

COWBOY NUTRITION AND IMMUNOLOGY

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TOPICS

- Immunology with a 4" brush
- Nutrition by the pound
- Parasitology for cowboys and ladies



IMMUNOLOGY WITH A 4" BRUSH

- Protects body from outside invaders
- Stimulated by “Antigens” , usually outside protein
- Body stimulated to make Immunoglobulins to each Antigen
- Repeated exposure increases immunity (or NOT)
- Dependent on PROTEIN, minerals, and energy



IMMUNOLOGY IS ORIGINAL SUICIDE BOMBER

- Immunoglobulins attach to and destroy invaders
- Helper cells stimulate White blood cells to attack invaders
- Continued response depends on supply line – protein, minerals, energy!
- Attack bacteria, viruses, fungi, parasites
- Can be overwhelmed by massive exposure or supply depletion



TYPES OF IMMUNITY

- Passive- acquired from mother
 - By **colostrum** or in utero transfer
 - Very important to early survival and growth
 - Effective immediately, wains with time
 - Can be stimulated and increased by exposure
 - NUTRITION DEPENDENT
- Acquired- developed by exposure and response
 - Need 2-3 weeks to be fully developed initially
 - Repeated exposure boosts immunity levels in 2-3 days
 - Can be stimulated and increased by exposure
 - NUTRITION DEPENDENT



WALKAROUND KNOWLEDGE-IMMUNITY

- Immunity is heavily nutrition dependent
- Genetics – if she's a thrifty, easy keeper, her daughter will be too.
- Immunity requires time and multiple exposure to develop



COMPETITION FOR NUTRIENT RESOURCES

- Maintenance (Cold vs Hot)
- Growth
- Wool or hair growth
- Reproduction
- Finishing
- Immune system
- Minimum levels of ALL nutrients are necessary for system to work properly



NUTRITION BY THE POUND

- Animals consume 2-3% of their body weight daily
- Cow- 20-40 lbs/hd/day
- Ewe- 2-6 lbs/hd/day
- Moisture content effects nutrient density and intake



NUTRIENT REQUIREMENTS VARY

- BODY SIZE
- Gestation
- Reproduction
- Growth
- Wool/hair growth
- Ambient temperature
- Precipitation
- Much higher in late gestation
- Higher in breeding season
- Higher in lactation
- Constantly high for wool/hair growth
- Higher in parasitized animals due to blood loss



LIMITING NUTRIENTS (IF BELLY IS FULL)

- Water!
- Minerals (primarily Phosphorus)
- Protein
- Energy
- Quality matters!
- Natural vs NPN protein
- SBM vs CSM vs feather meal
- Absorbtion varies



Table 1. Nutrient Requirements Of Sheep: Daily Nutrient Requirements Per Animal. (cont.)

Body Wt. (lb.)	Avg. Daily Gain (lb.)	Dry Matter (lb./head ^a)	% Body Weight	Total Protein (lb.)	TDN ^b (lb.)	Ca (lb.)	P (lb.)	Vitamin A (IU)	Vitamin E (IU)
Ewes (cont.)									
Flushing: 2 Weeks Prebreeding And First 3 Weeks Of Breeding									
132	0.22	3.7	2.8	0.34	2.2	0.012	0.006	2820	26
198	0.22	4.4	2.2	0.39	2.6	0.013	0.008	4230	30
Nonlactating, First 15 Weeks Of Gestation									
132	0.07	2.9	2.2	0.27	1.6	0.007	0.005	2820	20
198	0.07	3.5	1.8	0.33	1.9	0.009	0.008	4230	24
Last 4 Weeks Of Gestation (130-150% Lambing Rate Expected)									
132	0.40	3.7	2.8	0.40	2.2	0.013	0.011	5100	26
198	0.40	4.4	2.2	0.47	2.5	0.014	0.014	7650	30
Last 4 Weeks Of Gestation (180-225% Lambing Rate Expected)									
132	0.50	4.0	3.0	0.45	2.6	0.015	0.008	5100	27
198	0.50	4.6	2.3	0.51	3.0	0.020	0.014	7650	32
First 6-8 Weeks Of Lactation, Suckling Singles									
132	-0.06	5.1	3.9	0.70	3.3	0.020	0.014	5100	34
198	-0.06	5.9	3.0	0.78	3.8	0.021	0.017	7650	40
First 6-8 Weeks Of Lactation, Suckling Twins									
132	-0.13	5.7	4.3	0.89	3.7	0.023	0.017	6000	39
198	-0.13	7.0	3.6	0.99	4.6	0.025	0.020	9000	48
Last 4-6 Weeks Of Lactation, Suckling Singles									
132	0.10	3.7	2.8	0.40	2.2	0.013	0.011	5100	26
198	0.10	4.4	2.2	0.47	2.5	0.014	0.014	7650	30
Last 4-6 Weeks Of Lactation, Suckling Twins									
132	0.20	5.1	3.8	0.70	3.3	0.020	0.014	5100	34
198	0.20	5.9	3.0	0.78	3.8	0.021	0.017	7650	40



MARCH, HEAVY BRED 132#EWE,130% LAMBS, GOOD NATIVE PASTURE

- dry grass only
- $3.7\# \text{ intake (dry)} \times .06 \text{ (6\% protein)} = .22\# \text{ intake} - .40\# \text{ req'd} = 0.18\# \text{ deficit}$
- Feed $1\# \text{ 20\% protein feed per head per day} = .20\# \text{ protein}$
- Grass is 25% moisture adds $.93\#$ to intake. $3.7\# + .93\# = 4.63\# \text{ total intake}$
- wet spring, with filaree
- $3.7\# \text{ intake (dry)} \times .12 \text{ (12\% protein)} = .44\# \text{ intake} - .40 \text{ req'd} = \text{GOOD Immunity!}$
- No feed Req'd
- Grass/filaree is 45% moisture, adds $1.67\#$ to intake. $3.7 + 1.67 = 5.37\# \text{ total}$
- Consumption amount is critical on twin ewes- less abdominal space!!







MARCH, HEAVY BRED EWE, 130% LAMBS, LITTLE OLD GRASS, LUSH GREEN SAPPY WEEDS, OR SMALL GRAIN

- 80% moisture in forage, high protein
- Must consume large amount to get 20% of Dry matter
- $3.7\# \times 5 \text{ (20\% Dry Matter)} = 14.80 \#$ (not happening in late pregnancy!!)
- Add roughage (hay, cedar chips) to ration to raise DM intake.



WALKAROUND KNOWLEDGE (PROTEIN)

- Cows need 1 lb/hd/day of protein supplement, in winter, adjusted to forage quality.
- Sheep need .2-.5 lb/hd/day of protein supp. in winter, adjusted to forage quality.
- Adjust for stage of production
- Add significantly if parasitized (or deworm!)



MINERAL GENERALITIES

- Calcium is usually sufficient in grazing animals
- Phosphorus is generally deficient
- Copper, magnesium, manganese, selenium, zinc are usually deficient in trace amounts. THESE PLAY A HUGE ROLE IN IMMUNITY
- Few mineral excesses occur in Texas
- Copper is easily toxic in sheep- be careful of your mineral package for them!
- Blocks are convenient to use, but rarely get sufficient consumption amounts.
- Absorption is competitive between minerals





MINERALS IN NURSING ANIMALS

- Neonates are born with liver stores to carry them thru 3-4 months of life
- Minerals are stored to the liver in utero, few are absorbed in milk.
- Mineral intake is limited until they start to consume vegetation and mineral supplements
- Good colostral antibody transfer and good mineral storage in the liver provide for good immunity and fewer health problems in early life.



TESTING FOR MINERAL DEFICIENCIES

- Some minerals can be tested with blood samples – Calcium, Phosphorus, magnesium
- Most minerals can be efficiently tested with liver samples
- Post mortem liver samples should be frozen quickly and submitted frozen
- Liver biopsies in a herd setting can identify deficiencies/excess, and refine mineral supplement programs



MINERAL SUPPLEMENTS

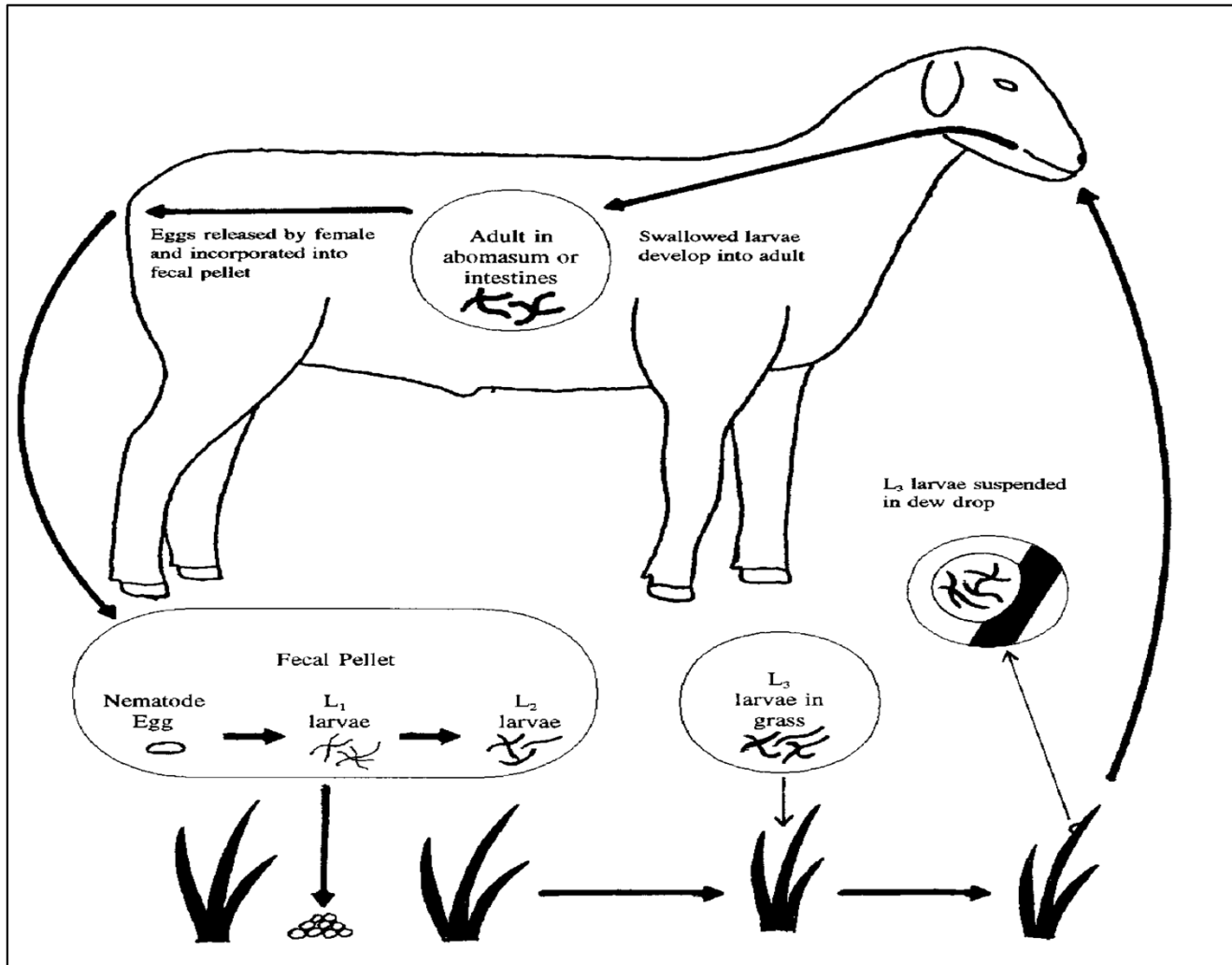
- Need a Ca:P ratio of 2:1 to 4:1
- Need a good trace mineral package
- Loose mineral with 20-30% salt to drive consumption.
- Monitor consumption and read the label. (ie 2-3 oz/hd/day)
- Expect variable consumption rates- heavy when growing rapidly, usually less as it dries out.
- Chemical form of mineral matters for absorption- oxides least absorbed, chelates highest.
- Good costs more!! But probably is better.

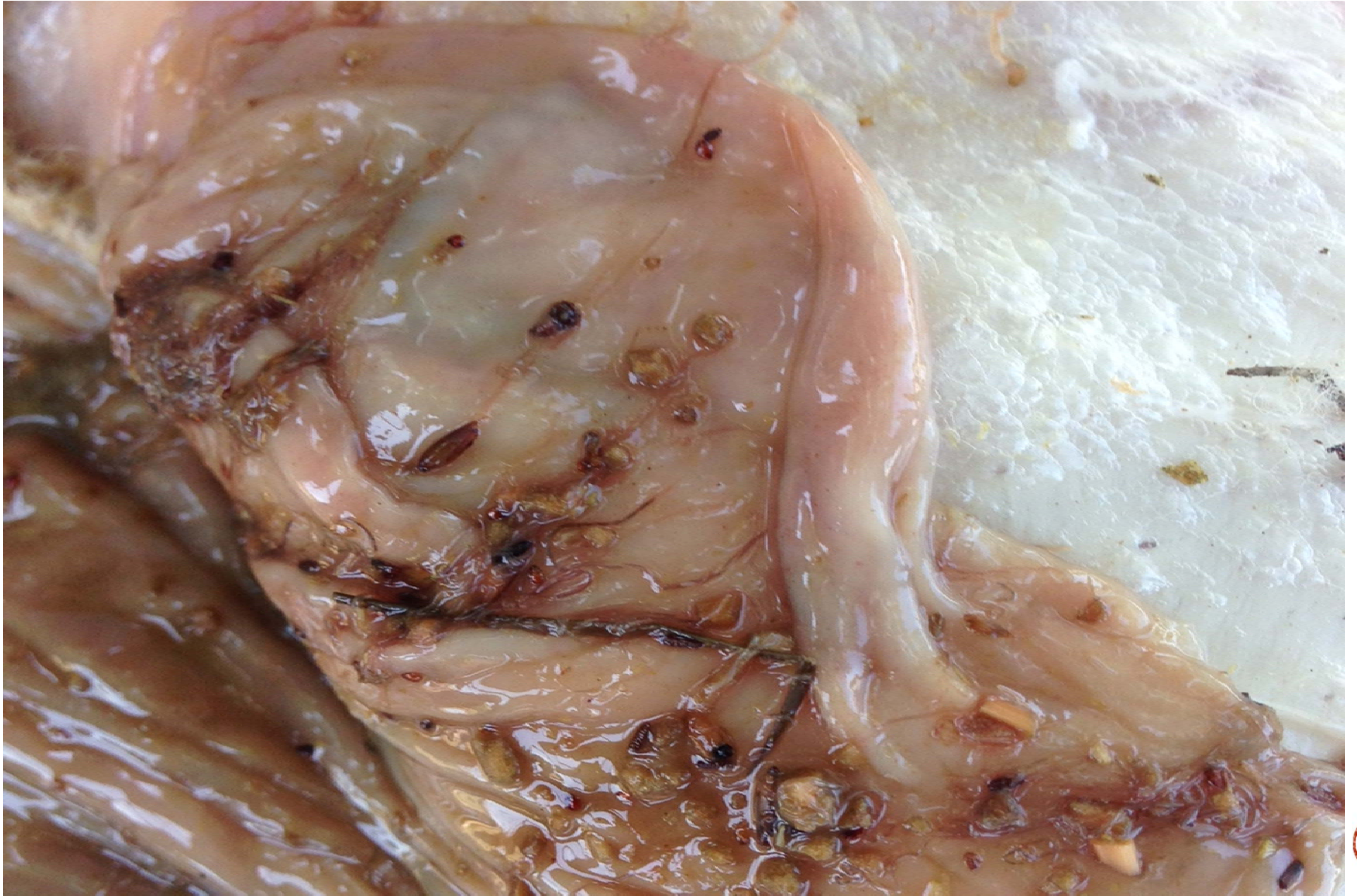


PARASITOLOGY

- Nutrition and immunity play a huge role- can reduce parasite numbers and egg production
- Pasture management plays a huge role- the higher they graze, the less worm larvae they ingest. Long rest decreases parasite numbers.
- Selection and management to enhance resistance are key to control.
- Livestock species rotation provides a natural control measure: cows vs sheep & goats, cows vs horses, horse vs sheep & goats, cows vs deer.
- Forage or supplement with tannins, turpeens, may provide natural control
- Few new drugs are coming down the pike...







PARASITOLOGY POINTS

- Need an inch of rain to melt fecal pills to release larvae onto grass
- Need dew drops on grass for larvae to swim up in order to be grazed/ingested
- Larval numbers increase logarithmically as graze nearer the ground
- Larvae die in 6 months or less, especially in hot and dry times
- Transmitted at over 45 degrees F
- Excellent survival with deep plant litter, moist cool conditions
- Host resistance reduces parasite survival and egg production



DEWORMING POINTS

- Deworm when poor pasture survival conditions for worms exist, and you select for anthelmintic resistance!! (Hot, dry, cold)
- Deworm when parasite transmission and survival is high, and you effect the parasite gene pool much less (REFUGIA)
- Use monitoring with fecal egg counts to avoid unneeded deworming, and to assess the efficacy of deworming
- Use Famancha or production testing to select, cull, and sell low resistance animals!!!
- If they keep getting wormy, **Look at your nutrition and management!!**



