

NUTRITION

NUTRITION

- ✘ Ruminant

- + Rumen

- + Reticulum

- + Omasum

- + Abomasum

- ✘ Ruminant not developed for 1.5 - 2 mos.

NUTRITION

- ✘ Principle function is to digest and absorb nutrients from the diet
- ✘ Rumen and Reticulum are capable of microbial fermentation
- ✘ Can use dietary protein as well as NPN
 - + Uses nitrogen and ammonia as the source for amino acids

NUTRITION

- × Climate
- × Age
- × Exercise
- × Body condition
- × Reproduction
- × Flushing
- × Replacement ewes
- × Gestation
- × Lactation
- × lamb BW

CLASSES OF NUTRIENTS

- × Water
- × Protein
- × Energy - Carbohydrates (CHO)
- × Fat
- × Minerals
- × Vitamins

WATER

- ✘ Single most important nutrient
- ✘ No water, no feed intake
- ✘ Factors affecting water intake
- ✘ Feed intake, nitrogen intake, mineral intake and environmental temperature
- ✘ Rise in water requirements above 70 F
- ✘ Urinary Calculi
- ✘ Water - 1 gal./day for mature sheep
 - + 1/2 gal./day for lambs

PROTEIN

- ✘ Protein through good pasture and legumes
- ✘ Regardless of type, amount is most important
 - + lbs vs %
- ✘ Supplements: SBM, CSM, Linseed meal, peanut meal, sunflower meal (35-45 % CP)
- ✘ Legumes are an excellent source of protein for sheep

ENERGY

- ✘ Energy through grain and roughages
- ✘ Net energy or TDN
- ✘ Grain and Protein suppl. = 70-80 % TDN
- ✘ Hay = 40-55 % TDN
- ✘ Feed for energy first
- ✘ Energy is especially important in late pregnancy

MINERALS

Ca and P

- ✘ Balance is more important than amount
 - + Ratio should be at least 2:1, 2 parts Ca : 1 part P
- ✘ Most forages are adequate for Ca and P
- ✘ Legumes are excellent sources for Ca
- ✘ Mature forages are low in P
- ✘ Therefore, consideration of P is needed , esp. for gestating and lactating ewes
- ✘ .29% P is needed for lactating ewes
- ✘ Sources: bonemeal, defluourinated rock phosphate, dical, Na tripoly P₀₄

MINERALS

Salt, NaCl - Sheep can tolerate 1.0 to 1.3 % salt, but cannot tolerate over 1.5 % for very long

+ Intake of grain may be limited by adding 10-25% salt

Copper (Cu) essential for life, required for normal iron metabolism, synthesis of elastin and collagen, melanin production and integrity of the central nervous system, wool production, effective immune response.

+ sheep require about 5 ppm; 25 ppm toxic

MINERALS

Magnesium— necessary for the metabolism of Calcium and Phosphorous, bone formation

Manganese (Mn) required for skeletal development and reproductive efficiency

Molybdenum (Mo)

- ✘ Forms an insoluble complex with Cu to prevent copper absorption
 - + If molybdenum levels are low (less than 1 ppm), sheep are more susceptible to Cu toxicity. If Mo intakes exceed 10 ppm, Cu deficiency may occur on diets that would normally be adequate.

MINERALS

Cobalt (Co)

- ✘ essential to the synthesis of vitamin B-12, In sheep and goats, 0.1 ppm is considered adequate.
- ✘ Increases bacterial fiber digestion
- ✘ Cobalt should be ingested daily. added to the salt at a level of 5.45 g/100 lb of salt, fed free-choice.
- ✘ Deficiency signs include loss of appetite, emaciation, weakness, anemia, and decreased production.

MINERALS

Iodine (I)

- ✘ Necessary for the formation of thyroxine, a hormone of the thyroid gland
- ✘ Deficiency
 - + enlargement of the thyroid gland (goiter)
 - + kids may be born weak or dead.
- ✘ Deficiencies are readily corrected by feeding iodized salt

MINERALS

Iron (Fe)

- ✘ Component of blood hemoglobin that is required for oxygen transport.
- ✘ Required for some enzyme systems
- ✘ Deficiencies seldom occur in mature grazing animals, but may in young goat kids because of their minimal body stores of iron at birth
- ✘ If an iron deficiency is observed in young kids on a milk diet, injection of iron-dextran (150 mg) at 2 to 3 weeks intervals. Ferrous sulfate and ferric citrate are recommended for incorporations in rations at a level of 45 ppm

MINERALS

Potassium

Required for maintenance of cell fluid volume, pH and osmotic relationships within the cell, vital to muscle contraction

Selenium (Se)

- ✘ Essential, but only in minute amounts
- ✘ Necessary for Vitamin E utilization
- ✘ Sheep and goats, are susceptible to selenium toxicity. Selenium toxicity occurs from prolonged consumption of plants containing over 3 ppm selenium

MINERALS

- ✘ Zinc (Zn)
- ✘ Essential for protein synthesis for skeletal growth and development, immunity, antibody titers, inflammatory response and protein synthesis to support hoof wall growth and repair
- ✘ Must be supplied continuously because little is stored in the body in readily available form
- ✘ Minimum ration requirements of 10 ppm. Levels of 1,000 ppm may be toxic.
- ✘ Deficiency symptoms include reduced feed intake, weight loss, stiffness of joints, excessive salivation, swelling of the feet and horny overgrowth, small testicles, and low libido

VITAMINS

- ✘ Vitamins are need in small amounts. Small ruminants require vitamins A, D and E, whereas vitamin K and all the B vitamins are manufactured in the rumen.
- ✘ **Vitamin A** - eyesight, fertility, fight infections, keeps skin surface and internal organs healthy
- ✘ **Vitamin D** – Sunshine Vitamin, bone growth and health, Absorption of Ca
- ✘ **Vitamin E** (fat soluble) –antioxidant, metabolic regulator, utilization dependent upon adequate Se
- ✘ **Vitamin K** - blood to clot
- ✘ **Thiamine— (B1)** coenzyme in energy metabolism, appetite, growth, important in the prevention of polioencephalomalacia
- ✘ **B12** - Essential in protein metabolism

OTHER FEED ADDITIVES

- ✘ **Yeast** –Enhances digestive efficiency, feed intake, mineral availability and overall rumen health
- ✘ **Kelp** - source of long chain n-3 Fatty Acids, Tannins (natural anthelmintic)
- ✘ **Ammonium Chloride**—Urinary Acidifier

OTHER FEED ADDITIVES

- ✘ **Direct-Fed Microbials (DFM) – Probiotics** - imperative for efficient utilization of nutrients and the production of vitamins and organic acids
- ✘ **Sodium Bicarbonate (Rumen Buffer)** help resist changes in the acidity of the digestive tract
- ✘ Coccidiostats and antibiotics

NUTRIENT DEFICIENCIES

- ✘ Slow growth
- ✘ Loss of weight
- ✘ Reproductive failure
- ✘ Decreased milk production
- ✘ Increased mortality
- ✘ Reduced resistance to parasites and diseases

NUTRITION

✘ Problems

- + urinary calculi - mineral deposits
- + poisonous plants
- + preg. disease - undernourishment in late preg.
- + expelled vagina or rectal prolapse

RANGE NUTRITION

- ✘ Grasses- mature vs young plants
 - + Mature is lower in protein and TDN
 - + Mature - Lignin and cellulose increases
- ✘ Browse- a broad leaf woody plant, a shrub, a bush or a tree of small stature. Protein only decreases slightly with maturity
- ✘ Forbs- broad leaf herbaceous plants (weeds). They are between grasses and browse in most respects

FEEDING MILK REPLACER

- ✘ Lambs that are orphans due to death of the ewe or udder dysfunction, etc.
- ✘ Case of triplets
- ✘ Symptoms of progressive weakness during the first week
- ✘ Bummer or orphan lambs that are stealing milk from other ewes than their mother
- ✘ Make sure they had colostrum – 6-8 OZ. min.

FEEDING MILK REPLACER

- ✘ The decision to switch the lambs from the ewe to the milk replacer should be the sooner the better
- ✘ Place in a warm dry enclosed area
- ✘ Lambs should not be able to see or hear their mother
- ✘ Do not place with other lambs if possible
- ✘ Inject Iron, Vit. A,D,E and Se
- ✘ Make sure the milk replacer contains antibiotic

MILK REPLACERS

- ✘ 25-30 % fat, 20-25 % protein, and 30-35 % lactose
- ✘ Should be diluted with water to a minimum of 17-20 % Dry Matter (usually 1.75 - 2.0 lb milk replacer per gallon of water)
- ✘ Mix powder in warm water and cool to 33 F
- ✘ Warm milk may be needed to start at first, but move to feeding cold milk
- ✘ In a self feeding system, each will consume ~ 2-4 pt

MILK REPLACERS

- ✘ Utensils must be kept clean
- ✘ Provide plenty of fresh water
- ✘ Creep feeding dry or solid food can start at about 3 weeks of age, but 4 weeks is better
- ✘ Double check the cost vs weight offset

CREEP FEEDING

- ✘ Used when weaning at less than 60 days
- ✘ When twins are born late in the lambing season
- ✘ May be beneficial in times of drought or marketed as slaughter rather than feeders
- ✘ Start should be started about 10 after birth
- ✘ If not 0.5 lb intake per day from day 20 to weaning, it will probably be beneficial
- ✘ Rations do not have to be complex

EFFECT OF NUTRITION ON WOOL

- ✘ Wool growth is affected by age, temperature change, lactation, parturition, hormone implantation
- ✘ Most limiting nutritional factor in range sheep production is insufficient amount of energy
- ✘ Rations below 80% of NRC protein levels will affect wool production