Sheep Winter Feeding Management

Lisa Surber, PhD
WestFeeds Livestock Nutritionist

Photo credit: Dwane Morvik
Ewe Nutrition:

• Proper ewe nutrition during pregnancy is essential to optimize productivity

• Feed costs are the largest single cost of maintaining ewes

• What are your biggest concerns about nutritional management of your flock??
Sheep Management Calendar:

Figure 1 Sheep Production Year

Blue areas are critical periods for feed and care.
Maintenance and Flushing

- Proper nutrition during dry and breeding season sets the stage for maintaining BCS during the remaining production cycle
- Allows ewes to go into gestation in average+ BC
- **How many utilize BCS in their flock??**
Sheep Management Calendar:

• Early/Mid Pregnancy (1st 100 days)
• Late Pregnancy (last 50 days)
• Early Lactation
• 70% of the feed required to produce a weaned lamb is consumed by the ewe
• Ewe cost is reduced when spread of more and/or heavier lambs
Sheep Management Calendar: Early Pregnancy

• 1 month after breeding
• Most critical to success of lambing season
• Embryonic implantation (20-24 d)
• 1/3 of embryos are lost during early pregnancy
• Avoid unnecessary activity
• Avoid drastic changes in nutrition

WestFeeds
Sheep Management Calendar: Mid Pregnancy

• What’s occurring?
  • Mammary gland development (30 – 90 d)
  • Placental development (30 -90 d)
  • Wool follicles forming (35 – 100 d)
  • Fetal programming

• Quantity of nutrients is more important than quality of nutrients

• Avoid over or under feeding ewes
  • Weight gain is minimal
  • 0.10 lb per day
Sheep Management Calendar: Mid Pregnancy

• The lamb's future wool production is affected by ewe nutrition during pregnancy
  • Primary follicle (large fibers) development d 60 - 90
  • Secondary follicles (fine fibers) develop d 90 to birth, with some follicle maturation occurring in the first month of the lamb's life.
  • Secondary follicles directly influence on the density and fineness of the fleece
  • A reduction in nutrient supply (either because of poor nutrition or because there are multiples competing for nutrients) impacts fiber diameter but also fleece weight!
Nutrient Requirements of 154 lb ewe

Ewes need only slightly above maintenance levels of nutrition for the first 15 weeks of pregnancy.
Sheep Management Calendar: Late Pregnancy

• Last 4 to 6 weeks MOST IMPORTANT TIME

• What’s occurring?
  • Rapid fetal growth (2/3 of fetal growth)
  • Reduced rumen capacity
  • Mammary development

• Nutrient restrictions will result in:
  • Lighter BW lambs
  • Unequal BW twin and triplet lambs
  • Reduced mothering instinct
  • Lower milk production
  • Increased early lamb loss
  • May increase risk for Pregnancy Toxemia
Nutrient Requirements of 154 lb ewe

Ewes carrying singles require 50% more energy and ewes carrying multiples require 75% more energy than ewes in early gestation.
Sheep Management Calendar: Late Pregnancy

- Ewes on traditional forage diets generally will not be able to consume enough forage to meet their daily energy needs.
- In these cases, supplementation is necessary
  - Energy requirement goes up the most
  - When quantity of forage is limited
    - ½ to 1 lbs of grain for lower lambing rate
    - 1 to 2 lbs of grain for higher lambing rate
  - When quality of the forage is limited a protein supplement is most appropriate
The nutrients that are important during late gestation are energy, protein, calcium, selenium, and vitamin E.

The amount of energy required depends upon the number of fetuses and cold stress.

Winter lambing ewes usually cannot consume enough forage to meet their energy needs.

More energy is required two weeks before lambing versus six weeks before lambing.

Ewes carrying singles do not need to receive grain as early as those carrying multiple births.
Sheep Management Calendar: Late Pregnancy

• Supplement vs no supplement
  • 2 out 3 years supplementation is needed (Van Horn)

• Protein vs. energy supplementation
  • 1 out of 2 years protein is most effective especially when ewes cannot select a diet higher than 5% CP (Thomas)

• Frequency of supplementation
  • Greater opportunity for animals in poor condition to get part of the supplement

• Vitamin E supplementation
  • Improves lamb survivability especially under poor nutrition (Thomas & Kott)
Supplemental products:

• Higher quality forages if available

• Grains/Energy supplements
  (Not enough CP to ↑ utilization)

• Protein supplements
  • Natural
  • Urea-based: an economical replacement for a part of the protein in a ration
  • Biuret-based

\[
\text{Biuret} \quad \begin{array}{c}
\text{O} \\
\text{H}_2\text{N} \\
\text{C} \\
\text{NH}_2
\end{array}
\quad \begin{array}{c}
\text{O} \\
\text{H}_2\text{N} \\
\text{C} \\
\text{NH}_2
\end{array}
\quad \begin{array}{c}
\text{Urea} 
\end{array}
\]
What are the consequences of poor nutrition during pregnancy?

Overfeeding -
• Dystocia
• Wasting money

Underfeeding -
• Pregnancy toxemia (ketosis)
• Hypocalcemia (low blood Ca milk fever)
• Weaker lambs
• Higher neonatal mortality
• Quantity and quality of colostrum
• Less milk production
• Fewer secondary follicles in offspring
Pregnancy Toxemia (Ketosis, Twin Lamb Disease)

• Metabolic disease of pregnant ewes near term
• Occurs in older ewes carrying multiple lambs and in extremely thin or overly fat ewes
• Caused by a diet deficient in energy during late pregnancy when fetal growth is occurring very rapidly.
• Can be prevented by preventing ewes from becoming overly fat in early pregnancy and to provide sufficient energy during the last four to six weeks of gestation.
Sheep Management Calendar: Shearing

• Shearing occurs ½ to 1 ½ months ahead of lambing
• During late gestation when nutrient demands are already high
• Nutrient requirements increase by 25 -30% because of shearing
• Full fleece can mask a thin ewe
Ewe responses to severe cold stress:

- Ewes that lose weight because of prolonged cold stress, lamb in poor condition
  - Increase in the number of lighter, weak lambs
  - Higher lamb mortality
  - Produce a reduced amount of colostrum (of lower quality)
  - Lower milk production
  - Reduced growth rate in surviving lambs
Newborn nutrition:

• Colostral fat in true colostrum is essential for newborn lambs

• Colostrum gives the lamb critical nutrients for it to use in maintaining his body temperature in those first critical hours of life

• Ability to absorb the antibodies contained in colostrum decreases rapidly with age
  • Full dose of colostrum within the first 6-12 hours following birth

• Lambs born to well nourished, healthy mothers have an advantage
  • Brown fat
Newborn lamb and brown fat:

• Newborn lambs lose considerable amounts of heat
  • Large skin surface area relative to body mass
  • Limited insulation

• Lambs are very susceptible to hypothermia, especially when they are born in cold and wet conditions

• Newborn ruminant should have lots of brown fat
  • Specialized tissue capable of generating heat to help the newborn maintain its core body temperature during cold

• Half of this cold-induced heat comes from shivering in muscle tissue with the remainder coming from brown fat thermogenesis (production of heat within an animal), also known as non-shivering thermogenesis
Brown fat or brown adipose tissue:

- Located around the kidneys, brown fat is a light tan to reddish-brown color due to the dense accumulation of blood vessels and mitochondria
  - Structures that produce energy in cells
- Lambs born to ewes that are underfed the last trimester will have less functional brown fat
- Research has suggested that inadequate levels of copper and selenium fed to pregnant ewes may impair brown fat thermogenesis of newborn animals
Sheep Management Calendar: Early Lactation

- Highest nutrient requirements
  - Young > Mature
  - Twins > Singles
  - Triplets > Twins
  - Accelerated > Annual

- Needs a more nutrient dense ration

- General rules of thumb...1 lb of grain for each lamb a ewe is nursing
Sheep Management Calendar: Early Lactation

• Important to come into lambing with a BCS of 3 to 3.5

• Most ewes will lose weight during lactation

• Weight loss during lactation affects protein requirements

• The more weight ewes lose, the higher their protein requirement will be
Sheep Management Calendar: Early Lactation

- Growth rate of lambs from birth to weaning is determined by milk production of the ewe
- Lactation also gives the producer an opportunity to control feed costs by splitting into management groups
- Target: 70% TDN and 14% CP
Nutrient Requirements of 154 lb ewe

CP requirement almost doubles
0.9 lbs of crude protein
(daily requirement for a 150 lb ewe with twins at peak lactation)

How much feed = .9 lbs of CP?
Mineral Supplementation

• Besides energy and protein, there are several macro and micro minerals that are especially important during gestation and lactation
  • Calcium
    • Requirements go up substantially in late gestation as the fetus grows and during lactation
  • Selenium and Vitamin E (0.3 ppm, 7 IU/lb DM)
    • Essential for breeding, gestation, lactation, neonate survival and immunity
    • White Muscle Disease (degeneration of skeletal and cardiac muscles)
  • Zinc (30 ppm)
    • Enhanced hoof health and immune response
• Promote year round use but can be used strategically (60 days prior to stressful events)
How many of you utilize TM salt blocks for your sheep?

• American Stockman TM Salt contains 280 ppm copper.
• Provides almost 8 mg copper per ounce.
• Recommended copper allowance for lambs is 8-10 mg/kg diet dry matter, or total of **18-22 mg** for a sheep eating 4-5 lbs of dry forage.
• If you subtract what might be provided by the forage (e.g. **12-18 mg**), there isn’t a lot of room for supplemental copper, unless the forage is low in copper, or there are antagonists like iron, sulfates, or molybdenum, that reduce available copper.
Veterinary Feed Directive (VFD)

- Ends the use of medically-important antimicrobials to enhance livestock performance
- Transitions many of the feed medications that are currently available “over-the-counter” into the VFD drug category
- Places the use of VFD animal drugs in or on animal feed under the professional supervision of a licensed veterinarian (must have a Veterinarian-Client-Patient Relationship)
- Requires producers to obtain written VFD orders from a licensed veterinarian to purchase and utilize the VFD antimicrobials on or in feed
Sheep Feeding Strategies:

• Just like with the cow herd the goal is to maximize the use of standing forage

• Use supplementation to substitute either a lack of quantity or quality forages

• Split your flock and strategically supplement the ewes that need more and/or better feed
Additional Thoughts:

• Test your forages
  • Many feed companies offer services for customers

• Balance rations to reduce waste
  • On-line ration programs
  • SheepBytes
    • More detailed animal inputs
    • BCS
    • Environment
    • Also allows water in ration
    • Excellent reports

• Take advantage of learning opportunities and seek out mentors
Sheep Feeding Myth:

• My sheep can get by on nothing and snow...

Photo credit Dwane Morvik
Is she coming out of winter with two lambs and a quality fleece?
Lisa Surber, PhD

Work Address: 81 Timberline Drive
Bozeman, MT 59718
lsurber@westfeeds.net

Personal Address: PO Box 5080
Bozeman, MT 59717
lmsurber@gmail.com

Phone number: 406-581-7772

WestFeeds®
“Excellence in Animal Nutrition”