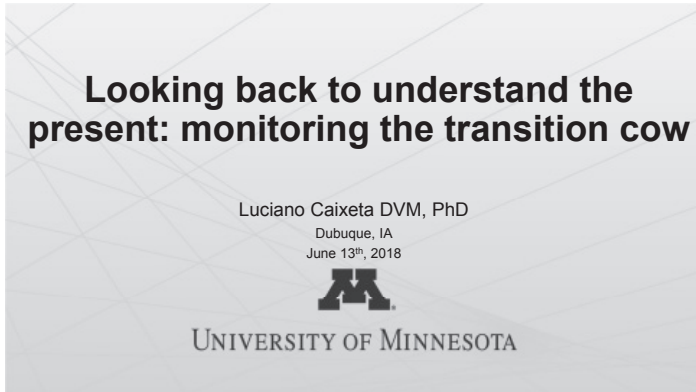
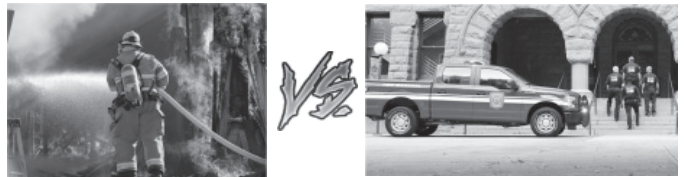


Looking Back to Understand the Present: Monitoring the Transition Cow

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Being *proactive* is better than being *reactive*.
What do we want to be?



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Monitoring is important to support management

- Detect unintended disruptions in performance under the existing management conditions
- Measure the impact of an implemented intervention or management change
- Help motivate management or employee behavioral change on the dairy
- Monitoring is intended to make sure that performance matches expectations.

Slide courtesy of Dr. Fetrow

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Photo credit: Dr. Jen Nightingale

We are looking for monitors that:

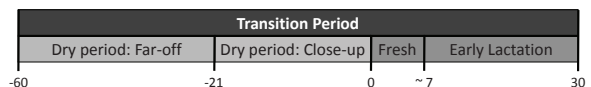
1. Minimum delay between cause and effect (**lag**)
 2. Use of historical data does not hide recent changes (**momentum**)
 3. Summary does not conceal problem deviations (detects **variation**)
 4. Information is not misleading (avoids **bias**)
 5. Sensitively detects problems (**sensitive**)
 6. Specifically identifies the problem (**specific**)
- Use the methods that are practical and most useful to address the problem(s) at hand

Slide courtesy of Dr. Fetrow

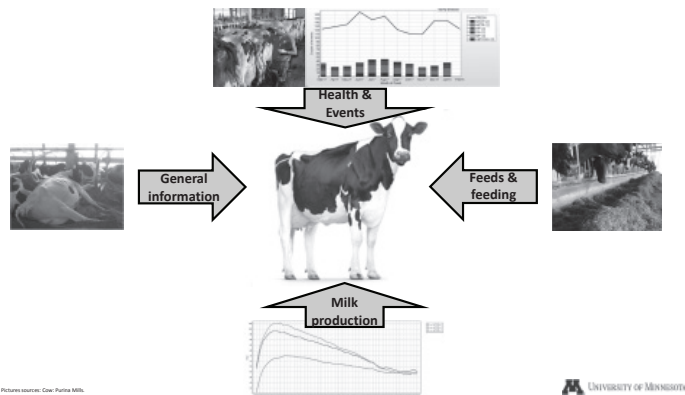
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Negative nutrient balance is a hallmark of the transition period

- Increased energy and mineral demands to support:
 - Fetal growth
 - Colostrum and milk production
- Changes in diet
- Delayed increase in DMI after calving



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Good management practices during the dry period can improve postpartum performance

- Control energy intake in far-off dry cows
- Minimize stress
- Avoid excessive weight variation
- Provide adequate and comfortable beds
- Management of calcium homeostasis (DCAD)
- Manage long dry days closely



Check list for monitoring factors associated with the occurrence of transition period diseases

- **Assess cow comfort**
 - Appropriate stocking density
 - Bunk space
 - Access to water
 - Stall design
 - Comfortable and sanitary bedding material
 - Heat abatement
- **Manage early lactation cows in “fresh cow pens”**
- **Routine comprehensive total mixed ration audits**
 - Particle length
 - Consistency of the delivered diet
 - Feeding routine
 - Bunk management
- **“Test-and-Treat” strategy to monitor hyperketonemia on fresh cows**
- **Use of anionic salts during the dry period to minimize the occurrence of hypocalcemia and assess urine pH on close up cows**
- **Use of automated health-monitoring systems for early diagnosis of diseases**

Adapted from Caiveta et al., 2017

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Strategies to improve calcium in fresh cows



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Avoid overcrowding for dry and fresh cows

- Appropriate stocking density depending on breed and parity
 - Far-off dry cows: 100% SD
 - Close up dry cows: 80% to 100% SD
 - Fresh cows: 80% SD
- Access to water
- Comfortable and sanitary bedding
- Heat abatement
- Avoid prolonged standing times



Nutritional strategies are effective in reducing the incidence of clinical hypocalcemia



- Use of low DCAD diets leads to metabolic acidosis allowing full PTH response
- Low DCAD diets can lower feed intake
- Forage potassium can greatly influence diet DCAD

When using anionic salts we should monitor:

- Urine pH (GOAL: pH = 6.0 – 7.0)
- Feed intake

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100% stocking density (headlocks) did not alter health parameters and culling in Jerseys

- Silva et al. (2014)
- SD80 vs SD100 – animals separated by parity
- 100% stocking density reduced lying time and increased displacement rate from the feedbunk
- Stocking density did not affect innate immune parameters, incidence of disease, BCS, milk production, and repro performance

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Blanket supplementation of calcium is not the solution for all fresh cows

- Blanket supplementation of calcium does not:
 - Improve health status;
 - Decrease culling in early lactation;
 - Improve milk production;
 - Improve reproductive performance.
- Oral calcium supplementation is only beneficial to a groups of cows
 - Lack (or very few) benefits for blind treatment
 - **Not recommended** for primiparous cows
- TARGET: “older” high producing cows and lame cows



Strategy	Mean	95% range	SD
High mature-equivalent milk yield cows			
Net herd impact (\$)	4,425	87 to 9,835	2,508
Net impact per dosed cow (\$)	15	0 to 33	9
Return on investment	1.1	0.0 to 2.4	0.5
Lame cows			
Net herd impact (\$)	5,812	1,614 to 11,403	2,523
Net impact per dosed cow (\$)	89	27 to 159	34
Return on investment	6.5	2.0 to 11.4	2.4
High mature-equivalent milk yield cows and lame cows			
Net herd impact (\$)	8,313	3,377 to 10,634	3,587
Net impact per dosed cow (\$)	25	6 to 47	10
Return on investment	1.8	0.5 to 3.4	0.8
All cows			
Net herd impact (\$)	3,605	3,377 to 10,634	3,587
Net impact per dosed cow (\$)	5	5 to 16	5
Return on investment	0.3	0.4 to 1.2	0.4

McArt and Oetzel (2015)



Disease	Definition	Herd Alarm	Cost/case
Ketosis	Decreased appetite, elevated milk, urine, and blood ketones in the absence of other disease (BHA > 1.2 mmol/L)	15%	\$289
Fatty Liver	Accumulation of fat within the cow's liver without any pathognomonic signs. Only diagnosed by liver biopsy.	50%	TBD
Milk Fever	Calcium deficiency causing progressive neuromuscular dysfunction with flaccid paralysis, circulatory collapse, and depression of consciousness	5%	\$246
LDA	Decreased appetite accompanied by a high-pitched tympanic resonance by percussion of the left abdominal wall.	3%	\$700
Retained Placenta	Fetal membrane visible at vulva or in vagina or uterus by vaginal examination for more than 24h after parturition	5%	\$232
Metritis	Abnormal cervical, vaginal, or uterine discharge.	10%	\$218
Mastitis	Visually abnormal milk from one or more quarters with or without signs of inflammation of the udder.	3%	\$376

Adapted from: Melendez and Risco (2005), McArt et al. (2015), Liang et al. (2017), Calveta et al. (unpublished)



Management of dry cows in essential for a successful transition to lactation

• How to monitor dry period?

- ✓ Check urine pH on a regular basis (weekly if possible)
- ✓ Keep track of pen counts
- ✓ Assess DMI and consistency of feed delivery
- ✓ Monitor days dry
- ✓ Make sure that cows have clean, comfortable, and sanitary beds

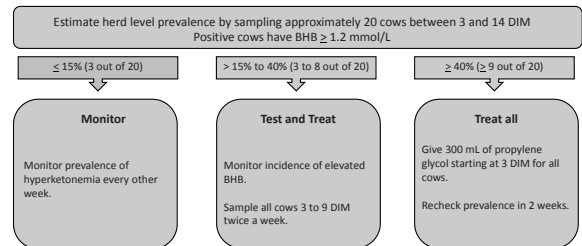


Fat-to-Protein ratio can be used as a herd level monitoring tool

- Good sensitivity (>80%) and specificity (70%)
- Goal should be < 40% of cows with 1st test F:P > 1.4
- Not a good test on the cow level



Monitoring Ketosis: Test-and-Treat Strategy



Adapted from: Ospina et al. (2013)



Reliable and effective data recording systems are essential for monitoring transition cows

- Monitor and treat metabolic and infectious diseases:
 - Hyperketonemia
 - Hypocalcemia
 - Metritis
 - Mastitis
 - Retained fetal membranes
 - Dystocia



KetoStix	N ^a	SCK ^b	CK ^c	Overall	Precision Xtra Results (mmol/L)	
					Mean (SE)	Range
Negative	43	4 (9%)	0 (0%)	4 (9%)	0.6 (0.05)	0.2–1.6
Trace (5 mg/dL)	10	5 (50%)	4 (40%)	9 (90%)	1.8 (0.22)	1.0–3.4
Small (15 mg/dL)	5	4 (80%)	0 (0%)	4 (80%)	1.5 (0.17)	1.1–1.9
Moderate (40 mg/dL)	6	2 (33%)	4 (67%)	6 (100%)	2.5 (0.50)	1.2–4.3
Large (> 80 mg/dL)	10	2 (20%)	8 (80%)	10 (100%)	2.9 (0.39)	1.4–5.3

^a N = number of cows.

^b The threshold for SCK was blood BHB ≥ 1.2 to ≤ 2.9 mmol/L.

^c The threshold for CK was blood BHB > 2.9 mmol/L.

Adapted from Galvão et al., 2012.



Automated health monitoring systems can identify cows suffering metabolic and digestive disorders

- Great number of options of sensors
- Health monitoring systems can identify cows with DAs, ketosis, metritis, and mastitis earlier than farm personnel
- HMS have a relatively lower sensitivity to identify cows with metritis and mastitis
- Opportunities and challenges when using HMS:
 - Earlier treatment of diseases and improvement of prevention programs
 - Challenging to make a treatment decisions when clinical signs are not present.



Thank you!

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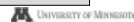
Monitoring of fresh cows assists is a good tool to make sure that performance matches expectations

- How to monitor fresh cows?
 - ✓ Keep track of pen counts
 - ✓ Assess DMI and consistency of feed delivery
 - ✓ Monitor days fresh pen
 - ✓ Make sure that cows have clean, comfortable, and sanitary beds
 - ✓ Postpartum disease occurrence
 - ✓ Changes in BCS (less than ≤ 0.75 BCS)
 - ✓ Keep lock-up times under 45 minutes/day



Management practice	Goal
Removal of old feed from bunk	Daily
Availability of feed	≥ 23 hours/day
Feed push-up	Every 4 hours
Eating space	≥ 60 cm/head (24 inches)
Water availability	≥ 10 linear cm/head (4 inches)
Pre-partum dry matter intake	
Primiparous	≥ 22 lbs/day
Multiparous	≥ 26 lbs/day
Post-partum dry matter intake	
Primiparous	≥ 34 lbs/day
Multiparous	≥ 42 lbs/day
Social groupings	Separate parity groups

Adapted from Calixeta et al., 2017



Take home message

- Transition period is challenging for animals and farmers
- Prevention >>>> Treatment
- Reliable and effective data recording system are paramount
- During transition period cows need to:
 - Have enough energy to avoid ketosis
 - Maintain normocalcemia
 - Have optimal cow comfort

