REPRODUCTIVE DISEASES OF SHEEP AND GOATS

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OBJECTIVES

EWE / GOAT REPRODUCTIVE HEALTH

ABORTION

METABOLIC DISEASES

LAMB / KID MANAGEMENT

LAMB / KID DISEASES
REPRODUCTIVE HEALTH
TYPES OF CYCLICITY

Seasonally polyestrus

Short day breeders (Fall)

Relative $E_2$

Long day breeders (Spring)

Relative $E_2$
NUTRITION
NUTRITIONAL REQUIREMENTS ONLY SLIGHTLY ABOVE MAINTENANCE
INADEQUATE NUTRITION CAN HAVE AN EFFECT ON EMBRYO IMPLANTATION
IDEALLY MAINTAIN A BODY CONDITION SCORE OF 2.5 – 3 AT BREEDING AND PARTURITION.

BCS = 2
Spinous process – prominent but smooth
Slight fat cover
Muscle fullness
Transverse processes rounded
Fingers go under with pressure

BCS = 3
Spinous process – rounded but smooth
Muscle development full
Transverse process rounded but smooth
Need hard finger pressure to find Transverse process end
EMBRYO DEVELOPMENT

GESTATION = 5 MONTHS (147-155 DAYS)
   Twins / triplets more common than single kids.
   Does carrying quads can kid early (3 days)

EMBRYO – CONCEPTUS – FETUS
   FETUS = recognize species

ATTACHMENT OF THE EMBRYO OCCURS 15-18 DAYS FOLLOWING FERTILIZATION

IMPORTANT SIGNALING BY EMBRYO TROPHECTODERM

PREGNANCY MAINTAINED BY OVARIES (CL) IN DOES
CL OF THE OVARY NOT AS IMPORTANT IN THE SHEEP

50 day embryo

http://arbl.cvmbs.colostate.edu/hbooks/pathphys/reprod/placenta/ruminants.html
EARLY GESTATION

MINIMIZE STRESS FIRST 30-50 DAYS OF GESTATION

• 15-30% of embryonic loss occurs within the first 30 days!

• Handling

• Heat

• Diet changes

• Placentation development

50 day embryo
http://arbl.cvmbs.colostate.edu/hbooks/pathphys/reprod/placenta/ruminants.html
MID – GESTATION (46-90 DAYS)

PREGNANCY DIAGNOSIS:

- Ultrasonography
  - Rectal (>25 days)
  - Abdominal (>35 days) 45-80 days ideal
- Pregnancy Specific Protein B (PSPB) BioPRYN
  - >30 days, cheap, false, misdiagnosis
- Progesterone
  - Expensive, need to know breeding dates, Best 20 -24 days after breeding

SEPARATE SINGLES FROM MULTIPLES

Twins require extra supplementation.

Practical Atlas of Ruminant and Camelid Reproductive Ultrasound", Figure 11.21 pg 193
LATE GESTATION (91-148 DAYS)

- APPROXIMATELY 70% OF FETAL GROWTH OCCURS DURING THE LAST 4-6 WEEKS OF PREGNANCY
- DOES/EWES SHOULD BE FED TO GAIN 0.25 - 0.5 LB/HEAD/DAY DURING THE LAST 4-6 WEEKS OF GESTATION
  - Support kid growth
  - Prevent ketosis – pregnancy disease
- CAN FEED SUPPLEMENTAL GRAIN TO DOES/EWES IN LATE PREGNANCY CONSUMING HIGH ROUGHAGE RATIONS:
- DON’T FORGET CLEAN FRESH WATER AND LOTS OF IT
- VACCINATE IF APPROPRIATE
- DEWORM IF FECAL COUNTS INDICATE
- COCCIDIOSTAT IF NEEDED
POSTPARTUM CARE OF DOE/EWE

- Assess for additional fetuses
- Muscle tone, quivers => hypocalcemia, ketosis
- Palpate udder express colostrum / milk (collect colostrum)
- Appropriate maternal response
- Monitor closely 72 hours
EWE / DOE HEALTH
PREGNANCY DISEASES
ABORTION: GENERAL CONSIDERATIONS

ABORTION – IS THE TERMINATION OF PREGNANCY AFTER ORGANOGENESIS IS COMPLETE BUT BEFORE THE EXPELLED FETUS CAN SURVIVE.

EARLY EMBRYONIC DEATH – PREGNANCY ENDS BEFORE ORGANOGENESIS.

STILL BIRTH – DEAD FULL TERM FETUS (LUNGS ARE NOT INFLATED) NO UMBILICAL ARTERY CLOT

NEONATAL DEATH – LUNGS INFLATED, CLOT IN UMBILICAL ARTERY

ZOONOTIC DISEASES – MANY OF INFECTIOUS ABORTION DISEASES IN SMALL RUMINANTS CAN CAUSE DISEASE IN HUMANS
ABORTION

MOST COMMON CAUSES OF ABORTION
- Campylobacteriosis
- Chlamydiosis
- Toxoplasmosis
- Non infectious (toxic plants, genetic, nutritional)

HOW TO RECOGNIZE ABORTION
- Absence of pregnancy after a positive pregnancy diagnosis (ultrasonography)
- Fetus found
- Vaginal discharge
- Sickness of dam
ABORTION DISEASES
CHLAMYDIA ABORTUS

- COMMON CAUSE OF ABORTION IN SHEEP AND GOATS
- SOURCES OF THE ORGANISMS:
  - ABORTED FETUS, PLACENTA, UTERINE FLUIDS
  - CARRIER FEMALES
  - RAMS CAN BE TEMPORARILY INFECTED
  - INFECTED THROUGH MUCOUS MEMBRANES OR EATING CONTAMINATED MATERIALS OR FEEDS
Chlamydia abortus

• Incubation period = 50 to 90 days
• Individual Scenario
  – infected in early to mid gestation
    • abortion
    • stillbirths and/or weak lambs
  – infected in late gestation or when not pregnant
    • abort during next pregnancy
• Naive Flock Scenario
  – 1\textsuperscript{st} year $\Rightarrow$ replacements abort
  – 2\textsuperscript{nd} year $\Rightarrow$ abortion storm
  – 3\textsuperscript{rd} year $\Rightarrow$ ewe lambs abort
Chlamydia abortus

• Prevention
  – separate pregnant ewes from aborting flock
    • manage ewe lambs separately
    • management of environment & contaminated materials
  – vaccinate \textit{(Chlamydia psittaci Bacterin)}
    • twice before breeding & booster yearly
    • vaccine does not prevent shedding but will decrease abortions
    • NOTE $\Rightarrow$ cat vaccine does not work (different strain)
  – good management $\Rightarrow$ avoid overcrowding
  – biosecurity $\Rightarrow$ “buyer beware”
CHLAMYDIA

• CHLAMYDIOSIS (Ovine enzootic abortion)
  • Bacterial disease caused by *Chlamydia abortus*.
  • Ubiquitous, obligate intracellular gram negative bacteria.
  • Disease in sheep tends to be subclinical. Source of infection. Economically more important than outbreak of serious disease.
  • Pregnant animals shed large amounts of *C. abortus* in the placenta and uterine discharges when they abort or give birth.
  • Can cause abortion in women so pregnant women should avoid contact with pregnant or aborting animals.
  • Diagnose via necropsy.
  • Treatment and control – vaccination, antibiotics (tetracyclines).
Campylobacter

Found in the intestinal tract of birds, sheep, cattle and on the surface of raw poultry.
CAMPYLOBACTER

- COMMON CAUSE OF ABORTION IN SHEEP
- CAMPYLOBACTER JEJUNI
- SPORADIC ABORTIONS
- CAMPYLOBACTER FETUS SUBSECIES FETUS
- LARGE ABORTION STORMS
- INCUBATION PERIOD = 7 TO 60 DAYS
Campylobacter

- Most abortions occur during the 3rd trimester
  - lesions seen on placenta & in fetus
  - ewes are not ill
    - some become immune (at least 3 years)
    - while others become carriers
  - if infected 2 weeks before lambing may see stillbirths and weak lambs
Brucella melitensis*

- Principal hosts - goats and sheep
- Most pathogenic in humans
- Sporadic cases in humans in the U.S. occur related to consumption of unpasteurized dairy products from countries where the disease is present.
Clinical Signs: Sheep and Goats

- **B. melitensis**
  - Late term abortions
    - Retained placenta
    - Birth of dead or weak lambs/kids

- **Goats**
  - Articular, periarticular hygroma localizations

- **B. ovis**
  - Abortions, fertility problems in sheep
    - Orchitis, epididymitis
    - Abnormal breeding soundness exam
CONT....

• BRUCELLOSIS
  • *B. abortus* and *B. melitensis* can be transmitted to people by milk, contact with placenta, fetus, fetal fluids, blood, and vaginal discharges from an infected animal.
  • Pregnant women avoid (abortions)
  • Human illness
**Coxiella burnetii (Q fever)**

- Common cause of abortion in sheep & goats
  - organism can survive in dust for years
- **Sources of the organism**
  - aborted fetus, placenta, uterine fluids
    - cattle, cats, rodents, birds & insects can also be a source of the organism
  - vaginal discharge, milk, manure, urine
  - venereal spread by males
  - “carrier females”
    - immunity is not complete ➔ large proportion of flock may be shedding with few abortions
    - shed organism but deliver normal lambs
ABORTION

WHAT TO DO?
- Wear gloves/sleeves (Risk of transmission to humans)
- Remove fetus
- Submit to diagnostic lab:
  - Fetus and placenta
  - Blood from dam
- Isolate the dam until laboratory results
PREVENTION

• Personal Protection equipment
• Coveralls
• Gloves
• Face masks
• Rubber
• Boots
• Avoidance
METABOLIC DISEASES
KETOSIS/PREGNANCY TOXEMIA
PREGNANCY DISEASE, LAMBING SICKNESS, TWIN-LAMB/KID DISEASE

PREGNANCY TOXEMIA = KETOSIS ASSOCIATED WITH:
- LATE PREGNANCY (LAST MONTH)
- INAPPROPRIATE NUTRITION
- VERY LOW (2/5) OR VERY HIGH (4/5) BCS
- NUMBER OF FETUS (3 OR MORE)

CLINICAL SIGNS:
- DULL/DEPRESSION
- INAPPETENCE
- RECUMBENT
- PAIN/DISCOMFORT (GRINDING THE TEETH)
- NEUROLOGIC SIGNS (OBTUNDED, PRESS HEAD AGAINST WALL)
PREGNANCY TOXEMIA

WHAT TO DO?

◦ Offer low volume/high concentration of energy food (grains)
  ◦ 0.5 lbs. grain daily + good quality hay
◦ Give propylene glycol oral (60-90ml two/three times a day)
◦ Monitor for progression
◦ Veterinary evaluation if signs progress
  ◦ More aggressive treatment will be needed (IV fluids, dextrose, antibiotics)
  ◦ Need to assess blood levels of glucose and ketones
  ◦ Need to assess fetal wellbeing

Prevention is the key.
PREGNANCY DISEASE, HYPOCALCEMIA

OCCURS PRE AND POST – PARTUM

Pre – partum – fetal Ca demands

Post – partum – lactational Ca demands

CLINICAL SIGNS: MUSCULAR WEAKNESS, ANOREXIA, DEPRESSION, RECUMBENCY, DEATH

TREATMENT: IV, SQ, PO, CA SUPPLEMENTATION

PROPER CALCIUM SUPPLEMENTATION AND DIET ARE IMPORTANT IN THE CONTROL OF THIS SYNDROME
POST-PARTUM DISORDERS
POST PARTUM DISORDERS

- UTERINE PROLAPSE
- RETAINED FETAL MEMBRANES
- METRITIS / ENDOMETRITIS
- PYOMETRA
- PREGNANCY TOXEMIA (KETOSIS)
- HYPOCALCEMIA
- MASTITIS
RETAINED PLACENTA

- Difficult births
- Induction
- Nutrition low in Mg, Ca, Se
- Slow uterine contractions
UTERINE PROLAPSE

Emergency situation
Call your Veterinarian
Cull + / -
PYOMETRA METRITIS
PREGNANCY DISEASE, MASTITIS

- MAJOR CAUSE OF PREMATURE CULLING
- NEW INFECTIONS USUALLY OCCUR AT DRY-OFF OR EARLY IN LACTATION (CHECK TEETH OF LAMBS/KIDS)
  INFECTION ASCENDS FROM TEAT END
- COMMON BACTERIA, S. AUREUS. PASTEURELLA SP. COLIFORMS
- TREATMENT: FREQUENT STRIPPING, INTRAMAMMARY ANTIBIOTICS, ANTI-INFLAMMATORY DRUGS, SYSTEMIC ANTIBIOTICS
- DRY TREATMENT USE IN SHEEP AND GOATS
- CHRONIC CASES RARELY FULLY RECOVER => CULL
MASTITIS

MASTITIS (HARD BAG; BLUE BAG)

Injuries, viral or bacterial infections.

Bacteria is most common cause.

- Clinical vs subclinical
- Culture

Viral cause is most frequently OPPV.

Treat with intramammary and/or injectable antibiotics, anti-inflammatory agents.

Prevention:

- Sanitation
- Reduce protein levels
- Withhold water 24 hours before weaning
LAMB/ KID DISEASES
PREPARATION FOR THE NEWBORN

PREPARE A PEN FOR THE FIRST 1-3 DAYS

- Clean and dry
- Sufficient bedding
- Warm and protected from wind/rain
- Easy access to regular checks
WEIGHT THE KIDS / LAMBS

CALCULATIONS:

Weight (in kilograms) x 0.20 x 1000 = Total volume of milk to feed in 24hs
Total volume of milk to feed in 24hs / 6 (number of intakes during one day) = Volume to give per feeding

WARM (BUT NOT OVERHEAT) COLOSTRUM
CLEAN BOTTLE/NIPPLES
STORE FRESH COLOSTRUM IN FRIDGE
FREEZE (SMALL BAGS) EXTRA COLOSTRUM
BIRTH TO 3 WEEKS

STILL BORN, WEEK OR DEAD LAMBS/KIDS
Important to be able to determine if born dead or died shortly after death.

Examine lungs
   Pink-spongy – did breathe
   Deep purple – did not breathe

Non-infectious causes most common.
   Hypothermia
   Hypoglycemia
   Dystocia

Infectious agents
   Chlamydia, Border disease virus, Campylobacter,
   Toxoplasmosis, Brucella ovis, Coxiella, Cache Valley virus.
HYPOTHERMIC / HYPOGLYCEMIC KIDS / LAMBS

TEMPERATURE BELOW 100 F
EARLY DISEASES

SUDDEN DEATH OF YOUNG LAMBS / KIDS

Bacteria and toxins.
- Clostridium, E. coli, Salmonella, Pasteurella
- Adequate colostrum intake critical (5% of BW)
  - Gut closure occurs within 12 hrs of birth
- Clean lambing areas
- Disinfect navel
- Clostridium perfringes Type C and tetani.
EARLY DISEASES

RESPIRATORY
Pneumonia
Bacterial or viral
- Pasteurella hemolytica most common
- Parainfluenza virus type 3 (PI3)
- Parasite

Causes
- Inadequate colostrum
- Stress/crowding
- Unsanitary conditions/poor ventilation

SCOURS (DIARRHEA)
Bacterial, parasitic, viral
- E coli
- Rota and corona viruses

Primary parasitic causes are cryptosporida and coccidia. (older lambs)

Rehydrate and provide electrolytes
Antibiotic treatment and prophylactically
Clean environment, isolate infected animals, clean equipment/self
EARLY DISEASES

NAVEL AND JOINT ILL

Occurs at birth, docking and castration
Typically bacterial especially *streptococci*
Dip navel, clean environments, aseptic techniques for docking and castration.
Castration before 6 weeks of age, docking before 3 weeks of age.
Prior to 1 week my preference
Healthy lambs only
LATE DISEASES

• Coccidiosis
  – Protozoan (Eimeria).
  – Sheep develop immunity with age.
  – Usually occurs at 4-8 weeks of age.
  – Diarrhea is most common sign.
  – Often signs occur at weaning.
  – Sanitation, coccidiostats (Deccox), reduce stress.
LATE DISEASES

• White muscle disease (stiff lamb disease)
  – Vit E or Selenium def.
  – Two forms of disease
    • Newborn lambs: Vit E/Selenium def in ewes.
    • Older lambs: Selenium def. (esp. important in our area).
  – Supplement ewes and/or lambs with Vit E/Selenium
LATE DISEASES

• Enterotoxemia: (“overeating”, pulpy kidney).
  – C. perfringens Type D
  – Rapidly fatal.
  – Prevent with good feeding/health management.
    • Vaccinate pregnant ewes 3-4 week prior to birth.
    • Vaccinate lambs 3-4 weeks of age and boost 14-21 days later
    • Anthilmentics/coccidiostats.
    • Gradual diet changes.
LATE DISEASES

- Acidosis: (grain overload, founder)
  - Rapid change to high concentrate diet.
  - Common in feedlots
  - Sudden death.
  - Avoid rapid increases in grain in diet
  - Drench with bicarbonate
LATE DISEASES

• Urolithiasis: (Water belly, urinary calculi)
  – Metabolic disease of male sheep.
  – Wethers at greatest risk
  – Treatment
    • Antispasmodics
    • Removal of ureteral process
    • Surgical intervention
    • Euthanasia
  – Prevention
    • Caused by calcium and phosphorus imbalance.
    • Provide adequate water, 2:1 Ca:P in diet
    • Acidify the urine with suppl. ammonium chloride
LATE DISEASES

• Polio: (polioencephalomalacia)
  – Lack of Thiamine (B1)
  – Animal is down on side and “paddling”.
  – Treat with thiamine hydrochloride.
LATE DISEASES

• Scours and Diarrhea
  – Salmonellosis (S. typhimurium)
  – Yellow/green odiferous manure
  – Prevention is Key: Sanitation
  – Transmissible to humans.
LATE DISEASES

• Pneumonia: (Pasteurellosis: shipping fever)
  – Can be viral in nature so antibiotics don’t always work (OAV, PI3; RSV), also mycoplasma.
  – Prevent by reducing stress
  – Avoid dusty feeds and pens
  – Adequate ventilation.
LATE DISEASES

• Rectal prolapse:
  – High concentrate feeding
  – Short docking
  – Dusty feed or pens
  – Growth promotant use
  – Virus infection
  – Cull affected animals, can repair if animal is valuable.
LATE DISEASES

• Copper
  – Difference between toxicity and deficiency is narrow.
  – Copper absorption is affected by molybdenum.
  – Cattle formulations of copper will be toxic to sheep.

• Club lamb fungus:
  – Trichophyton Verrucosum or Microspodrum.
  – Circular patches of crusted wool, wet raw surface beneath.
  – Highly contagious.
  – Transmissible to humans.
  – Consult vet for treatment.
QUESTIONS?