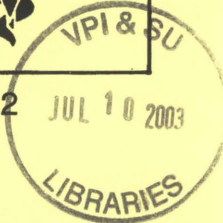


VIRGINIA COOPERATIVE EXTENSION SERVICE

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

# THE FOOD ANIMAL VETERINARIAN

VIRGINIA-MARYLAND REGIONAL COLLEGE OF VETERINARY MEDICINE



Spring 2000

No. 22

Dear Fellow Practitioner:

The joint Academy of Food Animal Practice/VVMA session was held at the Homestead in Warm Springs, Virginia in February. It was a very successful endeavor with about 50 in attendance at most of the sessions, making it the largest session at the VVMA conference. Discussions of Johnes disease were of special interest to practitioners.

The Homestead meeting was the third joint meeting of the Academy and the VVMA. This has been a very successful arrangement for both organizations. Next year, as the VVMA will be meeting in Virginia Beach, members of the Academy voted to meet in the Shenandoah Valley rather than go to Virginia Beach. A decision will need to be made whether to meet in February or in May when the Academy has historically met.

One item of particular interest at the Academy business meeting was the use of prescription drugs in beef cattle estrous synchronization programs. A significant change has occurred, as SYNCHROMATE B® is no longer being manufactured. This means that nearly all synchronization programs will now utilize prescription drugs. The dispensing of prescription drugs requires observing proper protocol, including labeling, having a proper veterinary-patient-client relationship, etc. The companies that market semen have often not been used to the involvement of a veterinarian, so there will be an educational process to make them aware of the requirements for legal use of these drugs.

The Academy of Food Animal Practice has sponsored scholarships at the Virginia-Maryland Regional College of Veterinary Medicine. This first award is to be given annually to a DVM student as an aid in completing a summer experience in Food Animal Veterinary Practice. \$1000 is to be given to a first or second year student who has demonstrated an interest in extending his/her knowledge of Food Animal Practice with a goal of eventually seeking a career position in Food Animal Veterinary Practice. The Academy assists in finding practices in which this experience can be carried out. A second award is given annually to a DVM student as an aid in recognition of outstanding performance during their time as a student in Virginia-Maryland Regional College of Veterinary Medicine, in the area of Food Animal Medicine, Surgery and Production Medicine. This award is given to a student who has demonstrated achievement in extending his/her knowledge and skills in Food Animal Practice and is a role model for other veterinary students in demonstrating behavior that promotes involvement in modern food animal veterinary medicine.

Best Wishes from Blacksburg!

W. Dee Whittier, DVM  
Extension Veterinarian



VIRGINIA POLYTECHNIC INSTITUTE  
AND STATE UNIVERSITY

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.





**BRSV—A VACCINE LOOKING FOR A DISEASE?**

Dear Food Animal Practitioners,

The title describes how our discussions about bovine respiratory syncytial virus at past Virginia Academy of Food Animal Practitioners meetings have categorized this viral respiratory disease. Unfortunately, I seem to have found the disease with a vengeance in a number of herds of lactating dairy cows several winters ago. Four individual milking herds came down with a quite severe respiratory disease in the adult milk cows. Rapid onset, high fevers, sudden and severe milk drop, and general inappetence characterized these outbreaks. Temps of 104 to 106 were quite common. All four of the herds where we acquired laboratory confirmation via acute-convalescent titers have almost closed herds with the exception of an occasional purchased herd bull for heifer clean up. None buy cows or replacements.

Symptoms are as described above plus an obvious auscultation note of emphysematous noises in a number of cows. A few individuals acquired subcutaneous air pockets under the skin of the back. The scenario reminds one of the sporadic acute interstitial pneumonia one sees from time to time in a milking herd. Most of the affected cows had higher temps than I am used to seeing with AIP and in no instance were these herds grazing any lush forage to speak of.

Due to our veterinary group's previous ambiguous characterization of this viral disease, none of these herds had been on a vaccination program that regularly featured BRSV. As a result, the acute serum samples in the first herd that broke with the problem had zero for acute titers. One herd had a grower raise some of his heifers and those heifers had received Bovishield 4 several times and none of these animals became sick. This would lead you to believe that the vaccine is protective. Strangely enough, in all but one herd the nearby young stock were unaffected. Quite some distance separated herds, so transmission from one to another was ruled out.

The outbreaks in two herds were quite costly from lost milk, the biggest factor, and labor and treatment costs. One herd lost several cows to the disease and the second had several that had to be culled due to the disease. The other two herds had 20 to 30 cows with a respiratory problem for a week but all affected cows did come back to production with aggressive treatment. In those two herds their acute titers showed a previous exposure to the virus. One owner estimates his loss at around \$14,000 with a 135 head milking herd. The second with a larger herd will probably approach \$18 to 20 thousand. As you can see, this entity can be quite a severe problem and in my opinion deserves more consideration in our vaccination protocol than many of us have given it in the past.

Sincerely,  
Don Gardner DVM  
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## NEW VACCINE COULD CUT SHIPPING FEVER IN CATTLE

A new oral vaccine developed by Agriculture Research Service (ARS) scientists may help U.S. cattle producers cut their losses from a disease that costs more than \$1 billion annually. The cost of bovine respiratory disease (BRD), commonly known as shipping fever, is more than all other cattle diseases combined.

The new oral vaccine may be commercially available in about three years, according to ARS veterinarian Robert E. Briggs at the National Animal Disease Center (NADC) in Ames, Iowa. Briggs and co-developer, ARS microbiologist Fred M. Tatum, conducted a field trial by feeding the newly developed oral vaccine to calves considered to be high and low risk for developing shipping fever.

Deaths among the high-risk calves fed the new vaccine were reduced from 16 to four percent. *Pasteurella haemolytica*—the main culprit behind shipping fever killed 16 percent of the nonvaccinates but none of the vaccinated animals. In the group of low-risk calves fed the oral vaccine, the average weight gain increased 25 percent during the first 28 days on feed. The oral dose also protected the animals within four days instead of the usual 10 to 14 days required by injectable vaccines.

**For further information contact: Robert E. Briggs and Fred M. Tatum, ARS NADC by phone (515) 663-7639 or via email at [bbriggs@nadc.ars.usda.gov](mailto:bbriggs@nadc.ars.usda.gov) and [ftatum@nadc.ars.usda.gov](mailto:ftatum@nadc.ars.usda.gov).) Cattle Health Report, Summer 1999.**

## ANTI-INFLAMMATORY BENEFITS OF TILMICOSIN IN CALVES WITH *PASTEURELLA HAEMOLYTICA*-INFECTED LUNGS

The objective of this study is to determine whether tilmicosin alters neutrophil infiltration or function, induces neutrophil apoptosis, and affects accumulation of leukotriene 134 (LT134), or tumor necrosis factor-alpha (TNF-a) in lungs of experimentally infected with *Pasteurella haemolytica*.

Twelve weight-ranked Holstein calves were studied for this. Calves were given 25% propylene glycol vehicle (n=5) or tilmicosin (10mg/kg of body weight;) subcutaneously, 18 hours and 15 minutes before intratracheal infection with  $2 \times 10^8$  *P. haemolytica* organisms. Two unmanipulated calves served as controls in some experiments. Rectal temperatures were recorded 15 minutes before, and at 3-hour intervals after infection for 24 hours. Samples obtained from bronchoalveolar lavage performed 3 and 24 hours after infection were used to assess colonization by *P. haemolytica*, membrane leakage as determined by trypan blue exclusion, oxidative function as determined by nitro blue tetrazolium reduction, and apoptosis, using electron microscopy and DNA fragmentation ELISA, were determined. Soluble TNF-a and LTB4 were measured from supernatants from bronchoalveolar lavage samples, using ELISA.

Treatment with tilmicosin resulted in significant clearance of *P. haemolytica* and neutrophil apoptosis at 3 hours, and decreased concentration of LTB, at 24 hours. Rectal temperatures, neutrophil infiltration, phagocytosis, oxidative functions, membrane leakage, and soluble TNF-cc concentrations were not significantly affected by tilmicosin.



Tilmicosin effectively controlled *P. haemolytica* infection, induced neutrophil apoptosis, reduced pulmonary inflammation, and did not affect neutrophil infiltration or function.

By inducing neutrophil apoptosis, tilmicosin prevents further amplification of inflammatory injury in *P. haemolytica*-infected lungs. We postulate that this mechanism confers anti-inflammatory properties to this macrolide, partly explaining its exceptional clinical efficacy.

**Abstracted from: A.C Chin, American Journal of Veterinary Research, June 1998, Vol. 59, No. 6**

### FEEDING COWS TO PREVENT SCOURS

The way cows are fed during the last two months of pregnancy can have a dramatic effect on the incidence of scours in newborn calves. This is especially true in years with severe weather stress such as increased snow, rain, wind, mud, and colder temperatures during that period of later pregnancy.

During that last sixty days of pregnancy, it is essential that cows receive two pounds of crude protein per day and enough energy to keep them gaining just a little body weight in addition to growth of the calf. The need of first-calf heifers is even more critical because they are still in the growing process themselves. If this feed is not provided and the weather turns severe during this period, the development of the calf may be impaired and the immune system may not develop as it should. The result is often a serious herd outbreak of calf scours later during calving. This occurs even though the weather at the time of calving may be relatively mild. If the weather is severe at calving also, the losses will be even greater. The response of these calves to the usual scours treatment is poor. If several calves are taken to the diagnostic laboratory for evaluation, most of the commonly listed scour causing bacteria and viral agents may be isolated. But these agents are really more "opportunists" than the real cause. The "cause" occurred a month or two ago in the form of the feed deficiency to the dam and it is almost impossible to overcome that effect during the scours outbreak. It is like a run-away buggy, and you just hang on for the ride.

This weather stress has an effect at much higher temperatures than we expect. When the temperature drops below 30°F, producers should plan to increase feed intake for the cows by 10% for each 10° F of decreased temperature. The effect of wind chill must also be considered. Wetness and mud make the effects even worse. So, when it is really cold, with snow and wind, a young heifer cannot even eat enough of some lesser quality roughages to meet her actual needs. Cattle are hardy critters and they can take a day or two of deficiency and recover fine. But, if it continues beyond this and they are unable to meet their nutritional needs, the process may extract a heavy price from the unborn calf currently and from the producer, later.

Cows that are in good body condition going into winter are better able to cope with weather stress. They have a thicker layer of body fat, which has a tremendous insulation effect. But they are also better able to draw on it when under nutritional stress. These effects may be important enough to justify the early weaning of calves to allow their dams to regain more body condition as they go through fall into winter.

Forage quality is important in regard to both protein and energy content. The cows may not be able to take in enough of a poor quality feed to meet their needs. Most feeding programs for beef cows are too low in energy for them to make effective use of urea. Urea requires lots of feed



energy to convert it to protein. Urea products can be used in feedlot rations that are high in grain (and energy) but this is not usually the case for cow diets. During muddy weather, cows fed a supplement on the ground will waste some of it by tromping it into the mud. This must also be considered in planning for the amounts to feed since that wasted doesn't provide nutrients for the cattle.

Adequate nutrition to the dam will still not prevent all calf scours but it will prevent some of the major herd problems with it. Plan ahead and provide the essential protein and energy needs to your pregnant cowherd. There are opportunities for short cuts in the cattle business, but marginal feeding of late-term, pregnant cows and heifers is not the place to try a short cut.

**Dr. Clell V. Bagley, Utah State Univ. *Beef Newsletter*; December 1998. As reported in the *Ohio Vet Newsletter*; Fall 1999.**

### **ABORTION ASSOCIATED WITH MASTITIS IN DAIRY COWS**

Pathogenic bacteria, which cause clinical mastitis in dairy cows, are classified as either contagious or environmental. Contagious bacteria are transmitted from infected quarters to uninfected quarters during the milking process and include such Grampositive bacteria as *Staphylococcus aureus* and *Streptococcus agalactiae*. Environmental bacteria, found in the soil, feces, and bedding and that enter the teat duct from these sources, include both Gram-positive and Gram-negative bacteria such as *Streptococcus nonagalactiae* and coliform organisms.

Clinical mastitis caused by Gram-negative bacteria may adversely affect the reproductive cycle of the dairy cow by altering the interestrus interval and by causing abortion through the release of inflammatory mediators. Endotoxin increases serum prostaglandin F<sub>2</sub> levels and, through its luteolytic action, alters the estrus cycle or causes abortion in cows. Grampositive bacteria that cause clinical mastitis might be associated with embryonic losses in dairy cows through inflammatory products and pyrexia.

The objective of this study was to assess the association between clinical mastitis and abortion during early gestation (1 to 45 days) in lactating dairy cows. During the study period, there were 2087 cows diagnosed pregnant, 60 cases of clinical mastitis, and 127 cases of abortion. Mastitis, days open, and type of breeding were significantly associated with risk of abortion.

Cows that had clinical mastitis during the first 45 days of gestation were at 2.7 times higher risk of abortion within the next 90 days than were cows without mastitis. Cows with a calving to conception interval >174 days were at lower risk (43%) of abortion compared with cows with a calving to conception interval <79 days. Conception on a breeding detected by secondary signs of estrus was also significantly associated with increased risk of abortion (odds ratio = 1.7).

No significant association was found between parity, breeding season, or milk production or use of PGF<sub>2</sub> to induce successful estrus and subsequent abortion. Associations found in this study do not imply causality because all confounding effects cannot be considered in an epidemiologic study.

**Taken from: Risco, C. A., et al. *J Dairy Sci* 82:1684-1689, 1999 As reported in *VetMed*, Vol. 6 Issue 1, January 2000, University of Iowa, Ames, IA**



## PASTURE SUPPLEMENTATION AND FEEDLOT PERFORMANCE

Provision of self-fed, creep supplements to beef calves is employed commonly as a means of increasing weaning weights and, hence, potential profitability of cow-calf operations. Creep feeding could potentially influence postweaning growth both positively and negatively. Given their previous exposure to concentrates, creep-fed calves might be less disposed to digestive problems during the transition from pasture to concentrate-based finishing diets. Creep feeding of animals that otherwise would be nutrient deficient, such as calves nursing dams with poor milk production, might influence satellite cell proliferation during critical periods of development, thereby altering future growth potential. Permanent effects of early postnatal nutrition on growth and metabolism, referred to as *nutritional programming*, have been demonstrated in ruminants. Early postnatal growth restriction can retard future growth potential as well as the expression of compensatory growth.

Myers et al. evaluated the effects of creep feeding during the final 8 weeks of suckling on finishing performance. Creep feeding increased preweaning gains in both years of the experiment. During the finishing phase, gains and efficiencies of supplemented calves were equal or superior to those of calves that did not receive creep. In general, increases in body weight acquired through creep feeding are retained throughout the subsequent finishing phase. However, creep feeding appears to have no dramatic effects on feedlot growth or carcass characteristics.

Stocker programs frequently are complemented by the strategic use of energy and protein supplements. Immature forages often contain an excess of degradable intake protein and presumably could be complemented by supplementation with readily available forms of energy and undegraded intake protein. As forages mature, protein may become limiting, particularly protein that is readily degradable. Consequently, supplements containing appreciable quantities of degradable protein can stimulate microbial digestion and forage utilization.

Considerable lack of consistency exists among studies evaluating carryover effects of grazing supplements on subsequent feedlot performance. However, studies showing no effect of previous supplementation on feedlot performance do appear to have the common feature of poor quality forages during the grazing season. Conversely, studies characterized by a compensatory growth response during the feedlot phase seem to have in common the use of higher quality roughages. Initially, this seems contrary to the concept of compensatory growth, which by definition requires a period of growth restriction. Cattle in the studies characterized by compensatory growth were not restricted severely, even when not supplemented during the growing period. This may imply that supplementation has a greater influence over changes in gut fill with higher quality forages.

**Taken from: Drouillard, J. S., and G. L. Kuhl J Anim Sci 77:136-146, 1999  
As reported in VetMed, Vol. 6, Issue 1, January 2000, Iowa State University, Ames, IA**



## BODY CONDITION SCORE AND CARCASS VALUE OF CULL BEEF COWS

Quality grades are designed to segregate carcasses into predictable palatability groups, and the quality grades presently applicable to carcasses of mature cows are US Commercial, Utility, Cutter, and Canner. Because many cull beef cows are typically marketed in poor condition immediately after being culled from the breeding herd, their carcasses have the inferior lean-quality characteristics indicative of the lowest two quality grades (US Cutter and Canner). These low-quality carcasses are destined for the production of "manufactured beef," used in ground beef and sausage production. On the other hand, fatter carcasses with desirable lean-quality characteristics equivalent to US Commercial and/or Utility are typically fabricated into several boneless subprimal cuts from the rib, loin, and round that can be marketed to the food-service trade.

Sales of cull beef cows account for 15 -to 25% of the yearly gross revenues of cow-calf operations in the United States. It has been reported that producers lose approximately \$69.9~) of potential revenues per non-fed animal slaughtered in the United States, but cattle producers could recoup \$27.65 per non-fed animal by monitoring body condition, and an additional \$27.65 by marketing cows in a timely manner. The obvious alternative is to feed cull cows a high-energy diet to improve external fatness/ body condition and carcass quality characteristics, thereby delaying the sale of these cows to the spring when seasonal prices are the highest.

Mature beef cows (n = 88) were slaughtered to determine the influence of body condition score (BCS) on carcass and live animal value. Cows were weighed and assigned a BCS (1 = extremely thin; 3 = thin; 5 = moderate condition; 7 = moderately fat; 9 = extremely fat) 24 hours before slaughter. Value of the hide and by-products for BCS-2 cows was greater than for cows assigned a BCS of 3 through 8. Even though US Utility carcasses from BCS-8 cows produced the least valuable subprimal cuts from the chuck, loin, and ground, the gross and net values of BCS-8 cows were greater than those of BCS-3,4,5, and 6. Within the grade of US Cutter, carcasses from BCS-6 cows had the highest, and BCS-2 cows had the lowest, gross and net values. Across the US Utility/Cutter mix, cows designated with a BCS of 7 and 8 had greater gross and net values than cows assigned a BCS of 6 or lower. Live value increased linearly from a low of \$76.10/100kg for BCS-2 cows to a high of \$90.84/100 kg for BCS-7 cows.

Data from this study indicate that marketing cows at a BCS of 6 could optimize economic returns to both cow-calf producers and non-fed beef packers. Feeding to, or marketing at, a BCS of 6 would result in a high percentage (73.3%) of carcasses grading US Utility and maximize total lean product yields. Carcasses from BCS-6 cows were lean and would achieve a marketable fat-trim level of 6.4 mm.

**Taken from: Apple, J. K. JAnim Sci 77:2610-2620, 1999**

**As reported in VetMed, Vol. 6 Issue 1, January 2000, University of Iowa, Ames, IA**

### Interesting Performance Evaluations

“It takes him 2 hours to watch 60 Minutes” **Taken from the Internet**

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