

VIRGINIA COOPERATIVE EXTENSION SERVICE

EXTENSION DIVISION - VIRGINIA POLYTECHNIC INSTITUTE AND STATE UNIVERSITY - BLACKSBURG, VIRGINIA 24061

THE FOOD ANIMAL VETERINARIAN

VIRGINIA-MARYLAND REGIONAL COLLEGE OF VETERINARY MEDICINE



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Dear Food Animal Practitioners,

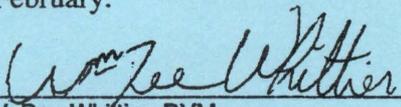
The annual meeting of the Virginia Academy of Food animal Practice will be held jointly with the Virginia Veterinary Medical Association on February 5, 2000 at The Homestead in Hot Springs, Virginia. Our featured speaker is Dr. Frank Garry, professor at the College of Veterinary Medicine at Colorado State University. Dr. Garry is a nationally recognized speaker that can bridge the beef/dairy split and has some topics that will be very interesting to everyone. His topics are Johnes disease, newborn calf disease and energy metabolism of the periparturient dairy cow. Dr. Ernest Hovingh is new at the VMRCVM and will address death loss in adult dairy cows. There will also be presentations on various aspects of intensive grazing that should be of interest to all given the recent adoption of intensive grazing practices by many in Virginia.

The Homestead is a considerably different setting than the Academy has met in before. We voted at last year's meeting and a majority still wanted to meet with the VVMA. If you plan to stay overnight it will be a little expensive but a nice winter get-away. Start saving your pennies and plan to attend this outstanding program. The daily registration is quite reasonable and the drive's doable if you just plan to spend the day.

Nutritional conditions are tight in much of Virginia due to our spring and summer drought. Low grain and protein prices and fall rains are providing some relief to producers. Now is a great time for veterinarians to get involved in producers' nutrition. Thin beef cows can be saved if supplemental feeding begins early but many down cows can't be saved! I have also been advocating pregnancy diagnosis in beef cows, even for producers who have never done it before. Favorable cull cow prices and higher-than-usual open rates make the economics of pregnancy checking better than ever.

A political issue has been a concern to many of you. In the past the Board of Veterinary Medicine has conducted inspections at your practices but has given you advance notice. Recently that Board announced that it would no longer give any advance notice. This has been a concern to many practitioners of all types. It has been a concern to food animal practitioners because of the fact that they are away from their practices much of the time on calls. The Academy has written a letter to the Board expressing our concern. A compromise position giving practices one working day notice before an inspection is being supported by the VVMA. Hopefully this compromise can be worked out and will be better than no warning for food animal practitioners.

Best of luck in your practices and looking forward to seeing you in February.


W. Dee Whittier, DVM
Extension Veterinarian

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This newsletter is published quarterly in support of the outreach program of the Veterinary Teaching Hospital VMRCVM, Blacksburg, VA and is prepared for and distributed to veterinarians in the Mid Atlantic Region.



Risk Factors for Paratuberculosis in Dairy Herds

Paratuberculosis (Johne disease) has been a frustrating problem for dairy producers for more than 100 years. Efforts to treat the disease or develop a fully protective vaccine have yet to succeed. Until an effective cure or preventive is found, disease detection and farm-management practices are the best weapon in the battle against this disease. A cross-sectional study was conducted in 1996 to identify management-related risk factors for herd-level *M. paratuberculosis* infection. Data were collected from 121 participating herds. In this study, five risk factors were identified that were associated with herd *M. paratuberculosis* infection status.

- 1. History of paratuberculosis test-positive animals on the farm within the past three years.** This is the only risk factor identified which appears to be directly related to the introduction or presence of an infected animal on the farm.
- 2. Use of an exercise lot.** Use of an exercise lot in 1993 was associated with a three-fold increase in the odds of a herd being infected with *M. paratuberculosis*. An exercise lot is generally an area in which cattle congregate at a much higher density than in a pasture. Manure removal from this area may be infrequent or incomplete. Contact with contaminated manure from the exercise lot by cattle and farm workers may result in the introduction of the organism to areas such as calf hutches and maternity pens (thereby bringing the organism to those animals that are most susceptible to infection).
- 3. Washing of cows' udder.** Udder washing prior to parturition proved to increase the risk of herd infection. The need to wash udders may indicate an excessive amount of fecal contamination that is not being adequately removed by washing. In fact, moistening dried fecal matter in the udder area may actually enhance teat contamination and facilitate infection of neonatal calves prior to removal from the dam.
- 4. Cleaning of calf hutches or pens after each use as a protective measure.** Cleaning of calf hutches and pens was associated with an almost three-fold reduction in the odds of a herd being *M. paratuberculosis* infection positive. This age group is most susceptible to infection from *M. paratuberculosis* and, thus, a key to preventing infection of these animals is minimizing contact with contaminated manure, feed, and equipment.
- 5. Application of lime to pasture as a protective measure.** Application of lime to pasture areas was associated with a ten-fold reduction in odds of herd infection. The mechanism behind the proposed protective effects of lime is not known. However, it is believed that the elevation in environmental pH caused by the lime, reduces the ability of *M. paratuberculosis* to compete with other microorganisms for available iron.

Johnson-Ifearulundu, Y J. & J. B. Kaneene *Prev. Vet. Med.* 37:41-54, 1998
As reported in *Vet-Med* May 99 Volume 5 Issue 3 Iowa State University, Ames, Iowa

Accessing Up-To- Date Information for Bovine Practitioners
Dr. Dee Whittier, Dept of Large Animal Clinical Sci., VA-MD Regional College of Veterinary
Medicine.

The Internet now offers a wealth of information that can be accessed by an increasing number of practitioners using computers and modems. Knowing where to go to find the information is a difficult challenge for many. An example of a site where valuable information, not otherwise available, can be readily retrieved is the Journal of Dairy Science site that is provided by the American Dairy Science Association (ADSA). The site address is <http://www.adsa.org/jds/I>. The full contents of the journal are available to members of ADSA by entering a name and user ID. Annual membership is \$110 and \$50 additional is required for domestic delivery of the journal. Nonmembers may receive the journal contents on CDROM for \$90 per year. However, abstracts can be browsed by anyone free of charge.

Botulism and Silage

Dr. Frank Galey, UC-Davis, reported at the last diagnosticians' (AAVLD) meeting a case of botulism poisoning on a California dairy. Four hundred twenty-seven adult Holstein cattle died within a week in the early spring of 1998. The history revealed that a load of total mixed ration, fed at noon the day prior to the onset of symptoms, may have included a rotten bale of oat hay that contained a dead cat. A search of the rumen contents of the victims revealed evidence of cat hair. Type C botulinum toxin was detected from case samples.

At the last American Association of Bovine Practitioners meeting, Drs. Julie Williams and Robert Whitlock, from the University of Pennsylvania, reviewed 31 cases of botulism in cattle. Fermented forages (silage) were found to be the most frequent source of botulinum toxin in the confirmed outbreaks of botulism.

Small grain silage, or cereal silage (such as rye, barley, or oat silage) were represented in disproportionately high numbers and were the source of toxin in more than half of all outbreaks. (To put this in perspective, small grain forages represent only about 0.5 Percent of the total silage tonnage for Pennsylvania.)

The authors mentioned that cool wet spring weather often creates challenging harvest conditions, resulting in forages with highly variable dry matter and carbohydrate levels. This may result in failure to undergo rapid complete fermentation and achieve proper pH.

The method of forage storage in these reviewed cases was significant. Twenty-two of the 31 cases involved silage stored in plastic. Twelve cases of these were from plastic-wrapped large round bales, and ten were associated with silage stored in plastic tubular temporary silos (like AgBags). Two of the outbreaks involved silage stored in conventional upright silos, and one was from a bunker silo.

Botulism should be considered as a differential diagnosis for recumbent cattle, especially in outbreaks involving multiple non-periparturient cattle of any age. Clinical signs of decreased tongue and jaw tone and inability to swallow are characteristic of botulism.

G-L. Meerdink, DVM, *Illinois Vet. Bulletin*, vol.7, no. 1, April 1999
As reported in Penn State Veterinary News May 1999

Risk factors for Clinical Mastitis in Dairy Heifers

A study was conducted in Norway to identify risk factors for clinical mastitis that occurred in heifers prepartum or on the day of parturition. Heifers that had been treated for clinical mastitis prepartum or on the day of parturition were eligible for inclusion as cases. Controls were heifers that had not been treated for clinical mastitis before parturition, during their first lactation, or during the dry period. The final analysis included 4,256 heifers with mastitis of which 56% were treated for clinical mastitis on the day of parturition or the day before.

An increase in the incidence of clinical mastitis in the corresponding herd, a decrease in the bulk milk somatic cell count, and an increase in the mean milk yield of the herd were associated with an increased risk for clinical mastitis in heifers. The risk varied among regions, and, depending on region, significant influences of both herd size and composition of the diet were observed. Heifers kept on pasture in summer were at a decreased risk for clinical mastitis. Calving in late spring or summer was associated with greater risk than was calving at other times of the year. An increase in age at first calving was associated with increased risk of mastitis. Mastitis was also more likely to occur in heifers leaking milk or in heifers that had a low milk flow rate in the subsequent lactation. Whether the heifer was purchased or not was not a significant factor.

Waage, S., et al. *J. Dairy Sci.* 81. 1997.
As reported in Penn State Veterinary News November 1998

Reproductive Tract Scoring to Predict Pregnancy Outcome

The relative economic importance of reproductive traits to the beef industry is estimated at twice the importance of beef production traits and four times the importance of product traits. Selection and management of replacement heifers influences the reproductive efficiency of the cattle industry. Heifers that mature early are capable of being bred earlier in a controlled breeding season and will wean a heavier calf. These heifers tend to breed early each breeding season for the rest of their reproductive life and have a lifetime heavier weaned calf weight. With this economic value placed on reproduction, ways to measure and predict reproductive efficiency in cattle are needed. One method to estimate reproductive efficiency was developed by researchers at Colorado State University. A reproductive tract scoring (RTS) system was developed as an indirect determination of age at puberty. Yearling heifers were palpated at approximately 30 days prior to breeding to determine uterine horn size, ovarian size, and ovarian structures. Heifers were assigned a reproductive tract score of 1 through 5. A RTS of 1 was an immature, non-cycling reproductive tract and a RTS of 5 was a cycling heifer with a functional corpus luteum. This system was used to generate the data for this study from cattle in the Midcrest Area Cattle Evaluation Program (MACEP) at Tingley, IA from 1992 through 1997.

An average of 12 different cattle producers entered heifers in the MACEP Heifer Development Program each year to be managed and bred. Heifers were returned to their owners after the final determination of pregnancy. Heifers were born between Feb 1 and May 15 each year. Heifers were co-mingled in the fall or early winter, fed a ration to attain 65% of their mature weight at breeding. The heifers were reproductive tract scored 30 to 60 days prior to breeding, estrus cycles were synchronized and heifers were bred by artificial insemination (AI) 12 hours after they were observed in standing heat. Ultrasound evaluation was utilized to determine the AI pregnancy rate, at approximately 30 days post AI breeding. The data in this study is from 1017 heifers over a five-year period. Heifers with an RTS of one were culled prior to breeding.

There was a positive correlation between high reproductive tract scores and percent conception by AI. The data showed that in each of the years studied, artificial insemination (AI) pregnancy rate increased as the RTS increased: RTS 2 - 50% pregnant; RTS 3 - 40% pregnant; RTS 4 - 54% pregnant; RTS 5 - 62% pregnant. The data also showed that in each of the years-studied, final pregnancy rate, including AI and bull bred, was increased as the RTS increased: RTS 2 - 75% pregnant; RTS 3 - 86% pregnant; RTS 4 - 87% pregnant; RTS 5 - 93% pregnant. **Reproductive tract scoring has been shown to be an effective predictor of reproductive efficiency in beef heifers.** Reproductive tract score is moderately heritable(.32). This procedure could be used in any commercial heifer-breeding program to select for reproductive efficiency

Mel Pence. DVM & Russell BreDahl Ph.D.

As reported in Penn State Veterinary News February 1999

Evaluation of a yearly insecticidal ear tag rotation for control of pyrethroid-resistant horn flies (*Diptera: Muscidae*)

From 1991 to 1997, the yearly alternated use of synergized pyrethroid (lambda-cyhalothrin + piperonyl butoxide) and organophosphate (pirimiphos-methyl) ear tags was evaluated for the control of two pyrethroid-resistant fly populations in Louisiana. At each site, weekly fly counts were used to assess product efficacy. Control achieved by synergized pyrethroid ear tag treatments was reduced from 7 to 2 weeks and from 4 to 0 weeks at St. Joseph and Winnsboro, respectively. Control by organophosphate ear tags decreased from 15 to 3 weeks and from 10 to 7 weeks at St. Joseph and Winnsboro, respectively. The rotation of synergized lambda-cyhalothrin and pirimiphos-methyl ear tags did not improve pyrethroid ear tag efficacy or prevent further development of resistance to the pyrethroid or OP compound.

A.T.M. Barros, et al (*Veterinary Parasitology*, 1999;82:317-325).

As reported in Animal Health Spectrum Vol. 10 No. 2 summer 1999 Mississippi State University

Viremia in Cattle Persistently Infected with BVD Virus

An important aspect of the biology and pathogenesis of bovine viral diarrhea virus (BVDV) is persistent infection that occurs following *in utero* infection of the bovine fetus. The development of persistently infected animals contributes significantly to the high prevalence of BVDV infections. Because persistently infected animals are a continuous source of virus, their identification and removal is an essential component of current prevention and control measures. Identification is routinely done by virus isolation from white blood cells (WBC) or serum. To detect noncytopathic BVDV, an immunoperoxidase microtiter plate assay is commonly used. The presence of low levels of virus or the presence of anti-BVDV antibody may interfere with the ability to isolate BVDV in cell culture from blood samples.

The purpose of this study was to characterize levels of viremia present in four persistently infected calves from birth until 70 days of age. Virus isolation and serum neutralizing antibody titers were determined. Passively acquired colostral antibody caused a precipitous drop in the virus concentration in serum of neonatal, persistently infected calves. The decrease in the concentration of virus in serum was correlated with detection and persistence of colostral antibody in serum from the calves. In 3 of 4 persistently infected calves, virus isolation from serum and white blood cells was negative until approximately 42 days of age, when colostral antibody had declined. The viremia present in persistently infected calves has been characterized previously by monitoring 11 persistently infected calves for 20 weeks following birth. In all 11 calves, the presence of antibody titers as low as 1:16-1:24 prevented virus detection in blood samples by virus isolation. Virus was detected in all 11 calves at 6 to 8 weeks of age following the disappearance of colostral antibody.

It is generally accepted that when conducting herd screening for BVDV using serum, calves < 3 months of age should not be included. In calves < 3 months of age, alternative methods of detection, such as PCR amplification, may provide a better level of sensitivity. Detection of virus by PCR is not affected by the presence of antibody.

In addition, persistently infected cattle were monitored over a period of four years. The level of viremia in 7 adult (>12 months) persistently infected animals decreased by one 10-fold dilution over at least a 2-year period. The level of viremia became undetectable by virus isolation from serum in one of the seven animals examined. This decline was associated with the development of virus neutralizing antibody. Although the level of viremia is fairly stable within persistently infected animals, the presence of specific neutralizing antibody may affect the ability to isolate BVDV. These findings are important when considering diagnostic testing to identify persistently infected animals by virus isolation.

In 6 of 7 animals, a gradual decline in serum virus concentration was not associated with the development of detectable neutralizing antibody titers against the three reference strains of BVDV in the virus neutralization assay. If persistently infected animals develop neutralizing antibody, virus isolation may only be possible from WBC preparations. In the persistently infected animal BJ, isolation of BVDV from WBC was possible despite the presence of virus neutralizing antibody in serum. Collecting an adequate volume of whole blood (10 ml) and the subsequent processing to obtain white blood cells become important factors in the ability to isolate BVDV in the presence of neutralizing antibody.

Taken from: Brock, K. V., et al. *J. Vet. Diagn. Invest.* 10:22-26,1998,
As reported in Penn State Veterinary News August 1999

Poisonous Plants Guide now Available on CD-ROM

Veterinarians at the University of California-Davis partnered with Iowa State University Press to create an instructional, interactive CD-ROM. This learning tool, which is available in Windows and Macintosh formats, provides information on the properties of poisonous plants relative to diagnosing toxic syndromes in animals. It includes botanical identification, geographical distribution, clinical symptoms, diagnostic tests and treatments. Contact: Mary Christopher (540) 752-1324.

AVMA Animal Health News & Feature Tips, P. 2 Spring 1999
As reported in Vet-Med May 99 Volume 5 Issue 3 Iowa State University, Ames, Iowa

Bovine Leukosis Virus in Dairy and Beef Cattle

Bovine leukosis virus (BLV) is a retrovirus infection of dairy and beef cattle. In less than 5% of infected cattle, BLV causes malignant lymphoma which leads to illness and death loss that may be economically significant. Signs of malignant lymphoma may include weight loss, decreased milk production, enlarged lymph nodes, loss of appetite, rear-limb weakness or paralysis, fever, protruding eyeballs, gastrointestinal obstruction, heart failure, and abnormal blood lymphocyte count. Bovine malignant lymphoma (BML) is always fatal because there are no economical and effective treatments. Other economic losses associated with BLV infection are due to restrictions on trade of infected animals and germplasm. There is no evidence that BLV is transmissible to humans, and no human disease has ever been attributed to BLV.

The USDA's National Animal Health Monitoring System (NAHMS) collaborates with others in the livestock industry to provide information on national animal health and related issues. NAHMS assessed BLV seroprevalence in U.S. dairy operations in 1996 as part of the Dairy '96 Study. Study findings showed that 89% of all U.S. dairy operations and 43.5% of all U.S. dairy cattle were seropositive for BLV using the agar gel immunodiffusion (AGID) test. At least 25% of individual dairy cows were positive on 75% of the positive operations.

During the Beef '97 Study, NAHMS assessed BLV seroprevalence in U.S. beef cow-calf operations. This study included 2,713 operations from 23 of the leading cow-calf states. Blood samples were collected from beef cows on 403 of those operations and sent to the National Veterinary Services Laboratories in Ames, Iowa to test for evidence of BLV infection. The AGID test was used to test samples from 78.2% of the cows' sera on 76.5% of the operations that participated in the biological sampling phase. During the study, the AGID test was removed from commercial production, and the remaining samples were tested with the enzyme-linked immunosorbent assay (ELISA). Studies have shown that the agreement between the AGID test and the ELISA test is excellent.

The Beef '97 Study results are valuable to researchers and others. Thirty-eight percent of all beef operations and 10.3% of all beef cows tested during the Beef '97 Study were seropositive for BLV. Larger percentages of positive operations and individual cows were found in the Southcentral (62.1% of operations, 20.6% of cows) and Southeast regions (51.1% of operations, 17.1% of cows). The lowest percentages of positive operations and individual cows were in the Western region (13.3% of operations, 0.92% of cows). The Northcentral region had 62.1% of operations positive, 20.6% of cows infected. Viewed by herd size, the operation prevalence was highest in herds of 1 to 49 cows (42.1%). Likewise, the individual-cow prevalence was highest in herds of 1 to 49 cows (17.6%). The operation prevalence and individual-cow prevalence were lowest in herds of 100 or more cows (34% of operations, 6% of cows). Less than 25% of the cows were positive on 56.4% of the positive operations. More than 75% of the cows were positive on 12.2% of the operations.

Prevalence estimates for beef operations that were sampled during the Beef '97 Study indicated lower prevalence in beef operations than dairy operations. Regional prevalences in beef operations varied from 13 to 51%, indicating the infection occurs at varying levels in some regions of the U.S. The high individual-cow prevalence on positive dairy operations indicates that culling alone will not be a cost-effective method for implementation of a program to reduce transmission may be necessary for other BLV prevalence on those operations. Regarding beef operations, control strategies may vary, depending on the number of infected animals. Culling alone may be effective in some operations. In addition, implementation of a program to reduce transmission may be necessary for other operations. For more information, contact the Centers for Epidemiology & Animal Health, USDA:APHIS:VS, ATTN. NAHMS, Fort Collins, CO, E-mail: nahmsinfo@usda.gov

As reported in Vet-Med Vol. 5 Issue 5 September 1999 Iowa State University, Ames, Iowa

Early Weaning and Creep Feeding for Beef Steers

Information on alternative management systems that can increase profit and produce high-quality beef are necessary. Consumers want high-quality beef and producers must be able to provide it efficiently. Feed costs account for 54 to 75% of the annual cost of keeping a cow. Energy is the feed component required in the greatest quantity by beef cattle, with about 70% of the energy consumed by a cow going to maintenance. Maintenance accounts for approximately 50% of the total energy required for the entire beef production system. The objectives of this study were to determine the effects of three weaning management systems, and three breed types on 1) steer performance and carcass traits, 2) cow performance, body condition score (BCS), and pregnancy rates.

A 2-year study was conducted in which cow-calf pairs on pasture were randomly assigned to one of three treatments, in which the steer calves were 1) early weaned (year 1, 177 days; year 2, 158 days of age) (EW), 2) weaned at the normal age and creep fed by supplementing with grain for 55 days prior to weaning (year 1, 177 to 231 days; year 2, 158 to 213 days of age) (NWC), and 3) weaned at the normal age (year 1, 231 days; year 2, 213 days) with no creep feeding (NW). All three groups were placed on a finishing diet after weaning. In year 2, potential breed differences were evaluated using steers of three breed types: 1) Angus x Hereford (British breeds, BRI); 2) Angus x Simmental (continental breeds, CON); and 3) Angus x Wagyu (Wagyu breeds, WAG).

Early weaning increased overall gain, decreased daily intake, improved efficiency, increased total concentrate consumed, and improved quality grades of steers in this study. In year 1 between 177 and 231 days of age, EW steers on a finishing diet gained 1.44 kg per day, NWC steers gained 0.82 kg per day, and NW steers gained 0.62 kg per day. In the feedlot from 231 to 443 days of age, EW steers had lower intakes (7.70 vs 8.16 kg/day) and better feed conversions (gain/feed, 0.170 vs 0.153) than the average of NWC and NW steers. Marbling score was improved for EW steers compared with the average of NWC and NW steers. In year 2, EW steers had higher gains during the entire study than the average of NWC and NW steers, and NWC steers had higher gains than NW steers. The EW steers had lower intakes (7.29 vs 7.68 kg/day) and better feed conversions (gain/feed 0.160 vs 0.141) than the average of NWC and NW steers.

Steers of British breed type had lower gain and reduced daily intake, consumed less total concentrate, had lighter carcass weights, reduced longissimus muscle area, had more undesirable yield grades, and improved quality grades than steers of Continental breed type. Steers of Wagyu breed type had more days finishing, lower gain, lower intake, more undesirable efficiencies, and lighter carcass weights than steers of British type in this study. The CON steers were heavier at slaughter than BRI steers, and BRI steers were heavier than WAG steers. Early weaning improved the percentage of steers grading Average Choice or higher by 40% over NW and NWC. The percentage of BRI steers grading Average Choice or greater was 72% vs 54% for CON steers and 71% for WAG steers. Early weaning improved feed efficiency and quality grades of beef steers.

Cow performance and pregnancy rate were improved by the early weaning of beef steers. Cows with EW steers had higher ADG than cows with NW steers (0.38 vs -0.17 kg/day) before weaning. Cows with EW steers gained in body condition score (0.23) and cows with NW steers did not change (0.00).

Taken from: Myers, S., E., et al., *J. An. Sci.* 77:300-310, 1999

As reported in VetMed Volume 56, Issue 4 July 1999, Iowa State University, Ames, Iowa

New Food Animal Faculty Member

Dr. Ernest Hovingh recently joined the Veterinary College faculty as an Extension Specialist in Ruminant Health. He received his D.V.M. from the University of Guelph and his Ph.D. in Epidemiology (with a minor in Biostatistics and Dairy Health Management) from the University of Prince Edward Island.

Virginia-Maryland Regional College of Veterinary Medicine Extension Staff:

Dr. J.M. Bowen	Extension Specialist - Equine
Dr. C.T. Larsen	Extension Specialist - Poultry
Dr. W. Dee Whittier	Extension Specialist - Cattle
Dr. T. Bailey	Extension Specialist - Dairy
Dr. E. Hovingh	Extension Specialist - Small Ruminant

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