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ANIMAL AGRICULTURE EXTENSION NEWSLETTER

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In this issue:

OPTIMIZING PRE-WEANING CALF CARE AND TREATMENT TO REDUCE THE IMPACT OF BOVINE RESPIRATORY DISEASE

Research with feedlot calves indicate those that stay healthy have a higher net profit than calves treated for disease. The fewer visits to the hospital pen, the better the average daily gain (ADG). Are the outcomes of lower death loss, higher ADG and lower cost of gain with healthy calves the same in cow/calf herds? The major profits in the cow/calf business come from weaning weights and the number of calves at weaning. ADG and low mortality contribute to these profit areas. Although we can try to keep the herd healthy by preventing disease, sometimes we still have to treat. Treatment effectiveness depends on a number of factors. What are the factors that influence treatment outcomes that will minimize the impacts of Bovine Respiratory Disease Complex (BRD) in the cow/calf herd?

Early detection is important to treatment success. When to concentrate efforts to watch calves for signs of BRD is not known; calves can develop BRD any time after birth. In one study, the highest incidence of BRD in beef calves was between 70 to 170 days of age. In a French study of over 6,000 Charolais calves, respiratory disease incidence was highest in 14 to 20 day-old calves.

Exactly what to look for is debatable because most clinical signs lack specificity, meaning that some clinical signs might be found with other disease conditions. For feedlot steers, the use of the DART program (depression, appetite loss, respiratory changes and temperature elevation) identified only 65% of infected calves. A recent challenge trial showed what cattle were actually experiencing early on in the course of BRD. Within 2 days of getting infected, they started to look “sick”, stopped grooming and dropped feed intake. Their fever did not peak until 7 days after infection. Some of these observations may be of value when trying to find sick animals. The predictive ability of these behaviors to say a calf has BRD or not, however, has not yet been established.

Combinations of some obvious signs of illness could be used to identify

sick calves. Use of a simple scoring system was proposed to identify sick cattle. In this system, a score of 0 = a normal animal, 1 = noticeable depression without apparent signs of weakness, 2 =marked depression with moderate signs of weakness without significantly altered gait, 3 = severe depression with signs of weakness such as significantly-altered gait, and 4 =moribund and unable to rise. A scoring system for respiratory disease for pre-weaned dairy calves was devised with decision points upon which to decide to treat or not, based on eye and nose discharge, temperature and cough. According to the authors, respiratory disease should be treated when calves receive a score 5 points or more using the Calf Respiratory Scoring System (www.vetmed.wisc.edu/dms/fapm/fapmtools/8calf/calf_respiratory_scoring_chart.pdf).

Early detection of BRD is important to successful treatment.

Use of respiratory disease scoring systems, however, had not been validated with lung lesions or treatment success until recently. Veal calves were evaluated for clinical signs of respiratory disease and subsequent lung lesions at slaughter. At two weeks before slaughter, 60% of calves with lung lesions had abnormal breathing, 55% had a nasal discharge and 61% had coughs. The prevalence of lung lesions in this study was much higher than the prevalence of any clinical signs, indicating many animals were sick but never identified.

Adding lung auscultation with a stethoscope and recording rectal temperatures may increase the predictive nature of clinical signs and treatment outcomes. In feedlot cattle, a lung auscultation score was assigned and rectal temperature recorded at the first assignment to the hospital pen. Lungs were listened to just behind and above the elbow. Lung sounds were scored from 1 to 10 independently on the left and right side of each calf. The lung sounds scores were correlated with lung lesions; indeed, lung sound scores could predict 90% of the variation in lung lesion scores and lung scores were associated with death rates in the calves. The higher the lung sound score, the greater the likelihood of death. Also, the higher the lung score, the higher the retreatment rate. The risk of retreatment also increased with a higher initial rectal temperature.

Recently, ultrasound was used to evaluate cattle lungs for bovine respiratory disease. In a group of feedlot cattle monitored over time, compared to non-ill animals, cattle with fever diagnosed with severe BRD after arrival at the feedlot were about 12 times more likely to have lung lesions on ultrasound. The predictive ability of this diagnostic technology, however, is not yet good enough for weight gain or other health outcomes.

Cow/calf producers should gather critical information when evaluating calves for possible respiratory disease. Evidence of calf BRD include:

- Increased respiratory rate (normal respiratory rate = 30 to 60 breaths per minute)
- Increased respiratory sounds (raspy loud breathing)
- Difficulty breathing
- Cough
- Nasal discharge
- Increased temperature (normal temp = 101.5-103.0°F for calves)
- Changed demeanor of calf (droopy ears, off feed, not suckling, lethargic)
- Dehydration (sunken eyes, prolonged skin tent*, dry nose, tacky lips and gums)

*Skin tent involves pinching the skin on the side of the neck of the calf. Normal hydrated skin will spring back to normal in less than two seconds.

Cattle producers and veterinarians need to use the diagnostic criteria available to them and develop case definitions for BRD on each ranch. Once defined, treatment protocols can be developed and evaluated for effectiveness if ranchers keep good records of all treatments used.

Effective Treatment

Calves that have to be treated for BRD may not gain as well as calves that never need treatment. There are a number of antibiotics available and labeled for treatment of respiratory disease in cattle. Some antibiotics require daily treatment and some have longer retreatment intervals. Producers and their veterinarians need to decide which antibiotic is right for their operations, based on facilities and medication effectiveness. One consideration when using most antibiotics in pre-weaned calves is there may be no established meat withdrawal time for this age class of cattle, so producers should keep treatment records on all treated calves and have their veterinarians determine a meat withholding period for these animals, particularly if are sold or marketed within a short time after treatment.

Getting animals treated right the first time is key to better performance later on. Retreatment of calves after entering the feedlot has an effect on feeding and carcass performance. Calves treated two or more times after arrival at a feedlot had lower ADGs, poorer marbling scores and lost money on average[1].

Treating cattle correctly the first time they show symptoms is important to future feedlot performance.

Anti-inflammatory drugs have been evaluated as ancillary treatments in conjunction with antibiotics. Although the use of these drugs remains controversial because of the lack of sufficient well-designed studies, some veterinarians recommend them to help reduce fever and improve first treatment success rates. Recent research with pre-weaned calves demonstrated a significant reduction in clinical signs of rectal temperature, respiratory rate and clinical index score when calves were treated with an antibiotic and diclofenac or flunixin meglumine, both of which are non-steriodal anti-inflammatory drugs.

Making sure cattle are treated with the right drug, the right dose (based on body weight), for the right duration of time and through the right route of administration (IV, IM or SQ) helps maximize treatment effectiveness.

Train People to Identify and Treat

People on the ranch tasked with observations and treatment need to be trained on the identification and scoring protocol employed, the treatments to be used (treatment protocols), record-keeping and observations needed to evaluate treatment success. Standardized operating procedures (SOPs) could be developed so each calf receives the same attention. Ideas for developing SOPs have been described by Moore[2].

Conclusions

Treatment success for calf cases of BRD depend on a number of factors. Early detection, proper identification, following a treatment protocol, abiding by label directions and keeping treatment records are essential. The right hospital environment and the right people working and treating cattle will help with the recovery of sick calves.

For more information and factsheets on reducing BRD on cow-calf operations, visit the WSU BRD website: http://extension.wsu.edu/vetextension/brd.

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[2] Moore, D.A. 2008. A guide to writing standard operating procedures. www.bqa.wsu.edu/states/wa/documents/GUIDETOWRITINGSOPsFORBQA2008.pdf

—*submitted by* Drs. Dale Moore, Andrew Allen, John Wenz, WSU Veterinary Extension; and Shannon Neibergs, WSU Livestock Economist.

5-STAR WATERSHED STEWARDSHIP PROGRAM

Livestock producers on the North Fork Palouse River in Eastern Washington recognized, over the last five years, the need to take a proactive approach to public conflicts over land use, water quality, and livestock grazing. They believed a non-regulatory approach to improving soil and water in agricultural watersheds, that could be shared with other areas in the Pacific Northwest, would alleviate some of the conflict. A peer-to-peer stewardship program would have the potential to function, negatively, as self-policing, but positively and more importantly, could engage forward-thinking livestock producers in a documented, verifiable, actionable adaptive management plan to improve water quality, soil quality, vegetation health, hydrologic function, animal health, riparian condition, and profit on land they own, lease, or permit.

This producer-driven program has just begun to get legs, with a recently formed board of directors now meeting on a regular basis to plan the initial steps in the certification process.

The Five-Star Watershed Stewardship program offers producers a positive feedback mechanism for making sound cultural, financial, and ecological decisions through an integrated program of continuing education, peer-to-peer mentoring to improve application, and robust monitoring to ground-truth management results. The five stars represent levels of cumulative progress toward a true adaptive management plan. The first is development of a written grazing plan that lays out where and why cows will be each day, establishment of photomonitoring locations, and participation in continuing education opportunities. The second is maintaining written observations about what's happening at the soil-plant interface on grazing lands to supplement and interpret photomonitoring. The third is collection of vegetation and watershed monitoring data. Fourth, producers conduct soil testing to collect baseline data on soil organic matter and minerals. Fifth, participating ranchers seek third-party verification of management actions and interpretation of monitoring results. Implicit in this process is the necessity to respond to monitoring results in order to correct management deficiencies or negative trends in watershed health.

At the heart of the social conflict over grazing lands is the rancher's belief that they provide ecological goods and services without commendation or compensation while they are penalized through regulation, litigation, and public complaint. The Five-Star program recognizes and rewards producers who succeed in producing food and fiber while maintaining vigorous soil-building, carbon-sequestering, habitat-providing, and clean water-sustaining perennial vegetation.

For more information, contact Mark Ryan (mark.ryan@email.wsu.edu)

—submitted by Tip Hudson, WSU Extension Regional Specialist.

WSU EXTENSION OFFERS BEEF/LAMB/ PORK/POULTRY 100 and PORK 300 PROGRAMS

Washington State University Extension and Departments of Animal Sciences are excited to announce *WSU BEEF, LAMB, PORK and POULTRY 100* short courses will be offered in Western Washington at the Stanwood-Camano Fairgrounds. The BEEF and PORK 100 courses will be offered May 17 and the LAMB and POULTRY 100 courses will be offered May 18, 2013. The 100 short-courses are designed for beginning farmers, but are also excellent energizers for experienced food animal producers to expand opportunities and sustainability of their current livestock operations. The registration fee is $65 per participant per class, which covers lunch, materials, and notebooks. Registration for individuals or farms that would like to attend two classes, same species or different, is $100. Registration after April 23rd will increase to $75 per person per class.

The *WSU PORK 300* Short-Course will be offered June 21 -22, 2013 at the WSU Department of Animal Sciences on the Pullman Campus. *WSU PORK 300* is a two-day, hands-on workshop designed for progressive individuals involved with the swine industry. The course will focus on teaching producers, feeders, and marketers (regardless of the size or type of operation) how to produce, evaluate, and market quality pigs and pork products. The registration fee for *WSU PORK 300* is $175 per participant, which covers meals, materials, and parking arrangements. The course is limited to 32 participants and will be available on a first-pay, first-serve basis. Registration deadline is May 15, 2013. There is a late fee of $25 per person for registrations received after May 15. For more information on either of these programs, please go to www.animalag.wsu.edu or contact Sarah M. Smith, WSU Extension at 509-754-2011, Ext. 413 or smithsm@wsu.edu.

IMPORTANCE OF IMPLEMENTING LOW-STRESS CATTLE HANDLING

Human safety, cattle performance, family dynamics, consumer perspectives are all impacted by the way we work cattle on our ranches. Individuals are seriously injured and even killed while handling cattle; however, there are also a large number of minor incidents, near misses, and even serious accidents to producers, family members, and handlers that go unreported. The National Safety Council ranks cattle ranches/farms second among all farming enterprises in the number of injuries per hour of work. Low-stress cattle handling not only improves producer and family safety, morale, and retention, but has also has been proven to improve animal performance, safety, health, meat quality and the perception of the cattle industry. Cattle care and handling is a top concern of consumers and has received negative media attention. Cattle ranchers and handlers are demonstrating their commitment to animal care and consumer concerns by implementing cattle handling facilities and handling procedures to ensure both human safety and animal care.

Stressors of weaning, transportation, processing and handling can significantly impact an animal's exposure and susceptibility to diseases, especially respiratory diseases, through the various stages of beef cattle production. Confinement anxiety and poor handling stresses cattle more than severe weather and a harsh environment, according to Dr. Tom Noffsinger, DVM and nationally recognized cattle handling expert. Decreasing stress during these management times with low-stress cattle handling can help reduce the interaction of these management stresses with psychological stressors, fear and flight. Cattle handled roughly in poorly designed facilities have significantly higher heart rates than quietly handled cattle in well-designed facilities. Research by Temple Grandin, nationally recognized animal behaviorist and handling expert, also demonstrated that cattle with elevated heart rates, as a result of psychological stressors from squeeze chute restraint, also had increased cortisol levels, suggesting disease prevention can be accomplished by minimizing both exposure to pathogens and stressors associated with managing cattle.

Behavioral indicators of stress are expressed by flight, vocalization, kicking, and struggling, while physiological indicators of stress are expressed by elevated levels of cortisol, beta endorphins, and heart rates. Bovine Respiratory Disease (BRD) causes significant economic losses to cattle producers as a result of mortality and decreased animal performance from the ranch to the packing plant. BRD is a complex disease caused by various pathogens, stressors, and the interactions of the two. There is evidence corticosteroid may indirectly inhibit pro-inflammatory responses necessary for the animal's immune system to develop a defense against BRD. Research has also demonstrated that vaccinations administered during immunosuppression due to elevated stress can reduce vaccine efficacy and immune development against viral and bacterial pathogen's responsible for diseases. To help minimize the incidences of BRD and other diseases that cause decreased cattle performance, producers and cattle caretakers should take care to manage pathogen exposure, environmental stressors and psychological stress through vaccination, bio-security, genetics, nutrition, and low-stress cattle handling.

Low-stress cattle handling involves implementation of equipment design and cattle caregiver's handling techniques to reduce and eliminate the amount of stress cattle experience during managed care, processing and transportation. To adequately develop facilities and develop low-stress cattle handling techniques, handlers must first understand basic cattle behavior. All individuals responsible for cattle care and handling should be trained in natural cattle behavior, handling movement techniques and be able to recognize signs of distress or behavior that could result in injury or additional stress to the animals.

Cattle Natural Behavior

Cattle are herd animals and prey animals that can become very stressed when they are isolated from the herd. The ultimate survival mechanism for a prey animal is to conceal weakness or sickness when confronted by a predator. According to Dr. Tom Noffsinger, when cattle view a handler as a predator, rather than a leader, the cattle are not likely to express their true state of health, and will hide sickness until it is in advanced stages and difficult to treat or has caused significant decrease in animal/herd performance. Cattle have a wide angle of vision and can become frightened by lighting shadows or moving distractions. Cattle are very sensitive to high frequency noises and can become very agitated by loud and unfamiliar noises. Cattle that are routinely worked in a calm manner will typically have a smaller flight zone than animals that have had aversive treatment. Cattle can learn to associate specific sights and sounds with both positive and negative experiences.

Facility Design:
Low-stress cattle handling techniques should be used when handling and managing cattle at all times, despite the quality of the facility. However, there are handling facilities that work better than others. Handling facilities should utilize cattle's natural behavior to minimize stress. Cattle will hesitate at flooring changes or lighting differences during movement in corrals and other cattle handling facilities. Animals can also become excited when their footing is unstable and they start slipping. Facilities should be designed to have no-slip floors or adequate bedding applied to crowding pens to provide proper footing for the animals. Lighting changes or shadows should be minimized in animal handling and loading facilities. Shadows will cause cattle to balk. Cattle will typically move from dim lighting to more brightly lighted areas, however, caution should be taken to ensure light does not glare into the animals' eyes. The facilities should also be checked regularly to make sure that there are no objects, such as tarps, coats, sorting flags, etc., that can cause flapping movement that may also cause cattle to balk. Facilities should be regularly maintained and cleaned to help minimize stresses related to injuries or exposure to environmental (mud) and pathogen stressors.

Genetics:
An animal's genetics can influence an animal's temperament and its ability to respond to handling stressors. There is a direct relation to stress stimuli and disease susceptibility. Therefore, an effort to reduce psychological and environmental stressors, in addition to decreasing pathogen exposure will aid in disease prevention. Research by Temple Grandin shows that cattle with poor temperament, or that are easily excitable, have a more difficult time adapting to repeated non-painful handling procedures than cattle with calm temperaments. Management decisions about culling and bull selection should consider an animal's temperament to help decrease potential injuries and stressors for both cattle and handlers.

Noises:
Strange, loud, or new sounds are strong stressors, as prey animals often associate them with danger. Noise can cause both behavioral and physiological reactions to stress and make them even more difficult to handle. Animals will adapt to a reasonable amount of continuous noise or human voices. Handlers should not elevate their voices to yelling or shouting as it can be as stressful to cattle as an electric prod. To decrease stress while handling and managing cattle, care should be taken to avoid loud or new noises.

Flight Zone/Movement:
The flight zone of an animal is an animal's comfort area, figure 1. When someone or an animal enters an animal's flight zone the animal will move away from the pressure. Flight zone of an animal vary depending upon temperament and previous experiences. Understanding an animal's flight zone and point of balance can help reduce stress when handling cattle. To get cattle to move calmly in a desired directions, handlers should work on the edge of the flight zone and in reference to the animal's point of balance, the point of the shoulder or the globe of the eye. Handlers should always walk where cattle can see them. Cattle cannot see directly behind them because of their sight; handlers should avoid being directly behind cattle because animals will turn and look preventing forward motion. To get an animal to move forward, the handler should move behind the point of balance. To get the animal to back up or turn around, the handler should approach in front of the point of balance. To cease cattle movement, the handler should ease pressure by retreating from the animal's flight zone.

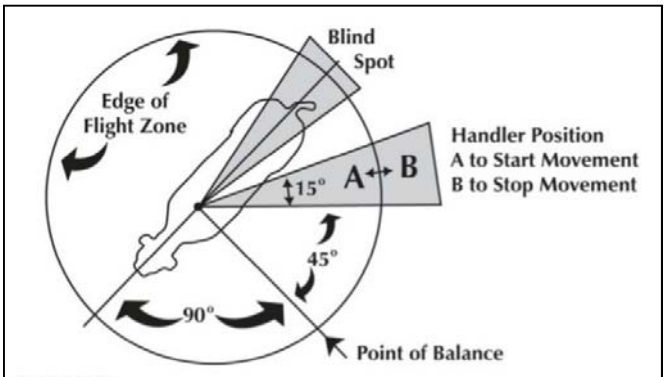

Figure 1 . Flight zone. From Beef Quality Assurance On-Farm Training Manual, page 6.

Moving Animal Aids:
Handlers can move animals with minimal to no equipment aids if the cattle have been handled calmly in the past and if the facilities are designed to use their natural behaviors. Nonelectrical moving aids, such as paddles, flags, and sorting sticks with visual stimuli (plastic bag or plastic ribbons) can be used as an aid with natural cattle behavior to move cattle. Care should be made to use aids calmly with small deliberate movement, so not to agitate or stress animals with the aid. Do not wildly wave the moving aid. Research by Grandin demonstrated that most cattle at meat packing plants could be moved through the plant's facilities without the use of electric prods. Electric prod's should not be a person's primary moving aid, rather only used

when absolutely necessary to move a stubborn animal. If situations arise where animals are continuously balking, evaluate why an animal refuses to move rather than using an electric prod as a primary moving aid.

Memory

Cattle learn quickly and act accordingly to past handling experiences. Cattle that have frequent positive handling interactions are less stressed by handling and restraint than animals that have had little people interaction. It is important to implement low-stress cattle handling techniques early in the calf's life, as it will impact how they will respond to psychological stressors later in life. Cattle that are mishandled or have a negative experience will associate handling or the management process with fear and resist handling or facility in the future. Raising calmer cattle requires cattle handlers to walk quietly among animals and teaching them to follow a lead handler or horseperson.

Implementing low-stress cattle handling techniques and proper facility design, along with other disease prevention management tools, can help aid in the animal's immune defense against bacterial and viral pathogens and minimize the incidences of BRD other diseases in the herd.

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—submitted by Sarah M. Smith, WSU Extension Regional Specialist.

SMALL RUMINANT FOOT HEALTH PROTOCOL

Attribution

This article is adapted from one developed by Richard Brzozowski and Drs. Charles Parker, Tom Settlemire and Anne Lichtenwalner for the University of Maine's Small Ruminant Foot Health research and educational outreach program. The protocol shared below was developed for sheep flocks enrolled in a research study, but there is no reason to think it would not also be effective in goats. More information about this program is available at http://umaine.edu/sheep and http://sheepandgoat.com/recordings.html#foothealth.

The Disease

Foot rot is a significant and ongoing concern for sheep and goat owners. Indeed, the USDA Animal Health and Inspection Service's National Animal Health Monitoring System Sheep 2001 survey reported 34.9% of responding operations had suspected or confirmed foot rot in the previous three years.[1]

This disease is caused by the interaction of two different types of bacteria; both must be present for foot rot to affect an animal. *Fusobacterium necrophorum* is found throughout livestock environments and is the precursor needed for the damaging effects of the less common *Dichelobacter nodosus. D. nodosus* is not present in all environments. It is spread between animals and premises through carrier animals; it can only live about two weeks in the environment without a host hoof. It produces a hoof-dissolving enzyme and is responsible for the pain, lameness, hoof deformation and smell associated with contagious foot rot (Photo 1). Factors affecting individual animals' risk of contracting foot rot include the strain of *D. nodosus* present on a premise, breed, genetic predisposition, foot health, history of hoof trimming, mineral supplementation program and environmental factors such as mud and rough terrain.

Foot rot affects the health, welfare, performance and longevity of individuals and increases livestock owners' labor and treatment costs. Buyers must always be cautious about bringing this disease into a herd and onto a property through animal purchases.

Protocol to Eliminate Foot Rot

The Foot Health Protocol spans four weeks. It is essential to abide by this timeframe and the recommendations made for each week so lateral transmission of infection between herdmates is prevented. As a result of following the protocol

described below, small ruminant producers will develop a "foot healthy flock". Strong commitment to the time and work involved is needed or the program will fail. To achieve a foot healthy flock/herd, all animals in the flock/herd must be included in the protocol. These efforts will create a healthier flock with more value for meat sales and/or breeding stock.

Skill in proper foot trimming, foot health scoring and recognizing foot infections and foot structures associated with carrier animals are needed by those who will carry out this protocol.

To investigate the genetic predisposition of animals to foot rot, a farm should have sire/dam information for all breeding animals recorded and available for at least two generations. These records may become very valuable when breeding and culling decisions are made.

Day 0 (first day)
All animals in the flock/herd must be included in the project. The farm will need a facility where the flock can be confined with panels, gates, working chute, etc. that will allow individual animals to be caught, examined, scored and trimmed. Recommended tools include hoof trimming shears and a foot knife. All tools should be cleaned and disinfected before use and between animals.

As each animal is trimmed, each hoof should be scored to indicate a healthy foot, a foot that is infected or one that has structural abnormalities; record this data for each animal. Also note hoof color (black or white). Accurate records are crucial to the success of this four-week protocol.

SCORING FEET

A. Score	Description
1	No sign of infection
2	Inflammation of foot skin, possible odor
3	Odor, undermining/separation, lameness
4	Excessive undermining, two or more feet infected, odor
5	Chronic carrier

B. Structure: normal, pockets, other abnormal growth

C. Hoof color: white, mottled, black, brown or gray.

Each individual should then be placed in a footbath containing a 10% zinc sulfate solution (8.5# of zinc sulfate in 10 gallons of water + one cup of detergent). Use old wool in the bottom of the footbath to create a soaked pad to reduce splashing and loss of zinc sulfate solution. Make each animal stay in the bath for three to five minutes, ensuring that all four feet are treated the entire time.

After footbath treatment, separate animals into either the healthy/infection-free group or the affected/recovery group based on pre-footbath trimming and scoring. Both groups need to dry their feet on a well-bedded area or dry hard surface such as a clean concrete slab or wooden floor for at least 30 min. Animals in the affected group might be candidates for culling, even on Day 0. Mark each animal in both groups with a color-coded mark and separate the two groups from here on out.

After drying, move each group to separate areas where small ruminants have not been for at least two weeks, the length of time the foot rot bacteria can live without contact with the host.

DAY 7
Send each animal through the footbath and drying protocol again as described above; send the healthy group through the footbath first. Examine all animals for limping or evidence of infection. If problems are found in the healthy group, trim feet as needed and move problem animals to the affected group or cull. Again, keep meticulous records on each individual.

DAY 14
Confine all animals and score each hoof; record results. Check and trim hooves as needed. Animals in the affected group that have healed and show no signs of infection or foot abnormality can be moved to healthy group. Any individuals in the healthy group that show any infection or suspicious feet should be moved to the affected group. Run all animals through the footbath and drying protocol described above, healthy group first. Keep the two groups separated from each other; move to separate pastures or areas where no sheep/goats have been for at least two weeks.

DAY 21
Run all animals through the footbath and drying protocol described above. Examine all animals; limpers in the healthy group should be examined, feet trimmed, moved to the affected group or culled. Record all observations.

DAY 28

Inspect all animals; score each hoof, record scores and treat all animals with the zinc footbath/dry area protocol described above. At the end of four weeks, the combination of proper trimming, zinc sulfate treatment and use of clean pastures will have allowed time for all except carriers to heal. All animals that have not healed and animals classified as carriers should be culled at this time. *The culling step is crucial to creating and maintaining a flock free of foot rot*.

Photo 1. Score 4 foot. From AS-596-W, Footrot in Sheep and Goats, from Purdue Extension, p. 2

Maintenance of Foot Baths

A poorly-maintained foot bath will probably spread more disease than it prevents. Organic matter such as mud, bedding and manure inactivates the pathogen-fighting chemicals in a foot bath. The frequency a bath needs to be changed will depend on how rapidly it gets contaminated with debris. If animals' feet are clean or cleaned before they enter the bath, that will prolong the active life of the bath's ingredients. Contact your hazardous waste hauler or waste transfer station regarding disposal of used foot bath contents.

Biosecurity

Every farm should have a written biosecurity plan. The plan should identify procedures to protect the flock from diseases such as hoof rot that may be brought onto the farm. The plan should describe how and if new animals will be introduced to the flock, vaccination plans, visitor access, wildlife issues, equipment use and sanitation, disinfection protocols and more. After using this protocol to eliminate foot rot from your flock or herd, it would be a tragedy to re-introduce it through a slip in biosecurity.

References and Resources

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Foot Rot or Scald: Which Is It? Dr. William P. Shulaw. http://Sheep.Osu.Edu/2008/06/20/Foot-Rot-Or-Scald-Which-Is-It/

Foot Baths—Key Points. http://nyschap.vet.cornell.edu/module/foothealth/section1/zinpro%20foot%20bath.pdf

Biosecurity on the Farm. David Snively, WVU Extension Service www.wvu.edu/~agexten/Biosecure/Farm.pdf

Sheep 201 Resources www.sheep101.info/201/hoofcare.html

Footrot in Sheep and Goats www.extension.purdue.edu/extmedia/AS/AS-596-footrot.pdf

—submitted by Dr. Susan Kerr, DVM, WSU Klickitat County Extension Director

FLY CONTROL NEWS TO MOO ABOUT

In a recent producer survey conducted in Washington State, 70% of responding dairy farmers reported a problem with too many flies. Whereas adult flies are quite apparent, especially as they build up numbers during the summer, it is not as obvious where the immature flies, called maggots or larvae, may be found. Each adult female house fly can produce up to 500 maggots, likewise, each female stable fly, up to 1,000 maggots, depending on temperature and moisture. So if you're estimating the number of flies gadding about, keep in mind that there are 500 to 1,000 times as many maggots dwelling nearby in what I refer to as the "Dairy Underground." Dairy managers report that their fly problems are most severe in and around the calf hutches. The "Dairy Underground" refers to the bedding in calf housing which gets mixed with urine, manure, spilled milk and grain, and water, creating an environment rich in organic matter and bacteria, an ideal situation for filth flies to thrive and increase in number (Photo 1). While house flies can be quite annoying to animals, dairy workers, and the neighbors, their potential to transfer human and animal pathogens and contaminate equipment, structures, and animals is considerably more important than the nuisance factor. Stable flies, also known

Photo 1 . "Dairy Underground"

Photo 2. Flies can transport pathogens to other animals.

as biting house flies, are also capable of transporting pathogens throughout the dairy, but principally, it is their biting/bloodsucking activity that directly results in reduced milk production and consequent economic loss.

Typically, fly populations on the dairy are reduced through sanitation and manure management (e.g., removal and spreading of bedding and manure, composting, cleaning feed alleys). When sanitation measures fail to lessen fly numbers to an acceptable level, insecticide applications to animal quarters become necessary to knock down fly populations. Many dairy or organophosphate sprays and different types of insecticidal scatter baits. Some Yakima Valley dairy managers have been fairly successful with managing flies in calf hutches by employing tiny wasps that parasitize both stable fly and house fly pupae. One of the drawbacks with these wasp parasites is that they must be released on a weekly basis at rates of up to 1,000 wasps, costing at least $1.30 per calf per week. During a long, hot summer on a large operation, the costs for these parasite releases can reach economically prohibitive levels. No one method of control will work in all situations; an integrated pest management (IPM) approach to reduction of fly populations is recommended.

In 2012, we received funding from the Washington Dairy Products Commission to work on making the "Dairy Underground" less hospitable to fly development through the application of treatments under or over the bedding. During the summer of 2012, we tested seven different calf bedding treatments in small-scale laboratory experiments and determined that sodium bisulfate (commercially available as Parlor Pal®) showed the greatest potential for fly reduction. This product is already labeled for use on dairies for footbaths, pH reduction, and ammonia and odor control but not for fly control.

In addition, small-scale on-dairy trials with sodium bisulfate were accomplished on commercial dairies during August and September 2012. Because calf housing and fly management practices varied with dairy (Table 1), each dairy was treated as a separate experiment. At four dairies, prior to calf introduction, the ground floors of individual or compound hutches were treated with a specified amount of sodium bisulfate: three hutches with a low label rate, three hutches with a high label rate, and three hutches left untreated. Bedding (straw or wood chips) was laid over the treatment. A low rate of sodium bisulfate was re-applied over the bedding in treated hutches at weekly intervals. Bedding samples (from the "Dairy Underground") were collected and processed weekly for six weeks. Counts of fly larvae as well as temperature, pH, and moisture readings were recorded for each bedding sample. Trials were repeated in early September at two of the cooperating dairies.

Dairy	Calf housing	Fly management	Sodium bisulfate treatment	% reduction
Outlook, Trial 1	Poly Square + pen; wood chips bedding; no lime	Scatter bait	Low rate High rate	93 85
Outlook, Trial 2	Poly Square + pen; wood chips bedding; no lime	Scatter bait	Low rate High rate	54 47
Granger1, Trial 1	Poly Square + pen; straw bedding; lime	None	Low rate High rate	Did not reduce 46
Granger1, Trial 2	Poly Square + pen; straw bedding; lime	None	Low rate High rate	37 15
Granger2	Wooden compound that houses three; straw bedding; lime	Wasp parasites, scatter bait	Low rate High rate	55 72
Sunnyside	Wooden compound that houses two; straw bedding; lime	Scatter bait	Low rate High rate	Did not reduce 52

Table 1. Percent reduction of fly larvae (relative to untreated hutch counts) as a result of sodium bisulfate treatments, Yakima County, 2012. All dairies practiced standard sanitation/manure management.

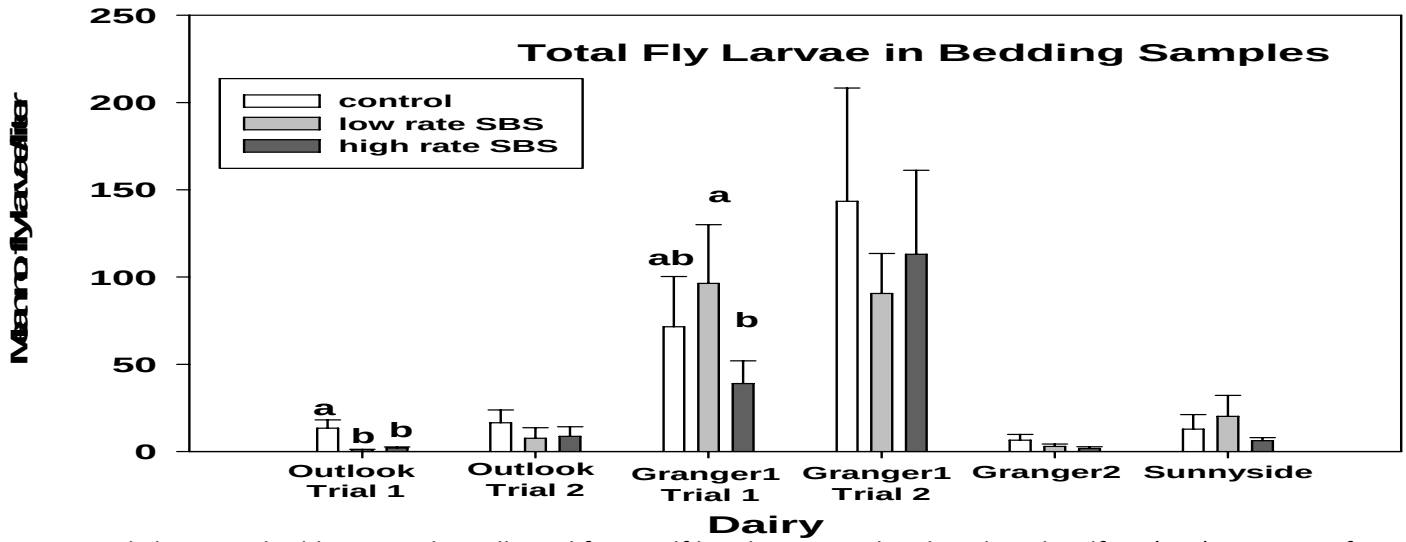

Figure 1. Fly larvae in bedding samples collected from calf hutches treated with sodium bisulfate (SBS), summer of 2012. Within dairy, means with the same letter or no letter above the bar are not significantly different (SAS Institute, 2010, PROC GENMOD using negative binomial distribution with log link, α = 0.05).

The greatest reduction of fly larvae due to sodium bisulfate treatment was seen at the Outlook dairy which used wood chips/sawdust bedding instead of straw (Table 1). The lowest reductive effect was seen at the Granger1 dairy, which had large, unchecked fly populations during the experimental period that could not be controlled by a simple manipulation of the bedding environment. Figure 1 shows the mean relative abundance of fly larvae at the cooperating dairies during the experimental period. While wasp parasite releases at the Granger2 dairy effectively managed fly populations at that dairy (Figure 1), sodium bisulfate treatment reduced the fly numbers even further (Table 1). The reductive effect of sodium bisulfate was statistically significant at the Outlook dairy and the Granger1 dairy for the first trials (Figure 1).

It is believed that flies are reduced via a reduction in pH brought about by the acidifying sodium bisulfate. The bacteria that are required for fly well-being cannot grow in acidic conditions. Correlation analysis revealed that pH and larval counts were positively correlated (rho = 0.3379, $P < 0.0001$, SAS Institute, 2010). This meant that samples with low larval counts had lower pH readings (more acidic) compared with samples with greater larval counts which tended to have higher pH readings (more basic).

That's the good news from the "Dairy Underground". In 2013, we plan to expand the on-dairy studies to involve more calf hutches and more intensive sampling. There will be an added focus on how the type of bedding influences the growth of fly populations on the dairy.

For more information:
Sodium bisulfate study: http://animalscience.ucdavis.edu/faculty/mitloehner/publications/calvo,%20michelle.pdf
House fly biology: http://entnemdept.ufl.edu/Creatures/urban/flies/house_fly.htm
Stable fly study in CA: http://ucce.ucdavis.edu/files/repositoryfiles/ca4203p20-68772.pdf
Stable fly biology: http://www.ag.ndsu.nodak.edu/aginfo/entomology/entupdates/Indoor_pest/stable_fly.htm
-Submitted by Holly Ferguson, PhD, WSU-Prosser

VACCINATION USE TO REDUCE BRD IN COW/CALF OPERATIONS

Bovine respiratory disease complex (BRD) is the most economically-damaging disease of beef cattle in North America. There are many risk factors that contribute to increased incidence of BRD in cattle such as shipping stress, high stocking density, and malnutrition. There are measures that can be taken to reduce the incidence of BRD. One measure is the use of BRD vaccines. There is evidence that vaccines can be effective in reducing the incidence of BRD; however, these vaccines need to be used appropriately to be effective. The cost of vaccinating cattle can be considerable so it is important to implement strategies to make vaccine programs as effective as possible.

When planning a vaccine program for cattle, there are a few important things to know about vaccines to get the most value: type of vaccine best suited to an operation, when to give vaccines and how to handle vaccines.

An effective vaccination program can help reduce the incidence of BRD in cow/calf operations.

There are two main types of BRD vaccines, modified live vaccines (MLV) and killed vaccines. There are advantages and disadvantages to both types of vaccines. MLV are usually considered to have a longer duration and cause stronger and more complete immune responses in cattle. MLV can cause abortion in pregnant cattle if used inappropriately; they are also more fragile and easily inactivated by improper handling than killed vaccines. Killed vaccines are considered safe in pregnant animals but often require more frequent application than MLV to be effective. Read and follow the label instructions to prevent problems, reduce the risk of vaccine failure and get the most benefit from a vaccine.

The timing of cattle vaccinations can be very important. Calves vaccinated before six months of age may not respond to vaccines well enough to gain full effect. The type of vaccine to be used may affect the time of year or time of the breeding cycle to administer a vaccine. Discuss your vaccine schedule with your veterinarian.

Appropriate handling of vaccines is very important. Vaccines should be kept cool until used; follow label instructions closely to avoid inactivation of vaccine effectiveness. MLVs should not be re-constituted until right before use and should be kept in a cold dark area such as a cooler or ice chest during use.

The cost of vaccines and vaccinating cattle can be considerable, and vaccines are only effective if used correctly. Thus, it makes sense to spend time to create and effective herd vaccination plan. Include veterinarians, herd managers and workers directly involved with the application of these vaccines when making a plan. Address which type of vaccine to use, when to give vaccines to specific animals, and how to appropriately handle and give vaccines to get the most benefit from them.

-Submitted by Dr. Andrew J. Allen, WSU Veterinary Extension and Don Llewellyn, WSU-Benton/Franklin Area Livestock Specialist

HORSE HOOF CARE THROUGH THE SEASONS

Most conscientious horse owners have heard the proverb *"no hoof, no horse"* and it is as true today as it was the first time it was said. Being conscientious means pay attention to detail and making seasonal adjustments to horse care, feeding and management, including hoof care. Barring major injuries or accidents, a horse that is in overall good health and condition should have healthy hooves and be able to perform at the owner's desired level. Neglecting hoof care can result in a lame horse or pony, which in severe cases can be irreversible. To begin with, horse owners should understand the form and function of the hoof parts. Horse owners should also be familiar with the idiosyncrasies of individual horses, such as; size of hoof, hoof hardness, thickness of hoof wall, sole shape, hoof travel pattern, impact of hoof/shoe wear and speed of hoof growth. These factors determine the frequency of trimming or shoeing and whether the horse grows more toe or heel or has balanced hoof growth.

Spring Hoof Care

With the onset of spring, many horses and ponies experience more rapid hoof growth and owners are riding more often than in the winter. This means horses need to be trimmed or shod every six to eight weeks, depending on hoof growth and wear pattern. Some owners, in consultation with their farriers, may decide a three-week interval is even better for the horse.

It is very important to clean hooves when grooming. Cleaning hooves on a regular basis provides the opportunity to examine hooves for bruises, chips, cracks, shoe fit, abscesses, foreign objects and thrush. Thrush is a bacterial disease that settles around the frog in a horse's hoof (Figure 1). Signs of thrush include repugnant odor, discharge, tenderness in the frog region and deformation of frog shape. Wet conditions make horses more susceptible to thrush.

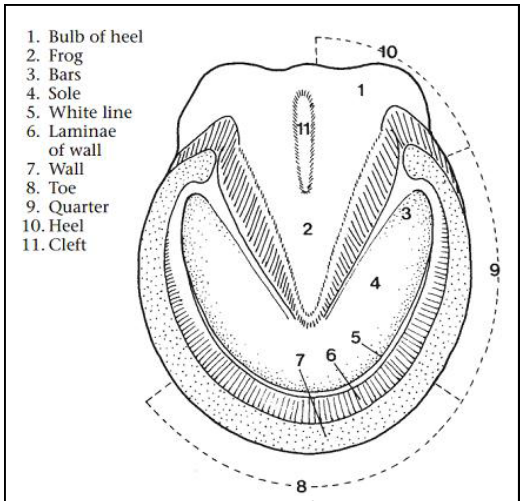

Figure 1. The equine hoof. From PNW587, The 4-H Horse Project.

Horse owners need to take caution in the spring when transitioning horses from hay to spring grass. Too much grass too quickly can cause laminitis/ founder in

horses and ponies. Early spring grass is high in sugar content and poses a founder risk to horses, particularly horses and ponies that are insulin resistant; sugars decline as grass matures. Laminitis and founder are two words that are often used interchangeably to describe the same hoof condition. According to Dr. Bryan Fraley, "founder" implies a more chronic condition where the horse's coffin bone has rotated and dropped in the hoof versus "laminitis" where the laminae which supports the coffin bone within the hoof capsule are inflamed. Whether the term is laminitis or founder, it is a complex metabolic condition that can cause significant chronic hoof pain, often limiting a horse's usefulness and quality of life.

When making feed adjustments for horses, make small adjustments slowly overtime. For instance, allow horses access to spring grass for fifteen minutes a day for three to five days and then increase to thirty minutes a day for three to five days and so on until they are on pasture for the desired time. Slowly transitioning horses onto grass will help reduce the likelihood of founder, but realize some horses are so prone to founder they must be kept on dry lots and fed hay with no access to grass.

Summer Hoof Care

Tips for summer hoof care include staying on a consistent trimming/shoeing schedule, cleaning feet frequently and applying hoof conditioner as need to prevent hooves from becoming dry and brittle. Cultivate a long-term relationship with a skilled, knowledgeable and dependable farrier. Because farriers are in great demand during the summer, schedule your appointments weeks in advance to guarantee they will be available when you need them.

Fall Hoof Care

As the riding season winds down in fall and winter, consider removing your horse's shoes if the condition warrants it. The benefits of this are twofold: it allows a horse's hooves to grow out and recover from the past six months of shoeing and it prevents snowballs from building up in a horse's shoes, which could cause a horse to slip and fall. Clean and examine horses' hooves on a regular basis, provide clean, dry places for them to stand when paddocks turn muddy and treat for thrush if it develops.

Winter Hoof Care

Winter hoof care is similar to fall hoof care. Regularly clean horses' hooves and check for signs of thrush. If it is present, treat with a commercial thrush treatment product by reading and following label instructions. Provide a clean dry area for your horse to stand, eat and lie on. Rubber mats in strategic locations or piles of wood chips can also provide a clean dry place for your horse to stand out of the mud. If you have extreme mud conditions, consider improving drainage and adding other mud and manure management practices in the next dry season.

Conclusion

Following these tips for year around hoof care and horse management will help promote a healthy, sound horse, bringing you many happy hours with your equine companion.

References

Dr. Bryan Fraley, "Founder vs. Laminitis", *Horse.com*, March 19, 2013.

The 4-H Horse Project, PNW587.

By Janet Schmidt, WSU-Whitman Co. Extension Director and Dr. Susan Kerr, DVM, WSU Klickitat County Extension Director

UPCOMING EVENTS

May 17-18, 2013 Beef, Pork, Lamb and Poultry 100, Stanwood-Camino Fairgrounds, Stanwood. Early Bird Registration due by April 23; $65/person or $100/couple Contact Sarah M. Smith, 509-754-2011, Ext. 413 or smithsm@wsu.edu for details.

June 21-22, 2013 Pork 300, WSU Campus, Pullman. Early Bird Registration due by May 15; $175/person. Contact Sarah M. Smith, 509-754-2011, Ext. 413 or smithsm@wsu.edu for details.

July 19-20, 2013 Northwest Junior Sheep Exposition, Grant County Fairgrounds, Moses Lake. Entries Due by May 1 for Market Lambs and other classes by June 15. Contact Sarah M. Smith, 509-754-2011, Ext. 413 or smithsm@wsu.edu for details.

Newsletter edited by Sarah M. Smith, WSU Regional Extension Specialist