Dear Virginia Food Animal Practitioner:

A few notes regarding issues and opportunities of interest to food animal veterinary medicine are listed below:

-- Spring meeting of the Virginia Academy of Food Animal Practice is scheduled for April 25, 1992. It will be held at the Ever’s Family Restaurant in Mt. Crawford just south of Harrisonburg. It is titled “Advances in Cattle Reproduction” and will feature Dr. Jack Britt (NCSU) and Dr. Ray Nebel on dairy reproduction and Dr. Jim Wiltbank on beef cattle reproduction. For those who are interested, we’ll arrange tickets for the Virginia Beef Expo program on the preceding Friday evening. This should be a great event so make plans now to attend. If you haven’t received a program, call 703-231-4621 to get one.

-- The AVMA is leading a legislative push to change to FD&C Act to explicitly permit the extra-label use of drugs by veterinarians. The bottom line, as I see it, is that the AVMA and many others have become convinced that this is the only way to preserve extra-label rights. Please read carefully the editorial on page 601-603 of the March 1, 1992 JAVMA. The article explicitly asks for practicing veterinarians to visit their congressional representatives and volunteers the help of AVMA personnel in the meetings. Please think about this one! Our companion animal and equine colleagues are much less affected by this issue than we are. Most of our colleagues in food animal practice are much further from Washington than we are. Here’s one where you had better ask yourself, “If not me, who?” This could be one of the best causes for a half day out of the practice in recent times.

-- The Virginia Academy of Food Animal Practice is scheduling another in-depth seminar. This one will deal with nutrition and is scheduled for the last week in May in Harrisonburg. Speakers are Dr. Steven Stewart and Dr. Mike Hutjens. Dr. Bobby Franck is spearheading this program. Call him at 804-883-5822 or 227-6533.

-- Hopefully all of you are well into swing with the Milk and Dairy Beef Quality Assurance Program. We appreciated the attendance of so many of you at the meetings on the subject in December. If you need any materials or have questions, please call me. Getting your clients to complete the program and having the certificate hanging on the wall is a vaccination against Grade A permit suspension if a residue occurs. BE SURE YOUR CLIENTS ARE PROTECTED!

-- Dr. Don Gardner continues to be active in representing our interest on the Animal Well-being issue. Don has put together a video-tape with several copies circulating. When you receive your mailing, please view it right away and forward it to the next person on the list.

Sincerely,

W. Dee Whittier, DVM
Extension Veterinarian
LEVELS SET FOR MILK MONITORING PROGRAM

In the last issue of the FDA Veterinarian, we reported that FDA had initiated the National Drug Residue Milk Monitoring Program (NDRMMP) which is routinely testing raw milk for drug residues. Under the NDRMMP, 250 locations throughout the U.S. will be chosen on a random basis to monitor raw milk for specific types and amounts of drug residues. Several readers have asked which drugs FDA will be testing for, and what safe levels have been established for residues of these drugs.

Initially, FDA will be testing for the presence of eight sulfa drugs and for three tetracycline drugs which have been widely misused in dairy cows. Below is a listing of those drugs and the safe levels or tolerances that have been set for them.

A safe level is the maximum acceptable concentration for the total residue of a veterinary drug in an edible tissue. Generally, methods to measure total residue are unavailable. A safe level is established through the use of a risk assessment analysis and is not binding on the courts, the FDA, nor the industry. FDA uses a safe level as an element in determining assay sensitivity requirements and in decisions regarding the need for regulatory action. Safe levels do not have the "force of law" that tolerances possess, and do not limit the Agency's discretion in regulatory matters.

On the other hand, a tolerance is the maximum acceptable concentration for a single chemical entity and is enforceable by the use of appropriate methods of analysis. The Agency sets tolerances for animal drugs during its review of a petitioner's New Animal Drug Application.

Additional drugs and new analytical methods will be added to the program as FDA develops and validates them.

- chlortetracycline 30 ppb safe level
- oxytetracycline 30 ppb safe level
- tetracycline 80 ppb safe level
- sulfachloropyridazine 10 ppb safe level
- sulfadiazine 10 ppb safe level
- sulfadimethoxine 10 ppb tolerance
- sulfamerazine 10 ppb safe level
- sulfamethazine 10 ppb safe level
- sulfapyridine 10 ppb safe level
- sulfquinocaxel 10 ppb safe level
- sulfathiazole 10 ppb safe level


OXYTOCIN AND MILK YIELD

The effect of oxytocin in milk production was evaluated using a clinical trial. Eighty-four Holstein cows were randomly assigned to treatment group (20 IU oxytocin at each milking) or control group (no injections at milking). Oxytocin infections followed forestripping, washing teats with a wet paper towel, teat dipping at drying of teats, and immediately preceded machine attachment. The authors reported that oxytocin treatment led to an 11.6% increase in lactational milk yield. This effect was primarily due to an increase in milk yield--after peak production. It was hypothesized that oxytocin decreased the rate or secretory cell involution during lactation. Oxytocin did not affect milk composition, somatic cell linear score
or rate of clinical mastitis. It should be emphasized here that "the use of exogenous oxytocin in herd for milk production reasons is presently prohibited by the United States Food and Drug Administration; thus, its use as a management tool is illegal and not recommended." --From S. D. Nostrand, et al, Journal of Dairy Science, July 1991, as reported in Veterinary News, Penn State University, Nov., 1991.

EFFECTS OF POSTMILKING TEAT TREATMENT ON THE COLONIZATION OF STAPHYLOCOCCUS AUREUS ON CHAPPED TEAT SKIN

Sixteen Holstein cows were used to test the effect of postmilking teat treatment on colonization and intramammary infection by Staphylococcus aureus on chapped teats. Treatments were (1) chapping the treat and using 1%/10% glycerin postdip solution, (2) 1%/10% glycerin postdip solution on nonchapped tests, (3) chapping the teat and using 10% glycerin postdip solution, (4) chapping the teat and not using a postdip solution. All mammary glands were free of S. aureus teat skin colonization and intramammary infection at the start of the study. Teats selected for chapping were dipped in 1N NaOH prior to 3 applications of S. aureus broth culture; cultures were applied at 12-hour intervals on all teats. Treatments were applied after each milking for 30 days and were initiated after the second broth dip. Teat skin swab specimens and milk samples were collected before treatment application. Teat skin condition was scored daily. Nonchapped teats (treatment 2) did not support skin or orifice colonization by S. aureus. Treatment-1 teats healed most rapidly and supported less colonization in skin and orifice than did treatment-3 and -4 teats. Teat skin scores and skin colonization were lower for treatment-3 than treatment-4 teats. A correlation between teat skin colonization and teat skin conditions were found. Two intramammary infections were found in treatment-4 quarters and 1 in a treatment-3 quarter. On the basis of our findings, we concluded that poor teat skin condition will more readily support S. aureus colonization, that a dip of 1%/12 with glycerin helped reduce S. aureus colonization and was associated with faster healing, and that glycerin on teat dips may be of value in preventing colonization by S. aureus and in promoting healing. --Fox, L. K., et al., Am J Vet Res 52, June 1991, as reported in Communications in Continuing Education, Vol. 7, No. 1, Jan., 1992, Hoechst Roussel Newsletter.

GLOBAL WARMING

Instead of trying to reduce methane emissions from cows, people should change their light bulbs to reduce global warming, two Cornell University economists recently told the Associated Press. According to Duane Chapman and Thomas Drennen, the methane given off by one cow during a year has the same effect on global warming as the fuel burned to generate power for one 75-watt light bulb. Chapman says replacing incandescent light bulbs in industrialized countries with new 18-watt fluorescent bulbs that give off the same amount of light would do more to solve the global-warming problem than trying to regulate bovine emissions. According to Chapman and Drennen, the carbon dioxide given off by driving cars and burning fuel is a much bigger problem than methane. The two also say it is an easier problem to handle. In recent years, some researchers have estimated cows give off as much as 15 percent of the methane released into the atmosphere. Chapman and Drennen say those estimates don't take into account the amount of carbon dioxide used by the growing hay and grains that cattle eat. --Beef Business Bulletin, September 20, 1991, as reported in Communications in Continuing Education, Vol. 7, No. 1, Jan. 1992, Hoechst-Roussel Newsletter.

THOUGHT FOR TODAY

"Our knowing is so far ahead of our doing that we don't need no more knowing."

--Overheard at an Extension meeting
GROWTH PROMOTING IMPLANTS IN REPLACEMENTS HEIFERS

Growth promoting implants are used extensively in suckling beef calves. Recent studies indicate that economic returns to the beef cattle industry per dollar invested may be greater for properly administered implants that promote growth than for any other available management tool. Implants have not been utilized extensively in heifer calves, however, because of possible detrimental effects on subsequent fertility. Concerns regarding long-term reproductive performance continue. Implants that are commercially available currently contain either steroids (estradiol, progesterone, and testosterone) or non-steroidal compounds (zeranol, trenbolone acetate) that mimic the activity of certain steroids.

University of Florida researchers recently summarized the effects of growth promotants in replacement beef heifers by implant type. A synopsis of their conclusions follows:

**Zeranol**. Heifers calves that are implanted with 36 mg zeranol at birth experience substantial reductions in fertility when bred as yearlings to calve first at 2 years of age. Potential replacement females should not be implanted at birth with zeranol or any other implant that is currently available because of the potential detrimental effect on subsequent development of the female reproductive system. Zeranol implants increase pelvic growth earlier in life. However, any associated increase in pelvic area resulting from the implant will generally disappear by calving time at 2 years of age. Implanting heifers with zeranol does not decrease the incidence or severity of calving difficulty.

**Estradiol**. Synovex C® is the only implant approved for use in suckling replacement heifer calves. There has been continued interest in using this implant to increase size of heifers at breeding and, consequently, increase pelvic area and decrease incidence and severity of calving difficulty. Nebraska researchers reported the results of a study completed recently, evaluating the effect of synovex C® implants in growth and reproduction of heifer calves. The study included 184 heifers calves that were assigned to one of four treatment groups: 1) nonimplanted controls, 2) implant at 2 months, 3) implant at 6 months, and 4) implant at both 2 and 7 months of age. The major finding of their study indicated: a) implants at 2 months of age increased heifer gain to weaning by 14 lb and weaning to yearling age by 19 lb; b) implants increased yearling pelvic area at either 2 or 6 months of age, but only implants at 7 months increased pelvic area before calving; c) conception and pregnancy rates were lower for heifers implanted at 2 months compared to the non-implanted heifers; and d) implants at both 2 and 6 months of age increased heifer weight and pelvic size. The study is being duplicated with larger numbers to determine repeatability of the results.

**Trenbolone Acetate**. Studies to date suggest that implanting heifer calves with trenbolone acetate delays age at puberty and increases the incidence of dystocia in first-calf heifers. Heifer calves that were implanted with trenbolone acetate had lighter uteri and ovaries, and less follicular development, compared with nonimplanted controls.

**Recommendations**. Recent studies indicate that zeranol, estradiol and trenbolone acetate inhibit or reduce the secretion of follicle-stimulating hormone and luteinizing hormone. These hormones, secreted by the anterior pituitary gland, are essential for reproductive tract development and normal sexual development. Based on these observations and reports published previously, the following recommendations can be made:

1. Do not implant replacement heifer calves if they can be identified positively before two months of age, or if there is a high probability a heifer calf will be retained for breeding.

2. Implant remaining heifer calves at least once before weaning, which will result in increased weaning weight.

--David J. Patterson, PhD, Extension Beef Cattle Specialist, University of Kentucky. As reported in Herd Health Memo, 1990-91, #8, February, 1991, University of Kentucky.
Livestock producers recognize that developing effective residue avoidance programs will require access to a vast array of information that was virtually inaccessible prior to the development of the FARAD program. FARAD (Food Animal Residue Avoidance Databank) offers a means of providing this vital information. FARAD is a computer-based decision support system designed to provide livestock producers, Extension specialists, and veterinarians with practical information of those drugs, pesticides, and environmental contaminants that have the greatest potential for staying in animal tissues at the time of slaughter. The overall goal in providing this information is to reduce the incidence of chemical residues in foods of animal origin. The FARAD program was developed by pharmacologists and toxicologists at the University of Florida, and North Carolina State University.

Funding for FARAD has been provided by the USDA through the Extension Service and the Food Safety and Inspection Service. FARAD maintains current label information including withdrawal times on all drugs approved for use in food animals in the United States and on hundreds of products approved in Europe. Official tolerance values for drugs and pesticides in tissues, milk, and eggs are accessible through FARAD, as in physicochemical information on approximately 300 compounds. The majority of information contained in FARAD, however, pertains to the fate of drugs and chemicals in food animals. This information is the most crucial to residue avoidance and mitigation, and has been compiled through exhaustive examination of more than 2,000 published literature articles.

FARAD is currently an "expert-mediated decision support system" in that an actual human expert is a critical element in service delivery. Typical questions concern appropriate drug treatment withdrawal times to prevent violative residues. The answer may be as easy as looking up the appropriate time in the FARAD Food Animal Drug Compendium, or it may entail a complex review of the scientific literature with sophisticated mathematical modeling. The effort involved varies considerably, but the goal is always the same: food safety. FARAD is not a static database. It is an evolving decision support system that will continue to improve the delivery of residue avoidance information. By providing this service, FARAD will continue to aid producers, educators, and the consuming public by helping ensure the production of safe foods. Producers and veterinarians are strongly encouraged to use the services by calling the Regional Access Center at the University of Florida (904) 392-4085. --Excerpted from the Extension Review, May, 1991, as reported in Herd Health Memo, No. 6, 1991-92, University of Kentucky.

PROSTAGLANDIN AND FERTILITY

Four autumn-calving dairy herds were selected to investigate the effect of an injection of prostaglandin in the period 14 to 28 days (mean 22 days) after calving on subsequent fertility. The cows were selected on the basis of having a condition likely to affect their fertility, including assisted calving, endometritis, retained fetal membranes, milk fever, cows with five or more lactations, cows having twins, or a combination of any of these conditions. They were assigned to treatment or control groups and paired as closely as possible on the basis of their condition and date of calving. Milk progesterone concentrations were measured on the day of treatment and then 3 and 10 days later. The trial ran for 4 months and involved 90 treated and 90 control cows. The combined data from all the animals in the trial failed to show any difference between the calving to conception interval, the first service conception rate, or the numbers of services per conception of the treated and control groups. A Student's paired t test for groups of cows with a particular condition, both within individual herds and in all the herds, failed to show any significant effect of treatment (p>0.05). Milk progesterone data showed that the presence of a corpus luteum did not influence the outcome of the prostaglandin treatment. There was no evidence for excessive failure of luteolysis. It was concluded that there was no benefit in a routine injection of prostaglandin to dairy cows in the period 14 to 28 days after calving when rebreeding commenced more than 70 days after calving. --S. F. Glanvill and H. Dobson, Vet Rec 128:374-376, 1991, as reported in Veterinary News, Penn State University, August, 1991.
OPTIMAL BULL POWER

The effect of different bull-to-female ratios on estrus synchronized heifers in a multi-sire, pasture breeding situation was evaluated. Eight hundred cycling beef heifers and 28 mature, experienced beef bulls were allotted to 4 treatments (2 replicated per treatment) at bull-to-female ratios of 2 per 100 (1:50-Trt. 1), 2 per 100 (1:50-Trt. 2), 4 per 100 (1:25-Trt. 3), and 6 per 100 (1:16-Trt. 4). Treatment 1 (control) utilized nonsynchronized heifers, while heifers in treatments 2, 3, and 4 were synchronized using the 33-days MGA-Lutalyse program.

Pregnancy rates following a 28-day breeding season indicate that there may be a limit to how far bulls can be extended when utilizing synchronization. Treatment 2 (bull-to-female ratio 1:50-synchronized) showed a 6% decrease (p<.10) in pregnancy rate (77%) compared to Trt. 3 (83%), indicating that the bulls probably weren't able to fully cover the synchronized heat. Treatment 4, with a bull-to-female ratio of 1:16, had the highest pregnancy rate (84%). Treatment 4 also had an earlier average day of conception than Trt. 2 (2 d; p<.05) and Trt. 3 (3 d; p>.01).

In this study, estrus synchronization failed to provide an advantage in heifer pregnancy rate or date of conception. Treatment 2 had a 5% decrease in pregnancy rate compared to Trt. 1 (77% vs 82%); p<.10) and no difference in average date of conception. In conclusion, considering reproductive performance and marginal cost and return, the optimal bull-to-female ratio for estrus synchronized heifers is 1:25. In this study, estrus synchronization failed to provide an advantage in terms of reproductive efficiency. --V. M. Healy et al., 1991 Beef Program Report, Colorado State University, as reported in Veterinary News, Penn State University, August, 1991.

SHEDDING PATTERNS OF STAPHYLOCOCCUS AUREUS

The accuracy of identifying S. aureus infection in a quarter by culture is a function of the culturing technique and the shedding patterns of glands. By routine bacteriological culture procedures, the sensitivity of a single quarter milk sample was 74.5%, which increases to 94% and 98% with the second and third consecutive samplings. Shedding patterns can be characterized as high or low. In a high shedding pattern, it is unlikely that an infected quarter will be missed on a single sampling even though the number of colonies per culture plate will vary. However, in a quarter with low shedding pattern, it is not unusual to miss an infected quarter even if the quarter milk samples, rather than a pooled sample, are taken. Therefore, it is possible to miss infected cows by taking milk samples in a routine herd survey. If composite samples are elected, the error rate will increase accordingly. Antibiotic therapy can also affect shedding of the microorganism. A cow should not be considered free of infection with S. aureus unless multiple consecutive samples have been taken. --Philip Sears, Cornell Veterinary Update, March, 1991.

HEIFER MASTITIS

Three hundred and eighty-two primigravid heifers from 11 Vermont dairy farms were evaluated for the presence of intramammary infection at parturition. A total of 45.5 percent of heifers and 18.6 percent of quarters had IMI at parturition. There were fewer heifers infected in the study than in two previous studies which reported 64 percent and 97 percent of heifers infected at parturition. Staphylococci, excluding Staph. aureus, were the most common bacteria isolated. The authors concluded that contrary to common wisdom; that replacement heifers are mastitis-free, 50 to 97 percent of heifers will have intramammary infection at parturition and are a potential source of mastitis for the lactating herd. --J. W. Pankey, et al., Mastitis prevalence in primigravid heifers at parturition. Journal of Dairy Sci, May 1991 as reported in the Veterinary Newsletter, Penn State University, Nov. 1991.
SOMATOTROPIN IN PREPUBERTAL HEIFERS

Thirty-two 5 month-old Friesian heifers were paired on the basis of weight, age, lactational performance of their dam, and transmitting ability of sire, production date (weight of heifers, weight of calves, milk production and components), and reproduction data. Heifers in the experimental group were given recombinant bST IM daily for at least 120 days beginning at 7 months of age. Control heifers received vehicle injections on the same schedule as the experimental heifers. The authors found no differences between the two groups for growth rate, age at puberty, age at first estrus, reproduction efficiency, milk yield or milk composition in the first lactation. The authors concluded that no benefit was derived from using bST prior to puberty to promote pubertal changes or increase milk production in the first lactation. --From M. G. Murphy, et al., Journal of Dairy Sciences, July, 1991, as reported in Veterinary News, Penn State University, Nov., 1991.

DIARRHEIC CALF TREATMENT

Thirty-six diarrheic calves infection with rota and corona viruses were randomly allocated to one of three oral electrolyte treatments: Ion-Aid (Syntex Agribusiness), Life-Guard (Norden, Inc.), or Revibe (Langford, Inc.). the calves were also allowed voluntary access to milk which was offered at the rate of 5% of body weight per feeding in two feedings daily. There were significant differences in recovery rate among calves treated with the different electrolytes. Only 33% of Ion-Aid treated calves recovered; Revibe and Life-Guard treated calves had high recovery rates of 92% and 83%, respectively. The much higher recovery rates with Life-Guard and Revibe were attributed to the presence of an alkalizing agent in these preparations. Life-Guard used bicarbonate to counteract acidosis and there were some evidence that this may have interfered with milk digestion. Revibe uses acetate; this was effectively metabolized within the calves' tissues and produced alkalization without interference with milk digestion. --J. M. Naylor, L. Petrie, M. I. Rodriguez, and P. Skilnick, Univ. of Saskatchewan, Can Vet J, Vol. 31 (11):753, 1990. As reported in Notes from the Extension Veterinarians, Kansas State University, May, 1991.

FDA BANS USE OF NITROFURANS

NPPC has contacted representative of SmithKline Beecham and Hess and Clark, Inc., the two companies that manufacture these nitrofurans, to learn their position on the ban. The companies and their attorneys do not feel that it is realistic to appeal the FDA decision. Nitrofuran products can NOT be used on farms as of January 31, 1992. The SmithKline Beecham products that will be discontinued are Furox, Furox-O-A, Amifur Feed Grade and Amifur Feed Grade Water Mix. The discontinued Hess & Clark products are nf-180 feed additives, n4-180 oral suspension and nfz soluble (Water). --Leader Letter, Georgia Pork Producers Association, Sept., 1991, as reported in Notes from the Extension Veterinarians, Kansas State University, Dec., 1991.

VIRGINIA BEEF EXPO

The third Annual Virginia Beef Expo is scheduled to take place Friday and Saturday, April 24-25, 1992 at the Rockingham County Fairground in Harrisonburg.

Various beef breed shows and sales, contests and the main food and entertainment event, "Expo Barn Party" on Friday evening are on the schedule. Call (703) 992-1009 for more information.
Virginia-Maryland Regional College of Veterinary Medicine Extension Staff:

Dr. J.M. Bowen - Extension Specialist - Equine
Dr. C.T. Larsen - Extension Specialist - Avians
Dr. K.C. Roberts - Extension Specialist - Companion Animals
Dr. W. Dee Whittier - Extension Specialist - Cattle

K.C. Roberts and Dee Whittier, Editors
Maura M. Wood, Production Manager of Food Animal Veterinarian

VIRGINIA POLYTECHNIC INSTITUTE
AND STATE UNIVERSITY
VIRGINIA COOPERATIVE EXTENSION
BLACKSBURG, VIRGINIA 24061-0512