BOVINE Leukosis Virus

If you know anything about BLV, you probably know more than you ever wanted.

BY TROY SMITH

PHOTO BY SHAUNA ROSE HERMEL

Among the animal health issues creating concern for cattlemen is bovine leukosis virus (BLV). Admittedly, the degree of concern varies, since plenty of cattlemen know little, if anything, about this retrovirus that infects cattle. Others, through personal experience, have learned far more than they might choose to know about the disease and its consequences.

Reasons for the disparity of knowledge include the fact that BLV is more prevalent in certain parts of the country. Usually, the malady is a purchased one introduced to a herd through the acquisition of females. Once introduced, BLV is more likely to spread through intensively managed herds. Unfortunately, there is no treatment, nor is there a preventive vaccine.

How great a threat does BLV pose to the U.S. beef industry? That is a subject of debate, but producers with infected herds know that its economic effect can be significant.

Voice of experience

California Angus breeder and American Angus Association past president Bill Borror's firsthand experience proved to be extensive and expensive. Borror can't pin down the source of infection, but the process for ridding his herd of BLV took eight years to complete.

"The point to remember is that animals can carry the virus without showing signs of the disease. An infected animal might not show symptoms for years, but the virus can be detected through testing," Borror warns. "Producers need to be aware of the disease and its potential impact. And if they aren't testing for it, they run the risk of passing it on to other herds."

Bovine leukosis has been recognized as a disease of cattle since the late 19th century. Its causal virus is classified as a retrovirus, meaning it has the ability to insert copies of its own

genome into the chromosomes of the host cell. This ensures the virus will survive as long as the host cell does. In essence, this means that once an animal is infected, it is virus-positive for life.

Symptoms

According to information compiled by the U.S. Department of Agriculture (USDA) Animal and Plant Health Inspection Service (APHIS), approximately 75% of infected animals show no evidence of the infection other than the presence of antibodies in their blood. And 25%-30% of infected animals develop persistent lymphocytosis, or abnormally high white-blood-cell counts. Data suggest these animals are of greatest risk for transmitting infected lymphocytes to other animals.

A malignant lymphoma, or tumor, develops in 1%-5% of infected cattle. Clinical signs become evident as tumors invade different tissues and may include loss of appetite, weight loss and decreased milk production.

Progressive symptoms also may include fever, abnormal heartbeat and visible signs, such as enlarged lymph nodes, rear-limb weakness or paralysis, and protruding eyeballs. Malignant lymphoma is invariably fatal.

There is no evidence that BLV is transmissible to humans, and no human disease ever has been attributed to BLV.

According to APHIS epidemiologist Gary Stevens, BLV is more prevalent among dairy herds. Stevens says a 1996 assessment by the USDA National Animal Health Monitoring System (NAHMS) indicated 89% of all U.S. dairy operations and 43% of all U.S. dairy cattle tested positive for the virus. In 1997 a beef study involving 2,713 operations from 23 leading cow-calf states estimated 38% of all beef herds and 10.3% of all beef cows were seropositive for BLV.

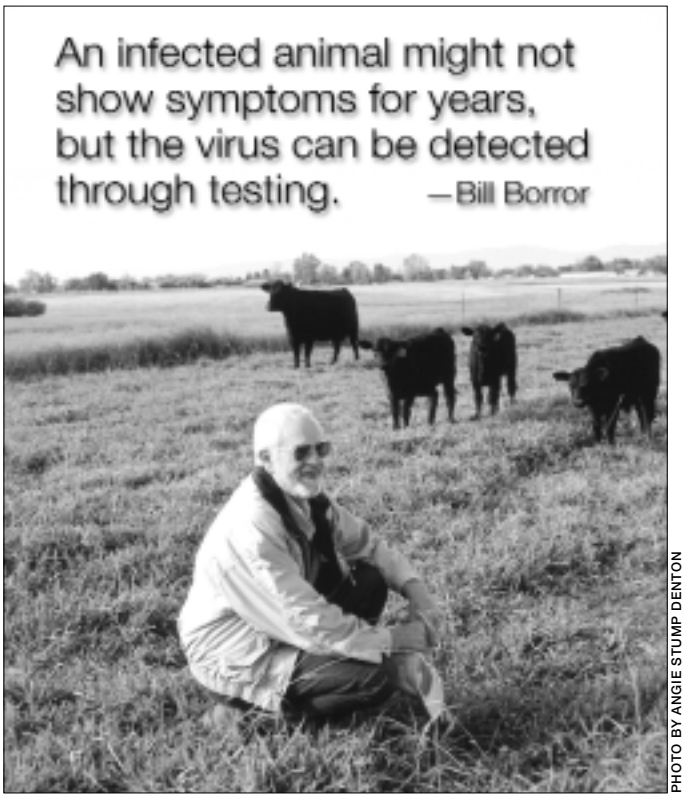

PHOTO BY ANGIE STUMP DENTON

Bill Borror of Tehama Angus Ranch, Gerber, Calif., reminds producers that the clinical manifestation of BLV is not a pretty sight. He says it's unacceptable for anyone in the cattle business to perpetuate the disease when it can be cleared up with diligent management.

"The study also showed geographical differences in the prevalence of the disease in beef herds," Stevens says. "The largest percentages of positive operations and individual cows were found in the south-central and southeastern states. As you move north and west, there seems to be less problem with BLV."

Considering the higher incidence of infection in dairy animals and the significant numbers of dairy cows that have been used by beef breeders as recipients for embryo transfer (ET), Stevens says it makes sense to suspect that some dairy cows could be the path by which BLV has been introduced to beef herds.

He adds, however, that too few studies have been conducted to draw definite conclusions. The introduction of purchased seedstock, including replacement heifers or mature cows, also is a likely means of transmitting the virus from one beef herd to another.

Transmission

Transmission from one animal to another occurs through exchange of infected blood. Parturition fluids also may carry the virus. Transmission is possible through the placenta, but Stevens says fewer than 6% of infected cows pass the disease to their calves prenatally. However, calves born uninfected can pick up the virus from other fluids — sometimes through colostrum or milk.

A higher incidence of BLV in herds under intensive management is attributed to the fact that animals are often kept in greater concentration and that practices including artificial insemination (AI), ET, and frequent handling or processing may provide more opportunities for transmission of the virus. For example, use of intravenous needles or the minor bloodletting associated with rectal examinations may provide avenues of transmission unless precautions are taken.

Stevens maintains that BLV is not sufficient cause to avoid any of those tools, but it presents another strong argument for evaluating all herd-management practices to reduce chances of spreading disease. Good management in accordance with beef quality assurance (BQA) guidelines, including precautions so simple as using clean vaccination needles, is recommended.

Options

"Concerned producers wanting to make sure that they aren't buying trouble can isolate and test replacements before introducing them to the herd," Stevens says. "Producers wanting to evaluate their own herds probably should test the whole herd. If BLV is present, but in less than 10% of the animals, culling those individuals is the quickest way to remove the infection.

"If too many animals are infected and their value is too great for culling to be economically feasible, segregation of those animals from the rest of the herd and continued testing of any animals sold from that group may be the most viable option."

Borror reminds producers that the clinical manifestation of BLV is not a pretty sight. He says it's unacceptable for anyone in the cattle business to perpetuate the disease when it can be cleared up with diligent management.

"Any death of unknown cause should be investigated for the possibility of BLV," Borror recommends. "If there is a positive BLV diagnosis, the entire herd should be tested and a protocol developed for action. The alternative is continual suffering by man and beast."