



# Infertility in sheep and goats

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# Sheep – short day breeder

- Dorset, Merino, Rambouillet- longer breeding season
- Shropshire, Hampshire, Southdown adhere to short day breeding season
- Sheep near equator less sensitive to effects of season
- Sheep in India have a major and minor season

- Puberty 6-8 months
- Suffolk ewe lambs show first signs of estrus at around 30 weeks of age.
- Estrus cycle length 14-19 days (average 17 days)
- Estrus period 15-45 h (Average 30 h) Wool breeds have longer estrus than meat breeds
- Ovulation – twin ovulation common in some breeds. Ovulation 21-45 h after estrus onset before end of estrus.

# Goats

- Pygmy and Tenesse breeds have longer season
- Nubian, Boer and Angora are more seasonal
- Puberty 6-8 months Earlier in Pygmy -3 months
- Estrous cycle 21 days (18-22 days)
- Estrus duration 24-72 h (Av 36 h)
- Ovulation before end of estrus
- Male: Female ratio 1:50



# Preparing ewes for breeding season

- If possible, put the ewes on a diet with higher nutrition
  - They will release more ova to fertilize
- Deworm the ewes before breeding
  - Use a product that will get tapeworms
- If possible, vaccinate ewes
  - *Chlamydophila* and *Campylobacter*
- Treat or cull lame or unhealthy ewes

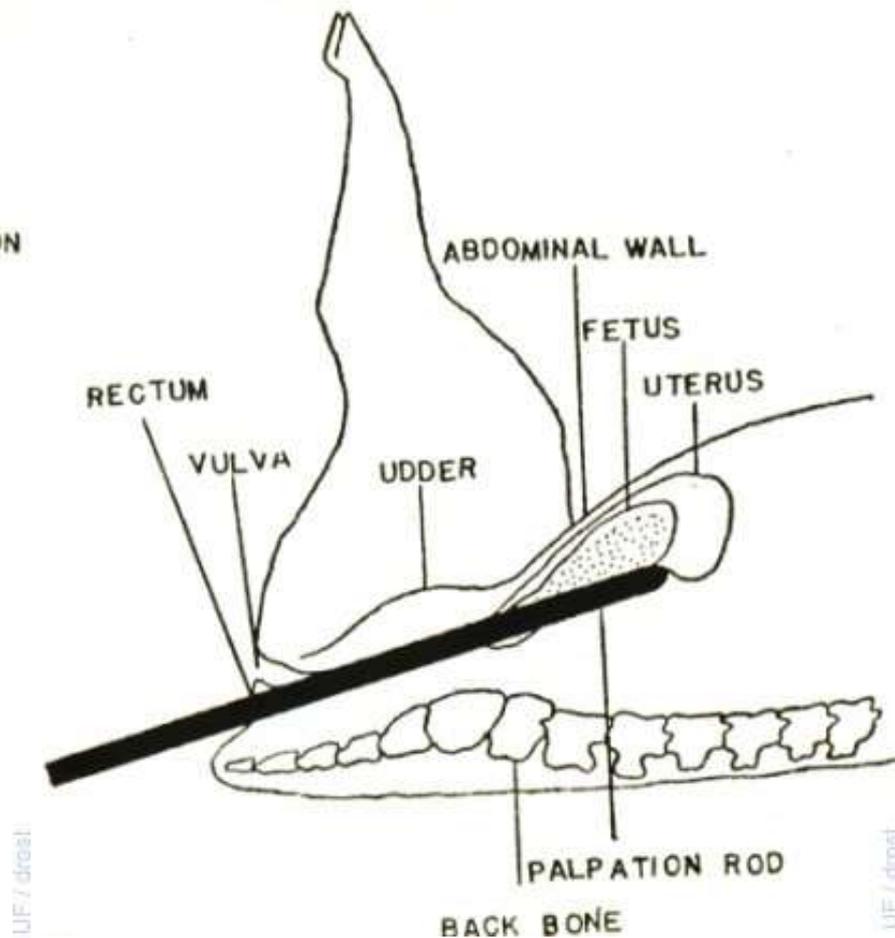
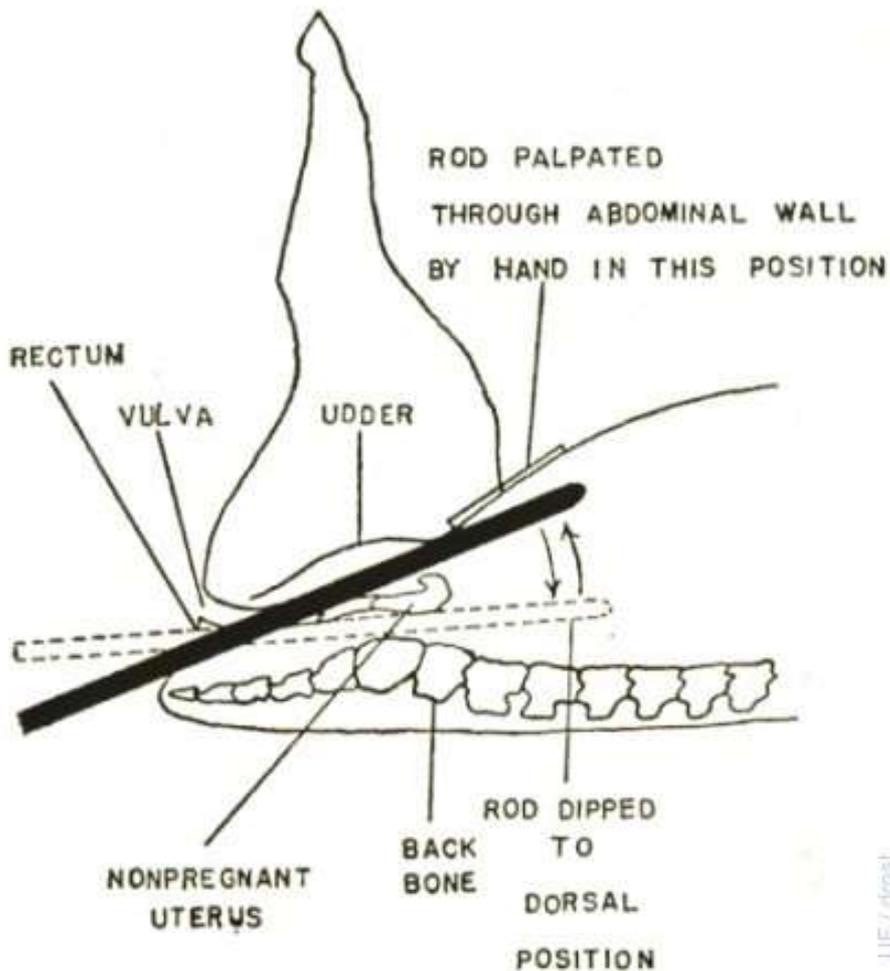
# Preparing ewes for breeding season

- Make plenty of salt available
  - Iodized salt to prevent congenital goiters
    - This is an infrequent cause of abortion
- Use additional selenium and vitamin E
  - Selenium helps with iodine metabolism
  - Helps prevent against white muscle disease
- Moist wool can mean fly strike

# Pregnancy diagnosis

- Trans-abdominal palpation
- Recto-abdominal palpation
- Ultrasonography
- Pregnancy associated glycoproteins

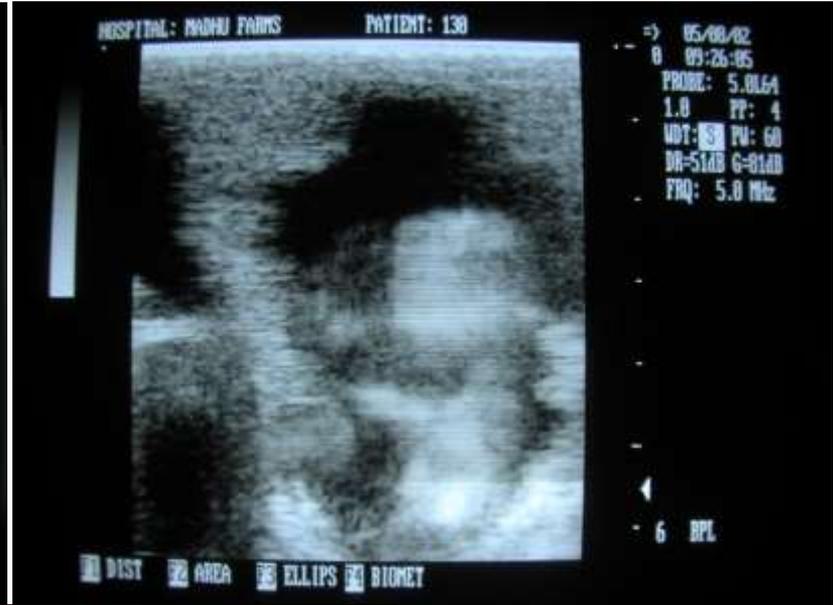
# Recto-abdominal palpation using the rod



## Ultrasonographic Findings With Pregnancy

Day(s)	Comments
17 to 25	Transrectal; embryo visible after 24 days
26 to 35	Transabdominal; hypoechoic amnion and hyperechoic fetus
30 to 75	Transabdominal; doughnut-shaped to C-shaped placentomes
45 to 90	Best time for twin detection; midabdomen in front of udder
90 to term	Determination of number of fetuses is less accurate close to term

# Ultrasonographic features of pregnancy



# Reproductive failures

- **Non-Infectious**
- Plant toxicity
- ***Veratrum californicum*** (contains a toxic alkaloid **cyclopamine**)  
Members of the *Veratrum* genus are associated with numerous congenital abnormalities in lambs.

- Exposure to *V. californicum* during the first 10 days of gestation is associated with early embryonic death. The classic, demonstrable conditions associated with *V. californicum* ingestion—severe facial abnormalities such as a cyclops-like appearance, anophthalmos, and cleft palate—result.

- *Locoweeds*

Members of the genera *Astragalus* and *Oxytropis* commonly are referred to as *locoweeds*; they have been implicated as causing abortions, birth of small weak lambs, and bent legs in newborns. The incidence of abortion and birth of small weak lambs has been reported to be as high as 75% in exposed ewes.

- *Broomweed*

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Broomweed (*Gutierrezia microcephala*, *Xanthocephalum lucidum*) ingestion can cause abortions and birth of small, weak, premature lambs, from the effects of an embotic toxin contained in these plants (triterpenoid saponin).

- **Estrogen-Producing Plants**

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Sheep appear to be sensitive to the effects of phytoestrogens from plants such as subterranean clover (*Trifolium subterraneum*), white clover (*T. repens*), and alfalfa (*Medicago sativa*). Clinical signs associated with phytoestrogen consumption include infertility, irregular and prolonged heats, vaginal prolapse, cystic glandular hyperplasia of the cervix and uterus, enlarged teats, and inappropriate lactation.

- ***Nutritional Abnormalities***

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Poor body condition, depressed energy intake, and decreased mineral and vitamin intake all suppress reproductive activity in ewes and does. Lower overall nutritional intake results in “weak” signs of estrus, depressed ovulation, abnormal estrous cycle length, and delayed puberty.

- ***Heat Stress***

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Heat stress depresses reproductive ability and causes fetal wastage. Causes of heat stress include decreased water intake, obesity, exercise intolerance, and fatigue during hot weather.

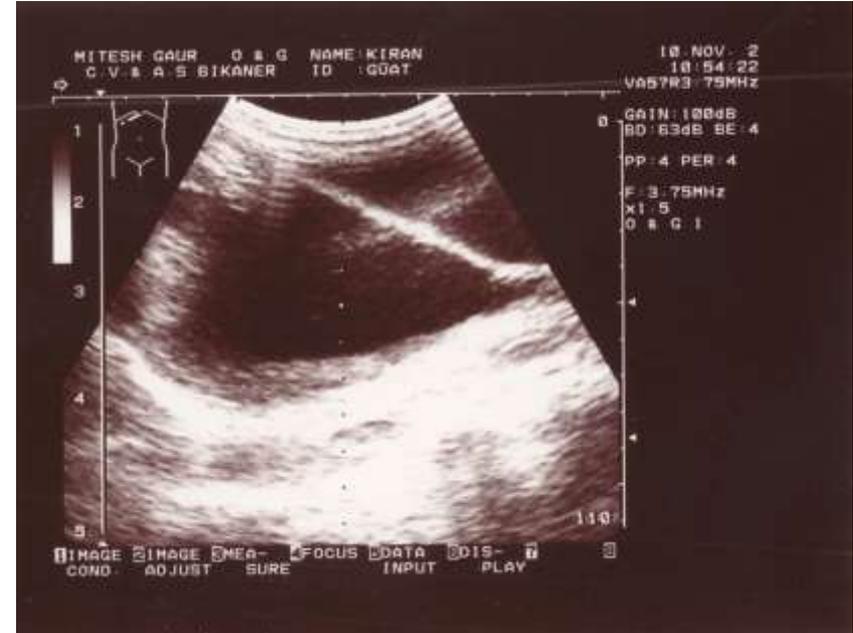
- Sheep can tolerate external temperatures higher than 110° F if the humidity is less than 65%, but they will pant if the rectal temperature is higher than 106° F.

- **Pseudopregnancy**

Pseudopregnancy (mucometra, hydrometra, “cloudburst”) is caused by a prolonged luteal phase in goats.

The incidence in dairy goats may be as high as 3% to 5% on some farms, with the highest incidence occurring in November through December. It is much less common in fiber or meat breeds of goats and sheep

# Ultrasonography reveals anechoic fluid, strands without fetal cotyledons or fetus/es



In a study hydrometra was diagnosed in 21 does and out of these it was diagnosed in 5 does by ultrasonography while in 16 does it was diagnosed in goats presented for examination with history of discharge without fetal delivery.

## **Therapy:**

Prostaglandin injections

Inj. Lutalyse 1.5 – 2.0 mL IM

Inj. Prostodin 125 µg IM

Anti-prolactins

Bromocryptine 1 mg SC twice daily for 6-10 days

# Ovarian cysts Uncommon in sheep

- ***Anestrus- Seasonal***

- ***Metritis and Endometritis***

Metritis is uncommon in sheep and goats but is encountered in dairy goat breeds and in association with RFMs; dystocia; retained dead lambs or kids; abortion caused by toxoplasmosis, chlamydiosis, and listeriosis; and possibly other diseases.

# Abortions in sheep and goats

- Abortions are most commonly seen during the final 2 months of pregnancy.
- Abortion rates of 5% are common and rates below that are considered good

# Major infectious causes of sheep and goat abortion

- *Chlamydophila abortus* (*Enzootic abortion*)
- *Campylobacter* spp.
- *Toxoplasma gondii*
- Various bacterial agents

**Chlamydiosis:** most common cause of abortion in sheep and goats and rarely cattle caused by *Chlamydia psittacci* is a gram -ve intracellular organism that have both DNA and RNA

**Transmission:** Pigeons, sparrows are reservoirs, ticks and insects help in transmission. The organism persist in feces of infected animals and shed in uterine discharges for 3 weeks post abortion.

**Clinical signs:** Abortion during last month in primiparous ewes. Slight febrile reaction and blood tinged discharge. Placentitis is common.

**Diagnosis:** Necrotic changes in placenta. Microscopic examination of ZN stained smears from placenta or fetal tissue.

**Treatment and control:** Oral feeding of 400-500 mg/animal/day of oxytetracycline for 2 weeks during an outbreak, or long acting tetracycline 6-8 weeks before parturition.

**Vaccine (Enzovac )** IM or SC 8 weeks prior to breeding. The immunity lasts for 3 years.

**Chlamydia** can affect human beings.

# *Campylobacter* spp.

- Infection with *Campylobacter fetus fetus* and *C. jejuni* results in late pregnancy abortions or stillbirths.
- Ewes may develop metritis and placentitis. The fetus is usually autolyzed, and many have necrotic areas in the liver.
- Diagnosis relies on finding *Campylobacter* organisms in abomasal or placental smears or in uterine discharge.
- Strict hygiene is necessary to stop an outbreak. Use of tetracyclines may help prevent exposed ewes from aborting.
- Vaccination programs should be consistently practiced.

# *Campylobacter* spp.

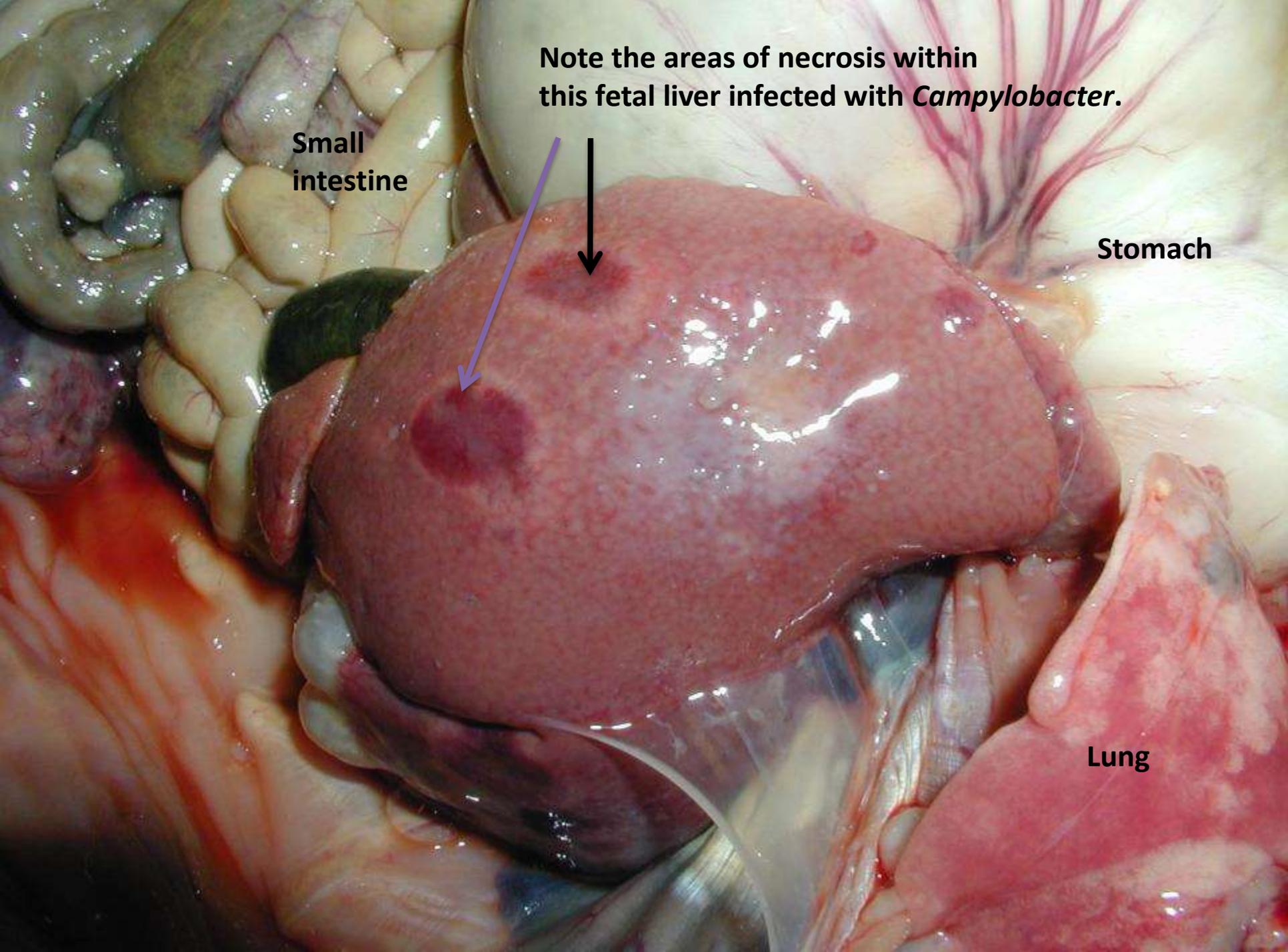
- Abortion rates range from 20 to 90%
- Infected ewes recover and are immune
- Persistently infected ewes may shed the organism in feces
- Stillbirths, weak lambs
- Infection is by ingestion
- There are sometimes prominent liver lesions

Note the areas of necrosis within this fetal liver infected with *Campylobacter*.

Small intestine

Stomach

Lung



# Toxoplasmosis

- Protozoan parasite which has the cat as a definitive host
- Infection is by ingestion of feed or water which has been contaminated by oocyst-laden cat feces
- Clinical signs range from fetal resorption to stillbirths and weak lambs depending upon the time of infection
  - usually see 20% abortion

# Toxoplasmosis

- Sometimes see necrosis and calcification of cotyledons
- The ewe does not become sick
- Antibody to protozoa may be detected in fetal fluids
- Submerge the placenta in isotonic salt solution and observe the necrosis of cotyledons



**Toxoplasmosis**

# Prevention

- Do not allow ground feeding or stagnant water
- Prevent contamination of feed and water with cat or bird feces
- Keep first lambing ewes/goats separate
- Do not mix newly acquired or aborting ewes/goats with pregnant ewes
- Avoid stress in the flock
- Dispose off placenta and aborted lambs

# Bluetongue

- Orbivirus, this is a vector borne virus
- Infection occurs in the first half of gestation – resorption of fetus, mummified fetuses
- Ewes do not show clinical disease
- Affects the fetal central nervous system
  - Hydrancephaly, cerebral cysts, hydrocephalus
- Diagnose by serology or virus isolation
- The affected lambs are born months after mosquito season

# Border disease

Border disease: is caused by pestivirus (related to BVD) affecting sheep in America and many other places, characterized by abortion and birth of congenitally affected weak lambs.

Clinical signs: Sheep show mild viraemia, lambs have a hairy dark wool over shoulder and evidence mild to severe tremors and hence called "*hairy shakers*". The lambs die in the first year of life. Lambs may also be born with neurologic changes (cerebellar hypoplasia, hydranencephaly)

Control: Slaughter lambs. Separate sheep and cattle and segregate newly introduced animals.

**Q fever:** is a zoonotic infection caused by *Coxiella burnetti* (an obligate intracellular rickettsia) causing abortion in sheep and goats and less frequently in pigs and lambs.

Transmission: Inhalation or by ticks. Cattle, sheep, goats and wild animals shed the organism in placenta, uterine fluids and milk

Clinical signs: Asymptomatic abortions

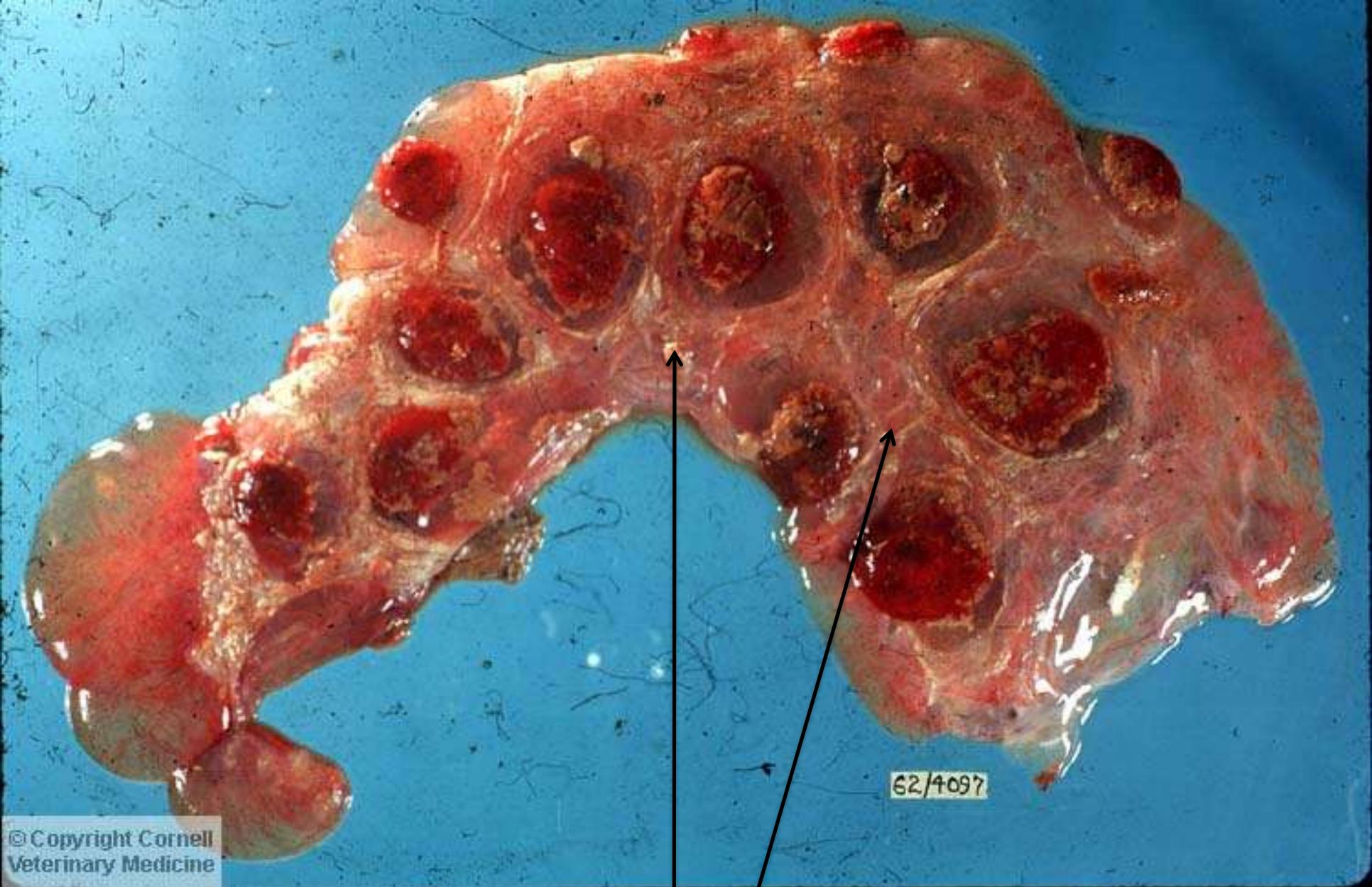
Diagnosis: Placental tissues. **Very few labs ready to handle tissue due to biosafety considerations**

# *Listeria* abortions

- *Listeria monocytogenes*
- Third trimester abortion
- Focal necrosis in cotyledons and liver
- Diagnose by culture of fetal tissues
- Intestinal carriers shed the bacteria into environment
- Ewes may have a fever
- Ewes may have a retained placenta

# *Brucella* spp.

- Late term abortions, stillbirths, weak lambs
- Placentitis, hepatitis and pneumonia may be seen in the fetus
- *Brucella* organisms are zoonotic
- Isolate *B. ovis* from tissues
  - Lung and abomasal contents



**This placenta shows thickening and fibrin deposits**

- The above lectures are also explained in video lectures at my YouTube Channel Govind Narayan Purohit
- Kindly share the videos and subscribe to my channel if you like them
- Thanks