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From the Editor – Although the Food and Drug Administration has postponed their project to look at more drug residues in milk, they have not completely abandoned the idea. Over the last couple of months the FDA was holding “listening” sessions with the dairy industry and others about the process they might employ. As some of you know, WSU Veterinary Extension teamed up with WSDA, NW Dairy Association and Pfizer Animal Health to host five residue avoidance meetings across the state. In this issue of *ag animal health*, we will highlight one particular class of drugs that many people are still confused about how to use on the dairy: *The Sulfa Drugs*.

Featured Faculty – Dr. Patricia Talcott, College of Veterinary Medicine



Dr. Patricia Talcott

Dr. Patricia (“Trish”) Talcott graduated from the WSU College of Veterinary Medicine in 1988, received her PhD in 1989 from the University of Idaho in Pharmacology /Toxicology and is board-certified in Toxicology. She wears a number of hats here in the vet school: Director of Admissions, diagnostic toxicologist, and renowned teacher of toxicology. She has won the Norden Distinguished Teacher Award three times. Her toxicological knowledge covers all species and all kinds of toxins. She is particularly well-known for her green thumb for growing toxic plants. All of us in Ag Animal and the diagnostic lab rely on her expertise and willingness to help with potential “poisoning” cases. And, all of us in the veterinary college rely on her energy and enthusiasm in shepherding the veterinary admissions process.

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Presynchronization with GnRH 7 days prior to resynchronization with CO-Synch did not improve pregnancy rate in lactating dairy cows

By: Alkar, A, Tibary A, Wenz JR, Kasimanickam R.

Key Points

- **Dairy producers and veterinarians often use resynchronization programs after a cow's first AI. One program involves the use of GnRH when a cow is found not pregnant 28 days after breeding.**
- **This research did not find any difference in conception whether cows got the GnRH or not -- which could save money for the producer.**

The objective of this project was to determine the effect of presynchronization with GnRH 7d prior to the initiation of resynchronization with CO-Synch on pregnancy/AI (P/AI) of resynchronization in lactating dairy cows, and the effect of GnRH on P/AI from previous breeding. All parity (lactation number) Holstein cows (N=3287) from four dairy farms were enrolled. Cows not detected in estrus by 28 ± 3 d (Day -7) after a previous breeding were assigned to receive either GnRH (100 μ g, im; N=1636) or no GnRH (Control; N=1651). Cows not detected in estrus during the 7 d after GnRH underwent pregnancy diagnosis (35 ± 3 d after previous breeding, Day 0); non-pregnant cows (N=1232) in the Control (N=645) and GnRH (N=587) groups were resynchronized with a CO-Synch protocol. Briefly, cows received 100 μ g GnRH on Day 0, 25 mg PGF 2α on Day 7, and 72 h later (Day 10) were given 100 μ g GnRH and inseminated. Serum progesterone concentrations (n=55 cows) were elevated in 47.3, 70.9, and 74.5% of cows on Days -7, 0, and 7, respectively.

The proportion of cows with high progesterone concentrations on Day -7 and 0 were 44.1% and 88.2% (P <0.003), and 55.2% and 33.2% (P>0.1), for GnRH and Control groups, respectively. Accounting for significant factors such as location (P<0.0001) and parity categories (P<0.05), the P/AI (35 ± 3 d after AI) for resynchronization was not different between GnRH and Control groups [26.7% (95% CI: 23.2, 30.5; (157/587) vs 28.4% (95% CI: 25.0, 31.9; (183/645); P>0.1]. Accounting for significant variables such as location (P<0.0001) and parity category (P<0.001), the P/AI was not different between GnRH and Control groups for the previous service [60.2%; 95% CI: 57.9, 62.6; (986/1636) vs 59.1%; 95% CI: 56.7, 61.5; (976/1651); P>0.1].

In conclusion, more cows pre-synchronized with GnRH 7 d prior to resynchronization with COSynch had elevated progesterone concentrations at initiation of resynchronization than those not presynchronized. However, the GnRH treatment 7 d prior to resynchronization with CO-Synch, when given 28 ± 3 d after a previous breeding, did not improve conception in lactating dairy cows. Furthermore, compared to controls, it did not significantly affect pregnancy rate from the previous breeding.



Why do we see Sulfa Drug Residues in Dairy Cattle?

By: Dr. Dale Moore

FDA is still interested in looking at many different drugs in the milk of dairy cows because they have seen a number of different drug residues in meat from cull “market” dairy cows. One drug that commonly pops up in cull cow testing is the sulfa class of drugs. It can be a little confusing as to which you can use in which group of animals but most information you need is on the label. Interpreting the label may be a challenge at times so we’ll devote a few sentences to this class of drug and why we might see sulfa residues in cows. First, we’ll start with the **FIVE Commandments for Using Sulfa Drugs in Dairy Cows**:

1. *Thou shalt not use ANY sulfa drug “off-label” (NO Extra-label Use) in dairy cows*
2. *Thou shalt NOT (never) use sulfamethazine (e.g. Sulmet®) in LACTATING dairy cows*
3. *The ONLY injectable sulfa drug you can use in LACTATING cows is sulfadimethoxine (Di-Methox Injection 40%, or Albon Injection 40%, for example). The ONLY uses (indications) on the labels are for pneumonia and footrot. A veterinarian cannot prescribe this drug for any other disease or condition.*
4. *Sulfachlorpyridazine (e.g. Vetasulid Injection) MAY be used in NON-LACTATING cattle. The same drug as a POWDER can be used for calf scours.*
5. *Sulfadimethoxine (e.g. as Albon Bolus) can be given to LACTATING cows - as per the label BUT NOT Albon SR (sustained release) which CANNOT be used in lactating cows or calves to be sent for veal.*

Key Points

- *Some Sulfa drugs are allowed for use in lactating dairy cattle and some are not*
- *The most common reason for seeing a residue is the extra-label use of sulfadimethoxine which is labeled for lactating cows but CANNOT be used “off-label”*
- *What to remember about Sulfa Drugs: NO different route of injection, NO different dose, NO different duration of treatment and ONLY to be used for pneumonia and footrot.*



The most common reason for seeing a sulfa residue in a cull cow is the extra-label use of sulfadimethoxine which is labeled for lactating cows but CANNOT be used “off-label” - That means NO different route of administration, no different dose, no different duration of treatment and is ONLY to be used for pneumonia and footrot (the indications on the label). Probably the single most important thing the dairy producer and hospital crew can do is to KNOW WHAT THE LABEL SAYS AND FOLLOW LABEL DIRECTIONS.

What's New at WADDL? Lead Poisoning in Cattle

Lead poisoning is still one of the most common forms of cattle intoxications. A recent case submitted to WADDL reinforces our need to be cautious about cattle exposures to the common sources of lead. From the Merck Veterinary Manual: *“In cattle, many cases are associated with seeding and harvesting activities when used oil and battery disposal from machinery is handled improperly. Other sources of lead include paint, linoleum, grease, lead weights, lead shot, and contaminated foliage growing near smelters or along roadsides.”* Take a look at cattle pens, fencelines, barns - anywhere cattle have access - for these potential sources of lead.

What would you see if a calf or cow has lead poisoning? Sudden, or acute, lead poisoning would most likely occur in calves. Within 1 to 2 days of exposure, the calves might be blind, walk abnormally, salivate, and may have convulsions and die. “Subacute” and a more chronic form of lead poisoning could lead to similar signs but might start with cattle going off feed, a non-working rumen, bouts of constipation often followed by diarrhea, head pressing, muscle spasms, and incoordination.

If you see cattle with these signs, it could be lead poisoning but these signs can occur with other diseases. Samples can be submitted to WADDL by a veterinarian. *“Concentrations of lead in the blood at 0.35 ppm, liver at 10 ppm, or kidney cortex at 10 ppm are consistent with a diagnosis of lead poisoning in most species.”* See the WADDL website for details on sample submission. http://www.vetmed.wsu.edu/depts_waddl/toxicology.aspx

There is treatment for cattle, if caught soon. Therapy depends on how much damage has already been done to the animal and is applied on a case-by-case basis. The best thing to do is prevent exposure by walking the pens and removing the potential sources.

Pre-breeding mineral levels and pregnancy in beef cows

by Dr. Dale Moore



In a recent research report in the May 15th *Journal of the American Veterinary Medical Association*, a research group from Saskatchewan determined the mineral and vitamin levels in over 700 beef cows' serum samples before the breeding season and followed up to see whether those cows got pregnant or not. They looked at a number of other factors as well, since we know there are many reasons why a cow might not get pregnant. All the bulls had a breeding soundness examination and were tested for trichomoniasis before being turned out with the cows. They had to be “trich” negative, have at least 70% normal sperm, sufficient scrotal circumference for age and breed and the absence of physical abnormalities.

If we take a look at the individual risk factors they found for cows NOT being pregnant:

1. Cows with a Body Condition Score (on a 1-5 scale) less than 2.5 (*similar to at 4 on a 9-point scale*) were three times more likely to be *Not Pregnant* at pregnancy examination compared to cows with a higher condition score (P=0.001).

2. Age appeared to influence pregnancy. Compared to 4-9 year-old cows, younger and older cows were two times more likely to be *Not Pregnant* at pregnancy examination (P=0.058 and P=0.063, respectively).
3. Cows with a calving-to-breeding interval less than 51 days were two times more likely to be *Not Pregnant* at pregnancy examination (P=0.049).
4. Precipitation and mean temperature just before breeding had an influence on pregnancy. Precipitation received in the first 21 days of the breeding season had a positive effect on pregnancy outcome but mean daily maximum temperature during the same time period had a negative influence.

Using the power of a statistical model, the researchers were able to control for herd of origin, body condition, age, and short calving interval to examine the effects that pre-breeding blood levels of the different micronutrients had on pregnancy outcome. After making these adjustments, only copper levels significantly influenced pregnancy in these cows. **As serum copper concentration DECREASED from about 0.5 ppm, the probability of becoming pregnant DECREASED, particularly for 2-3 year-old cows. Controlling for body condition and calving-to-breeding interval for 2-3 year-olds, the probability of becoming pregnant was about 92% at 0.4 ppm serum copper before breeding, 75% for 0.3 ppm, 40% for 0.2 ppm, and less than 20% for 0.1 ppm.**

The group suggested that measuring serum copper before the breeding season may be a better measure of pregnancy outcome than at other times in the breeding cycle. We know that the liver is the primary storage site for copper. Although serum copper levels do not significantly decrease until liver levels go below 40 ppm, "*serum copper concentrations of 0.45 ppm have been correlated with low copper concentrations in the liver*". Copper deficiencies result from inadequate intake of copper or secondarily from high molybdenum or sulfur levels. Forages vary in copper concentration due to plant species, soil type and growing conditions. Now we have some new evidence that knowing your forage mineral levels and supplementing pre-breeding cows with the right mix of minerals should help improve the pregnancy rate in the beef cow-herd. For more information on formulating the right mix, go to: <http://www.extension.org/pages/19631/formulating-mineral-supplements-for-beef-cattle>

I asked a question to our *Ag Animal Health* group about the availability of "maps" of potentially copper deficient areas in the state. Dr. Clive Gay, Professor Emeritus, responded: "I tried this [developing mineral maps] for Stevens County and Pacific County but it proved too simplistic. The problems are that we have both the potential for primary copper deficiency in the acid soils west of the Cascades and secondary [copper deficiency] (Molybdenum conditioned) on the alkaline soils east of the Cascades and iron conditioned [copper deficiency] in areas across the State. Both are influenced by the water table. Briefly, the best bet for prediction for a map is the soil map for the county.

East of the Cascades any organic soil with a high water table (usually synonymous unless there has been drainage) is a fair bet for a problem. High pH soils on high water table areas are also at high risk, such as some areas of the Colville silt loam series. Other high pH soils with low water tables are not risk areas but can become so when irrigated or when subject to seeps from irrigation channels passing through the ranch (obviously very small risk areas in terms of a county but important to the rancher affected). Also, irrigated pastures can have a sudden problem that is occasioned when they use fertilizers that contain presumably conditioning minerals... Consequently it is hard to make a map although I have used soil maps showing the extremes of water table and pH to predict (correctly) ranches that have a problem.

West of the Cascades there are large areas of acidic organic soils which bind copper and have risk for a primary copper deficiency... ...milking cattle, ...on formulated diets [do] not have any problem with copper deficiency, but the replacement heifers [that are] grazing [can]...

Briefly, if you think there is a problem you should test blood (if you wish, liver, but the number of samples and the time and expense will give you no better information than blood) on the growing cattle (yearlings) in the late spring, early summer. Plant sampling at this time can tell you what the nature of the deficiency (primary, conditioned), is and will give you a guide for the need of the strength of copper intervention. Do not worry about soil mineral testing. It will give you no useful information.” (Comments from Dr. Clive Gay, May 27, 2011.)

For soil maps of your county and other soil information (although a little navigation is required) go to: http://www.or.nrcs.usda.gov/pnw_soil/wa_reports.html

Reference -- Van De Weyer LM, Hendrick SH, Waldner CL. Associations between prebreeding serum micronutrient concentrations and pregnancy outcome in beef cows. JAVMA 2011;238(10):1323-1332.

WSDA Corner by Dr. Leonard Eldridge, State Veterinarian

Animal Disease Traceability

HB 1538 provides for rule making authority to set a fee to fund a state based animal disease traceability program. The activities will include data collection, data entry into the state data base where the information is secure at the state level, maintenance of the data base, and epidemiological investigations that determine where a cattle disease came from and where exposed cattle may have traveled to. As part of the rulemaking process, we will conduct a small business economic impact study, file the required paper work with the Office of the Code Reviser and conduct hearings this fall. I look forward to working with the cattle industry in developing a system that protects and contains diseases.

We are currently reviewing requirements for allowing entry permits to be transmitted to us electronically. We will also be looking at the ability and requirements to allow other animal health regulatory forms such as certificates of veterinary inspection, vaccination and test charts to be submitted electronically. The electronic transmission of data will make data entry and data collection more efficient.

USDA addresses Rural Veterinarian Shortages in Washington State

USDA Veterinary Medicine Loan Repayment Program (VMLRP) awarded five applicant positions to fill rural veterinarian shortages in Washington. This program repay's student loans of qualified veterinarians in return for serving in vet-deficient areas in the state. Washington's designated shortage areas are:

- Central Washington - Benton and Franklin Counties
- Northeast Washington - Ferry, Pend Oreille and Stevens Counties
- Western Washington - Jefferson, Kitsap and Mason Counties
- Western Washington - Snohomish County
- South Central Washington - Central I-90 corridor south to the Oregon border

One requested shortage area was not awarded to support the counties of Okanogan, Chelan and Douglas. This shortage will be resubmitted next year to USDA's VMLRP. Veterinarians who commit to at least three years to providing veterinary services in a designated veterinary shortage area may be repaid up to \$25,000 of their student loan debt per year. The application period is tentatively scheduled to open on May 9, 2011 and close on July 8, 2011 with offers made to selected individual veterinarian applicants in September, 2011. An individual may submit only one application per cycle. Applicants interested in applying for a VMLRP award please visit the VMLRP website and select Applicants. http://www.nifa.usda.gov/nea/animals/in_focus/an_health_if_vmlrp.html.

Continuing Education

Veterinarians

FREE Recorded WEBINAR: Pre-harvest control of E coli O157:H7 in cattle



Dr. David Smith

Professor & Extension Dairy / Beef Veterinarian
University of Nebraska-Lincoln

Details

Veterinarian Online CE for Official Trich Testing

To take the course and receive certification - go to:

<http://vetextension.wsu.edu/programs/bovine/trich/index.htm>

Veterinarian Online CE for TB Testing Certification

To take the course and receive certification - go to:

<http://vetextension.wsu.edu/programs/bovine/tb/index.htm>

Assessing Calf Housing and Environments: Part I and II for veterinarians at:

<http://vetextension.wsu.edu/courses/index.htm>

Producers

DairyBeef: Maximizing Quality and Profits at <http://dairybeef.wsu.edu> See the Residue Avoidance Video – in English and Spanish.

Assessing Dairy Calf Housing and Environments for producers and dairy employees at:

<http://www.vetextension.wsu.edu/EnvLoad.htm>

4-H Leaders

“Providing clean and comfortable environments to optimize livestock health and wellbeing. *Volunteer*

Leaders Online Educational Program <http://vetextension.wsu.edu/programs/4-H/index.htm>

Send newsletter comments to the Editor:

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