Weaning Stewardship: The Art of Weaning Without Stress

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Stewardship: A Philosophy of Life

• Careful and responsible management of something entrusted to one's care (noun, Webster) and leaving behind a better place for the next generation
Stewardship: A Philosophy of Life

Mission statement:

“I have a stewardship responsibility to manage available resources; land, livestock, my personal life, while conserving and improving the resources.”

Stokka 2012
Stewardship: Purpose of Weaning

- Reduce demand on available pasture and water resources.
- Maintain adequate gains in young calves.
- Maintain adequate BCS in cows for the winter and calving season.
Stewardship: Purpose of Weaning

Reduce Demand,

- Dry cows consume 30% less forage than lactating cows. They also require only 60% of the energy and 50% of the protein.
- Dry cows require 60% less water than lactating cows.

Maintain gains

- More efficient to feed calves directly than to feed cows to sustain milk production.
- Calf performance and health need not be compromised.
Weaning Strategies

- Pasture, Fence-line wean
- No Suck devices – stops nursing while maintaining companionship
- Confinement, wean with minimal separation
- Confinement wean, complete separation

- Fenceline contact of beef calves with their dams at weaning reduces the negative effects of separation on behavior and growth rate. E. O. Price, J. E. Harris, R. E. Borgwardt, M. L. Sween and J. M. Connor JAS 2003, 81:116-121
Pasture Weaning

Definition: Calves remain on pasture while cows are removed or pastured adjacent to the calves.

- Advantages – Less labor, less stress, lower feed costs
- Disadvantages – Gains may be less and treatment is more difficult. Need more than an adequate fence.
  
  1.2 – 1.5 lb/hd/day.

  May supplement with soy hulls, corn gluten feed, whole shell corn etc. depending on the quality of the forage.


  25% morbidity to <1%.
  1st 4 – 5 days 100hd/2 – 5 acres.

  3 strand electric fence.
Anti-suckling devices
Anti-suckling devices

Weaned and separated calves vocalized (bawl) 20 times more often than calves weaned in two stages with anti-suckling devices when separated from cows at the same time.

Calves weaned with anti-suckling devices walked about 15% more while nursing was prevented in the first stage, but after separation from their dams, conventionally weaned calves took approximately twice as many steps as calves weaned in two stages.

Gains were similar by day 50 post weaning.

Table 1. Average daily gain ± SE (kg) (on a per pen basis) over a 28 d period after weaning of calves housed with fence line contact with their dam (contact treatment) and calves housed without fence line contact (remote treatment)

x,y Within a column values with different letters are significantly different (P < .01)

<table>
<thead>
<tr>
<th>Treatment</th>
<th>Days After Weaning</th>
<th>1996</th>
<th>0-3</th>
<th>0-7</th>
<th>0-14</th>
<th>0-21</th>
<th>0-28</th>
</tr>
</thead>
<tbody>
<tr>
<td>Contact</td>
<td></td>
<td></td>
<td>.74 ± .06&lt;sup&gt;x&lt;/sup&gt;</td>
<td>.98 ± .23</td>
<td>.55 ± .03</td>
<td>.65 ± .05</td>
<td>.56 ± .04</td>
</tr>
<tr>
<td>Remote</td>
<td></td>
<td></td>
<td>.32 ± .06&lt;sup&gt;y&lt;/sup&gt;</td>
<td>.91 ± .23</td>
<td>.67 ± .03</td>
<td>.64 ± .05</td>
<td>.62 ± .04</td>
</tr>
<tr>
<td>n=62</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
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<table>
<thead>
<tr>
<th>Treatment</th>
<th>Days After Weaning</th>
<th>1997</th>
<th>0-3</th>
<th>0-7</th>
<th>0-14</th>
<th>0-21</th>
<th>0-28</th>
</tr>
</thead>
<tbody>
<tr>
<td>Contact</td>
<td></td>
<td></td>
<td>1.80 ± .18</td>
<td>1.61 ± .41</td>
<td>1.22 ± .07</td>
<td>.93 ± .17</td>
<td>.81 ± .02</td>
</tr>
<tr>
<td>Remote</td>
<td></td>
<td></td>
<td>1.92 ± .18</td>
<td>1.43 ± .41</td>
<td>1.12 ± .07</td>
<td>.97 ± .17</td>
<td>.80 ± .02</td>
</tr>
</tbody>
</table>

n = 58

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# Weaning Strategies

Table 2. Mean (±SE) percentage of observations in which calves were exhibiting various behaviors on d 1 through 3. Years are combined; N = 30 animals per cell.

<table>
<thead>
<tr>
<th>Variable/Day</th>
<th>Nonweaned (pasture)</th>
<th>Fenceline contact (pasture)</th>
<th>Separated, preconditioned to hay (drylot)</th>
<th>Separated, not preconditioned to hay (drylot)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Eating</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>42.4 ± 2.8</td>
<td>43.9 ± 2.1</td>
<td>25.9 ± 2.2</td>
<td>33.7 ± 2.1</td>
</tr>
<tr>
<td>2</td>
<td>35.1 ± 2.2</td>
<td>31.7 ± 2.0</td>
<td>20.7 ± 1.5</td>
<td>19.8 ± 1.6</td>
</tr>
<tr>
<td>3</td>
<td>46.0 ± 2.1</td>
<td>36.2 ± 2.8</td>
<td>24.6 ± 1.5</td>
<td>33.2 ± 1.8</td>
</tr>
<tr>
<td>Mean</td>
<td>41.1&lt;sup&gt;a&lt;/sup&gt;</td>
<td>37.3&lt;sup&gt;a&lt;/sup&gt;</td>
<td>23.7&lt;sup&gt;bc&lt;/sup&gt;</td>
<td>28.9&lt;sup&gt;b&lt;/sup&gt;</td>
</tr>
<tr>
<td>Walking</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>12.5 ± 1.8</td>
<td>10.2 ± 1.6</td>
<td>26.5 ± 2.7</td>
<td>12.1 ± 1.5</td>
</tr>
<tr>
<td>2</td>
<td>7.8 ± 1.2</td>
<td>11.1 ± 1.3</td>
<td>34.2 ± 2.4</td>
<td>12.3 ± 1.6</td>
</tr>
<tr>
<td>3</td>
<td>5.4 ± 0.7</td>
<td>9.2 ± 1.7</td>
<td>23.6 ± 2.9</td>
<td>4.4 ± 0.7</td>
</tr>
<tr>
<td>Mean</td>
<td>8.6&lt;sup&gt;a&lt;/sup&gt;</td>
<td>10.1&lt;sup&gt;ab&lt;/sup&gt;</td>
<td>28.1&lt;sup&gt;c&lt;/sup&gt;</td>
<td>9.6&lt;sup&gt;ab&lt;/sup&gt;</td>
</tr>
<tr>
<td>Lying down</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>27.9 ± 2.1</td>
<td>21.9 ± 2.1</td>
<td>11.4 ± 2.1</td>
<td>11.4 ± 1.3</td>
</tr>
<tr>
<td>2</td>
<td>21.9 ± 1.6</td>
<td>23.1 ± 1.9</td>
<td>14.0 ± 1.0</td>
<td>20.4 ± 2.1</td>
</tr>
<tr>
<td>3</td>
<td>18.9 ± 2.3</td>
<td>24.8 ± 2.4</td>
<td>22.5 ± 2.8</td>
<td>34.0 ± 2.3</td>
</tr>
<tr>
<td>Mean</td>
<td>22.9&lt;sup&gt;a&lt;/sup&gt;</td>
<td>23.3&lt;sup&gt;a&lt;/sup&gt;</td>
<td>16.0&lt;sup&gt;b&lt;/sup&gt;</td>
<td>21.9&lt;sup&gt;a&lt;/sup&gt;</td>
</tr>
<tr>
<td>Vocalizations/h/10-calf group</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>0.1</td>
<td>117.1</td>
<td>466.7</td>
<td>218.6</td>
</tr>
<tr>
<td>2</td>
<td>0.2</td>
<td>425.8</td>
<td>587.9</td>
<td>663.3</td>
</tr>
<tr>
<td>3</td>
<td>0.1</td>
<td>107.2</td>
<td>249.2</td>
<td>231.8</td>
</tr>
<tr>
<td>Mean</td>
<td>0.1&lt;sup&gt;a&lt;/sup&gt;</td>
<td>216.7&lt;sup&gt;b&lt;/sup&gt;</td>
<td>434.6&lt;sup&gt;c&lt;/sup&gt;</td>
<td>371.2&lt;sup&gt;bc&lt;/sup&gt;</td>
</tr>
</tbody>
</table>

<sup>a, b, c</sup> Rows with treatment means with different superscripts differ P < 0.05.
Confinement Weaning

Advantages; feed TMR, easier to spot abnormal behavior?, easier to pull and treat.

Disadvantages; more commingling and pecking order stress, closer contact between animals, greater chance for transmission of pathogens. Environmental challenges may be greater, mud, wet weather.
Confinement, No Separation

Stressors

- Less weaning separation stress
- Commingling
- Pecking order
- Pathogen
Confinement + Separation

Piling on of stressors

- Weaning separation
- Closer commingling
- Pecking order
- Greater pathogen exposure
Risk

Etymology: French *risque*, from Italian *risco*
1 : possibility of loss or injury : **Peril**

the probability of such loss

The purpose of proper animal husbandry is to reduce the risk to the animal by stressors; weaning stress, commingling, environmental, handling, nutritional, and people stress. Which ultimately enhances performance and reduces the risk of clinical disease.
Stress Equation

Stress - an abnormal or extreme adjustment in the physiology of an animal to cope with adverse effects of its environment and management.

- Murata H, Takahashi, H. Effects of environmental and management stressors on bovine lymphocyte and neutrophil parameters Ninth JADCI abstracts pp129-130
Weaning & Health

The first two to three weeks after weaning are the most critical.

The key is getting them to eat quickly after weaning.
  - Creep feed prior to weaning

Use top quality, highly palatable ingredients in the starter rations.
Cost of Illness
# Performance of Sick Vs Healthy Cattle
Texas Ranch to Rail
By Year 1992-1993 through 2000-2001

<table>
<thead>
<tr>
<th></th>
<th>Sick</th>
<th>Healthy</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>(4,341 Hd/24%)</td>
<td>(13,439 Hd/76%)</td>
</tr>
<tr>
<td>Death Loss (%)</td>
<td>avg 4.5</td>
<td>avg 0.6</td>
</tr>
<tr>
<td></td>
<td>range 1.7-7.7</td>
<td>range 0.008-1.8</td>
</tr>
<tr>
<td>Avg Daily Gain (lb)</td>
<td>2.66</td>
<td>2.96</td>
</tr>
<tr>
<td></td>
<td>range 2.4-2.99</td>
<td>range 2.85-3.07</td>
</tr>
<tr>
<td>Total Cost of Gain ($)</td>
<td>66.69</td>
<td>55.42</td>
</tr>
<tr>
<td></td>
<td>range 54.46-76.95</td>
<td>range 49.03-65.34</td>
</tr>
<tr>
<td>Medicine Cost ($)</td>
<td>28.76</td>
<td>0</td>
</tr>
<tr>
<td></td>
<td>range 21.39-44.55</td>
<td>range 0</td>
</tr>
<tr>
<td>Net Return ($/hd)</td>
<td>-10.83</td>
<td>80.94</td>
</tr>
<tr>
<td></td>
<td>range -101.57 to 85.15</td>
<td>range -36.18 to 176.38</td>
</tr>
</tbody>
</table>

## Carcass Quality

<table>
<thead>
<tr>
<th></th>
<th>Sick</th>
<th>Healthy</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>(4,341 Hd/24%)</td>
<td>(13,439 Hd/76%)</td>
</tr>
<tr>
<td>Choice (%)</td>
<td>avg 29</td>
<td>avg 42</td>
</tr>
<tr>
<td></td>
<td>range 19-41</td>
<td>range 26-56</td>
</tr>
<tr>
<td>Select (%)</td>
<td>avg 62</td>
<td>avg 53</td>
</tr>
<tr>
<td></td>
<td>range 53-73</td>
<td>range 41-67</td>
</tr>
<tr>
<td>Standard (%)</td>
<td>avg 9</td>
<td>avg 5</td>
</tr>
<tr>
<td></td>
<td>range 2-17</td>
<td>range 2-8</td>
</tr>
</tbody>
</table>

Source: McNeill, J, Texas Ranch to Rail Summaries
http://animalscience.tamu.edu/ansc/index.htm
Impact of Disease on Carcass Quality

- Heifers treated for BRD had lower marbling scores resulting in a 37.9% reduction in the percentage of carcasses grading USDA Choice, or above.
- Heifers never treated produced a net return (carcass basis) that was $11.48/head more than heifers treated once for BRD, and $37.34/head more than those treated two or more times.
- This negative impact on carcass traits 200 d later illustrates the importance of preventing BRD in calves.

Stovall, TC; Gill, DR; Smith, RA; Ball, RL Oklahoma State University, Stillwater, USA: 2000. P-980, 82-86. 4 ref.
Impact of Disease on Carcass Quality

Disease has the potential to affect not only carcass weight, but also carcass characteristics. How?

1) change in metabolic signals.
   - Cytokines and cortisol could affect carcass composition through modification of hypothalamic secretions of thyrotropin-releasing hormone, by inhibition of IGF-I and insulin actions on muscle and fat tissues, and by direct protein catabolism and lipolysis.

2) disease-induced anorexia causing a decrease in serum IGF-I and an increase in serum GH, which induces a change in the partitioning of nutrients for tissue deposition.

3) an indirect (and reversible) effect of anorexia, whereby sick cattle are on feed for fewer effective days than pen mates that do not become sick.

Effect of cattle disease on carcass traits R. L. Larson
Weaning Health

Risk & Vaccination

- The purpose of vaccination is to reduce stress from “bad bugs”, reduce the spread of “bad bugs” and decrease the risk of BRD (pneumonia).
Vaccination

- Philosophy
- Science
- Logic
Philosophy of Vaccination

- **Necessary** – Reasonable risk of pathogen exposure

- **Effective** – The vaccine has been demonstrated to be effective.
  - Best, < Best, Better than nothing

- **Safety** – Minimal tissue reactivity, and systemic reactions.
Vaccination

- Derived from the Latin term **VACCA** (cow).
- The first vaccine was using Cow Pox Virus to vaccinate a human against Smallpox.
- Expose the immune system to a disease causing pathogen, such as a virus or bacteria, so that the immune system learns to recognize it more quickly and with greater immune activity than if not previously exposed.

Erskine, R. NMC Newsletter 23(6);3-4
Innate Immune System

- Highly impacted by stress.
  - Cortisol leads to neutropenia

- Highly impacted by nutritional deficiencies.
  - Cu, Se, Zn, Vit E,
Management & Vaccination protocols

Handling Events

- Early in life
- Pre-weaning
- Weaning
- Post weaning
Logic: Management & Vaccination protocols

Based on risk assessment, labor, philosophy of vaccination

- Nothing
- Weaning alone
- Early in life + Post weaning
- Early in life + Weaning
- Early in life + Pre-weaning
- Early in life + Pre-weaning + Weaning
- Pre-weaning + Weaning
- Pre-weaning + Weaning + Post weaning

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Logic & Application

Calves

- Branding age – MLV respiratory virus (intranasal or parenteral), 7-way Clostridial.
- Pre-weaning – 5-way MLV respiratory virus, 7-way Clostridial, Mannheimia hemolytica.
  - Optional – Histophilus somnus
- Weaning – 5-way MLV respiratory, Mannheimia hemolytica
  - Optional – Histophilus somnus
Summary

Weaning Stewardship

- Weaning Strategies
- Risk
- Cost of Illness
- Vaccination