

THE FOOD ANIMAL VETERINARIAN

VIRGINIA-MARYLAND REGIONAL COLLEGE OF VETERINARY MEDICINE



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Dear Food Animal Practitioners:

BLACKSBURG, VA

A number of issues are of current concern to Virginia's Food Animal Practitioners:

- Reports of a very virulent Type 2 BVD continue from the Northeastern U.S. with major problems in Pennsylvania and West Virginia. They are close neighbors! It appears that the major steps we should be taking are: 1) discourage clients from bringing animals into their herds if at all possible, and encourage quarantine if not, 2) encourage vaccination for BVD. Evidence suggests that vaccination with currently available products is protective but that proper procedures are important. Modified live products appear to have been totally protective. Killed products need to be given as directed, including the booster. Some are recommending more frequent boosting if the killed products are used.
- Tuberculosis has been a major issue in the press. The State Veterinarian's office has done a nice job of both handling the situation and keeping practitioners informed. It appears at this writing that the fate of Virginia's TB free status hangs on a culture from one cow from a herd that was tested in the area neighboring the infected farm that was depopulated. This outbreak may have the positive effect of letting us talk to clients about infectious diseases and encouraging procedures that will prevent the introduction of serious diseases into their herds.
- The July state Dairy Herd Improvement (DHI) Summary is a synopsis of the data from the 618 herds on test and revealed some interesting things about the current status of Virginia's Dairy Industry:
 - Rolling Yearly Herd Average stands at 18,280 lb., virtually unchanged from a year earlier.
 - Total cows in the herd is at 118, also unchanged from a year earlier. Are larger herds not participating in DHI as much so that their larger numbers are not being reflected?
 - Reproductive indices show some declines. Projected Minimum Days Open now stands at 143 days (corresponds to 13.9 month projected calving interval). This is a function of a Voluntary Waiting Period of 58 days, a heat detection value of 42% (% Heats Observed) and a conception rate of 43% (% Successful Breedings). When summer months (which are typically lower), are added to the data base, the Projected Calving Interval could go over 14 months and the percentage of Successful Breedings dip below 40% for the 60% of Virginia herds on DHI.

We hope all is going well for you in your practices.

W. Dee Whittier, DVM
Extension Veterinarian



ORAL REHYDRATION THERAPIES FOR SCOURING CALVES

The best procedure for feeding calves with diarrhea has been a subject of controversy. In particular, it has been debated whether it is beneficial to feed milk during treatment with oral rehydration solutions (electrolyte solutions). Milk is usually withheld during oral rehydration therapy, because it is assumed that calves are less able to digest milk during diarrhea. Researchers at the University of Illinois tested the therapeutic value of keeping calves on milk while feeding an oral rehydration solution. Only milk from the last two days of the non-salable period was used from cows that had been treated for mastitis. Forty-two calves that averaged 10-days-old when diagnosed with diarrhea were used in the trial. Dietary treatments are in Table 1. Treatment A represented the traditional protocol for therapy, which consisted of removing milk from the diet during the first two days of therapy and feeding an oral rehydration solution, then gradually reintroducing milk to the calves. For treatment B, calves were given oral rehydration solution and partial allowance of water. Treatment C included a full ration of milk in combination with decreasing amounts of the oral rehydration solution.

Dietary treatments^a

Day	Treatment A		Treatment B		Treatment C	
	Milk ^b	ORS	Milk	ORS	Milk	ORS
1	0	10.0	2.5	10.0	10.0	10.0
2	0	10.0	2.5	10.0	10.0	10.0
3	5.0	5.0	5.0	7.5	10.0	5.0
4	5.0	5.0	5.0	7.5	10.0	5.0
5	7.5	2.5	7.5	5.0	10.0	2.5
6	7.5	2.5	7.5	5.0	10.0	2.5
7	10.0	0	10.0	0	10.0	0

^aTreatments A and B were fed in two equal feedings; treatment C was fed in three equal feedings.

^bWhole milk

Calves given treatment A had an average net loss of over 2 pounds of body weight (BW) by day 3 of therapy, but gained BW during days 3 to 7; overall calves given treatment A had a net loss of BW during the 7 days of therapy. Calves fed treatment B had a net loss of about 1/2 pound of BW by day 3 of therapy, but replenished lost BW during days 3 to 7. In contrast, calves given treatment C averaged a net gain of over 1 pound of BW during days 1 to 3 and continued to gain weight during days 3 to 7 of therapy. --Proceedings 1994 Professional Dairy Management Seminar, June 22-23, 1994, Dubuque, IA, Garthwaite, B.D., et al. 1994. J. Dairy Science 77:835 (Contributed by Lee Kilmer, Extension Dairy Specialist, ISU), as reported in Veterinary Medical Extension Newsletter, #406-V755, July 1994, Iowa State University, Ames, IA.

THOUGHT FOR THE MONTH

The greatest good to society that any man can contribute is to be responsible for his own welfare.

STAPHYLOCOCCUS AUREUS INTRAMAMMARY INFECTIONS IN PREPARTUM DAIRY HEIFERS

Staphylococcus aureus is a major contagious mastitis pathogen that is considered to be primarily transmitted from cow to cow during the milking process. Control measures have been developed that enable the producer to greatly reduce the prevalence of this mastitis pathogen. Despite superior efforts, many dairies have been unable to completely eradicate *S. aureus* mastitis. One reason for failure to eradicate *S. aureus* is that heifers may enter the lactating herd already infected with *S. aureus*.

It has been suggested that heifers develop *S. aureus* mastitis due to being fed mastitic milk and being allowed to suckle each other. There is little if any evidence to support this view. In fact, when *S. aureus* and non-*S. aureus* milk was fed to preweaned heifers, the prevalence of *S. aureus* mastitis in heifers at first parturition was equal.

Because the epidemiology of this disease in heifers was not clear, a 4 year study was instituted to: (1) determine the significance of *S. aureus* mastitis in heifers, (2) determine the sources of *S. aureus* on dairies, and (3) determine the most likely sources of *S. aureus* causing mastitis in prepartum heifers.

The prevalence of *S. aureus* mastitis among the 23 herds studied for objective 1 was nearly 7% with 21 of the 23 herds having at least one heifer freshen with *S. aureus* mastitis. There was not a significant difference in the prevalence of *S. aureus* mastitis in heifers at first parturition between herds with a low prevalence (<6%) and a high prevalence (>10%) of *S. aureus* mastitis in the lactating herd.

Sources of *S. aureus* on dairies was studied on 7 herds. *Staphylococcus aureus* was recovered from body sites of prepartum heifers and cows at parturition, bedding, housing, feedstuffs, flies, instruments and equipment, non-bovine animals, air, and man. The most common sources were milk and heifer body sites. All herds, regardless of lactating herd *S. aureus* prevalence, had prepartum heifers with *S. aureus* colonized body sites.

Isolates of *S. aureus* were typed and a similarity coefficient was used to determine the *S. aureus* isolates that were most similar to the *S. aureus* isolates recovered from lacteal secretions of heifers at first parturition. Seventy percent of 91 *S. aureus* isolates from heifer mastitis at parturition were the same as preexisting lactating cow mastitis isolates, 35% were the same as heifer body site isolates, and 19% were the same as environmental isolates.

Staphylococcus aureus mastitis in heifers can be an important disease in most dairy herds. Measures to eradicate this disease are likely to fail because herds with excellent control of *S. aureus* in the lactating herd still have a reservoir of *S. aureus* in the prepartum heifer population (and possibly the adult cow population). Thus, intramammary antibiotic therapy in prepartum heifers may be a justifiable control measure. --Jerry R. Roberson, DVM, PhD, Production Management Medicine, VMRCVM, Blacksburg, VA.

FARAD INQUIRIES - NEW NUMBER

The Food Animal Residue Avoidance Databank (FARAD) has been transferred from the University of Florida to North Carolina State University. Veterinarians who have questions about drug withdrawal times following treatment of food producing animals should call (919) 829-4431. The FAX number for FARAD is (919) 829-4358. Electronic mail inquiries should be addressed to: FARAD@NCSU.EDU.

Dr. Steve Sundlof, who served as FARAD Director at the University of Florida, has accepted the position on Director of FDA's Center for Veterinary Medicine. Dr. James Riviera of North Carolina State University, who has worked with FARAD since its inception has assumed responsibility for directing FARAD operations. --AVMA Washington Veterinary News, Governmental Relations Division, Washington Office, July 1994.

BOVINE BREDA VIRUS

Bovine Breda virus, a torovirus, causes diarrhea in day-old to eight-week-old calves. The virus infects villi and crypts of both small and large intestine. Mildly affected calves develop a yellowish diarrhea; severely affected calves develop hemorrhagic enteritis. Outcome of the disease depends on the number of factors; age, immune status of the calves, and serotype of Breda virus. Approximately 15% of affected calves die. Infected calves excrete large amounts of the virus in their feces and contaminate the surroundings. Spread of virus can be controlled by good management and hygienic practices. In addition, the virus is heat labile and fecal material loses infectivity within a few days even in cold weather. In adult cattle, Breda virus, in association with bovine coronavirus, may be a cause of winter dysentery.

Outbreaks of Breda virus enteritis can be prevented by feeding colostrum to neonatal calves, by avoiding overcrowding, by quickly isolating sick calves, and by careful cleaning and disinfection of calf pens. There is no Breda virus vaccine. The virus is antigenically distinct from bovine coronavirus and, therefore, bovine coronavirus vaccine does not protect against Breda virus infection.

For diagnosis, veterinarians should submit, to a diagnostic laboratory, fecal material (about 10 grams) from an acutely ill calf for electron microscopy or a piece of intestine (small or large) from a recently dead calf for an indirect fluorescent antibody test. The Wisconsin Animal Health Laboratory--Madison also offers services for serotyping Breda viruses (Serotypes 1 or 2) by hemagglutination-inhibition or immuno electron microscopy.

Bovine Breda virus enteritis has been diagnosed in only a few states (Iowa, Minnesota, New York, Ohio, South Dakota, and Wisconsin), but the virus may be more widespread. On the basis of a published report, 86% of the U.S.A. cattle tested were seropositive for Breda virus. --**Sanjav Kapil, DVM, PhD, ACVM, Wisconsin Animal Health Laboratories, in Animal Health Newsletter, Jan/Fed, 1994 as stated in the Herd Health Memo, March 1994.**

PROPER MANAGEMENT COULD LESSEN CALF LOSSES

Results from a study on calf mortality may help you make future management decision. Some of the causes of calf loss can be limited or controlled with good management practices.

Colorado State University researchers, using the National Animal Health Monitoring System, monitored 73 Colorado cow-calf operations over a two-year period. During the study period, 24,396 calves were born in the 73 herds. Of those births, 1,101 calves died before weaning, resulting in a calf mortality rate of 4.5 percent. The cost for each dead calf was \$216. Of that average cost, \$208 was due to the value of the calf. All other costs - veterinary services, drugs, labor and carcass disposal -- accounted for \$8 or 4 percent.

Dystocia was the largest single cause of death at 17.5 percent. By selecting bulls that produce lower birth-weight calves and choosing heifers with adequate pelvic openings, some dystocia problems can be limited. Keeping a closer eye on first-calf heifers could also help prevent calf losses.

Stillbirth was the second greatest cause of calf loss, accounting for 12.4 percent of all calf deaths. Researchers assumed that many of these stillbirths were the result of difficult births that were not observed by the producer.

Enteric diseases, mainly diarrhea, accounted for 13 percent of all deaths. Vaccination has been shown to provide protection against bacteria and viruses that cause diarrhea. Proper nutrition of the cow prior to calving can improve her colostrum which provides antibodies to the calf. --**Drovers Journal, February 1994, as reported in The University of Georgia Cooperative Extension Service Veterinary Newsletter, No. 296, March 1994, Athens, GA.**

VITAMIN D TOXICOSIS IN LAMBS FED LAMB MILK REPLACER

Four lambs between 1 and 4 weeks old were presented with signs of weakness and ill-thrift. The lambs either could not stand and/or could not walk. The lambs were bright, alert, and had good appetites. Total serum calcium levels were elevated, ranging from 16.5 to 30 mg/dl. Control lambs from the university flock had total serum calcium levels of 10.45 to 12.46 mg/dl. All affected lambs had been receiving lamb milk replacer fed per label directions. Three of the affected lambs had previously received vitamin E/selenium injections. Vitamin D levels were evaluated in two of the lambs and two control lambs from the university flock. The vitamin D (25-hydroxy vitamin D) levels in the affected lambs were 154 and 174 nmol/L, whereas the levels in the control lambs were 9 and 20 nmol/L. The milk replacer (from a reputable company) was the only common source of vitamin D among the 4 lambs. Three of the lambs were then placed on kid milk replacer and all 3 lambs recovered within 3 days. Total serum calcium was reevaluated in two of the recovered lambs and was within normal limits.

Vitamin D toxicosis should be suspected in weak or downer lambs that are being fed lamb milk replacer. The total serum calcium should be evaluated, and if elevated, another milk replacer should be used. --**Jerry R. Roberson, DVM, PhD, Production Management Medicine, VMRCVM, Blacksburg, VA** .

INJECTING VITAMIN E INTO PREGNANT COWS

Previous research had shown there is minimal placental transfer of vitamin E from the dam to the fetus; consequently, calves normally are born with very little vitamin E in their tissues. In this trial, Colorado State University researchers injected pregnant cows intramuscularly with 3000 IU of vitamin E (α -d-tocopherol) at 4 to 6 weeks before calving. Prior to first nursing, blood was drawn from the newborn calves and analyzed for vitamin E. Approximately 36 hours after calving, by which time maximal colostrum antibody absorption normally has occurred, blood was again drawn and analyzed for serum antibodies (immunoglobulins, IgM and IgG₁).

Among calves whose dams had received vitamin E injections, there was a significant increase in presuckling plasma vitamin E concentration. Although not statistically significant, there was also an increase in presuckling red blood cell vitamin E content. These same calves also had higher post-colostral serum IgM and IgG₁ concentration. The authors concluded that injecting the dam with vitamin E in late gestation may increase placental transfer of the vitamin to the fetus as well as increase immunoglobulin production of the dam so that more is transferred to the calf via the colostrum. --**Nockels et al. 1994, Colorado State University Beef Program Report as published in Michigan State University Animal Science Newsletter, JUN 94.**

NEW SCROTAL TAPE AVAILABLE

Dr. Glenn Coulter of the Agriculture Canada Research Station, Lethbridge, Alberta, and his associates, have developed a scrotal measuring tape that allows more repeatable measurements. The tap is spring-activated and the same degree of tension is applied during each measurement. After the loop is slipped around the scrotum, the lock is released and the measuring tape is automatically tightened. The tape is then locked place, removed, and the measurement read. For more information or to order Coulter Scrotal Tapes, contact: Trueman Manufacturing, Box 774, Edmonton, Alberta T5J2L4, Canada; telephone (403) 434-0554, fax (703) 435-0876. --**Society for Theriogenology Newsletter, November-December 1993; as reported by Large Animal Veterinary Report, Volume 5, Number 4, April 1994.**

DRY TREATING ALL COWS STILL THE SAFEST BET

The role of dry cow therapy is to decrease existing infections and prevent new infections during the early dry period. In well-managed herds where hygiene and management practices are good, and the prevalence of infections is low, the necessity of dry treating all cows is often questioned. To help answer this questions, a study was conducted at the University of Utrecht, The Netherlands to evaluate the use of dry cow therapy in a low SCC herd. Sixty-eight cows were enrolled in the study. For each cow, half of the udder was treated with an antibiotic dry cow infusion; the other half was not infused.

The quarters that were infused with an antibiotic showed a significantly lower incidence of clinical mastitis in the dry period. Quarters that were uninfused had 10 cases of clinical mastitis versus one case in infused quarters. Seven cases occurred during the first two weeks of the dry period. The infused quarters showed a reduction of minor pathogens at calving. The uninfused quarters showed little evidence of spontaneous cure during the dry period.

Results reaffirmed the high susceptibility of cows in the early dry period, even when the prevalence of infections at dry-off was low. Although selective dry cow treatment can be practiced successfully, infusing all quarter of all cows with a dry cow treatment is the safest practice. --Source: **Journal of Dairy Science**, Vol. 76, No. 10 (1993) p. 2925; as reported by **Udder Topics** - Vol. 17, No. 2, April 1994.

EFFICACY OF INJECTABLE ABAMECTIN AGAINST GASTROINTESTINAL TRACT NEMATODES AND LUNGWORMS OF CATTLE

Efficacy of abamectin against gastrointestinal tract nematodes and lungworms of cattle was determined in four experiments. The first two experiments were controlled trials in which efficacy was determined at necropsy in calves or with either experimentally induced (n = 14) or naturally acquired (n = 16) infections. Half the calves in each experiment were treated with abamectin (200 µg/kg of body weight, SC), and half were left untreated as controls. Efficacy was >99% against adult stages of *Dictyocaulus viviparus*, *Haemonchus placei*, *Ostertagia ostertagi*, *Trichostrongylus axei*, *Cooperia punctata*, *Trichuris discolor*, and *C. oncophora*, and was 92.4% against *Nematodirus helvetianus*. The second two experiments were clinical trials in which efficacy was determined by fecal egg count reduction in naturally infected yearling heifers (n = 75). Within replicates of 5, 4 heifers were assigned at random to treatments with 200 µg of abamectin/kg and 1 was left untreated as a control. Abamectin was 100% effective in eliminating strongylate nematode eggs from the feces of these heifers. In all experiments, adverse reactions were limited to small, clinically unimportant injection site swellings in 29% of abamectin-treated calves. Abamectin was judged to be safe and effective in these trials. --Abstracted from Kaplan, R., et. al, **J. Am. Vet. Res.** 55 (1994) pp. 353-357 as reported in **Veterinary Medical Extension Newsletter**, #406-V755, July 1994, Iowa State University, Ames, IA.

SOURCE OF SUPPLEMENTAL PROTEIN HAD NO EFFECT ON PERFORMANCE OR MORBIDITY OF NEWLY ARRIVED FEEDER CALVES

In a previous study, New Mexico researchers had noted that adding a high bypass protein supplement (blood meal) to a 65 percent concentrate receiving diet may improve feed efficiency and decrease sickness in newly arrived feeder calves. In the present 28-day trial, they allotted 120 newly arrived feeder calves (448 lb) to one of three supplemental protein treatments: 1) 4.5 percent soybean meal; 2) 2.0 percent blood meal + 0.5 percent soybean meal; 3) 2.7 percent fish meal + 1.0 percent soybean meal. A summary of results revealed that protein source had no effect on average daily gain, feed intake, feed efficiency, or percentage of calves treated for bovine respiratory disease. Based upon these results, the authors concluded that selection of soybean meal, blood meal, or fish meal should be determined primarily on the unit cost of protein (Gunter et al. 1993, Clayton, NM Livestock Research Center Program Report No. 85). --KSU Clin Vet Med Newsletter, 4/94, as reported in **Veterinary News**, The Pennsylvania State University, May 1994.

OPPORTUNITIES FOR MARKETING COW/CALF SERVICES

A 1994 Beef Cow/Calf Health and Productivity Audit (CHAPA) report of the National Animal Health Monitoring Service (NAHMS) on Beef Breeding Management reveals a low rate of adoption of technology in beef cattle operations. This report details a survey of 540 operations owning over 174,000 cows and heifers in the eighteen largest beef producing states. Data was collected from these producers concerning their use of reproductive management practices in their herds.

Forty-seven percent of the operations remove bulls from the breeding herd. This represents about 65% of the total cow inventory of the survey. As the herd size increased, the percentage of operations removing bulls increased ranging from a low of 37% for herds with 20-49 cows to 92.8% for herds having 300+ cows. Nearly half of the operations semen test newly purchased, leased, or borrowed bulls, while only 18% of the operations tested the remainder of their bulls prior to the start of the breeding season. Fewer than a third of all bulls are scrotal measured. Less than 5% of the operations are testing newly introduced bulls for Trichomonas fetus.

Table 1 lists several procedures which have been advocated for a number of years by animal scientists, veterinarians, and extension specialists as realistic management practices for use on breeding beef females. These practices, in many instances, have been shown to be profitable to the producer through the standardization of breeding animal selection, the monitoring of nutritional programs, improved reproductive performance, enhanced calving season management, and by identifying nonproductive animals. The NAHMS survey reveals that a high percentage of producers have yet to grasp the benefits associated with many of these practices.

While the numbers at first glance may appear that the beef industry hasn't gotten out of the starting gate, they actually represent opportunities for veterinarians to market production-oriented programs and services to producers. Education is the key. Each practitioner has a unique opportunity to be an advocate for the adoption of technology within the scope of their practice. A practitioner can organize educational meetings, as opposed to client appreciation meetings, to detail the cost/benefits of each of the procedures. This initial educational offering can be followed with reinforcing materials through newsletters, informational reprint mailings, videos, and/or on-farm visits.

Working with a producer on a one-on-one basis, a practitioner can show their client how and when to merge these practices into their operation. Cost is always a primary concern at these meetings, so a basic set of figures needs to be developed which can be modified for each producer. At an initial meeting, preimplementation production parameters can be established and post-implementation dates set to monitor progress being made in the program. Program monitoring gives a practitioner the opportunity to reinforce the cost/benefits associated with a particular practice. This type of positive, production-oriented relationship between a producer and a practicing veterinarian has been shown to be profitable to both parties.

For more information about the Reproductive and Nutritional report and other CHAPA reports, contact: Center for Epidemiology and Animal Health - USDA:APHIS:VS, Attn: NAHMS - 555 South Howes, Suite 200, Fort Collins, CO 80521. Phone (303) 490-7800.

Table 1: The percentage of Cow/Calf Operations Utilizing Reproductive Management Procedures on Replacement Heifers and Cows: This sample represents 174,513 Cows in 540 Herds from 18 states.

Procedure	Replacement Heifers (% of Operations)	Cows (% of Operations)
Monitor Weight	7.9	1.9
Body Condition Score	4.6	5.5
Use Artificial Insemination	3.3	5.4
Pregnancy Test by Palpation	15.9	17.7
Synchronize Estrus	3.0	4.3

--Mark F. Spire, DVM, MS, Veterinary Medical Newsletter, Sept. 1994, CVM, Kansas State University, Manhattan, KS.

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