



# Ewe Lactation and Weaning Management

SCOTT P. GREINER, PH.D.  
PROFESSOR, EXTENSION ANIMAL SCIENTIST  
VIRGINIA TECH  
SGREINER@VT.EDU      540.231.9159

# Nutrition Requirements

- **Nutrients of interest**
  - **Water**
  - **Energy (TDN)**
  - **Protein**
  - **Minerals**
  - **Vitamins**



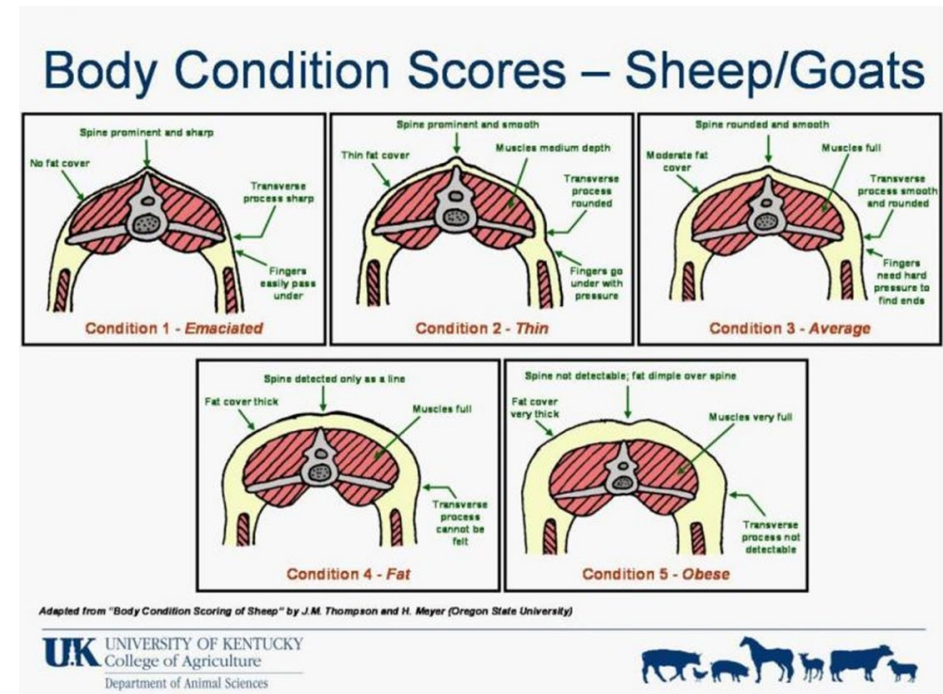
- **Affected by**
  - **Size / body weight**
  - **Stage of production**
  - **Level of production**
  - **Environment**
  - **Health (parasites)**
  
- **Age**
- **Temperature/Weather**
- **Breed**

# Key Production Stages

- Breeding season
  - Body condition related to fertility
  - Goal- increasing plane of nutrition
  - Flushing (increase energy) increases ovulation rate and litter size
- Late Gestation
  - Growing fetus
  - Colostrum quality
- Lactation
  - Milk production = lamb/kid growth rate
  - Nutrition dependent

# Preventing Lamb Losses Starts with Gestation Nutrition

- Optimum nutrition particularly in 3<sup>rd</sup> trimester
- Condition at parturition is important determinant of lamb/kid survival (effect on birth weight)
- Newborns need high quality colostrum
  - First source of energy
  - Utilized to produce heat
  - Ewe/Doe must have adequate BCS and mineral supplementation



# Sheep Body Condition

Group	Stage of Production	Ideal BCS
Breeding Ewes	Pre-Breeding	3
	Mid-pregnancy	2.5-3
	Pre-Lambing	3
	<b>Lambing</b>	<b>3+</b>
	Weaning/Drying off	2+
Rams	Pre-Breeding	3-3.5
	Summer	2+



**BCS 1**



**BCS 3**



**BCS 5**

# Body Condition Scoring

- At lambing 3-3.5 BCS
- Positive plane of nutrition during late gestation (even fat ewes)
- Increase BCS, if necessary, starting early/mid gestation



**BCS 1**



**BCS 3**



**BCS 5**

# Fat and Thin Females

## Reasons and Consequences

- Why are females too thin?
  - Inadequate nutrition, parasitism, inadequate bunk space, inadequate grouping of animals, wasting diseases, chronic diseases, genetics, high milk production (multiple lambs), old (need to be culled)
  - This sets them up for: failure to conceive, less lbs kid weaned, pregnancy toxemia, parasitism and disease
- Why are females too fat?
  - Were not culled, poor milk production (low wean wt), overfed in early-midgestation, dominant ewes
  - This sets them up for: pregnancy toxemia, dystocia, vaginal prolapse



# Nutrition- Late Gestation

- 70% fetal growth last 4-6 weeks
  - Mammary development
  - Colostrum quality
  - Newborn strength/vigor (birth weight)
  - Metabolic disease prevention
- 
- 21 days of severe underfeeding or 80 days of moderate underfeeding
    - Both result in smaller placenta leading to reduced birthweights





# Ewe Nutrient Requirements: Gestation

Stage of Production	DM intake lb/day	Energy TDN (%)	Protein (%)	Ca (%)	P (%)
1st 15 wk. gestation	3.3	55	9.4	.25	.21
Last 4 wk. gestation:					
(130-150% lamb crop)	4.2	57	10.5	.33	.32
(180-225% lamb crop)	4.4	66	11.1	.41	.25

**\*Energy typically limiting nutrient in late gestation**

**\*Increase in Ca requirement**

**\*Feed complete mineral- Se and Vitamin E**

Example diets: 3.5-4 lb. med/good quality hay + 1.5 lb. concentrate  
4-5 lb. med quality hay + 1 lb. concentrate

## Yearling ewes (first time lambing)

- Manage and feed separately from mature flock
- Need to gain 15-25 pounds during gestation
- Feed for growth and pregnancy (energy late pregnancy)
- Ca and P requirements higher than mature ewes/does- feed fortified trace mineral salt free choice
- Feed highest quality feedstuffs to yearlings- avoid poor quality hay

# Consequences of Underfeeding

- Weak, small lambs/kids with high mortality
- Reduced colostrum quality and quantity
- Retarded weight gain both pre & post weaning
- Reduced peak milk yield and less total production
- Decreased re-breeding success

# Lactation

- Dramatic increase in nutritional requirements
  - Energy
  - Protein
  - Minerals (Ca)
- Milk output (and lamb growth) determined by nutrition
  - Balance nutrition and management with marketing goals
- Forage testing and proper supplementation key



Daily nutritional requirements of lactating ewes							
	BW, lb	DMI, lb	% BW	TDN, lb	CP, lb	Ca, lb	P, lb
Early lactation Single lamb	88	2.40	2.73	1.58	0.328	0.0090	0.0075
	110	2.77	2.51	1.83	0.372	0.0101	0.0086
	132	3.89	2.96	2.07	0.440	0.0119	0.0110
	154	4.31	2.80	2.29	0.482	0.0130	0.0121
	176	4.69	2.67	2.49	0.521	0.0139	0.0130
	198	5.06	2.56	2.68	0.559	0.0147	0.0141
	220	5.43	2.47	2.88	0.598	0.0156	0.0150
	264	6.12	2.32	3.23	0.667	0.0172	0.0167
	BW, lb	DMI, lb	% BW	TDN, lb	CP, lb	Ca, lb	P, lb
Early lactation Twin lambs	88	3.08	3.51	2.05	0.469	0.0132	0.0110
	110	3.54	3.22	2.35	0.532	0.0147	0.0125
	132	3.96	3.01	2.64	0.590	0.0161	0.0139
	154	4.36	2.83	2.88	0.642	0.0174	0.0152
	176	4.73	2.69	3.15	0.693	0.0187	0.0163
	198	5.10	2.57	3.39	0.741	0.0198	0.0176
	220	5.46	2.48	3.61	0.790	0.0209	0.0187
	264	7.63	2.89	4.05	0.926	0.0249	0.0235
	BW, lb	DMI, lb	% BW	TDN, lb	CP, lb	Ca, lb	P, lb
Early lactation 3 or more lambs	88	2.99	3.41	2.38	0.557	0.0156	0.0125
	110	4.14	3.76	2.73	0.653	0.0183	0.0154
	132	4.60	3.48	3.04	0.719	0.0200	0.0172
	154	5.04	3.27	3.34	0.783	0.0216	0.0187
	176	6.84	3.89	3.63	0.889	0.0249	0.0227
	198	7.35	3.71	3.89	0.948	0.0264	0.0242
	220	7.83	3.56	4.16	1.008	0.0279	0.0257
	264	8.76	3.32	4.64	1.118	0.0306	0.0286

**Total ration**  
65% TDN  
13.3% CP

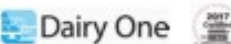
**Total ration** TW vs. S (lb/hd/d)  
71% TDN +26% TDN  
14.8% CP +32% CP

**Total ration** TR vs. TW (lb/hd/d)  
72% TDN +15% TDN  
15.0% CP +28% CP

# Forage Testing

- TDN
  - >60%: Excellent for lactation
  - 55-60%: Good for late gestation, lactation
  - 50-55%: Caution for late gestation and lactation, intake critical
  - <50%: Maintenance only

Forage TDN	DMI, % BW
≤ 50%	1.5
51 – 54%	2.0
55-59%	2.5
≥ 60%	3.0



FORAGE TESTING LABORATORY  
DAIRY ONE, INC.  
730 WARREN ROAD  
ITHACA, NEW YORK 14850  
607-257-1272 (fax 607-257-1350)

Sample Description | Farm Code | Sample |  
GRASS HAY | 103 | 24543780 |  
-----  
ROUNDS MIXED GRASS HAY |

Analysis Results

Sampled | Recvd | Printed | ST | CO |  
| 02/02/18 | 02/02/18 | | | |

Components	As Fed	DM
% Moisture	6.8	
% Dry Matter	93.2	
% Crude Protein	11.7	12.5
% Available Protein	10.5	11.3
% ADICP	1.2	1.3
% Adjusted Crude Protein	11.7	12.5
% Soluble Protein % CP		29
% Degradable Protein % CP		65
% NDICP	4.4	4.7
% ADF	32.8	35.2
% NDF	50.9	54.6
% Lignin	4.4	4.8
% NFC	20.4	21.9
% Starch	1.4	1.5
% WSC (Water Sol. Carbs.)	9.5	10.2
% ESC (Simple Sugars)	7.0	7.5
% Crude Fat	3.9	4.1
% Ash	6.50	6.97
% TDN	60	64
NEE, Mcal/Lb	.58	.62
NEM, Mcal/Lb	.58	.63
NEG, Mcal/Lb	.34	.36
Relative Feed Value		105
% Calcium	.65	.70
% Phosphorus	.36	.39
% Magnesium	.32	.34
% Potassium	1.55	1.66
% Sulfur	.22	.24
% Chloride Ion	.81	.87
% Lysine	.41	.44
% Methionine	.15	.16
Horze EE, Mcal/Lb	.98	1.05

Page 1

Run: 2/2/2018 3:20:22PM Report 1C Page 1

# Lactation Nutrition Management

- Know hay/forage quality, supplement accordingly
  - Energy biggest limiting factor
  - Protein supplementation
- Gradual transition from lambing jug to lactation diet (grain)
- Mineral and vitamin nutrition very important
  - 1% limestone commonly added for Ca
  - Feed fortified with (or fed free choice)-complete mineral designed for sheep with macro and micro minerals and vitamins

Daily nutritional requirements of lactating ewes							
	BV, lb	DMI, lb	% BV	TDN, lb	CP, lb	Ca, lb	P, lb
Early lactation Single lamb	88	2.40	2.73	1.58	0.328	0.0090	0.0075
	110	2.77	2.51	1.83	0.372	0.0101	0.0086
	132	3.89	2.96	2.07	0.440	0.0119	0.0110
	154	4.31	2.80	2.29	0.482	0.0130	0.0121
	176	4.69	2.67	2.49	0.521	0.0139	0.0130
	198	5.06	2.56	2.68	0.559	0.0147	0.0141
	220	5.43	2.47	2.88	0.598	0.0156	0.0150
264	6.12	2.32	3.23	0.667	0.0172	0.0167	
	BV, lb	DMI, lb	% BV	TDN, lb	CP, lb	Ca, lb	P, lb
Early lactation Twin lambs	88	3.08	3.51	2.05	0.469	0.0132	0.0110
	110	3.54	3.22	2.35	0.532	0.0147	0.0125
	132	3.96	3.01	2.64	0.590	0.0161	0.0139
	154	4.36	2.83	2.88	0.642	0.0174	0.0152
	176	4.73	2.69	3.15	0.693	0.0187	0.0163
	198	5.10	2.57	3.39	0.741	0.0198	0.0176
	220	5.46	2.48	3.61	0.790	0.0209	0.0187
264	7.63	2.89	4.05	0.926	0.0249	0.0235	
	BV, lb	DMI, lb	% BV	TDN, lb	CP, lb	Ca, lb	P, lb
Early lactation 3 or more lambs	88	2.99	3.41	2.38	0.557	0.0156	0.0125
	110	4.14	3.76	2.73	0.653	0.0183	0.0154
	132	4.60	3.48	3.04	0.719	0.0200	0.0172
	154	5.04	3.27	3.34	0.783	0.0216	0.0187
	176	6.84	3.89	3.63	0.889	0.0249	0.0227
	198	7.35	3.71	3.89	0.948	0.0264	0.0242
	220	7.83	3.56	4.16	1.008	0.0279	0.0257
264	8.76	3.32	4.64	1.118	0.0306	0.0286	

# Weaning-Time Management Strategies: Goals

- Lambs
  - Fast, low stress transition
  - Diet
  - Health
- Ewes
  - Udder health



# When to Wean?

- Flock goals and marketing program should determine!
- Early weaning
  - Goal: rapid lamb growth
  - Lambs 50-90 days of age (60-75 typical)
  - Requires creep feeding and transition to supplemental feed post-weaning
- Late weaning
  - Typically applicable in systems where lambs grazing with ewes during lactation
  - Lambs 90+ days of age



# Early Weaning

- Advantages
  - Lamb growth efficiency
  - Marketing
  - Forage management (drought)
- Disadvantages
  - Weaning stress on lambs and ewes
  - Dependence on creep/grain
  - Ewe management



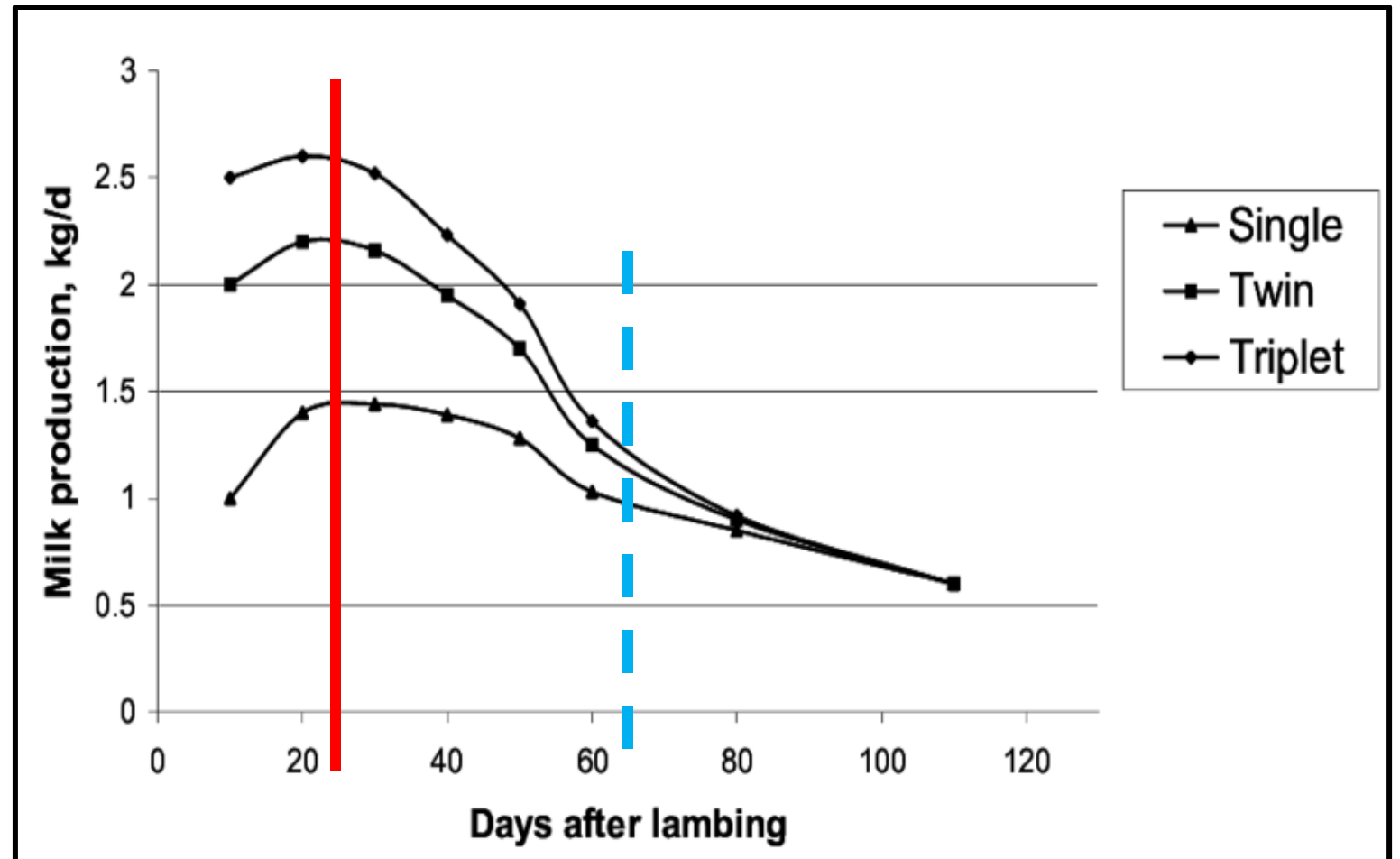
# Late Weaning

- Advantages
  - Less animal stress and management
  - Ewe health
  - Economics- pasture/grazing
- Disadvantages
  - Lamb parasitism (grazing)
  - Forage availability/competition



# Ewe Lactation Curve

- **Peak lactation 3-4 wk**
- **Lactation slows down after 8 wk (60 days)**
- Lamb rumen development ~3 wk age
- Ewe nutritional requirements for energy and protein coincide with lactation curve
  - S vs. TW/TR
  - Nutrient requirements peak ~3-4 wk then decline



# Early Weaning- Key Points

- Early weaning dependent on lamb's ability to acquire adequate nutrition to support growth not supplied by nursing
  - Age
  - Nutrition source (grains/forages)
  - Size/weight (?)
- Ewe health (primarily udder health, prevent mastitis)
  - Length of lactation (beyond 6-7+ wk)
  - Nutritional status

# Early Weaning- Lamb Management

- Creep feeding
  - Supply highly palatable creep starting 2-3 wk age (ewe feed, commercial creep feeds)
  - Use strategies to promote consumption
    - Creep design and location
    - Bedding
    - Lighting
    - Water source
  - Monitor lamb feed consumption to determine appropriate time to wean
- Vaccinations
  - CDT at 6 wk age, booster at 8 wk (~2 wk before weaning then booster at weaning)
- Docking and castration
- Do everything possible to minimize stress!



# Early Weaning- Ewe Management

- Ewe nutrition- goal is to reduce nutritional status of ewes to reduce milk production (coincide with lactation curve)
  - 10-14 days pre-weaning reduce and eliminate grain feeding
  - 7-10 days pre-weaning reduce hay quality
  - Last 7 days pre-weaning provide poor quality forage (palatable)
  - Monitor lamb creep feed consumption in concert with ewe nutritional changes
- At weaning- move ewes to different location (leave lambs in familiar location)
- Keep ewes in dry lot, and provide low quality forage for 7-10 days
  - Monitor udder health
- Water restriction not necessary
- Suckling after weaning stimulates milk production- do not allow lambs to nurse after weaning

# Late Weaning

- At 90+ days of age, ewe milk production low and lamb dependence on milk for nutritional decreases substantially
- Natural weaning will occur at 4+ months of age (dependent on several factors)
- Ewes may be removed from lambs at 90-120+ days
  - Move ewes to minimize lamb stress
- Management considerations:
  - Lamb parasite management
  - Transition of lambs from forage to grain diet, as applicable (CDT vaccination program)

# Summary

- Base weaning on marketing program and goals for flock
- Allow lamb feed consumption to dictate early weaning timing
- Manage ewe nutrition prior to and after weaning to maintain udder health
- Closely monitor lambs and ewes post-weaning

**Happy lambing season!**



# Nutritional/Metabolic Diseases

- Pregnancy toxemia
- Milk fever
- Enterotoxemia
- Acidosis
- Urinary calculi
- Polioencephalomalacia
- Listeriosis
- Bloat
- Copper-related
- Selenium-related



## Pregnancy toxemia/ketosis

- Inadequate energy intake during late gestation.
- Treat with propylene glycol or IV glucose (or c-section).

## Milk fever

- Low blood calcium caused by not enough or too much calcium in diet.
  - Treat with IV or sub-Q calcium solution.
- 
- Fat or thin females more prone to metabolic disease
  - Manage ewes so they are in positive and increasing plane of nutrition through late gestation

