Three critical things you need to know about calculating growth curves using partial body weights

Mark Nelson, Director of Industry Relations
Kevin Garossino, Lead Data Analyst

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GrowSafe Overview

Platform of livestock monitoring solutions impacting

- Sustainability
- Efficiency
- Profitability

We are partnering globally with breeders, breed associations, feedlots and academia
Agenda

• Technology
• Data collection review
• Use cases
• Questions
Technology

GrowSafe Beef® Continuous In Pen Weighing
Mark Nelson, Director of Industry Relations
Technology - GrowSafe Beef® (GSB)

- Load Bar Below the Structure
- Antenna
- DAQ Panel
- Partial Body Weight Measurement taken
  Convert partial body weight to Live Weight
Continuous In-Pen Weighing
Data Collection Review

GrowSafe Beef® Continuous In Pen Weighing
Kevin Garossino, Lead Data Analyst
Uncertainty of Chute Weighing

Factors Affecting Chute Weights:
• Time of Day
• Rumen Fill
• Other Cattle Pushing up Against Chute
• Proper Calibration and Taring of Chute Scales

<table>
<thead>
<tr>
<th>Weight Difference</th>
<th>&gt; 10 lbs</th>
<th>&gt; 20 lbs</th>
<th>&gt; 30 lbs</th>
<th>&gt; 40 lbs</th>
</tr>
</thead>
<tbody>
<tr>
<td>Proportion of Weights</td>
<td>54.0 %</td>
<td>25.6 %</td>
<td>11.2 %</td>
<td>5.0 %</td>
</tr>
</tbody>
</table>
Technology GrowSafe Beef ® (GSB)

Continuous Weighing
Uncertainty of Chute Weighing

1) Δ ADG = 2.54 lbs
2) Δ RFI = 1.61 lbs
Uncertainty of Chute Weighing

1) 378.75 - 333.39 = 45.36 kg (~100 lbs)
2) $\Delta$ ADG = 1.32 lbs
3) $\Delta$ RFI = 1.48 lbs
Correlation of Chute vs GSB Weight
Correlation of Chute vs GSB Weight

\[ R^2 \text{ Correlation of Start to End Period} \]
Use Cases

GrowSafe Beef® Continuous In Pen Weighing
Mark Nelson, Director of Industry Relations
Use Cases

1. **Seedstock**
   - RFI Standards 49 Day vs 70 Day
   - Establish Growth Curves and Weights

2. **Feedlot**
   - Continuous Performance Measurements

3. **Pasture**
   - Portable Technology for Weights on Pasture
Seedstock: Shortened Duration RFI Feed Efficiency Trials

- Standard trial with chute weights in 70-day following a warm up
- 49-day trial length, following a 10-14 day warm-up period
- Opportunity to run more trials per year, reducing cost
- Reduction of animal stress and labor
Guidelines for Running Feed Efficiency Trials

<table>
<thead>
<tr>
<th></th>
<th>BIF</th>
<th>GrowSafe</th>
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</thead>
<tbody>
<tr>
<td>DMI (total valid)</td>
<td>35 Days</td>
<td>35 Days</td>
</tr>
<tr>
<td>Tests that use coupled feed intake and gain; Such as RFI w/ Chute Weights (4)</td>
<td>70 Days</td>
<td>70 Days</td>
</tr>
<tr>
<td>Tests that use coupled feed intake and gain; Such as RFI w/ continuous weighing</td>
<td>Under discussion*</td>
<td>49 Days</td>
</tr>
</tbody>
</table>

*BIF Guidelines Wiki: New remote-sensing technologies continue to be developed and older technologies improved such as automated animal weighing systems and ear tags monitoring feeding behavior. Given the rapid advancements, the guidelines for measuring individual feed intake and gain, will likely need review on an ongoing basis. These technologies will likely result in changes to the current recommendations.

http://guidelines.beeffimprovement.org/index.php/Intake_and_Feed_Efficiency

Impact of Changing Technology of Feed Efficiency Trials
Seedstock: Future Suggested Uses

- Growth Curves
- Third Party Verified:
  - Cow Weights
  - 205 and 365 weights
Feedlot: Monitoring Continual Performance

Monitor individual animals to make data-based decisions

Performance
- Manage Variation by Individual & Pen

Nutrition
- Access Rations & Performance Insights

Well Being
- Early detection of Behavior Changes

Labor Optimization
- Optimize resources

Marketing
- Daily Live Weights
- Daily Carcass Weight
- Predict Harvest Date
Pasture

• **Emerging** Technology for Growth Management & Monitoring on Pasture

• Research Collaborations with Noble Research Institute, West Virginia University and Olds College
Summary

1. Understanding how the GSB technology works
2. Continuous weighing with GSB is accurate & precise
3. 49 days of continuous weighing on GSB provides equivalent ADG to 70 days with chute weights
4. There is a high level of uncertainty in chute weights vs continuous weighing
5. Review of various uses of continuous weighing
Questions