Why Control BVD?
Economic and Production Costs
Tools to Accomplish Control

Bob L. Larson, DVM, PhD

University Outreach & Extension
Commercial Agriculture Program
University of Missouri-Columbia

Bovine Virus Diarrhea (BVD)

- Production losses stem from…
  - Reproductive losses
  - Clinical diseases from acute infections
  - Part of other disease complexes (immunosuppression)
  - Losses from persistently infected animals

Bovine Virus Diarrhea (BVD)

- Respiratory System
  - Part of respiratory disease complex (BRD)
- Digestive System
  - Diarrhea
- Reproductive System
  - Abortion, stillbirths, fatal birth defects

Transmission of BVDV

Horizontal

(occurs after birth)

- Direct contact
- Inhalation or ingestion of contaminated material
  - Transiently infected animals shed virus 4 to 10 days
  - Persistently infected animals shed virus throughout life
  - Virus persists in environment short time (≤ 2 wks)

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Vertical (occurs during gestation)

- Infection of fetus from viremic dam
  - Can result in persistently infected (PI) animal

Transmission of BVDV

- Persistently infected (PI) cattle have a very high and persistent viremia
- Virus is shed from all body secretions

  nasal discharge, saliva, semen, urine, tears, milk, and feces
- One hour contact with PI will transmit virus to susceptible cattle
- Air transport over short distances is likely
- Transiently (temporarily) infected cattle are far less efficient at transmitting BVDV

Economic and Production Costs of BVDV – Suckling Calf Diseases

- Potential Costs:

  Increased number of cases of scours, pneumonia, pinkeye (anecdotal reports)

  Treatment costs, death loss, performance reduction to weaning, performance reduction post-weaning?

Economic and Production Costs of BVDV – Reproductive Losses

- Potential Costs:

  Reduced percentage of cows pregnant

  Increased abortion and stillbirth percentage

Economic Cost of BVD in Cow Herds

- Wittum et al. surveyed herds from five geographically diverse states. (Alabama, Nebraska, Nevada, North Dakota, and Ohio)
  - A fairly large number of herds were found to have at least one PI calf (n=13).
  - Therefore, one can assume that the positive herds represented a cross-section of levels of herd immunity, gestational status and virus virulence combinations present in the U.S.

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- The model used by Larson *et al*. considers the cost of BVD infection to the cowherd to the point of selling the calves at weaning.
  - Using cattle and feed prices for the 10 year period from 1991 to 2000, Larson *et al*., estimated that the average cost of having at least one PI animal present in a beef cow herd was about $20 per cow

So, what do I mean by a $20 per cow cost if a PI animals is present?

Real Results of Production
(Veterinary Clinic / Cattle Operation)

So, what do I mean by a $20 per cow cost if a PI animals is present?

Variation Caused By:

- Different virulence of BVDV
- Susceptibility of herd
- Stage of pregnancy when first exposed
- Animal husbandry
- Presence of other diseases

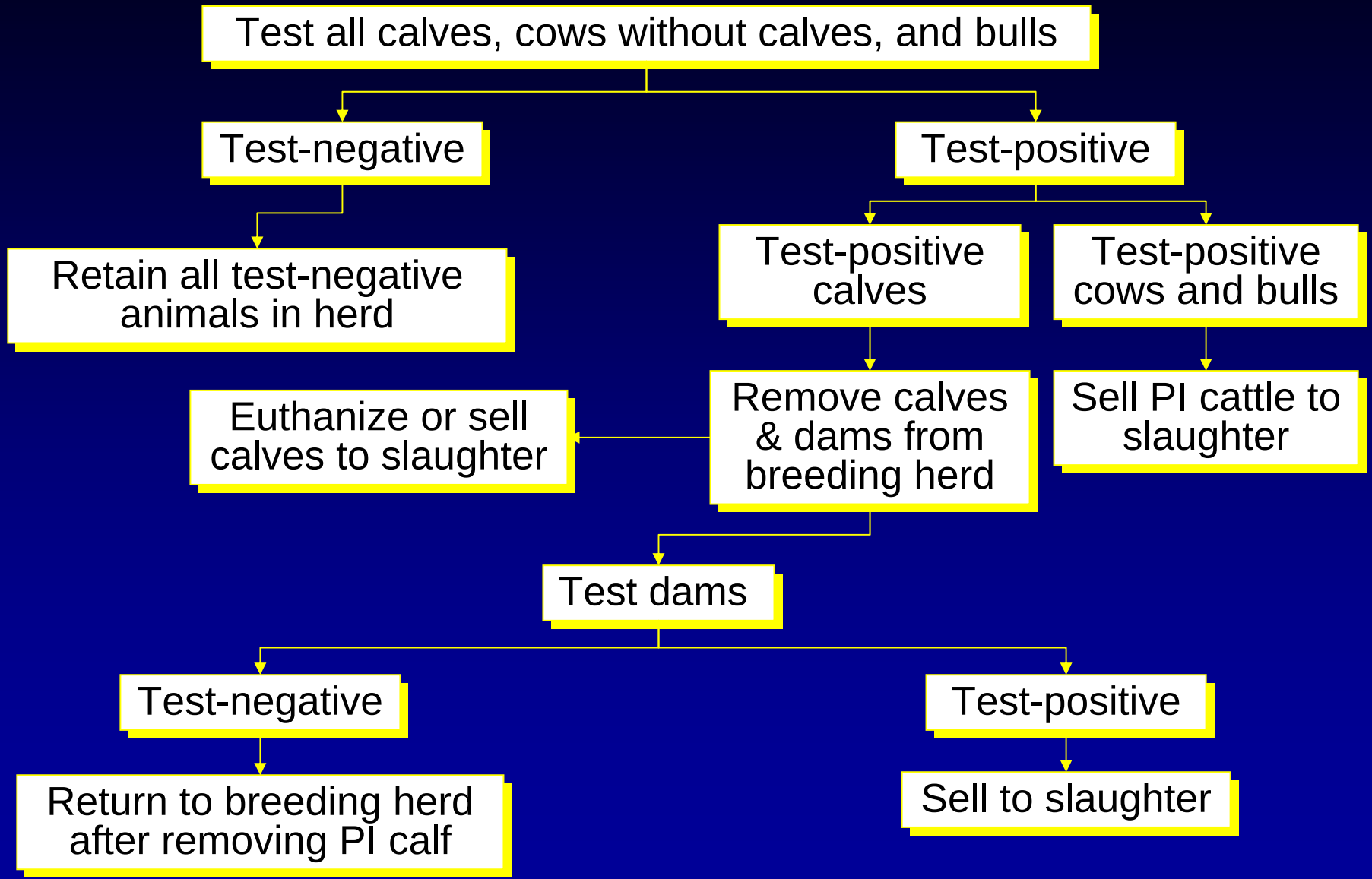
Economic Cost of BVD in Cow Herds

- By doing a whole herd screening the initial year, and screening all replacement animals (15% annual replacement rate) in subsequent years.
  - The level of return indicates that whole herd screening and removal of PI cattle is economically justified if PI presence is known.

Economic Considerations for BVDV Testing

- In herds where PI presence is not known, the economic benefit of testing to find PI animals must be evaluated in relation to the risk of having PI calves.
- Practitioners are able to categorize U.S. beef herds as high-risk or low-risk for the presence of BVDV PI animals
  - High-risk herds benefit from whole-herd testing
  - Low-risk herds may not benefit from whole-herd testing

Identifying PI Animals – High Risk Herd



Identifying PI Animals – High Risk Herd

Must Do Prior to Breeding Season!!!

Monitoring for Presence of BVD PI Animals

Component of Herd Biosecurity

Cow-Calf Herd

BVD is Not Suspected

- Good reproductive performance
- High percentage of cows exposed wean a calf
- No laboratory evidence BVDV TI or BVDV PI animals

Surveillance Strategy I – Monitor production and health

- Low cost / low sensitivity strategy
- Monitor overall pregnancy proportion and percent pregnant in first 21 d
- Monitor stillbirths, neonatal morbidity, neonatal mortality, and weaning percentages
- Necropsy and submit tissues (thymus, Peyer's patches, spleen, skin, blood) for laboratory analysis on high % of abortions, stillbirths, and calves that die pre-weaning

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Surveillance Strategy II – Pooled PCR of blood or ear notch samples (entire calf crop)

- Moderate cost / high sensitivity strategy
- Identifies PIs prior to breeding season if done before bull turn-out
- Pool samples of 20-50 with re-pooling and re-running of positive pools
- Positive PCR does not differentiate between TI and PI, therefore, must do other confirmatory testing (IHC, ACE)

Surveillance Strategy III – IHC or AgELISA of individual skin samples (entire calf crop)

- High cost / high sensitivity strategy
- Identifies PIs prior to breeding season if done before bull turn-out0

Use of Vaccination to Reduce the Negative Effects of BVDV Introduction to a Herd

Component of Herd Biosecurity

- BVDV transmission between and within herds can be reduced with an appropriate vaccination program
- Only empirical recommendations can be made as to what constitutes an effective vaccination program

BVD in Feedlot and Stocker Operations

Stocker and Feedlot Operations

Economic losses in feeder animals

- Treatment costs

  (drugs, labor, feeding disruption)
- Death of PI animals (or realized)
- Reduced gain of in-contact penmates
- Increased deaths and chronics of in-contact penmates
- Decreased carcass value of in-contact penmates (carcass weight, marbling)

Tools to Control BVD

- New tests
- Vaccination

- Test strategies for:
  - Determining if PIs are present
  - Detecting PIs in the herd
  - Surveillance to monitor re-infection
- Biosecurity to keep PIs out:
  - Vaccination
  - Testing of herd additions


Questions ?