Transition Cow Management & Nutrition: 
How to Assess the Effectiveness of Practical Transition Interventions

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AGENDA

• Transition Period – Definition & Overview  
• Interaction of Nutrition and Immune Status  
• Research-Proven Transition Management Concepts  
  • Define Concepts  
  • Methods of Assessment  
• Take Home Messages  
• Questions
TRANSITION PERIOD – DEFINITION

- The transition period sets the stage for optimal performance in the upcoming lactation
- Cows experience hormonal and energy changes in the weeks prior to calving
  - DMI often drops off
  - Negative energy balance
- If not properly managed, cows can have greater health problems at calving and lower milk production

NAVIGATING TRANSITION CHALLENGES
DMI VARIATION IN CLOSE-UP PEN

GROUP AVERAGE DAILY DMI OF DRY COWS AND VARYING STOCKING DENSITY OF HEADLOCKS ON 24-INCH CENTERS.
DAYS IN CLOSE-UP PEN

- Stocking Density Target
  - <85% of Stalls or
  - >30 inches of linear Bunk Space
- Duration Targets (Ideal)
  - Heifers: ~28 days (90% 19-37 days)
  - Lactation >1 >24 days (90% 15-33 days)
  - TARGET 21 days

IMPACT OF DAYS IN CLOSE-UP PEN

INTERACTION: NUTRITION AND IMMUNE FUNCTION

• The interaction of nutrition and immune status is believed to have a significant impact on reproductive performance, although the precise mechanisms are not yet fully understood.

• However, research continues to prove nutritional status impacts postpartum immune function and subsequent reproductive performance.

ASSESSING TRANSITION HEALTH

Commonly used, research-proven and accepted parameters to assess Immune Function in Transition Cows:

• Individual cow blood β-hydroxybutyric acid (BHBA)
• Fat % at First DHI
• Urine pH | Blood Calcium
• First Projection Milk (Start Milk)
• First Test Linear Score SCC
• First Test Fat to Protein Ratio
1. Negative DCAD Philosophy

2. Use of Essential Fatty Acids
WHY NEGATIVE DCAD?

University study #1 compared milk yield results from cows fed either BIO-CHLOR, anionic salts or a control diet for 21 days prepartum.

NEGATIVE DCAD BENEFITS

Effects of prepartum DCAD supplement on postpartum milk yield.
NEGATIVE DCAD DIET DURATION

University study #2 compared feeding a negative DCAD Diet using BIO-CHLOR for 21 or 42 days prepartum or a control diet for 21 days prepartum.

ASSESSMENT: URINE pH

WHY TEST FOR URINE pH?
HOW TO MONITOR URINE pH

HOW TO SAMPLE URINE pH

EXPECT SOME VARIATION

• Variation can be caused by many behavioral and management factors:
  - Drinking Patterns
  - Eating behavior and sorting
  - Recent urination before sampling
  - Proper mixing of the ration
  - Adequate amounts of available feed
  - Overcrowding
  - Forage variability in K and Cl (changes in forages without adjusting the DCAD minerals can cause large shifts in urine pH)

Wet Chemistry Forage Analyses is a MUST!
HOW TO SAMPLE URINE pH

INTERPRETING RESULTS

• 80% of the samples should fall within the desired range according to the DCAD level of the diet

• The outlying 20% is likely caused by improper sampling or one or more of the factors previously listed

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<thead>
<tr>
<th>BREED</th>
<th>URINE pH LEVELS</th>
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<tbody>
<tr>
<td>HOLSTEIN</td>
<td>5.8 – 6.5</td>
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<tr>
<td>JERSEY</td>
<td>5.6 – 6.2</td>
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HOW TO SAMPLE URINE pH

SUMMARY

• Urine pH is an established proxy measurement for blood calcium – a commonly used, research-proven and accepted parameter to assess Immune Function in Transition Cows.

• Monitoring Urine pH is key to metabolic disorder prevention.

• If your prepartum urine pHs are not where they need to be, BIO-CHLOR™ can help achieve the negative DCAD levels needed for successful start-up milk, DMI and reduction in hypocalcaemia.
2. USE OF ESSENTIAL FATTY ACIDS

- Research continues to prove essential fatty acids (EFAs) have a positive impact on immune function and reproductive performance when adequately and properly supplied to the cow.
- EFAs are critical to all biological functions.
- Cows cannot naturally produce EFAs—must be supplemented through diet.
- Omega-3 and Omega-6 EFAs support improved immune function and are vital for reproductive success.

ROLE OF EFAS

- Studies have shown that feedstuffs high in linoleic (Omega-6) and linolenic (Omega-3) EFAs are biohydrogenated in the rumen; rendering them into nonessential fatty acids.

- To overcome biohydrogenation, EFAs must bypass the rumen and be absorbed by the small intestine, which can be accomplished by feeding ruminally inert fats, such as MEGALAC®-R.
EFAS IMPACT ON UTERINE HEALTH & IMMUNE FUNCTION

- 66% reduction of subclinical & clinical endometritis
- Zero cases of metritis

EFFECTS OF RUMINALLY INERT ESSENTIAL FATTY ACIDS ON POSTPARTUM IMMUNE-RELATED FUNCTIONS AND PRODUCTIVITY IN LACTATING DAIRY CATTLE.

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² Linwood Management, LLC, Linwood, NY
³ Purina Animal Nutrition, LLC, Caledonia, NY
⁴ Cows Come First, LLC, Batavia, NY
IMPROVED IMMUNE FUNCTION

- 44% reduction in BHBA
- 12% reduction in 1st Linear SCC
- 67% reduction in Early Embryonic Death

DISCUSSION

- At the cow level, increased serum concentrations of BHBA around parturition has been associated with increased risk of disease (Ospina et al., 2010a; Chapinal et al., 2011; Seifi et al., 2011), milk loss (Duffield et al., 2009; Ospina et al., 2010b; Chapinal et al., 2012), and impaired early reproduction (Walsh et al., 2007; Ospina et al., 2010b).

- Our results are consistent with previous research in which animals with increased BHBA around parturition experienced a higher risk of milk loss at the first DHIA and impaired early lactation reproduction (Chapinal et al., 2012).
EFFECTS OF MEGALAC®-R ON POSTPARTUM IMMUNE FUNCTION AND REPRODUCTION IN LACTATING DAIRY CATTLE – SUMMARY RESULTS 2013 DEMOS.

METHODS

• Five Dairies agreed to evaluate the efficacy of MEGALAC-R relative to postpartum immune function and reproduction in 9,947 cows.

- NY 2,219 cows treated v. 1,989 control (JDS)
- ID 3,807 cows treated v. 4,152 control
- WI #1 1,660 cows treated v. 1,020 control
- WI #2 847 cows treated v. 864 control
- CA 1,414 cows treated v. 1,215 control

• Supervising Nutritionists incorporated MEGALAC-R into the respective dairy’s pre- and post-fresh diets as such:

  Pre-Partum Period:
  • Feeding rate per head per day 0.25 lbs. for 21 days (All).

  Postpartum Period:
  • Feeding rate per head per day of 0.75 lbs. (NY) for 100 days,
  • Feeding rate per head per day of 0.70 lbs. (WI #1) for 20 days,
  • Feeding rate per head per day of 0.50 lbs. (CA) for ~120 days,
  • Feeding rate per head per day of 0.50 lbs. (WI #2 & ID) for ~30 days
• Peripartum concentrations of circulating BHBA are useful indicators of the ability of cows to deal with metabolic challenges in the transition period.

• Serum concentrations of BHBA measure oxidation of fat and reflect the success of a cow in adapting to negative energy balance.

• At the cow level, increased serum concentrations of BHBA around parturition have been associated with increased risk of, milk loss, and impaired early reproduction.
HOW TO MONITOR BHBA

SUMMARY
• Monitoring BHBA is key to metabolic disorder prevention.

• A routine monitoring program helps track postpartum health over time.

• Herd managers, veterinarians and nutritionists can help reduce postpartum disorders and boost energy by supplementing with bypass energy and essential fatty acids, like the combination of Omega-3 and Omega-6 EFAs found in MEGALAC®-R.

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TRANSITION PERIOD – DEFINITION

TAKE HOME MESSAGES

• The transition period sets the stage for optimal performance in the upcoming lactation.

• If not properly managed, cows can have greater health problems at calving and lower milk production.

• Research continues to prove nutritional status impacts postpartum immune function and subsequent reproductive performance.

• Recent research demonstrates the efficacy of Negative DCAD Philosophy and Use of Essential Fatty Acids during the Close-up Period and the positive impact of each on postpartum immune function in lactating dairy cattle.
Questions?

Thank you for your time!

ADDITIONAL SUPPORTING REFERENCES

Weich WD, Block E, Litherland NB. Effects of feeding moderate-energy high-fibre diets with reduced DCAD for twenty-one or forty-two days prepartum on mineral homeostasis and postpartum performance by multiparous dairy cows. J Anim Sci 2012;90 (Suppl.3).J Dairy Sci 2012;90 (Suppl.2)