Our objective: **Do what’s right for the calf** by continuing to lead the industry towards improving the health, performance and profitability of raising calves and heifers.

Special Thanks to:
- Dr. Mike Van Amburgh (Cornell)
- Dr. Don Sockett (Wisconsin Veterinary Diagnostic Lab)
**Past Goals**
- Keep them alive
- Minimize Treated Calves
- Get them to weaning as fast as possible
- Growth???

**Research Partnerships**

**Improving Calf Health**
- Reduce Failure of Passive Transfer (FPT): Gram negative sepsis
- Does fixing this stop all calf health issues?
- Why Not?

**Improving Calf Health**
- Higher plane of nutrition at right temp.
- Consistent milk/milk replacer
- High quality water
  - Free Choice & mixing
  - Electrolytes
  - Cleaning water
Improving Calf Health

- Proper Cleaning & Sanitation
  - Anything that touches calf - especially hands & feet of people
  - Chlorine dioxide - breaks down biofilms & kills crypto
- Dry, Well Ventilated Calf Housing
  - Better options for people & calf

What is a Higher Plane of Nutrition?

- Is this enough?

<table>
<thead>
<tr>
<th>Temperature °F</th>
<th>32</th>
</tr>
</thead>
<tbody>
<tr>
<td>100 lb. Bodyweight</td>
<td>1.5</td>
</tr>
<tr>
<td>Qts/day</td>
<td>6.0</td>
</tr>
<tr>
<td>Qts/fdg (2X)</td>
<td>3.0</td>
</tr>
<tr>
<td>Qts/fdg (3X)</td>
<td>2.0</td>
</tr>
<tr>
<td>Qts./fdg (2X) at 15% Solids</td>
<td>2.3</td>
</tr>
</tbody>
</table>

Other than Temperature - What Else Impacts Energy & Protein Needs?

- Short of bedding one day
- Out of grain/water for a short time
- Changes in weather
- Scours - even minor cases
- Respiratory disease - even minor cases
- Moderate infections increase energetic needs by 150 to 200%

Rate of Gain at Different Stress (scours, draft, poor bedding, etc.) Levels.

<table>
<thead>
<tr>
<th>Assumptions</th>
<th>Temperature °F</th>
<th>Rate Of Gain</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>32</td>
<td></td>
</tr>
<tr>
<td>100 lb. Bodyweight</td>
<td>1.5</td>
<td>No Add’l Stress</td>
</tr>
<tr>
<td>Qts/day</td>
<td>6.0</td>
<td></td>
</tr>
<tr>
<td>Qts/fdg (2X)</td>
<td>3.0</td>
<td>Maintenance Needs Increase</td>
</tr>
<tr>
<td>Qts/fdg (3X)</td>
<td>2.0</td>
<td></td>
</tr>
<tr>
<td>Qts./fdg (2X) at 15% Solids</td>
<td>2.3</td>
<td></td>
</tr>
<tr>
<td>Daily Gain Lb.</td>
<td>0.68</td>
<td>0.14</td>
</tr>
</tbody>
</table>

And this is with what appears to be a “good” plane of nutrition!!!
So should I just add Fat?

- Typically added fats are 7% protein and 60% fat
- It is not a balanced diet!
- Will quickly be short of protein
- Shorter, fatter calves - poorer feed efficiency
- Fat adds to total solids, causes mixing and cleaning problems
- Fat is not quickly nor efficiently utilized by the calf!
- Fat above 20% of diet dry matter hinders starter intake
- Best option is to feed more milk/milk replacer!!

Feeding 3X Daily

% of Operations Feed Calves 3X

- Coincidence or trend? Trying to do what is best for the calf!
- 2007: DCHA data 5.4%
- 2008: Personal research - 6.5%
- 2010: ISP research - 14%
- 2012: DHM - 25% + 36% Considering

Consider an automated calf feeding system?

- An efficient tool for delivering a higher plane of nutrition
- Land O’Lakes has 7 years of research on the feeders (>2100 calves)

Body Condition

Evaluate energy reserves “fat storage”.

Good
Body Condition

Ever heard someone say “Look at my skinny baby!”

Fowler 2004

Phagocytosis
Ballou et al. 2015

- “These data also indicate that the innate leukocytes of Jersey calves fed a higher plane of nutrition are increased more rapidly after an oral challenge with a *Salmonella typhimurium*. The more active innate leukocyte responses likely reduced the incidence of systemic inflammation.”

ADSA Full Potential

- Abstract 24 Brown at Guelph 8 better (19.6# bigger at 70 days) than 6 week weaning when feeding 2.6 lb/d CMR

- Abstract 619 Hammon German/Slovakia Title: Intensive milk feeding (vs. 1.65# CMR) in calves affects growth performance, metabolic and endocrine traits, but not rumen development. Better growth, no diff in starter intake.

### Profiling CMR Users vs. Pasteurizer Users (all with 100+ calves)

- Compared to CMR Users, Pasteurizer Users are larger, use a higher feeding rate, and wean later.

### Milk Yield Response to Increased Pre-weaning Milk or Milk Replacer Nutrient Supply

- Milk response is the difference between treatment milk yield minus control.
- $P < 0.05$. $P < 0.1$. $P > 0.1$
Impact on Milk Production

- 11/12 University Trials show improved milk production (1000 to 3000 lb. more milk in 1st lactation) by providing a higher plane of nutrition in the first 8 weeks of life of the heifer.

New Data:


Economic Comparison of Conventional vs. Intensive Heifer Rearing Systems

(with new higher feed prices, $175 calf, 7% interest, $18 milk)

Michael Overton, DVM, MPVM

Summary of Results

<table>
<thead>
<tr>
<th>Advantage</th>
<th>Feed costs</th>
<th>Labor costs</th>
<th>Health/vet med</th>
<th>Interest cost</th>
<th>Reproductive costs</th>
<th>Other costs</th>
<th>Lost investment (dead calves)</th>
<th>Calf investment cost</th>
<th>Net Result Savings</th>
</tr>
</thead>
<tbody>
<tr>
<td>Conventional</td>
<td>($61)</td>
<td>$29</td>
<td>$31</td>
<td>$10</td>
<td>$10</td>
<td>$10</td>
<td>$12</td>
<td>$4</td>
<td>$47</td>
</tr>
<tr>
<td>Intensive</td>
<td>$47</td>
<td>$10</td>
<td>$25</td>
<td>$15</td>
<td>$15</td>
<td>$15</td>
<td>$25</td>
<td>$5</td>
<td>$62</td>
</tr>
</tbody>
</table>

- Add in value of additional milk in 1st lactation of $152 and the average advantage for Intensive Rearing is $199.
Full Potential Protein Blend

<table>
<thead>
<tr>
<th>Number Calves</th>
<th>Avg. Period Gain, lbs.</th>
<th>P Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Full Potential</td>
<td>142</td>
<td>141</td>
</tr>
<tr>
<td>Week 1</td>
<td>5.78</td>
<td>5.23</td>
</tr>
<tr>
<td>Week 2</td>
<td>13.23</td>
<td>13.12</td>
</tr>
<tr>
<td>Week 3</td>
<td>12.30</td>
<td>12.95</td>
</tr>
<tr>
<td>Week 4</td>
<td>12.63</td>
<td>12.68</td>
</tr>
<tr>
<td>Week 5</td>
<td>12.40</td>
<td>12.81</td>
</tr>
<tr>
<td>Week 6</td>
<td>14.96</td>
<td>14.86</td>
</tr>
<tr>
<td>Week 7</td>
<td>11.63</td>
<td>12.87</td>
</tr>
<tr>
<td>Total Gain</td>
<td>82.93</td>
<td>84.52</td>
</tr>
</tbody>
</table>

The Effects of Supplementing Two Pasteurized Milk Balancer Products to Pasteurized Whole Milk on the Health and Growth of Dairy Calves

ADSA 2014 Abs. 336

K. Glosson1, B. Hopkins1, S. Washburn1, S. Davidson1, G. Smith1, T. Earleywine2, and C. Ma2

1North Carolina State University, Raleigh
2Land O'Lakes Animal Milk Products, St. Paul, MN

Will Future Milk Replacers be all-milk Protein?

- Not likely but will perform as good or better than all-milks at significantly lower cost!
- Will use less alternatives than they have in the past.
- Ask for the research!
What is this New Formulation System - Protein Blend?

- Utilizes a similar approach as is used in baby formulas
- Based on a blend of highly digestible proteins that complement each other

Why Does it Work?

- WELL RESEARCHED!
- Still include technologies we always have such as:
  - Beta glucan – for immunity
  - FOS – for proper gut microbial growth
  - MOS – gut protection
  - Many other technologies – fatty acid formulation, etc.
- We make formulation adjustments to assure performance

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“Calves receiving supplemental milk balancer products resulted in greater growth rates with similar overall calf health. The similarity of calves receiving either of the two supplemental balancers in all growth measurements analyzed, combined with similar health data, indicates that there were no adverse effects when using the more economical protein blend balancer alternative over the all-milk balancer product.”
Summary - Trends
• Feeding More!
  – Calves need nearly 2 gallons of milk/milk replacer daily in 2 to 3 feedings to survive and thrive
• New Formulation Options of milk replacers.
  – need to be well researched
  – These options are the future of milk replacer

Summary - Trends
• Water Quality Analyses
• Cleaning & Sanitation Protocols
• Enhancing Pasteurized Milk Nutrition with Powder/Technologies
• Better Housing Options

He had balanced nutrition & perfect ventilation, however...

Do what’s right for the calf by continuing to lead the industry towards improving the health, performance and profitability of raising calves and heifers.
Thank You!