\$79.00	\$78.00	\$1.00	chino
WBEETP	11/30/2015 7:42:00 AM	2103	484	2120	488	17	0.8%	\$33.00	\$33.00	\$0.00	chino
Mix Time Call = 03:00 Actual = 02:58 Error = -1.11%											
		16401	7741	16410	7758	113	2.5%	\$664.00	\$662.00	\$10.00	

Load		Call Wt.		Loaded Wt.		Deviation		Price			
Ingredien	Time	Actual	Dry	Actual	Dry	Deviation	%	Planned	Actual	Error	Name
14CSIL	11/28/2015 7:57:00 AM	8219	2959	8220	2959	1	0.0%	\$156.00	\$156.00	\$0.00	chino
prmix	11/28/2015 7:58:00 AM	3676	3248	3670	3243	6	0.2%	\$339.00	\$339.00	\$0.00	chino
FAT	11/28/2015 8:00:00 AM	77	76	120	119	43	55.8%	\$53.00	\$83.00	\$30.00	chino
GLUTEN	11/28/2015 8:00:00 AM	2098	892	2060	876	38	1.8%	\$79.00	\$77.00	\$2.00	chino
WBEETP	11/28/2015 8:01:00 AM	2103	484	2090	481	13	0.6%	\$33.00	\$32.00	\$1.00	chino
Mix Time Call = 03:00 Actual = 03:06 Error = 3.33%											
		16173	7659	16160	7677	101	11.7%	\$660.00	\$687.00	\$33.00	

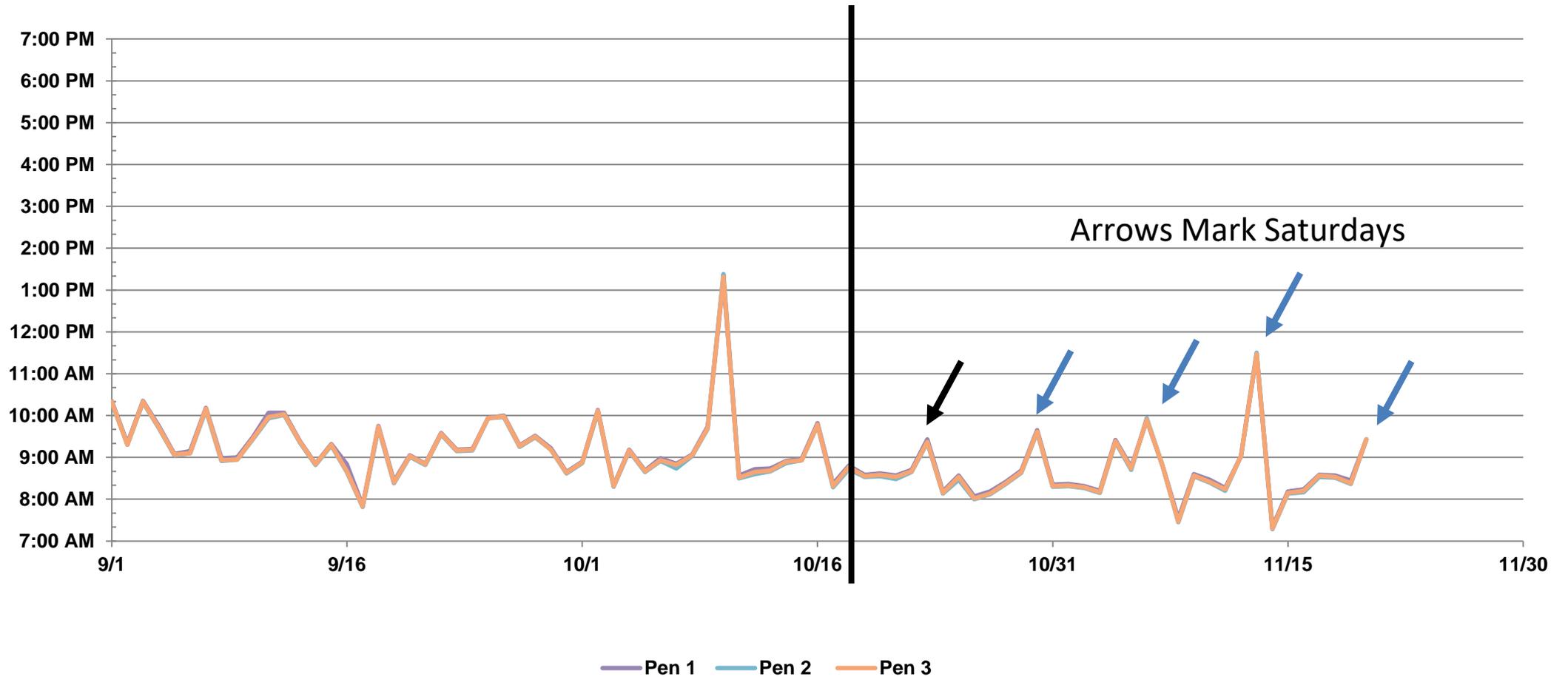
# Using On Farm Premixes

Load				
Ingredient	Start	Stop	Time	34 rpm
Silage	9:47 AM	9:48 AM	53s	480 PTO RPM
Alfalfa	9:48 AM	9:49 AM	1m 34s	
Baleage	9:49 AM	9:51 AM	2m 11s	
Hulls	9:51 AM	9:52 AM	53s	
Cotton	9:52 AM	9:53 AM	45s	
Straw	9:53 AM	9:54 AM	1m 12s	
Fat	9:54 AM	9:56 AM	1m 38s	
Corn	9:56 AM	9:57 AM	1m 28s	
Grain 1	9:57 AM	10:00 AM	2m 49s	
SBM	10:00 AM	10:01 AM	1m 27s	
Canola	10:01 AM	10:03 AM	1m 24s	
Haylage	10:03 AM	10:06 AM	3m 28s	
Molasses	10:06 AM	10:08 AM	1m 24s	
Water	10:08 AM	10:13 AM	5m 21s	
Brew	10:13 AM	10:16 AM	2m 27s	
CS	10:16 AM	10:18 AM	2m 18s	
CS2	10:18 AM	10:19 AM	44s	
Mix	10:19 AM	10:25 AM	6m	1000 PTO RPM
Total			37m 56s	

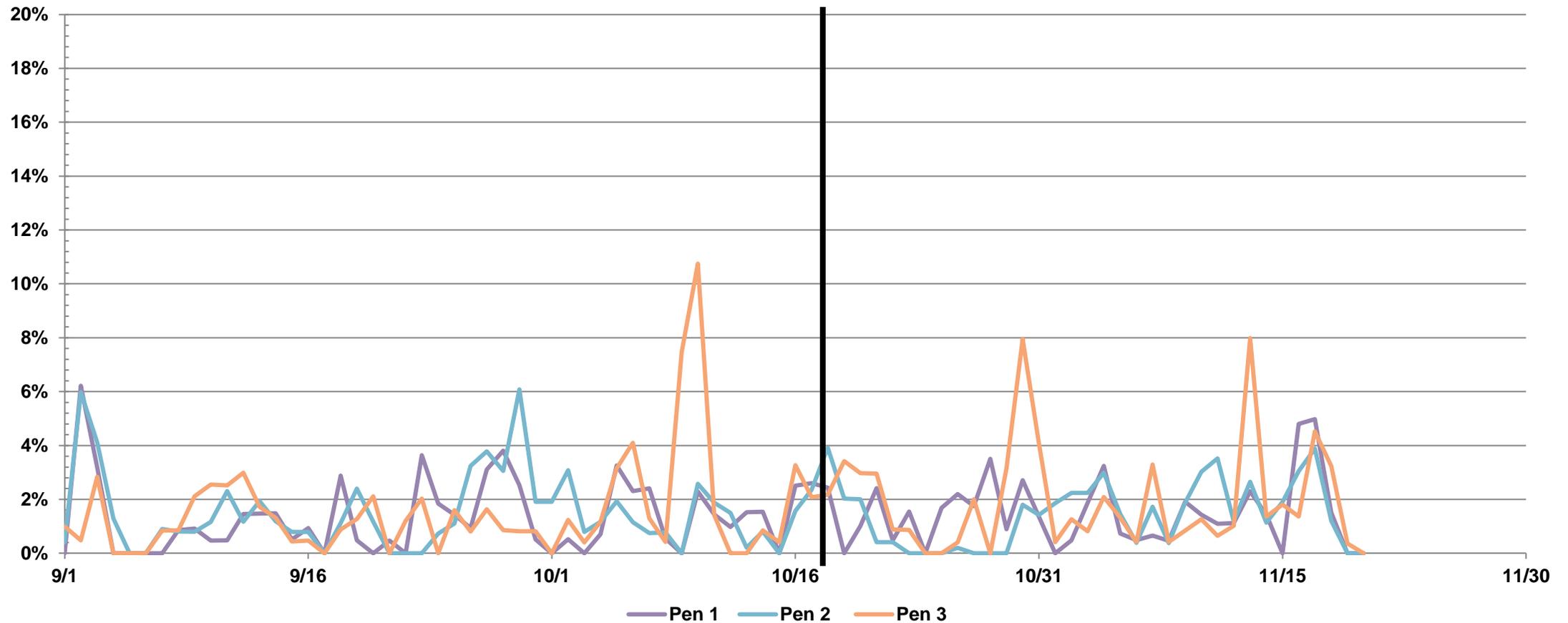
	af/hd	Cows	Lbs req
Baleage	1.32	500	660
Straw	0.72		360
Kansas Ha	2.9		1450
Cotton	3.29		1645
Bean Hulls	5.71		2855
Brew	4.59		2295
Molasses	3.08		1540
Water	7		3500
Total			14305

- ◆ Premix reduced loading time approx. 15 min
- ◆ Cut loaded ingredients in half
- ◆ Reduced loading errors

# First Feeding Time: Milk Cow



# Refusal %: Milk Cow



# Summary

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- ◆ Manage feed to maximize quality and minimize shrink losses.
- ◆ Maximize efficiency of feeding operations
- ◆ Get cows fed on time
- ◆ Keep feed in front of cows
- ◆ Accurately load and deliver rations to cows