

# Diet and Momma

## Feeding the Ewe

BCS of 2.5-3 (1-5) and gaining wt

Flushing – good response moderate condition

- poor response good to fat does
- begin 2 wks prebreeding=>for 2-3 wks

## Feeding Ruminant Animals

- Feed related costs account for >60% of total expenditures for herds/flocks herds
- Four-Step Supplementation
  - 1) Energy
  - 2) Protein – maintain 7-8% CP for entire diet when not lactating
  - 3) Vitamin – supplement / inject
  - 4) Minerals – free choice salt w/ 8-12% Ca & P, and TM (S Wikse)

## Feeding the Doe: Late Gestation

Trimester 1 & 2 => maintenance

Trimester 3 => increase CP & E

BCS >3 => potential for dystocia and pregnancy toxicity

## Protein / Energy / Vitamins

- Adequate energy (BCS)
- Adequate protein (7 –10% to 12 – 16% CP)
- Mineral mix
- Supplemental Vitamins....when needed
- Browsing ....tannins

## Pregnancy Toxemia

Twins & Triplets...but occasional singleton

4 wks pre partum → 4 wks post partum

Some other associated problem

## Pregnancy Toxemia

Signs – Anorexia, lethargy, blindness, tremors, bruxism, star gaze, convulsing, etc) ataxia, recumbency, coma+ fetal death (metritis), late 3rd trimester, sluggish, isolate from flock, wt loss → → DEATH

Glycosometers

Glucose blood glucose ,40 mmol/L

**BHB** 0.8 mmol/L = normal  
> 0.8 mmol/L = subclinical (?)  
> 3 mmol/L = clinical

Ketonuria – test strips

## Hypocalcemia

- Dx – history / signs / low serum Ca
- Tx – Ca gluconate / borogluconate / dextran / dextrose IV (slow to effect)  
- Ca / P / Mg – IV (slow), and or PO

## Pregnancy Toxemia

- Control – avoid extremes in BCS
  - Sort by # feti and feed accordingly
  - Dietary modification (Niacin, Lasalocid, Monensin), better quality intake in late gestation
  - Cull poor producers, control disease (OPP, CAE, Footrot, Parasites, etc)
  - Shear..... yep

## Hypocalcemia

Dx – weak; down; temp +/-; irregular rhythm heart sounds; muscle twitching; neuro; decreased rumen contractions; poor poor anal tone / corneal reflex

Decreased blood Ca (<9mg/dL total or ??? <1.0mmol/L ionized ???)

Prevent – Good diet, good quality mineral mix, NO STRESS

## Pregnancy Toxemia

Increase nutrient density

Offer mineral mix with Ca:P ratio of 2:1

## Hypocalcemia

Pre partum (except renal disease or dairy animals); uncommon; diets deficient in Ca, P, ~ Mg, ~ Vit D, general poor quality, +; twins/triplets (+); stress (transport, predators, weather, decrease available fee, +)

Usually not 'clean', but mixed wih PT, Hypo Mg, Polio, ++

## Pregnancy Toxemia ++

Tx- IV Dextrose, B complex, oral propylene glycol, oral CMPK, flunixin (may increase survival of Dam)

Tums Ultra – Ca carbonate

Increase nutrient density (grain, pellets, alfalfa, etc)

Feed separately

## Blood Glucose

- NWC maintain higher blood glucose conc than ruminants & extreme hyperglycemia in response to stress
- Propionate (?-diet), AA (higher SUN)
- Moderate insulin resistance & slowed insulin response (Cebra AJVR 2001 X2)

## Feeding the Doe: Lactation

More nutrients needed for more milk produced  
(30% more milk for twins vs singleton)

Doe weighs ~10% of cow... but needs >12-14% more nutrients

Lactating doe can consume ~4-5 % of BW... or more

Peak lactation => expect wt loss

## Pregnancy Toxemia

- Control – avoid extremes in BCS
  - Sort by # feti and feed accordingly
  - Dietary modification (Niacin, Lasalocid, Monensin), better quality intake in late gestation
  - Avoid stress, monitor herd serum BHB (0.8 - good, >1.6 – bad)
  - Cull poor producers, control disease (OPP, CAE, Footrot, Parasites, etc)

## Feeding the Doe: Lactation

Can feed a diet up ~4-5% fat (2-3% oil seed – 1-2 % speciality fats)

WCS – 90% TDN & 21-23% CP..... <20% of diet

Feed a diet of 12-14% CP and 55-60% TDN

## Hypocalcemia

- Diet modification – reduce Cations prepartum, add Ca / P / Mg to diet when needed...., avoid under or over conditioned animals, avoid / minimize stress

## Mineral Needs

- Phosphorus and Trace Minerals
  - 6 to 12 % P
  - All trace minerals
- Consumption is very important
  - 1 to 2 ounces/day of total mineral supplement

# Diet and Baby

## Clostridium perfringens type D

- Sheep, Goats, Camelids, Cervids
- Peracute death – well fed, fast growing, best looking babies
- Diarrhea, ataxia, convulsions

## Orphan Kids

Ensure colostrum by 12 hrs/ day (cross specie colostrum OK – CAE / Johnes free)

If feed colostrum.. wait 5 – 6 hrs before beginning bottle

If insufficient milk for twins, remove smallest kid for bottle raising

Feed 10-20% bw divided into 3-4 feeding daily

## Clostridium perfringens type D

- Organism elaborates an exotoxin, excess dietary CHO in SI => GI stasis => Type D goes proliferates (CRAZY) => excess toxin created / altered / absorbed / vascular damage => capillary integrity compromised => edema => DEATH
- Signs – swollen lungs, intestinal edema, pulpy kidney, diarrhea, ataxia, convulsing, blindness, glucosuria

## Orphan Kids

Feed a good quality milk replacer (goat-cow-sheep)

- CP- 25% DM
- CHO- 31% DM
- Fat- 34% DM
- TS- 13% as fed

Heat to 103 F & Insure proper mixing

Wean when consuming forage & 0.75 – 1# grower / day...and gaining wt...

## Clostridium perfringens type D

- Dx – ELISA for toxin, culture organism,

## Enterotoxemia in Small Ruminants

- Caused by a growth of the *C perfringens* type D ....elaborating the epsilon toxin
- Typically kids-lambs-crias on grain rich diets
- Hemorrhagic enterocolitis

## Creep Feeding Lambs

- Lambs use supplemental nutrients more efficiently pre weaning vs post weaning
- Begin creep feeding 7-10 d of age
- Maintain creep feeders near water & resting areas, and keep them well light

## Prevention of Enterotoxemia

- On endemic farms.....consider administration of the antitoxin
- Avoid excessive grain intake
- Oral antibiotics may be of benefit
- Slow introduction to creep feeding

- If offering creep feeds to young growing animals...insure the fermentable CHO content is < 20% (< 15% corn, oats, wheat midds, etc), and has a ground forage base (alfalfa, etc)

## Prevention Enterotoxemia

- Vaccination- 'babies' from Dams vaccinate during late gestation, vaccinate at 1-2 months of life , then boosted 3- 4 wks later
- 'Babies' from non vaccinated Dams should be vaccinated at 1-3 wks and boosted 3-4 wks later

## Weaning Kids

Wean as early as 3-4 wks

- weigh 20-25 #, eating 0.5# grain/d (16-18% CP)
- feed Bunks 'T' to fence line
- good quality forage
- feed dam hay only

Need a post weaning death loss of < 4%

# Sick Baby Care

## Kid/Lamb/Cria (Baby – Angel from Heaven)

- Rule 1-2-3
    - 1 – should be standing by 1 hr
    - 2 – should be nursing by 2 hrs
    - 3 – Placenta should be passed by 3 hr
- If any of the above don't fit.... Maybe..... possibly.... Sometimes a Problem (?)

## 'Angel From Heaven' Care

- A – Airway.... Is it open
- B - Breathing..... Is he/she moving air  
..... Is she/he mucosa pink
- C – Cardiac.... Is he/she heart beating

## 'Angel From Heaven' Care

- IF NEEDED
  - Tie off umbilicus 2 in from body ( usually breaks on it's own)
  - Dip cord – Nolvasan / Glycerin,  
2% Iodine,  
1% betadine

## 'Angel From Heaven' Care

- IF NEEDED
- Stimulate breathing by rubbing w/  
towel,  
'nasal tickling', & flex limbs  
Breath- mouth to nose

## Neonate – Problems

Breathing – open mouth in stressed ...but  
maybe within realm of normal

Suckle Reflex – Should be Strong

Mentally alert, strong head & Neck up

Temperature – 99-102 F, thermoregulatory  
ability is compromised

## Neonate – Congenital Defects

VSD

Wry face, Choanal Atresia

Polydactyly, fused digits

Cataracts

Supernumary teats, cryptorchid

## Kid/Lamb Care

Baby will consume 10-20% of it's BW daily

Colostrum – Needs >10% bw first 12-18 hrs

- Momma's
- Johne's Free Goat
- Johne's Free Cow (dairy vs beef)
- consider sp when evaluating immune status

## Neonatal Examination

Heart – Patent Ductus Arteriosis –  
murmur left thorax (?)...common <  
2 wks

- VSD – left thorax....

Lungs – Clear sounds

Testicles in scrotum & palpable at  
birth

## Neonate – Problems

Premature – Droopy ears  
un-erupted incisors

Weak pasterns, unable to stand, tendon  
laxity

## Post Partum Care

- Enemas – Impactions are not common (?)
  - routinely, if impacted (?)
  - Fleet, soapy water (1 pt)

Above All, Do No Harm

## Neonate – Premature

Tx – keep warm, O2, transfuse, antibiotics (?),  
if chilled...warm up pre feeding (99-  
102F)

### ‘Angel From Heaven’ Care

- IF NEEDED

Ck for success passive transfer

- > 800mg/dl blood – probably ok
- < 800mg/dl blood - concern
- < 400mg/dl blood – decide

ALL of above should be viewed with respect to a good examination

### Neonatal Examination

General Examination with Focus routes of bacterial entry

- Skin, umbilicus, GI, Respiratory, genitourinary, .....

- Any question...ultrasound the heart, umbilicus,

### ‘Angel From Heaven’ Care

Concentrations as low as 200 mg/dl may be sufficient...in clean environments

Increasing AB via transfusion should NOT be considered a benign procedure

### ‘At Risk’ Kid

Septicemia

Hypothermia

Hypoglycemia

Respiratory Disease

Retained meconium

Dumb

### Baby ‘immune status’ examination

TP (temp comp refractometer) – 5 gm/dl PP (4.5) and healthy => no transfusion

Sick, signs of sepsis, ???? => transfusion

### Septic Baby

General Signs - malaise, recumbancy, inability to track Dam, decrease nursing, hyperemia of unpigmented skin, petechial hemorrhages

Respiratory signs – tachypnea - nasal flare – dypnea... possibly more common than cough, nasal discharge, audible abnormalities



## Septic Kid/Lamb

Ophthalmic signs – scleral injection, uveitis, aqueal flare, hypopyon  
Omphalophlebitis - ~ grossly appreciated  
>3-4d, heat swelling, pain, discharge, moistness ....any  
question...**Ultrasound**

## Septic Baby

- Plasma
- Antibiotics – bactericidal, Gram -/+, preferably iv  
..circulatory collapse/dehydration/shock => interosseous  
    ceftiofur  
    amikacin/ampicillin  
    Erythromycin / Chloramphenicol /TMS ?

## Septic Kid/Lamb

- FPT common, mean age 2d
- Common signs - hypothermic, tachycardia, tachypnea ..rarely febrile

## Sick Baby

Stress and dehydration  
=> hyperglycemia, hypernatremia, hyperosmolarity => fine head tremor, ataxia, wide base stance.....  
Probably due to poor insulin response + hyperglycemia => glucose diuresis....  
Tx – fluids...support...?

## Septic Kid/Lamb

- Blood culture -?
- Bacteria – E coli – Enterococcus – Listeria - Citrobacter - & 46% Gram+  
(Dolente J Vet Int Med 2007)
- Bacteria – E coli – Actinobacillus – Klebsiella (Adams JAVMA 1992)

## Sick Baby

Diarrhea  
- septic / FPT  
- owner-trogenic (milk, tubing, ?)

### Baby Care

“I am unsure if I have ever saved any creature. I have provided support and allowed the Lord and the baby perform a miracle.”

An Alabama Prophet

# TOO MUCH GRAIN DISEASES

### Cria Care

Feeding – feed colostrum within 2 hrs of birth

- feed frequent small quantities (8 feedings of 150 ml/d)
- cow milk (2%) + plain yogurt (15 ml/240 ml milk)
- goat milk replacer

### Urolithiasis in Goats & Sheep

- Vary due to geographic location
- Struvite
- Calcium Complexes (eg: carbonate, etc)
- Oxalates
- Silicates

### Baby Care (Morin JDS 1995)

Animal	Water %	Protein %	Fat %	E (kcal/L)
goat	87	3.3	4	680
sheep	81	6.2	7.9	1138
cow	87.3	3.3	3.6	653

### Causes of Urolithiasis

- General- inadequate water intake, early castration, estrogenic compounds (legumes, phytoestrogens, implants), inadequate intake of Vitamin A
- Struvite- high concentrate/low forage diets, low Ca:P ratio, high Mg intake, pelleted feeds, sweet feeds,

## The Holy Bible & Nutrition

- The wild asses stand upon the bare hills, panting like jackals, their eyes do fail, for there is no grass to eat

Jeremiah 14:6

## Causes of Urolithiasis

- Oxalate - grazing certain plants (lush clover, sugar beets, spinach, greasewood, etc)...with no adaptation
- Silicates – grazing cereal grains / grasses or on soils rich in silicates, high pH diets (?), high Ca:P ratio,

## Vitamins

- Vitamin A .... 'may' have lower Vitamin A requirements...or....greater ability to resist Vitamin A deficiency disease, as suggested by no problems 'documented' when fed deficient diets ( Van Saun Small Rumin Res 2005)
- Vitamin E ..... Disease of Vitamin E deficiency 'like' that of other species is described ( Chauvet Prog Vet Neuro 1996)

## Treatment Options

- Medical (catheterization, dietary changes)- rarely enough
- Surgical
  - Tube cystostomy
  - Bladder marsupialization
  - Perineal urethrostomy

## Goats and Water Intake

- Very efficient in water use and turn over
- Lactating goats require 1-4 gal water / day plus 2.5 gal / gal of milk
- Goats drink 1.4 – 1.7 lb of water/ lb DM intake

## Prevention of Urolithiasis

- Fresh clean water ad lib
- Avoid estrogenic compounds (lush legumes, growth implants, etc)
- Avoid sweet feeds, pelleted feeds, high grain/low forage diets
- Maintain Ca:P ration 2:1 with Mg < 0.6% of diet,

### Prevention of Urolithiasis

- Add NaCl to diet ...up 3-5% of DM intake....slowly....and only with access to fresh clean water
- Add Ammonium Chloride ( Sulfate ) at rate up to 200- 400 mg/kg bw/d (urine pH < 6.8)
- Vitamin C 3-4 mg/kg ....6x /d (?)

### Management Practices

- Avoid pelleted feeds, mucopolysaccharide 'makers' (CSM, milo, etc)
- Insure adequate water & Vit A intake water, Ca:P ratio
- Urine acidify-ers
- Avoid early castration (>6mo ?)
- NO Treats

### Prevention of Urolithiasis

- Include chlortetracycline or tetracycline in diet or mineral mixture (3-5mg /kg bw /d)
- Insure adequate intake of Vitamin A precursors
- If browsing.....slow introduction to oxalate rich feed stuffs

### Prevention of Urolithiasis

- Analyze the stones.....
- EXAMINE THE DIET
- DON'T FEED 'EM LIKE HOGS !!!!

- Feed Bucks-Rams a grass/forage based diet (no sweet or pelleted feed), adequate trace minerals, Good Ca:P ratio, with ammonium chloride

### Rumen Acidosis

- Intake of high conc:low roughage diets
- Increased lactic acid formation => acid accumulation => bacterial death => increased rumen water accumulation / rumen epithelium damage => dehydration => endotoxemia / shock / liver abscesses / fungal rumenitis – polio – diarrhea - bloat => death

## Rumen Acidosis

- Signs – as early as 12 hrs post feed engorgement
- Dx – signs, rumen fluid w/ reduced or absent protozoa, (pH ?)
- Prevention – high forage intake, feed buffers, slow dietary change

## Bloat

- Prevention – limit access / slow introduction of offending feedstuffs, legumes w/ condensed tannins (.5g/kg) minimize bloat, graze mixed forages, poloxalene / ionophores in feed,

## Bloat

- Gas or froth retention in forestomachs
- Gas bloat – obstruction (choke, mediastinal LN swelling, etc), high conc diets, endotoxemia, hypo-Ca, an, peritonitis, xylazine
- Frothy – ingestion of lush pastures / legumes / finely ground – grain based diets

## Camelid

<b>Bloat</b>	<b>Less</b>
<b>Lactic Acidosis</b>	<b>More</b>
<b>Polio</b>	<b>More</b>

## Bloat

- Signs - Enlarged left paralumbar fossa, colic, anxiety, respiratory distress, death
- Tx – NG tube, frothy bloat – poloxalene (44mg/kg), DSS (28ml), peanut oil (20-100 ml), veg oil (20-100 ml) via NG tube

## Polioencephalomalacia

- Cerebrocortical necrosis 2<sup>nd</sup> to thiamine deficiency &/or sulfate (sulfide) toxicity
- Growing ruminants, high conc diets, dietary change, moldy feed, rumen acidosis, 2<sup>nd</sup> to stress, altered rumen production of thiamine, amprolium toxicity, high dietary sulfate intake (>0.43% dietary S)

## Polioencephalomalacia

- Signs – anorexia, blindness, convulsions, depression, diarrhea, head pressing, incoordination, opisthotonus, down, coma, death
- Prevention – long stem forage, decreased conc feeding, slow dietary change, balance diet, avoid high sulfate intake

# Selective Diseases

## HCN Toxicity

- Ingestion of plants damaged by frost, wilt, drought with accumulation of prussic acid (cherry, corn, Johnson grass, Sudan grass, sorgham)
- Signs – Blood bright red (inhibited Hb release of O), anxiety, salivation, dilated pupils, tremors, death
- Tx – iv Na Nitrate followed by methylene blue; Na thiosulfate

## CL

- Neat organism – taken up by macrophage => stabilizes lysosome => free ride
- TX – lance and flush = source of infection
  - surgical excision = difficult / costly
  - long term antibiotics - ?????
  - vaccinate / autogenous vaccine

## Nitrate – Nitrite Toxicity

- More toxicity in ruminants (nitrate converted to nitrite anaerobically), nitrite 10x more toxic than nitrate => decreased O transport, feeding nitrate accumulators (beets, corn, sorgham, johnson grass, alfalfa) due to recent fertilization, rain, drought, freezing
- Sign – Brown blood, trembling, weakness, death
- Tx – iv methylene blue
- Prevention – avoid grazing accumulators, avoid intake of > 0.6% nitrate

## CL

- Control – ID Cull
  - vaccinate ?????
  - isolate infected animals, vaccinate

### Contagious Ecthyma (Orf)

- Sheep / goats / camelids / cervids
- Worldwide, Zoonotic
- papules => vesicle => pustule; crusting – proliferative @ mucocutaneous border (mouth, nose, teats, coronary band genitals,...)
- Self-limiting, but neonates may starve due to refusing to nurse & 2<sup>nd</sup> bacterial infection

### Geriatric Care

- Dental disease => pre-moistened, pelleted diet, senior horse feeds (Cu, fat)
- Osteoarthritis- wt loss (slow), phenylbutazone, trim toes, aspirin, adequan

### Conatgious Ecthyma

- Transmission – contact, fomites (virus persists for yrs)
- Morbidity - ~< 80%, mortality low
- Dx – biopsy
- Tx – supportive care (feed babies), treat 2<sup>nd</sup> bacteria, leave crusts, (scars)  
WEAR GLOVES

### Geriatric Care

- May have higher requirements for P, poor protein, some vitamins.....if like other species (?)
- Good teeth & BCS => Good quality forages
- Insure adequate individual intake

### Conatgious Ecthyma

- Control – biosecurity, vaccinate (brush on- live virus – CAUTION) ~ 3wks to full immunity
  - Vaccinate ewes, 6-8 wk old lamb.....
  - Endemic areas 1-2 d old lambs

### Geriatric Care

- Ensure adequate intake of fresh clean water, mineral salt
- If low BCS, yet free of overt disease .....may include fat up to 7-10% caloric intake, preferably in the form of fat containing seed (low gossypol whole cotton seed)

## Geriatric Care

- CBC & Clinical Chemistries as needed
- Renal disease: maintain CP < 10%, Ca:P ratio of 1:1
- Hepatic disease: maintain CP < 10%, avoid fat, maintain Cu < 8 ppm

## Mycoplasma mycoides & sp

- Dairy Goats, ET goats, all SR, associated with CAE (?)
- Goats – polyarthritis / pneumonia (kids)
  - febrile, conjunctivitis, wt loss, CNS signs
  - Mastitis / abortion
  - High morbidity, low mortality (?)

## CAE / OPP

- Dx – serology, AGID, ELISA, CSF (chronic granulomatous inflammation)
  - sheep- necropsy (mononuclear cell infiltration of lungs)
- Tx – CULL,
  - pain control (make life easier)
  - Acupuncture, NSAID's, Glucosamines, etc

## Mycoplasma mycoides

- Dx – neutrophilic leucocytosis, hyperfibrinogenemia, neutropenia (peracute), enlarged joints (fibrin clots, PMN's)
- Tx – Macrolides (?)

## CAE / OPP

Control – ID & CULL

- isolate positive animals
- dispose of needles, avoid 'fomite'
- C- section, feed 'clean' colostrum
- Induce parturition, tape teats, feed 'clean' colostrum

Clean Colostrum – from a 'CAE/OPP free animal; pasturized colostrum (low temp-long time)

## Mycoplasma mycoides

Control – ID & CULL

- Biosecurity
- Spread while milking by carriers  
SO..... ID/CULL, milk last, etc
- Spread via nasal exudate ....  
SO..... ID/CULL, segregate
- CK bulk tank



## Border Disease

- BDV (same family as BVDV)
- Low lamb viability, steel wool, short thick body, dome head, ataxic, tremors, hopping gait
- Vertical & Horizontal transmission
- Dx (?)... like BVD
- ID and CULL

## Any Questions?

