

## WSU BVD Project Funded

The **BVD Control and Eradication Project** is a joint effort of WSU Extension, Veterinary Clinical Sciences, Animal Sciences and the Washington Animal Disease Diagnostic Lab (WADDL) funded through WSU Extension's Issue-focused Teams Initiative. Working with herd veterinarians, the program will facilitate implementation of infectious disease control Best Management Practices and subsidized herd testing for BVDV persistently infected animals to control and ultimately eradicate BVDV from Washington's cow-calf herds.

The project focuses on ranch assessment, subsidized testing for BVD-Persistently Infected cattle, and practices to prevent disease transmission.

**Herds should enroll and be tested before their next breeding season! For more information contact: Dr. John Wenz (509)335-0773**

Email- [BVDCEP@vetmed.wsu.edu](mailto:BVDCEP@vetmed.wsu.edu) or go online: [www.vetmed.wsu.edu/BVDCEP](http://www.vetmed.wsu.edu/BVDCEP)



## Featured Faculty -- Dr. Steve Parrish



Dr. Steve Parrish, Diplomate ACVIM, is a Professor of Large Animal Internal Medicine at the College of Veterinary Medicine at WSU. He spends most of his time in Ag Animal Health clinics providing services via the VTH and to University herds and flocks. Dr. Parrish also provides telephone consultation to veterinarians and producers and does some continuing education programs for veterinarians and producer groups. He most recently has focused on small ruminants. [smp@vetmed.wsu.edu](mailto:smp@vetmed.wsu.edu)



## Sheep Feet

*By: Steve Parrish, DVM*

At any given time up to 80% of sheep flocks have some sheep that are lame with most lameness being associated with lesions of a single or multiple feet. Lameness in sheep is from many causes and the list of differential diagnoses is substantial. Lameness not only inhibits the ability of an individual sheep to move around normally and prosper in its environment, affected sheep often become debilitated or subsequently develop diseases that could be life threatening. During the wet months of the year, it is common for several particularly devastating infectious forms of foot lesions to develop in sheep. Ewes that are pregnant may develop life threatening metabolic diseases such as pregnancy toxemia or hypocalcemia as a direct

result of the lameness and decreased nutritional intake. Such conditions can be devastating to the producer's program and economic stability.



A lame ewe may walk on her "knees".

At the first evidence of lameness in a flock, the producer should be aggressive in determining the cause and underlying risk factors involved in the lameness issue. The most important thing that a producer can do when approaching lameness issues in sheep is to attain an accurate diagnosis. It does not do any good to simply assume that foot rot is the only cause of lameness in sheep. And when one assumes that foot rot is present it is important to remember that only after a complete examination of all the sheep's feet can we come to an accurate diagnosis and a plan for addressing the lameness.

Probably the most confusing issue that surrounds lameness in sheep is an understanding of the common conditions that are associated with foot lameness in sheep. And the term "foot rot" is one of the most confusing. Basically there are two types of foot rot in sheep. Confusion regarding these two types is often related to multiple synonyms that are used to describe these two diseases. **True foot rot** (progressive foot rot, virulent foot rot) is characterized by usually affecting multiple feet in an individual with lesions starting in the interdigital space and quickly being associated with an undermining of the horn of heels, sole and hoof walls and an extremely foul odor. All ages of sheep can be infected and multiple feet are affected. Often both claws/cleats are involved on an individual foot. The disease is infectious and contagious and is associated with very specific strains of the causative bacteria (*Dichelobacter nodosus*) and outbreaks usually occur during the wet, warm seasons as the agent that causes the disease can only survive in the environment for less than 2 weeks. Carrier animals that are either actively infected or chronically are the source of infection for other sheep and of continuing problems in the flock. Secondary bacteria (*Fusobacterium necrophorum*) are present and are associated with much of the odor that is present. **Benign foot rot** (non-progressive foot rot, foot scald, ovine interdigital dermatitis) is associated with

lesions that are confined to the interdigital (between the toes) space with limited or no extension and undermining of the horn of the heel, sole or hoof walls. Multiple feet can be involved. Less virulent strains of *Dichelobacter nodosus* are associated with benign foot rot. Benign foot rot in a flock is often associated secondarily with heel and toe abscesses particularly in heavy or pregnant ewes. As with true foot rot, wet and warm conditions under foot are usually present during outbreaks of the disease in sheep flocks. Unfortunately these conditions often occur in late winter and early spring when ewes are heavy and in late pregnancy. Lameness precludes normal mobility and eating, often leading to secondary metabolic issues such as pregnancy toxemia or hypocalcemia.



### What's New at WADDL?

#### Development of New Johne's Disease Test Using Fecal PCR

Johne's disease is an infectious enteritis of cattle, sheep and goats caused by infection with *Mycobacterium paratuberculosis* (MAP). The disease, also known as paratuberculosis, is most prevalent and economically important in cattle resulting in losses due to chronic diarrhea and progressive emaciation. Transmission occurs primarily by ingestion fecal-contaminated feed or water. Youngstock are most susceptible to infection but the incubation time (time between initial infection and clinical disease) is usually over 2 years making disease control and diagnosis a challenge. Infected animals can shed MAP for 15-18 months before showing signs of disease so identification and removal of pre-clinical animals is essential to reducing infection rates in a herd.

Several diagnostic tests are available for detection of MAP infection and consensus guidelines for choosing and using paratuberculosis diagnostic testing were published in 2006 by the National Johne's Working Group and Johne's Disease Committee of the United States Animal Health Association (Collins et al). The publication highlights the strengths and weaknesses of the various paratuberculosis diagnostic tests, which are outlined in Table 1. It is evident that the best diagnostic tests for Johne's disease, those giving the fewest false positive and false negative results, are intestinal biopsy and necropsy, which are the most expensive to obtain and least practical for large scale disease surveillance. The diagnostic tests for live animal, large scale testing (fecal culture, fecal PCR, and

ELISA on blood serum or milk) have very poor sensitivity (false negative result rates) because of the tests themselves and the disease biology (long “silent phase” during incubation).

Although bacterial culture has the highest test sensitivity (60%), MAP is extremely slow-growing, requiring up to 16 weeks for culture. The lengthy delay for culture results leads to months of bacterial shedding by positive animals and disease spread to the rest of the herd. Serology by ELISA can be a valuable herd screening tool, but lacks sensitivity during the early pre-clinical disease stage. Thus the consensus guidelines make recommendations to choose a paratuberculosis test to fit the purpose of the testing. For example, to confirm a clinical diagnosis in a herd without prior Johne’s disease confirmation, necropsy or biopsy would be optimal because these tests are most accurate. Conversely, to control disease in a herd with known high prevalence, whole herd ELISA on serum or milk would be practical and adequate to remove the highest shedders from the herd. Surveillance to classify herds of unknown Johne’s disease status as infected or not infected would optimally use fecal culture or fecal PCR. Although the previously published sensitivity of fecal PCR (30%) is lower than fecal culture (60%) technological advances in processing fecal samples for PCR have been published in the past year. At the annual meeting of the American Association of Veterinary Laboratory Diagnosticians in Fall 2007, two companies presented data showing equal performance of fecal bacterial culture and fecal PCR for detecting cattle infected with MAP. Since the test turnaround time for fecal PCR would be days while the test turnaround time for fecal culture is months, this provides an exciting opportunity to provide a new tool for producers to help control Johne’s disease.

The *Washington Animal Disease Diagnostic Laboratory* is currently evaluating a fecal PCR test in order to provide rapid turn-around for Johne’s testing. To date, this direct PCR from fecal samples has passed 4 check tests provided by the National Veterinary Services Laboratory. A fifth check test is expected soon. In addition, field testing in collaboration with the Washington State Department of Agriculture has been performed on limited samples. Based on the early data, the fecal PCR assay has near 100% agreement when compared to fecal culture. WADDL expects to finish “in house” validation of the Johne’s direct fecal PCR and offer it as a routine diagnostic test in Spring 2008. Turn around time for results should average 3 working days, which would be a great improvement over the months currently required for fecal culture.

By: Fred R. Rurangirwa, BVSc, MS, PhD, Molecular Diagnostics and Tim Baszler, DVM, PhD, Director

[http://www.vetmed.wsu.edu/depts\\_waddl/](http://www.vetmed.wsu.edu/depts_waddl/)

## References

Collins MT, Gardner IA, Garry FB, Roussel AJ, and Wells SJ: Consensus recommendations on diagnostic testing for the detection of paratuberculosis in cattle in the United States. *Journal of the American Veterinary Medical Association* 229: 1912-1919, 2006

**Table 1. Assumptions of test sensitivity and specificity used when selecting the best test for detection of paratuberculosis in cattle. (From Collins et al, 2006)**

Test	Sensitivity	Specificity
Bacterial culture of fecal samples from individual cattle	60% +/- 5%	99.9% +/- 0.1%
PCR assay of fecal samples from individual cattle	30% +/- 5%	99.5% +/- 0.5%
ELISA on serum or milk	30% +/- 5%	99% +/- 1%
Intestinal biopsy	90% +/- 5%	100%
Necropsy	100%	100%

Sensitivity = Ability of test to correctly identify known positive animal. Amount below 100% is false negative rate of the test.

Specificity = Ability of test to correctly identify known negative animal. Amount below 100% is false positive rate of the test.

## Research Notes

### Targeted Therapy vs. blanket Treatment for neonatal calves: Are all those antibiotics working for us?

In a recent clinical trial, we were able to demonstrate that targeted antibiotic therapy, based on lack of appetite for milk and the presence of a fever (>103F), using a defined treatment protocol, resulted in greater weight gain, lower overall morbidity and lower costs without impacting mortality in pre-weaned calves.

Calves receiving the conventional antibiotic treatment had 2 times the diarrhea days compared to calves receiving the targeted treatment. Calves receiving antibiotics in the milk the first 14 days had 1.3 times as much diarrhea as calves not receiving antibiotics in the milk. The direct medication cost for the conventional therapy with antibiotics in the milk was \$16.50 per calf, whereas the targeted therapy with no antibiotics in the milk was \$1.50 per calf.

By: Cat Berge, DVM, MPVM, PhD

### The Case of the Thin Calves

This story starts in December when the nights were long and cold and the calves were snuggling in the bedding of their hutches. I was called out to visit a dairy to investigate why many



calves appeared thin between 2 to 3 weeks of age while older pre-weaned calves appeared to look normal.

The feeding program for hutch calves consisted of 2 quarts of a 20:20 milk replacer fed twice daily in buckets for the first week of life. From 7-42 days, the calves were to receive 3 quarts of the same replacer twice daily. After that, the calves got 3 quarts in the morning for three days and then no milk replacer for the remaining time in the hutch (until about 65 days of age). During warmer months, the mix is 1.1 pounds per calf per day. During the winter, the mix is 1.3 pounds of powder per calf per day. The calf feeder mixes the milk replacer according to a mixing sheet and carefully measures the amount of powder that is needed. The milk appeared to be warm when offered to the last calf. *The preferred feeding temperature is 100-105°F.*



(Photo by ACB Berge 2007)

I suspected that there might be some variation in the amount of nutrients young calves get from the milk replacer feedings. First, in mixing, although the amount of powder to be mixed is carefully measured, I could not see how the amount of hot water was determined. There could be variation in concentration of the mix.

Second, when I asked how the amount of milk to be placed in each bucket is determined, the feeder pointed to a level on an unmarked white bucket for the 2 quart amount. I poured water to that level and then poured amount into a 2-quart bottle. The actual volume was about 2/3rds of a bottle, less than 2 quarts. Although, on average, the group of milk replacer-fed calves might be getting the calories because of the total volume of replacer that is mixed, some calves were getting more and some were getting less, leading to more variation in weight gain.

Third, I ran milk replacer and grower grain specifications through the NRC program for dairy cattle nutrient requirements for several ages of calves, based on complete compliance with the feeding protocol. These analyses assume that the milk replacer is based primarily on milk-derived constituents.

*First week of life in Winter* – In winter, the feeding protocol is to provide 2 quarts of milk replacer twice daily at 1.3 lbs of powder per day. An 85 lb calf will be limited by energy at 29°F to about 0.75 lbs of growth. *Third week of life in Winter* – At 3 weeks of age (at 100 lbs) the 3 quarts of milk replacer (at 130% or 1.95 lbs total powder) and 0.25 lbs of starter could result in an ADG of 1.37 lbs, in theory. If the calf is larger or does not eat the grain, the gain would be lower.

One reason I think this 3-week age group is so critical is that they may not be eating much starter grain OR they may not be able to absorb all the nutrients from digestion of the starter grain. One Ohio State study had calves eating about 0.5 lbs of starter per day at 21 days. However, until the rumen lining develops enough to absorb nutrients from grain fermentation, the calf must live on milk replacer. *The rumen growth process takes a minimum of about three weeks. That's three weeks after a heifer starts eating a handful of grain daily and has access to water.*

This three-week time period can start at different times depending on milk replacer intake. In a New York trial, calves fed about 1.25 lbs of milk replacer powder daily did not begin regular starter grain intake until around 14 days. But this varied. Some calves started eating grain regularly at one week. Others didn't begin regular intake until nearly three weeks. At 1.9 lbs of milk replacer powder daily, significant grain intake didn't occur until 18 days, on average.

I observed the grain feeding and it appeared that the grain bucket was "topped off" with fresh grain but that no old grain was discarded. *One practice to get neonatal calves to start eating grain regularly is to provide at least a cupful of starter grain daily which is replaced with fresh grain daily.*

**Bottomline:** It is important to review your calf feeding protocols and compliance in different seasons to make sure they meet the nutrient needs of calves of all ages. The critical period of 2 - 3 weeks of age is when liquid feeding may not be enough to sustain calves if they are not eating sufficient grain. This is also the time when susceptibility to common diarrhea-causing agents is highest. Everyone knows that calves need more energy in the winter but developing a system that consistently meets this need is the challenge.

By: Dale Moore, DVM, MPVM, PhD

### FDIU Notes: The Case of the Blotchy Pigs



(Photo: <http://www.ipic.iastate.edu/topics.html> from National Institute for Agriculture)

**Erysipelas** was recently diagnosed in a 4-week old pig in Washington. Because this finding is relatively unusual, we thought it would be worth reviewing the disease.

**Cause:** The bacteria *Erysipelothrix rhusiopathiae*

**Source:** Apparently normal carrier pigs. The bacteria live in the tonsils of carriers and are shed in the feces. The bacteria can survive in soil and water contaminated with feces for up to a month.

**Signs of infection:** Pigs of all ages are susceptible. The first signs of an outbreak are dead pigs and pigs with high fevers (104 to 108°F). Lameness, fever, vomiting and diarrhea are also seen. Unfortunately, these signs are not specific to erysipelas. Fever, arthritis causing lameness and death are associated with spread of the bacteria throughout the body in the blood. The red diamond patches that are classic for the disease is most commonly seen in swine that are recovering from the whole body infection (septicemia). Chronic arthritis and lameness as well as heart lesions seen at slaughter may occur for weeks to months after a disease outbreak.

**Treatment:** If caught early, before (or shortly after) septicemia has occurred the disease is effectively treated with penicillin. However, the disease can progress rapidly and losses during an outbreak can be significant. Furthermore, mild chronic forms of the disease can result in significant long term losses associated with arthritis and lameness which reduces growth rate and increases carcass trim at slaughter. Therefore routine vaccination is recommended as 'insurance' against the risk of an outbreak.

**Vaccination:** Vaccination of sows and gilts should be performed a month prior to farrowing to provide colostral protection to pigs. Growing pigs should be vaccinated at 8-10 weeks of age. If pigs are vaccinated at 5-6 weeks of age the colostral antibodies may interfere. Remember if killed 'bacterins' are being used any animal being vaccinated for the first time needs to receive a second "booster" shot 2-3 weeks after the first shot. Thereafter a single shot is adequate to increase immunity. Consult with your veterinarian to determine the best vaccination protocol for your operation and conditions.

Finally, it is important to remember that Erysipelas is a zoonotic disease, meaning humans can become infected with the bacteria and potentially develop *erysipeloid* with is usually results in a cellulitis (inflammation under the skin).

By: John Wenz, DVM, MS -- FDIU



## **Ag Animal Health Continuing Education College of Veterinary Medicine Annual Conference for Veterinarians and Veterinary Technicians: March 28-30, 2008, Pullman WA**

### **Friday March 28: 1:00pm-5:00pm**

Reducing Protocol Drift: Working Effectively with Dairy Employees -- Dr. John Wenz, WSU

Using on-farm necropsies to your best advantage --

Dr. Dale Hancock, WSU

The Trojan Cow: Thoughts on Testing protocols for herd replacements -- Dr. Dale Moore, WSU

Fatty acids and bovine reproduction --

Dr. Rob Gilbert, Cornell

### **Saturday March 29: 8:30am-5:00pm**

Getting live calves: News on Stillbirths and Obstetrics

Dr. Rob Gilbert, Cornell

Current research on post-partum disease in dairy cattle

Dr. Rob Gilbert, Cornell

Influence of genetics on bovine reproduction

Dr. Rob Gilbert, Cornell

How do you know what you know? Evidence-based medicine

Dr. Bill Sischo, WSU

*(This is an interactive workshop for practitioners working with any species.)*

Contact [kseaman@vetmed.wsu.edu](mailto:kseaman@vetmed.wsu.edu)



### **Academy of Dairy Veterinary Consultants**

The Academy of Dairy Veterinary Consultants (ADVC) is a group of dairy veterinarians who meet twice a year to discuss current issues in dairy herd health and dairy performance. Founded in California in the early '80s, the group has expanded to practitioners primarily in the West but members come from states as far away as Massachusetts. The next meeting of the ADVC will be held in **Spokane, WA, April 25-26, 2008**. Dr. Ynte Schukken, Director of the Quality Milk Promotion Services, at Cornell University, will be the featured speaker.

For Membership and registration, contact Bill Sischo: <mailto:wmsischo@vetmed.wsu.edu> or (509) 335-7495 or Dale Moore: <mailto:damoore@vetmed.wsu.edu> (509) 335-7494.



(USDA Photo -- FMD Lesion)

### Foreign Animal Disease Practitioner Course

The Washington State Department of Agriculture, Animal Services Division is looking for veterinarians interested in participating in the Foreign Animal Disease Practitioner (FADP) course to be held in Ames, IA June 2-6, 2008. Travel expenses and a modest stipend are provided. The purpose of providing this training is to identify and train specific practitioners in each area of the state so they can help organize local responders and will be able assist WSDA field staff in case of an animal disease event. Participants are trained in recognizing and responding to foreign animal disease threats to our country. For more information, please contact Jodi Jones at the Washington State Department of Agriculture, no later than March 6, 2008. Jodi can be reached by phone at 360-902-1889 or by e-mail at <mailto:jjones@agr.wa.gov>.

### Producer Education Meetings:

#### Central Washington Beef Information Day

Ellensburg, WA – Washington State University Extension – Kittitas County is holding a Beef Information Day on February 19 from 9:30-4:00 at the Kittitas County Fairgrounds. Speakers include Edd Bracken, WA Dept of Fish & Wildlife range ecologist, on grazing management for rangeland health and wildlife habitat enhancement; Dr. Dale Moore, WSUE veterinary outreach specialist, on biosecurity practices for cow-calf operations and emerging animal health issues; Dr. Shannon Neibergs, WSUE livestock economist, on managing a cow herd for profit during down calf prices and high forage costs; Charles Cox, Pfizer Animal Health, on new developments in animal health technologies; Tip Hudson, WSUE rangeland & livestock management educator, on avoiding water quality pollutions and regulatory consequences on grazing lands and livestock confinement facilities. Thanks to event sponsors Trinity Farms, Pfizer Animal Health, and the Kittitas County Cattlemen's Association registration is free and includes a superb lunch by Rodeo City BBQ, but space is limited to the first 75 participants.

To register, contact Tip or Andrea at WSU Extension—Kittitas County (509-962-7507 or <mailto:HUDSONT@WSU.EDU> [amorse@wsu.edu](mailto:AMORSE@WSU.EDU)).

### Cascade Boer Goat Association presents our 3rd Annual April Fool's Boer Goat Weekend

April 5th and 6th. Skamania Co. fairgrounds in Stevenson, WA. Two ABGA shows on Saturday. Seminar classes for youth and adults on Sunday morning featuring Drs. Cary Heyward and Susan Kerr. CBGA's **Northwest Champion Market Goat Sale** on Sunday. There will be great goats to choose from for 4-H and FFA market projects. [Becki@CopperCreekboers.com](mailto:Becki@CopperCreekboers.com) or call at 503-631-3996



(UMassmeatgoat.com)

**2008 WA State Sheep Producers (WSSP) Convention** is going to be hosted by the Whitman County sheep producers in Pullman, October 31 – November 2, 2008.

<http://www.wssp.org/index.htm>

### Web Resource for Dairy Information

DAIReXNET is a national, extension-driven web resource designed to meet the educational and decision-making needs of dairy producers, allied industry partners, extension educators and consumers.

- Answers to frequently asked questions (FAQ's) and user-submitted queries on various aspects of dairy cattle production.

- Ask the Expert—Users ask dairy professionals questions when answers are not available in the FAQ's or resource material.

- Current in-depth, peer-reviewed articles covering various topics in dairy production.

- State and regional dairy newsletters, the latest news releases and highlighted news stories from across the country.

[http://www.extension.org/pages/What\\_is\\_DAIReXNET%3F](http://www.extension.org/pages/What_is_DAIReXNET%3F)

Send Newsletter comments to:

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