On October 26, 2019, WSDA was pleased to partner with UC Davis for the 2019 Sheep Day! It was a beautiful day at the University of California, Davis campus for this impactful event highlighting the dorper breed. WSDA set free-ticket registration at 100 participants, but the RSVP’s quickly exceeded 150! The program was coordinated by Brad Foyil, UC Davis Sheep Unit Manager, and Catherine Diaz-Khansefid, President of WSDA, with a line-up of speakers, experts in their field.

The day started with a warm welcome from Dr. Anita Oberbauer, Associate Dean for the College of Agriculture and Environmental Sciences, where she described the many unique qualities that make UC Davis’ College of Agriculture rank first in the nation, and second in the World (https://caes.ucdavis.edu/). Dr. Oberbauer, introduced Catherine Diaz-Khansefid, President of WSDA, where she thanked Dr. Oberbauer, Brad Foyil, and Dan Sehnert in the Animal Science Department, the speakers, and welcomed a crowd of about 125 livestock producers to a day of education, networking and fun!

Matthew Hayes, Superior Farms, West Coast Livestock Buyer
Email: matthew.hayes@superiorfarms.com

Matt Hayes from Superior Farms highlighted the carcass traits that Superior Farms seeks and of the unique and advanced technology they have that can provide significant and consistent data on carcass quality and measurements for marketing, as well as to the producer for making informed breeding decisions. Superior Farms buys sheep with the carcass traits for fabrication that follow the parameters:

- Carcass, 66-88 lbs (130-170 live weight)
- Grading of Choice or better with .06 - .25 inches of back fat
- Yield Grade of 2-3

Discounts are applied against the following carcasses:
- Yield grade and weight outside of the parameter’s above

The following are non-gradable characteristics:
- Spool joints
- Buck lambs
- No roll
- Damages

When marketing to Superior Farms, it’s important to know these parameters, and how the Dorper breed fits into this data to ensure maximum prices per carcass. The Dorper sheep grow and mature faster than many other breeds, therefore, a 130-170 lb live weight Dorper might be too mature and get discounted. Hays also described carcass traits for the Niche/Ethnic Market. These markets seek a carcass weight of 35-45 lbs (live weight 70-90 lbs), for which grading is not required, and the preference is usually a young, in-tact male. Hayes ended his presentation by stating that Superior
Farms also has three specialty programs that they offer, which are purchased from breeders at a higher price point. These include: 1) Superior Farms, which are Naturally Raised and Minimally Processed; 2) Farmers Mark, Antibiotic and Hormone Free, 3) Cascade Creek: Antibiotic and Hormone Free and Pasture Raised.

**Lesa Eidman, Superior Farms, Director of Producer Resources & Sustainability**  
Email: Lesa.Eidman@SuperiorFarms.com

Lesa Eidman from Superior Farms described the advancements happening in the sheep industry and how Superior Farms is leading in this innovation. Her talk focused on Camera Grading, Producer Portal, Flock54 and Probiotics. The Dorper lamb that WSDA provided was harvested by Superior Farms, and Superior matched WSDA’s Dorper carcass with a Suffolk/Cross carcass of similar weight.

The data in the chart illustrates the carcass comparison. The Suffolk/Cross carcass is a 7-month old wether, and the Dorper carcass is an 8 month old ram lamb. Both carcasses have good yielding numbers, and there isn’t anything wildly different about them based on this information.

A **critical** point between these two carcasses is that the Dorper ram at 8 months of age showed early maturity in the spool joints (which was discounted) and more muscle in the shoulders, indicating that it was a ram (which was discounted), which are all typical characteristics of a dorper ram. These characteristics did not meet metrics for Superior’s market; so this carcass would be discounted.

<table>
<thead>
<tr>
<th>Superior Farm’s Data</th>
<th>Dorper Ram Lamb, 8 mo</th>
<th>Suffolk Cross Wether, 7 mo</th>
<th>Difference</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hot Weight</td>
<td>81.5</td>
<td>76.3</td>
<td>5.2</td>
</tr>
<tr>
<td>Yield Grade</td>
<td>3.51</td>
<td>2.59</td>
<td>0.92</td>
</tr>
<tr>
<td>Occ</td>
<td>52.1</td>
<td>50.5</td>
<td>1.6</td>
</tr>
<tr>
<td>Occ Yield</td>
<td>64.61</td>
<td>66.87</td>
<td>-2.26</td>
</tr>
<tr>
<td>Breast</td>
<td>10.5</td>
<td>9.7</td>
<td>0.8</td>
</tr>
<tr>
<td>Rack</td>
<td>10.4</td>
<td>9.2</td>
<td>1.2</td>
</tr>
<tr>
<td>Shoulder</td>
<td>19.4</td>
<td>18.8</td>
<td>0.6</td>
</tr>
<tr>
<td>Legs</td>
<td>25.7</td>
<td>24.3</td>
<td>1.4</td>
</tr>
<tr>
<td>Loins</td>
<td>10.9</td>
<td>8.1</td>
<td>2.8</td>
</tr>
<tr>
<td>Neck</td>
<td>1.6</td>
<td>1.8</td>
<td>-0.2</td>
</tr>
<tr>
<td>Trotters</td>
<td>2.9</td>
<td>3.2</td>
<td>-0.3</td>
</tr>
</tbody>
</table>

**Dr. Wes Patton, CSU, Chico Professor Emeritus, Glenn Land Farms**

Dr. Patton had the two carcasses delivered to the classroom for a physical comparison and discussion. These carcasses that were harvested from Superior Farms, and their data is above. Dr. Patton described the spool joints and shoulders and explained Superior Farm’s data and standards. While the data didn’t appear to present vast differences, there were visual difference between these two carcasses, specifically in leg and body length, and thickness. While the Dorper carcass was not acceptable to Superior Farms based on their marketing metrics, if selling direct to customers, this Dorper carcass is impressive and the larger size of the primal cuts may be more desirable. While the age of these two animals were similar, due to the early maturity signs, it’s reasonable to conclude that the Dorper carcass would have been marketable to Superior Farms if 2-3 months younger than the cross-bred, which means less expenses on the farm, and quicker production to the plant. This rapid production to plant makes the Dorper attractive to the commercial growers.

Lesa also outlined the advances Superior Farms in Dixon, CA has made with the Electronic grading system. It is an official USDA Grade system that utilizes RFID readers in pens and plant linking each lamb to camera digitally. It has also converted all CA fairs to EID Data Collection.

Electronic Identification (EID) Readers implemented at Superior Farms includes chipped hooks tied to individual carcass image of the grading camera. This provides full transparency through Producer
Portal, which provides individual lamb performance, Lot performance, and tracks lambs through birth to slaughter. There is a complete feedback loop – from packer to feeder to producer to seedstock owners.

We learned that the key consumer trends across the broad spectrum of the lamb market, where consumers are increasingly seeking food choices that are humanely raised/cared for, local, antibiotic free/no added hormones, and sustainably raised. She also pointed out that the Millennials are the next generation of “Foodies” who also seek the beforementioned, in addition, they seek an authentic experience and are not opposed to bold flavors. As breeders, we can leverage this information in our marketing, with the emphasis on humanely raised/cared for, local, sustainably raised, milder in flavor, and so on. The dorper has a tremendous appeal to consumers who previously have never enjoyed the flavor of lamb.

Superior Farm’s FLOCK 54
FLOCK54’s Primary goals are to create a reasonable priced genetic test to increase flock efficiency and producer margins by reducing costs; and increase the number lambs in the US flock.

Flock54 is a targeted genotyping panel that allows producers to test their flock’s DNA for animal parentage and traits associated with disease, production and meat quality. The test identifies single-gene traits such as disease resistance for scrapie, OPP and spider, glycogen storage, etc., as well twinning potential, double muscling and horns. This genetic test was created by Superior Farms in coordination with the University of Idaho and marketed through RILE Ag. Leveraging this program provides valuable data for decision making, as well as marketing value to our breeders.

The cost is $16 - $20 per test, and they are working to get this price point even lower. The test determines Parentage and Single Gene Traits. The tissue sample can be an ear notch, clean tail at docking, blood tubes, or TSU. The genetic data obtained is impressive and allows breeders to make informed decisions that were previously not available or cost prohibitive.

Strong indicators – Single gene traits
- Disease resistance
- Scrapie, OPP, spider, glycogen storage, etc.
- Twinning potential
- Fleece variation
- Yellow fat
- Double muscling (callipyge)
- Horned or Polled

Parentage test
- Identify sires in group breeding
- Pair lambs with sires, mothers

Flock54 processes the data and results are emailed to the producer. In the example provided, the data suggest that a producer would want to keep “Ewe Lamb 3” in their breeding program, and cull “Ewe Lamb 2” from their breeding program.
Superior Farm’s Barrier Lamb Probiotic

The gastrointestinal immune system develops rapidly in the first days and weeks of a lamb’s life, and the use of Barrier Lamb probiotic has proven to produce a healthier lamb. The producers that have participated in the trials of Barrier Lamb have found (compared to traditional antibiotics) that the lambs are in better condition, have a greater averaged daily gain, can eliminate mass applications of antibiotics, and is just as cost effective. Barrier Lamb Probiotic is a formula that includes a blend of yeast cell wall fractions that effectively binds many *E. coli* and *Salmonella* strains. The concentration of the 2 probiotic bacterias are approximately 10X than many other probiotics available. **The daily dose of 2.5cc of oral paste within 24 hours of birth will increase the health of the lamb.** The Barrier Lamb Probiotic has been tested in 5 producers in OR, MN, ID, KS and IA during lambing, and the use has eliminated their need for mass treatment of antibiotics, and some producers have completely eliminated antibiotics from their health treatments since the lambs were noticeably more healthy. The cost for Paste is $0.27/dose, and the Powder form is $0.26/dose. Please contact Lesa directly for more information.

This concluded the morning sessions and we had a lunch featuring pulled-dorper lamb and cole-slaw sandwiches, chips, brownies and refreshments. We ate and socialized under a beautiful and massive oak tree. Many came back for “seconds”, so the dorper meat appeared to be a hit! After lunch, we reassembled to learn more from our amazing speakers!

Dr. Allen Pettey, UC Davis, Department of Animal Science Sheep Nutrition – “Feeding Ewes in Breeding and Gestation”

Dr. Pettey described key factors in sheep that influence nutrition, which are Genetics, Feed Intake, Environment/Stress. Dr. Pettey pointed out that that different breeds have different nutritional needs based on their genotype/phenotype. The traditional way of thinking is that there are only three periods of critical importance when feeding ewes, which was breeding, late gestation and early lactation. However, this is not correct. Body Condition Score (BCS) is one of the most critical factors influencing reproductive success, and *ewe management starts as early as ewe lambs are in the creep*. Underfed ewe lambs (pre-weaning) have delayed first estrus and lower ovulation rates, and even more nutritional considerations are necessary when flushing. Basically, quality nutrition is necessary at times!

**Flushing - Increasing dietary energy levels**
- Start 2-3 weeks before breeding
- Continue through breeding interval
- Need optimum nutrition when egg attaches to uterine wall

**Results of flushing** = Increased ovulation rate, and starch feed ingredients are best to use
Guiding Principles in Feeding Ewes During Breeding

- Select a clean, high quality grain source or complete feed supplement
- Provide access to a high-quality forage source
- Consistent Feeding Practices
- Focused use of micronutrient supplements
- Fertility of progeny starts in the uterus
- Underfed ewe lamb fetuses have delayed first estrus and lower ovulation rates
- Reduced early fetal growth = delay to puberty

Fetal programming

- Reproductive success of progeny
- Day 0-30 gestation – ovary development in lambs
- Day 50-65 – follicle development

Minerals Required by Sheep

- Calcium and Phosphorus
- Sodium and Chloride
- Electrolytes – Mg, K, S
- Iron, Iodine
- Copper and Molybdenum
- Zinc, Manganese
- Selenium, Cobalt

Calcium and Phosphorus

- Ratio of Ca:P is still critical
  - 2:1 or at least more Ca than P
- Calcium easy to supplement
- Legume hays are high in Ca

Mitigating Risks of Urinary Calculi

- Use mineral supplements with no added P to mature rams and feed ammonium chloride when feeding grain to rams

Selenium

- Only nutrient currently regulated by FDA (0.3 ppm in feed)
- Sheep can tolerate more in their diet – depending on source. Toxicity arises when consuming organic form or when injected

Copper

- Susceptibility of sheep to Cu toxicity is well described
- Copper absorption reduced by Molybdenum and/or Sulfur
- Required by sheep in many areas of metabolism
- Sheep store copper well in liver, but no bile excretion. Stress can release stored copper – immune response

Zinc

- Critical for cell replication – growth and reproduction
- Oxide form is poorly used by sheep
- Too much Zn reduces absorption of Fe and Cu

Manganese

- Critical for normal reproduction – especially ewes
- Involved in proper collagen formation in fetal lambs
- Grazing animals get plenty of Mn from forage and soil
- However - high Ca, P, or Iron may induce a Mn deficiency

General Considerations

<table>
<thead>
<tr>
<th>Nutrient Requirements - 154 lb. ewe</th>
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<tbody>
<tr>
<td>Production Stage</td>
</tr>
<tr>
<td>------------------</td>
</tr>
<tr>
<td>Maint</td>
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<tr>
<td>Flush/Breed</td>
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<tr>
<td>Early Gest</td>
</tr>
<tr>
<td>Late Gest</td>
</tr>
<tr>
<td>Lactation</td>
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</tbody>
</table>

Total Digestible Nutrients (TDN) – old system of measuring energy of feeds
Digestible Energy – energy digested and absorbed by the animal
Metabolizable Energy – energy used by the organs and is available for use
Net Energy – energy actually used for body functions – maintenance, growth, lactation
Keep ewes in positive energy balance when reproductively active; use probiotics to maintain gut health and provide loose salt/mineral w/ Se and Vit. E. Please review the PDF of this presentation as the data provided is comprehensive.

**Rosie Busch, DVM, UC Davis Sheep and Goat Extension Specialist**  
**Email:** rcbusch@ucdavis.edu

Dr. Rosie Busch discussed disease management to keep flocks healthy. The types of common problems seen are endemic disease and disease outbreaks, which can be caused by a change of management, Naïve animals (open herd), exposure to a new strains of pathogens, and inadequate vaccination. Some of the risk factors include:

- Virulence
- Reservoir
- Mode of transmission
- Viability in environment
- Concurrent infections
- Antibiotic susceptibility patterns

An animal can be more subject to disease based on their age, size of herd, nutritional status, Immunity, Historical disease, and stage of pregnancy or production. The principles of control include to treat infections, minimize infection pressure, prevent new infections, improve host response (vaccines), genetic selection for disease resistance, and enforce biosecurity practices.

**Caseous Lymphadenitis (CL) main sources of infection is from the discharge from ruptured abscesses, and nasal and oral secretions. Control strategies include screening of new additions, fly control/waste management plan, control external parasites, minimize sharps objects in facilities/alleys, disinfection of equipment, isolate ewes with clinical signs, remove bedding & top soil, disinfect, and consult with your veterinarian on abscess management and a vaccination program.**

**Bret McNabb, DVM, UC Davis School of Veterinary Medicine, Department of Population Health & Reproduction. “Improving Fertility in your Flock”**

Dr. McNabb’s talk focused on “getting ewes pregnant and keeping them pregnant”. He too, provided a tremendous amount of valuable data, so I encourage readers to review the PDF of his presentation.

Discussion was on the eggs before fertilization, eggs/follicles up to 100 days before ovulating, and the embryos less than 6 days old, and the needs of the ewe.

While conception and pregnancy sound like a simple act of natural, the science behind it is very complicated! The is graph illustrates the days of estrous and below is adds more description of this cycle.
- Estrous Cycle: 16-17 days
- Estrus: 30-36 hours
- 3-4 follicular waves
- Ovulation: 20-30 hours
- after the onset of estrus

**Brucella Ovis** is a bacterial infection that effects the ram’s sperm. It can be felt in 50% of cases and can cause male infertility. In this image, you can see the difference between a healthy testicle versus a testicle with brucella ovis. It is recommended to cull all Brucella Ovis positive rams, and conduct testing annually, and on all new additions prior to co-mingling or semen collection.

| Expectations |
|--------------|-----------------|-----------------|
| Natural Breeding | In-Season | 95-98% | Out of Season | 60-90% |
| Artificial Insemination | Fresh | 40 – 80% | 40 – 70% |
| Artificial Insemination | Frozen | 40 – 80% | 40 – 70% |

80-85% Fertilization Rate
70% Embryos survive to 40 days
85% x 70% = 60% conception from one natural breeding

There are various methods to confirm pregnancy. Pregnancy Specific Protein B is available by BioPryn® at $6.50, and can detect pregnancy at 30 days or more after breeding and indicates a functional placenta. Pregnancy Associated Glycoproteins (PAGs) is Idexx Pregnancy Test at $8.00, 35 days or more after breeding. Ultrasound Exam can detect pregnancy 35 days or more after breeding.

Dr. McNabb also discussed the various reasons for fetal loss.

- Non-infectious
  - Lamb not developing properly
  - Severe nutrient imbalance
  - Toxins, poisonous plants

- Infectious
  - Vibrio (Campylobacter fetus fetus/jejuni)
  - Chlamydia (Chlamydophila)
  - Q fever (Coxiella)
  - Toxoplasmosis
  - Bluetongue Virus

**Dr. Wes Patton, Professor Emeritus, Glenn Land Farms**
“Breeds to Consider, Dorper & White Dorper”

Dr. Patton shared that 1930’s, South Africa had low quality slaughter sheep, and in 1942 they successfully crossed the Dorset Horn and Blackhead Persian, which resulted in the Dorper. In the United States, the dorpers arrived in 1995 as imports of sheep and embryos to Texas and Arizona. In 1996, Dr. Patton received two rams at Chico State. Unfortunately, imports stopped because of disease in South Africa, but in the US, the love for dorpers was strong and upgrading programs began which is how we got the Fullblood vs Purebreds. Then entrepreneurial breeders began importing embryos and semen from Australia as a source of new genetics. Today, the dorper is the fasting growing breed registry in the US and breeders are committed to following the South African breed standards.

Some of the qualities of the Dorper and White Dorper breed is that they are hardy and adaptable, have excellent maternal and carcass qualities, have long breeding seasons, have a reproductive efficiency of 180%, non-select grazers, and heat and insect tolerant.
Dr. Patton also shared information on two leaders in the Sheep Industry. The California Wool Growers Association (CWGA) was established in 1862 and is a non-profit trade association.

CWGA is the voice of the California sheep industry, delivering lasting value to support and grow all segments of the California sheep industry through advocacy, education, and investment in markets and infrastructure. CWGA represents more than 500 sheep producers including farm-flock, large commercial operations, lamb feeders, seedstock producers, club/show lamb producers, producers of wool/fiber, goat producers, and industry stakeholders. It also has an annual Ram sale, an online sale, and published excellent material to stay current on trending issues.

The American Lamb Board is an industry-funded national promotion, research and information organization (national checkoff program) that represents all sectors of the American Lamb industry including producers, feeders, seed stock producers, and processors. The 13-member Board, appointed by the Secretary of Agriculture, is focused on increasing demand by promoting the freshness, flavor, nutritional benefits, and culinary versatility of American Lamb. The work of the American Lamb Board is overseen by the U.S. Department of Agriculture and the board’s programs are supported and implemented by the staff in Denver, Colorado. The program is funded through mandatory assessments collected under the federally mandated Lamb Checkoff program. There is a live weight assessment of $.007 per pound paid by the seller of sheep or lambs and a first handler assessment of $.42 per head assessment paid by the entity who owns sheep or lambs at the time of slaughter. The assessments are remitted to the American Lamb Board. The Board’s expenditures for administration are limited to 10 percent or less of projected revenues. All remaining revenues are expended on programs related to promotion, research and information for the lamb industry.

We concluded the day with new information and friendships.

In appreciation to the American Dorper Sheep Breeders Society, UC Davis, Superior Farms, and Western States Dorper Association for making this event possible.