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## BVD in Cow-Calf Operations

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### Transmission and Diseases

Bovine viral diarrhoea viruses (BVDV) are responsible for an economically important complex of diseases affecting western range cowherds<sup>13</sup>. Fetal infection with BVDV causes calf losses due to infertility, abortions, stillbirths and weak calves<sup>1</sup>. Combined with the practice of synchronous breeding in beef cattle, fetal BVDV infections result in “abortion storms.” Persistently infected (PI) calves generated by fetal infections during the breeding season are the main source of BVDV for cowherds<sup>2</sup>. The survival of PI calves into the next breeding season perpetuates the infection if susceptible pregnant females are exposed. After the initial introduction and epizootic, enzootic BVDV herd infection may follow. The latter scenario is characterized by a return to acceptable reproductive rates in 3 year old and older cows and a reduction in the number PI calves. However, sub-optimal reproduction in 2-year-old heifers and increased calf-hood diseases may be observed<sup>9,10</sup>.

Horizontal spread of BVDV from PI calves to other calves may be manifested in an increase in diarrhoea and respiratory disease in the cohort. Although PI calves have a reduced survivability compared to normal animals, they may survive weaning to reach feedlots where their presence triggers outbreaks of bovine respiratory disease<sup>5</sup>. In addition, vaccine-induced mucosal disease may occur when modified-live viral vaccines are administered to calves at branding or weaning.

### Sources

A major source of BVDV for beef herds are purchased, bred replacement heifers or heifers bred in heifer-development feed yards. While these animals are usually not persistently infected themselves, they may be exposed to PI animals in the first trimester of pregnancy and give birth to PI calves on return to the ranch. If their PI calves are co-mingled with other females during the following breeding season, then BVDV will be transmitted to susceptible cows and their fetuses. BVDV may also be introduced by purchased PI bulls, heifers and calves. Co-mingling herds on summer pastures or back-grounding mixed-origin stocker calves and yearlings are also risk factors. There have been occurrences of BVDV infection through the widespread application of contaminated vaccines. BVDV has been isolated from free-ranging deer in North America; however, transmission from infected wild species to cattle has not been documented. At this point in time cattle are assumed to be the source of BVDV infection for wild ruminant species.

### **Diagnostic testing**

Several options are now available for the diagnosis of BVDV. The identification of PI animals may be accomplished by virus isolation, reverse transcription-polymerase chain reaction, immunohistochemistry and antigen-capture ELISA<sup>4,6,7,8</sup>. Comparative serology and planning of surveillance strategies may be used to monitor the infection status of beef herds<sup>11</sup>. Remaining diagnostic needs include tests to detect cows pregnant with BVDV-infected fetuses and reliable diagnosis of acutely infected animals, i.e., BVDV-associated outbreaks of respiratory disease.

### **Prevention and Control**

Overall, vaccination with existing products has been largely unsuccessful as a means of controlling BVDV-associated diseases as evidenced by continual circulation of the viruses and occurrences of related diseases after more than 40 years of vaccine availability<sup>3,12</sup>. Successful prevention of BVDV infection include testing all new introductions in a herd, separation of purchased bred heifers or cows and their offspring from the breeding herd until all calves are tested for BVDV.

Ultimately, the control of BVDV associated disease in beef cattle depends on the identification and removal of PI animals from the cowherd prior to the breeding season. This strategy has been outlined by the Academy of Veterinary Consultants and is the basis of a voluntary BVDV control and eradication program in Colorado. The diagnostic technologies to identify PI animals and several schemes for their application in the field are available. Success of such programs will depend on the cooperation of grazing associations, benefit added value to ranchers for attaining BVDV-free status and pre-sale screening of cattle.

### **Abstract**

Les infections au BVD sont la cause des épizooties d'avortements, des mortinatalités, des veaux non-viables. Chez les troupeaux de bovins de boucherie ces infections se traduisent par des problèmes de diarrhée et respiratoires plus élevés. Des facteurs, comme certains programmes d'accouplements et pratiques de gestion, contribuent aux manifestations cliniques.

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