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THE FOOD ANIMAL VETERINARIAN

VIRGINIA-MARYLAND REGIONAL COLLEGE OF VETERINARY MEDICINE



Spring 1989

No. 3

LABELING AND STORAGE OF DRUGS ON THE DAIRY

As all of you are certainly aware by now the sulfa residues in milk issue prompted the Interstate Milk Shippers to dust off some old regulations and begin to enforce them with vigor. There are at least three points of contact with the dairy farmer who are all trying to enforce these regulations namely: 1) a federal inspector, 2) state milk inspectors, and 3) processing plant fieldmen. The regulation they are attempting to enforce is part of the PMO (Pasteurized Milk Ordinance) and states roughly:

Animal drugs which are stored in the milkhouse, milking barn or adjacent areas shall be labeled for use in dairy animals. Animal products that do not meet this requirement may not be stored in these areas and are in violation of Item 1r.

Item 16r requires that animal drugs stored in the milkhouse and adjacent storage areas shall be properly labeled, which means it must contain the name and address of the manufacturer or distributor and in the case of extra-label use it must have the name and address of the veterinary practitioner dispensing the product; directions for use with milk discard times; and cautionary statements, if applicable.

A combination meeting of the VVMA Food Animal Committee, leaders of the Academy, VDACS (state) milk inspectors, coop milk inspectors, and the federal FDA inspector met in Lynchburg in February. Here are some of my quick observations from the meetings and observations about the situation:

- 1) The enforcement of these regulations has been a "hurry up" deal with much misunderstanding and some lack of communication between the agencies.
- 2) Whether this effort covers topicals, vaccines, non-antibiotic drugs, etc. is still somewhat under discussion. Officially the feds said topicals weren't included and at the meeting the VDACS generally came around to that. Everyone is not informed and many inspectors have their own opinions.
- 3) This effort has, in a sense, put the regulation of our drug usage and dispensing practices under the supervision of lay personnel with almost no knowledge of drugs and usage.
- 4) Increased labelling will be a requirement for all food animal practitioners. At this point you'll have to decide what you want to do about topicals and non-antibiotic but extra-label antibiotics will have to be labeled as above or you run the risk of having some irate clients perhaps facing economic sanctions.
- 5) This may be an opportunity for the **prepared** veterinarian to recapture some of the drug sales business that has gone to other drug salesmen in recent years. Other salesmen cannot write the "extra-label" label. Farmers are going to need these labels.

W. Dee Whittier, DVM
 W. Dee Whittier, DVM
 Extension Veterinarian

REVISED NUTRIENT REQUIREMENTS OF DAIRY CATTLE

The National Research Council has recently published the Sixth Revised Edition of Nutrient Requirements of Dairy Cattle. This classic reference includes sections on nutrient requirements and signs of deficiency, special aspects of dairy cattle nutrition, formulating rations, dry matter intake and nutrient requirements tables, and composition of feeds.

Researchers can use this publication to determine dairy cattle protein requirements on the basis of crude protein or degradable and undegradable intake protein. One of the most useful new tables in this edition enables users to find examples of lactating cows resembling their own animals and to locate their specific energy, protein, and other dietary requirements. Other tables have been expanded to include data on the first three weeks of lactation and on cows with higher milk yields. In addition, the statement of requirements for growing heifers and bulls now more accurately reflects their needs.

The most significant advance in this revision of Nutrient Requirements of Dairy Cattle is a computer program, provided on diskette, that includes all requirements for energy, protein, calcium, phosphorus, and vitamins A and D. It is compiled to run on PC or MS DOS on IBM-compatible personal computers. The program will run on a personal computer with no additional software. A diskette accompanies each book.

A new 1988, 168-page edition of Nutrient Requirements of Dairy Cattle (with diskette included) is available from:

National Academy Press
2101 Constitution Avenue, N.W.
Washington, D.C. 20118

The cost is \$14.95. --FDA Veterinarian, Nov/Dec 88, as reported in Herd Health Memo, Jan 1989, University of Kentucky, Lexington, KY.

VITAMIN E AFFECTS THE IMMUNE SYSTEM

When groups of seven Holstein heifer calves, 1 day old, were given 2800 mg dl-alpha tocopherol acetate (Hoffman-LaRouche) PO or 1400 mg dl-alpha tocopherol IM weekly for 12 weeks, lymphocyte stimulation indices (LSI) were significantly higher than for controls or calves given 1400 mg tocopherol PO. Values were highest for calves treated IM. Average serum IgG levels over the weeks were similar in all groups, but levels of IgM were significantly higher in calves given the high oral doses.

IBR virus neutralization (VN) tests revealed significantly greater VN at 12 weeks by sera from calves in the high oral and IM groups. In a second study, serum alpha-tocopherol and LSI of 12 yearling heifers, determined seven days after a single IM injection of 2000 mg dl-alpha tocopherol, were significantly higher than preinjection values. The enhanced cell-mediated and humoral immune responses of heifers given vitamin E suggested such supplementation could increase protection against disease occurring in intensive management conditions. --P. G. Reddy, et al., J. Dairy Science, 1986 as reported in Veterinary News, Jan 1989, Penn State University.

PORCINE AUTUMN ABORTION SYNDROME

Each year there is a large increase in the number of porcine abortion specimens submitted to the diagnostic laboratory during the months of August, September, and October as compared to other times of the year. At this same time, there is a decrease in the percentage of successful diagnoses. This phenomenon is not unique to South Dakota or even to the USA. Dr. E. A. Wrathall, Central Veterinary Laboratory, Weybridge Surrey, England, has noted the same thing occurs in Great Britain and has investigated the possible causes.

Dr. Wrathall found, as we do, that usually there are no lesions in the aborted pigs, and usually no significant infectious agents are found. He found that the increased abortion rate correlated with the period of fastest decrease in the length of daylight. He also learned that European wild pigs do not cycle during the months of July through September, and attributes this to an inherent photoperiodic rhythm. Assuming that domestic swine may have vestigial tendencies toward this sexual rhythm, he investigated the levels of luteinizing hormone and progesterone in the serum of pregnant sows during September and in the same sows when they were pregnant during other months of the year. In 5 of the 7 herds sampled, progesterone levels were significantly lower in September than in other months. This is evidence that apparently the hormonal support for pregnancy is lower during the autumn months than at other times of the year.

Dr. Wrathall concludes that hormonal changes associated with declining day length during late summer and autumn predispose pregnant sows to abortion of maternal failure type. Resistance to this kind of abortion can be provided by improving the maternal energy balance, increasing social contacts between pregnant sows and boars, and minimizing the decline in day length with artificial lighting. --Dr. Clyde Kirkbride, South Dakota State University, DVM News, Sept/Oct 88, as reported in Herd Health Memo, University of Kentucky, November 1988.

DEWORMING BY RUMEN INJECTION

In the near future, Syntex Animal Health, Inc. plans to jointly market their rumen injection device and Synanthic® (oxfendazole) pending USDA approval and licensing of this broad-spectrum dewormer.

A new U.S. trend in cattle deworming could emerge with this rumen injection system. This method is designed to administer up to 10 ml of dewormer through a 13-gauge needle directly into the rumen. When the injection device is firmly pressed down into the left paralumbar fossa, it automatically releases a mechanism that triggers the injection. The skin and rumen penetration and automatic administration of anthelmintic takes approximately 1 second. Multiple dosing is made possible through a tube connecting a canister of dewormer to the injection device. When cattle are restrained in a chute, the operator can simply move down the side of the chute, reach over the top and rapidly deworm one animal after another. The injection device needle is designed to allow cleaning and disinfection between cattle.

Some cattle receiving this injection may jump but overall they seem to tolerate it well. Syntex safety trials in the U.S. and other countries indicate that rumen injection is an acceptable method of anthelmintic administration. --L. C. Hollis, DVM, MAg, Manager, Field Technical Services, Syntex Animal Health, Inc., Veterinary Quarterly Review, Vol. 4, No. 4, Texas A&M University.

IMPROVEMENTS IN TREATMENTS FOR BOVINE CYSTIC OVARIAN DISEASE

Prostaglandin-F-2-Alpha (PGF) treatments have been used to shorten the interval from treatment to rebreeding after successful gonadotropin releasing hormone (GnRH) therapy for cystic follicles. A new study by Dr. A. S. Nanda and co-workers from the Department of Veterinary Clinical Sciences at the University of Liverpool, Great Britain (Vet Rec, 1988, 122:155-158) investigated various combinations of treatments designed to shorten treatment to breeding interval following GnRH therapy for cystic follicles.

A total of 227 cows with cystic ovarian disease in 4 different Friesian or Holstein-Friesian herds were detected and treated from 6/84 - 9/86. These cases were usually diagnosed during gynecological examination (per rectum) of cows with nymphomania, irregular estrous cycles, or no observation of estrous. One hundred and fifty of these cows were diagnosed with cystic thin walled structures greater than 25 mm in diameter on one or both ovaries. One hundred and forty-three cows with cystic follicles were treated with GnRH: 500 µg gonadorelin, IM (5 ml Fertagyl, Intervet) or 20 µg buserelin, IM (5 ml Receptal, Hoechst). Seven days after GnRH treatment 27 of these cases received PGF: 500 µg cloprostenol, IM (2 ml Estrumate, ICI). Twenty cases received one injection of PGF 15 days after GnRH treatment. Twenty-five cases, including 18 which did not respond to GnRH and/or PGF, received a "Synchro-Mate-B like" treatment: 1:55 g progesterone + 10 mg estradiol benzoate (PRID, Ceva) inserted in the vagina and removed 12 days later. Recovery was classified as the absence of a cyst and the presence of a corpus luteum (CL) within: 15 days after GnRH therapy alone, 10 days after GnRH and PGF therapy, or 10 days after PRID removal.

Two important results were found by Dr. Nanda and co-workers. First, significantly more cows treated 7 days after GnRH therapy with PGF had recurring follicular cysts (33%) than did cows treated 15 days after GnRH therapy with PGF (10% recurring) or cows treated with just GnRH (8% recurring). This result indicates that treatment with PGF, to shorten the interval from treatment to breeding in cystic follicle cows, should be delayed until approximately 15 days after GnRH therapy.

The second important result was that cystic follicle cows that were unresponsive to GnRH or GnRH and PGF therapy, were responsive to PRID treatment. Sixty-eight percent (17/25) of PRID treated cows recovered, and 88% of recovered cows conceived within three inseminations (average services/conception = 1.5). PRID treatments are not easily available in the US. However, Synchro-Mate-B (Ceva), using both a progestin implant, and a progestin and estradiol injection has similar physiological effects and conception rates in estrous synchronization programs. Consequently, prescription of Synchro-Mate-B may be a reasonable alternative for cystic follicle cows that are unresponsive to GnRH and/or PGF therapy.

In summary, recurrence of cystic follicles can be a problem when GnRH therapy is followed in 7 days with PGF. Recurrence of cystic follicles was found significantly less if GnRH was used alone or followed in 15 days with PGF. Cows unresponsive to GnRH and/or PGF therapy can be treated successfully with a "Synchro-Mate-B like" product. --Dr. Mark Varner, Extension Dairy Specialist, University of Maryland as reported in Herd Health Memo, Dec 1988, Penn State University.

MASTITIS IN BEEF COWS AND ITS EFFECTS ON CALF WEIGHT GAIN

In this study, one herd consisting of a total of 51 purebred Angus and Hereford cows and a second herd consisting of 69 crossbred cows were followed through lactation in order to determine the prevalence of mastitis pathogens and their effects on calf weight gain. Thirty days post-calving, 25.8% (31) of cows and 13.1% (62) of quarters were infected with mastitis pathogens as compared to 29.2% (35) of cows and 14.9% (71) of quarters infected at mid-lactation and 54.4% (60) of cows and 27.5% (130) of quarters infected at weaning.

Corynebacterium bovis was the most common bacterium, being isolated from 19 quarters (4.0%) post-calving, 36 quarters (7.6%) at mid-lactation and 86 quarters (18.2%) at weaning. *Staphylococcus aureus* was isolated from 14 (2.9%), 13 (2.7%) and 15 (3.2%) quarters post-calving, mid-lactation and weaning, respectively. Geometric mean somatic cell counts for *S. aureus* were 1522×10^3 , 344×10^3 , and 509×10^3 at post-calving, mid-lactation and weaning respectively; while for *C. bovis* cell counts were 65×10^3 , 36×10^3 , and 86×10^3 , respectively.

Adjusted 205 day weight gains for calves nursed by dams infected with *S. aureus* was 224.1 kg as compared to 233.7 kg ($p < 0.05$) for calves nursed by uninfected dams. The critical period for calf gain appeared to be between 60 and 100 days of calf age. During this time period, calf weight gains were 34.8 kg and 41.6 kg ($p < 0.05$) for calves nursed by infected dams and uninfected dams, respectively.

By contrast, adjusted 205 day weight gains for calves nursed by dams infected with any mastitis pathogen versus calves nursed by uninfected dams showed no significant difference between them. However, for gain between 60 and 100 days of calf age, there was a significant difference in weights (35.0 kg for infected and 41.8 kg for uninfected, $p < 0.05$).

It is theorized that until approximately 60 days of calf age, calves are unable to utilize the total milk volume supplied by the udder and therefore, any effects due to the presence or absence of pathogens are not apparent. However, in the next 40-day time period (60 to 100 days of age), calves begin to use the total capacity of the udder and effects due to infection may become apparent. During the second half of lactation (100 to 205 days), calves begin to use supplemental forage supplies and the capacity of the udder is once again of secondary importance. The effects due to major mastitis pathogens, however, may not be entirely overcome in the second half of lactation. --by **Melanie Newman, Penn State University, February 1988, as reported in Food Animal Professional Topics 1988 - Vol. 14, #3, University of Illinois.**

COMPARISON OF TREATMENTS FOR OVINE FOOT ROT

Vaccination and/or hour long footsoaks, with and without hoof parings, were compared for treatment of foot rot in sheep. In the absence of foot paring, vaccination combined with foot soaking resulted in a higher cure rate than did vaccination or foot soaking alone. However, the resulting cure rates were not acceptable for a good control or eradication program. An acceptable response rate was achieved with the combined treatment methods of hoof paring, vaccination, and repeated medication applied topically by either foot soaking, foot bathing or aerosol spray. --**C.V. Bagley et al., J. Am. Vet. Med. Assoc., 1987: 191:541-546; Communications in CE, Vol. 3, No. 6, Dec. 1987, Hoechst Roussel.**

RETAINED PLACENTA

Prostaglandin injection (10 mg PGF_{2α}) within one hour after INDUCED parturition reduced the incidence of retained placenta from 90.5% to 8.8%. Sixty-six cows and heifers were induced to calve with dexamethasone five days before expected parturition. Prostaglandin injected animals released fetal membranes in 7.4 ± 1.35 hr vs. saline treated controls, 98.3 ± 10.93 hrs after parturition ($P < 0.001$). --*Theriogenology* 26 (Sept. 86):365 as reported in *University of Vermont Herd Health*, Aug 87.

CORONAVIRUS FROM WINTER DYSENTERY

Winter dysentery is a sporadic problem among adult beef and dairy cattle characterized by explosive outbreaks of bloody diarrhea during the winter months and a marked drop in milk production. Two weeks to one month may be required for milk production to recover in affected herds. The causative agent(s) of winter dysentery has not been conclusively identified. At present, no specific vaccine or treatment exists to prevent or control winter dysentery. We investigated an outbreak of winter dysentery in the closed OARDC dairy research herd last year and results are summarized in this report.

Twenty of 136 lactating cows (14.7%) in the dairy herd developed profuse dark bloody diarrhea. There was a marked decrease in feed consumption and milk production during the diarrhea outbreak, which persisted for 2 weeks in the herd. The average age of the clinically-affected cows was 4 years (range of 2-7 years). Examination of feces from 9 of the sick cows and 5 clinically normal cows revealed no enterotoxigenic *E. coli*, *Salmonella* sp., cryptosporidia, coccidia or bovine viral diarrhea (BVD) virus. Typical coronavirus particles were observed by immune electron microscopy in 8 of 9 fecal samples from sick cows, but were not observed in samples from the normal cows. Neutralizing antibody titers to the NCDV strain of coronavirus increased 2 to 14-fold in convalescent sera from 5 of 6 cows, but did not change in sera from normal cows. No antibodies to BVD virus were evident in sera from sick or normal cows.

Oral inoculation of 3 gnotobiotic calves with a pooled fecal filtrate from the sick cows resulted in diarrhea and fecal coronavirus shedding in all calves. Typical coronavirus immunofluorescence and villous atrophy were observed in the intestine of 1 euthanized calf. Two calves which recovered seroconverted to NCDV coronavirus at day-14 and were immune to subsequent challenge with NCDV coronavirus.

Our results indicate a positive association between detection of coronavirus, increases in coronavirus antibody titers and the winter dysentery syndrome. Further work is needed to determine whether coronavirus is associated with outbreaks of winter dysentery in other herds. Veterinary practitioners working with herds experiencing outbreaks of winter dysentery are encouraged to submit fecal samples collected close to the onset of diarrhea and from age-matched normal cows and paired acute and convalescent serum to OARDC. Please contact the extension veterinarians or the investigator, Dr. L. J. Saif, OARDC, Wooster (Ohio) prior to submitting samples. --Linda J. Saif, PhD, Food Animal Health Research Program, Ohio Agricultural Research and Development Center, Wooster, Ohio, in *Ohio Veterinary Newsletter*, Dec 88, as reported in *Herd Health Memo*, Jan 1989, University of Kentucky, Lexington, KY.

VIRGINIA ACADEMY OF FOOD ANIMAL PRACTICE

The Food Animal Practice Workshop will be held on April 29, 1989 at the Red Carpet Inn in Waynesboro. The program is well under way and Dr. William Chalupa from The University of Pennsylvania College of Veterinary Medicine (New Bolton Center) will be our guest speaker. Dr. Chalupa is a nutritional expert and will be discussing nutritional considerations for cows treated with BST (growth hormone). This topic should be of considerable interest as it appears that BST will be released for marketing in the very near future. Dr. Chalupa will also discuss fat and protein feeding including protein feeding and fertility. Program committee members had also recommended John Fetrow to speak at the workshop but he was not available...maybe next year. I am working on other suggestions made by the program committee. The program should be to all of you by mid-March but put the date on your calendars now.

AN OVERLOOKED PUBLICATION

A myriad of veterinary and agricultural publications are available to food-animal practitioners. Some are expensive and some are free. All have value, but some don't have much. I receive all kinds.

Only in the past couple of years did I discover the one I value most. There may be many food-animal veterinarians who would find it to be as valuable as I have and who aren't familiar with it.

I am referring to FEEDSTUFFS, the Weekly Newspaper for Agribusiness. It has news of industry changes, regulatory actions, domestic and world trade news and market reports. All relevant notices published in the Federal Register are noted. Every issue has feature articles on livestock health/nutrition topics.

FEEDSTUFFS has the kinds of useful information that veterinarians tend to miss, or that they get piecemeal by listening to clients. Example articles from the December 26, 1988 issue include:

- European community to permit some U.S. meat imports
- Cactus Feeders, Inc. and Moorman Mfg. Co. form joint cattle venture
- Nutritionists able to prevent mycotoxin harm
- Pitman-Moore to acquire Coopers Animal Health
- Pillsbury agrees to be bought by Grand Metropolitan
- Energy values of high fat feed ingredients for dairy animals
- Research characterizes creep feed consumption of nursing pigs
- Management of gilt herd profitability

This weekly tabloid, published by the Miller Publishing Company, is not distributed free. It costs about \$40 for one year, or \$60 for two years, but I think it is well worth the cost. --Herd Health Memo, Jan 1989, University of Kentucky, Lexington, KY.

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