Sheep and Goat Management Basics

Sheep and Goat 101
Alison Crane, Ph.D.
Changing Industries

• Women as Principal Operator, USDA
  – 2012, 13.66% of farms; 2017, 29.13% \(\rightarrow\) 15.47% increase
  – 36% American producers are women; 31.5% increase since 2012
    • 500,000 more women involved in Agriculture

• Wool/Mohair/Fiber is making a comeback
  – Support the infrastructure

• Lamb is too
  – Foodies, Millenials and GenZs
  – Natural, Grass-fed

https://www.agdaily.com/insights/2017-census-of-agriculture-women-farmers/
What’s the Most Important?

Rule #1
“Do what you love and you’ll never work a day in your life”
- You will, so take pride in it and love it
- If you don’t care, can’t expect other too

Rule #2
There are no superior breeds of sheep/goats; Only superior managers
See rule #1

Rule #3
If you are passionate about it, you will love learning about it and how to be better
This will make you a superior manager and producer of products
GOAL Setting

Must ask yourself some questions:

• What animals do you want?
  • Will they be profitable in your environment?
• What do you want those animals to be able to produce?
  • Can they produce in your environment at a profitable level?
• Can you market those products where you live? In your region?
  • Do you want to?
• Do you want to be profitable?
  • If not, need a different set of questions here.
• Will you enjoy pursuing the goals you have set for your operation?
  • If not, reassess...
Reproduction

- Seasonality, dependent on hours of daylight
  - Seasonally polyestrus

- Sheep
  - Estrous cycle = 17 days
  - Breeding Season = 2 cycles or 34 days
  - Ram: Ewe ratio = 1:40-50

- Goats
  - Estrous cycle = 21 days
  - Breeding Season = 2 cycles or 42 days
  - Buck: Doe ratio = 1:40-50
Reproduction

- **Sheep/Goat**
  - Gestation period = ~ 5 months
    - Singles, **Twins**, Triplets
      - Lambs 8-16 pounds
      - Kids 7-10 pounds
    - Some sheep are litter bearing
      - Lactation period = 45 to 60 days
Reproduction

• Sheep/Goats
  – Fall Lambing (Sept to Nov)
    – Breeding- Late April to July
    – Most successful using Dorset or Finn
      » Less seasonal breeders
  • Spring Lambing (Jan to early May)
    – Breeding- Sept to Jan
    – Ideal, forage availability
Reproduction

• Fall
  – Usually more difficult because of hot summer weather
  – Hormones or selection
    • Management
  – Feed availability

• Spring
  – Ideal in terms of forage availability
  – Jan/Feb not really the ideal for Kansas, MW, West
  – Less management
Nutrition 101

• Faulty nutrition:
  – Failed reproduction, Ewe Health
  – Lamb death from birth to weaning

• Sheep/Goat production is:
  – Efficiency of converting feed resources (pasture, forage, or grain)
  – Into products of economical value (meat, wool, or milk)

• Feed is the largest cost associated with livestock production

• But, what is nutrition?
  – The sum of the processes by which an animal takes in and assimilates the nutrients in feeds.
Nutrient Requirements

• Change with:
  – Weight
  – Stage of Production
  – Level of Production
  – Age

• Change with:
  – Climate
  – Level of Wool Production
  – Physical Activity
  – Diseases and Parasite Load
  – Body Condition
Nutrients

- Water
- Energy:
  - Carbohydrates
- Protein
- Vitamins
- Minerals
Minerals

• Sixteen essential minerals:

<table>
<thead>
<tr>
<th>Mineral</th>
<th>Requirement</th>
<th>Deficiency</th>
<th>Toxicity</th>
</tr>
</thead>
<tbody>
<tr>
<td>Salt</td>
<td>0.5-1.0% of diet</td>
<td>Feed/water intake, production, chewing wood/dirt</td>
<td>Death possible, but not likely</td>
</tr>
<tr>
<td>Calcium</td>
<td>0.2-0.82% of diet</td>
<td>Rickets, tetany, urinary calculi</td>
<td>Not likely, deficient in o/minerals</td>
</tr>
<tr>
<td>Phosphorus</td>
<td>0.16-0.38% of diet</td>
<td>Rickets, slow growth, decreased appetite</td>
<td>Urinary calculi</td>
</tr>
<tr>
<td>Magnesium</td>
<td>0.12-0.18% of diet</td>
<td>Skeleton, tetany, frothy mouth, falling on side, death- Spring grazing ewes</td>
<td>Not likely</td>
</tr>
<tr>
<td>Potassium (Grass Tetany)</td>
<td>0.50-0.80% of diet</td>
<td>Listlessness, stiffness, convulsions, death</td>
<td>3% of diet (DM) causes depression of Mg absorption</td>
</tr>
<tr>
<td>Sulfur</td>
<td>0.14-0.26% of diet</td>
<td>Loss of appetite, reduce gain, wool growth, shed</td>
<td>0.4% of diet, decree intake- tie up CU, Mb</td>
</tr>
<tr>
<td>Copper</td>
<td>7-11 ppm, most feeds adequate, but can be tied up</td>
<td>Decreased immune status, swayback, stringy wool, infertility</td>
<td>25 ppm, RBCs splice, death! Do not use mineral salts for other species</td>
</tr>
</tbody>
</table>
Major Points

Goals

- **Quantity and quality of what sheep eat**
  - Nutrition or energy intake

- **Controls their fatness (body condition)**
  - Which in turn directly affects a number of production factors
  - Offspring survival
• Begins long before lambing/kidding season

• Early management of the ewe/doe flock
  – Can prevent many headaches throughout gestation, during and following parturition

• Managing ewes/does can have a direct influence on the lambs/kids and their prosperity in life
Body Condition Scoring

- Over- and under-nutrition are not accurately determined by body weights
- Body Condition Scoring (BCS) estimates external fat cover
- BCS:
  - Scale: 1-5
  - 1 = extremely thin
  - 5 = extremely fat
### Target Body Condition Scores

<table>
<thead>
<tr>
<th>Stage of Production</th>
<th>Target BCS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dry Ewe</td>
<td>1.5 to 2.0</td>
</tr>
<tr>
<td>Breeding</td>
<td>2.5 to 3.0</td>
</tr>
<tr>
<td>Early Gestation</td>
<td>2.0 to 2.5</td>
</tr>
<tr>
<td>Late Gestation*</td>
<td>2.5 to 3.0</td>
</tr>
<tr>
<td>Early Lactation*</td>
<td>3.0 to 3.5</td>
</tr>
<tr>
<td>Late Lactation, Weaning</td>
<td>2.0 to 2.5</td>
</tr>
</tbody>
</table>

*Add 0.5 to BCS for ewes expecting or nursing twins.

10-12% change in BW required to change BCS 1.0 units.
Target BCS

![Graph showing Target Body Condition Score across different stages of production with scores ranging from 1.5 to 4.0. The stages include Dry, Breeding, Early Gestation, Mid Gestation, Late Gestation, Early Lactation, and Late Lactation.](image-url)
Doe Diets, Production Stage

- Maintenance Flushing
- 1st 15 wks gestation
- Last 5 wks gestation
- Early Lactation
- Late Lactation

- lbs./hd/day
- Dry Matter
- TDN
- CP
Proper Management Can Prevent

• **Pregnancy Toxemia (Ketosis):** Caused by rapid fat mobilization during late pregnancy
  – Most common in over- or under-conditioned females
  – Commonly affects does with triplets or quads
  – Glucose (oral, sub q, or i.v.) is the usual treatment

• **Milk Fever:** can occur pre-partum or post-partum
  – Symptoms similar to pregnancy toxemia
  – Response to calcium therapy (oral or i.v.) is the definitive indicator
Lamb/Kid Management

• First 48 hrs of a lamb/kids life are critical
  – 70% of mortality occurs between birth and weaning
  – Lamb/Kid survival is related to BW
  – BW related to the nutrition of the female during pregnancy, last trimester

• Optimum BW for max lamb survival is 10-13 lbs (Kid = 6-8 lbs)
  – But, environment and birth type affect this
Three main causes of death:
- Starvation/Hypothermia
- Pneumonia
- Difficult Birth

Pneumonia:
- Some management: barns, draft, ventilation
  - Can lead to chronic pneumonia

Maternal Genetics, Nutrition, some not manageable
• Normal: 102-103 F
• Hypothermic: <100 F
  – Tubing
  – Colostrum
  – Milk Replacer
• Best Option:
  – Milk from ewe/doe, Others in flock, frozen/fresh reserves
Checklist

- Tagging
- Weighing
- Branding
- Docking (Banding, Cut, etc.)
- Castration (Banding, Cut, etc.)
- Some: vaccinate, anti-toxin
Tool Bucket

- OB sleeves
- OB lube
- thermometer
- ear tags and tagger
- vaginal retainer
- lamb warming box
- heat lamps
- scissors
- docking and castration tools
- stomach tube with 60 cc syringe
- bottle with lamb nipples
- frozen colostrum

- lamb milk replacer
- 18 and 20 gauge needles (1 inch)
- 3, 6, and 12 cc syringes
- 7% iodine solution
- injectable selenium/vitamin E
- tetanus antitoxin
- fly spray
- propylene glycol
- antibiotics
- electrolytes
Lambing/Kidding Rate affects nutrient demand

Old and yearling ewes/does need higher energy rations
- Early lactation = Highest requirements
- Need to be losing BCS

Enter each stage of production at adequate BCS
LAMBS/KIDS: POST-WEANING
Growing and Finishing Lambs

• Wean as early as 60 days or as late as 120 days
• Sold for slaughter at 130 – 140 lbs
  – 0.15 to 0.25 in. backfat and YG less than 3.0
• Diets can range from predominately forage to predominately grain
  – Adjust to grain ration over 2 – 3 wks
Ration Balancing Software

• **OSU Ration Software:**
  http://agecon.okstate.edu/meatgoat/

• **Other software:**
  http://agecon.okstate.edu/meatgoat/record.asp

• [Https://msusheepration.montana.edu/](https://msusheepration.montana.edu/)

• Brands (Iowa State)
Vaccines for Sheep and Goats

- Annually across flock:
  - Clostridium type C and D
    - Annual booster
    - Some prefer the 8-way
  - To consider: Parainfluenza (Pi3), campylobacter (Vibrio)
  - You might hear: orf, foot rot, chlamydia, E.coli, rabies, CL

- CD-T pre-breeding to females and Rams/Bucks (30 d prior)
  - Booster females 3-4 wks before parturition
  - Give to lambs/kids: 2 weeks prior to weaning and at time of weaning
    - Give to kids at banding/disbudding
External Parasites

• Lice, ticks, mites, etc.
• Ewes/Does:
  – Pour/inject prior to lambing/kidding
  – Wool sheep: immediately after shearing
• Products:
  – UltraBoss
  – Ivomec Plus
Internal Parasites

• Internal
  – Strongyles
    • *Trichostrongyle* spp.
    • *Nematodirus* spp.
    • *Haemonchus* spp.
  – Whipworms
    • *Trichuris*
    • *Capillaria* spp.
  – Tapeworms
    • *Monezia* spp.
  – Coccidia
    • *Eimeria* spp.
Internal Parasite Control

• Pasture factors
  – Stocking density needs to be < 6-8 head/acre
  – Bermuda, brome, other improved pastures, form a dense canopy
    • 155°F in sun-exposed fecal pellets
  – Sparse brush allows for heat and drying of fecal pellets
  – Changes will be reflected in worm burdens in 3 to 8 weeks
Internal Parasite Control

- Animal factors
  - Young animals
  - Genetics
    - 20% of animals harbor 80% of worms [sheep and goats]
  - New purchases, social, weather stresses
  - Immunosuppression of individuals
  - Periparturient rise
    - Large increase in infections from 2 weeks prior to until 8 weeks after delivery
Internal Parasite Control

• Drugs factors
  – Drugs are related
  – Rotation of dewormers is not currently recommended

• No new drugs are being made
  – There are no “better dewormers”
  – There are no “broad spectrum dewormers”

• No drug has ever been or ever will achieve 100% kill

• Drug resistance is a random event
  – But we do speed it up
Plan of Attack

• Deworm frequently? High doses?
  – **NO!!**
  – Monitor risk

• Ways to monitor
  – Composite sampling of fresh dung (DrenchRite)
    • Test 10% of each animal group or 10 animals, whichever is greater
    • For dewormer decisions and evaluation
    • Serial monitoring of herd
  – Selective sampling of individuals
    • For individual thin animals
Parasites

• Diagnostic strategy
  – **Fecal Egg Count Reduction Test (FECRT)
    • Modified Stoll’s, deworm, repeat Modified Stoll’s in 14 d
  – Used to verify drug efficacy
  – Reduction of EPG by >90%
  – Lower reduction = trouble
    • Resistance
    • Lack of efficacy
      – Dose, route, drug, weight

• Resistance
  – Lack of efficacy
Internal Parasite Control

• Treatment strategies
  – **Goal is not no worms!**
  – **BUT**, manageable numbers in animals and on pasture, who are susceptible to treatment if they become a problem
Guiding Principles

• If you don’t measure it, you can’t manage it
• The best way to know how much something weighs, is to weigh it
• Not all traits should be measured
• Populations respond to selection
• Selection without an objective that includes profit, is a hobby
• EPDs are currency of realm (Spangler)
Tools for Genetic Selection

• National Sheep Improvement Program
  – “A profit driven genetic selection tool”
• Our Mission
  – To provide predictable, economically important genetic evaluation to the American sheep industry by converting performance records into relevant decision making tools.
Adjust For Variation

• NSIP analysis accounts for all the non-genetic factors (Birth Type, Heritability, Feed...)

Phenotype = Genetics + Environment
Does it Work?

**Targhee Reproduction**
- Number of Lambs Born EBV (%)
- Years: 2005-2014

**Targhee Wool**
- Fleece Weight and Fiber Diameter EBVs
- Years: 2005-2014

**Targhee Growth**
- Weaning and Maternal Weaning Weight EBVs (lb)
- Years: 2005-2014

**Western Range Index**
- USA Range EBVs ($)
- Years: 2005-2014
Genetic Progress-Polypay

Averge Polypay Ewe Output
(NLW*65 lb + WW + MWW)

Weaned Lamb Production

Year


0 2 4 6 8 10 12 14 16 18
Genetic Progress-Suffolk
Genetic Progress-Katahdin

**Katahdin Reproduction**

- Lambing & Weaning Rate EBV (%)
- 2005-2016

**Katahdin Growth**

- Weaning and Maternal EBVs (lb)
- 2005-2016
Genetic Progress-Katahdin

**Katahdin Parasite Resistance**

- Weaning Worm Egg Count EBV (%)

**Katahdin Ewe Output**

- Predicted Ewe Output (lb)
- lb lamb / ewe
Efficiency

• Production efficiency has to be the priority
  – High weaning
  – High feed efficiency
  OR
  - Higher lambing/weaning rates
  - Maternal Ability- milk, mothering ability
MARKETING AND FINAL NOTES
Technology that Really Works

• How do we collect all of this data?
  – EID Tags and systems:
    • Shearwell (UK)
    • Prattley (NZ)
    • Sapien Technologies and Gallagher
    • BreedElite (AUS)
  – Systems capable of sorting based on almost any data, qualitative traits
  – Costs:
    • $2500 or more depending on brand, piece of equipment, etc.
    • $1.25/tag
Marketing: How Can You Tell Your Story?

• Farm to Plate
  – https://www.youtube.com/watch?v=8tMrQFKeTe4 → Superior Farms, Emigh
  – https://www.youtube.com/watch?v=U7xMJVQWa3A → SF, Osguthorpes

• Farm to Fabric
  – https://www.youtube.com/watch?v=iYAJj18_Y9E → Icebreaker Wool
  – https://www.youtube.com/watch?v=AW-7R1nLtDA → Duckworth
Other Things to Consider:

• Facilities
  – What do you already have?
  – How could it be adapted?
  – How much space is needed?
  – Chutes, alleys, etc.
  – Jugs

• Things to Change:
  – Fencing, predator challenges, lambing/kidding
Resources

- Genetic information: Nsip.org
- Lifetime Ewe Management: http://www.lifetimewool.com.au
- Purchase feeds on nutrient costs (APP)
  - https://www.igrowlivestocktools.org/#!/calculators/feed-cost
- WYO Ranch Tools: https://uwyoextension.org/ranchtools/
- KSU: https://www.agmanager.info/decision-tools
- Parasites: https://www.wormx.info/
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Facebook
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## Growing/Finishing Lamb Rations

<table>
<thead>
<tr>
<th>Period</th>
<th>Corn</th>
<th>Hay</th>
<th>SBM</th>
<th>Mollasses</th>
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<tbody>
<tr>
<td>Up to 70 lbs.</td>
<td>49</td>
<td>33</td>
<td>10.5</td>
<td>5</td>
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<tr>
<td>70 – 90 lbs</td>
<td>59</td>
<td>23</td>
<td>10.5</td>
<td>5</td>
</tr>
<tr>
<td>90 lbs and up</td>
<td>69</td>
<td>13</td>
<td>10.5</td>
<td>5</td>
</tr>
</tbody>
</table>

1% Dicalcium phosphate  
1% TM salt + Selenium  
0.5% Ammonium chloride
## Early Gestation (wk 1-15)

**Ewe Rations**

<table>
<thead>
<tr>
<th></th>
<th>Hay</th>
<th>Corn Silage</th>
<th>Haylage</th>
<th>Straw</th>
<th>Grain</th>
<th>SBM</th>
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<tbody>
<tr>
<td>1</td>
<td>3.5</td>
<td>2.0</td>
<td>6.0</td>
<td>5.0</td>
<td>0.5</td>
<td>0.25</td>
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</table>
Late Gestation (wk 16-20)
Ewe Rations

<table>
<thead>
<tr>
<th></th>
<th>Hay</th>
<th>Corn Silage</th>
<th>Haylage</th>
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<tr>
<td>1</td>
<td>3.5</td>
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<tr>
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<td>2.0</td>
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<td>1.5-</td>
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<tr>
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<tr>
<td>4</td>
<td>7.0</td>
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<td></td>
<td>0.75</td>
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</table>
## Early Lactation (wk 1-6)
### Ewe Rations

<table>
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<tr>
<th></th>
<th>Hay</th>
<th>Corn</th>
<th>Haylage</th>
<th>Straw</th>
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<th>SBM</th>
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<tbody>
<tr>
<td>1</td>
<td>4.0</td>
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<tr>
<td>2</td>
<td>1.0</td>
<td>7.0</td>
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<td></td>
<td>1.0</td>
<td>0.65</td>
</tr>
<tr>
<td>3</td>
<td>9.0</td>
<td></td>
<td></td>
<td>1.0</td>
<td></td>
<td>0.85</td>
</tr>
<tr>
<td>4</td>
<td>8.0</td>
<td></td>
<td></td>
<td>2.0</td>
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</table>
Late Lactation (wk 7-10)
Ewe Rations

<table>
<thead>
<tr>
<th></th>
<th>Hay</th>
<th>Corn</th>
<th>Haylage</th>
<th>Straw</th>
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</tr>
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<tbody>
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</tr>
<tr>
<td>2</td>
<td>1.0</td>
<td>7.0</td>
<td></td>
<td>0.5</td>
<td>0.65</td>
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<tr>
<td>3</td>
<td>9.0</td>
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<td>0.5</td>
<td>0.85</td>
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<tr>
<td>4</td>
<td></td>
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