Navajo Sheep Research

Felix Nez Extension Agent
Diné College Land Grant Office
Abstract

Diné College, Land Grant Office focuses on “Enhancing the quality of sheep wool fibers, meat carcass and livestock meat markets for Navajo producers through applied research.” Our interpretation of quantitative research method by adapting genetic traits to measure sheep-breeding program. Diné College, Extension Outreach please to share the framework of 10 Diné sheep producers that analyze the change of sheep wool fibers and meat carcass quality over a three-year period of data. This data examines a crossbreeding program between sheep on Navajo Nation and the South African Meat Merino (SAMM) dual-purpose breed, of insights to strategic improvement of wool fibers and carcass quality. Diné College, Land Grant Office discuss how research can potentially connect markets in a cooperative approach for sheep producers by development of quality animals.
Motivation

- Increase fine-wool fleeces in commercial wool production with Annual Wool Buy
- Increase economic return on lamb sales
- Possible health benefits

<table>
<thead>
<tr>
<th>Year</th>
<th>Total Pounds</th>
<th>Average per lbs</th>
<th>Dollars Paid</th>
</tr>
</thead>
<tbody>
<tr>
<td>2012</td>
<td>12,077 lbs.</td>
<td>$0.70</td>
<td>$12,077.00</td>
</tr>
<tr>
<td>2013</td>
<td>44,688 lbs.</td>
<td>$0.73</td>
<td>$32,622.24</td>
</tr>
<tr>
<td>2014</td>
<td>80,503 lbs.</td>
<td>$0.58</td>
<td>$46,591.80</td>
</tr>
<tr>
<td>2015</td>
<td>80,939 lbs.</td>
<td>$0.53</td>
<td>$42,991.38</td>
</tr>
<tr>
<td>2016</td>
<td>78,206 lbs.</td>
<td>$0.63</td>
<td>$49,536.69</td>
</tr>
<tr>
<td>2017</td>
<td>123,763 lbs.</td>
<td>$0.60</td>
<td>$74,257.80</td>
</tr>
<tr>
<td>2018</td>
<td>113,645 lbs.</td>
<td>$0.63</td>
<td>$73,258.01</td>
</tr>
<tr>
<td>2019</td>
<td>138,771 lbs.</td>
<td>$0.58</td>
<td>$80,487.18</td>
</tr>
<tr>
<td>2020</td>
<td>9,749 lbs.</td>
<td>Consignment</td>
<td>Consignment</td>
</tr>
</tbody>
</table>

Total: $411,922.10
Research Focus

- Diné College Land Grant Office to work with 10 Diné sheep producers to analyze change over a 3 year period
- Incorporate a breeding program to improve the genetics traits of their herd resulting in wool and meat quality
- Annually, over the 3 year term, the animals will be tested through wool analysis, blood drawn in year one to remove any QQ animals, and establish meat evaluations on 20 wether (2 from each herd).
- Utah State University faculty will serve as an evaluator to the program along with provide technical assistance in the area of sheep meat and wool analysis.
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Why Rambouillet SAMM genetics

- an easy-care, low-maintenance sheep that can regularly register 130 – 150 pc lambing percentages
- converts well with good growth, heritable and produces top first cross lambs
- produces an acceptable fleece of wool that is nearly equal to that of a Merino, usually less than 22 microns
- Tend to be hardy; long live; are well – adapted to arid climates
- Most valuable commercial market because highest quality wool garments and most versatility of use
Research Study

- Study area NM/AZ
  - Recruit announcements: chapter presentations; annual wool buy; ram lease and extension outreach

- Stocking Rate
  - 2020, 297 breeding ewes- Oct.
  - 12 SAMM rams

- Rangeland pasture /corral/ summer, winter pasture
Objective of research

- Animal genetics is a powerful tool that allows farmers to select superior/quality animals to become the parents of the next generation and has been shown to be directly responsible for over half the production gains achieved across livestock species.

- Genetics involves the passing of genes (favourable and unfavourable) from parents to offspring and unlike feeding or management it is permanent and cumulative.

- Enable farmers to make more informed breeding and selection decisions to ensure that they have the desirable traits for their flock, to date rapid increases in genetic gain.

- The genetic indexes aim to identify a low cost, easy care sheep with good maternal characteristics, but that also produces a good quality lamb that reaches slaughter at an early age.

- Animal’s index is calculated based on its individual animal performance (such as lambing information and weights).

- Commercial and pedigree data.

<table>
<thead>
<tr>
<th>Trait Group</th>
<th>Terminal</th>
<th>Replacement</th>
</tr>
</thead>
<tbody>
<tr>
<td>Growth</td>
<td>40%</td>
<td>12%</td>
</tr>
<tr>
<td>Carcass</td>
<td>23%</td>
<td>7%</td>
</tr>
<tr>
<td>Maternal</td>
<td>0%</td>
<td>68%</td>
</tr>
<tr>
<td>Lambing</td>
<td>37%</td>
<td>13%</td>
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</tbody>
</table>
Measurements
Wool Evaluation and Lamb Harvest: USU, Animal, Dairy, and Veterinary Sciences Department meat harvest facility, Logan UT

• Does Genetics Work?
  • overall lamb meat production, much of these production gains have been attributed to baseline genetics
  • helped to accelerate the increase in genetic gain

<table>
<thead>
<tr>
<th></th>
<th>CW</th>
<th>M</th>
<th>FFS</th>
<th>F</th>
<th>Con</th>
<th>BF</th>
<th>LE</th>
<th>BW</th>
<th>YG</th>
<th>QG</th>
</tr>
</thead>
<tbody>
<tr>
<td>2018 Average</td>
<td>30.21</td>
<td>L</td>
<td>PD</td>
<td>S</td>
<td>MU</td>
<td>0.07</td>
<td>1</td>
<td>0.3</td>
<td>1</td>
<td>Good</td>
</tr>
<tr>
<td>2019 Average</td>
<td>31.75</td>
<td>L</td>
<td>PD</td>
<td>S</td>
<td>MU</td>
<td>0.06</td>
<td>1.48</td>
<td>0.26</td>
<td>1</td>
<td>Good</td>
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<tr>
<td>2020 Average</td>
<td>51.1</td>
<td>L</td>
<td>SL</td>
<td>F</td>
<td>MS</td>
<td>0.17</td>
<td>2.21</td>
<td>0.46</td>
<td>2</td>
<td>Choice</td>
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</tbody>
</table>
Measurements

AVERAGE CARCASS DATA

VINCENT B.  49.5  62.5  96
SARAH L.  52  62  75.5
CECELIA B.  64  80  123.5
GLORIA B.  60.5  55  81.5
CECELIA C.  56  59  65.5
ZEITA B.  45  38.5  65.5
MARIAN H.  0  0  150
NATHAN T.  0  0  85.5
WESTON C.  0  0  96
PERRY W.  0  0  126

LVESTOCK PRODUCERS

2017  2018  2019
Measurements

• Wool traits generally bring value of fleece down due to genetic defects

• Improve fine-wool fleeces by illuminating American Blood Grade System. Wool grade was simply defined as a percentage of Merino genetics. The first cross expressed as 1/2 blood; the same applied for 3/8 blood and 1/4 blood.

• Determine what type of animals producers have by taking wool samples for testing.

- Vincent B. (28 mic = ¼ Blood)
- Sarah L. (24.9 mic = ½ Blood)
- Cecelia B. (28.3 mic = ¼ Blood)
- Gloria B. (22.1 mic = ¼ Blood)
- Cecelia C. (24.5 mic = ½ Blood)
- Zeita B. (26.6 mic = 3/8 Blood)
- Marian H. (26 mic = 3/8 Blood)
- Nathan T. (28 mic = ¼ Blood)
- Weston C. (28.6 mic = ¼ Blood)
- Perry W. (26.5 mic = 3/8 Blood)
Measurements

American Blood Grade System

- Fine-Wool Merino genetics (Spanish origin)
- 2017 baseline
- 2018 wool samples
- 2019 wool samples

Livestock Producers

- Vincent B. (28 mic = ¼ Blood) 25mic 3/8 blood
- Sarah L. (24.9 mic = ½ Blood) 21 mic Rambouillet/ SAMM
- Cecelia B. (28.3 mic = ¼ Blood) 26 mic 3/8 blood
- Gloria B. (22.1 mic = ½ Blood) 20 mic Rambouillet/SAMM
- Cecelia C. (24.5 mic = ½ Blood) 18 mic Rambouillet/ SAMM
- Zeita B. (26.6 mic = 3/8 Blood) 22 mic Rambouillet/SAMM
- Marian H. (26 mic = 3/8 Blood) 22 mic Rambouillet/SAMM
- Nathan T. (28 mic = ¼ Blood) 23 mic 1/2 blood
- Weston C. (28.6 mic = ¾ Blood) 24 mic ½ blood
- Perry W. (26.5 mic = 3/8 Blood) 22 mic ½ blood
# Measurements

<table>
<thead>
<tr>
<th></th>
<th>Mic Ave</th>
<th>SD Mic</th>
<th>CF %</th>
<th>SF Mic</th>
<th>SL mm</th>
<th>CRV dg/mm</th>
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<tbody>
<tr>
<td>2017</td>
<td>24.3</td>
<td>5.5</td>
<td>86.5</td>
<td>24.1</td>
<td>75.9</td>
<td>32.8</td>
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<tr>
<td>2018</td>
<td>22.4</td>
<td>4.2</td>
<td>96</td>
<td>21.4</td>
<td>95</td>
<td>60</td>
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<tr>
<td></td>
<td>18.8</td>
<td>3.3</td>
<td>99.5</td>
<td>17.8</td>
<td>70</td>
<td>60</td>
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<tr>
<td></td>
<td>18.7</td>
<td>3.7</td>
<td>99.3</td>
<td>18</td>
<td>110</td>
<td>25</td>
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<tr>
<td></td>
<td>17.4</td>
<td>3</td>
<td>100</td>
<td>16.4</td>
<td>70</td>
<td>15</td>
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</tbody>
</table>

23.04348 4.462222 91.66444 80.10667 92.25556
Marketing
Thank you to Livestock Producers
Questions

Dr. Lyle G. McNeal, Carnegie Professor Emeritus
Livestock & Range Specialist

Haden Davis
USU Meats Lab Manager
Utah State University

Michael Patrick Agricultural Economics and Agricultural Business Department,
Director of the Doctorate of Economic Development program, and Community
Resource & Economic Development Specialist with the Cooperative Extension
Service at New Mexico State University.

Paul Gutierrez
Extension, ranch economics, economic development

Dine College Land Grant Office Benita Liston Director, Interns and Staff
Wool Buyers