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<http://extension.wsu.edu/vetextension/Pages/Newsletters.aspx>

From the Editor - *The VCPR - What is it?* To answer that question with specificity, the *American Association of Bovine Practitioners* created guidelines for effective veterinarian-client-patient relationships. The 2-page guidelines, *Establishing and Maintaining the Veterinarian-Client-Patient Relationship in Bovine Practice*, can help veterinarians develop more 'comprehensive relationships' with cattle owners.

The 6 principles are:

- Maintain written agreements for working relationships
- Have a Veterinarian of Record
- Clarify any and all relationships with consultants and other veterinarians
- Provide written protocols
- Ensure written or electronic treatment records are maintained
- Provide drugs or prescriptions for specific time frames and for specific protocols

The major outcomes of an effective or valid VCPR include assurance of responsible drug use and assurance to the public that there are responsible and documented procedures for drug use on livestock operations. For more specific information about the guidelines, see: http://aabp.org/resources/AABP_Guidelines/VCPRGuidelineFinal11-2013.pdf

Also see the following for FDA resources:

http://www.fda.gov/AnimalVeterinary/ResourcesforYou/ucm380135.htm?source=govdelivery&utm_medium=email&utm_source=govdelivery

The state of Washington is currently looking at defining VCPR and having it codified within the Washington Administrative Code (WSVMA. *Washington Veterinarian*. Jan/Feb 2014:p.8)

What are we up to?

The *Veterinary Medicine Extension* and Field Disease Investigation Unit have been busy the last quarter of 2013. The BRD Risk Reduction Project got underway with two Extension meetings to cow-calf producers in Washington this fall and two meetings planned in January, 2014 (<http://extension.wsu.edu/vetextension/brd/Pages/default.aspx>).



Veterinary Medicine Extension partnered with Mississippi State University on a national webinar on pre-harvest E. coli control in cattle. The FDIU did two investigations in December - one dairy investigation and one feedlot investigation.

Food Safety Webinar Speakers at Mississippi State University: Dr. Dale Moore (WSU), Dr. Tom Besser (WSU), Dr. David Smith (MSU), Dr. David Renter (KSU)
Photo (Left to Right)

Current WSU Faculty Research Abstracts

Minten MA, Bilby TR, Bruno RG, Allen CC, Madsen CA, Wang Z, Sawyer JE, Tibary A, Neibergs HL, Geary TW, Bauersachs S, Spencer TE. **Effects of fertility on gene expression and function of the bovine endometrium.** PLoS One 2013 Aug 5;8(8). Infertility and subfertility are important and pervasive reproductive problems in both domestic animals and humans. The majority of embryonic loss occurs during the first three weeks of pregnancy in cattle and women due, in part, to inadequate endometrial receptivity for support of embryo implantation. To identify heifers of contrasting fertility, serial rounds of artificial insemination (AI) were conducted in 201 synchronized crossbred beef heifers. The heifers were then fertility classified based on number of pregnancies detected on day 35 in four AI opportunities. Heifers, classified as having high fertility, subfertility or infertility, were selected for further study. The fertility-classified heifers were superovulated and flushed, and the recovered embryos were graded and then transferred to synchronized recipients. Quantity of embryos recovered per flush, embryo quality, and subsequent recipient pregnancy rates did not differ by fertility classification. Two in vivo-produced bovine embryos (stage 4 or 5, grade 1 or 2) were then transferred into each heifer on day 7 post-estrus. Pregnancy rates were greater in high fertility than lower fertility heifers when heifers were used as embryo recipients. The reproductive tracts of the classified heifers were obtained on day 14 of the estrous cycle. No obvious morphological differences in reproductive tract structures and histology of the uterus were observed in the heifers. Microarray analysis revealed differences in the endometrial transcriptome based on fertility classification. A genome-wide association study, based on SNP genotyping, detected 7 moderate associations with fertility across 6 different chromosomes. **Collectively, these studies support the idea that innate differences in uterine function underlie fertility and early pregnancy loss in ruminants.** Cattle with defined early pregnancy success or loss is useful to elucidate the complex biological and genetic mechanisms governing endometrial receptivity and uterine competency for pregnancy. **[From the Editor - Current research at WSU and with other partners is focused on finding the genetics behind dairy cow fertility. The uterine environment for successful embryo implantation is just one piece of the fertility puzzle.]**

Davis MA, Moore DL, Baker KN, French NP, Patnode M, Hensley J, Macdonald K, Besser TE. J Clin Microbiol. 2013 Dec;51(12):3921-7. **Risk factors for campylobacteriosis in two Washington state counties with high numbers of dairy farms.** Campylobacteriosis is a

frequently reported, food-borne, human bacterial disease that can be associated with ruminant reservoirs, although public health messages primarily focus on poultry. In Washington State, the two counties with the highest concentrations of dairy cattle also report the highest incidences of campylobacteriosis. Conditional logistic regression analysis of case-control data from both counties found living or working on a dairy farm (odds ratio [OR], 6.7 [95% confidence interval [CI], 1.7 to 26.4]) and Hispanic ethnicity (OR, 6.4 [95% CI, 3.1 to 13.1]) to have the strongest significant positive associations with campylobacteriosis. When the analysis was restricted to residents of one county, Hispanic ethnicity (OR, 9.3 [95% CI, 3.9 to 22.2]), contact with cattle (OR, 5.0 [95% CI, 1.3 to 19.5]), and pet ownership (OR, 2.6 [95% CI, 1.1 to 6.3]) were found to be independent risk factors for disease. *Campylobacter jejuni* isolates from human (n = 65), bovine (n = 28), and retail poultry (n = 27) sources from the same counties were compared using multilocus sequence typing. These results indicated that sequence types commonly found in human isolates were also commonly found in bovine isolates. These findings suggest that, in areas with high concentrations of dairy cattle, exposure to dairy cattle may be more important than food-borne exposure to poultry products as a risk for campylobacteriosis.

[From the Editor - We know that there are a few bacterial zoonoses from cattle - Brucellosis and TB, for example - for which our federal control programs have been very successful - and we know that Salmonella, E coli O157:H7, and now Campylobacteriosis can affect cattle and people. It just reminds us to make sure that everyone on the farm wash before eating if we are working around manure.]

What's New at WADDL?

Abortion Diagnosis

Maintenance of a profitable livestock industry depends upon efficient animal reproduction. Diseases that interrupt pregnancy are very costly, and control measures cannot be devised until the cause for the reproductive loss is accurately identified. However, identifying the cause for abortion in agricultural animals is a diagnostic challenge for clinicians and laboratory diagnosticians alike. The efficiency of diagnosing abortions in laboratories around the world varies widely, at best 30-40% of fetal submissions result in a successful abortion diagnosis. The low success rate of abortion diagnosis occurs because:

1. abortion results from an event that occurred weeks to months earlier, and the cause is not present at the time of abortion.
2. the fetus is often retained for days or weeks after death and is expelled in a state of advanced postmortem autolysis, making lesion identification difficult.
3. the placenta, which often harbors valuable diagnostic information, is often not available for examination.
4. toxic, nutritional, hormonal, and genetic causes of abortion are often not detectable in fetal tissues.

Despite the above limitations, abortion diagnosis can be attained by knowledge of herd husbandry (primarily nutrition and environment), thorough sampling for laboratory examination, and utilization of current laboratory technology, such as PCR and immunohistochemistry, which can greatly aid the accuracy and rapidity of diagnosis. However, the cornerstone of consistent abortion diagnosis will continue to be close

cooperation among livestock managers, clinicians, and laboratory diagnosticians to uncover all clues that may lead to a specific diagnosis.

The basis for bovine and ovine abortion is diverse and includes genetic, thermal, nutritional, toxic and infectious causes. By far the greatest proportion of diagnosed abortions fall into the infectious disease category, and recent technological advances in laboratory diagnosis are heavily biased toward identification of infectious agents. Because of the importance of either “ruling in” or “ruling out” infectious causes of abortion, the linked guidelines will focus primarily upon investigation, sampling, and laboratory examination to identify infectious abortifacient (abortion-causing) agents.

Abortion Diagnostic Kit

An Abortion Diagnostic Kit has been assembled for collecting samples when it is not possible to deliver the fetus and placenta to the Laboratory within a few hours of expulsion. Everything needed is included except for a knife to be used to make the original incision. Kits are available upon request from the Laboratory for a small fee. The charge for processing the samples is listed in the fee schedule. Upon receiving the kit, please remove ice packs for freezing. To maximize the possibility of arriving at a diagnosis, please obtain samples as outlined in the “abortion sampling” form. Also complete a field history on the “abortion accession” form. Package all materials (put paperwork in a separate waterproof bag within the abortion kit) and send with coolant to WADDL by the quickest means.

Genetic Selection in Dairy Cattle - A Double-Edged Sword? By Dr. D.A. Moore

Think about the progress that has been made using AI in dairy cattle. Milk production per cow per year has increased from 9,700 lbs in 1970 to over 22,000 lbs. We have improved milk and milk component yield, used ‘low somatic cell count’ bulls, shifted foot and leg conformation and improved the udder. But, as production has increased, fertility has declined, overall, in dairy cattle. Is there a genetic component?

Over the last decade if fertility was not improving or was declining, we could look at the Predictive Transmitting Ability (PTA) of daughter pregnancy rates (DPR) of bulls we wanted to use. For each 1 percentage unit increase in PTA DPR, approximately 4 fewer days open were to be expected. However, the rate of change in fertility would be slow because DPR is of low heritability when used to select bulls for breeding.

Fertility remains an issue in some high producing herds, some of which can be explained by nutrition and energy balance and some which might have a genetic component. In a recent article from Europe looking at genetics and fertility of Nordic Red Cattle, Kadri et al. reported finding a 4-gene deletion that affected fertility. The deletion appears to be recessively lethal for the embryos (if homozygous) of carrier cows if they were mated to carrier bulls. This would be manifest as insemination failure - no conception. This particular gene deletion is also associated with increased milk production and is now fairly common in this breed. So, it appears that genetics has an influence on embryonic mortality.

Another recent article from a **WSU-Texas A&M**, University of Georgia and LAFUGA, Germany, collaboration, some associations with fertility and genetic differences across 6 chromosomes were found. This and other studies will lead to our understanding of genetic differences in uterine function and competence to maintain a pregnancy. There are some current tools to help speed up selection for fertility. Genetic testing can help you select bulls to use or heifers to keep. There are several genetic markers from commercially-available tests that include: DPR, calving ease (because dystocia can reduce fertility), and still birth tendencies.

Additional research is being conducted to find the specific genetic markers of fertility in dairy cattle. A dairy farmer will be able to balance the selection for milk yield and fertility, depending on the herd's needs.

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Minten MA, Bilby TR, Bruno RGS, Allen CC et al. 2013. Effects of Fertility on Gene Expression and Function of the Bovine Endometrium. *PLoS One* 8(8): e69444. doi: 10.1371/journal.pone.0069444

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WSDA Corner

By Dr. Paul Kohrs, Acting State Veterinarian



DISEASE INVESTIGATIONS

On 11 October, Dr. Dobbs went to investigate a 21 month old dairy heifer with oral lesions in Paterson. She collected the samples by head lights and the next morning samples were sent to WADDL in Pullman by courier (Livestock Investigator Daugherty). By 4:00 PM (24 hours after notification of the animal) we received FMD negative. The next working day samples were submitted to Plum Island for confirmation. (BVD)/PI was confirmed and the animal was euthanized. Although this finding will have significant impact on the cohorts of this animal, the regulatory significance disappears. The animal was also positive for Epizootic Hemorrhagic Disease (EHD) and this disease has been seen with some regularity throughout the country the past couple of years.

On October 16th Drs. Gilliom and Kohrs met with the Elk Foot Rot Task force to gain information and brain storm on possible causes of this problem in the Mt. St Helens elk herd and the Willapa herd. There are reports especially in the Willapa herd of 30-40% of the animals limping at one time. The disease is affecting all ages and there seems to be only a minimal recovery rate, as some of these animals have very severe lesions. Animal

Services is there to assist in determining the cause of this but also to build relationships with other agencies, lab experts and local private veterinarians that could prove very helpful in future disease events affecting domestic animals.

Dr. Kohrs and Investigator Hartsock as well as Mark Johnson, Acting Animal Services Assistant Director, got involved with the animal abuse/neglect case at the Olympic Animal Sanctuary in Forks. The Forks Police Department had jurisdiction in the case and Animal Services was not invited in to assist so we did not have authority to remedy the situation. We also were involved with a rescue in Spanaway in December where some clinical cases of distemper were traced as the source. The investigation revealed that the puppies had originated from a shelter in Bakersfield, California. These two cases illustrate the fine line we walk at Animal Services with regard to our authority in animal abuse/neglect cases. The one case where there did not appear to be import or sick animal violations, we have very limited authority on our own. In the second case we do have statutes that prohibit the sale of known sick/exposed animals and we had authority to investigate.

OUTREACH

The fall season is also industry meeting season and WSDA staff strive to have a presence at the major animal industry groups all around the state. This year the topic was what is happening with ADT and how is the allotment of funding being used to develop the ADT project in Washington State. The project is on track in the development of modules. The Request for Proposal (bid) for the Livestock Inspection Program (brand) portion of the work is nearly ready for release. We anticipate that the vendor will be under contract by late March. If you would like to follow the progress the information is available on the website: <http://agr.wa.gov/FoodAnimal/AnimalID/ADTproject.aspx> Or if you would like to be included to get automatic updates contact David Hecimovich, WSDA Animal ID Program Manager at 360-725-5493.

After nearly a 4 year moratorium on rule making, WSDA will be opening several of our rules that affect the day to day imports of animals into the state. Some of the notable proposed changes will be the removal 96 hour exemptions for several species on imports (sheep, goats, and horses). The major reason for this is that there is not reciprocity with our neighboring states and if the animals leave the state for the events to come to Washington, they do not have a CVI for return. I am also proposing raising the age of TB test for dairy animals to 20 months as long as it is between two free states. The last change is Trich testing and extending the length of time we honor a test from 30-60 days as long as there is no female contact. The age of virgin bulls is being looked at as well. Make sure you watch our website in the coming months to obtain the information on rules hearings.

PERSONNEL CHANGES

Dr. Minden Buswell will be joining Animal Services on Feb 1st as the new RVC coordinator. Minden graduated from Western College of Health Sciences in Pomona in 2009 and more recently completed her MPH at University of Minnesota. Minden will be based in Olympia. We are very excited to have Minden join the Animal Services Team.

Continuing Education

Veterinarians

Academy of Dairy Veterinary Consultants Spring 2014 Meeting. April 25-26, 2014. Seattle, WA. For more information contact Dale Moore at damoore@vetmed.wsu.edu

Producers

WSU Beef Production conference. June 13-14, 2014. For more information, contact Curtis Beus at beusc@wsu.edu

Free Low-Stress Cattle Handling Video From WSU Now Available

Washington State University Extension has a new video available to individuals interested in low-stress cattle handling. This video is a review of WSU Extension training seminars featuring nationally recognized cattle handling expert and veterinarian Dr. Tom Noffsinger from Benkelman, NE. The 24 minute video highlights low-stress cattle handling concepts and techniques with slides, animated computer graphic illustrations, and live cattle handling videos. The video is a result of funding from a WSU Extension Western Center for Risk Management grant and is free to view at <http://vimeo.com/83256777>. Producers can also request a free high-definition DVD version to watch through your TV by contacting Sarah Smith at <mailto:smithsm@wsu.edu> with your mailing address. The video is extremely large (over 1GB) therefore I cannot email copies. I also welcome any comments you have about this video or suggestions you have for future handling videos.

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