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<http://vetextension.wsu.edu/newsletters/>

From the Editor - It's Fall and the start of Volume 11 of *ag animal health* (that means 11 years!). This quarter we are focusing on practical aspects of animal health and the importance of making observations and monitoring the flock and herd. The ag animal faculty have been busy with numerous recent publications, current research projects, the start of the veterinary school year, and the onslaught of the meeting season... Look for us at a meeting near you and say hello (WSVMA, WSDF and WCA). **SAFETY ISSUE** - FDA just sent an announcement reminding us all to train people in the SAFE use of Micotil because of injuries and deaths in people. For more information, go to: https://www.fda.gov/AnimalVeterinary/NewsEvents/CVMUpdates/ucm575194.htm?source=govdelivery&utm_medium=email&utm_source=govdelivery

The ag animal health newsletter is devoted to the transfer of current, relevant information to food animal owners and veterinarians in the Pacific Northwest.

Active Dairy Management – Walking the Pens...

by Dale A. Moore, Extension Veterinarian, WSU

Although I am a very strong proponent in the use of records to help make dairy management decisions, sometimes we just need to walk the pens. And, if your spouse bought you an activity tracker, like mine did, you'll also benefit by getting in all those steps.

It's not that you don't trust those to do their job, it's just that another set of eyes can see the things that others might overlook. Besides, the cows can tell you an awful lot. In this article, we'll focus on the lactating cow pens and the kinds of observations that you can make. Whether it is the dairy owner, manager, herdsman or veterinarian, a regular walk through the pens can tell you two things: (1) Things are looking really good and I am going to tell the employees about it, or, (2) There are a couple things we need to tweak to improve cow comfort or well-being, Dry Matter Intake (DMI), employee safety, etc., and I am going to tell the employees about it.

The following list of observations is not exhaustive and some items may not be important to some farms or could be measured in a different way, such as by newer technologies. There may be other items that you might want to include that are not listed.

Pen Stocking Rate

Is this lactating pen really less than 120% stocking capacity for headlocks or stalls? Is “everyone” eating together? Lying down together? Is the fresh pen stocked less than 100% and 30 inches of bunk space per cow? Are the cows distributed throughout the pen or bunk or are they bunching due to heat or flies?

Cow Observations

- Hygiene - If you looked across the pen, would you see many cows with manure above the pastern?
- Teat dip - If cows have returned from the parlor - do they all have a visible coating of teat dip?
- Lameness - if you are walking through the pen, are there any cows that are obviously lame that need immediate attention?
- Body condition scores (BCS) - Are there any really thin cows in the pen? Does this pen of cows meet the suggested BCS target and range? (Penn State Extension - <https://extension.psu.edu/body-condition-scoring-as-a-tool-for-dairy-herd-management>)?

Stage of Lactation	BCS Goal	BCS Minimum	BCS Maximum
Calving	3.5	3.25	3.75
Early Lactation	3.0	2.75	3.25
Peak Milk	2.75	2.5	3.0
Mid Lactation	3.0	2.75	3.25
Late Lactation	3.25	3.0	3.75
Dry Off	3.5	3.25	3.75

- Manure - Manure observations can indicate some things about a cow’s ability to digest the nutrients offered her. Although there are manure scoring systems (<http://livestocktrail.illinois.edu/dairynet/paperDisplay.cfm?ContentID=550>), making the observations is the first step. The optimal consistency for dairy manure is porridge-like and in a pile. If it is runny, bubbly, or splashy, has lots of whole corn particles or is too sticky or dry, there are nutritional or digestive issues going on.
- Rumination - If cows are resting, more than 60% should be chewing their cud (Amaral-Phillips -- <http://articles.extension.org/pages/70518/what-are-your-dairy-cows-telling-you-about-their-nutrition-program>). Less than that may indicate digestive issues.

Stalls

While the cows are eating or in the parlor, you should be able to make important stall observations. Are the backs of the stalls dry? Dirty? The picture below shows stalls that are



dug out at the back and are wet. The stalls should be well-bedded to the back curb and dry. If making your observations after cows had their fill of feed, they should be resting (about 14 hours a day). How are the cows using the stalls? Are they standing? Lying? The stalls should be well-occupied and the cows should be using them appropriately after eating. The picture below shows some unusable stalls because of a broken water pipe.

That would increase stocking density because the cows would not use these stalls.

Alleys

While the cows are away at the parlor, most farms clean the alleyways. Observations on cleanliness as well as manure build-up areas can be made quickly.

Bunk

Recommendations are that feed be available for 21 hours per day to maximize DMI and that about 5 percent refusals remain (although that may vary depending on the quality of the TMR). Feeding behavior of the cows can also be noted (Aggressively eating? Sorting?). Are there any broken headlocks? Obstructions to the feedbunk?



Records of Pen Observations

A clipboard and a pen is old-school but can still be useful. A number of years ago, Dr. Don Niles, co-owner of Dairy Dreams in Wisconsin, created a simple record-keeping system for making daily pen walks. It would be easy to adapt this to what a dairy wanted to record or even create a smartphone-based recording system.

1 Time _____	2 Time _____
% Cows eating _____	% Cows eating _____
% Standing _____	% Standing _____
% Laying _____	% Laying _____
% Cud Chewing _____	% Cud Chewing _____
Score 0-5	Score 0-5
Bunching _____	Bunching _____
Manure _____	Manure _____
Stallbeds _____	Stallbeds _____
Water _____	Water _____
Flies _____	Flies _____
Teat Dip _____	Teat Dip _____

Seeing the cows in their pens and making pen observations takes time but can find the things that employees are doing well and can find those things that can help improve health, performance, and comfort of the cows.

Keys to Managing Small Ruminant Nematode Parasites

by Craig McConnel, Extension Veterinarian, WSU



A recent article in the journal *Small Ruminant Research* (2016. Vol. 142. Pp 11-15) highlighted that the epidemiology of nematode parasites has changed. Parasites have adapted to climatic and management changes and the inappropriate use of anthelmintic drugs. Consequently, it is commonplace to find anthelmintic resistance and suboptimal animal productivity when using standardized “blueprint” control programs. The end result is that sensible nematode control has shifted from attempts to eliminate parasite populations toward the adoption of

management strategies aimed at maintaining acceptable animal health in the face of a constant, low level of challenge.

With that in mind, it is worth reviewing currently accepted standards for sustainable nematode control. The goal of small ruminant nematode control is to limit the challenge to the sheep or goat to a level that does not compromise performance or welfare. At the same time, it is important to enable the development of protective immunity within affected animals. Therefore, managing nematodes requires knowledge of the farming systems employed by individual flocks or herds, and an understanding of the relationship between pasture contamination, the availability of infective larvae, and the build-up of infection in animals. An example provided in the aforementioned article points out that a plan for nematode control in summer-grazed lambs on a particular field would need to consider the following: the *size of the overwintered infective larval population* as a consequence of prior autumn and winter grazing management and climate; *ewe/doe fecal egg output* onto that field as influenced by anthelmintic drug treatments of periparturient ewes, ewe nutrition, and the lambing percentage; and *autoinfection of the field by the lambs* themselves as impacted by anthelmintic drug treatments, nutrition, and grazing management.

Anthelmintic resistance management should focus on evasive grazing management and individual animal drug treatments, leaving select animals untreated as a source of *refugia*. Briefly, refugia refers to the practice of maximizing the number of parasite stages left *unexposed* to drugs. This limits the number of nematode progeny that have survived treatment of their hosts and theoretically reduces the proportion of parasites that are genetically drug resistant. The frequency of susceptible nematodes in the total population remains high, the size of the parasite population achieves a more-or-less steady state, and subsequent anthelmintic treatments remain effective.

Anthelmintic resistance management is based on the premise that resistance is already present in most flocks. Current management advice can be summarized as follows: 1) ensure that nematodes are exposed to an effective anthelmintic drug concentration, 2) manage the timing and frequency of anthelmintic drug treatments so that only a small proportion of the population is exposed



to the anthelmintic, 3) treat introduced animals with effective anthelmintic drugs, and 4) monitor for anthelmintic resistance.

Interestingly, the validity of this advice is relatively unknown as it is based primarily on theoretical principles. The extent to which the first three points of advice above influence anthelmintic resistance and susceptibility lacks empirical clarity. Consequently, the most valuable recommendation likely has to do with *monitoring* parasitism and anthelmintic resistance.

Conventional parasitological tools for the diagnosis and monitoring of anthelmintic resistance hinge on fecal egg counts (FECs), along with standard speciation methods, FEC reduction tests, identification of larvae recovered pre- and post-treatment, and bioassays such as egg hatch, larval development, and larval feeding inhibition tests. However, the interpretation of FECs depends on knowledge of fecal dry matter content and feed management, and can be influenced by host responses to parasitism and parasite species. Therefore, FECs must be interpreted in light of farm management practices including parasite control, judgement of the most likely parasite species, and knowledge of climate and local geography.

Unfortunately, conventional parasitological tools only allow for the estimation of the prevalence of resistant nematodes in single species populations and are inaccurate in determining the true population prevalence of genetic resistance. Future efforts to understand anthelmintic resistance and implement effective strategies aimed at slowing its emergence and spread will likely focus on novel genetic crossing methods. Nonetheless, through the use of staged investigations into parasite resistance and monitoring of animal performance, it is possible to document current management practices and conditions that enhance animal productivity. Thus, consistent small ruminant flock and herd health oversight provides an essential first step toward sustainable nematode control.

Ram and Buck Breeding Soundness Examinations

by Ahmed Tibary, DVM PhD DACT, Comparative Theriogenology, WSU

Male breeding soundness examination (BSE) is an important aspect of reproductive management of the flock or herd. The objective of the BSE is to evaluate a male's ability to produce and deliver semen in sufficient quantity and quality to achieve high conception rates.

The Ram -- The ram BSE should be conducted 30 to 60 days before they join the ewes, preferably during the natural breeding season and when sexually rested. A breeding soundness examination of a ram begins with a thorough physical examination. He must be healthy, able to walk and see, be in good body condition (neither thin nor obese), and have no physical problems.

The external reproductive organs are then palpated and evaluated for abnormalities. This includes observation and palpation of the penis, prepuce, sheath, testicles, and epididymis, as well as measuring scrotal circumference. Physical problems and penile or preputial problems reduce the ram's ability to find and service estrous ewes (Figure 1). The testes, on palpation, typically are firm, freely movable within the scrotum, and even in size and shape (Figure 2). Outside the breeding season or after intensive use, rams will

have generally smaller and softer testicles. Scrotal circumference (SC) is measured and represents the best estimator of daily sperm production. The evaluation of scrotal circumference is based on the age and/or weight of the ram.



Figure 1: Blenorrhagia (“pizzle rot”) is the most common lesion of the prepuce in rams



Figure 2: (a) Enlarged epididymal tail=Epididymitis. (b) Scrotal abscess. (c) Scrotal dermatitis. (Contact dermatitis should be differentiated from mange)

Sperm motility and morphology are evaluated after collection of an ejaculate (Figure 3). Rams are classified into one of 4 categories: Unsatisfactory, questionable, satisfactory, and excellent. Factors that can affect semen quality include heat stress, systemic diseases, fever or pathological processes at the level of the scrotum, testis or epididymis. The most common genital pathology in rams is contagious epididymitis due to *Brucella ovis*. Infected rams can be detected by serology. An ELISA test is most sensitive and false positives are generally not a problem.

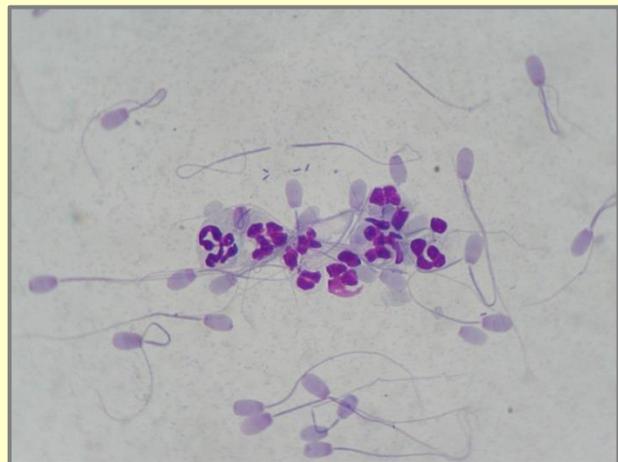


Figure 3: (a) High number of sperm abnormalities (midpiece reflex) in an infertile ram. (b) High number of white blood cells (PMNs) in semen of ram with epididymitis.

Libido (mating ability or serving capacity) is not evaluated during BSE. It is very important to track ram breeding activity and identify rams with poor serving capacity by using a marking harness. Monitoring of serving capacity is critical when using young, virgin rams.

The Unsatisfactory Ram -- A ram is an unsatisfactory potential breeder if he fails the physical examination, presents any hereditary disorders or has congenital or acquired pathology of the reproductive system. Rams should be eliminated if they do not meet the minimum standards for scrotal circumference (30 cm for ram lambs <14 months, or 33 cm for adult rams >14 months), normal sperm morphology (70%), and sperm motility (30%) or are positive for *B. ovis*.

The Questionable Ram -- This category includes all rams with one questionable parameter or suffering from a treatable or reversible condition. Questionable rams should be retested within 50 to 60 days. Common reasons for classifying a ram as questionable include:

- Body condition score: Under-conditioned (1 or 2) or over-conditioned (5)
- Mild to moderate pizzle rot, scrotal dermatitis, frost bite, mange
- Scrotal circumference: less than 30 cm for lambs or less than 33 cm for rams
- Sperm morphology: >30% abnormalities
- Sperm motility: < 30%
- Suspect ELISA test for *B. ovis*, retest in 30 to 60 days

The Satisfactory Ram -- These rams should meet the minimum requirements for general health, scrotal circumference, sperm motility and morphology. They achieve good reproductive performances if joined to ewes at a ratio of 1:50 for 60 days.

The Excellent Ram -- These rams meet more stringent requirements for scrotal circumference (>33 cm for ram lambs, >35 cm of older rams), progressive motility (>50%) and normal morphology (\geq 90%). Exceptional rams are expected to achieve good reproductive performance at a ratio of 1 ram to 100 ewes.

The Buck -- Bucks should ideally be tested for *Corynebacterium pseudotuberculosis* and Caprine arthritis-encephalitis virus (CAEV). They should also be checked for gastrointestinal parasites. Common abnormalities of the genital organs include testicular hypoplasia, atrophy or degeneration, and cryptorchidism. Scrotal circumference should be at least 25 cm for breeds weighing more than 40 kg. Most dairy breed bucks have a scrotal circumference of 25-28 cm when they reach 45 kg (100 lb) of body weight. Meat breed bucks have a SC of 26-29 cm around 7 months of age (45 kg BW). A buck is a satisfactory breeder if he passes the physical examination and produce ejaculates with > 50% progressive motility and less than 30% total sperm abnormalities.

Conclusions

About 3 to 10% of rams fail the BSE. In a retrospective study of 14,667 rams in the western US, 29% failed the BES (Van Metre et al 2012). The most common reason for failure was poor semen quality (44% of failures) which emphasizes the importance of semen evaluation. Inflammatory conditions, physical abnormalities and emaciation were the cause of failure in 20%, 16% and 14% of rams, respectively. Seroprevalence of *B. ovis* was 10% which emphasizes the importance of serologic testing. It is important that males be purchased from reputable breeders with sound biosecurity and preventive herd health programs and be evaluated by a veterinarian with training in BSEs at least a month before breeding.

Reference

Van Metre DC, Rao S. Kimberling CV, Morley PS. Factors associated with failure in breeding soundness examination of Western USA rams. Preventive Veterinary Medicine 2012, 105:118-126

Tuberculosis Testing Reminders for Practitioners

by Ben Smith, DVM, Eastern Regional Field Veterinarian, WSDA

Tuberculosis (TB) testing for large animal practitioners is becoming more common as the disease seems to be in the spotlight across the country. A few states have herds under quarantine and others are worried about getting an introduction. The cost to producers is significant and USDA doesn't have money to purchase large herds to eradicate the disease as in the past.

There are some misconceptions and reminders that need to be addressed. In Washington, a state and federally accredited veterinarian must take and pass a test administered through Washington State University Extension, <http://vetextension.wsu.edu/Beef/tb/>. This has a short video and exam embedded within the link. Once a veterinarian passes the exam, they are certified to perform official testing in this state.

A caudal fold tuberculin (CFT) test is the initial weeding-out process and is done by the private veterinarian. About 3-5% of animals **should** respond to this primary test. Performing CFT's on lots of animals and not having any responders is looked at with suspicion and could get an accreditation inquiry. Any swelling or inflammation palpated at the 72 hour post-injection reading is considered a responder. Swelling can be the size of a grain of rice to something that can be seen from across the corral, and can be firm or diffuse. This does not indicate severity of infection or disease presence.

The same veterinarian that did the injection must be the one to read the test at the 72 hour interval, and every animal must be palpated. Official identification and all other ID must be recorded on the official USDA test form. If you have a responder, call a federal or state regulatory official as soon as possible. They have to schedule a comparative cervical test within 10 days of the first injection. If this is not done, then the animal and any cohorts on the property will be under quarantine for 60 days before the comparative cervical follow-up test can be done.

Another thing to keep in mind, make sure the owner doesn't give vaccinations for at least 30 days prior to testing for TB or brucellosis. These can prime the immune system and possibly cause a false positive test result.

This whole process takes time and having the truck waiting for the practitioner to finish reading the CFT's so they can load and haul, is setting everyone up for failure. Plan far enough ahead to allow for responders and follow-up testing. Most states have entry requirements that allow for testing 30 days prior to movement. Allowing as much time as possible will decrease frustrations with scheduling.

For more information, please contact the Washington Department of Agriculture, <https://agr.wa.gov/AboutWSDA/Divisions/AnimalHealthServices.aspx>, or United States Department of Agriculture offices, https://www.aphis.usda.gov/aphis/ourfocus/animalhealth/contact-us/sa_area_offices/ct_area_offices_avic.

WSU Research Updates

(1) **McConnel CS, McNeil AA, Hadrich JC, Lombard JE, Garry FB, Heller J. Dairy cow disability weights. *Prev Vet Med.* 2017;143:1-10. [doi:10.1016/j.prevetmed.2017.04.014](https://doi.org/10.1016/j.prevetmed.2017.04.014)**

Over the past 175 years, data related to human disease and death have progressed to a summary measure of population health, the Disability-Adjusted Life Year (DALY). As dairies have intensified there has been no equivalent measure of the impact of disease on the productive life and well-being of animals. The development of a disease-adjusted metric requires a consistent set of disability weights that reflect the relative severity of important diseases. The objective of this study was to use an international survey of dairy authorities to derive disability weights for primary disease categories recorded on dairies. National and international dairy health and management authorities were contacted through professional organizations, dairy industry publications and conferences, and industry contacts. Estimates of minimum, most likely, and maximum disability weights were derived for 12 common dairy cow diseases. Survey participants were asked to estimate the impact of each disease on overall health and milk production. Diseases were classified from 1 (minimal adverse effects) to 10 (death). The data was modelled using BetaPERT distributions to demonstrate the variation in these dynamic disease processes, and to identify the most likely aggregated disability weights for each disease classification. A single disability weight was assigned to each disease using the average of the combined medians for the minimum, most likely, and maximum severity scores. A total of 96 respondents provided estimates of disability weights. The final disability weight values resulted in the following order from least to most severe: retained placenta, diarrhea, ketosis, metritis, mastitis, milk fever, lame (hoof only), calving trauma, left displaced abomasum, pneumonia, musculoskeletal injury (leg, hip, back), and right displaced abomasum. The peaks of the probability density functions indicated that for certain disease states such as retained placenta there was a relatively narrow range of expected impact whereas other diseases elicited a wider breadth of impact. This was particularly apparent with respect to calving trauma, lameness and musculoskeletal injury, all of which could be redefined using gradients of severity or accounting for sequelae. **These disability weight distributions serve as an initial step in the development of the disease-adjusted lactation (DALact) metric. They will be used to assess the time lost due to dynamic phases of dairy cow diseases and injuries. Prioritizing health interventions based on time expands the discussion of animal health to view profits and losses in light of the quality and length of life.**

(2) **McConnel CS, Garry FB. Dairy cow mortality data management: the dairy certificate of death. *Bovine Practitioner.* 2017;51(1):64-72.**

On-farm cow mortality is a significant problem for North American dairies. Analysis of causes of death should provide important information about outcomes of current management, and direction for management changes required to improve cow health, production, and well-being. Currently available information about mortality losses is not useful for making appropriate changes because information gathering and storage are inadequate for that purpose. Here we propose and analyze the use of a dairy cow death certificate that provides an information gathering tool intended to improve analysis and communication about outcomes of dairy management

(3) Hall JB, Kasimanickam RK, Glaze JB Jr, Roberts-Lew MC. Impact of delayed insemination on pregnancy rates to gender selected semen in a fixed-time AI system. *Theriogenology*. 2017;18:154-161. doi: [10.1016/j.theriogenology.2017.07.014](https://doi.org/10.1016/j.theriogenology.2017.07.014)

The objectives of the current experiment were to determine if delaying insemination by 8 h in a FTAI protocol would alter estrus expression and pregnancy rates in cows inseminated with sex-sorted semen, characterize bull variation in pregnancy rates to sex-sorted semen and examine the impact of repeated years of FTAI to sex-sorted semen on calving distribution. Over three breeding seasons, postpartum cows (n = 839) were estrous synchronized using the 5-day CO-Synch + CIDR system. Cows were given GnRH (100 µg i.m., Factrel) at time of insertion of a controlled internal drug releasing device (CIDR; Eazi-Breed CIDR). Five d later CIDR was removed and PGF2α (25 mg i.m., Lutalyse) was given at removal and 8 h later. Estrus detection aids were applied at CIDR removal. Cows were inseminated with X-sorted or Y-sorted sex-sorted semen at 72 h (NORM) or 80 h (DELAY) after CIDR removal, and GnRH was administered at AI. At insemination, estrus status was categorized as positive (YES), partial (QUES), unknown (NR) or negative (NO). Bulls were introduced to cows at 14 d and removed at 60 d after FTAI. Pregnancy diagnosis was performed by ultrasound at d 60 after FTAI and via palpation at 60 d after bull removal. **There was no difference (P > 0.05) in pregnancy rates to sex-sorted semen or final pregnancy rates between NORM and DELAY cows. Pregnancy to sex-sorted semen averaged 35.2% whereas final pregnancy rates were 90.6%.** More cows (P < 0.05) in the DELAY group expressed estrus before FTAI, but this increase did not alter pregnancy rates to sex-sorted semen. Expression of estrus before FTAI increased (P < 0.02) pregnancy rates to sex-sorted semen across treatments with differences being YES > QUES or NR > NO. **There was considerable variation in pregnancy rate by bull (P < 0.05) with pregnancy rates ranging from 55.6% to 19.3%.** Whole herd calving distribution was altered (P < 0.05) after 3 y of use of sex-sorted semen compared to the previous 3 y when conventional semen was used. We conclude that **delaying insemination by 8 h in an FTAI protocol did not improve pregnancy rates to sex-sorted semen** despite more cows exhibiting estrus before FTAI. In addition, a high bull to bull variation in pregnancy rates to sex-sorted semen is a limitation in FTAI systems. Further research into FTAI strategies for use with sex-sorted semen is warranted.

(4) Abdel Aziz RL1, Khalil AAY2, Abdel-Wahab A3, Hassan NY4, Abdel-Hamied E5, Kasimanickam RK. Relationship among circulating anti-Müllerian hormone, insulin like growth factor 1, cadmium and superovulatory response in dairy cows. *Theriogenology*. 2017;100:72-79. doi: [10.1016/j.theriogenology.2017.06.007](https://doi.org/10.1016/j.theriogenology.2017.06.007)

The objectives of this study were 1. to determine the associations among circulating anti-Müllerian hormone (AMH), insulin like growth factor 1 (IGF1) and cadmium (Cd) concentrations of lactating Holstein cows at the time of superovulation and 2. to determine the effect of circulating AMH, IGF1 and Cd concentrations on the superovulatory response in Holstein dairy cows. Holstein cows (n = 30) were milked thrice daily and housed and fed in free stall barn as a separate group. All animals were synchronized for superovulation and flushed. Three blood samples for AMH, IGF1 and Cd analysis were collected prior to superovulation, at estrus and at the time of embryo collection. The concentrations of blood makers prior to superovulation were highly correlated to superovulatory response. Circulating concentrations of AMH, IGF1 prior to superovulation were negatively correlated to Cd concentrations (P < 0.05). There was no correlation between circulating concentrations of AMH and IGF1. The number of corpus luteum (r = 0.71), total embryo (r = 0.67), total transferable embryo (r = 0.51) and total grade 1 embryo (r = 0.5) were positively correlated to AMH concentrations (P < 0.05). There was a trend for negative correlation found between circulating cadmium concentrations and total grade 1 embryo

yield ($P < 0.1$). When cows were classified into quartiles (Q) of circulating AMH concentration, number of corpus luteum, and total embryos, total transferable embryos and total grade 1 embryos yield was significantly different for AMH quartiles. The superovulatory response parameters evaluated were increased with increased AMH concentrations; particularly we observed a >2-fold difference between first and fourth AMH quartiles in total transferable embryo yield and total grade 1 embryo yield. In conclusion, circulating AMH concentration was strongly associated with superovulatory response. **Measuring AMH before enrolling cows in superovulation programs will likely allow practitioners to improve numbers of embryos produced and, thereby, reduce costs per embryo produced.**

(5) Adkins PRF, Middleton JR, Calcutt MJ, Stewart GC, Fox LK. Species Identification and Strain Typing of *Staphylococcus agnetis* and *Staphylococcus hyicus* Isolates from Bovine Milk by Use of a Novel Multiplex PCR Assay and Pulsed-Field Gel Electrophoresis. *Journal of Clinical Microbiology*. 2017;55(6):1778-1788.

Staphylococcus hyicus and *Staphylococcus agnetis* are two coagulase-variable staphylococcal species that can be isolated from bovine milk and are difficult to differentiate. The objectives of this study were to characterize isolates of bovine milk origin from a collection that had previously been characterized as coagulase-positive *S. hyicus* based on phenotypic species identification methods and to develop a PCR-based method for differentiating *S. hyicus*, *S. agnetis*, and *Staphylococcus aureus* Isolates ($n = 62$) were selected from a previous study in which milk samples were collected from cows on 15 dairy herds. Isolates were coagulase tested and identified to the species level using housekeeping gene sequencing. A multiplex PCR to differentiate *S. hyicus*, *S. agnetis*, and *S. aureus* was developed. Pulsed-field gel electrophoresis was conducted to strain type the isolates. Based on gene sequencing, 44/62 of the isolates were determined to be either *S. agnetis* ($n = 43$) or *S. hyicus* ($n = 1$). Overall, 88% (37/42) of coagulase-positive *S. agnetis* isolates were found to be coagulase positive at 4 h. The herd-level prevalence of coagulase-positive *S. agnetis* ranged from 0 to 2.17%. Strain typing identified 23 different strains. Six strains were identified more than once and from multiple cows within the herd. Three strains were isolated from cows at more than one time point, with 41 to 264 days between samplings. **These data suggest that *S. agnetis* is likely more prevalent on dairy farms than *S. hyicus*. Also, some *S. agnetis* isolates in this study appeared to be contagious and associated with persistent infections.**

WSDA Corner

by Dr. Brian Joseph, State Veterinarian



The Lowdown on Livestock Tags: One Tag Fits All!

When it comes to ID: Is your herd “Official” or Not? Livestock owners will say any tag on cattle has some informational benefit. That’s true. Use of an “840” tag, for example, shows the animal is from the U.S. Official identification is required to meet federal Animal Disease Traceability (ADT) standards. Identification methods, such as farm livestock management tags, brands, and backtags, however, are not recognized as official identification by state and federal health officials, including our programs at WSDA. Farm management tags and brands can be duplicated between several animals and backtags lack retention ability.

What is official identification? An official identification eartag must be imprinted with a nationally unique, 15-digit official animal identification number, the US official eartag shield, and be tamper proof. Acceptable official tags include: National Uniform Eartagging System (NUES) eartags also known as the silver tag, Brucellosis Vaccination eartag, and Animal Identification (AIN) tags also known as “840” tags. “840” tags come in the form of an RFID tag and a National Farm Animal Identification and Records tag.

Is the 982 or 985 Radio Frequency Identification (RFID) farm management tag considered official identification? Farm management tags starting with 982 or 985 are the most common farm management tags. However, the 982 and 985 RFID tags are not considered to be official identification.

What is the difference between a farm management RFID tag and an 840 RFID tag? The farm management RFID tags are functionally identical to the 840 RFID tags. However, the farm management tags are not considered official and the 840 tags can be recorded to meet both state and federal animal health and movement requirements. Both the farm management tags and the 840 tags are manufactured by the same companies and both are compatible with electronic farm management programs.

How do I get an 840 RFID farm management tag? To order 840 tags, a Federal Premise Identification Number (PIN) is required. To get a PIN number you can go to the Washington State Department of Agriculture’s (WSDA) website and fill out an application or call the Animal Services’ Division at (360) 902-1987 to submit your information. If you are a producer, once you have obtained a PIN number you are able to order 840 RFID tags through a tag manufacturer.

Can my veterinarian use an 840 RFID tag instead of an orange metal clip tag at Brucellosis vaccination? Yes. Veterinarians can order 840 RFID Brucellosis tags directly through WSDA by calling (360) 902-7566.

If I already have an 840 RFID or an 840 National Farm Animal Identification and Records tag, does my veterinarian need to apply another official identification (orange metal tag or RFID tag)? No. Once an 840 tag is applied, it can be recorded to meet both state and federal animal health and movement requirements on CVIs, brucellosis test/vaccination records. This results in only one identification ear tag being assigned per animal for life. When your veterinarian brucellosis vaccinates your cattle, he/she can record the existing official identification on the vaccination record.

Why should I use RFID? Capturing official identification remains a challenge as metal clip ear tags can prove difficult to read and record accurately. Official Electronic Identification (EID) devices, including the AIN tags with RFID technology have proven to be a reliable, efficient, and a cost effective way to capture official identification for ADT. WSDA is developing strategies to support RFID infrastructure to expedite the speed of commerce and create a robust traceability system that can track the movements of animals from birth premise to slaughter.

For more information on official ID, visit the WSDA website at <https://agr.wa.gov/FoodAnimal/AnimalID/tags.aspx> or call David Hecimovich at (360) 725-5493.

Livestock Inspection Program

This month we bid a fond farewell to our customer service representative in Olympia, April Milan. April was with our program for more than five years. She started out as a brand inspector in 2012, supporting Chehalis Livestock Market sales every Friday. She also supported countless private farm and ranch sales in the south Puget Sound area. April became a full-time employee starting in 2016. If you've ever called the Olympia office or sent us an email, you've had the pleasure of working with April. I want to personally thank her for all of her hard work. Everyone here at the livestock inspection program wishes her the best of luck in her new position with WSDA's Food Safety program.

As we say goodbye to April, we are looking for someone to fill the customer service position. In the interim, Kristina McDonald, one of the brand inspectors at Chehalis, has agreed to fill the customer service role on a part-time basis. We also want to remind everyone that we are heading into the "fall run" when our livestock inspectors are going to be extremely busy doing county fairs and youth sales in addition to their regular workload of scheduled sales and markets. We advise you to get in contact with your inspector sooner rather than later if you know you are going to need an inspection.

Call us in Olympia at 360.902.1855 for livestock inspector contacts. Or see our list on the internet at <https://agr.wa.gov/FoodAnimal/Livestock/WhoToContact.aspx>

Case Study from the State Veterinarian's Office

Have you ever wondered what happens if you have an animal on your farm develop unusual lesions or clinical signs? The following case is based on a real case that occurred in Washington this year, but details, names and locations have been changed to protect the privacy of the individuals involved. This case will help you better understand the process and the response from regulatory animal health officials when a foreign animal disease is suspected.

History: Mr. and Mrs. Orville Ganic, organic dairy producers in Northwest Washington, noticed that their heifers have been slobbering for about 10 days. It started with just a few, but then they noticed that some of the heifers were having difficulty chewing and were losing weight.

The dairy milks about 80 head with an equivalent number of youngstock. The heifer facility is on a separate premise from the milking herd. None of the milk cows had lesions. There is direct contact with wildlife, especially deer. Mr. Ganic decided to call his private practitioner, Dr. Pete.

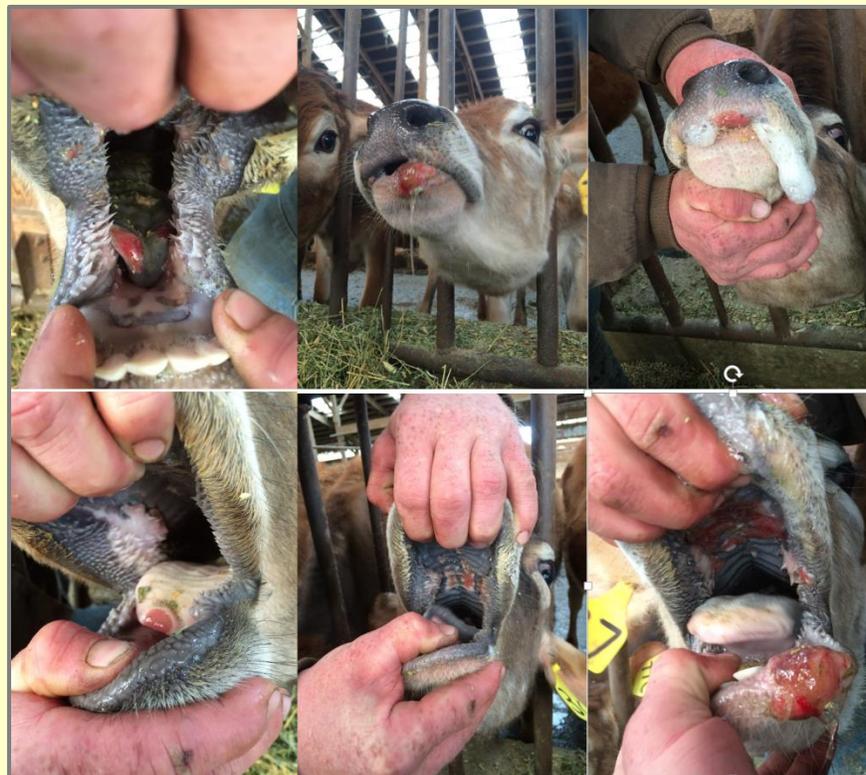
Private Veterinarian Assessment: Upon arrival, Dr. Pete examined five, 12-15 month old heifers penned with 20 in the group that seemed to be the most sick. One of the heifers had a temperature of 103 degrees and was dull and depressed. The other four heifers did not have a fever and were bright and alert. The veterinarian determined that the heifers all had variations of blisters, erosions and ulcers on the lips, tongue and mouth. These lesions are all consistent with diseases on the Washington State Departments of Agriculture's reportable disease list. Dr. Pete contacted the State Veterinarian's office to report the concerning lesions. Dr. Amber Itle, WSDA field veterinarian is required to be in contact within four hours of the report.

Dr. Pete and Dr. Itle generated a list of differential diagnoses:

- Foot and Mouth Disease (foreign animal disease)
- Vesicular Stomatitis (endemic)
- Bovine Viral Diarrhea (endemic)
- Bluetongue (endemic)
- Mechanical or chemical burn
- Trauma

Some of these diseases are domestic, common endemic diseases such as Bovine Viral Diarrhea (BVD) and occur commonly. In contrast, foreign animal diseases such as Foot- and-Mouth Disease (FMD), is not present in the United States. *The challenge is that all of these diseases are clinically indistinguishable and require diagnostic tests to differentiate these diseases from each other.*

State Assessment: Dr. Itle arrived on the farm the next morning to assess the animals and take the appropriate diagnostic samples. After gathering a short history, Mr. Ganic confirmed that he did have a worker that returned from a visit to Mexico a few weeks ago, but no one else had traveled internationally. Dr. Itle examined the oral cavity of the clinical heifers in the pen to confirm the extent of the lesions that were described by Dr. Pete. She also looked in the mouths of non-clinical heifers and found that they all had oral lesions. Approximately 30 heifers from 15 months of age to 10 days of age were affected with varying degrees of lesions. Calves less than 10 days of age did not appear to be affected. A few calves had low grade fevers of 102.5, but fever was not consistent between animals. All the youngstock had oral exams revealing similar ulcerative lesions.



****NOTE:** It is ALWAYS a good idea to wear gloves when handling animals.

Prioritize Samples for Diagnostics: Dr. Itle contacted State Veterinarian Dr. Brian Joseph and USDA Area Director Dr. Leonard Eldridge to report the findings. They directed Dr. Itle to take the appropriate samples and mail them to the Foreign Animal Disease Diagnostic Laboratory at Plum Island in New York for confirmatory testing. A “hold order” was placed on the farm that restricted movement of any heifers on or off the premise until lab results confirm a negative test.

The second report: Dr. Itle followed strict biosecurity practices on the farm and avoided contact with other farms and animals that day. The next day, a second call came into the State Vets Office for another organic dairy 100 miles away from Mr. Ganic’s dairy. Dr. Gilliom, WSDA SW Region veterinarian, responded to the call and found a similar history and clinical signs including deep oral ulcers on the hard palate, lips and tongue. The 200 cow organic dairy had three of 30 heifers with lesions. Dr. Gilliom also overnights samples to Plum Island, NY to rule out the vesicular diseases of concern.

The Results: Both of the dairy’s private veterinarians had submitted samples to the Washington Animal Disease Diagnostic Laboratory (WADDL) in Pullman that confirmed negative results for Bovine Viral Diarrhea and Blue tongue virus. Two days later, the Plum Island Diagnostic center confirmed negative results for the vesicular diseases of concern, including foot-and-mouth disease and vesicular stomatitis. The hold order or movement restriction was lifted for the dairy.

With many of the infectious diseases of concern ruled out, additional history from the dairy farms revealed that they were both sourcing organic grass hay from the same farm in Eastern Washington. Dr. Pete sent the hay to an agronomist that identified yellow foxtail all through the sample. Yellow Foxtail has an awn that has been well documented to cause lesions consistent with clinical signs seen on both dairies. Because these lesions are gradual and slow to progress from the time of penetration of the mucosal tissue in the mouth and the development of lesions, the calves continued to consume the hay, as there was not an immediate negative stimulus. The hay was removed and replaced on both dairies and the lesions resolved.

If you or your veterinarian see unusual lesions on your farm, don’t hesitate to report it to Dr. Brian Joseph, State Veterinarian at (360) 902-1881 or contact your regional field veterinarian. We will work very efficiently with your private veterinarian to quickly respond, assess, and diagnose the problem to ensure quick recovery and continuity of business.

Regional Field Vets:

Northwest WA: Dr. Amber Itle (360) 961-4129

Southwest WA: Dr. Thomas Gilliom (360) 688-4294

Central WA: Dr. Dana Dobbs (509) 607-4974

Eastern WA: Dr. Ben Smith (509) 350-0081

Continuing Education

Veterinarians

Academy of Dairy Veterinary Consultants, October 6, 2017, Reno, NV. **The Veterinarian's Role in On-Farm Antimicrobial Stewardship**. For more information and registration, go to:

<https://academyofdairyveterinaryconsultants.org/registration/>

CVM Homecoming CE Event, 9 AM to Noon. October 21, 2017, WSU Pullman. Veterinarians & veterinary technicians -- earn 3 free credit hours of CE prior to the CVM Alumni Pre-Game Reception and Homecoming football game. For more information and registration, go to: <http://vetextension.wsu.edu/event/2017-homecoming-ce-event/>

Poultry Institute 2017 Program, October 18 from 8:30am-2:30pm, Puyallup, WA. Veterinarians can earn 4.5 credit hours of CE. For more information about registration and the program visit: <http://vetextension.wsu.edu/event/poultry-institute-2017-program/>

CVM Spring Conference, April 13-15, 2018. WSU Pullman. 1 ½ days of continuing education for large and small animal practitioners and technicians. SAVE THE DATE!

Producers

Washington State Sheep Producers, October 26-29, 2017, Pullman, WA. For information: <https://www.wssp.org/projects>

Washington State Dairy Federation, November 4-6. Yakima, WA. For information: <http://wastatedairy.com/2017-washington-dairy-conference-schedule-for-nov-6-7-in-yakima/>

Washington Cattlemen's Association, November 8-10, 2017. Kennewick, WA. For information: <http://www.washingtoncattlemen.org/new-page-2/>

Visit our website for information on current research projects and outreach materials for veterinarians and producers! <http://vetextension.wsu.edu/>

Send newsletter comments to the Editor: *ag animal health*
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