



SAND2013-1947P

PREGNANCY



Sandia National Laboratories is a multi-program laboratory managed and operated by Sandia Corporation, a wholly owned subsidiary of Lockheed Martin Corporation, for the U.S. Department of Energy's National Nuclear Security Administration under contract DE-AC04-94AL85000.SAND 201





Pregnancy

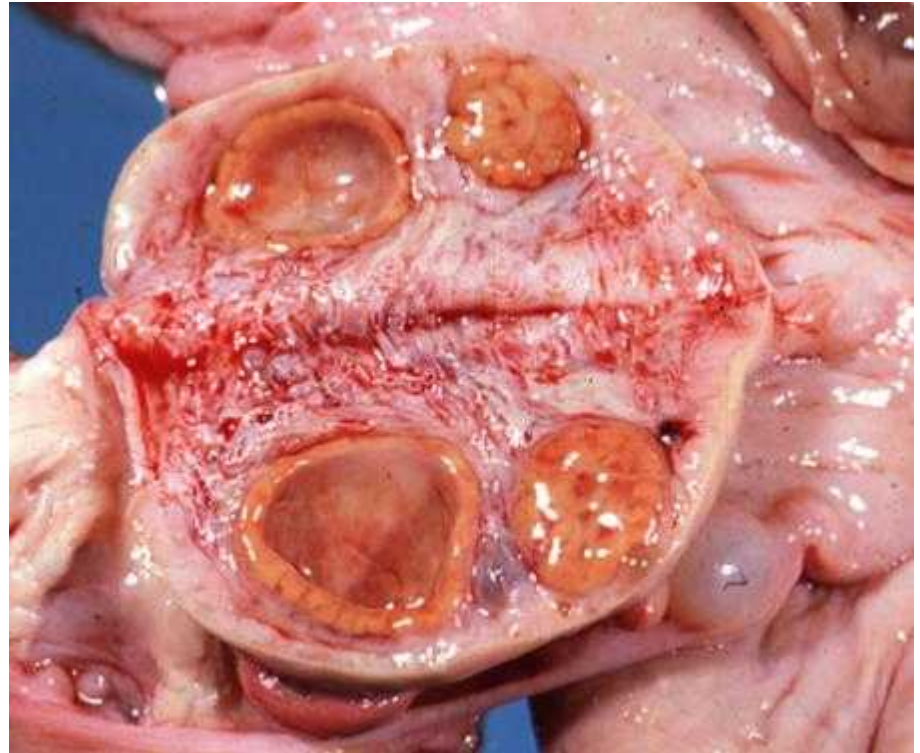
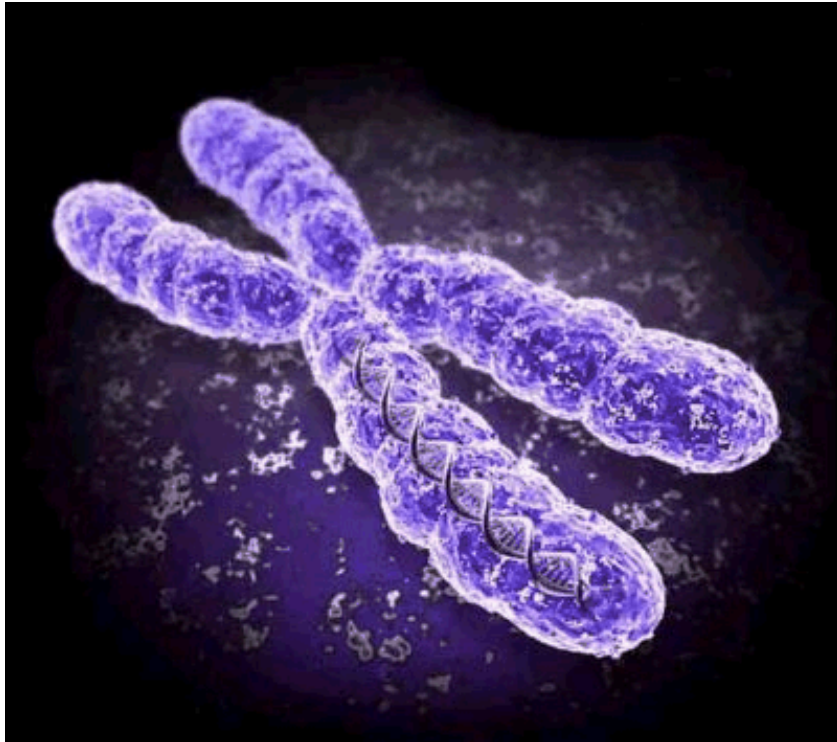
- **What starts it?**
- **What maintains it?**
 - Cattle – blastocyst IFNgamma, then fetal membranes
 - Mares - endometrial cups, then fetal membranes
 - Dogs and cats - CL





Early Embryonic Death

- Chromosomal abnormalities
- Not enough progesterone





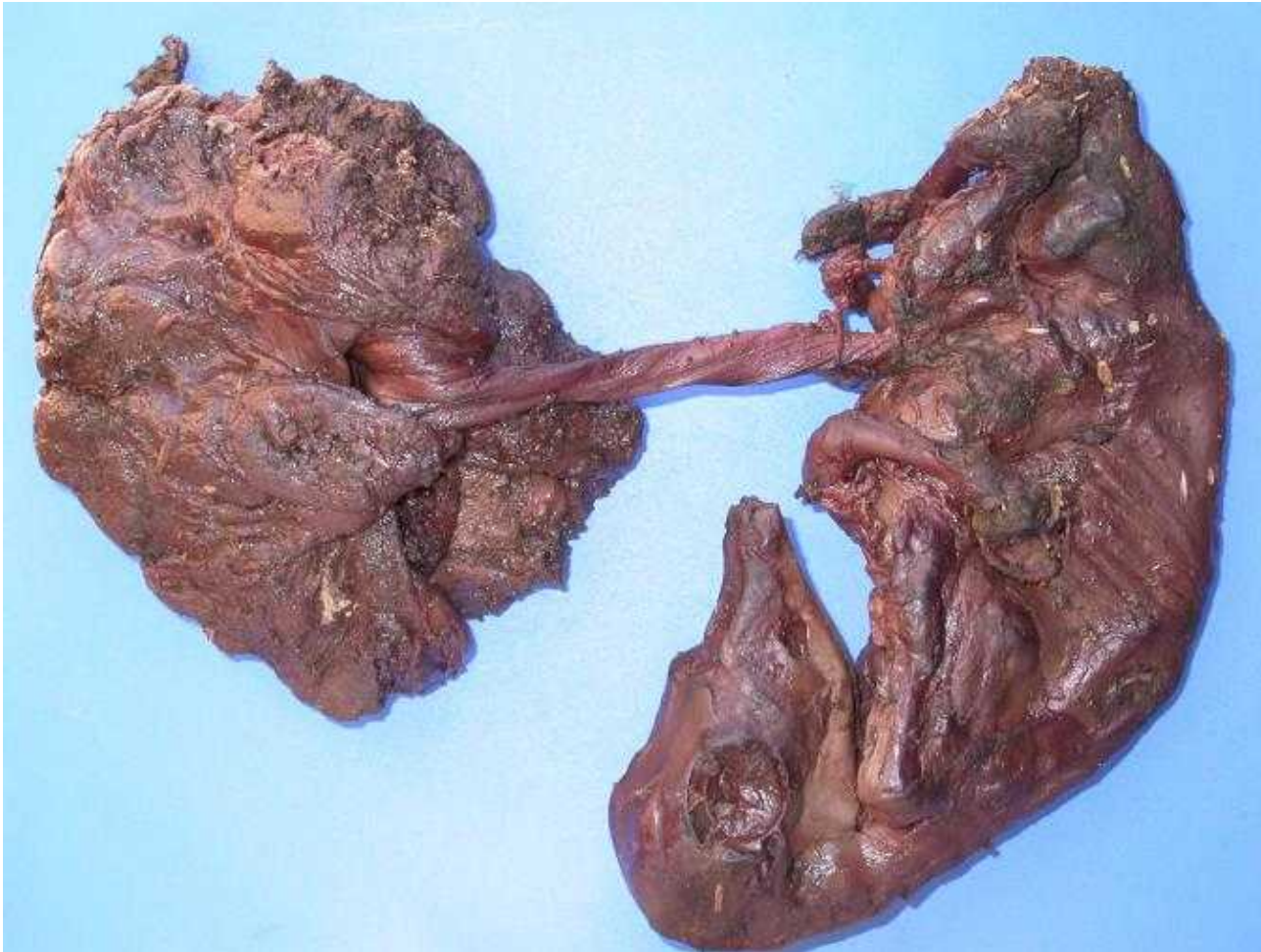
Mummification/Maceration

- **Multiparous species only**
- **Difference is whether or not bacteria get in**
- **Can look pretty bizarre**





Mummified fetus





Macerated fetus





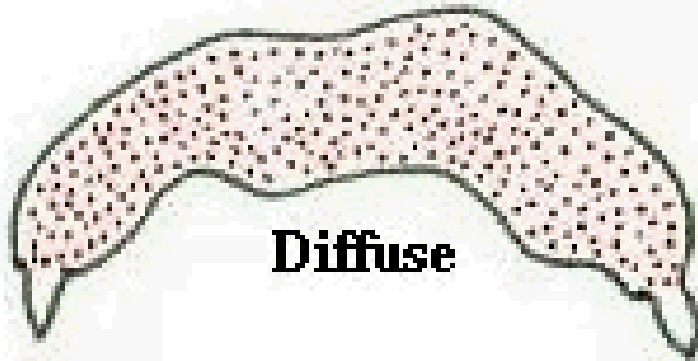
Placentation

- Based on AREAS of connection
- Based on LAYERS of connection

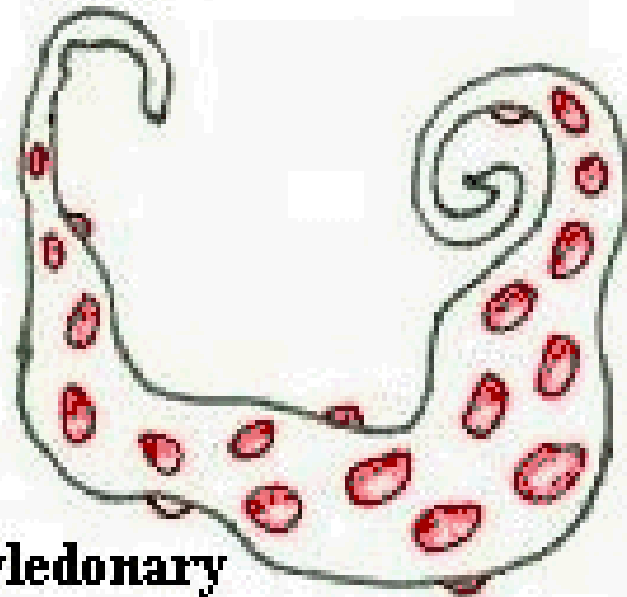




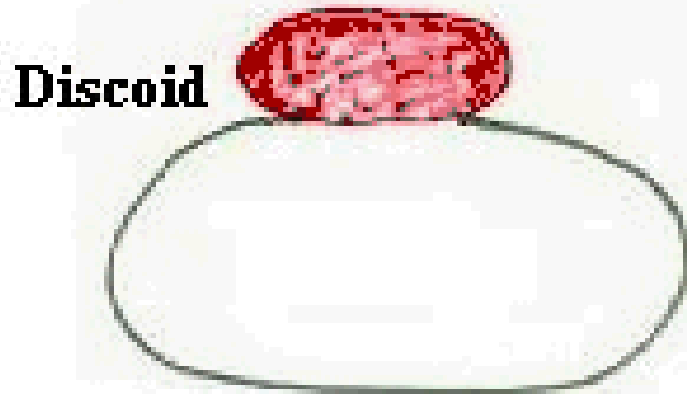
Based on AREAS



Diffuse



Cotyledonary



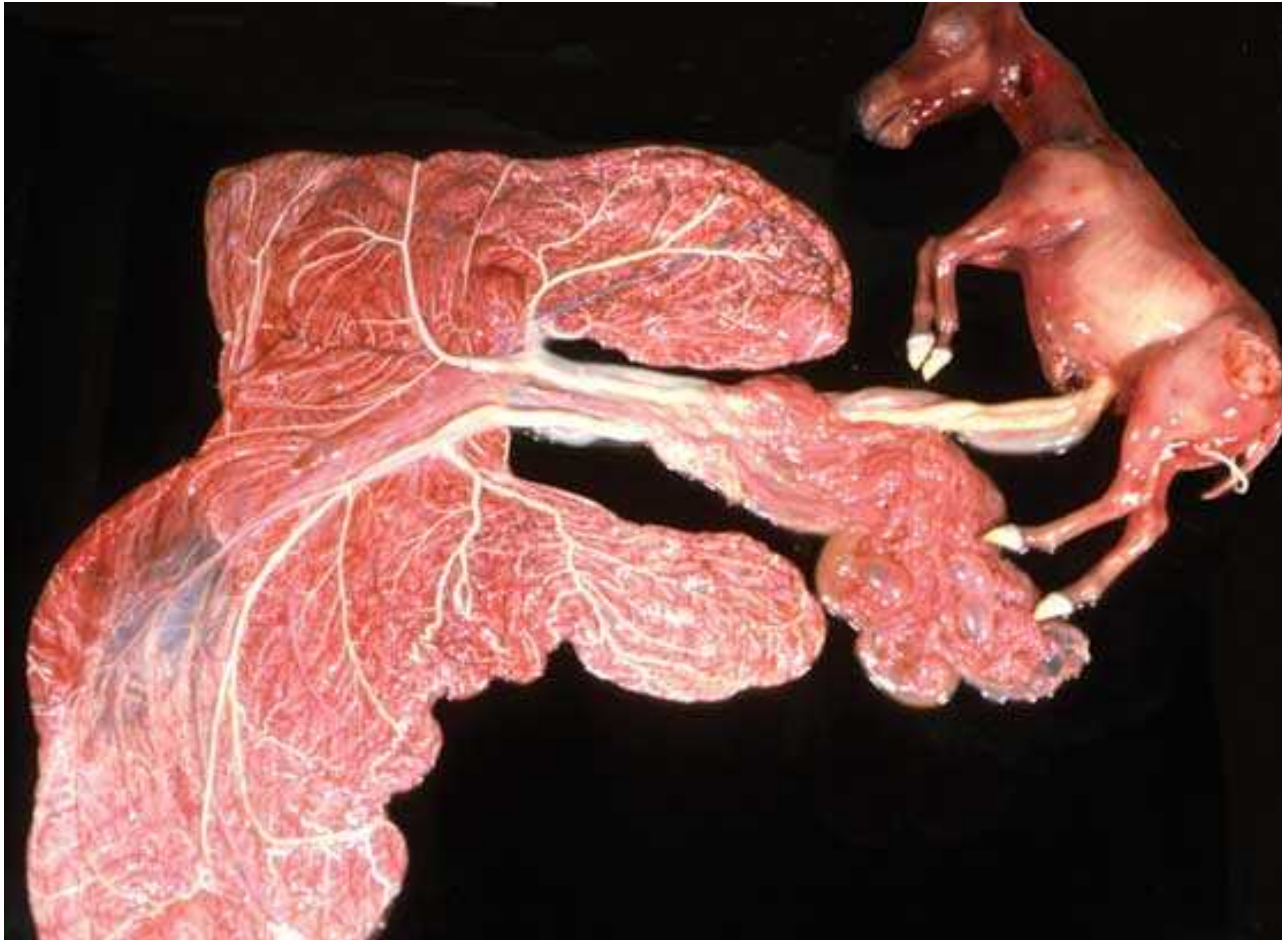
Discoid



Zonary

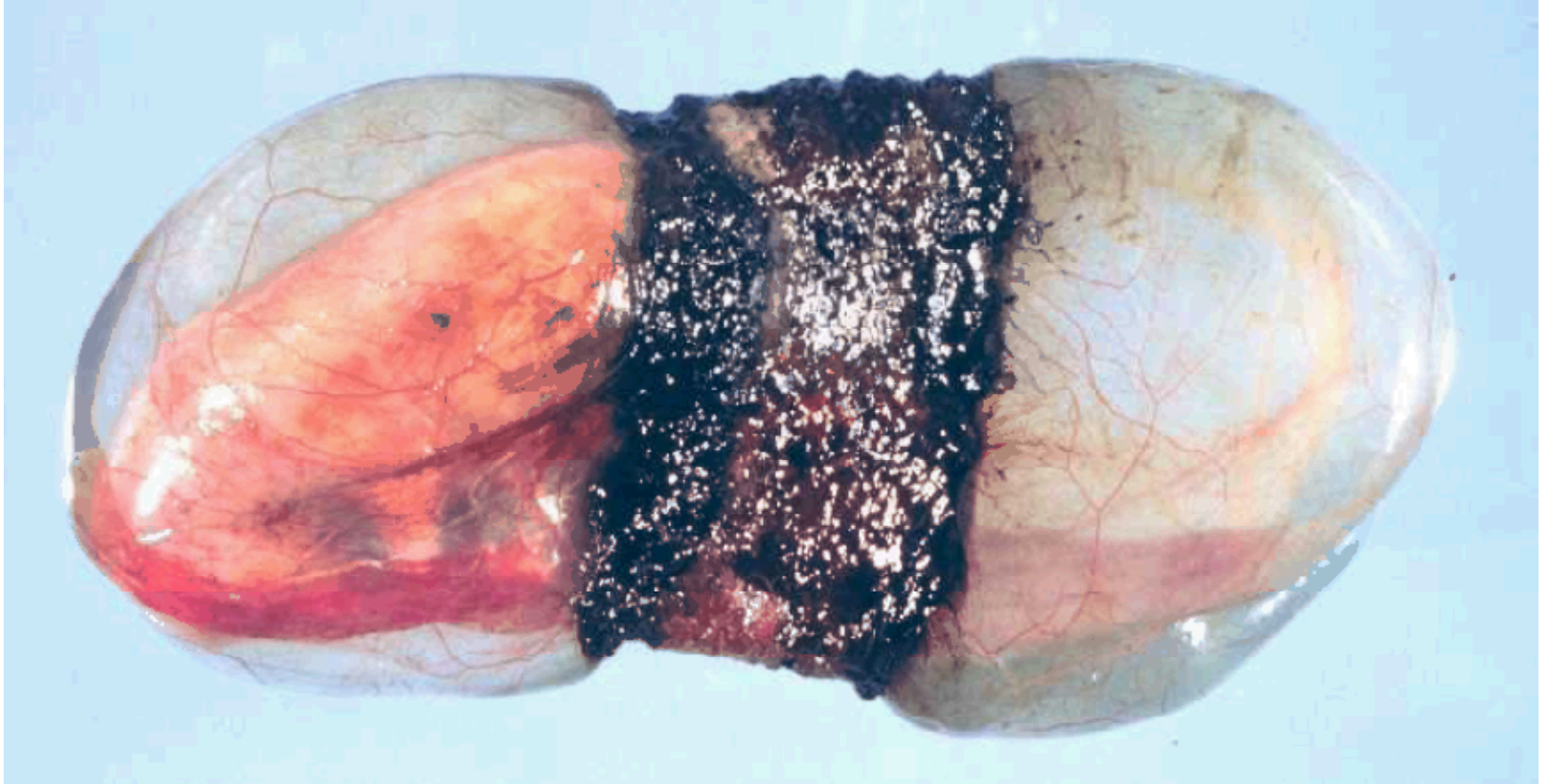


Horse - diffuse



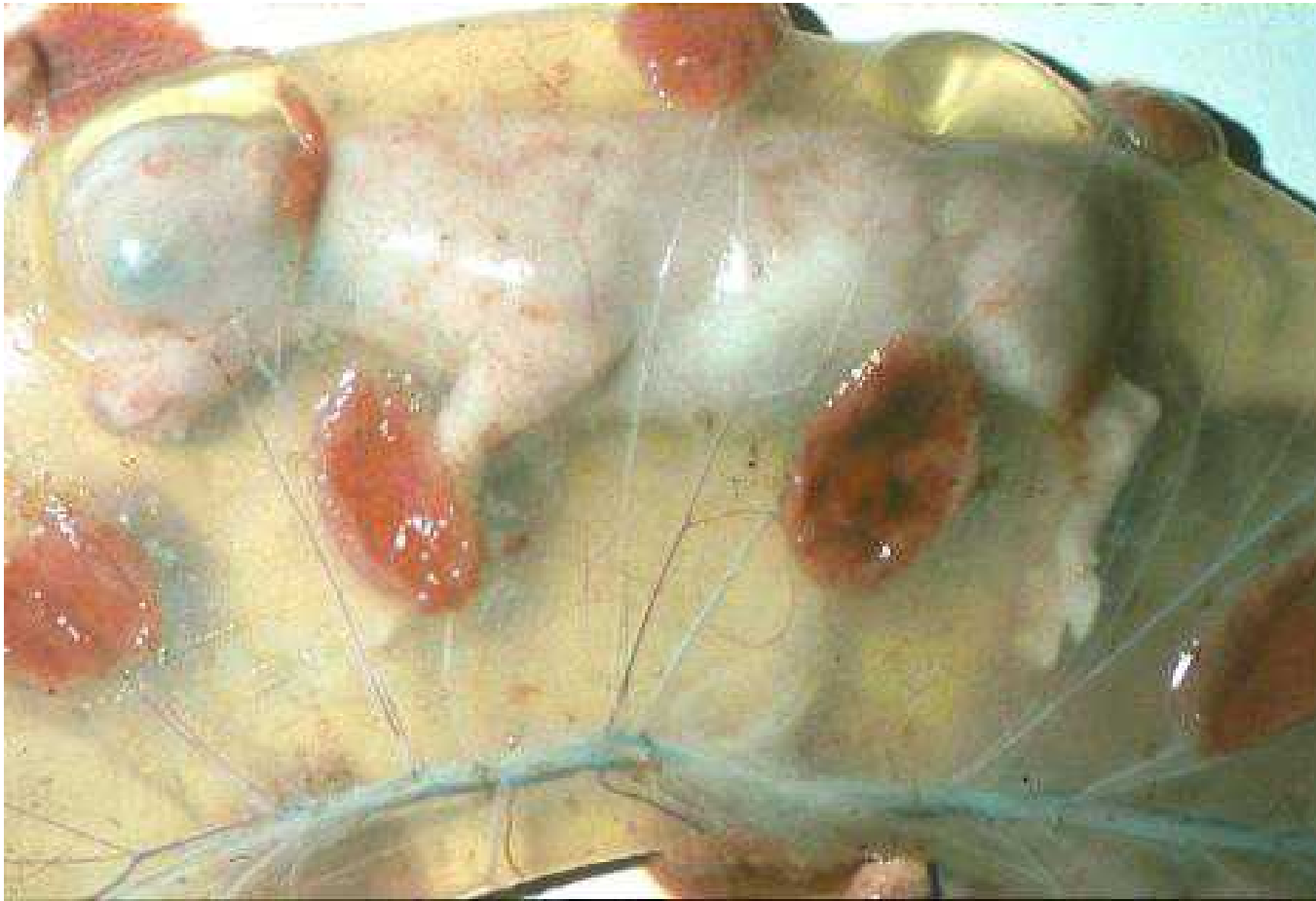


Carnivores - zonary



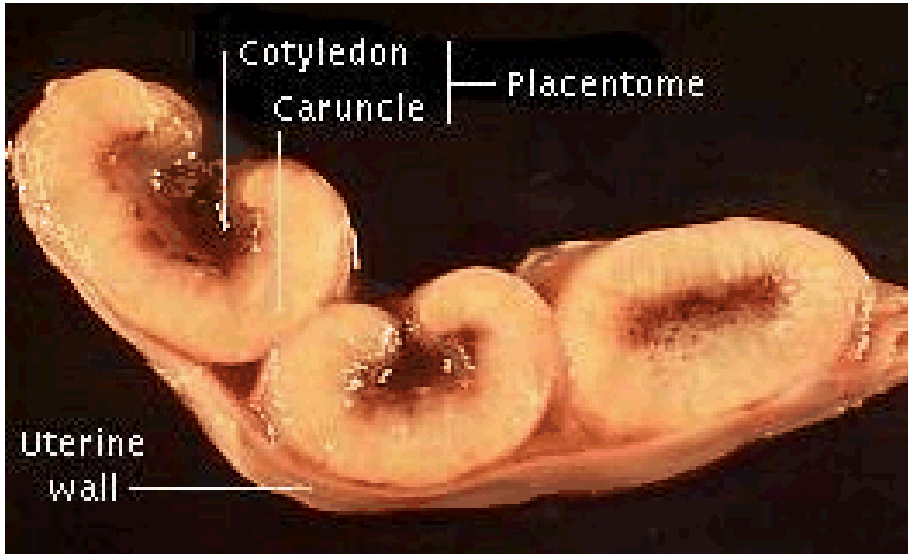


Ruminants - cotyledonary





Bovine - cotyledonary





Based on LAYERS



What does this mean in terms of prenatal transfer of large proteins, like antibodies?

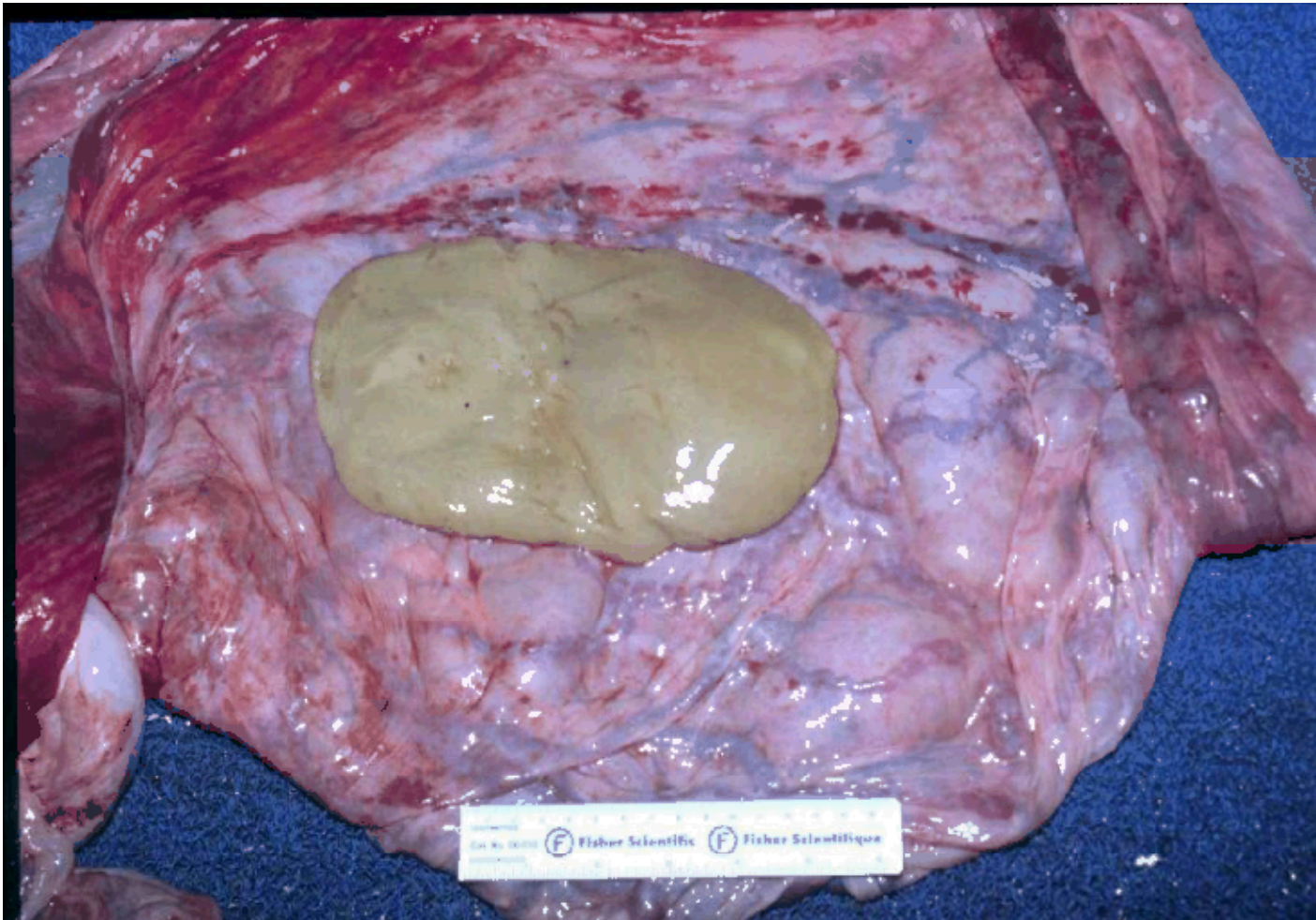


Placental structures that are **NOT** lesions!

- **Adventitial placentation**
- **Amniotic plaques**
- **Hippomanes**



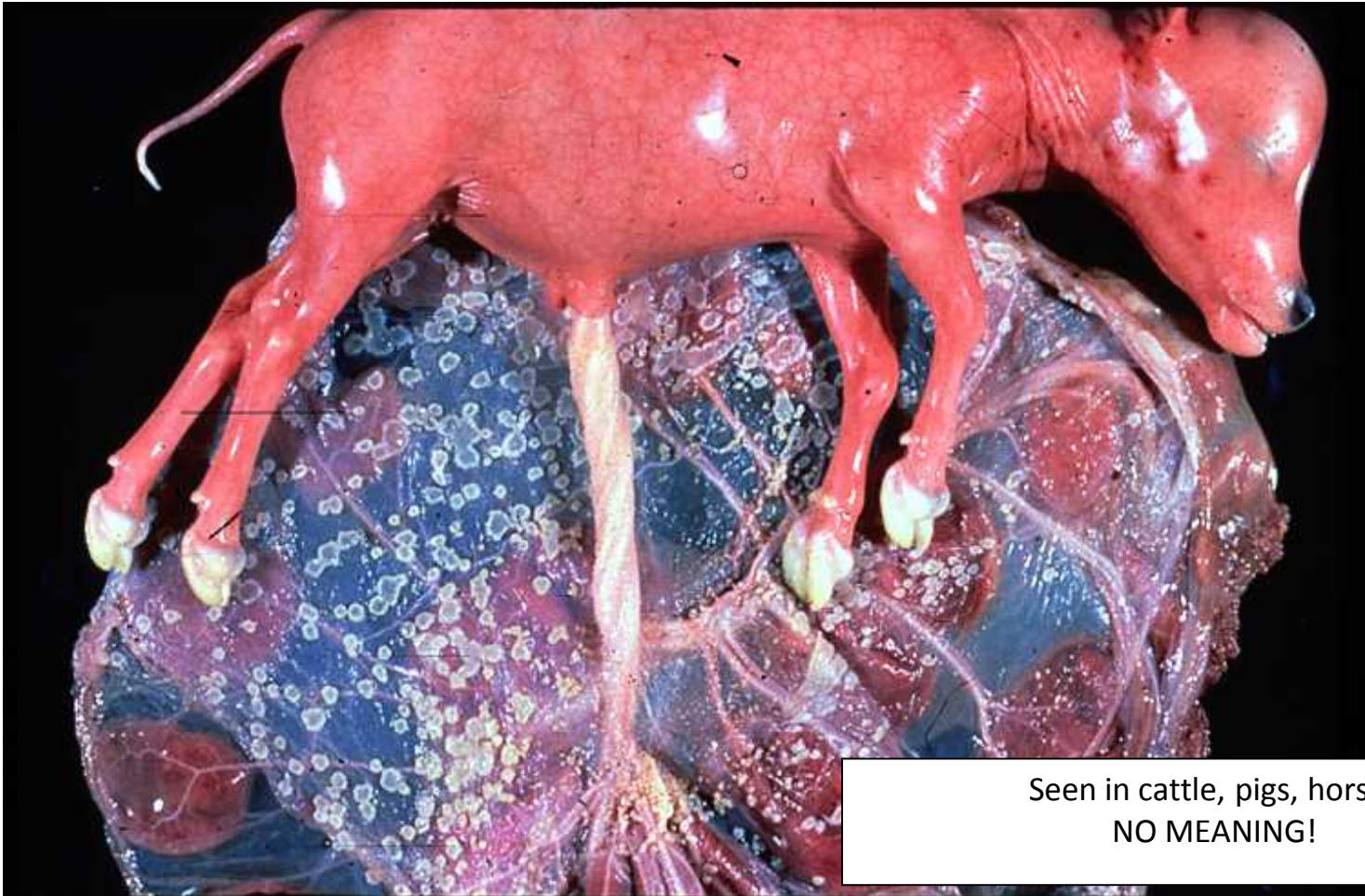
Hippomane/ Bovimane/ Camelomane







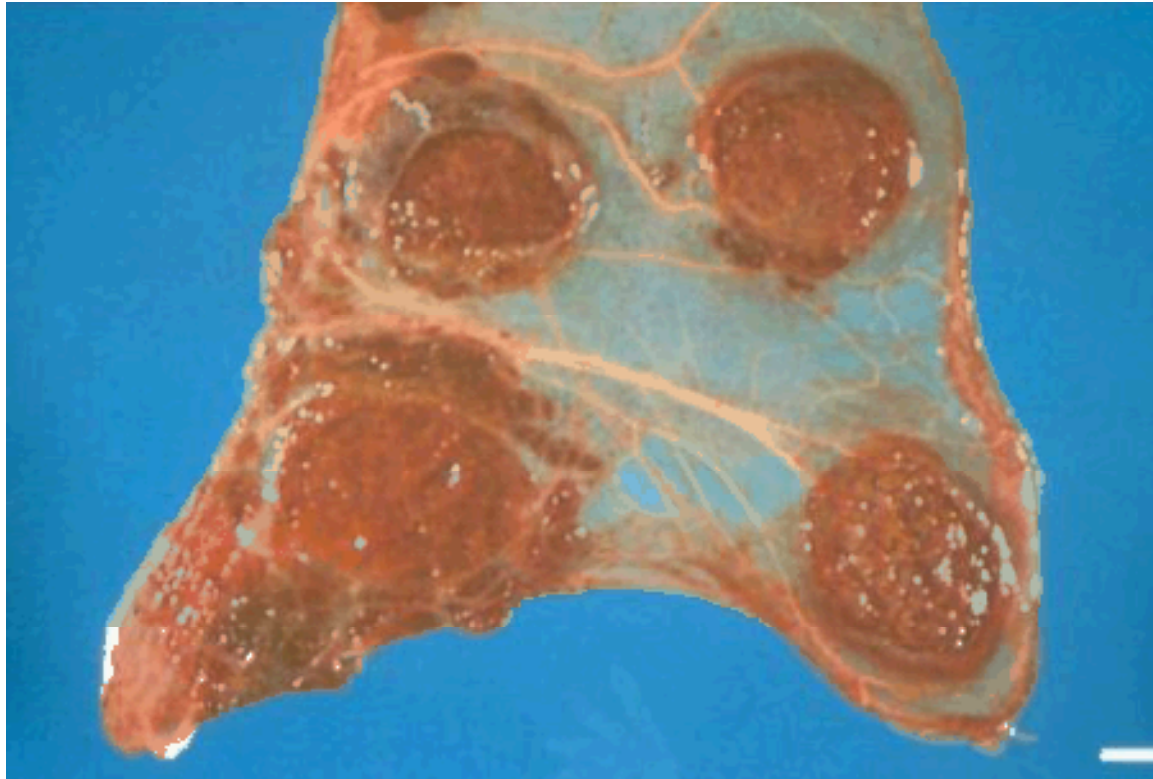
Amniotic plaques



Seen in cattle, pigs, horses
NO MEANING!



Adventitial placentation

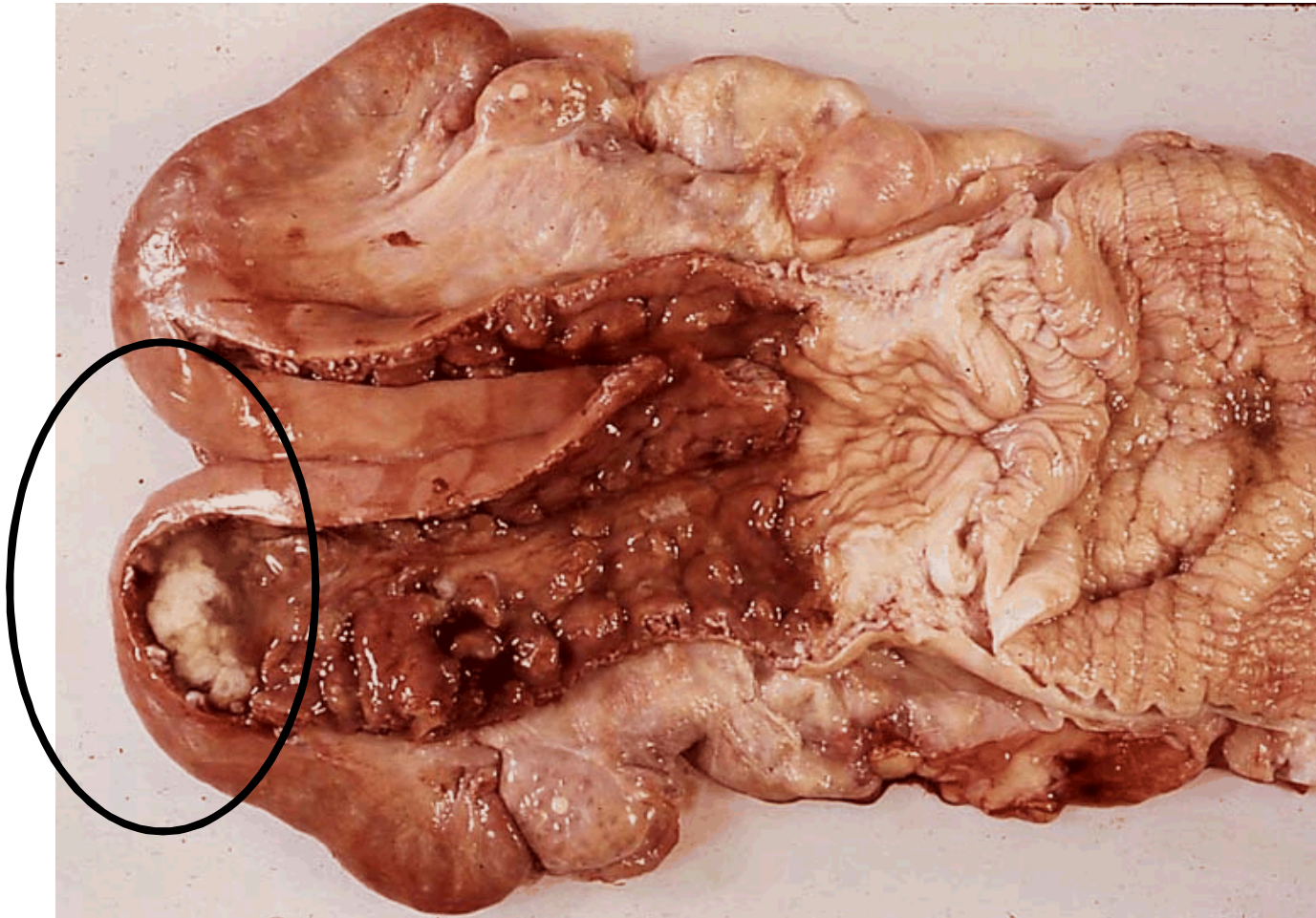




Retained placenta

- **Placental expulsion in the mare should not take more than 2 hours.**
- **In the cow, placenta should be expelled within 12 hours.**
- **A retained placenta can predispose to infection**







Abortion and Stillbirth

- **What is the difference?**
 - Timing
 - Viability

**MAJOR cause of stillbirth:
DYSTOCIA**

How to diagnose dystocia????

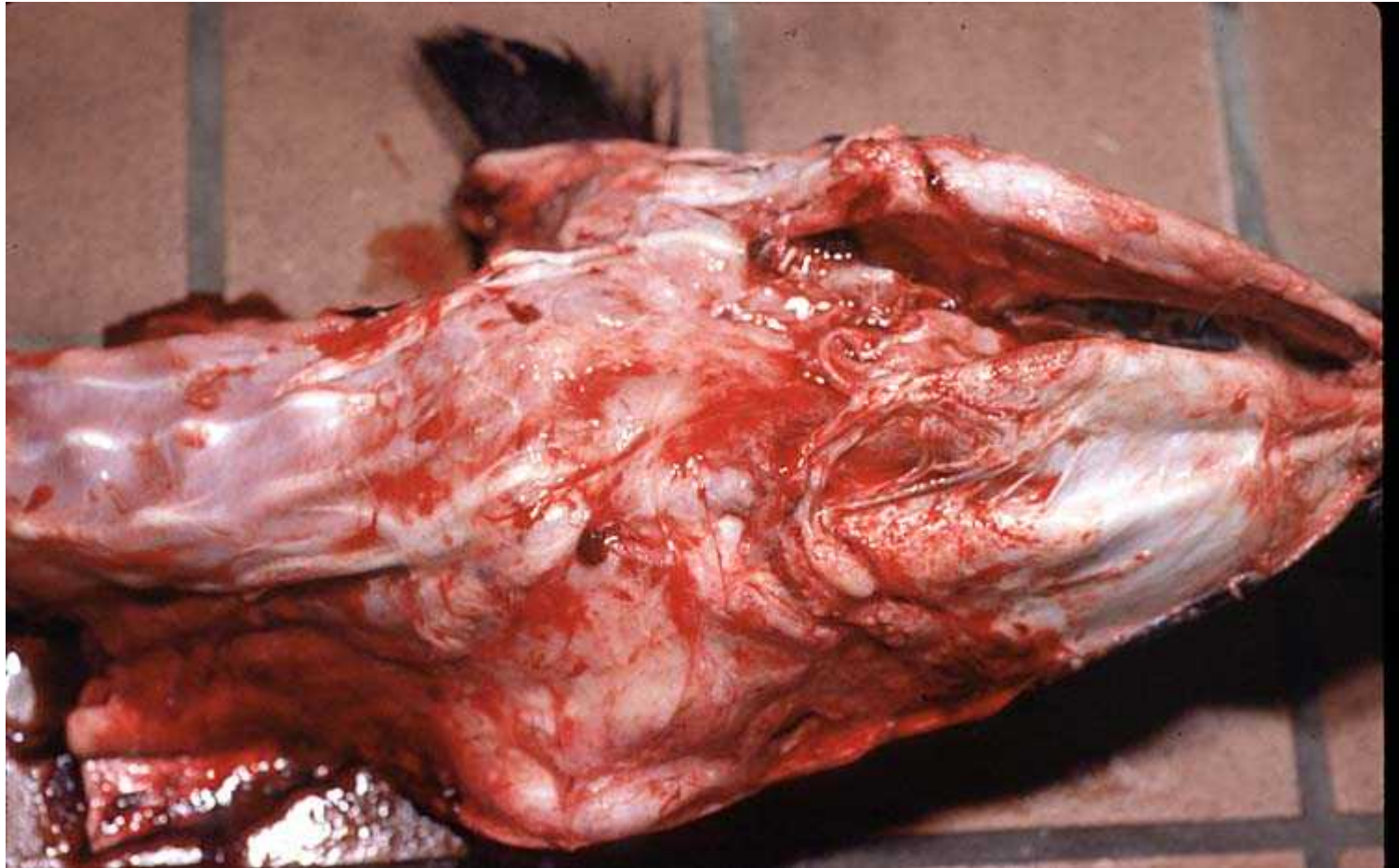


Dystocia

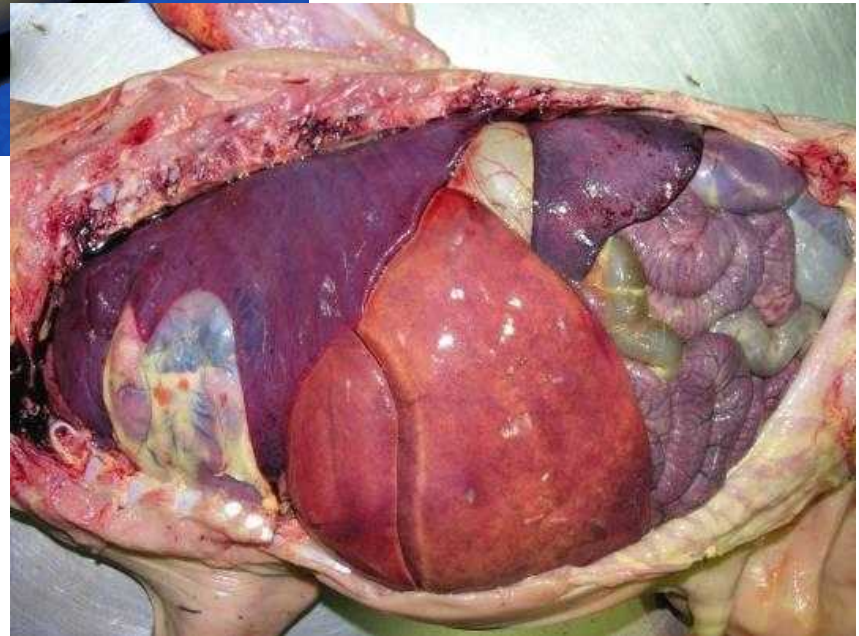
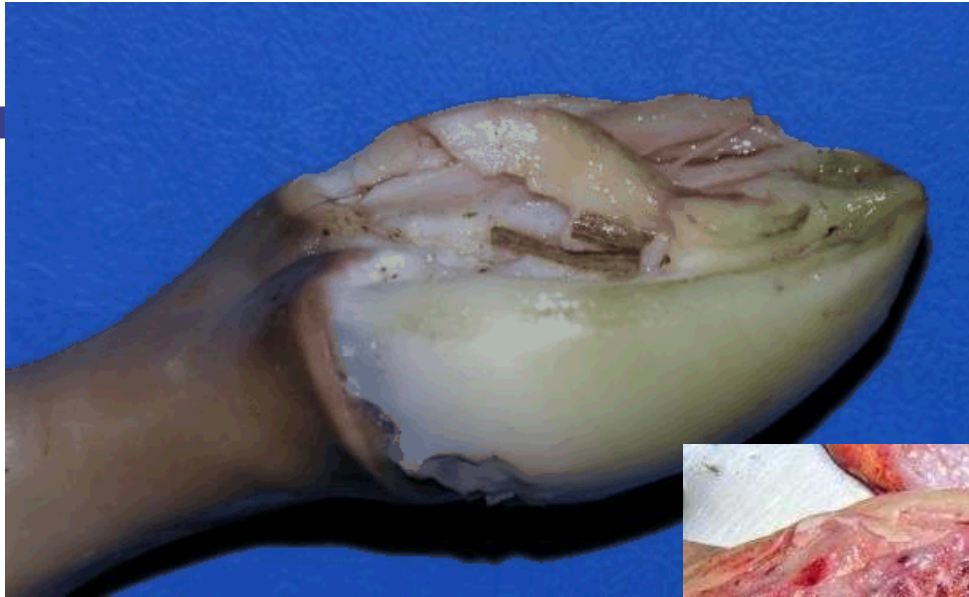
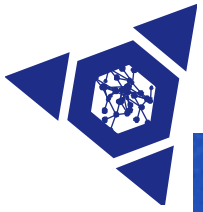




Dystocia











Abortion - Examination

- **PLACENTA**
- **Fetal organs – liver, lung, kidney, brain**
- **Stomach/abomasal fluid**
- **Serum from dam**



Abortion - Infectious

- **Bacteria**
- **Fungus**
- **Virus**

Fetus dies with infection for only two possible reasons –

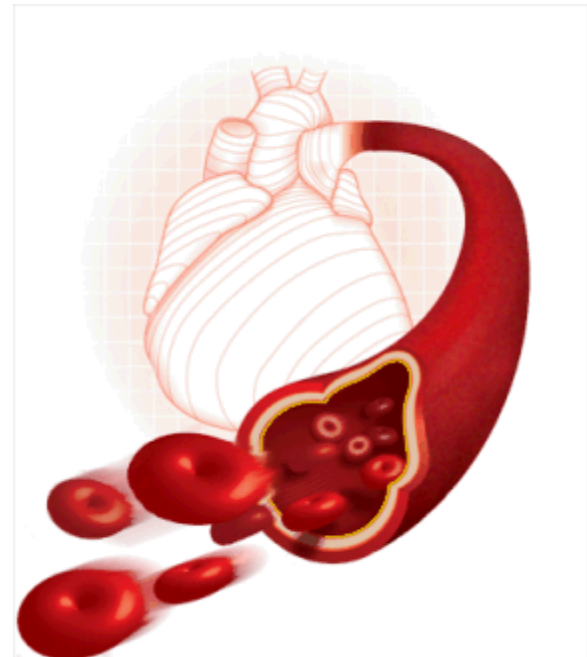
- Infection enters fetus to kill tissue
- Infection causes placenta to be insufficient so fetus dies due to lack of nutrients





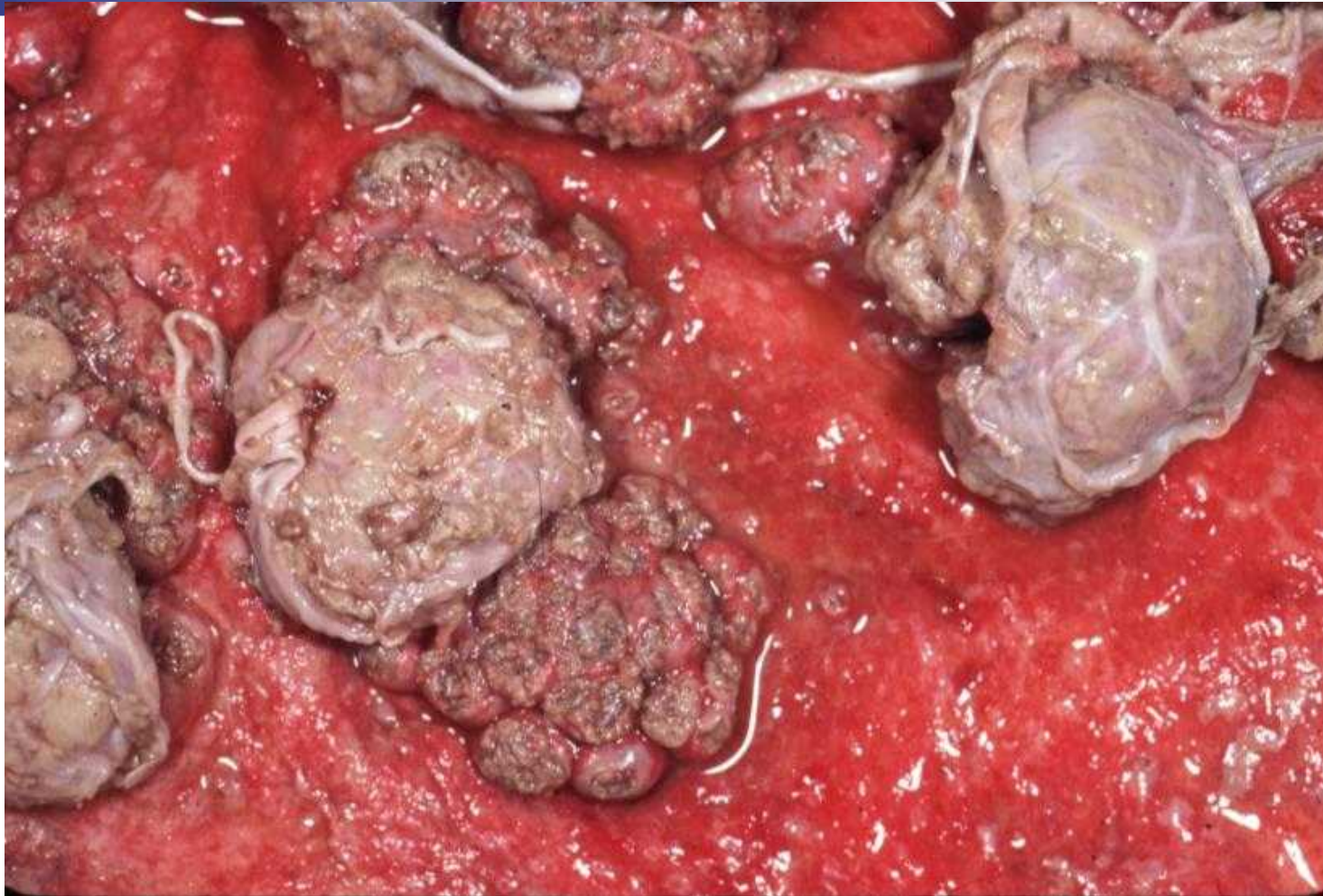
Cattle

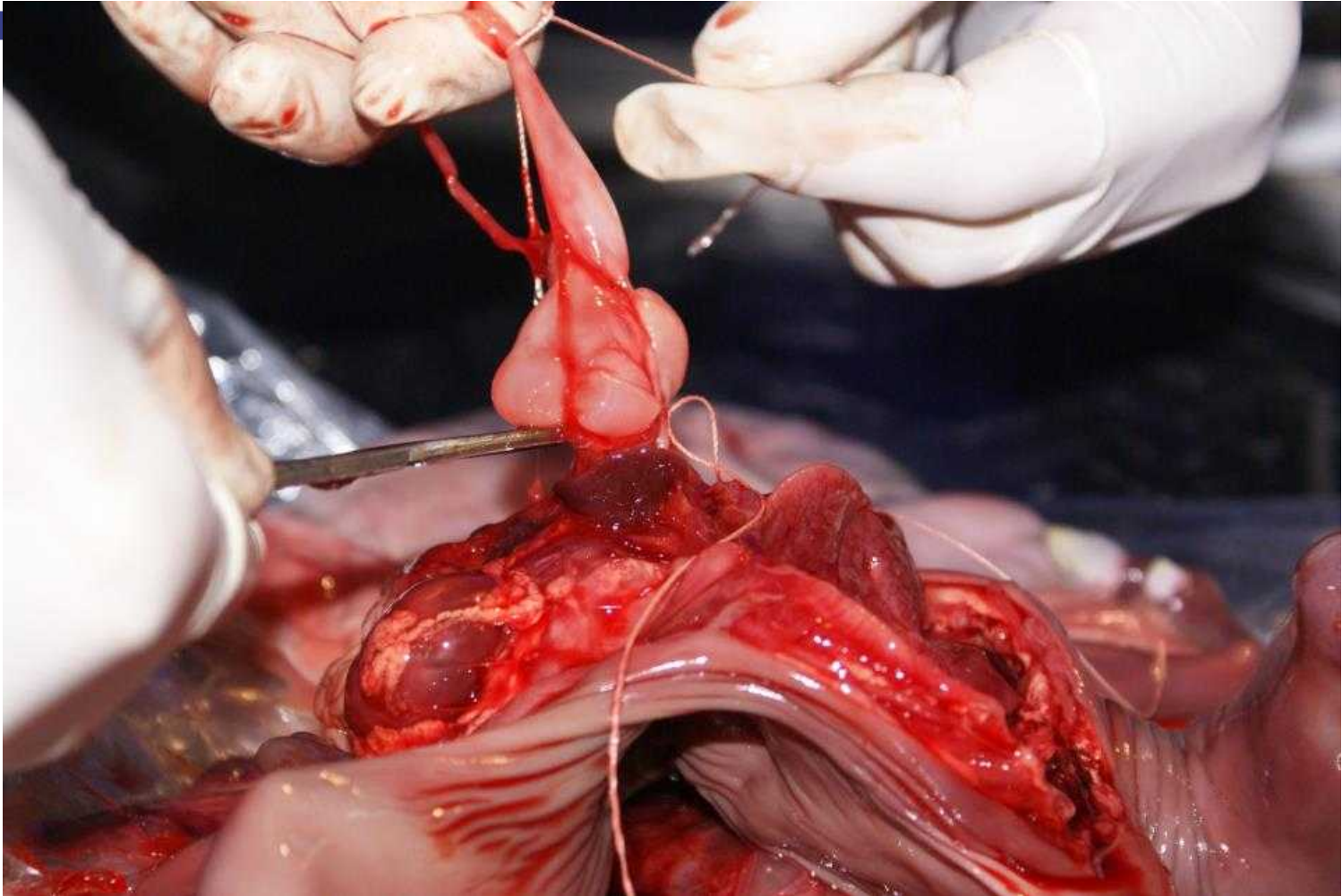
- **Bacteria and fungi – many kinds, not uterine specific**
- **Usually get there through the circulation**





Bacterial placentitis







Mycotic placentitis





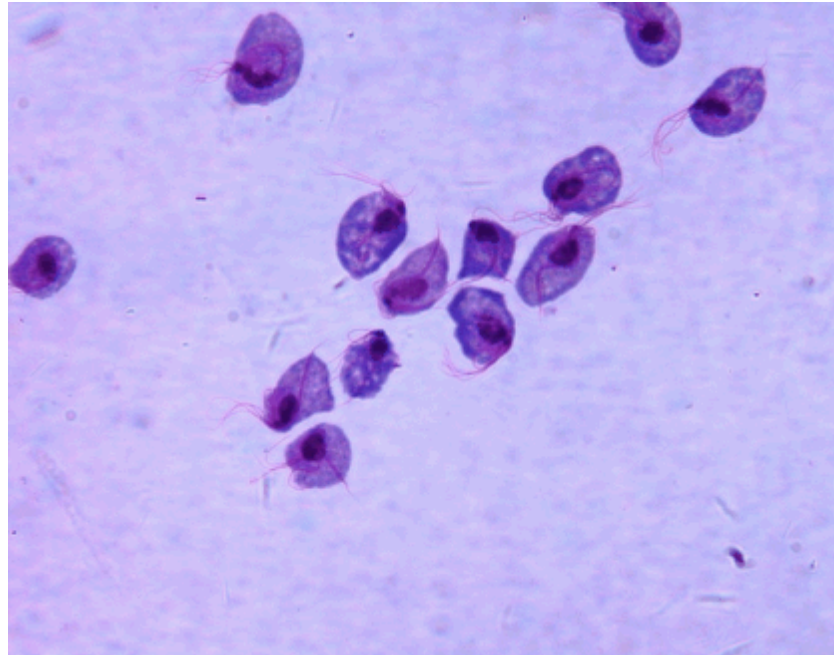
Bovine herpesvirus-1





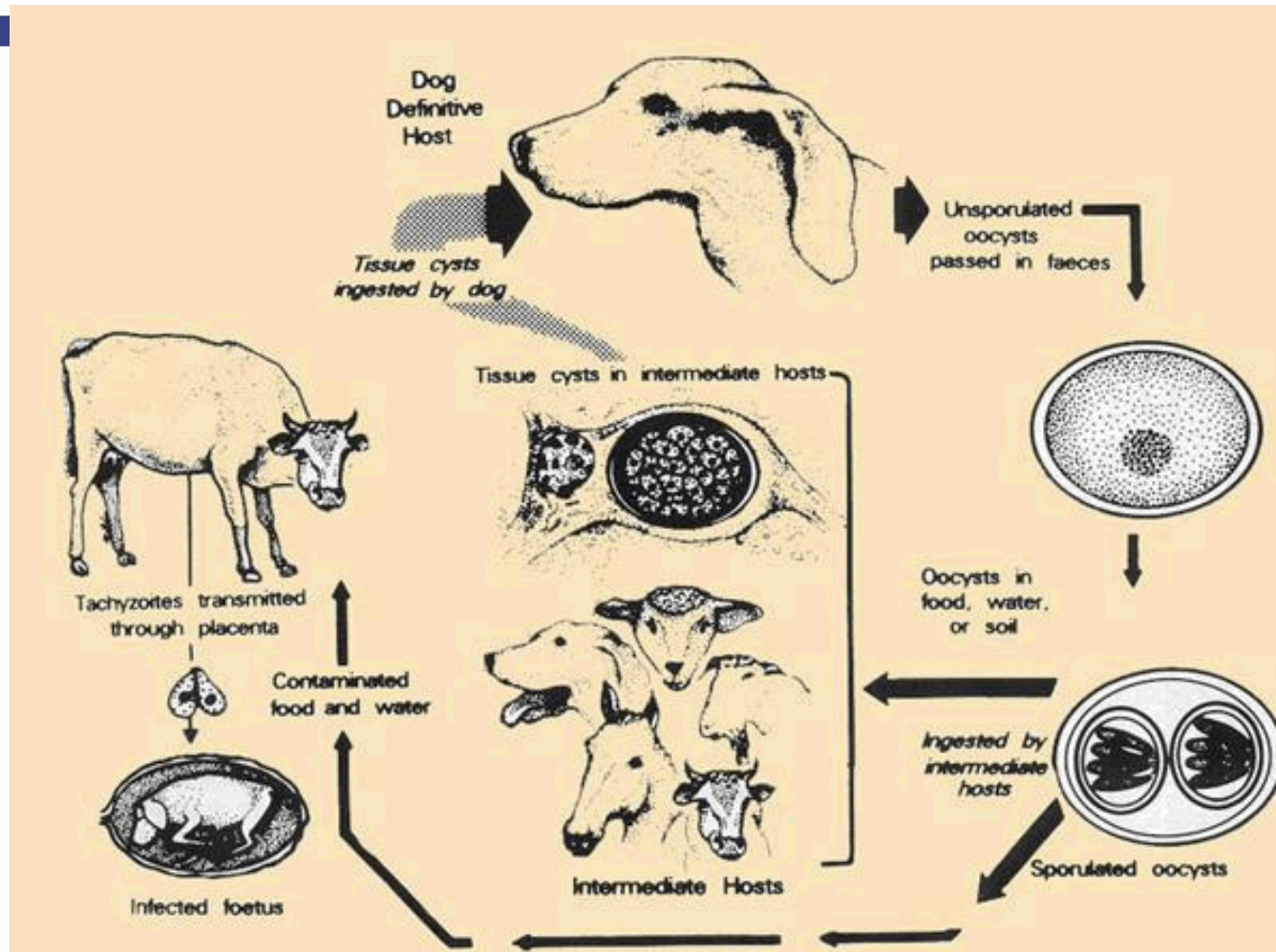
Tritrichomonas foetus

- Abortion is usually **EARLY**, first half of pregnancy





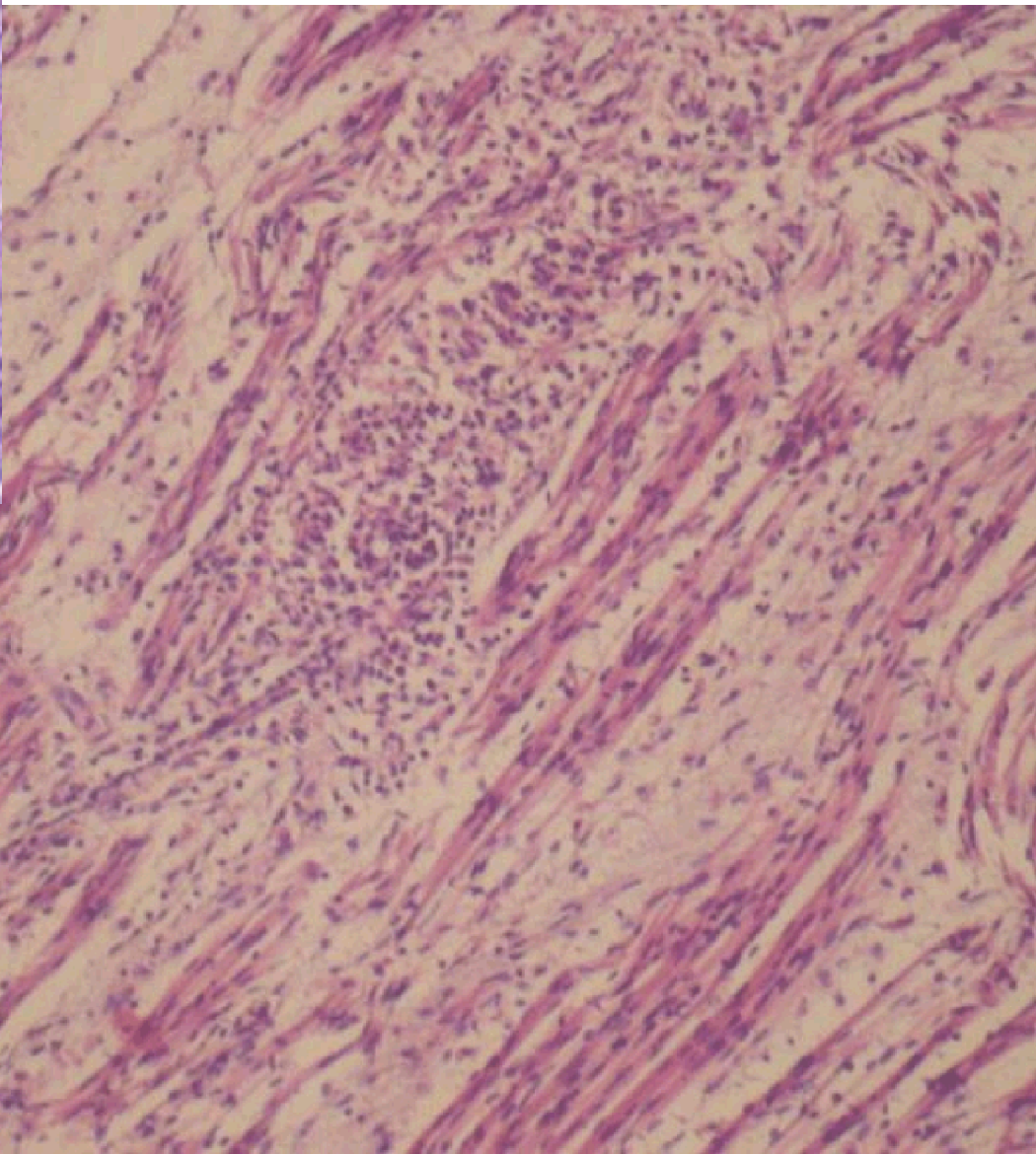
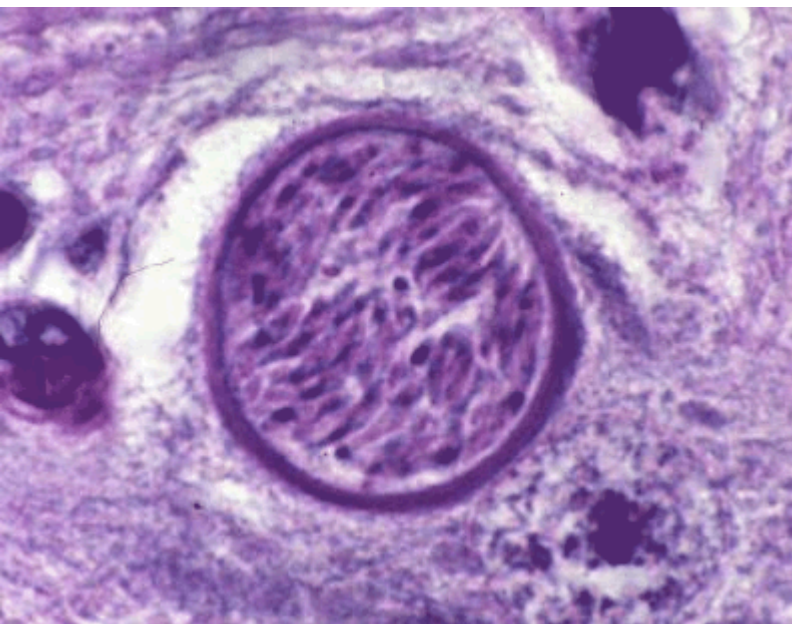
Neospora caninum





6 month gestation, aborted calf







Bovine viral diarrhea

- **Large RANGE of reproductive problems – EED, mummies, abortion, stillbirth, weak calves, congenital defects**



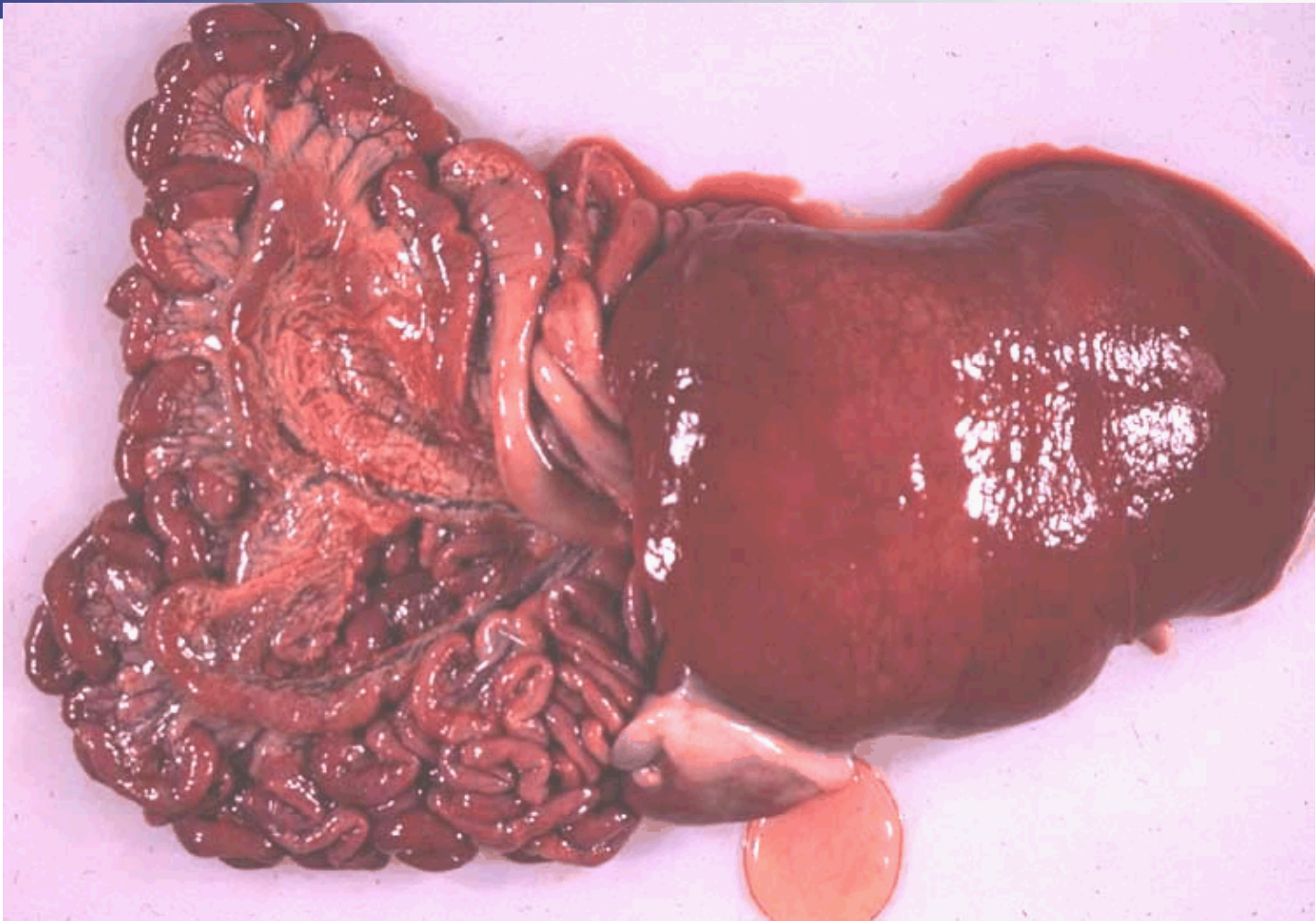
Sheep and goats

- *Chlamydophila abortus*
- *Toxoplasma gondii*
- Q fever (*Coxiella burnetii*)

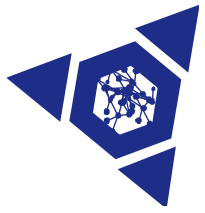




Chlamydophila abortus

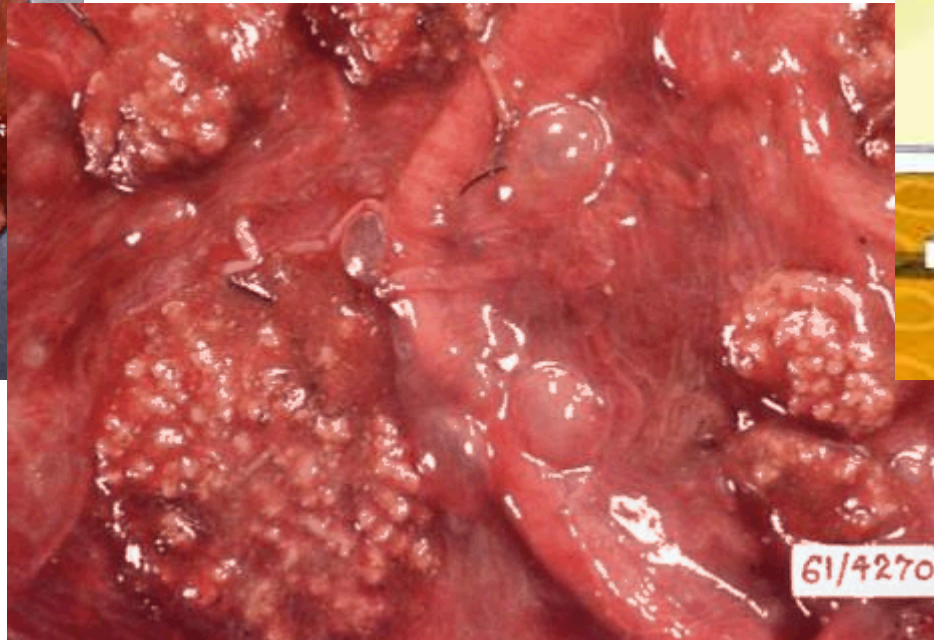
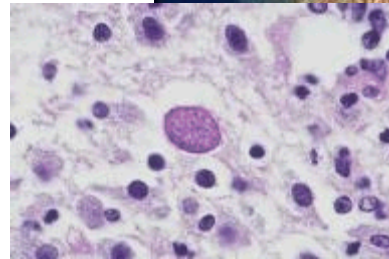
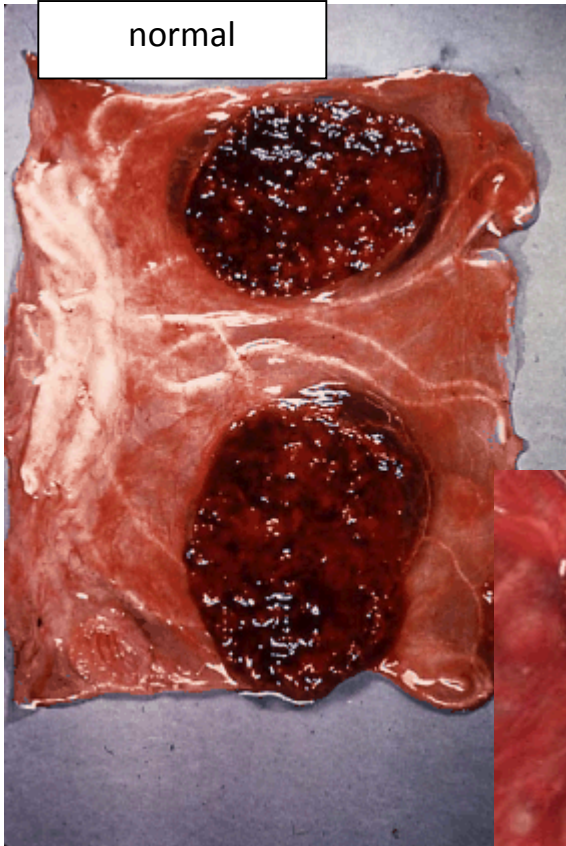


“enzootic abortion of ewes”



Toxoplasma

normal





Q Fever





All ruminants

- **Listeria**
- **Leptospira**
- **Campylobacter**

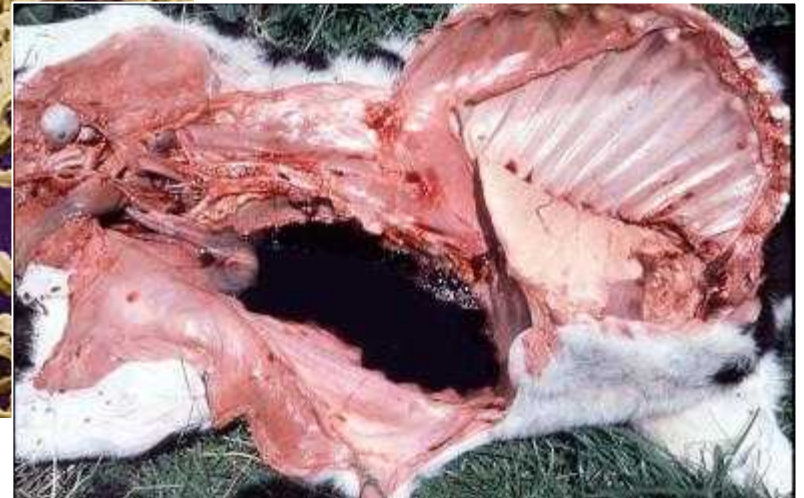
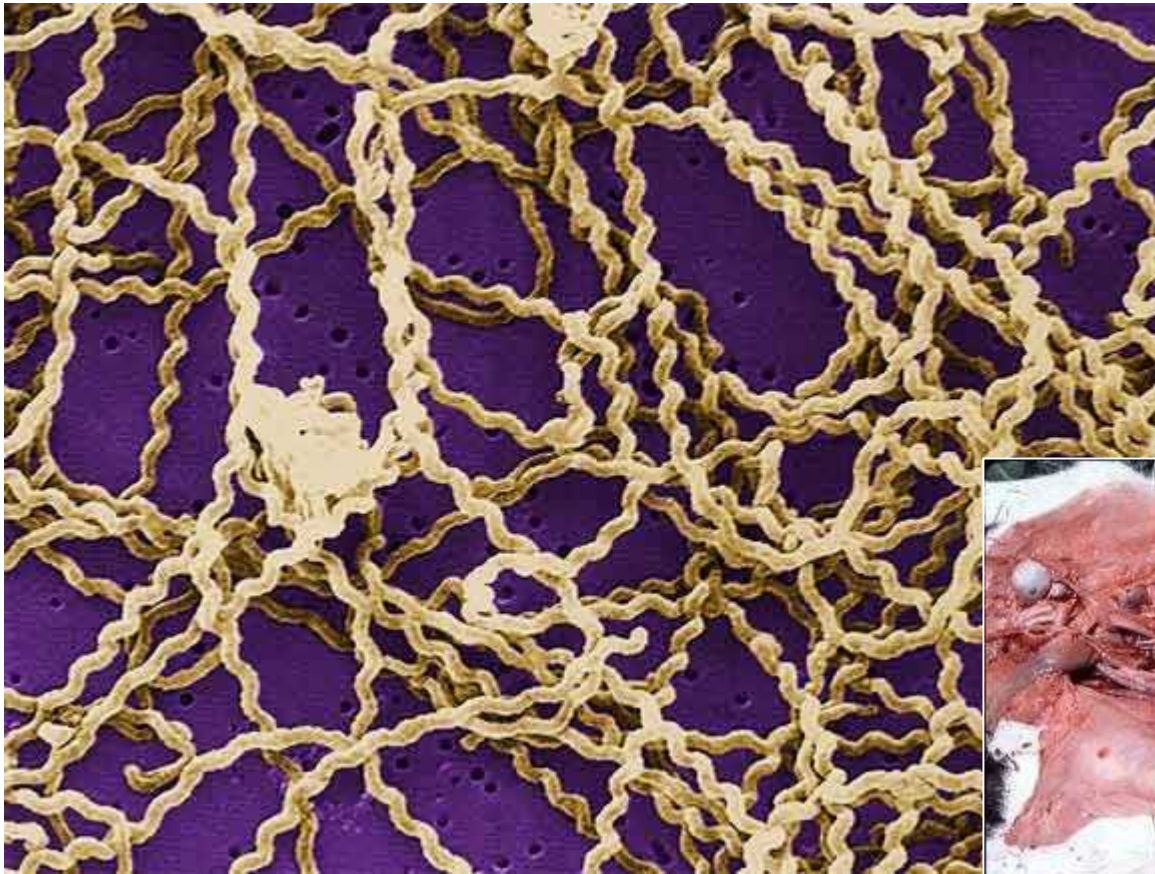


Listeriosis





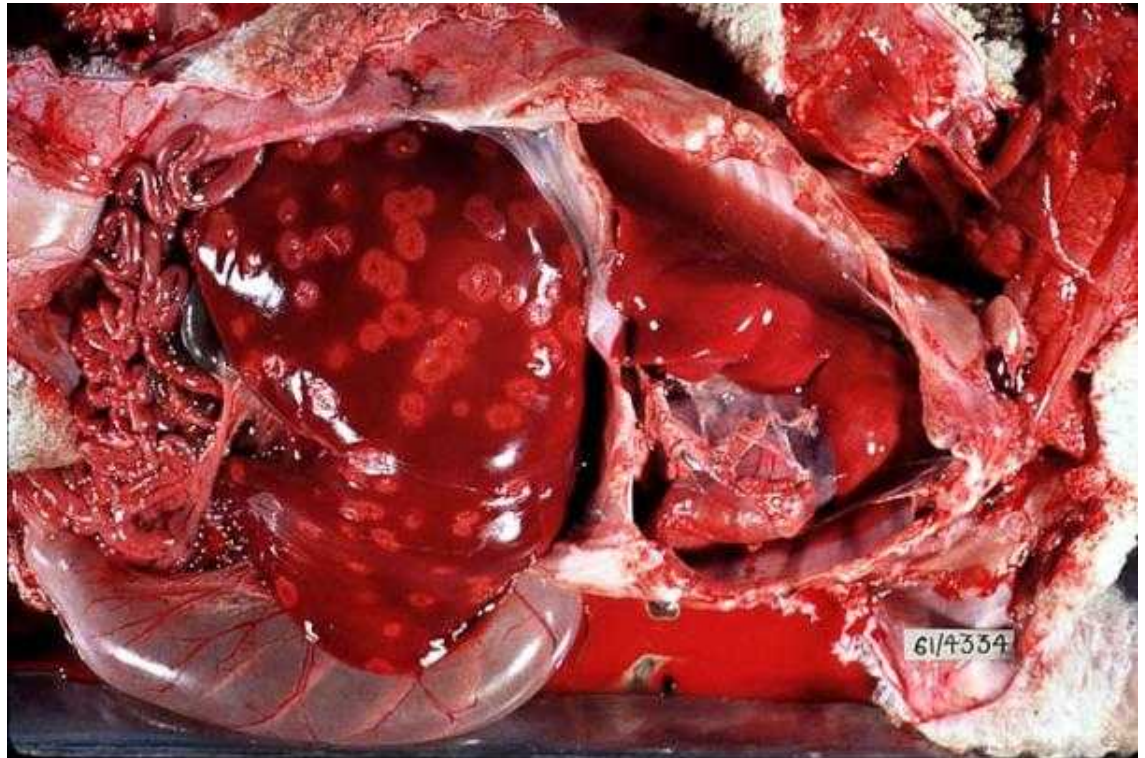
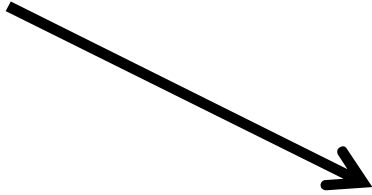
Leptospira

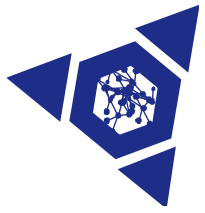




Campylobacter

- Cattle – mostly infertility
- Sheep – Abortion





Equine abortion

- **Most common cause is TWINNING**
- **Another common cause is twisted umbilicus**





Equine abortion

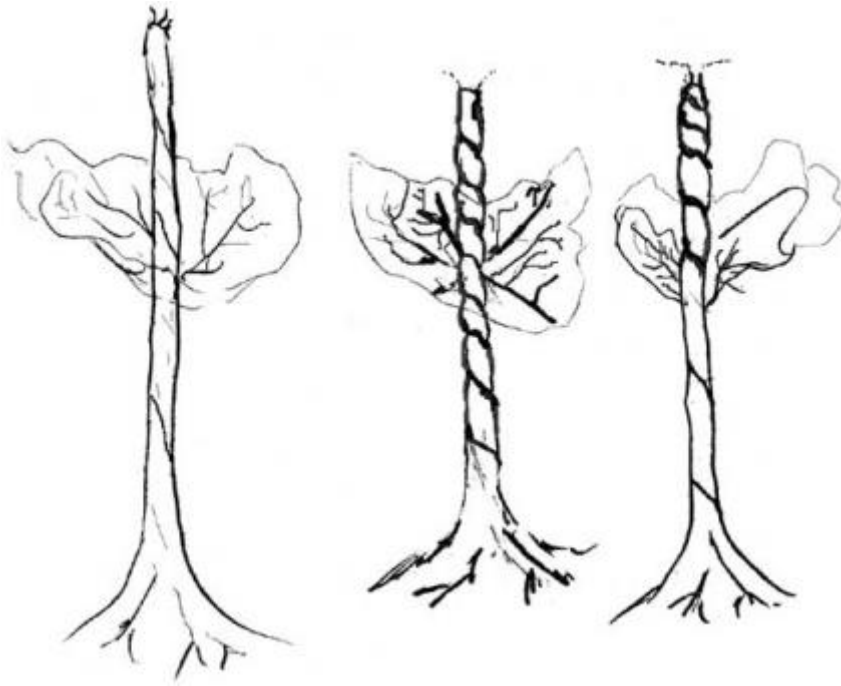
- Twisted umbilicus





Equine abortion

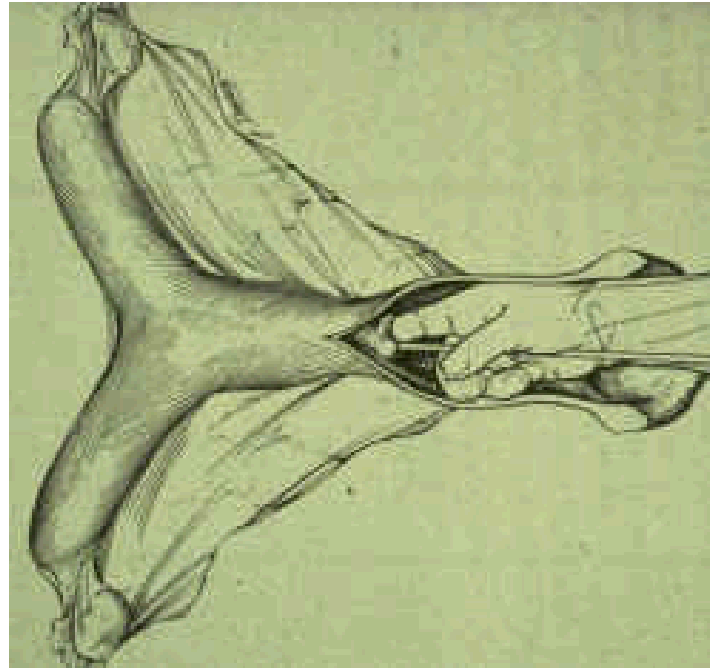
- **Twisted umbilicus**





Equine abortion

- **Common bacteria and fungi, usually come in THROUGH THE CERVIX**





Equine herpesvirus-1





Equine viral arteritis

- Kills the fetus – pneumonia, periarteritis
- Vascular lesions in mare's uterus also

