


# Pregnancy Failure

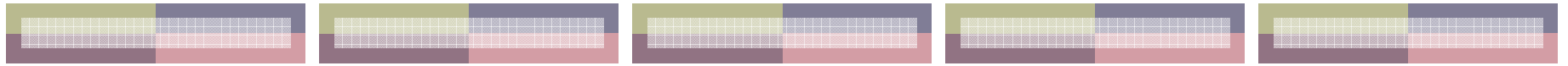
Ovine and Caprine





# Small Ruminant

- Infectious causes are more common in the list of diagnoses
  - CCC and T: *Chlamydophila*, *Coxiella*, *Campylobacter* and *Toxoplasma*
  - *Chlamydophila* and *Coxiella* are zoonotic.
- 



# Ovine Abortion\*

● No Diagnosis	48
● Noninfectious	2
● Infectious	50
● <i>Chlamydophila abortus</i>	17
● <i>Campylobacter</i>	4
● <i>Toxoplasma gondii</i>	19
● <i>Coxiella burnetti</i>	5
● Virus (Border disease)	0

\* Animal Health Laboratory, University of Guelph



# Fetal lesions



# Fetal lesions

- Cyclopia

- *Veratrum californicum* (d14)

- Arthrogryposis

- Anencephaly

- Cache Valley virus

- Hepatic necrosis

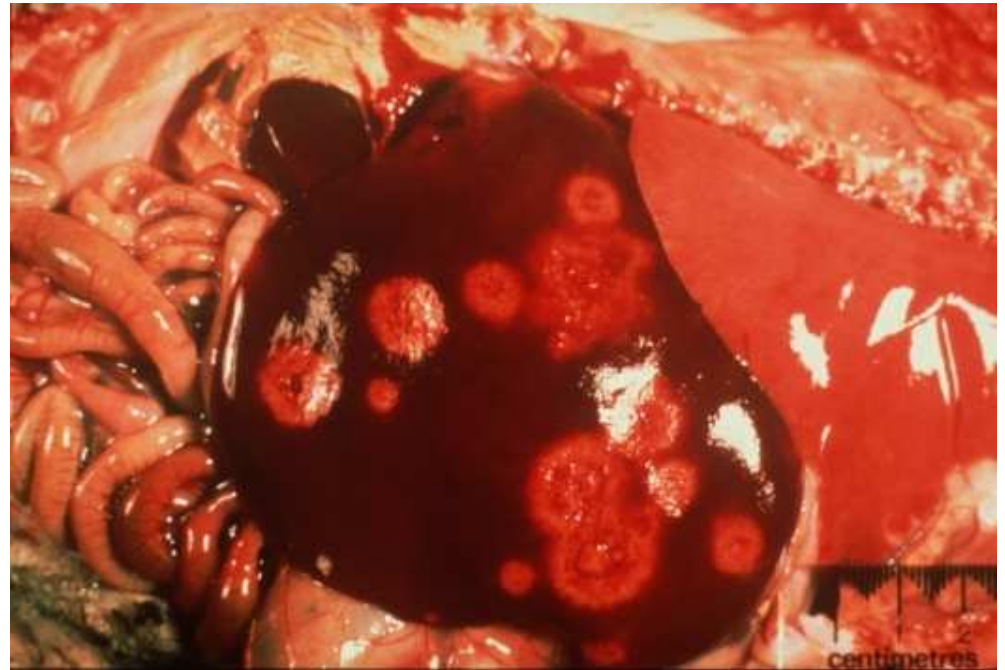
- *Regions - Campylobacter*
  - *C.jejuni, fetus fetus, and fetus venerealis*
- Multifocal necrosis – *Listeria*



Photo complements of Pathologic Basis of Veterinary Disease

# Fetal lesions

- Cyclopia
- Arthrogryposis
  - Cache Valley virus
- Hepatic necrosis
  - *Regions – Campylobacter, Spirillum*
    - *C.jejuni, fetus fetus, and fetus venerealis*
  - Multifocal necrosis – *Listeria*



# Placental lesions

Chronic placentitis (CCC)  
Focal necrosis in cotyledon  
(toxoplasmosis)

# Chronic placentitis





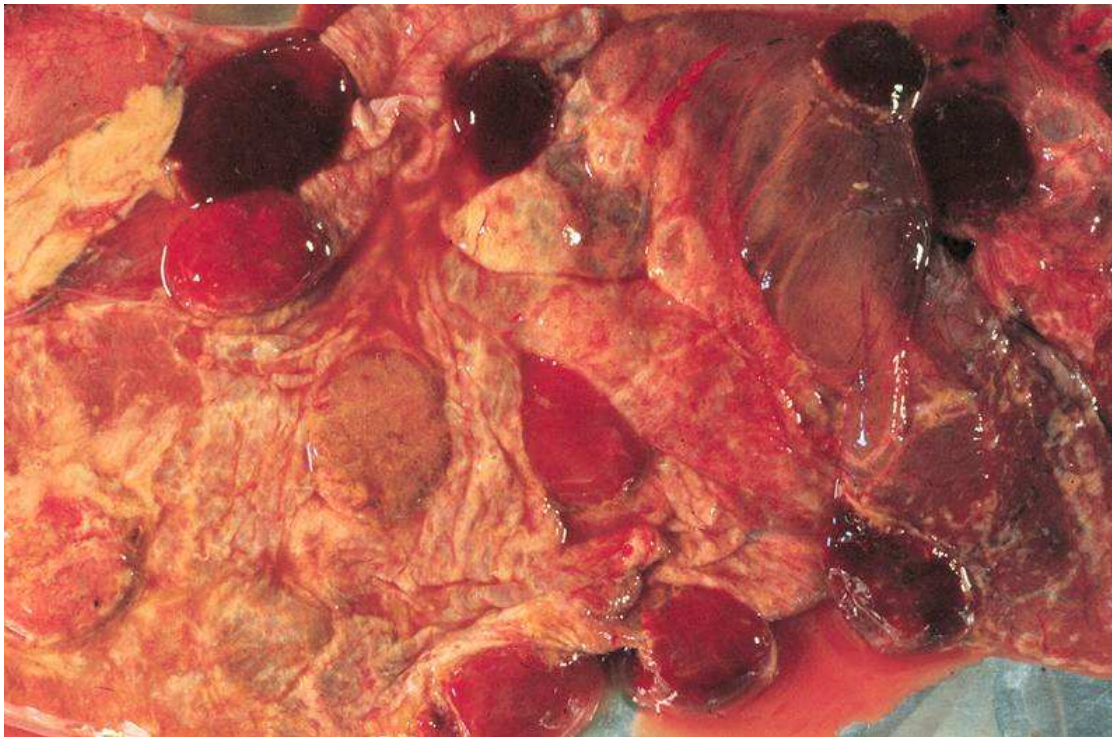
# Placentitis

- Chlamydophila abortus
- Campylobacter fetus
- Coxiella burnetii
- Others




# *Chlamydophila abortus*

- Ovine epizootic abortion (aka EAE or enzootic abortion of ewes) is an important disease






# *Pathogenesis*

- Exposure of mucous membranes
    - Uterine discharge and fluids, aerosols.
    - Carrier ewes – secretions at estrus
    - Rams temporarily – semen, prepuce
  - Ewe develops Ab in 15 d, mild lesions for month, then latency.
  - Mononuclear cells in endometrium
  - Endometrial cells of placentome, neutrophils control infection here
  - Trophoblasts around placentome
  - Logarithmic growth of organism
  - Necrosis, neutrophilic inflammation,
- 



# Individual history

- Incubation (FOP) 50-90 days during gestation
  - Gestation 150 d. (138-159)
  - Infection early to middle gestation – abort.
  - Infection late in gestation – abort next gestation.
  - Ewe lambs abort at first pregnancy
  - Carrier state despite immunity.
- 



## Herd history - naive herd

- First year - replacements abort
- Next year – storm with up to 75% loss
- Following year enzootic – ewe lambs





# *Chlamydophila abortus*

## ● Treatment


- Long acting oxytetracycline every 10-14 days
- Tetracycline in feed or water
- Poor efficacy because of long incubation

## ● Prevention

- Killed vaccine (Endovax, UK), variable efficacy
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# *Campylobacter*

- *C fetus* subsp *fetus*, *C jejuni*
  - Incubation
    - 7-60 days
    - Can cycle within lambing season
  - Sources
    - Fetal fluids
    - Carriers – feco oral – gall bladder
    - Carrion birds
- 



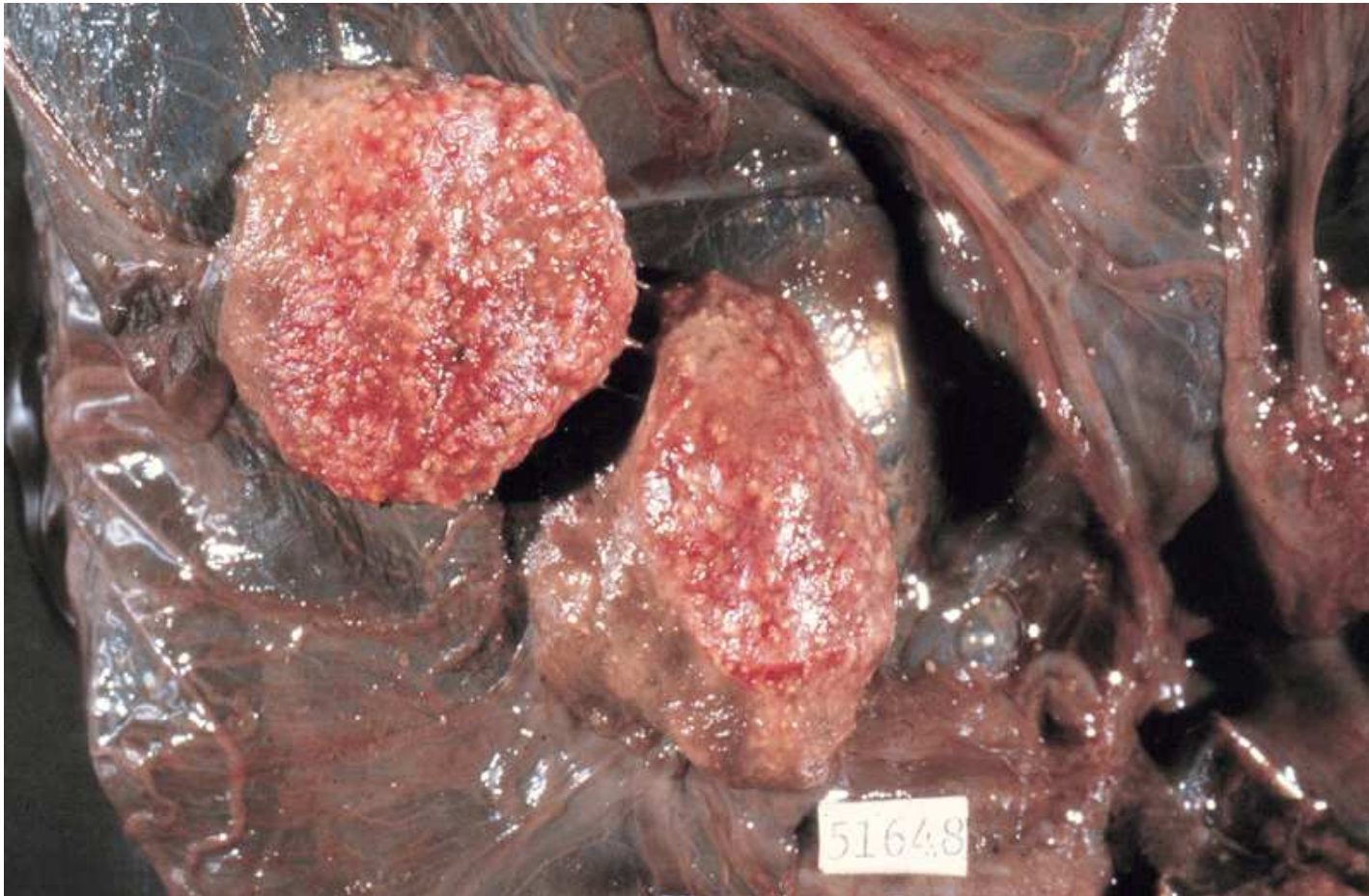
# *Campylobacter*

## ● Treatment and Control

- LA oxytetracycline in the face of an outbreak works well
- Tetracycline in feed.
- Bivalent vaccine
  - In face of outbreak
  - Prior to breeding




# Placental lesions: Focal necrosis in cotyledons





# *Toxoplasma gondii*

- Cat – rodent lifecycle
  - Cat sheds oocysts for 7 days post infection
  - Herbivores infected from contaminated feed – stored and pasture
  - Adults develop immunity
  - Infection during pregnancy
    - Placental and fetal infection
    - Abortion with characteristic lesions, mummification, stillbirth, weak lambs
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# *Toxoplasma gondii*

## Control

- Control cats and rodents
- No kittens, have cats use litter
- Feral cats and contaminated feed problematic

## Prevention


- Monensin or decoquinate throughout gestation
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# Regionally important diseases





# *Brucella ovis*

- Western Canada especially
  - Not zoonotic
  - Epididymitis is major manifestation
  - Abortion is sporadic (<2%), but rare storms of 15 – 70%
  - Transmission
    - Rams
    - Fetal fluids
    - Ewe
- 



# *Brucella ovis*

## ● Detection and control

### ● Rams


- Replacements from free flocks
- Palpate prior to breeding
- Serology
- Eradicate during off season
- Vaccine helpful in heavily infected flocks

### ● Ewes

- Self limiting disease with immunity.
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# Border disease

- BDv very similar to BVDv, but no cross protection
  - Subclinical disease in adults
  - Congenital infection
    - <65 days early embryonic mortality, abortion
    - 65-85 days – persistent infection (PI)
    - >85 days - immunity
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# Border disease

## Diagnosis

- PI animals by viral isolation on buffy coat
- Fetal viral isolation
- Lambs – ‘hairy shakers’ - coat and hypomyelinogenesis

## Control

- Self limiting disease without PI
  - Identify and remove PI
  - BVD vaccine ineffective
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# Goats

Similar to sheep  
Coxiella really important



# Goats

No diagnosis	52
Noninfectious	4
Infectious	40
● <i>Coxiella burnetii</i>	13
● <i>Chlamydophila abortus</i>	9
● <i>Toxoplasma gondii</i>	9
● Bacteria	3





# Goats

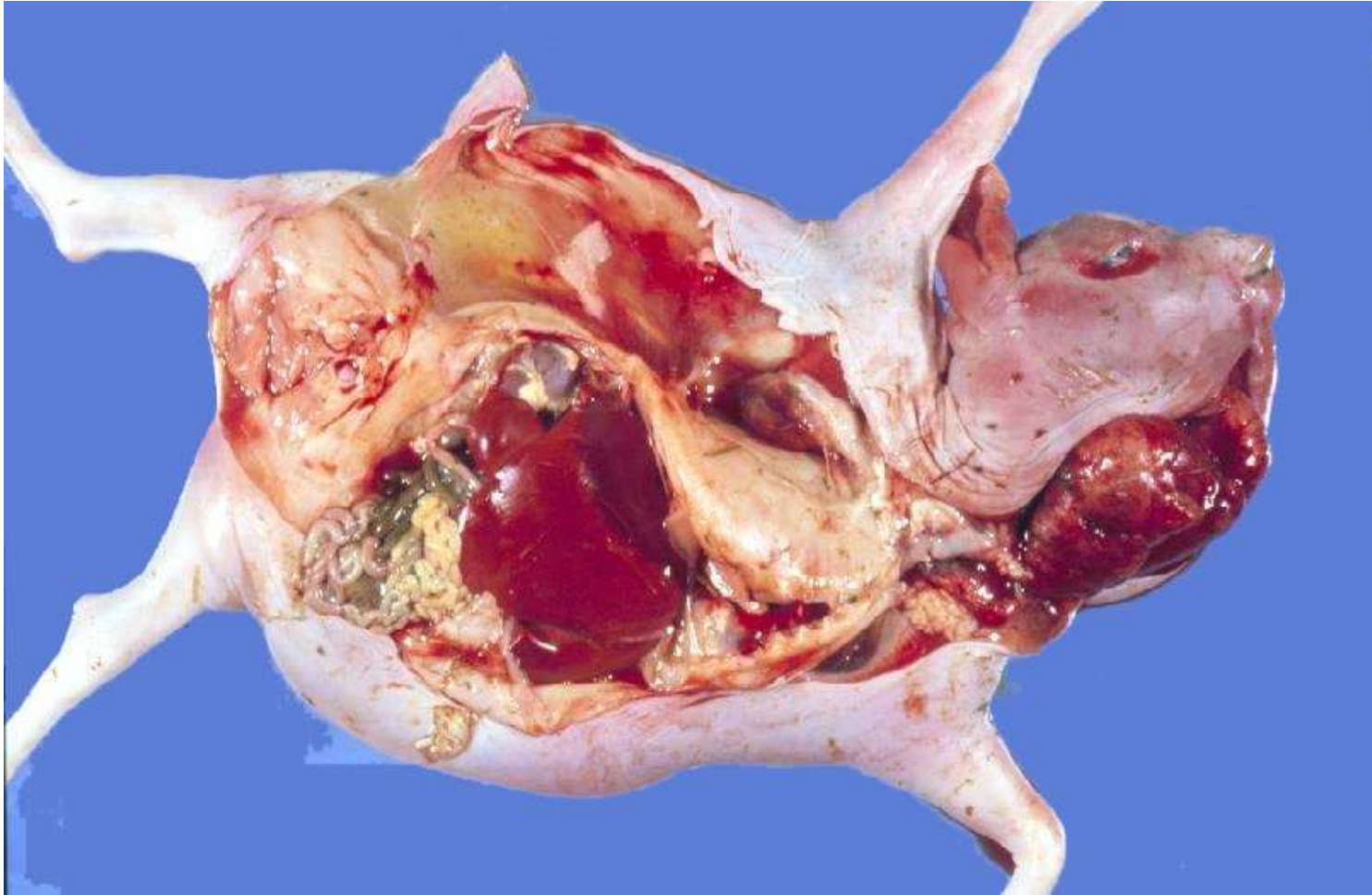
- *Coxiella* especially important
- Goats are very susceptible to ‘stress’ and luteolysis



# Fetal lesions



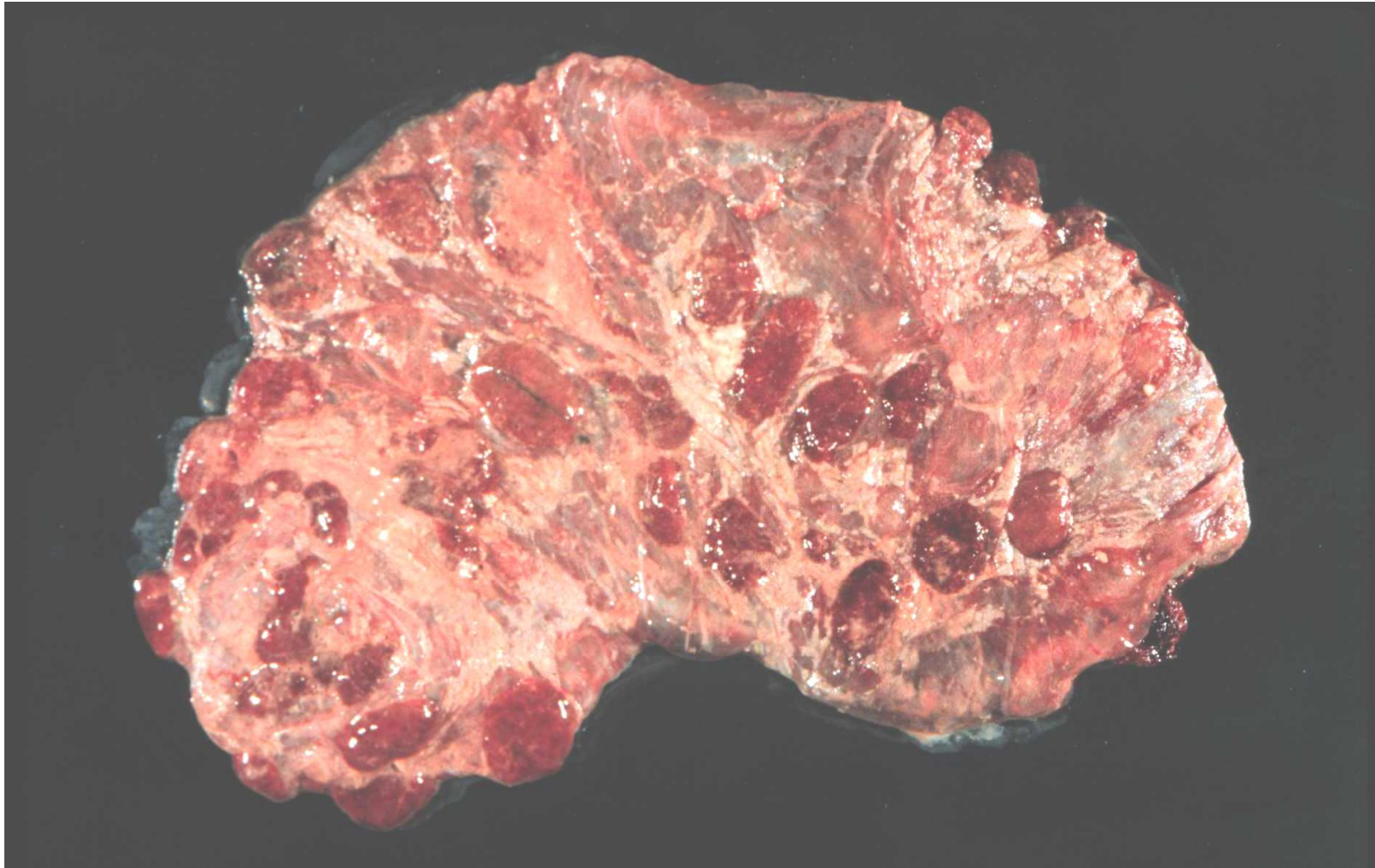
# Iodine deficiency



# Placental lesions


CCC & T

*Coxiella burnetii*






# *Coxiella burnetii*

- Q fever, Poker players pneumonia – zoonotic
  - Gram negative obligate intracellular bacterium (Legionellales). Closely related to *Legionella* and *Francisella*.
  - Highly resistant to physical and chemical agents, and has ‘endospores’.
  - Clinical disease in humans; animals are asymptomatic carriers (except abortion).
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# Q fever

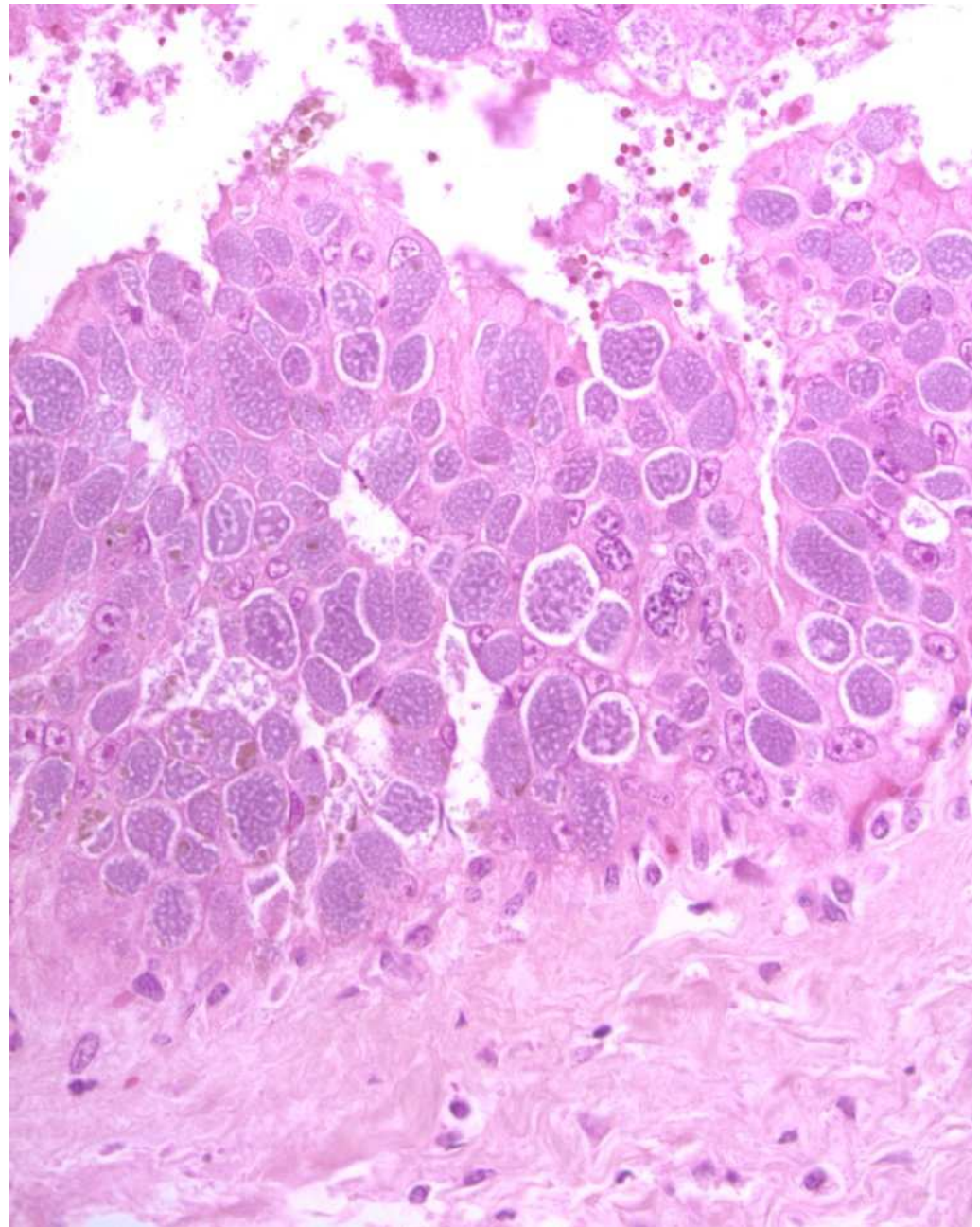
- Amniotic and allantoic fluids have large numbers.
  - Carrier goats, cattle, sheep, cats, birds and other wildlife
  - Shed in urine, faeces, milk, uterine discharge, but usually in parturient period.
  - Triggers for multiplication and shedding not known.
  - Highly infective in dried state – barns persistently infected for years
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# Pathogenesis


- Aerosols or ingestion
  - Primary multiplication in lymph nodes
  - Bacteremia (5-7 days)
  - Localizes in mammary gland and placenta
  - LPS is important component of virulence
  - Individual variations in immunity.
  - Carriers and shedders
- 

Coxiella in  
trophoblasts





# *Coxiella burnetii*

- Treatment in face of outbreak
    - Tetracyclines as in *Chlamydophila*
    - Shedding continues though
  - Precautions
    - Wear protective clothing, gloves and masks when assisting kidding, cleaning barn – DUST
    - Treat barn as quarantine
    - Children, elderly, pregnant keep out of barn
    - Pasteurize milk
    - Be aware – highly infective
- 



# Regionally important agents

- Iodine deficiency (Great Lakes basin)
- Wesselbron
- Rift Valley fever
- *Brucella melitensis*

