Low Stress Cattle Handling and Weaning Training; Its Effects on Weight Gain and Activity in Calves Post-Weaning

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Introduction

- Improve gain and profit.
- Improve public perception of the beef industry.
- Virginia is a Cow/calf operation state
- Virginia Marketing programs (VQA and BQA)
- Weaning
Cattle Temperament

Two Factors:

Genetics

Learned behavior from the environment
Researchers have studied the effects of stress and/or temperament cattle on...
Safety

The most frequently reported injuries
- chased by cattle
- by gates when cattle challenge the handler (Fox, 2003).

The average age, 59.5 years (NASS.USDA.GOV, 2013).

Harsh handling and agitation of cattle can lead to toe abscesses (Grandin, 1998), broken bones, lacerations, and bruising.

http://connect.ag.vt.edu/bqapresentation/
Reproduction

- Excitable temperament take longer to become pregnant and are more likely to lose pregnancy (Kasimanickam, et al, 2014)
Milk Production

- Fear: 19% of the variation in milk yield between farms (Breuer, et al, 2000)

- LS handling
  - Increase milk yield by 5% (Hemsworth, et al, 2002)
  - Increase Milk fat and Milk protein (Hemsworth, et al, 2002)
Immune Function

- More likely to become infected due to deficiencies in neutrophil function (Hulbert, L.E., et al, 2011)
- Negatively affect leukocyte levels (Kim, M., 2010).
- Visual identification of sick animals is affected by disposition (Hulbert, L.E., et al, 2011)
Identify the potential sick calf
Differences in behavior may affect overall energy metabolism (Nkrumah, J.D., 2007)

Temperament can negatively influence tenderness (King, D.A., et al, 2006).


Reduced glycogen increases incident of dark cutters
Weaning

- Increased activity (Weary and Chua, 2000; Loberg, J. M., et al 2008; Price et al., 2003; Solano, J. et al. 2007),
- Walking requires additional energy over maintenance requirements (Ribeiro, et. al. 1977),
- Other weaning methods
  - Fence-line weaning
  - Nose flaps
Low Stress Handling

- Flight zone
- Point of balance
- Natural instincts, behaviors, and tendencies
- Little to no voice, hand, or arm movement
- Keep the front of the herd moving
Low Stress Cattle Handling: Emptying a Pen, Weaning Training Part 2
Low Stress Cattle Handling: Weaning Training, Sorting Cows/Calves
Low Stress Cattle Handling: Weaning Training, Results
Low Stress Cattle Handling: Loading an Alleyway
Low Stress Cattle Handling: Moving Cattle Along and Alleyway
Potential Benefits of Low Stress Handling on Weaning
Purpose

- Determine the benefits of LS cattle handling/weaning training
- The most critical time in a calf’s growth and development
- The most critical time for the cow’s reproductive success, synchronization and breeding time.
- Economic impact
- Calmer for the benefit of the whole beef industry and final beef product.
Materials

- Angus and Angus cross cattle
- Brunswick Correctional Center, Lawrenceville, VA
- James River Correctional Center, Maidens, VA
- Farm personnel and offenders
- Handlers and Calves scored
- Fitbit Zip™ pedometers
- Weights

Combined study:

- 114 LS handled calves
- 110 Conventionally handled calves
LS handlers scored a majority of 1s
Control handlers scored a majority of 2s and 3s
LS calves scored a majority of 1s and 2s on a group basis
Control calves scored a majority of 2s and 3s on a group basis
Weights were compared using Analysis of Variance with regression analysis.

Pedometers readings (SPH) were compared using Multivariate analysis of variance with repeated measures.

P < 0.01

Standard Error (+/- 1.3 lbs to 1.6lbs)
James River Calves’ Pedometer Results

Average Daily Steps per Hour

Days Post Weaning

#1 Calf A6210
#2 Calf 5810
#3 Calf 5750
#4 Calf 5500
#5 Calf 5520
#6 Calf 5040
Combined Pedometer Readings

Calf Average Steps per Hour (SPH)

- LS
- Control

Days After Weaning

Day 0  Day 1  Day 2  Day 3  Day 4

Steps Per Hour (SPH)

0  200  400  600  800  1000  1200  1400  1600  1800
James River Calves' Average Weight Loss/Gain

<table>
<thead>
<tr>
<th></th>
<th>Post Weaning period Loss/Gain</th>
<th>Wean Mo. Loss/gain</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pounds</td>
<td></td>
<td></td>
</tr>
<tr>
<td>0</td>
<td></td>
<td></td>
</tr>
<tr>
<td>20</td>
<td></td>
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</tr>
<tr>
<td>40</td>
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<tr>
<td>60</td>
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<tr>
<td>100</td>
<td></td>
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<tr>
<td>120</td>
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</tbody>
</table>

- C Group Average
- LS Group Average
- C Steers average
- LS Steer's Average
- C Heifers average
- LS Heifer's Average
Brunswick Calves' Average Loss/Gains

Post Weaning Period Loss/Gain

- C Group Average
- LS Group Average
- C Steer's Average
- LS Steer's Average
- C Heifer's Average
- LS Heifer's Average

Wean Week Loss/Gain
Wean. Mo. Loss/gain
## Least Squares Means Table One Week Post-Weaning

<table>
<thead>
<tr>
<th>Level</th>
<th>Least Sq Mean</th>
<th>Std Error</th>
<th>Mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>Con</td>
<td>4.199743</td>
<td>1.3505484</td>
<td>4.3796</td>
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<tr>
<td>LS</td>
<td>16.547887</td>
<td>1.3394926</td>
<td>16.9381</td>
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</table>

## Least Squares Means Table One Month Post-Weaning

<table>
<thead>
<tr>
<th>Level</th>
<th>Least Sq Mean</th>
<th>Std Error</th>
<th>Mean</th>
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<tbody>
<tr>
<td>Con</td>
<td>48.985032</td>
<td>1.9739891</td>
<td>49.0092</td>
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<tr>
<td>LS</td>
<td>66.448623</td>
<td>1.9604783</td>
<td>68.5965</td>
</tr>
</tbody>
</table>
Combined Trial Average Loss/Gain Post-Weaning

- **P < 0.0001**

Day 4 loss/gain

Day 30 loss/gain

- Control Combined
- LS Combined
- Control Steer's
- LS Steer's
- Control Heifer's
- LS Heifer's
AI Conception

- Brunswick data
  - Control cows AICR 70%
    - 57 cows
  - LS cows AICR 79%
    - 58 cows

- James River data was skewed
# Calf Weight Economic Comparison

<table>
<thead>
<tr>
<th></th>
<th>C handled market sold</th>
<th>LS handled market sold with $0.04 slide</th>
<th>C handled VQA sold</th>
<th>LS handled VQA sold @ 720lbs w/$0.04 slide</th>
<th>LS handled VQA sold @ 745 lbs</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Average weight</strong></td>
<td>727</td>
<td>752</td>
<td>720</td>
<td>745</td>
<td>745</td>
</tr>
<tr>
<td><strong>Price per pound</strong></td>
<td>$2.0975</td>
<td>$2.0875</td>
<td>$2.60</td>
<td>$2.59</td>
<td>$2.5850</td>
</tr>
<tr>
<td><strong>Price per calf</strong></td>
<td>$1,524.88 25</td>
<td>$1,569.80</td>
<td>$1,872</td>
<td>$1,929.55</td>
<td>$1,925.82 5</td>
</tr>
<tr>
<td><strong>Price difference (C market)</strong></td>
<td>0</td>
<td>$44.9175</td>
<td>$347.1175 5</td>
<td>$404.6675</td>
<td>$400.942 5</td>
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<tr>
<td><strong>Price difference (C VQA)</strong></td>
<td></td>
<td>0</td>
<td>$57.55</td>
<td>$53.825</td>
<td></td>
</tr>
</tbody>
</table>

* Prices based on the Buckingham Cattlemen’s Association 2014 feeder calf sale date and prices
Conclusions

- Pedometer readings showed that LS handled calves paced/walked less
- Positive impact on weight gain in calves post-weaning
- These techniques can complement the use of genetics and aid in the utilization of marketing programs that provide premium prices for cattle.
- Further study is needed in the area of LS handling and its effects on AI conception rate
- The economic impact on calves alone: $5,353.20 on 100 head, being fed the same grain amounts (hay and forage may increase)
- Workforce and Time
References

References


