Let's Grow Program Round 2 – Funded Projects, 2016

2016 Sheep Producer Webinar Education Program

AWARDED TO:
Optimal Ag Consulting, Inc.

SCOPE:
Nationwide

SUMMARY:
Since the fall of 2012, we have offered a total of 14 webinars in cooperation with the American Sheep Industry (ASI) Association and the Let's Grow Committee. The presently proposed project will fund five additional educational webinars for sheep producers and aspiring sheep producers during 2016. As a result of this project, over 400 sheep producers across the U.S. are expected to benefit from attending live educational webinars on timely and important topics that can help them be successful in today's challenging world. In addition, recordings of the webinars are expected to provide over 4,000 more participants access to these educational events by the end of the project.

STATUS:
Completed.

PROGRESS REPORT -- Scheduled Webinars:

Webinars from all funding cycles can be accessed through the Resources tab of the Let's Grow Website. Webinar Archives.

March 29, 2016
Producer Groups: What Are These About, How Do They Work, And Why Can They Be So Successful
Dr. Woody Lane and Dave Ollila
Registrants: 262 / Attendees: 112
Recording of Event: Producer Groups
Copy of Slides: PowerPoint Presentation

May 24, 2016
A Journey: The Opportunities and Challenges of Melding Genomics into U.S. Sheep Breeding Programs
Dr. Ron Lewis, Department of Animal Science, University of Nebraska-Lincoln
Registrants: 227 / Attendees: 83
Recording of Event: The Journey
Copy of Slides: PowerPoint Presentation

July 19, 2016
Refining Our Nutrition Program to Meet the Mineral and Vitamin Needs of Our Sheep Flocks
Dr. Dan Morrical, Department of Animal Science, Iowa State University
Registrants: 359 / Attendees: 142
Recording of Event: Refining Our Nutrition Program
Copy of Slides: PowerPoint Presentation

August 30, 2016
Best Practices to Increase Your Lamb Crop
Dr. Reid Redden, Texas A&M University
Registrants: 414 / Attendees: 170
Recording of Event: Best Practices to Increase Your Lamb Crop
Copy of Slides: PowerPoint Presentation

October 11, 2016
Improving Reproductive Performance of Ewe Lambs Bred at Eight Months of Age
Dr. Paul Kenyon, Massey University in New Zealand
Registrants: 411 / Attendees: 185
Recording of Event: Improving Reproductive Performance
Copy of Slides: PowerPoint Presentation

April 25, 2017
Lamb Meat Quality
Dr. Jay Parsons, University of Nebraska-Lincoln
Register Now!
https://attendee.gotowebinar.com/register/9061362678810614275

Improving Sheep Carcass Quality through the Development of a Range Ram Index Utilizing Ultrasound Genetic Measures

AWARDED TO:
California Wool Growers Association

SCOPE:
California, Idaho, Oregon and Utah

SUMMARY:
Development of a Range Ram Index utilizing ultrasound carcass measurements collected at the 2016 California Ram Sale to measure the expected value return of the heritability of carcass characteristics of a range ram through its progeny. The Range Ram Index will be calculated using the following carcass characteristics: loin eye area, loin depth, fat thickness, and ram weight. An interactive consignor educational program will provide an overview of the development of ultrasound in the livestock industry, the practical application of ultrasound techniques in a range/commercial setting for carcass evaluation, benefits of the quantitative data of ultrasounding in a value-based pricing system, and how the data can be utilized in the producers breeding program. In addition, all ultrasound data and educational information will be provided to buyers in a variety of formats including but not limited to: sale catalogs, buyer informational packets, newsletter articles, etc.

STATUS:
Complete.

PROGRESS REPORT:

January 2018 SIN Story

Range Ram Index

Final Report

The Ram Index is calculated using ultrasound technology which has been used extensively in The cattle and swine industries but has not been applied much in the sheep sector. This technology provides an objective measurement of carcass traits in live animals and has proven to be an important means for the improvement of beef and swine carcass characteristics. Carcass traits are highly heritable and in utilizing range rams with highly desirable carcass traits, a producer can implement changes in progeny carcass traits, such a larger loin eye size, in a relatively short period of time. This ability contributes to increased production efficiency as improvements in lamb carcass qualities can be accomplished more quickly than relying on traditional selection methods that focus on phenotypic characteristics.

The Range Ram Index (Ram Index) is calculated using the following variables: loin eye area (LEA) and fat thickness (BF) gathered from ultrasound measurements and body weight (BW). As described in the previous section, there lack thereof any genetic information on the rams

consigned to the Sale to serve as a normalized base for the Ram Index. To account for this issue, the variables used to calculate the Ram Index are standardized based on the average carcass traits of the 506 rams sold in the Sale (refer to Table 1 and Table 2).1 This allows each ram's carcass traits to be measured in relation to a normalized base or average value. Each ram's Ram Index is then calculated using the genetic variables of the individual ram relative to the average all of the rams.

The Ram Index is presented as a numerical value relative to the average meaning those rams with more desirable carcass characteristics are assigned a positive Ram Index value and those with less desirable a negative Ram Index value. Those rams with average carcass characteristics are assigned a zero Ram Index value. There was much discussion among project collaborators regarding calculating the Ram Index as either a positive/negative value or a more common weighted average 100 index. In reviewing industry literature related to ultrasounding and carcass characteristics, as well as current genetic tools (i.e., EBVs) it was decided that a positive/negative value relative to an average approach would be better understood and consistent with other genetic tools utilized in the livestock industry.

An objective of utilizing genetic information is to improve certain heritable traits, in this case carcass characteristics. Therefore, to account for rams with less desirable carcass characteristics for fat thickness and body weight, boundaries were established on the each of the variables, with deductions applied to the Ram Index for outlier rams (see Table 2). The bounds and deductions can be adjusted to reflect for changes in the industry regarding carcass and product characteristics. The bounds and deductions incorporated into to the Ram Index were based on industry research regarding premiums and discounts on carcasses with desirable and less desirable carcass characteristics and discussion among project collaborators. A boundary and deduction was not placed on loin eye area due to a greater focus on current issues associated with the other two carcass traits (fat thickness and body weight). The Ram Index and statistics are calculated on the total number of rams sold (506 rams). A total of 523 rams were ultrasounded at the Sale, of which 17 were sifted.

Other buyers via the survey and in discussions at the Sale, do not utilize any type of genetic selection in their operations and select rams based on phenotype and prior purchases from consignors. These buyers are reluctant to utilize genetic information until data consistently reflect actual performance in progeny and the benefits or market value exceeds the additional costs of purchasing rams with more desirable genetic traits. In regards to the Ram Index, some buyers noted there was not enough evidence to indicate those rams with a higher Ram Index values would pass those traits onto their progeny as the Ram Index was just a snapshot of carcass characteristics and did not account for age, breed, and management programs. Many buyers repeatedly indicated the cost in paying more for rams with desirable genetic traits is greater than the current benefit (i.e., feeder lamb price) received and is not justifiable at this time. Similar results and comments were submitted by those consignors that returned their surveys. Of the 28 consignors, only seven (or one-third) returned the survey. The survey in hindsight was too long as it addressed not only the understanding and adoption of the Ram Index and genetic selection, but also allowed for comment on factors pertaining to consigning at the Sale. According to the surveys, most raise traditional meat breeds (i.e., blackface) and consigned only such at the Sale. Many consign rams as it provides an outlet to provide high quality rams to California and

Western sheep producers. Those that responded and in conversations, indicated they read the outreach materials on the Ram Index and for the most part understood the concept of the Ram Index and the genetic information provided. However, consignors believed that the buyers did not understand the concept of the Ram Index, nor had any interest in applying it in their purchasing decisions. Some consignors recognized the positive correlation between prices received and the Ram Index value, while other consignors did not see any difference in the prices received for those pens with positive and negative Ram Index values. According to the surveys, consignors indicated the buyers were not willing to pay more and did not pay more for rams with more desirable carcass characteristics, others were unsure, while some consignors suggested that buyers might be willing to pay five to ten percent more. However, as stated by one consignor "my highest selling pen was also my highest Ram Index value pen" would suggest that some buyers were willing to pay higher value for rams that have the potential to sire progeny with more desirable carcass characteristics. Many of the consignors do not collect genetic information nor select rams using genetic information. Those that do use genetic information focus on bodyweight and phenotype, with some referencing the genetic markers for Scrapie. Comments mirrored those by buyers in regarding the confidence and credibility in genetic information of either the ultrasound data or EBVs. One consignor commented, "I use big thick rams and all my rams ultrasounded just as good as everybody else's at the sale." Similarity, consignors noted the cost of collecting genetic information currently exceeds the benefit (i.e., higher price received) at this time. Many consignors suggested buyers are interested in having loin eye area and bodyweight information on rams more so than EBVs. Consignors indicated they are willing to provide genetic information (some even stated wool data) on future ram consignments if demanded by buyers and the information will help in netting a higher return. Overall, consignors also recognize that market dynamics factor into the prices paid at the Sale, despite the genetic information provided on the rams.

Concluding Comments

The objective of this project was to improve sheep carcass quality and increase the practice of genetic selection in commercial range operations through the development of a Ram Index that utilizes ultrasound technology focusing on carcass quality characteristics. It is rather difficult in a range operation to collect the data required to develop EBVs, which is a challenge in an industry that is focusing on genetic selection and improvement. The Ram Index is designed as an alternative for producers to use when evaluating range rams that do not have established EBVs. Regardless of the buyers or consignors use of genetic selection tools such as the Ram Index, it was apparent during the Sale that consignors and buyers were actively engaged and interested in the carcass performance provided on the rams sold. In reviewing the Sale data, survey responses, and conversations with stakeholders there was a positive correlation between the value paid for rams and the Ram Index, suggesting that some buyers may have been willing to pay more for rams with more desirable carcass traits. It can also be concluded that as a result of this project, all parties became aware of the industry's efforts in utilizing genetic improvement tools to produce a more consistent and desirable product and improve producer profitability to ensure the economic viability of the sheep industry.

Looking Ahead

This project established a dataset and baseline for which to continue to develop and refine the Ram Index as a reliable tool for producers in selecting range rams without any genetic

information. In preparation for next year's Sale, project collaborators plan to review and assess the data, survey results, related educational materials, and the components of the Ram Index calculation (i.e., breed variable, variable bounds and standardization). CWGA as part of its educational objective, plans to continue to ultrasound rams and provide buyers with genetic information on the rams consigned at future Sales. This will contribute to the development of a more robust dataset for analytical purposes by CWGA staff, project collaborators, and industry stakeholders and further the objectives of this project. In addition to carcass information, a question that respects further discussion is how to utilize ultrasound techniques and genetic data to determine the longevity of an animal. This information would be greatly useful not just to Sale buyers and consignors, but to all those in the sheep industry. The project collaborators plan to discuss how to transform data gathered from ultrasound techniques to determine the longevity of a ram and if this information could be incorporated into the Ram Index or if in another tool such as Ram Longevity Index is warranted and how it would benefit producers in selecting range rams, while contributing to the industry's goals and objectives.

California Ram Sale -- April 9, 2016

All 500 rams were weighed and scanned for Loin Eye Area and Fat Depth. Data, as well as Range Ram Index, was printed in the sale catalog. Discussion of using this technology was held with consignors at Friday's sale banquet.

Photos from the California Ram Sale


LOT # 103 HEAD 5
CONSIGNOR HANSEN
BREED XB
AVG LOT WEIGHT 283
AVG LOT LEA 5.17
AVG RAM INDEX 4.16

GM1 Sheep Production for Huntington's Disease

AWARDED TO:
Dakota Lamb Growers Cooperative

SCOPE:
Nationwide

SUMMARY:
A safe, plentiful source of GM1 ganglioside for therapeutic use for clinical trials in Huntington's disease (a fatal progressive genetic neurologic disease) is needed. Prior development in the field was based on GM1 production from bovine brain collected at slaughter plants throughout Europe. In the 90's, Phase II clinical trials were in progress for spinal cord injury and Parkinson's disease when Mad Cow Disease (BSE) was diagnosed in cattle in England. With the discovery of BSE, raw material from non-source verified animals of any species could not be reliably used for ganglioside production for pharmaceutical use. GM1 ganglioside cannot be practically synthesized. Glycoscience Research Inc. (GRI) has developed a unique genetic line of sheep that has been deemed an acceptable raw material source for GM1 ganglioside production for pharmaceutical use in a recent pre-Investigational New Drug review by the FDA. While these sheep represent the only avenue for GM1 ganglioside production, the Pharmaceutical Industry, venture capitalists and many in the National Institutes of Health are skeptical of the Sheep Industry's ability to meet demand for GM1 ganglioside. variety of formats including but not limited to: sale catalogs, buyer informational packets, newsletter articles, etc.

STATUS:
Completed

Final Report

Let's Grow Funds Huntington Disease Presentations

https://www.youtube.com/watch?v=UUlwjwOSmG8&list=PLvmdHSmZBuFsZmnvJMI6shGvXBRIho2yP

Sue Holler Gives Photo Tour of Farm

https://www.youtube.com/watch?v=DALszJlSTkE&index=2&list=PLvmdHSmZBuFsZmnvJMI6shGvXBRIho2yP

Ludlam's Share HD Family Story

https://www.youtube.com/watch?v=MN57ACA_yIs&list=PLvmdHSmZBuFsZmnvJMI6shGvXBRIho2yP&index=3

GM1 Sheep Production for Huntington's Disease

https://www.youtube.com/watch?v=4On6IUSq_QE

GM1 Sheep Can Treat Neurologic Disease

https://www.youtube.com/watch?v=v3pbvoPPHN4

Glycoscience Research Farm Tour and History

https://www.youtube.com/watch?v=3FJj6c--_8I

Pam and Greg Taylor

https://www.youtube.com/watch?v=wzqsHM2HWoY

Jim Hanssen

https://www.youtube.com/watch?v=kWrye2O84R8

Jeff Petersen Family

https://www.youtube.com/watch?v=5DQK3IpWotY

Heather and Mike Ludlam

https://www.youtube.com/watch?v=rwlpbOYS3-0

Building a Fine-Wool Sheep Breeders Group

AWARDED TO:
NSIP Fine-Wool Sheep Breeders

SCOPE:
Nationwide

SUMMARY:
The Fine-Wool Breeders Consortium wants to improve wool quality of sheep through quantitative genetics and NSIP data collection and shared linkages. Through exchanging sheep and ideas amongst each other, we are creating a genetically superior wool sheep that will help improve the U.S. commercial breeder's flocks. We want to continue collaboration amongst the Consortium for forward thinking to see growth in the sheep industry today and for generations that follow.

STATUS:
Complete.

PROGRESS REPORT:

January 2017 Update
View the presentation provided during the 2017 ASI Convention at: Fine Wool Consortium

August 2016 Update
In August 2016, a group of sheep/wool producers all gathered in Dubois, ID to determine the possible framework for developing a system for adding value to the American wool clip. Determination of the goals for the progress of a premium wool product and a willingness of the group to commit to their individual portion was the main focus of the meeting. The goal from this meeting was to cement a group of goals for the group and provide some framework and structure for the group moving forward.

Goal: Grow the U.S. Sheep flock by improving fine wool sheep productivity and fleece quality by:

- Increasing utilization of NSIP
- Facilitate distribution of genetics among group for genetic linkages · Support the need for technical quantitative genetic expertise and research
- To facilitate growth of the U.S. commercial sheep flock, develop a means to disseminate genetics for productivity improvement and profitability
- Continued long-term collaboration and information exchange among fine wool sheep breeders Precise

Goals:

1. Develop organizational structure that will progress the group

Action Item: Development of a statement of principle and defining group structure

Statement of Principle

We are a group of fine wool sheep seed stock producers, enrolled in and actively using NSIP, who aim to improve the profitability of the US sheep industry by using NSIP records and other proven subjective and objective measures to increase weaning weights, weaning percentage, wool weights, wool staple length, and decrease fiber diameter in the US sheep flock. We aim to do this while producing low maintenance sheep that are adaptable to all climates and management systems.

Organization:

- Chair- Plan and lead the annual meeting -Coordinate the sharing of rams -Fill out grant applications as they become available
- Treasurer- Collect dues, pay bills and other duties normally associated with the position
- Secretary- Maintain a web site and social media -In charge of advertising -Record minutes
- Directors- All other voting members of the group, one per NSIP membership. Ex-officio (non-voting) members – Industry and academic people interested in seeing the group succeed.
- Voting Membership requirements 1. Pay dues as determined by the group in a timely manner 2. Be enrolled in and submit data to NSIP annually. 3. Provide access to the members of the group at least one proven stud ram each calendar year at no charge.
- New members may be admitted to the group provided they agree to meet all membership requirements and receive at least 50% of a yes vote from the membership on their request.
- Voted on officers for the FWC Ben Lehfeldt –chairman Reid Redden—vice chairman Matt Benz—executive secretary

2. Develop a structure to lead to a genetically linked database as quickly as possible.

Action Item: Organized a breeding scheme to link rams utilizing John Helle's flock. The upcoming Let's Grow grant will include the procedure for the genetic linkage project between the members

Rams will be sampled from all members to be raised in a common contemporary group of 2017 born lambs. We will collaborate with NSIP and MSU for technical guidance on structure.

3. Develop a system to analyze the data to make an educated suggestion for developing a new index to progress the group.

Proposed another Let's Grow grant project to facilitate the development of a wool index. Ben Lehfeldt will coordinate and submit the grant on behalf of the FWC with collaboration from other entities such as MSU, USSES…

Tri-state Small Ruminant Summit – Let's Grow Together

AWARDED TO:
Kentucky Sheep and Goat Development Office

SCOPE:
Kentucky, Indiana and Ohio

SUMMARY:
The KIO Tri-state Small Ruminant Summit – Let's Grow Together initiative is intended to bring together three neighboring states to share common goals and barriers to production, and then to find innovative solutions to increase sustainable industry productivity, profitability and growth. A pre-conference survey of stakeholders from each state will be used to identify the top five goals and/or barriers to increased production that are common to all three states. Production specialists in the field will be recruited to present solutions that enhance the producer's ability to grow the domestic meat and fiber industry in the tri-state region.

STATUS:
Complete.

PROGRESS REPORT:
October 1, 2016 -- Burlington, Ky.

Funded by a grant from ASI's Let's Grow Committee, the KIO Tri-State Small Ruminant Summit hoped to tap into the growing interest among prospective sheep and goat producers in the Kentucky-Indiana-Ohio region. With nearly 200 producers in attendance, it looks like it was mission accomplished in Burlington, Ky., on Oct. 1.

Numbers released by the U.S. Department of Agriculture earlier this year showed Kentucky with a 10.42 percent increase from the previous year in the total number of sheep – a figure that helped push the overall U.S. sheep population up for the second consecutive year. Kentucky trailed only North Dakota (at 14.06 percent) and joined a handful of eastern states (Pennsylvania, Tennessee, West Virginia, Michigan, North Carolina and Illinois) in the top 10. All showed increased numbers of 5 percent or better.

In addition to animal health and productivity seminars devoted to both sheep and goats, the summit offered additional activities that included hide tanning, cooking and soap making. A dozen or more vendors were also on hand to interact with and educate new producers.

“Many of the attendees are very new to the business and I received emails and phone calls from people thanking us for conducting the event,” said Kentucky Sheep and Goat Development Office Executive Director Kelley Yates. “They appreciated the knowledge and expertise of the speakers and were excited to learn more. The networking that events like this offer is invaluable, as well. Experienced producers have the opportunity to share knowledge and give a helping hand. We are blessed in Kentucky to have so many seasoned producers willing to go the extra mile to help beginners. That’s why we had a good turnout, and that is what has kept our numbers growing in the state.”

A delicious lunch of sheep and goat meat also included a Make It With Wool Style Show that allowed new producers to see just how versatile American wool is when it comes to fashion.

The sessions also encouraged several new producers to sign up for Kentucky’s Small Ruminant Profit School, which offers a series of lessons on the basics of properly implementing sound management practices into a new operation. Current SRPS students attended health training with Beth Johnson, DVM and state veterinarian for the Kentucky Department of Agriculture, during the morning session. Dave Thomas, Ph.D., from the University of Wisconsin-Madison led a session on genetics as it applies to breeding, breeding selection and crossbreeding. He reminded attendees that 86 percent of genetic improvement comes from the ram – meaning it’s important to choose the best ram available for your needs.

Roger High of the Ohio Sheep Improvement Association closed the summit by encouraging attendees to utilize what they’d learned as they continue to build sheep numbers in the Midwest.

Improving the Adoption of Accelerated Lamb Production in the USA

AWARDED TO:
Michigan State University

SCOPE:
Nationwide

SUMMARY:
Accelerated production offers an opportunity to improve production efficiency, decrease the cost of lamb production and provide a consistent supply of high-quality lamb throughout the year. This project seeks to raise awareness and educate producers on this production system with the goal of increasing its adoption rate through: 1) producing a peer-reviewed production guide made available for wide distribution on this system, highlighting identified critical management factors and resources required for success, 2) producing a high-quality series of video profiles consisting of 4 successful accelerated farms that vary in feed resource base and geographical location, and 3) produce and deliver an electronically accessible educational series (webinars) on accelerated production. All of these educational materials will be made available nationally in electronic format.

STATUS:
Complete.

FINAL REPORT:

Final Report: "Improving the adoption of accelerated lambing in the USA"
July 31, 2018
Project supported by "Let's Grow" fund of the American Sheep Industry Association
Richard Ehrhardt, Small Ruminant Extension Specialist, Michigan State University

Project Summary:

The major goals of this project were to: 1) Introduce and promote accelerated lamb production and 2) To provide novel insight on best management practices for accelerated lamb production to help producers in successful adoption of this production system. To accomplish these goals, over 4 hours of primary video was captured on 4 large and successful accelerated sheep farms ranging in location from the plains of southwest Kansas, the fertile corn belt in Northwest Iowa, the rich muck soils of south central Michigan and to where the fertile plains of Lake Ontario and rugged Allegheny plateau intersect in upstate New York. These farms were chosen based on their unique resource bases across a large geographical area and on their success and experience with accelerated lamb production. We performed video interviews with these farms with a standardized series of questions designed to describe their farm resource base, capture the reasons why they choose an accelerated production system and to highlight the best management practices that they have developed to optimize accelerated production. From these video interviews we have created a total of

5 videos ranging from a short summary video introducing accelerated production to much more intensive, content-driven videos on the specifics of management regarding optimizing nutrition, reproduction, labor and genetic resources. We anticipate that the introduction video will be of popular interest whereas the management series videos will appeal to those looking for deeper and more specific content.

Cooperator farms:

The 4 cooperator farms included: Kyle Farms in Avon New York, Oswalt Farms in Vicksburg Michigan, Moser Family Farm in Lester Iowa, and Gibson Sheep Farm in Copeland Kansas.

Production process:

In collaboration with Premier1, Washington, Iowa, over 4 hours of video along with hundreds of still photos. Filming took place at Oswalts and Kyles in September 2016 and then at Mosers and Gibsons in November 2016. video was completed in early November of 2016. Premier1 compiled all of the video and did the initial sound and video editing completed by January 2016. MSU created a 13-minute summary video from the 4+ hours of video that introduced accelerated lambing and highlighted its advantages and keys to success. This video was presented as an initial offering to an audience of approximately 320 at the Premier1 field day program on Feb 18, 2017. This initial video has been further edited to meet accessibility requirements and can be found at: http://www.canr.msu.edu/sheep_goats/farm-management/accelerated-production-informational-video-series We are developing a website at Michigan State University as well to host these videos and other educational content on accelerated lamb production and on sheep production in general.

We have also produced a video on the Accelerated production and its labor requirements which can be found at: https://mediaspace.msu.edu/media/Labor+required+for+accelerated+sheep+production+systems/1_kabxrmpw This 7:47 minute video discusses labor bottlenecks discusses benchmarks for labor efficiency for both birth management and feeding.

The final 3 management-oriented videos on accelerated production are in the video production phase and cover the topics of 1) reproductive management, 2) nutritional management and 3) genetic resources. The reproduction (52:17 min) and nutrition management videos (44:20 min) are much longer and more in-depth than the overview and labor videos. These videos are currently (July 31, 2018) in the final process of editing to meet accessibility requirements and will be available by September 1, 2018. The reproduction video covers sections on seasonal changes in lambing rate and conception, ram management, nutritional management to optimize reproduction, body condition score targets, pregnancy detection, lighting and hormone therapies, and ewe lamb development programs. The nutritional management video covers sections on: farm feed resources, advantages for accelerated production, nutrient requirements for the entire accelerated production cycle and feeding system infrastructure.

The final video on genetic resources will be a shorter video (approximately 15 minutes) and is the production phase. This video will be available by Oct 1, 2018. All links to the final 3 videos will be made available for use the ASI Let's Grow as soon as they are accessible on the web.

These videos will all be hosted within our media space hosting site at Michigan State University and fully available to the public.

MSU is now working to create videos on specific aspects of accelerated systems and their management from this material. MSU is also created specific farm profile videos for each individual farm. No videos have been made publicly available yet, but we are in the process of producing them with that intent and making them available to ASI this summer.

MSU is also working on production of an Accelerated production guide to make available later this summer.

Roadmap To Boost National Lamb Crop

AWARDED TO:
National Lamb Crop Task Force
Project Leader: Reid Redden

SCOPE:
Nationwide

SUMMARY:
The American Lamb Industry Roadmap implementation team identified the goal of doubling domestic consumption of lamb. The National Lamb Crop Task Force was developed to create awareness and educational information to assist producers in production practices that will increase national lamb to meet this potential demand. The task force identified and developed 12 steps to increasing the national lamb crop. This grant was used to write and review 12 facts sheets to serve as core communications, specifically the writing and review of fact sheets. The American Lamb Board funded designing and completion of the fact sheets. They are online at the Lamb Resource Center website in the Best Practices Resource section: Best Practices.

STATUS:
Completed.

ADDITIONAL BACKGROUND:
This project addresses the need for productivity improvement. The National Lamb Crop Task Force was appointed by the roadmap's implementation committee to address the need for more domestically produced lamb to meet the goal of doubling lamb consumption. The task force was given the goal of increasing the national lamb crop from 110% to 150% by 2020. To accomplish this goal, this task force prioritized the need to increase industry awareness of current best management practices that research and industry have proven to be effective. Our initiative will be done in three phases:

Phase 1: Industry awareness
Phase 2: Science-based fact sheets
Phase 3: Industry case studies

As was stated previously, the goal presented to this task force was to increase the national lamb crop to 150% by 2020. This is most certainly an aggressive goal and will take ongoing work on many fronts to bring about such a large change. Realistically, not every sheep flock will adopt and implement the steps. However, individual flocks that strategically use the 12 steps as a guide for increased flock production could see a 40% increase in their lamb crop. But we anticipate that it will take decades for this type of change to spread across an entire industry with such varied production methods and motivations. Regardless of timeline, the fundamentals of this initiative can and will continue indefinitely after they have been introduced into general flock management plans.

Objectives:
The goal of this project is to increase industry awareness and provide methods to optimize reproductive efficiency, and specifically develop fact sheets which will also serve as the cornerstones for other communications outreach to America's sheep producers. Some of the industry will be early adopters and use the information to refine management and increase reproductive efficiency right away. Others will take more time to process the information and changes will be more spread out. And others will not deviate from current management. That is reality. Yet those who are dedicated and in the sheep industry for the long-term should see the benefit.

The measurable objective is to develop fact sheets for each of the 12 lamb crop best practices, so that producers can gain more information on how to reach their goals. This was accomplished.

Ultimately, the effectiveness of this project can be assessed by evaluating trends in the national lamb crop statistics over time.

Timeline:
Authors identified, and fact sheet development initiated
Anticipated Completion: Jan. 15, 2016
Actual Completion: Feb. 1, 2016

Fact sheets returned from authors
Anticipated Completion: April 1, 2016
Actual Completion: Sept. 15, 2016
Notes: Authors began sending us their manuscripts in mid-April. Some authors had significant time conflicts which required adjustments in timelines. We received the last manuscript in September.

Fact sheets reviewed internally and sent to expert reviewers
Anticipated Completion: April 15, 2016
Actual Completion: Oct. 1, 2016
Notes: The panel of 4 reviewers were thorough about content accuracy and applicability for the variety of U.S. sheep enterprises. Some manuscripts were in very good shape in first draft. Others took more revisions, which were achieved by working with authors.

Fact sheets returned from reviewers
Anticipated Completion: April 1, 2016
Actual Completion: Sept. 15, 2016
Notes: See a above

Fact sheet contents finalized and flowing into design template started
Anticipated Completion: Aug. 1, 2016
Actual Completion: Nov. 1, 2016
Notes: This step was funded by the American Lamb Board

Fact sheets completed, collated and posted online
Anticipated Completion: Sept. 15, 2016
Actual Completion: Dec. 1, 2016
Notes: This step was funded by the American Lamb Board

Grant completion date:
Anticipated Completion: Dec. 31, 2016
Actual Completion: Dec. 5, 2016

Project Team:
Dr. Reid Redden (Chair)

- 25+ years of commercial industry experience
- 5+ years of experience as a state sheep specialist

Dr. Dan Morrical

- 40+ years of commercial industry experience
- 30+ years of experience as a state sheep specialist

Dr. Rodney Kott

- 40+ years of commercial industry experience
- 30+ years of experience as a state sheep specialist

Paul Lewis

- 45+ years of commercial industry experience
- 14 years of experience keeping genetic records

Kathy Bielek

- 15+ years of commercial industry experience
- 10 years of experience as an educator

Assisting from Lamb Board "Best Practices Tool Kit Project":
Megan Wortman – Executive Director of American Lamb Board
Sharlet Teigen – Senior Partner at Demeter Communications
Robert Ludwig – Principal at The Hale Group

PROGRESS REPORT:
Access the Best Practices on the Lamb Resource Center website at: Best Practices.

South Dakota Post Weaning Lamb Performance Program

AWARDED TO:
South Dakota State University Extension

SCOPE:
South Dakota

SUMMARY:
This proposal is "Phase 2" of the SD Post Weaning Lamb Performance Program initiated in 2015 to educate sheep producers in range production, systems where lambs are typically marketed as feeder lambs. The primary program goal is to expand producer knowledge beyond the feeder lamb by evaluating their flock genetics based on feedlot performance parameters and carcass merit on the rail. This program will establish baseline growth performance and carcass merit characteristics for each flock. Producers will build upon the lamb growth performance; cost of gain and carcass data derived to improve management practices and incorporate genetic selection tools (NSIP-EBVs) to meet industry roadmap goals for improved flock productivity. In this proposal, 15 farm flocks that currently finish lamb will be added to the program with the focus on carcass characteristics. South Dakota is uniquely positioned to accurately represent lambs from both range and farm flock production systems, we expect to involve the current 12 participating range flocks along with the addition of the 15 farm flocks to represent close to 20,000 head of ewes from these operations of the Northern Plains.

STATUS:
Completed.

PROGRESS REPORT:
September 2017 Report:
Early Weaned Feedlot Performance Trial Summary Segment 1: Feedlot Growth Performance Animal and Nutritional Management Procedures Producer participants delivered lambs (n=281 head) to the Newell Sheep Yards for the “Early Weaned Feedlot Performance” trial between September 26-October 5, 2016. Lambs originated from 8 different flocks, they weighed 88 lb at the beginning of the trial on October 6. Upon delivery lambs were weighed and processed including vaccination (Clostridium perfringens CD&T) and dewormed with Dectomax. Lambs were housed in outdoor lots with 20 sq ft allowed per lamb and access to “rural” water ad libitum. During the pre-trial transition period lambs were offered a 16% commercial crude protein starter pellet, “Market Lamb Head Start”, ad libitum using lamb self-feeders and offered 2nd cutting alfalfa equivalent to 30% of expected intake. Expected daily dry matter intake was defined as an amount equivalent to 4% of body weight, 100 lb lamb x 0.04 = 4 lb of dry matter. On October 6, initial start date for trial, the lambs were offered CHS B30 Lamb Finisher Grower diet, 14 % crude protein, ad lib and the amount of alfalfa hay remained constant at 30% of expected intake. Over several weeks the amount of alfalfa hay was gradually reduced to 10% of expected intake followed by replacement with wheat straw to provide supplemental dietary fiber. Due to lower than expected lamb performance in mid-December CHS 30 was reformulated to increase the energy density by inclusion of 10% corn. Lambs were allocated 3 in. feeder space; industry standards are generally at 2 in. per lamb with self-feeder feedlot

management. Sodium bicarbonate, a buffer and also known as “baking soda”, was available on a free-choice consumption throughout the trial basis to protect against the metabolic disorder known as acidosis. Daily feedlot management responsibilities included monitoring lamb health status, to provide forage supplement and confirm proper feeder function. Lambs were weighed monthly to monitor growth performance, reported as average daily gain (ADG).
Animal Health Observations During the 1st week of the trial approximately 80 lambs were sorted off to a small pen to more closely monitor health with access to forage, trial diet and water. Within 1 week all but 15 head were returned to the main population, by the 3rd week the transition to the trial diet was completed for the balance of these lambs. Interestingly the lambs that were sorted off came from flocks that delivered lambs directly following weaning practices. Lambs that were weaned and started on feed prior to delivery transitioned seamlessly into the feedlot environment. It is a common feedlot management practice to sort off lambs that need more attention during the initial stages of the finishing period. Mortality occurred with 3 lambs, all from the same source, during the 1st week of the trial despite treatment practices and oversight by experienced management and professional animal health advisement. No additional mortality was recorded through the balance of the feeding period. In the lamb feeding industry a 2% mortality due to all causes is often cited, in this trial the rate was 1.1%.

Feedlot Growth Performance and Nutritional Management The projected feedlot performance for the lambs in this trial was 0.6 lb live weight gain per day. The genotype of the lambs were mostly straight wool breeds white faced, and approximately 20% were terminal sire cross. All were sourced from the front edge of the producers’ lamb crop and overall, in excellent health entering the trial, 179 lambs were fresh weaned and 102 lambs had been backgrounded on grain based lamb diets prior to the trial. The initial weight on October 6 was typical for lambs reared and marketed in the region at 88 lb, the final weight on February 4 was 137.1 lb. The overall trial growth performance was 0.41 lb per day, 49.1 lb gain divided by 119 days. The monthly growth performance data showed a consistent level of performance at or near 0.4 lb live weight gain per day. Therefore, the growth performance, or described as average daily gain (ADG), was just 2/3 of the level predicted. There was no difference in ADG for lambs based on pre-trial management practices, the lambs from the groups of lambs that required extra care during the trial transition period performed equally. Following the transition phase of the trial lamb health was excellent indicated by minimal health treatment required and 0% mortality after the 1st week of the trial. Yet less than a desired level of growth performance did occur during the trial.

Sub-Optimal Growth Performance

Explanations for the sub-optimal growth response include could be related to animal genetic potential, health status, diet and interactions among these variables. The growth potential for these lambs is higher than observed, lambs sourced from these flocks and the region generally perform between 0.6 and 0.85 lb gain per day in commercial feedlots. Normally for ad lib finished lambs the growth curve is arched over time with higher performance and a peak at lighter weights then trend downward at heavier weights due to increasing inefficiency of gain associated with higher degree of fat deposition. In this trial the ADG was flat from start to finish at slightly more than 0.40 lb of gain per day. Given this observation from the data collected it can be concluded that the genetic potential for performance was not achieved, in any month, during the trial…period! Why? The other primary topic areas to explore includes animal health and diet.

The low mortality is certainly an indication that health was excellent, however a closer look at the behavior of these lambs would suggest otherwise.

A unique observation during the entire trial was the level of ad lib sodium bicarbonate intake, representing 3 to 4 % of daily dry matter intake compared to an expected level of 0.5% or less. Ruminant animals readily consume sodium bicarbonate, known as “baking soda and has high capacity to neutralize acid, this buffering agent when the rumen environment pH drops to the 5.5-6.0 range to avoid more acidotic conditions in the rumen. Dietary ingredients resulting in rapid rates of feedstuff fermentation are typically the cause of the surplus acid production in the rumen, supplementing the diet with long-stemmed forage aids in protecting the rumen environment from acidosis. Under severe acidotic conditions with feedlot lambs mortality can be very high despite intense treatment practices, lambs generally stop eating feed and water without treatment they would be at risk of mortality. In this trial it is very clear that clinical observations and symptoms of severe acidosis was avoided likely due to the consumption of the buffer and the beneficiary outcomes from the long-stemmed hay intake. The consistent documented pattern of high buffer consumption indicates that the rumen environment was regularly challenged by acidotic conditions resulting from dietary ingredient digestion. So how does this relate to sub-optimal ADG? Due to the abnormalities associated with the rumen environment the animal dry matter intake may have been decreased or inefficient utilization of the nutrients for growth or low nutrient density of the diet…. probably all factors could have contributed simultaneously. Further examination of dietary factors influencing the performance outcome in this trial include the documented level of dry matter intake. Between October 29 and December 10, the lambs weighed 105 lb and were consuming 5.04 lb of pelleted diet (CHS 30), when converted to dry matter intake as a percent of body weight the value is 4.3 %. At this level of intake most commercial lamb finisher diet formulations would expect to support the targeted growth performance of 0.6 lb gain per day. Based on this data the sub-optimal performance in this feedlot trial is more than simply a function of the level of dry matter intake. The remains dietary variable to address is the negative effect of diet on the rumen environment resulting in decreased efficiency of nutrient digestion.

Formulations for commercial pelleted feeds, whether a complete feed or a protein supplement, can include a wide variety of different feedstuffs. It is common for manufacturers to rely on coproducts more than traditional feed grains to meet formulation nutrient specifications for energy and crude protein. A typical commercial feed tag for sheep will list the class source of ingredients rather than specific items. For example, if “grain products” appears on the feed tag they might include corn, oats, wheat, barley, etc. Currently the most common classes of primary ingredients on a sheep feed tag include “processed grain byproducts” and “roughage products”. These classes include DDGS, wheat middlings and soyhulls just to name a few, they are referred to as coproducts and are terrific feedstuffs for sheep. All 3 coproducts have high levels of fiber, in the case of soyhulls and DDGS the fiber type is considered highly fermentable which means it is digested rapidly upon delivery to the rumen; wheat middlings also are expected to have a modest level of starch in the range of 15-25%. Research at South Dakota State University has demonstrated that sub-clinical acidosis can occur in feedlot lambs when offering lamb finishing diets formulated with primarily highly fermentable fiber based feedstuffs coupled with modest levels of starch based feeds. In this research using pelleted diets formulated with soyhulls (60%), DDGS (20%) and corn (20%) (starch content of corn 67%) growth performance and dry matter

intake were lower compared to other treatments with more and less corn inclusion. Symptoms of acidosis affected lambs were also observed when fed this diet. In the current trial diet ingredients are unknown yet if the diet formulated was primarily highly fermentable fiber with a modest level of starch it could help us understand the animal behavior to consume large quantities of sodium bicarbonate to counteract excess acid in the rumen. With these dynamic conditions in the rumen environment, it is possible that nutrient digestion and utilization of end-products of rumen fermentation by the animal reduced and as a result lowered growth performance during the finishing period.

Segment 2: Lamb Carcass Merit

Two-hundred seventy-eight (278 hd) live lambs were shipped from Newell to Mountain States Lamb in Colorado on February 5 with harvest on February 6. Trained and experienced lamb carcass evaluators from Colorado State University cooperated with our project, they facilitated transferring ID information at the time of harvest and on the 7th of February collected individual carcass data. The measurement recorded on each carcass included hot carcass weight (HCW), fat thickness (FT), body wall thickness (BW) and ribeye area (REA). In addition, the carcass evaluators recorded the USDA Yield Grade (YG) and Quality Grade (QG) designated on each carcass by a USDA lamb grader. (See more details in "Lamb Carcass Merit and USDA Lamb Grading Standards") A primary objective of this project was to have both traditional carcass data collection and evaluation using the state-of-art lamb carcass instrumentation grading technology. Unfortunately, the instrumentation technology was, and is, not yet fully operational.

Enclosed is a spreadsheet with the individual animal carcass data (Owner ID, genotype, live weight, HCW, FT, REA BW, YG, QG and %BCTRC), the computed average carcass data values for each producer consignment and for the entire set of lambs in the project. The overall live weight given in the producer report is 137.1 lb. That figure is based on individual weights taken on February 4, at which time the lambs were sorted into 4 groups by owner. Lambs were held on an overnight stand with access to hay and water then re-weighed before shipment on February 5, average weight at that point was 133 lb. Therefore, the shrink loss due to the overnight stand was 2.9 %. (137.1 lb-133 lb/137.1 lb x 100). The estimated live weight off loaded at Mountain States Lamb plant was 126.6 lb live weight, computed by using HCW at 64.7 lb/0.511 (Dressing % = 51.1). Using the settlement sheet for the largest producer group of 173 lambs, the computed dressing % (average HCW divided by average live weight off the truck at the plant) for that group was 51.1 percent. Thus, the live weight change, shrink loss, from Newell to the lamb harvest plant was 133.0 – 126.6 = 6.4 lb, or expressed as % shrink loss was 4.8 (6.4/133) x 100 = 4.8%). Subsequently the overall live weight shrink loss, between the individual weights taken on February 4 to the delivery of the lambs at the plant on February 5 was 137.1 lb -126.6 lb = 10.5 lb or expressed as percent shrink loss computes to 7.7 %. The percent live weight shrink loss for this set of lambs with described handling practices and 400-mile transport distance is in the expected range. According to research reports the vast majority of the shrink loss is due to gut fill and lower water intake although some tissue shrink due to dehydration will occur although it would represent a small portion of the total weight change. These lambs were sold on a carcass weight basis rather than a live weight pricing structure so the shrink loss would have limited impact on return per lamb.

Carcass Merit Determination

In the producer reports we list the lamb carcass merit values for each producer consignment and the overall values for the entire set of lambs (n=278). In the report the information collected and reported includes producer information, assigned animal ID, final live weight, and the carcass data measurements collected by evaluators including hot carcass weight (HCW), fat thickness (FT) at the 12-13th rib, body wall thickness (BW) measured 4.5 inches from the spine and just past the edge of the REA, and ribeye area (REA, sq. in.). A USDA lamb grader subjectively evaluated each carcass for USDA Quality Grade (QG) and the USDA Yield Grade YG) designation, they roll the carcass with their call on the official grades. Our evaluation team collected the USDA grading information, USDA QG and YG. Each producer received a financial settlement sheet, it gives the distribution of lamb carcasses by weight range and USDA YG. This designation (USDA YG) is the primary factor in premium and discounts in this carcass merit-based pricing system. In most producer reports there are some carcasses that were designated with "no roll". A "no roll" refers to an individual carcass that did not receive grading designation by the USDA grader. There are several explanations for this outcome including decisions by plant management and specifications related to USDA grading. Lamb carcasses that lack adequate fat thickness, less than 0.10 in, often are considered outliers for the purposes of marketing and pricing. These carcasses are priced based on a carcass weight category however no yield premium nor discount is applied. Under USDA regulations lamb carcasses with 2 spool joints (mutton) or excessive carcass trim loss due to bruising or other carcass abnormalities cannot be graded using the USDA lamb quality and yield grade standards. For this project the majority of the "no rolls" reported are most likely related to excessive carcass trim loss.

The %BCTRC is a scientific equation that uses objective measures of a carcass to predict the percent lean. The USDA yield grading system and the % BCTRC are both methods to categorize lamb carcasses by degree of leanness or fat. The %BCTRC method is considered more accurate since it uses 4 different measurements of a carcass whereas the USDA YG primarily considers fat thickness along with a subjective call based on overall carcass confirmation. In this project we find that the lamb grid-based pricing used the USDA YG rather than % BCTRC. Well, there is a simple answer to this, in practice due to regulatory specifications the USDA lamb grading is completed on whole carcasses therefore measurements of FT, REA and BW are unavailable. In our project the lamb carcasses were graded by the USDA grader then ribbed using a knife between the 12-13th rib to expose anatomical points of measurement for FT, REA and BW. Lamb carcass grading instrumentation technology will also require carcasses to be whole for this analytical procedure.

USDA lamb yield grades, %BCTRC and the instrumentation grading technology currently being tested in US packing plants all have a common goal to estimate lamb carcass composition, by degree of leanness, conversely the degree of fatness. The USDA grading system uses exclusively fat deposition to classify carcasses. The % BCTRC equation is more accurate than USDA lamb yield grades in predicting carcass leanness, actually the retail cuts of the shoulder, rack, loin and leg, because in addition to accounting for differences in fat deposition it incorporates muscling characteristics plus the effect of carcass weight. Instrument grading technology can account for the influence of even more objectively measured variables simultaneously to improve accuracy

in predicting the degree of leanness in a lamb carcass. An advantage of the instrument grading technology is application to whole carcasses at line speed in a lamb packing plant. Improving lamb product characteristics, reducing fat and increasing muscle and product uniformity, is given the top priority in the "Industry Roadmap". Using advanced technologies, instrumentation grading, to more accurately determine the composition and subsequently the value of the cuts derived from a lamb carcass can provide the sheep industry with critical tools to increase and sustain consumer demand. An outcome from instrumentation grading adoption for the US sheep industry would include greater reliance on grid-based lamb marketing and pricing. Using this information for value determination of a lamb could provide the knowledge and economic signals to change production practices including but not limited to flock genetic selection and lamb feeding management practices.

Summary and Assessment of EWT Project Lambs

The overall carcass data results for this project indicate that the lambs were high quality, packer preferred lambs, properly finished at 0.25 in fat thickness equating to a USDA YG 2, slightly more muscular than industry averages for 65 lb carcasses, 2.7 vs 2.5 sq. in. Although when observing the individual producer reports one can quickly identify considerable variation for carcass data traits and final live weight which is fairly typical for feedlot finished lambs in the US. For example, select and view the FT column, there were some lambs with less than 0.10 in. and instances with greater than 0.50 inches FT. For lamb carcasses with greater degree of finish, those with more than 0.40 in the USDA YG reported tended to underestimate with many called an YG 3. These types of data underscore the need for more precise tools and methods adopted for the lamb industry.

Fat Thickness (FT)

The degree of finish, YG or equivalent assessment of fat deposition, at harvest can be impacted by feeding and marketing management. Lamb carcasses that are above 0.30 in FT are too fat for the US industry to compete with the lean qualities present with imported lamb meat products. The lamb industry expects consumers to purchase a premium product, lean cuts of lamb from properly finished carcasses is the starting point. The wide range in FT, lack of uniformity, in this lamb finishing project is common in any US packing plant. This project demonstrates that the target finished weight to consistently produce an YG 2 carcass for a group of lambs from the same flock genetics could vary by more than 30 lb live weight. The source of this variation is mostly related to genetic variation in frame size, sex of animal and environmental factors including but not limited to birth type. Developing marketing management strategies that harvest lambs based on degree of finish, as YG 2 or 3, rather than a finished weight target would sharply improve lamb carcass composition and resulting retail cuts for consumers. Improperly finished lambs are a primary concern to industry leaders, adopting instrumentation grading technology would better enable identifying ideally finished lamb carcasses. Using this marketing management tool could be the key component in achieving the primary goals of the "industry roadmap" that are to improve lamb product characteristics and consumer demand creation.

Ribeye Area (REA)

With ribeye area (REA), our assessment of muscularity in lamb carcasses, there was considerable variation across the lamb population. The least REA was 2.0 sq in and largest REA recorded was 3.90 sq. in. In general, larger REA are preferred by the industry to enhance consumer satisfaction on their purchase. When REA falls below 2.3 sq in the resulting lamb chop retail cuts simply lose appeal with consumers do to limited edible product value. Large ribeye's those above 3.2 have more value. Why? Although larger REA results in lamb chops with more appealing plate appearance, there is more, since a larger REA will also positively impact the most valuable ($/lb) retail cut from a lamb carcass, the rack. REA is the measurement of one specific muscle called the longissimus, this same muscle is the primary muscle featured in the lamb rack. With a larger REA measurement, we can safely assume a more desirable lamb rack; conversely with smaller REA the lamb rack from this carcass can be disappointing due to limited edible product and poor consumer appeal.

The biology on REA size is rather simple…. larger REA are bred into the animal not fed into them! Review your producer reports, find some carcasses with similar weight and compare the REA. Those observations will show that despite animals being fed the same diet we can often find more than 30% difference in REA, this variation is due to genetic differences rather than plane of nutrition. A common misconception is that the solution to eliminating small REA and creating the large REA is simply finish lambs to heavier weights. It is true that a positive relationship exists between REA and finished weight, REA will increase with heavier finished weight. However, we expect just a 0.1 sq in REA increase for every additional 10 lb carcass weight.

For additional comments and details in this summary, or body wall thickness and USDA Quality grading contact Dr. Jeff Held.

Segment 3: Grid-based Marketing - Carcass Premium and Pelt Credit Value

In this project lambs were marketed on a carcass merit basis, often referred to as "in the meat". The grid pricing specifications were developed by the Mountain States Lamb Cooperative, lambs in this project followed the same pricing structure as with members of the cooperative. In this lamb marketing system, the value of the animal is determined by the carcass weight and the USDA Yield Grade. For each carcass weight range listed, 55 lb and down, 55 to 65 lb…. etc. the carcass pricing is based from USDA data sources. Generally, the carcass price per lb will slide downward from lightest to heaviest categories. Premiums and discounts are applied within each carcass weight range with premiums for YG 2 and 3 carcasses and discounts on YG 4 and 5, those with limited fat thickness the YG 1 carcasses neutral for value adjustment. For each producers' group of lambs, the weighted average carcass value was then converted back to a live value using the equation listed, 2 x dressed price @ hot weight. Listed is a value close to $1.30 per lb that was the computed live value based on using the weighted average carcass value divided by 2, therefore in this example the weighted average carcass value was conversely $2.60 per lb. Another economic income variable is the pelt value, a complete breakdown by size and quality is shown on the settlement sheet. Wooled pelts are very important in determining the

value of finished lamb, large clean skins that meet staple and color usually have the most value. For this set of lambs, the carcass premium and pelt credit is or nearly equivalent to the harvest cost and marketing fees, approximately $12.50 per lamb.

An increasing proportion of the lambs marketed in the US are being sold on a carcass basis to determine value using similar grid specifications implemented in this project. As stated earlier the instrumentation grading technology being evaluated by major packers is expected to serve as the foundation for a grid-based marketing structure for the US sheep industry in the future.

Penn State Sheep Home Study Course Enhancements

AWARDED TO:
Pennsylvania Sheep and Wool Growers Association

SCOPE:
Pennsylvania

SUMMARY:
This funding would be used to enhance the current Penn State Extension Sheep Home Study Course. Enhancements would include varying levels of participation in the course as well as additional educational pieces such as learn-now videos and interactive visual aids. Funding would be used to pay a technical communications specialist to work on this project as a collaboration with Penn State University.

STATUS:
Complete.

FINAL REPORT: June 26, 2018

To: American Sheep Industry – Let's Grow Funds

From: Melanie Barkley, Penn State Extension Educator

Re: Final Report for Penn State Sheep Home Study Course Enhancements

The enhancements to the first two sections of the Penn State Sheep Home Study Course have been updated and have been loaded into the online course software. In previous reports, I noted that the first section was broken out into three sections: basic production (section 1), evaluating and selecting sheep (section 2), and wool production basics (section 6). Since the last report, section 6 has been completed. The following is an outline of section 6 information:

Learning Objectives

As you work through this section, you will learn:

- The characteristics of wool that determine its quality
- What you can do to improve wool quality
- Factors that decrease wool value
- How to shear sheep
- Packaging options for selling wool
- Aspects related to processing wool at home

6.1 Overview

6.2 Wool Characteristics

- Fiber structure and diameter
- Wool grades
- Crimp
- Fiber length and strength
- Fiber color
- Wool yield

6.3 Improving Wool Quality

- Genetic influences
- Environmental influences

6.4 Factors that Decrease Wool Value

6.5 Shearing

- Shearing equipment and maintenance (includes YouTube video)
- Shearing area
- Shearing techniques (includes YouTube video

6.6 Packaging Wool for Sale

- Preparing individual fleeces – skirting (learn now video for skirting)
- Packaging – bulk or individual fleeces
- Value added products

6.7 Home Wool Processing

- Washing fleeces
- Dyeing wool options
- Spinning wool into yarn or felting

6.8 Check Your Learning questions

In addition to these sections, the Sheep Home Study Course will include these section topics:

Section 3: Reproduction

Section 4: Nutrition

Section 5: Health

Section 7: Marketing

Section 8: Finances

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Let's Grow the West

AWARDED TO:
Superior Packing - Dixon, Calif.

SCOPE:
Oregon, California, Washington, and Wyoming

SUMMARY:
This multi-state project will: 1. Build on the successes of our 2015 Let's Grow Symposiums held in Eastern Washington and Eastern Oregon with a third program in Western Oregon to serve the needs of the sheep-rich Willamette Valley as well as Western Washington, and 2. Take the model of WSU's proven Lamb 300 program to California and the Rocky Mountain Region through collaborations with Superior Farms and the University of Wyoming. The educational efforts described in this proposal are the beginning of a major effort to increase the knowledge and skills of sheep producers throughout the country, regardless of flock size or marketing plan. The Lamb 300 Workshop, the Sheep Symposiums and the Genetic Selection roundtable and outreach are designed to place ideas, concepts and skills in the hands of participants that will enable them to be more competitive and ultimately increase the pounds of quality lamb and wool produced and marketed.

STATUS:
Complete.

PROGRESS REPORT:
March 2017 - Final Report -- Click Here.

The Lamb 300 course was held June 9-11, 2016, in Dixon, California. A full class of 40 students participated. A second Lamb 300 class is being planned for early October. The Let's Grow seminar scheduled for early May in western Oregon was canceled due to lack of enrollment.

The following photos were captured during the three-day course.

Shepherds for Profit

AWARDED TO:
Texas A&M AgriLife Extension Service

SCOPE:
Texas and North Dakota

SUMMARY:
Producer workshops and benchmark data will provide a platform for producers to assess opportunities to increase production efficiency. The workshops and state-wide meeting will also allow producers to network among each other and sharing successful production practices. Establishing and fostering these relationships will naturally improve industry collaboration and industry communication.

STATUS:
Complete

FINAL REPORT: Click Here

Let's Grow Arkansas Small Ruminant Regional Conference Series

AWARDED TO:
The Board of Trustees of the University of Arkansas

SCOPE:
Arkansas

SUMMARY:
In order to increase the knowledge and skill level of small ruminant producers in Arkansas, educational efforts must be made. There are several producer groups in Arkansas who host field days and/or workshops here and there, but there have not been efforts on extension's part to host conferences, mainly because there has not been a small ruminant specialist in the state office in many years. It is important for producers to be provided with unbiased, factual information derived from reputable sources. The Let's Grow Arkansas Small Ruminant Regional Conference Series will consist of five conferences held throughout Arkansas. These conferences will provide a place for participants to receive ideas, concepts and skills pertaining to small ruminants. This will enable Arkansas producers to become more competitive in the sheep industry, and, in the end, able to increase on-farm profitability. Parasites are a major problem in the sheep industry. One thing all producers will gain from attending this conference is FAMACHA certification. It's imperative to educate Arkansas producers about industry trends and timely topics. Five conferences held throughout Arkansas (Northwest, Northeast, Southwest, Southeast, Central) will provide educational training to small ruminant producers at advantageous locations that are more easily accessible than if there was one large conference. It is the goal of these conferences to reach as many producers as possible and to create awareness about Arkansas Extension, producer groups and other industry stakeholders located in Arkansas. Furthermore, it provides a place for producers to meet with other producers and create networks.

STATUS:
Complete

PROGRESS REPORT: Click here.

Engaging the New Biology: Establishing the Foundation for Genome-Enhanced Breeding Values in the U.S. Sheep Industry

AWARDED TO:
Board of Regents, Univ. of Nebraska, Univ. of Nebraska-Lincoln

SCOPE:
Nationwide

SUMMARY:
The efficiency of lamb and wool production has increased substantially by applying quantitative genetic principles in sheep breeding programs. Accelerating those gains depends on melding state-of-the-art technologies in animal genomics with quantitative genetics approaches to more accurately identify high merit animals. This proposal focuses on three key steps for the U.S. sheep industry to combine molecular and quantitative tools in genetic improvement programs: (i) provide producer education clarifying the opportunities and limits of genomics, and the practices needed in order to collect molecular information to obtain more accurate estimates of genetic merit (genome-enhanced estimated breeding values); (ii) devise efficient strategies to collect genomic data; and, (iii) establish a reservoir of genomic samples (DNA) on well-chosen performance-recorded animals through collaboration with the National Sheep Improvement Program (NSIP); such is necessary to develop procedures for their incorporation in genetic improvement programs. These efforts will lead to productivity improvement, a goal of the Sheep Industry's Roadmap, contributing to the long-term profitability of the American sheep industry.

STATUS:
Completed.

FINAL REPORT: Click Here

Building Value for Suffolk Sheep using NSIP

AWARDED TO:
United Suffolk Sheep Association

SCOPE:
Nationwide

SUMMARY:
This project will link the association functions of breed promotion, youth development, and education with the NSIP functions of creating and meeting commercial demand for documented performance and utilizing the technology of genetic analysis. The USSA will update its registration process to record performance measures and submit that data set (in large batches) directly to NSIP, creating a user-friendly system to fully integrate registration and performance. In the interim, USSA will subsidize the cost of data input for individual breeders, to immediately increase participation in NSIP. This project will dramatically increase the number of Suffolk breeders participating in NSIP and the number Suffolk sheep in the database, thereby increasing the accuracy and validity of the genetic analysis. With heavy overfinished lambs hindering the efficiency of the U.S. sheep industry, Suffolk terminal sires (with reliable estimates for efficient lean gain) will be a great tool in managing this problem. As the largest single contributor of terminal sire genetics to the US sheep industry, the USSA is dedicated to assuming a leadership role, and within a cooperative effort with NSIP, addressing the opportunities presented in the American Sheep Industry's Roadmap, and plans to contribute matching funds to achieve the goals of this project proposal.

STATUS:
In Process.

PROGRESS REPORT:
In the Spring of 2017, the USSA mailed a survey to over 900 Suffolk breeders. The survey included questions regarding flock status, recordkeeping, NSIP knowledge and NSIP participation. Surveys are currently being summarized; approximately 200 were returned. Additionally, the USSA uses funds to cover the cost involved with entering USSA member's data into NSIP. This is ongoing; over 100 head have been submitted to-date. Members continue to show interest in this opportunity. Since the USSA was awarded grant funding in 2015, NSIP Suffolk flock enrollment has doubled. Click here for graph.

2018 Update:

NSIP Educational Sessions to be held in conjunction with the 2019 Center of the Nation Sale. The USSA is organizing two different sessions:

1) A program directed toward purebred breeders on the afternoon and evening of July 26, 2019

2) A program directed toward commercial producers the morning of July 27, 2019

The goal of these programs is to promote the breed to the commercial industry and address their needs. Utilizing NSIP will be a major component of the program.

Leading Edge Sheep Production - Part II

AWARDED TO:
Utah Wool Growers Association

SCOPE:
Utah, Idaho, Wyoming and Nevada

SUMMARY:
This proposal encompasses two additional follow-up meetings/seminars from our previous Leading Edge Sheep Production seminar held this past August. The goal now is to organize the participants into a producer consortium that can synergize in production and marketing. The group met in Park City at the Western States Wool Grower Convention where Rick Stott from Superior Farms addressed the group and they expressed interest in moving forward – thus this application to assist in moving that process forward. Additional discussions will continue on production issues identified in the Industry Roadmap. Anticipated and/or desired presenters will include: Rick Stott, Lesa Eidman, Dennis Stiffler, Bill Shultz, Alan Culham, Steven Pollmann [Swine Industry Consultant], Noelle Cockett and Mike Caskey. The seminar will be slated for 2 days again. A ram production test is also included in the scope of this grant which is being conducted at Matt Mickel's ranch in Spring City, Utah. Matt has purchased a group of Bunker Hill rams that have significantly higher projected weaning weight EBV's than average. Matt also has a group of average rams that do not have EBV's. He will make up a commercial herd of 1200 ewes and gate cut those ewes into 2 groups for breeding which will be run on the same type of feed during the breeding season. Upon completion of the breeding season the ewes will be returned to a single band and run together through lambing at which time the lambs will be identified [tagged] according to the group from which they came. The ewes and lambs will be run together throughout the summer of 2016 and will be weighed separately with the results being made public. The continued reluctance to seek out EBV rams and availability of NSIP rams with positive EBV's can hopefully be addressed through this test.

STATUS:
Complete.

PROGRESS REPORT:

November 2016 -- Better Genetics Equals More Profit
Terri Queck-Matzie submitted this article on behalf of the Leading Edge Group. Click here to read the article.

June 24 -- Leading Edge II Meeting - Salt Lake City, Utah

The Leading Edge Group held another face-to-face meeting in Utah where they continued their discussions about tailoring a terminal sire breeding program for the West. Presentations offered during this gathering are available below.

- **Vertically Integrated Sheep Production** - Alan Culham, Let's Grow Program Coordinator
  Tailoring a Terminal Sire Breeding Program for the West - Dr. Ron Lewis, University of Nebraska-Lincoln
  Terminal Sire Breeding Group - Seeing the Vision - Bill Shultz

NSIP vs. non-NSIP Sires:
The comparison of performance differences between NSIP Suffolk sires and non-NSIP Suffolk sires at the Matt Mickel ranch in Spring City, Utah, is under way. Rams were mated to ewes in the late fall of 2015. Performance data will be obtained and analyzed later this year.

March 17 -- Leading Edge II Producer Meeting - Salt Lake City, Utah

The group met and agreed to establish a vertically integrated sheep production system. Group decided to develop a genetic base for terminal sires. A part of the membership will act as seedstock producers. Those flocks will be enrolled in NSIP with selection of Elite NSIP studs obtained to produce terminal sires used by the group's participating flocks. Future considerations will be the possibility of retained ownership of lambs through the feeding process and the development of a differentiated branded lamb product provided by the membership.

February 11-12 -- Leading Edge Seminar II - Homestead, Utah

Attendees: All Interested Producers

Presenters and Topics:

Production Economics - Alan Culham
Seed Stock Economics - Bill Shultz

Pipestone Model Discussion Do's and Don'ts - Mike Caskey
Mountain States Rosen Model Presentation - Brad Boner and Team
Superior Farms Model Presentation - Rick Stott and Team
The Future? Organize? Future Seminars? Production Education?

Producer Tom Boyer review's previous seminar and marketing economics.

Rick Stott discusses the Superior Farms model.