Data Driven Decisions: Electronic ID Tags and Individual Animal Management

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Let’s Grow Initiatives

• Response to decline in U.S. sheep numbers
  • Drop 1-2% each year
• 402 million lbs of lamb consumed in 2021
  • Almost 70% of lamb consumed is imported
• Focus on growing the US sheep flock
On the Ground – Producing more Lamb

• Collect DNA (tissue) samples and tag rams & lambs – 5 ranches

• Use Superior’s Flock 54 test

• Determine parentage of lambs

• Focus on market lambs

• Attribute lamb carcass qualities to rams
## About the Producers

<table>
<thead>
<tr>
<th>Ranch A</th>
<th>Ranch B</th>
<th>Ranch C</th>
<th>Ranch D</th>
<th>Ranch E</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Flock size</strong></td>
<td>Large</td>
<td>Large</td>
<td>Small</td>
<td>Large</td>
</tr>
<tr>
<td><strong>Breeds of Rams</strong></td>
<td>Black and White-face</td>
<td>White-face</td>
<td>Black-face</td>
<td>Composite</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Black and White-face</td>
</tr>
<tr>
<td><strong>Ram:Ewe Ratio</strong></td>
<td>1:10</td>
<td>1:35</td>
<td>1:30-35</td>
<td>1:50</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>1:40</td>
</tr>
<tr>
<td><strong>Average Lamb Crop</strong></td>
<td>145%</td>
<td>130%</td>
<td>140-150%</td>
<td>145-150%</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>115%</td>
</tr>
<tr>
<td><strong>Length of Breeding</strong></td>
<td>75 days</td>
<td>75 days</td>
<td>62 days</td>
<td>120 days</td>
</tr>
<tr>
<td><strong>Season</strong></td>
<td></td>
<td></td>
<td></td>
<td>185 days</td>
</tr>
<tr>
<td><strong>Avg Weaning</strong></td>
<td>85-110 lbs</td>
<td>70-95 lbs</td>
<td>60 lbs (110-115 days; ~4 mos)</td>
<td>105-110 lbs (4-7 mos)</td>
</tr>
<tr>
<td><strong>Weights</strong></td>
<td></td>
<td></td>
<td></td>
<td>110-115 lbs</td>
</tr>
<tr>
<td><strong>Use EID’s</strong></td>
<td>Yes</td>
<td>Yes – on maternal flock</td>
<td>Yes – on all animals</td>
<td>No</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>No</td>
</tr>
<tr>
<td><strong>Traits tracked with</strong></td>
<td>None</td>
<td>Health, pregnant vs. open, twins, wool microns</td>
<td>Disease, BCS, vaccines, wormers, dam of lambs</td>
<td>n/a</td>
</tr>
<tr>
<td><strong>EID’s</strong></td>
<td></td>
<td></td>
<td></td>
<td>n/a</td>
</tr>
</tbody>
</table>
# Samples Collected

<table>
<thead>
<tr>
<th>Ranch</th>
<th>Rams Males</th>
<th>Rams Females</th>
<th>Lambs Parentage</th>
<th>Lambs Carcass</th>
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</thead>
<tbody>
<tr>
<td></td>
<td>TOTAL COLLECTED</td>
<td>2963</td>
<td>305</td>
<td>1669</td>
</tr>
<tr>
<td>Ranch A</td>
<td>62</td>
<td>662</td>
<td>7</td>
<td>606 (63)</td>
</tr>
<tr>
<td>Ranch B</td>
<td>37</td>
<td>423</td>
<td>406</td>
<td>796 (33)</td>
</tr>
<tr>
<td>Ranch C</td>
<td>6</td>
<td>36</td>
<td>44</td>
<td>80 (0)</td>
</tr>
<tr>
<td>Ranch D</td>
<td>12</td>
<td>331</td>
<td>310</td>
<td>623 (19 F)</td>
</tr>
<tr>
<td>Ranch E</td>
<td>11</td>
<td>217</td>
<td>222</td>
<td>149 (74)</td>
</tr>
<tr>
<td><strong>TOTAL ANALYZED</strong></td>
<td><strong>128</strong></td>
<td><strong>1452</strong></td>
<td><strong>989</strong></td>
<td><strong>2254</strong></td>
</tr>
</tbody>
</table>

*Samples Collected*
Flock Variation: Meat v.s. Wool breeds

Ranch A

Ranch B
Rambouillet

Ranch D
4-way composites
Number of Ram Lambs Per Sire – Ranch A

669 lambs submitted
606 (91%) matched to sires

83 Possible Sires
62 Rams with identified progeny

Top ten most prolific breeders sired 55% of lambs submitted

Ram to Ewe Ratio 1:10
Number of Lambs per Sire – Ranch B

829 lambs submitted
796 (96%) w/ identified sires

Top ten most prolific breeders sired 61% of lambs submitted

150 Possible Sires
37 Rams with identified progeny

Ram to Ewe Ratio 1:35
Number of Lambs Called Per Sire – Ranch C

- 80 Lambs submitted
- 80 (100%) with identified sires
- 7 Possible Sires
- 6 Rams with identified progeny

Top two most prolific breeders sired 69% of lambs submitted

Ram to Ewe Ratio 1:30-35
Number of Lambs Called Per Sire – Ranch D

642 lambs submitted
623 (97%) w/identified sires

40 Potential Sires
12 Rams with identified progeny

Top five most prolific breeders sired 69% of lambs analyzed

Ram to Ewe Ratio
1:50
Number of Ewe Lambs Per Sire – Ranch E

- 222 ewe lambs submitted
- 149 (67%) w/identified sires
- 25 Possible Sires
- 11 Rams with identified progeny

Top three most prolific breeders sired 74% of lambs analyzed

Ram to Ewe Ratio: 1:40
## Results

<table>
<thead>
<tr>
<th>Ranch B</th>
<th>Hot Weight</th>
<th>Yield Grade</th>
<th>Quality Grade</th>
<th>Breast</th>
<th>Rack</th>
<th>Shoulder Square Cut</th>
<th>Legs</th>
<th>OCC</th>
<th>OCC Yield</th>
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<tbody>
<tr>
<td></td>
<td>n=315</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
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</tr>
<tr>
<td></td>
<td>AVERAGE</td>
<td>76.1</td>
<td>2.7</td>
<td>9.5</td>
<td>8.7</td>
<td>19.0</td>
<td>24.6</td>
<td>50.7</td>
<td>67.3</td>
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<tr>
<td></td>
<td>STD</td>
<td>11.6</td>
<td>0.5</td>
<td>2.0</td>
<td>1.4</td>
<td>2.5</td>
<td>3.6</td>
<td>7.4</td>
<td>1.1</td>
</tr>
<tr>
<td></td>
<td>MIN</td>
<td>41.1</td>
<td>1.4</td>
<td>Good</td>
<td>3.4</td>
<td>4.3</td>
<td>11.5</td>
<td>14.1</td>
<td>28.0</td>
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<tr>
<td></td>
<td>MAX</td>
<td>106.9</td>
<td>4.6</td>
<td>Prime</td>
<td>14.6</td>
<td>12.5</td>
<td>25.9</td>
<td>34.3</td>
<td>69.7</td>
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</table>

<table>
<thead>
<tr>
<th>Ranch A</th>
<th>Hot Weight</th>
<th>Yield Grade</th>
<th>Quality Grade</th>
<th>Breast</th>
<th>Rack</th>
<th>Shoulder Square Cut</th>
<th>Legs</th>
<th>OCC</th>
<th>OCC Yield</th>
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<tr>
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</tr>
<tr>
<td></td>
<td>AVERAGE</td>
<td>73.5</td>
<td>2.7</td>
<td>8.9</td>
<td>8.2</td>
<td>18.4</td>
<td>24.2</td>
<td>49.3</td>
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<td>1.8</td>
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<td>2.2</td>
<td>3.1</td>
<td>6.5</td>
<td>1.1</td>
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<tr>
<td></td>
<td>MIN</td>
<td>50.4</td>
<td>1.4</td>
<td>Good</td>
<td>4.4</td>
<td>5.1</td>
<td>13.4</td>
<td>17.1</td>
<td>34.7</td>
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<tr>
<td></td>
<td>MAX</td>
<td>102.4</td>
<td>4.2</td>
<td>Choice</td>
<td>14.2</td>
<td>12</td>
<td>24.2</td>
<td>32.6</td>
<td>67.7</td>
</tr>
</tbody>
</table>
Progeny Differences in Hot Weight & OCC – Ranch A

Avg. HCW = 73.18 LBS.
OCC Avg. = 49.18 LBS.
Managing Individuals vs. Managing the Flock

• More Effective Culling

• Increase lbs weaned per ewe

• Reduce lamb grafting

• Reduce $$ spent on animal health
Tools for Genetic Selection

- Visual Assessment
- Individual Animal ID (no EID)
- Paper Records
- Electronic Records
- Paint Brands
- Ear Notches/Marks
- Ultrasound (preg testing)
- Electronic ID Tags
EID’s and Individual Animal Records

- Managing individuals creates genetic change
- Improves reliability of data
- Facilitates animal disease traceability

Weigel et al., 2017

These make genetic selection easier
Producer Viewpoint

• “When you’re tending to 5,000 to 8,000 sheep (or 5 to 8 “bands”) every year, having every ram, ewe and lamb microchipped saves ranch hands both time and labor while increasing information accuracy.” Evan Helle (AG Daily, 11/5/20)
Using EID’s to Eliminate OPP in a Flock

- 2 Western Range Flocks
- Tested Ewes for OPP
- Positive band kept separate
- No replacements kept from OPP positive flock
- Reduction in death loss and $$ on animal health
- Estimated $12/ewe saved total
When Considering EID’s...

• Recommend thorough analysis

• Discuss with all affected parties

• Requires some experience with Excel

• Consider costs vs. returns
Using Data to Make Decisions

<table>
<thead>
<tr>
<th>Tag</th>
<th>Breeding Group</th>
<th>Age</th>
<th>EZ Care Score</th>
<th>Average 100-day Wt</th>
<th>2021 Deworm</th>
<th>Age Score</th>
<th>Weight Score</th>
<th>Total Index</th>
<th>Keep or Sell</th>
</tr>
</thead>
<tbody>
<tr>
<td>2201</td>
<td>Term/Shrop</td>
<td>2</td>
<td>3</td>
<td>108</td>
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<td>2</td>
<td>6</td>
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<tr>
<td>2236</td>
<td>Term/Shrop</td>
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<td>3</td>
<td>114</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>6</td>
<td>Keep</td>
</tr>
<tr>
<td>2221</td>
<td>Term/Shrop</td>
<td>3</td>
<td>2</td>
<td>110</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>5</td>
<td>Keep</td>
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<tr>
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<tr>
<td>2229</td>
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<td>3</td>
<td>76</td>
<td>0</td>
<td>1</td>
<td>0</td>
<td>4</td>
<td>Keep</td>
</tr>
<tr>
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<td>BFL/WF</td>
<td>4</td>
<td>3</td>
<td>124</td>
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<td>0</td>
<td>2</td>
<td>4</td>
<td>Keep</td>
</tr>
<tr>
<td>2300</td>
<td>BFL/WF</td>
<td>4</td>
<td>3</td>
<td>91</td>
<td>1</td>
<td>0</td>
<td>1</td>
<td>3</td>
<td>Keep</td>
</tr>
<tr>
<td>2206</td>
<td>BFL/WF</td>
<td>2</td>
<td>3</td>
<td>28</td>
<td>0</td>
<td>1</td>
<td>-2</td>
<td>2</td>
<td>Sell</td>
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<tr>
<td>163</td>
<td>Term/Shrop</td>
<td>8</td>
<td>3</td>
<td>73</td>
<td>0</td>
<td>-1</td>
<td>-1</td>
<td>1</td>
<td>Sell</td>
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<td>2101</td>
<td>Term/Shrop</td>
<td>5</td>
<td>2</td>
<td>50</td>
<td>0</td>
<td>-1</td>
<td>-2</td>
<td>0</td>
<td>Sell</td>
</tr>
</tbody>
</table>
Partial Budget Analysis

• Four Questions:
  • What new or additional costs will be incurred?
  • What current income will be lost or reduced?
  • What new or additional income will be received?
  • What current costs will be reduced or eliminated?

 객체 1) 증가 냄비 끊은/뿔 by 10%
  2) 증가 엄마 생활 능력 of ewes

**Assumptions:**
- 3,000 ewe base flock
- Labor is $172.25/man/day
Analyzing Risk

1. **RightRisk ANALYTICS**
   - RightRisk Analytics is a toolbox of over 30 individual risk analysis tools developed by RightRisk.
   - CLICK here to download and run on your local computer: [50.51 KB zip file] | 5/24/2019
   - Check your download folder after downloading the file.

2. **Risk Scenario Planning (RSP)**
   - Use this tool to evaluate the risk or uncertainty in your partial budget projections.

3. **Enterprise Risk Analyzer (ERA)**
   - Use this tool to evaluate larger changes or changes in enterprise risk for the operation.

4. **Forage Risk Analyzer (FRA)**
   - Use this tool to estimate the cost of forage from various sources - lease, harvested feeds, or owned pasture.

5. **Machine Risk Calculator (MRC)**
   - Use this tool to estimate the cost of individual machinery services, the cost of a field operation (power unit + implement), or to estimate the cost of performing a custom operation.

6. **Multi-Temporal Risk Analyzer (MTRA)**
   - Use this tool to evaluate the risk or uncertainty in your budget projections for changes that take place over a period of time, up to 20 years.

7. **RD Financial (Whole Farm Budget)**
   - Use the RD Financial tool to evaluate more substantial changes, adding ranches/lambs, whole enterprises, etc. to the operation.
Individual Animal Management

• Wanting to make change in your flock

• Know your starting point
  • Identify key production traits
  • Measure those traits

• Clearly define where you want to go
  • Track progress towards goals
  • Adapt as needed
How to start using RFID tags as your Scrapie Tag

• First, you must obtain a Flock ID and a National Premise Number (PIN) or Location Identification Number (LID). Get PIN/LID from your State Animal Health office, then call call 866-USDA-Tag (866-873-2824) to get your Flock ID and to have PIN/LID linked to your Flock ID.

• The USDA 840 official numbers will be linked to your Flock and Premise number for traceability.

• Then you purchase the 840 Scrapie tags from an approved provider.
National Scrapie Eradication Program

• USDA Scrapie Eradication Program

• How to get a Premise ID or Scrapie ID
  • Call 866-USDA-Tag (873-2825) or contact your state veterinarian’s office

• How to get 840 EID’s
References

- USDA, NASS. 2022. Lamb and Mutton Slaughter in Pounds
THANK EWE!