Successful Eradication of BLV from Dairy and Beef Herds in New York

Michael A. Brunner, DVM, PhD
Diagnostic Laboratory
College of Veterinary Medicine
Cornell University
Ithaca, New York 14853

The New York State Department of Agriculture and Markets, together with the Diagnostic Laboratory at Cornell University offer a bovine leukemia virus (BLV) eradication/certification program to New York dairy and beef producers. This is the only official BLV certification program currently available in the United States. The program, which began in 1985, provides State supported testing and management services through the Diagnostic Laboratory to farmers who wish to eradicate BLV and establish a "Certified BLV-Free" herd. To achieve this status a herd must complete three consecutive negative BLV herd tests. The certificate is valid for one year and an annual negative BLV herd test is required to maintain the certificate.

Eradication is achieved through a joint effort of herd testing at six month intervals and practical management to prevent transfer of blood (lymphocytes) from infected to noninfected animals. After the results of the first herd test are available, a specific management protocol for each farm is agreed upon and outlined in a memorandum of understanding signed by the farmer, the local veterinarian and a representative of the Department of Agriculture and Markets. Owners of herds with only a few BLV positive animals usually choose to sell these animals and thereby eradicate the disease immediately. Others, with a greater number of BLV positives cannot afford to sell all of them immediately and their program is usually designed around management that will (a) prevent the spread of infection within the milking herd and (b) insure that all replacement heifers are BLV negative, which allows for the introduction of only BLV-negative heifers into the herd whenever BLV-positive cows are culled for other reasons. This is a much slower, but more economically feasible process for eradicating the disease. On most farms the eradication program is designed with the following facts in mind:

1. The virus resides primarily in lymphocytes.
2. The virus is spread by iatrogenic and natural vectors that transfer blood (lymphocytes) from infected to noninfected animals.
3. Once an animal becomes infected, it remains infected and is a potential source of infection for life.
4. Some calves born to BLV infected dams (3-20%) will already have been infected *in utero.*

Specific management practices required of herds participating in the eradication program include:

1. Sterile, disposable needles must be used only on one animal and then discarded immediately.
2. Blood contaminated instruments (dehorning, castrating, tattooing, ear tagging etc) must be cleaned and disinfected between animals.
3. A different disposable obstetrical sleeve must be used in the palpation of each individual cow.
4. Contamination of the environment with blood should be avoided.
5. Satisfactory methods of insect control must be employed.
6. Calves from seropositive cows must not be raised in contact with BLV negative animals until these calves are determined to also be seronegative.

7. Do not feed mastitic milk from BLV positive cows to calves.
8. Herd additions must be BLV negative animals.

Suggested additional practices include:

1. Animal handling procedures should be established such that BLV negative animals are processed first.
2. Use only artificial insemination in the herd.
3. Maintain separate maternity pens and heat check facilities for BLV positive and negative animals.
4. Raise calves in individual hutches.
5. Do not feed whole milk from BLV positive cows.

Feeding colostrum from only negative cows does not appear to have a significant bearing on the rate of progress toward BLV eradication[1,2]. In herds with a very low prevalence, where BLV negative calves are at low risk of being exposed to the virus, it may be best to feed only negative colostrum, thereby avoiding the slight risk of colostral mediated infection. In these herds any whole milk fed to calves must only come from negative cows as well. In herds with a high BLV prevalence it may be most beneficial to feed colostrum from positive cows in order to provide all calves with antibodies to BLV at a time in their life when they have many opportunities to become infected (dehorning, tattooing, vaccinating, etc). In these herds a more important factor may be to freeze colostrum prior to feeding it, since this may sufficiently disrupt the lymphocytes to the degree that the virus is no longer capable of remaining infectious.

The New York program recommends herd AGID tests for BLV at six month intervals. Frequent herd tests are necessary to identify newly infected animals and to monitor the rate of new infections. A decreasing rate of new infections is a better indicator of progress toward eradication than is the total number of BLV positives, since the latter is heavily influenced by the culling rate in the herd.

Testing of blood drawn from newborn calves out of positive dams prior to colostrum intake is also of value. If this blood is already BLV positive, one can assume that these calves were infected *in utero*[3]. It is economically more feasible to decide not to raise such calves when they are very young rather than waiting approximately six months until colostral antibodies no longer interfere with the AGID test.

It is also important to test new additions prior to purchase to ensure that only BLV negative animals enter the herd. These animals should be retested at 90 and 180 days following entry to insure their true negative status. This is especially important when introducing embryo recipients since they often have numerous opportunities for exposure to the virus just prior to entering the herd.

The program has become very popular and successful in New York. In 1991 a total of 137 herds participated, fourteen of these herds are currently certified as "BLV-Free". Eleven of these certified herds were infected with BLV when they enrolled in the program. Many other herds began the program as heavily infected (40-80% BLV positive on the first herd test) and yet they are making significant progress toward eradication and certification. These herds concentrate on raising BLV negative replacements, usually separate from the milking herd. At the same time they conscientiously follow the management practices necessary to minimize further spread of the disease within the herd. This approach provides a practical and economically feasible means of eradicating BLV from the herd.

Summary

The New York State Department of Agriculture and Markets, together with the Diagnostic Laboratory at Cornell University offer a bovine leukemia virus (BLV) eradication /certification program to New York State dairy and beef producers. The program provides State supported BLV testing and management control services through the Diagnostic Laboratory to farmers who wish to eradicate BLV and establish a "Certified BLV-Free" herd. To qualify for "Certified BLV-Free" status a herd must complete three consecutive negative BLV herd tests. The certificate is valid for one year and an annual negative BLV herd test is required to continually maintain a "Certified-Free" herd status. BLV eradication is achieved through a joint effort of testing at six-month intervals and practical management to prevent transfer of blood (lymphocytes) from infected to noninfected animals. These management practices include: using sterile disposable needles once and discarding, cleaning and disinfecting blood contaminated instruments used in dehorning, tattooing, eartagging, etc., using a different disposable obstetrical sleeve in the palpation of each cow, avoiding contamination of the environment with blood, practicing satisfactory insect control, preventing contact between BLV seropositive and seronegative calves, avoiding feeding mastitic milk from BLV positive cows to calves, and adding only BLV negative animals to the herd. In 1991, 137 herds participated in the program. By following the recommended protocol, 14 herds have achieved "Certified BLV-Free" status.

References

1. Brunner, M., Prevention of Infectious Diseases: A Herd Approach to Preventing Johne's Disease and Leukosis. *Proc. AABP* 23:34-39. 1990. 2. Johnson, R., Kaneene, J., Bovine Leukemia Virus. Part IV. Economic Impact and Control Measures. *Compendium Cont. Education* 13 (11): 1727-1737.1991. 3. Johnson, R., Kaneene, J., Bovine Leukemia Virus. Part I. Descriptive Epidemiology, Clinical Manifestations, and Diagnostic Tests. *Compendium Cont. Education* 13 (2): 315-325. 1991.

Resúmen

El Departamento de Agricultura y Mercados de Estado de New York y el Laboratorio de Diagnóstico de la Universidad de Cornell ofrecen a los ganaderos de carne y de leche un programa de erradicacion/certificación para el virus de la leucosis bovina (VLB). Este programa, subvencionado por el Estado, provee servicios de laboratorio y de control a través del Laboratorio de Diagnóstico a los ganaderos que desean erradicar el VLB y establecer un hato "Certificado libre de VLB". Para calificar como "Certificado libre de VLB" el rebaño debe tener tres muestreos serológicos consecutivos negativos para el VLB. El certificado es válido por un año debiendo muestrearse el rebaño anualmente y este muestreo ser negativo para mantener la continuidad del "Certificado libre de VLB". La erradicación de la leucosis bovina se basa en el muestreo de los rebaños cada seis meses y a prácticas de manejo que previenen la transferencia de sangre (linfocitos) desde animales infectados a animales sanos. Las prácticas de manejo incluyen: uso de una aguja desechable por cada animal, limpieza y desinfección de instrumentos ensangrentados que se hayan usado en el descorne, marca, castración, etc., uso de una manga obstetrica desechable para cada vaca durante palpación, evitar la contaminación ambiental con sangre, practicar control de insectos, prevenir el contacto entre terneros positivos y negativos, no usar leche mastítica de vacas infectadas para la alimentación de terneros, y agregar solo animales negativos al rebaño. En 1991, 137 rebaños participaron en el programa. Usando el

protocolo aquí recomendado, 14 rebaños fueron certificados libres de VLB.

Zusammenfassung

Das New York State Department of Agriculture and Markets bietet, in Zusammenarbeit mit dem Diagnostiklabor der Cornell Universität, den Milch- und Rindfleischproduzenten des Bundesstaates New York ein Programm an, welches zum Ziel hat, das bovine Leukämievirus (BLV) auszurotten. Durch die finanzielle Unterstützung des Bundesstaates New York, ermöglicht das Programm die Durchführung von BVL Tests und Massnahmen zur Ausrottung und Kontrolle der Infektion. Dies führt zur Etablierung von "Certified BLV-Free" Viehbeständen, welche mit einem Zeugnis ausgezeichnet werden. Drei umfassende, zeitlich aufeinanderfolgende Untersuchungen einer Herde müssen negative ausfallen, um einen Bestand als BLV-frei zu erklären. Das Zeugnis ist für ein Jahr gültig und jährliche Wiederholung der Herdenuntersuchung mit negativem Resultat is notwendig, um diesen "BLV-freien" Status ("Certified-Free") zu erhalten. In infizierten Herden besteht die Ausrottung des BLV aus einer Kombination von Bluttesten, welche in Abständen von 6 Monaten durchgeführt werden, und praktischen Massnahmen, welche die Uebertragung von Blut (Lymphozyten) von infizierten auf nicht-infizierte Tiere verhindern. Die praktischen Massnahmen bestehen aus: dem einmaligen Gebrauch von sterilen Nadeln, der Reinigung und Desinfektion von Blut-kontaminiertem Instrumentarium, welches für die Enthornung, das Tätowieren, und das Anbringen von Ohrmarken usw. verwendet wird. Zusätzlich müssen die Plastikpalpationshandschuhe zwischen den Untersuchungen mehrerer Kühe gewechselt werden, die Kontamination der Umgebung mit Blut vermieden werden, Kontrollmassmahmen gegen Insekten durchgeführt werden und der Kontakt von nicht-infizierten mit infizierten Kälbern verhindert werden. Kälber dürfen nicht mit Milch von BLV positiven Kühen getränkt werden und nur BLV-negative Tiere dürfen in die Herde eingeführt werden. In 1991, nahmen 137 Bestände an diesem Programm teil. Vierzehn dieser Bestände wurden mit dem Status "BLV-frei" ausgezeichnet.