Leave No Dairy Calf Behind
Educational Series

Lee Kilmer, ISU Professor of Animal Science & State Extension Specialist
Jennifer Bentley, ISU Extension & Outreach Dairy Specialist
• Type Name/Email address into chat box

• Questions? Type into chat box

• Webinar/Resource Materials:
  – [http://www.extension.iastate.edu/dairyteam](http://www.extension.iastate.edu/dairyteam)
    - Dairy Nutrition Tab (Calves and Heifers)

• Archived Webinars
  – [http://www.extension.iastate.edu/dairyteam/calves-heifers](http://www.extension.iastate.edu/dairyteam/calves-heifers)
  – March 13, Colostrum Management & Calf Management Goals
  – March 20, Calf Housing and Design
  – March 27, Automatic Calf Feeding Systems
Considerations for Success of Automatic Calf Feeding Systems

Jennifer Bentley
Extension Dairy Specialist
jbentley@iastate.edu
Traditionally housed calves in individual pens

- Isolation for reduced disease transfer
- Emphasis on individual feeding and care
Growing interest in group-housed systems

- Increase labor efficiency
  - shift from physical labor to management
  - Challenge employees
- Calf well-being
  - Socialization
  - Natural behaviors
  - Smoother transition from birth to post-weaning
- Maximize calf growth
  - Short term growth & health
  - Efficient cost/lb gain
- Positively influence future performance
Group Housing and Feeding Systems

– Gang/mob feeders
– Ad-lib feeders; milk barrels/milk lines
– Automated systems
Automatic Calf Feeder Types
Assumptions in Calf Raising Systems

- Good dry cow program (vaccination & nutrition)
- Good calving environment (clean & dry)

- Colostrum Management
  - Quality (>50 g IgG/L)
  - Quantity (10-15% BW)
  - Quickness (<2 hours)
  - sQueaky Clean (<100,000 cfu/ml TPC)
Assumptions in Calf Raising Systems:

• Properly designed facility
  – Adequate space
  – Adequate ventilation for good hygiene

• Attention to detail and cleanliness
Automatic Calf Feeders
Automatic Calf Feeders
Age of Entry into System
Help manage competition at the auto feeder

• Design a stall that prevents calves from displacing one another to maintain milk intake and discourage competitive behavior
Nutrition and Feeding Management

• Increasing the feeding rate and the number of portions fed per day may:
  – Improve body weight gain
  – Increase starter intake
  – Improve feed efficiency
  – Increase in survival of calves through their first lactation
## Typical Machine Plan

### Quantity

<table>
<thead>
<tr>
<th>Period</th>
<th>Days</th>
<th>Start Quantity</th>
<th>Final Quantity</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>14</td>
<td>6 liters</td>
<td>10 liters</td>
</tr>
<tr>
<td>2</td>
<td>23</td>
<td>10 liters</td>
<td>10 liters</td>
</tr>
<tr>
<td>3</td>
<td>2</td>
<td>10 liters</td>
<td>5 liters</td>
</tr>
<tr>
<td>4</td>
<td>9</td>
<td>5 liters</td>
<td>3 liters</td>
</tr>
<tr>
<td>Total</td>
<td>48</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### Limitation

<table>
<thead>
<tr>
<th>Period</th>
<th>Days</th>
<th>Start Quantity</th>
<th>Final Quantity</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>14</td>
<td>2 liters</td>
<td>2.5 liters</td>
</tr>
<tr>
<td>2</td>
<td>34</td>
<td>2 liters</td>
<td>3.5 liters</td>
</tr>
<tr>
<td>Total</td>
<td>48</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### Concentration

**Concentration:**

150g is added to 1000 ml (gms) water

\[
\frac{150}{1150} = 13\% \text{ solids}
\]
Feeding milk or milk replacer?

• If you have enough waste milk, there are areas of opportunity within the dairy
• You can choose to pull milk from the tank, this should be pasteurized
• Some machines can handle both sources of milk, some only handle one
Weaning Management

• Weaning can occur automatically at a preset age by reducing the number of feedings per day and the amount of milk or milk replacer offered over a predetermined period of time, usually one week.
Weaning Management

• Reduce other stressors during this time:
  – Don’t dehorn, vaccinate or move at the same time they are being weaned
Cross-Sucking Behavior

• Cross-sucking, competition around the feeder, and dominance behavior can occur if the system is managed improperly

• Associated factors:
  – Inadequate meal size
  – Sucking stimulus persists post feeding
  – Inadequate energy density
  – Calves develop habit
Cleaning and Maintenance

• Follow the schedule for the autofeeder!
• Do the manual cleaning on the autofeeder!
Cleaning & Maintenance

• Closely monitor and clean the powder and additive outlets
• Calibrate powder and additive delivery
• Monitor and replenish cleaning solutions
• Inspect delivery hose and nipples
Use the computer software

- % of entitled milk consumed
- Drinking speed
- Number of unrewarded
- Alarm list
# Still Need to Look at the Calf!

## Calf Health Scoring Criteria

<table>
<thead>
<tr>
<th>Rectal Temperature</th>
<th>100–100.9</th>
<th>101–101.9</th>
<th>102–102.9</th>
<th>≥103</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Cough</strong></td>
<td>None</td>
<td>Induce single cough</td>
<td>Induced repeated coughs or occasional spontaneous cough</td>
<td>Copious bilateral muco-purulent discharge</td>
</tr>
<tr>
<td><strong>Eye scores</strong></td>
<td>Normal</td>
<td>Small amount of ocular discharge</td>
<td>Moderate amount of bilateral discharge</td>
<td>Heavy ocular discharge</td>
</tr>
<tr>
<td><strong>Ear scores</strong></td>
<td>Normal</td>
<td>Ear flick or head shake</td>
<td>Slight unilateral droop</td>
<td>Head tilt or bilateral droop</td>
</tr>
</tbody>
</table>

*Source: McGuirk, 2009.*
Skills needed for Manager!

• Good observer, attention to detail
• Likes and can manage calves
• Can use the information, make decisions, and set protocols
Conclusion

• Auto-feeders allow “individual” management within groups
• Proper Management Mindset
• Auto-feeders generate a lot of data
• All other calf management factors need to be in place for autofeeder to be successful
Leave No Dairy Calf Behind
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Lee Kilmer, ISU Professor of Animal Science & State Extension Specialist
Jennifer Bentley, ISU Extension & Outreach Dairy Specialist
Calf Management Practices-Producer Surveys
Why calves?

- Having healthy dairy replacements is critical to a farm’s overall profitability and sustainability

- 2012 Iowa Dairy Survey indicated that 40% of Iowa dairy farms will be making changes to calf facilities in the next 5 years
RME Grant Goals

- Assist producers in evaluating their current practices and potentially new calf housing and feeding systems

- Enhance management skills to operate these systems successfully
Automatic Calf Feeder Survey

• 20 producers responded
• Average installation - 2.6 years old

• Herd average – 367 cows
  – Two operations utilized ACF for bull calves only
  – Average cost with software included: $17,301
  – Used price: $5,500
  – Monthly associated costs excluding MR: $55
  – Average building costs associated with ACF $66,643
ACF-Facility Management

- 47% used straw for bedding
- 10% did not use bedding as calves were housed on raised grated floor
- Other: Combination of straw, sawdust, and cornstalk bedding
- Average square feet of space per calf: 34 sq. ft.
- Calves per nipple station: 21 calves
78% fed 1 gallon or more of colostrum at 1st feeding
ACF-Colostrum Management

Colostrum Type Fed

- Occasionally fed Colostrum Replacer
- Always Fed Colostrum Replacer
- Pasteurized Colostrum
- Occasionally fed Frozen Colostrum
- Fresh Colostrum

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ACF-Colostrum Management

- 18% evaluated colostrum
  - Visually or Colostrometer

- 25% measured success of passive transfer
  - Refractometer or serum test
ACF-Feeding Management

- Calves averaged 4-6 meals per day
- Feeding programs varied depending on system and heifers or bulls being fed
  - 140-150 grams per liter and fed up to 10 liters per day
  - 2 weeks prior to weaning, liters fed backed down until they no longer received milk
ACF-Feeding Management

- Non-pasteurized
- Pasteurized wastemilk
- 25-28% Protein Milk Replacer
- 20-22% Protein Milk Replacer

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ACF-Feeding Management

- Consumption at weaning age:
  - 73% 3-5 pounds
  - 13% 5 pounds or greater

Calf Starter Protein

- 16-20% Protein: 44%
- 21-22% Protein: 56%
ACF-Labor Management

- Average time feeding calves
  - Feeding, monitoring, vaccinating dehorning, bedding, sanitation
  - 2.2 hours per day
- Labor time managing calves before moving into ACF
  - 1 hour per day

Who’s feeding calves?
ACF-Labor Management

• No labor time was saved; time is more flexible
• Physical labor has been replaced with management time
• Others reported an average of 1.5 hours per day reduced labor
• Software usage: .44 hours
ACF-Health Management

• Key indicators to move calves to ACF:
  – Age
  – Health of calf
  – Consumption

• Main Indicators used on ACF software
  – Drinking speed
  – Daily consumption of milk

When are calves moved into ACF?

- 45% At Birth
- 33% 2-5 days old
- 22% 7-14 days old
ACF-Health Management

- Mortality Rate: 3%
- Treatment for scours: 14%
- Treatment for respiratory: 14%

- 37% monitored Average Daily Gain
- ADG from birth to weaning: 2.3 lbs
  - 8 week weaning age for heifers
  - 7 week weaning age for bulls
Reasons for installing ACF

1. **Labor efficiency**
   - Focus more on management of calves rather than physical labor, flexibility of feeding schedule

2. **Calf Health**
   - Consistent, multiple feedings, temperature of milk always the same, increase space per calf, calf comfort

3. **New Facility**
   - Going to build anyway, needed more room, installed AMS for cows, and needed new project to challenge employees
Management factors needed for success of ACF

1. **Cleanliness**
   - Detail oriented employees closely monitoring and cleaning of the lines, nipples, circuit, and cleanliness of calves

2. **Ventilation**
   - Facility is designed with air quality being a key component of the system

3. **Management/Software**
   - Software is invaluable, pays for itself, and worth the cost to catch calves earlier; watching calves is still important
ACF Challenges

• Learning the software and ID system
• Developing a feeding plan to control behavioral issues
• Keeping system clean
• Compatibility issues with ACF and pasteurizer
• Respiratory and ventilation were main challenges moving to group housing system
ACF Summary

• Producers showed success in switching from previous calf feeding system

• Labor was not always reduced, labor efficiency was improved

• Learning curves for software technology and facility management

• Added value to quality of life
Complete survey questions:

- [http://www.extension.iastate.edu/dairyteam/](http://www.extension.iastate.edu/dairyteam/) then Dairy Nutrition
  - then Calves & Heifers

or

- [http://www.extension.iastate.edu/dairyteam/calves-heifers](http://www.extension.iastate.edu/dairyteam/calves-heifers)
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Economics of Automatic Calf Feeders

Jennifer Bentley
Extension Dairy Specialist
jbentley@iastate.edu
# Calf Inventory and Financial Information

<table>
<thead>
<tr>
<th>Variables</th>
<th>Units</th>
<th>Instructions or Reference Values</th>
</tr>
</thead>
<tbody>
<tr>
<td>Heifers, Yearly Total</td>
<td>95 no. heifers</td>
<td>Typically 45 to 48 percent of cow herd</td>
</tr>
<tr>
<td>Bulls, Yearly Total</td>
<td>95 no. bulls</td>
<td>Typically 45 to 48 percent of cow herd</td>
</tr>
<tr>
<td>Veal, Yearly Total</td>
<td>- no. veal calves</td>
<td>Feeding station can feed 15-20 veal calves</td>
</tr>
<tr>
<td>Number of Feeders Needed</td>
<td>1 no. feeders</td>
<td>Feeder can feed 50 to 60 calves</td>
</tr>
<tr>
<td>Estimated Cost of Automatic Calf Feeding Housing</td>
<td>$66,000 total $</td>
<td>Include value for remodel or new building</td>
</tr>
<tr>
<td>Estimated Cost per Automatic Calf Feeding Feeder</td>
<td>$18,000 $ per feeder</td>
<td>Range of $2 to 28,000 per station, used $5500</td>
</tr>
<tr>
<td>Estimated Cost of Optional Computer and Program</td>
<td>$4,000 $ per system</td>
<td>Range of $0 to $5000</td>
</tr>
<tr>
<td>Years of Useful Life</td>
<td>10 years</td>
<td>Typical range of 7 to 15 years</td>
</tr>
<tr>
<td>Value of Feeder after Useful Life</td>
<td>$1,800 $ per feeder</td>
<td>Typical range of 10% to 20% purchase price</td>
</tr>
<tr>
<td>Interest Rate of Money</td>
<td>5.50 %</td>
<td>Value of owned or borrowed money</td>
</tr>
<tr>
<td>Insurance Rate per $1,000 Value</td>
<td>0.50 %</td>
<td>Typical rate is 0.5% per 1,000 investment</td>
</tr>
<tr>
<td>Increased Insurance Value of Feeder System</td>
<td>$30,000 $ per farm</td>
<td>Value of facility over current system</td>
</tr>
</tbody>
</table>
# Feed Intake Changes

<table>
<thead>
<tr>
<th>Description</th>
<th>Value</th>
<th>Description</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Milk Replacer Cost per Pound of DM</td>
<td>$1.90 / lb</td>
<td>Typical range of $1.20 to $2.10 per pound</td>
<td></td>
</tr>
<tr>
<td>Pasturized or Whole Milk Cost per cwt.</td>
<td>$19.30 / cwt.</td>
<td>Typical range of $13.00 to $23.00 per cwt</td>
<td></td>
</tr>
<tr>
<td>Current Milk Replacer Intake</td>
<td></td>
<td>Typical range of 1 to 3 pounds per day</td>
<td></td>
</tr>
<tr>
<td>Anticipated Milk Replacer Intake</td>
<td></td>
<td>Typical range of 1.05 to 3.3 pounds</td>
<td></td>
</tr>
<tr>
<td>Current Pasturized/Whole Milk Intake</td>
<td></td>
<td>Typical range of 4 to 6 quarts</td>
<td></td>
</tr>
<tr>
<td>Anticipated Pasturized/Whole Milk Intake</td>
<td></td>
<td>Typical range of 4 to 13 quarts per day</td>
<td></td>
</tr>
<tr>
<td>Current Days on Milk</td>
<td>56.0 days</td>
<td>Typical range of 6 to 8 weeks</td>
<td></td>
</tr>
<tr>
<td>Current Number of Days in Weaning Stage</td>
<td>7.0 days</td>
<td>Typical range of 7 to 14 days</td>
<td></td>
</tr>
<tr>
<td>Anticipated Days on Milk</td>
<td>49.0 days</td>
<td>Typical range of 6 to 8 weeks</td>
<td></td>
</tr>
<tr>
<td>Anticipated Days in Individual Starter Pen Stage</td>
<td>5.0 days</td>
<td>Typical range of 1 to 14 days</td>
<td></td>
</tr>
<tr>
<td>Anticipated Number of Days in Weaning Stage</td>
<td>14.0 days</td>
<td>Typical range of 7 to 14 days</td>
<td></td>
</tr>
<tr>
<td>Anticipated Dump Milk per Day</td>
<td>1.0 quarts</td>
<td>Typical range of 0 to 2 quarts per day</td>
<td></td>
</tr>
<tr>
<td>Calf Starter Cost per Pound of DM</td>
<td>$0.30 / lb</td>
<td>Typical range of 0.18 to 0.34 per pound</td>
<td></td>
</tr>
<tr>
<td>Current Total Calf Starter Intake, Pounds of DM</td>
<td>90.0 pounds/calf</td>
<td>Average total feed intake of 90 pounds</td>
<td></td>
</tr>
<tr>
<td>Anticipated Total Calf Starter Intake, Pounds of DM</td>
<td>100.0 pounds/calf</td>
<td>Anticipated increase of 10 to 20 percent</td>
<td></td>
</tr>
</tbody>
</table>
## Labor Changes

<p>| | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Current Feeding Labor Time Per Day</strong></td>
<td><strong>8.0</strong> minutes per calf</td>
<td>Typical range of 5 to 10 minutes per day</td>
</tr>
<tr>
<td><strong>Anticipated Feeding Labor Time Per Day</strong></td>
<td><strong>1.0</strong> minutes per calf</td>
<td>Typical range around 1 minute per day</td>
</tr>
<tr>
<td><strong>Current Calf Labor Management Per Day</strong></td>
<td><strong>7.0</strong> minutes per calf</td>
<td>Typical range 4-9 minutes</td>
</tr>
<tr>
<td><strong>Anticipated Calf Labor Management Per Day</strong></td>
<td><strong>7.0</strong> minutes per calf</td>
<td>Typical range 4-9 minutes</td>
</tr>
<tr>
<td><strong>Labor Rate for Feeding Calves</strong></td>
<td><strong>$12.50</strong> per hour</td>
<td>Typical range from $8 to $15 per hour</td>
</tr>
<tr>
<td><strong>Increased Hours for Record Management</strong></td>
<td><strong>0.5</strong> hours per day</td>
<td>Include feeder report analysis</td>
</tr>
<tr>
<td><strong>Reduced Hours for Labor Management</strong></td>
<td><strong>0.5</strong> hours per day</td>
<td>Include hiring, training, overseeing, etc.</td>
</tr>
<tr>
<td><strong>Labor Rate for Records and Labor Management</strong></td>
<td><strong>$16.00</strong> per hour</td>
<td>Typical range from $12 to $25 per hour</td>
</tr>
</tbody>
</table>
# Calf Health Changes

<table>
<thead>
<tr>
<th>Calf Health Changes</th>
<th>10% calves</th>
<th>Typical range of 10 to 20 percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Current Calf Treatment Rate</td>
<td>10% calves</td>
<td>Typical range of 10 to 20 percent</td>
</tr>
<tr>
<td>Anticipated Calf Treatment Rate</td>
<td>14% calves</td>
<td>Anticipated change of -5 to 5 percent</td>
</tr>
<tr>
<td>Cost of Treatments per Calf including labor</td>
<td>$4.00 per calf</td>
<td>Typical range of $2 to $12 per calf</td>
</tr>
</tbody>
</table>
Utility and Supply Changes

<table>
<thead>
<tr>
<th>Description</th>
<th>Cost</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Anticipated Change in Electricity and Maintenance</td>
<td>$325 per year</td>
<td>Anticipated increase of electricity use</td>
</tr>
<tr>
<td>Anticipated Change in Supplies and Repairs</td>
<td>$200 per year</td>
<td>Include cleaning and feeding supplies</td>
</tr>
</tbody>
</table>
# Annual Partial Budget Analysis

**Economics of Automatic Calf Feeding Systems**

<table>
<thead>
<tr>
<th>Positive Impacts</th>
<th>Negative Impacts</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Increased Incomes</strong></td>
<td><strong>Increased Expenses</strong></td>
</tr>
<tr>
<td>Total Increased Incomes</td>
<td>Capital Recovery Cost of Feeder (Dep &amp; Int) $13,460</td>
</tr>
<tr>
<td>ISU Extension</td>
<td>Increased Insurance Costs $150</td>
</tr>
<tr>
<td><strong>Decreased Expenses</strong></td>
<td>Increased Milk Replacer Intake $5,453</td>
</tr>
<tr>
<td>Reduced Calf Treatment</td>
<td>Increased Pasturized Milk Intake $0</td>
</tr>
<tr>
<td>Reduced Feeding Labor</td>
<td>Increased Calf Starter Intake $570</td>
</tr>
<tr>
<td>Reduced Calf Management Labor</td>
<td>Increased Calf Treatment $30</td>
</tr>
<tr>
<td>Reduced Labor Management</td>
<td>Increased Utilities and Supplies $525</td>
</tr>
<tr>
<td><strong>Total Decreased Expenses</strong></td>
<td>Increased Records Management $2,920</td>
</tr>
<tr>
<td>$19,811</td>
<td><strong>Total Increased Expenses</strong> $23,108</td>
</tr>
</tbody>
</table>

**Annual Value to Quality of Life =**

<table>
<thead>
<tr>
<th>QoL and Herd Software</th>
<th>QoL, Software, and Milk Gain</th>
</tr>
</thead>
<tbody>
<tr>
<td>$2,000</td>
<td>$18,240</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th><strong>Total Positive Impacts</strong></th>
<th><strong>Total Decreased Incomes Expected</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>$19,811</td>
<td>$0</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th><strong>Net Financial Impact</strong></th>
<th><strong>Estimated Payback Period, Years</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>-$3,297</td>
<td>n/a</td>
</tr>
<tr>
<td>with QoL and Herd Software</td>
<td></td>
</tr>
<tr>
<td>-$547</td>
<td></td>
</tr>
<tr>
<td>with QoL, Software, and Milk Gain</td>
<td></td>
</tr>
<tr>
<td>$17,693</td>
<td></td>
</tr>
</tbody>
</table>

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**Iowa State University Extension and Outreach**

**Healthy People, Environments, Economies.**
Loan Amortization and Net Cash Flow Analysis

### Calf Feeder Loan Amortization for 1 Calf Feeder

<table>
<thead>
<tr>
<th>Years of Loan</th>
<th>Total Payments</th>
<th>Annual Interest Rate</th>
<th>Principal Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td>3</td>
<td>12 Annual Payment(s)</td>
<td>5.50%</td>
<td>$15,000</td>
</tr>
<tr>
<td>36</td>
<td>Total Payments</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th></th>
<th>Interest</th>
<th>Principal</th>
<th>Total Payment</th>
</tr>
</thead>
<tbody>
<tr>
<td>First Month Payment</td>
<td>$69</td>
<td>$384</td>
<td>$453</td>
</tr>
<tr>
<td>First Year Payment</td>
<td>$825</td>
<td>$4,610</td>
<td>$5,435</td>
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</tbody>
</table>

### Net Cash Flow Analysis of Calf Feeder

<table>
<thead>
<tr>
<th></th>
<th>Totals</th>
</tr>
</thead>
<tbody>
<tr>
<td>Net Annual Financial Impact from Partial Budget Analysis</td>
<td>-$3,297</td>
</tr>
<tr>
<td>Capital Recovery Cost of Calf Feeder</td>
<td>$13,460</td>
</tr>
<tr>
<td>Annual Payment on Calf Feeder Investment</td>
<td>$5,435</td>
</tr>
<tr>
<td>Cash Flow Difference of Capital Recovery vs Annual Payment</td>
<td>$8,025</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Cash Flow Adjustment for Unpaid Labor and Management</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Calf Feeding Labor Saved</td>
<td>$14,048</td>
</tr>
<tr>
<td>Amount Hired, Current</td>
<td>$15,000</td>
</tr>
<tr>
<td>$592</td>
<td></td>
</tr>
<tr>
<td>Labor &amp; Records Management Changes</td>
<td>$0</td>
</tr>
<tr>
<td>Amount Hired, Current</td>
<td>$0</td>
</tr>
<tr>
<td>$0</td>
<td></td>
</tr>
<tr>
<td>Total Change in Calf Feeder Cash</td>
<td>$5,319</td>
</tr>
</tbody>
</table>
Use of Spreadsheet

• Slight changes in input values can dramatically influence the net financial impact
  – Anticipated days on milk
  – Anticipated milk replacer intake
• Careful review to confidently make decision
Thank you!

• Materials and Resources:
  – [http://www.extension.iastate.edu/dairyteam](http://www.extension.iastate.edu/dairyteam)
    - Dairy Nutrition Tab (Calves and Heifers)

• Archived Webinars
  – [http://www.extension.iastate.edu/dairyteam/calves-heifers](http://www.extension.iastate.edu/dairyteam/calves-heifers)
  – March 13, Colostrum Management & Calf Management Goals
  – March 20, Calf Housing and Design
  – March 27, Automatic Calf Feeding Systems