

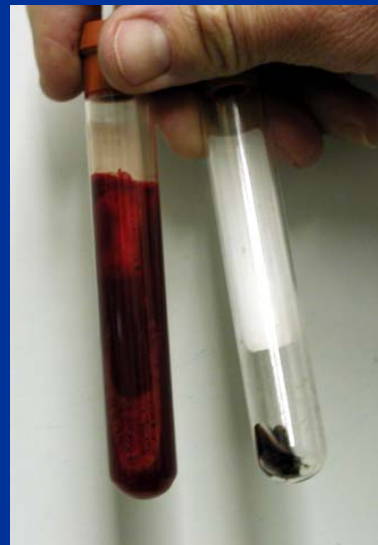
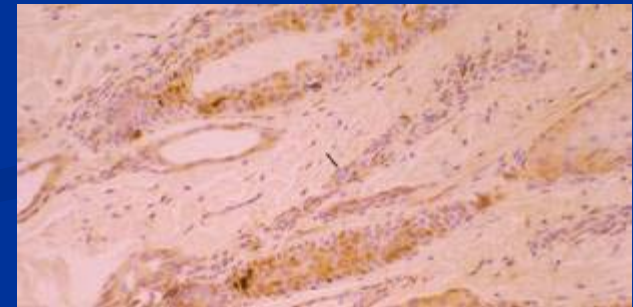
# Use of Placental Tissue for diagnosis of Bovine Viral Diarrhea Virus Persistently Infected Alpaca Crias

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# Diagnosing BVDV PI Neonates

- Cattle:
  - Ear Notch (Skin) Sample
    - Immunohistochemistry
    - Antigen Capture ELISA
    - PCR
- Alpacas:
  - Blood
    - PCR



# Camelid Owner Concerns

- Blood sampling frequently requires a veterinarian's assistance
- Cost to owner for testing
- Ear notch (skin) sampling
  - Aesthetics for Alpacas?
  - Validity

# How else can we test for BVDV in Neonatal Alpaca's?

- Placental tissue
  - Easy to get
  - Owner
  - Tests at birth
- Fetal tissue has been studied in cattle, why not in alpaca's?



# Objective

- Determine if PCR testing of placenta tissue could be used to identify BVDV infection in newborn alpaca crias.



# Study Protocol

- 20 Alpaca Crias
  - Blood Sample
  - Placenta Tissue Sample
- BVDV rtPCR performed on samples
  - CSU Veterinary Diagnostic Laboratory
- Compared the results of the placental PCR with that of the blood PCR



# BVDV rtPCR Procedure

## ■ CSU Diagnostic Laboratory

### ■ Primers

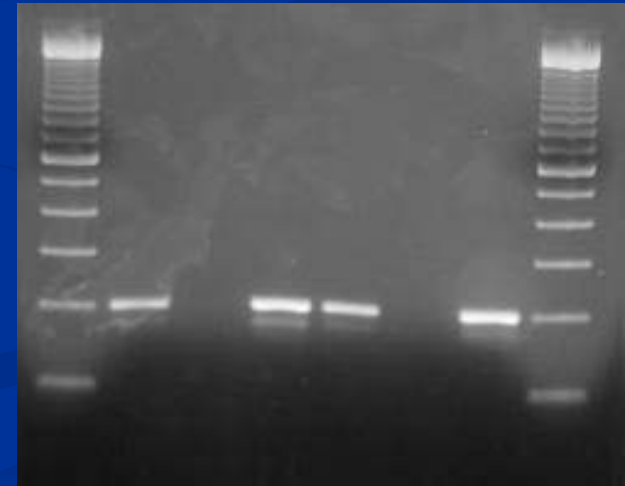
#### ■ Forward

- 5'-GTA GTC GTC AGT GGT TCG-3'
- 5'-CGA CAC TCC ATT AGT TGA GG-3'

#### ■ Reverse

- 5'-GCC ATG TAC AGC AGA GAT-3'
- 5'-GTC CAT AAC GCC ACG AAT AG-3'

### ■ Reverse Transcriptase



# Results

Blood PCR	Placenta PCR	Total
Positive	Positive	2
Positive	Negative	0
Negative	Positive	1
Negative	Negative	17

# Test Validity

- Sensitivity
  - 100%
  - Small sample size ( $n=2$ )
- Specificity
  - 94.4% (17/18)
  - 95% CI = 72.7-100%
  - One False Positive Test?



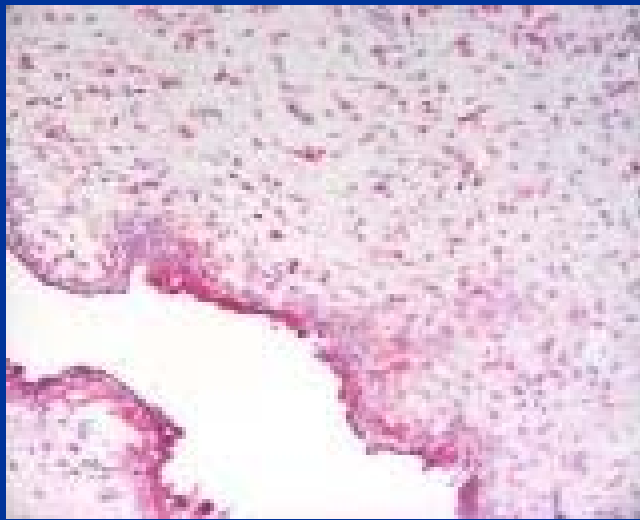
**Why the False Positive?**

# Transient Congenital Infections

- Fetus and Placenta Infected *in utero*
- Fetal immunity clears fetal infection
- Placenta Immune Privileged
  - Maternal Tissue Rejection
  - Fetal Tissue Rejection
  - BVDV persists in placental tissue

# Placenta Immunohistochemistry

- Collaboration with Dr. Clayton Kelling



**BVDV IHC Positive Placenta**



**BVDV IHC Negative Placenta**

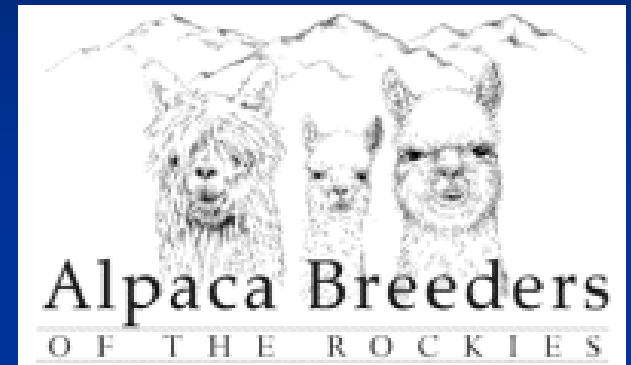
# Conclusions

- **BVDV PCR of Placental Tissue is a good PI screening test for alpaca neonates.**
- **The placenta sample can be easily collected by the owner.**
- **A confirmatory Blood PCR is recommended for positive animals to confirm PI status.**
- **Congenital BVDV infection may provide a model to study placental immune recognition.**



# Acknowledgements

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- Dr. Clayton Kelling



***Integrated  
Livestock  
Management***

