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In This Issue

From the Editor–Dale A. Moore	1
Decrease in Sales of Antibiotics	1
Antibiotics, Animal Care, Food Animals	2
Dairy: Impacts on Average Daily Gain Calves	3
Dairy: Do Pest Birds Affect Cow Wel–being?	4
Beef: Fat Soluble Vitamins Requirements	6
Beef: Minimizing Weak Calf Syndrome	7
Swine: Update on African Swine Fever	8
Sheep: Sheep Care Management Resources	10
WSU Ag Faculty Research Updates	11
Continuing Education: Vets & Producers	11

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

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

From the Editor – I write this as we wait for the signing of the Farm Bill… or a government shut-down… The five-year bi-partisan-approved legislation pretty much continues current farm and nutrition policy. Tariffs, though, have taken their toll on farmers and ranchers and net farm income has plunged. However, the new Farm Bill will increase commodity payments (when prices fall) and improve the dairy margin program, particularly for small herds.

And, in the news – antibiotics, again. Although we, the food animal industries, have done a great job at reducing antibiotic use after the Veterinary Feed Directive (see article on FDA report), three major companies that purchase products have new policies on antibiotic use on supplier farms.

Decrease in Sales and Distribution of Medically Important Antibiotics in Food Animals in 2017

by Dale Moore, Extension Veterinarian, WSU

The US Food and Drug Administration just released their 2017 report on antibiotics distributions and sales. Although it is difficult to track actual antibiotic use, this report shows the impact of the rulings for the Veterinary Feed Directive for antimicrobials used in feed and transition from over-the-counter water antibiotics to prescription. Total sales of antibiotics used in food animals decreased by 33% from the previous year and 43% from 2015. Tetracyclines, the most commonly used antibiotic was reduced by 40%. In feed antibiotics were reduced by 43% from 2016 and water antibiotics were reduced by 14%. However, injectables, intramammary, oral or topical medications increased 3, 9, and 5 percent, respectively.

For the full report, go to:
https://www.fda.gov/downloads/ForIndustry/UserFees/AnimalDrugUserFeeActADUFA/UCM628538.pdf

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Antibiotics, Animal Care, Food Animals, and the Food We Will Eat: Changing Policies

by Bill Sischo, Food and Waterborne Disease and FDIU, WSU

No surprise as antibiotic resistance remains an important public health issue that the companies that buy, modify, and sell our farm products are announcing new initiatives and goals for how they will source their products.

Costco recently posted the principles and standards they will have for their meat and dairy products on their web site. Relative to antibiotic use: "Costco Wholesale's goal is to control the use of antibiotics medically important to humans in its meat and poultry supply chains, consistent with protecting the health and welfare of our members and of poultry, hogs and cattle in our supply chains. Our policy is to limit application of these antibiotics to therapeutic use for the prevention, control, and treatment of disease and not, for example, for purposes of growth promotion or feed efficiency, and only under the supervision of a licensed veterinarian in a valid Veterinary Client Patient Relationship."

Costco indicated that they will be working with their suppliers and producers over the next two years to develop and apply protocols for assessing compliance. Costco will likely require the certificates or affidavits by producers, audits commissioned by producers and suppliers, audits commissioned by Costco Wholesale, and product testing. On or before December 2020, Costco will be setting a target date by which compliance with the policy will be mandatory and monitored and assess the feasibility of eliminating the routine use of medically important antibiotics for prevention of disease among supplier farms.

McDonalds also set up new policies and goals. Their theme is "Using Our Scale for Good". "McDonald's understands that reducing the overall use of medically important antibiotics in beef is complex and cannot be accomplished overnight. Additionally, there is limited antibiotic usage data available across the global beef industry. That is why, in collaboration with our suppliers and beef producers, we are taking a strategic and phased approach." McDonald's is partnering with beef producers in their top 10 beef sourcing markets to measure and understand current usage of antibiotics. By the end of 2020, they will establish reduction targets for medically important antibiotics for these markets. Starting in 2022 they will be reporting progress against antibiotic reduction targets across their top 10 beef sourcing markets.

McDonald's is looking towards responsible use and suppliers that use preventive medicine strategies, farm hygiene practices, animal husbandry, and vaccination programs. When antibiotics are prescribed by a veterinarian, they encourage adoption of a tiered approach to antibiotic use: the lowest importance human drugs as the first choice, and highest priority critically important antibiotics restricted to last choice.

Wendy's, building on their "Corporate Social Responsibility" initiatives, also announced some policy and programs relative to how they will source beef. They are the first restaurant chain to partner with the *Progressive Beef*™ program that builds on industry best practices and third party verification. The goal is to have an important part of their beef supply sourced through Progressive Beef by 2019 and at least 50% by 2021. The program has 3 core areas: "**Cattle Care:** providing a

safe, humane environment for cattle through staff training on management practices and hands-on veterinary care. **Food Safety and Antibiotic Use:** responsibly using antibiotics under the supervision of a veterinarian and with thorough record-keeping, strictly adhering to withdrawal times, utilizing HACCP principles and ensuring a clean and safe environment for the animals. **Environmental Sustainability:** responsibly utilizing natural resources while investing in the people who care for the cattle and the local communities through staff training and certification."

Most of these antibiotic policies adhere to the principles and rules from the Veterinary Feed Directive, but what is important for our animal industries is that these companies are asking for verifiable systems that minimize use of antibiotics and systems requiring staff training and certification. We often talk about *judicious use of antibiotics* policies but it seems that we need to be setting up our use practices to be verifiable and demonstrate how the people tasked with diagnosing and treating food animals are trained to be effective stewards of antibiotics.

For more information on the companies' policies:

- Wendy's policy: http://ir.wendys.com/phoenix.zhtml?c=67548&p=irol-newsArticle&ID=2380391
- McDonald's policy: https://news.mcdonalds.com/stories/using-our-scale-for-good/antibiotic-policy-beef-2018
- Costco policy: https://www.costco.com/sustainability-animal-welfare.html

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Dairy: Impacts on Average Daily Gain in Preweaned Dairy Heifer Calves

by Craig McConnel, Extension Veterinarian, WSU

A series of articles were recently published in the October issue of the *Journal of Dairy Science* (Volume 101, Issue 10) based on results from the National Animal Health Monitoring System's Dairy 2014 study. One particular article of interest had to do with factors associated with average daily gain (ADG) in preweaned dairy heifer calves. It is no mystery that growth determines the age at first breeding, and that average daily gain has been shown to be affected by many different factors such as passive transfer of immunity, disease, nutrition, management practices, and environmental factors.

The objective of this particular 18-month longitudinal USDA study was to evaluate the association of different health, feeding, and management practices, as well as environmental factors on ADG in preweaned heifer calves. The study consisted of a convenience sample of 102 dairy operations with Holstein calves, including both conventional and organic operations. These operations were located in 13 states, and included California, Colorado, and Washington. Data collection for the calf component of the study occurred from March 2014 through September 2015.

Prior to enrollment, each calf was screened and excluded from the study if positive for persistent infection with bovine viral diarrhea virus. Each calf enrolled in the study had a Heifer Calf Health Card filled out to record information on events that occurred between birth and weaning. The Calf

Card contained questions in both English and Spanish and was completed by farm personnel, a veterinary medical officer, extension personnel, veterinarians, or a combination of people involved with calf raising. Farmers were provided a Calf Health Scoring Chart to guide the reporting of clinical signs.

Complete data were available for 1,410 calves from 97 operations in 12 states. The average of the ADGs in calves was 0.74 kg/d (1.63 lb/d), and calves were fed liquid diets for an average of 65 d. Average birth weight was 43.2 kg (95 lb), average final weight was 90.9 kg (200 lb), and average preweaning weight gain was 48.4 kg (106 lb). A statistical model was constructed to determine the factors associated with ADG. Only Holstein calves were included and predictors were considered for the model based on biological plausibility.

The results showed that ADG of dairy heifer calves during the preweaning period was influenced by many factors, including disease, amount of protein fed per day in the liquid diet, temperature humidity index (THI) for the preweaning period, dam lactation, bedding type, the number of calves born (single vs. twin), *Cryptosporidium* status, and *Giardia* status. Nutrition during the preweaning period is obviously critical for growth, with both the quantity and the quality of the liquid diet having significant effects.

A previous study demonstrated that calves fed milk ad libitum consumed twice as much milk and gained 4 times as much compared with restricted-fed calves. Other studies have demonstrated that increased milk fed during the preweaning period can increase future milk yield, and decrease the time to first calving. In the current study, within the range of observed amount of protein fed per day in the liquid diet, every additional 0.1 kg (0.22 lb) of protein fed per day equated to 0.02 kg/d (0.044 lb) of gain. Furthermore, calves fed milk replacer gained significantly less than calves fed pasteurized or unpasteurized milk. Although the percent fat and protein in the milk replacers were accounted for in the model, the sources of fat and protein were not controlled for and may have impacted the results.

Additional findings from this study indicated that calves bedded with sand or had no bedding gained less (0.49 kg/d or 1.08 lb/d) than calves on all other bedding types. Calves negative for *Cryptosporidium* or *Giardia* at the time of sampling gained 0.03 or 0.02 kg/d (0.07 or 0.04 lb/d) more, respectively, than calves that were positive for *Cryptosporidium* or *Giardia*. Calves with no disease events gained 0.07 kg/d (0.15 lb/d) more than calves with one or more disease events. Calves experiencing an average THI <50 gained more (0.67 kg/d or 1.47 lb/d) than calves experiencing an average THI from 50 to 69 (0.62 kg/d or 1.36 lb/d), or ≥70 (0.59 kg/d or 1.3 lb/d). Any deviation from the thermoneutral zone for a calf causes some degree of thermal stress; however, calves seem better able to handle cold stress than heat stress ***if provided enough nutrition***.

Overall, the results from this NAHMS study highlight the importance of feeding an appropriate quantity and quality of a liquid diet, keeping calves comfortable and free from disease, and mitigating the effects of temperature and humidity during the preweaning period.

Dairy: Do Pest Birds Affect Cow Well-being?

By Amber Adams Progar, Dairy Management Specialist, WSU

As the winter weather approaches, barns on dairies become increasingly appealing to wildlife, especially wild birds. Birds flock to these barns because they provide shelter from the cold weather

and offer a plentiful food supply when other sources of food (insects and crops) are scarce. Although these accommodations are beneficial to the birds, we know that it is not a win-win situation. In 2016, Washington dairy farmers estimated that pest bird damages cost up to $200,000 per farm per year. Depending on the farm, these economic losses may be caused by feed lost to bird depredation, feed spoilage, building depreciation, or bird deterrence costs. The economic importance of effective pest bird deterrence methods is one reason our Pest Bird Management Research Team was established. We are also interested in exploring how pest birds may affect cow well-being.

Wild birds have been linked to pathogens such as *Escherichia coli (E. coli)*, *Salmonella spp.*, and *Mycobacterium avium paratuberculosis* (MAP). Some strains of *E. coli* appear to cause few or no significant clinical signs of disease in cattle, but other strains are linked to mastitis. Cattle infected with *Salmonella spp.* may develop salmonellosis, which can induce abortion, reduce milk yield, and cause death in cattle. Johne's disease is a serious condition caused by MAP. Forty-eight Washington dairy farmers participated in a pest bird management survey we distributed at the 2017 Washington State Dairy Conference. Over 50% of surveyed farmers reported that 1,000 – 10,000 birds were seen per day on their dairies. Surprisingly, dairies with higher numbers of pest birds were more likely to report Johne's disease in their herds. We are eager to explore this relationship more closely. Another question to consider is whether bird depredation of cow feed may contribute to the development of metabolic diseases in dairy cows.

Farms lose 7 to 14.2 % of cattle feed from pest bird depredation. Pest birds mostly eat the energy-dense components (starches such as corn) of livestock feed. When pest birds deplete the amount of energy available in feed, cattle are at a greater risk of developing a negative energy balance and the metabolic diseases associated with a negative energy balance. We conducted a study on five Washington dairies last year that aimed to determine how pest bird depredation at the feed bunk affects the nutritional value of TMR. First, we collected a fresh feed sample upon feed delivery to each pen. It is important to note that on most farms, fresh feed was delivered while the cows were being milked. The fresh feed sample represented the balanced ration (what the cow should have been eating). Then, we allowed pest birds to eat at the feed bunk for 30 minutes before we collected a feed sample from the area in which birds were eating. After only 30 minutes of uninterrupted depredation by birds, some farms lost up to 31% of net energy for lactation. If a flock of birds can deplete the nutritional value of feed this much in a mere 30 minutes, which nutrients are truly available for our cows when they return to the feed bunk? We plan to continue investigating this very question.

Pest birds have a significant economic impact on dairies. Most dairy farmers consider the costs of feed lost and feed spoilage when determining the cost-benefit analysis of a bird deterrence

method. Ideally, we would like to be able to include the impact of pest birds on cow well-being as well. At the end of the day, we need effective bird deterrence methods that are economically viable, user-friendly, and long-lasting. As we continue to work on finding solutions for this problem, we encourage you to share any bird deterrence methods that you find useful. My email address is amber.adams-progar@wsu.edu .

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2. Burvenich et al. 2003. Severity of *E. coli* mastitis is mainly determined by cow factors. Vet. Res. 34:521-564. https://doi.org/10.1051/vetres:2003023
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4. Warnick et al. 2001. Risk factors for clinical salmonellosis in Virginia, USA cattle herds. Prev. Vet. Med. 49:259-275. https://doi.org/10.1016/S0167-5877(01)00172-6
5. Wells et al. 2001. Fecal shedding of *Salmonella* spp. by dairy cows on farm and at cull cow markets. J. Food Prot. 64:3-11. https://doi.org/10.4315/0362-028X-64.1.3

Beef: Fat-soluble Vitamin (A, D and E) Requirements For Beef Cows and Calves

by Craig McConnel, Extension Veterinarian, WSU

In the Spring 2018 *Ag Animal Health* Newsletter we touched on the importance of Vitamins A and E to beef calf health. As we near the next calving season it is worth briefly revisiting the topic. Dr. Rob Stuart of Stuart Products, Inc. recently reviewed the topic in the MWI Animal Health, Fall 2018 Veterinary Update. He pointed out that research on fat-soluble vitamins for beef cattle is very limited. In fact, prior to the 8th Edition of the National Research Council's (NRC) Nutrient Requirements for Beef Cattle (2016) there was no published requirement listed for vitamin E. As Dr. Stuart points out, if cows are consuming lush green grass vitamin supplementation is typically not required. However, the need for fat-soluble vitamin supplementation dramatically increases for cows consuming stored roughages (hay, silage, corn stalks, wheat stubble, etc.). As such, pregnant cows wintered on stored forages are prime candidates for vitamin A and E supplementation.

Based on NRC guidelines, a 1,000 lb cow consuming 2.0% of her body weight requires daily intakes of 25,460 I.U. vitamin A, 2,500 I.U. vitamin D, and 320 I.U. vitamin E. If a vitamin mix is fed at a rate of four ounces per cow per day, then each pound of a mineral-vitamin mix should contain four times the cow's daily requirement. The reality is that many supplements are lacking appropriate levels of these critically important vitamins due to low inclusion levels and poor stability of mineral products.

Unlike vitamin A, vitamin E is not stored in the liver and therefore may be depleted quickly when cattle stop consuming forages adequate in vitamin E content. Although vitamin E was the last to be listed as a required nutrient for beef cattle, it plays a critical role in antioxidant activity, reproduction, muscle function, and immunity. Vitamin E supplementation in dairy cows has been shown to reduce the risk of retained placentas and may play a role in the efficiency of parturition itself. Supplementation not only impacts the cow, but may improve calf health given that the newborn calf largely depends on colostrum as a source of vitamin E.

The most efficient method to supplement vitamins in gestating and lactating cows is through a properly fortified free-choice mineral-vitamin mix. Monitoring intakes is essential and in the case

that they are insufficient, alternative injectable vitamin supplements may be given approximately one month before calving. Similarly, calves born to vitamin deficient cows may be supplemented at birth with an injectable product. Research from North Dakota State University (Dahlen et al. 2014. Bovine Practitioner. 48:109-113) demonstrated that calves injected with 5 mL of a vitamin A, D and E solution had significantly higher vitamin A and vitamin E status post-injection.

The bottom line is that fat-soluble vitamins are vital for both the cow and calf, particularly during winter-spring calving. To evaluate your herd's vitamin A and E status, serum samples can be submitted through the Washington Animal Disease Diagnostic Lab through the Toxicology section. If serum levels prove to be low you will need to evaluate your vitamin supplementation program with your nutritionist or veterinarian. If you are interested in additional information and details related to vitamins in ruminants, you may want to check out DSM's excellent website regarding Ruminant Vitamin Nutrition.

Minimizing Weak Calf Syndrome in Beef Herds this Spring

by John Wenz, FDIU, WSU

The 2017 spring calving season had many reports of herds with problems with Weak Calf Syndrome (WCS). In response we performed a retrospective study of beef producers in the region to better understand the problem. The results confirmed that 2017 was "a bad year" for WCS. During 2017 40% of respondents reported experiencing WCS in their herd compared with only 20% during 2015 and 2016. In a more detailed survey of 47 herds the incidence of WCS was reported to be 3 times higher in 2017 (1.5%) than in the preceding 2 years (0.5%) and stillbirths nearly doubled in 2017 to 1.5% from 0.8% in 2015-16. The definition of stillbirth in the survey was a calf born dead. Clearly, the frequency of observation of cows and heifers due to calve will have an impact on a calf being classified as stillbirth vs. weak born. However, the risk factors for both are likely similar.

Risk factors suggested to play a role in WCS include nutritional, infectious, developmental problems, and dystocia (calving difficulties). Unfortunately, we didn't have enough data to shed more light on which of these factors might have the biggest impact on herds in the region. However, there was one obvious factor that stood out in 2017 and is common in most descriptions of bad WCS years; cold weather. The low temperature in Ellensburg, WA, December 2016 through February 2017, was, on average, 7-10 degrees colder than usual. A Nebraska study of about 400 2-year old beef heifers found that calves born in years with colder winter temperatures weighed more and had more calving difficulty (Colburn et al., 1996). This is consistent with observations that calves born in Northern (colder) regions weigh more than those born in Southern (warmer) climes. Also, an Oklahoma study found Fall born calves were 4.5 pounds lighter than those spring born calves from similar cows artificially-inseminated to the same bulls (Belk and Buchanan 1990). Thus, colder temps could lead to larger calves and a higher probability of delayed parturition that could compromise calf vigor. Less vigorous calves have a higher probability of failure of passive transfer and may also be more susceptible to chilling if they spend more time on the cold ground, particularly during colder weather. With the El Niño, our region is predicted to have a 50-60% probability of above normal temperatures for January to March, 2019 (NOAA 2018), hopefully decreasing the risk for many weak calves.

So to minimize WCS, should you move south? No, but if a herd has had problems with WCS in the past, increasing the frequency of observations during the day during the calving period could be warranted to provide assistance during calving or earlier identification of compromised calves and provision of supportive care (drying/warming, giving colostrum, etc). Another thing to consider is

the time of feeding and its potential impact on the time of calving. A couple studies suggest feeding between 4:00 and 6:00 pm can result in about 85% of calves being born between 6:00 am and 6:00 pm. Other areas of focus that may reduce WCS and calf death loss:

- Test your forages to know the Crude Protein (CP) levels. Aim for 12% CP in the cows' total ration during the last 60 days before calving. In many cases this may require protein supplementation.
- Manage trace mineral supplementation for adequate intake. Make sure the mineral mix is readily available and that the labelled amount is being consumed during the winter feeding period.
- Ensure adequate Vitamin A and E is provided in the cow's ration during winter feeding.

Weak Calf Syndrome appears to be influenced by a number of things such as weather and calving difficulties as well as cow nutrition. Close attention paid to cows and heifers during late gestation and the calving period could help save some of those calves that might be susceptible.

Swine: African Swine Fever: It's Only a Plane Away

by Dale Moore, Extension Veterinarian, and Sarah Smith, Extension Regional Specialist

A hot topic at a meeting I (Dr. Moore) recently attended in Chiang Mai, Thailand (*The International Society for Veterinary Epidemiology and Economics*), was African Swine Fever (ASF) and its potential spread outside of China into the rest of Asia and greater spread throughout Europe. ASF is not currently in the Americas but is being tracked in Europe, Asia and Africa. The World Organization for Animal Health (OIE) has been keeping tabs on outbreaks in backyard pigs, farmed pigs and wild boar. In response to an increased threat to the United States, the U.S. Department of Agriculture, Animal and Plant Health Inspection Service has further strengthened protections to prevent spread of the disease to the U.S.

Figure 1: Locations of African swine fever outbreaks 2018. Center for Food Security and Public Health, Iowa State University, 2018

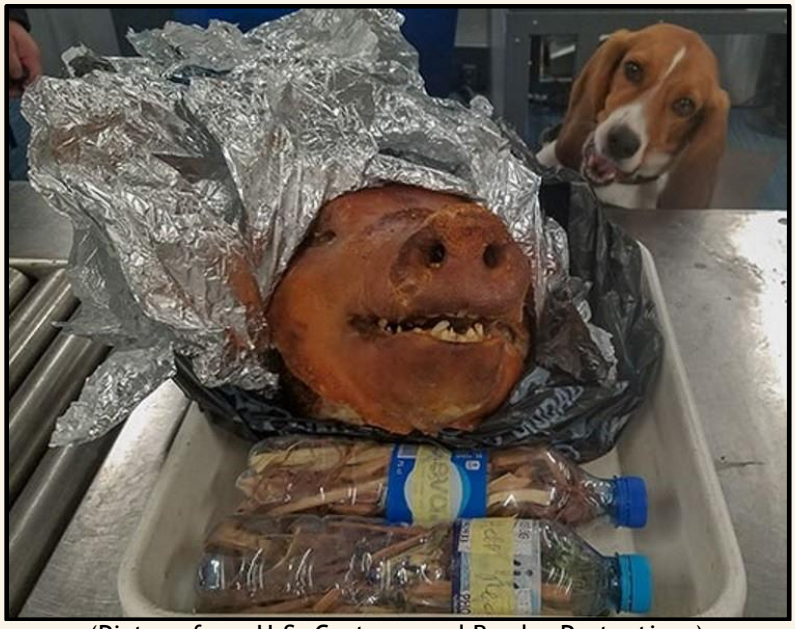
Why should we be concerned about ASF? Although the state of Washington is not a top producer with regards to the number of swine in the United States, we do have commercial swine operations

and also could potentially serve as a gateway for entry of this highly contagious, deadly disease of pigs for which there is no vaccine and no treatment. The virus that causes ASF is not a threat to human health and cannot be transmitted to people from pigs or pork. The real threat is from high illness and death rates in pigs and trade and movement restrictions because of an area's or country's positive ASF status. Depopulation of pigs is the only method to rid an area of the disease and disease risk.

Where is the risk? If you think about how ASF is spread, from contact with infected pig fluids, you can assess the risk in the state. First, we have international ports of entry – ships into the ports in Puget Sound and international planes coming into SeaTac. Undercooked pork products fed to pigs that were either imported or illegally brought in to Romania and China were the causes of the 2018 outbreaks there.

Pork or pork products may unintentionally be brought in to the state by passengers and others from ASF-affected countries. The USDA does **not allow** travelers to bring back most cattle, swine, sheep or goat meat or meat products from countries affected with certain serious livestock diseases such as Foot-and-mouth disease, Bovine spongiform encephalopathy (BSE), Swine vesicular disease, Classical swine fever, and African swine fever. These items will be confiscated. To find out a country's status for these diseases, visit the USDA's animal disease status page.

Just this fall, in October 2018, a USDA APHIS sniffer dog in Atlanta found a pig head in a bag at the airport. https://www.globalmeatnews.com/Article/2018/10/23/US-sniffer-dogs-help-protect-borders-against-ASF



(Picture from U.S. Customs and Border Protection.)

In addition to bringing in pork products, passengers that have visited a pig farm in a country with ASF can potentially bring back the virus on their shoes or clothing. The USDA says, "Anyone who has contact with pigs or swine farms on travel must ensure they carefully clean and disinfect their shoes, wash their clothes and shower prior to having contact with pigs here in the U.S. Report the visit on the CBP (Customs and Border Control) form (question 12)."

We do have commercial swine operations in Washington that result in about 11,000 head of pigs marketed to slaughter each year (Pork Checkoff, 2018). We also have had and have the potential for feral hog populations. In addition, we have many backyard pigs and 9,000 to 10,000 head of show pigs for 4H and FFA projects in the state. Many pigs come into Washington from neighboring

states but also from the Midwest and California. So, we have the potential points of entry (although the government is working for us on that end), pigs moving around the state, and susceptible populations of pigs.

What do we need to look for? If the virus does sneak into the country, veterinarians and pig owners need to be able to know what signs pigs might show and what to do if the disease is suspected. Pigs with ASF will have a high fever, loss of appetite, be weak, and have red, blotchy skin. They may also have diarrhea and vomiting, coughing, difficulty breathing and swollen joints. If the veterinarian opens up a dead pig, they will see blood spots (hemorrhages) on multiple organs, consistently in the spleen, lymph nodes, kidneys and heart.

If ASF is suspected, the state and USDA veterinarians need to be contacted. They will determine when and how samples should be taken and submitted for testing. All pigs on the farm should be isolated or quarantined until the diagnosis is confirmed. For more information on diagnosis, what to do if the disease is suspected, and farm biosecurity, go to Iowa State University's Center for Food Security and Public Health (http://www.cfsph.iastate.edu/DiseaseInfo/disease.php?name=african-swine-fever&lang=en).

Practicing biosecurity to improve defenses against disease entry means you need to: (1) know something about new animals coming to your farm, (2) isolate new pigs for at least 30 days before comingling them with your pigs, (3) become knowledgeable about and vigilant for the signs of disease, (4) contact your veterinarian if you have any diseases with high fever and red blotches on the skin, and (5) make sure everyone on the farm is trained in biosecurity plans for the farm.

For More Information:

- Center for Food Security and Public Health. African Swine Fever. Iowa State University. http://www.cfsph.iastate.edu/DiseaseInfo/disease.php?name=african-swine-fever&lang=en
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- OIE. African Swine Fever. Situation Reports. http://www.oie.int/en/animal-health-in-the-world/information-on-aquatic-and-terrestrial-animal-diseases/african-swine-fever/reports-on-asf/
- Pork Checkoff. State Rankings by Hogs and Pigs Inventory. June 14, 2018. https://www.pork.org/facts/stats/structure-and-productivity/state-rankings-by-hogs-and-pigs-inventory/
- USDA APHIS. Factsheet, African Swine Fever. November 2018. https://www.aphis.usda.gov/publications/animal_health/asf.pdf

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Sheep: Sheep Care Management

by Dale A. Moore, Extension Veterinarian, WSU

Video Available: The Ohio State University Sheep Team recently posted a YouTube Video on identification, docking and castration of sheep. Now is the best time to view before the upcoming lambing season for most flock owners. See the posting from December 11th, 2018, at: https://u.osu.edu/sheep/tag/health/

Sheep and Goat Management Calendar Available: The 2019 Kentucky Sheep and Goat Management Calendar is available. Although focused on Kentucky flock management, the calendar has a wealth of information and can be customized you're your own events. https://www.kysheepandgoat.org/product-page/2019-ky-sheep-and-goat-management-calendar

WSU Ag Animal Faculty Research Updates

(1) Kasimanickam RK1, Kasimanickam VR2, Arangasamy A3, Kastelic JP. Sperm and seminal plasma proteomics of high- versus low-fertility Holstein bulls. Theriogenology. 2018 Nov 28;126:41-48. doi: 10.1016/j.theriogenology.2018.11.032. [Epub ahead of print]
Sperm are highly specialized compartmentalized cells, with unique compositional, morphological and functional properties, including a plasma membrane that undergoes dynamic protein remodeling and surface modifications. Seminal plasma is a highly complex biological fluid containing proteins, amino acids, enzymes, fructose and other carbohydrates, lipids, major minerals and trace elements. Seminal plasma proteins are involved in regulation of osmotic pressure and pH of seminal plasma, transport of ions, lipid and hormones. The objective was to compare sperm and seminal plasma proteomes of bulls with differing fertility and to relate differences to biological processes. Semen was collected from bulls with high or low fertility (4 bulls in each category). Sperm and seminal plasma proteins were isolated, purified, subjected to 2-D gel electrophoresis, protein identification and ontology. In sperm and seminal plasma, binder of sperm proteins (BSP)-1, -3 and -5, and spermadhesin-1, ALB, TIMP, AKI and PEBP1 were higher for high-versus low-fertility bulls ($P < 0.05$), whereas proteins CLU, CCT5 and 8, ELSPbP1, and PSMA6 were more abundant in sperm and seminal plasma of low- versus high-fertility bulls ($P < 0.05$). Further, HSP90, ZFP34, IFNRF4, BCL62, NADHD, TUBB3 and Histone H1 were in greater abundance in sperm of high- compared with low-fertility bulls. The two key biological processes of proteins differentially expressed in high- and low-fertility bulls were metabolic processes and biological regulation. The most prominent molecular functions for proteins that differed are binding, catalytic and receptor activities. The main cellular components for proteins that differed are cellular, extracellular, and plasma membrane. Since protein content differed in high- versus low-fertility bulls, we inferred that the efficiency of associated sperm functions that are necessary for fertility may also differ between high- and low-fertility semen. ***In conclusion, differences between high- and low-fertility bulls regarding abundance of sperm and seminal plasma proteins likely contributed to differences in fertility***.

(2) Wenz JR. Optimization of Clinical Mastitis Records on Dairies. Vet Clin North Am Food Anim Pract. 2018 Nov;34(3):493-505. doi: 10.1016/j.cvfa.2018.07.004.
Deriving value from clinical mastitis records requires accurate and consistent records and tools for efficient summary and analysis. Variation in clinical mastitis case definition or detection intensity across dairies does not preclude consistent data recording. Dairy management software can improve consistency of clinical mastitis records by prompting users for quarter(s) affected, treatment, and severity. User-defined record systems must establish and follow protocols for clinical mastitis data recording. All records must have the same information in the same order and use the same abbreviations. Clinical mastitis episodes should be recorded at the quarter level. Cow-level recording compromises record consistency and accuracy of outcomes.

Continuing Education

Veterinarians
WSU CVM Spring Conference, March 29-31, 2019. SAVE THE DATE!! Pullman, WA. For updates visit: https://cvme.vetmed.wsu.edu/

Producers

2019 Washington State Sheep Producers Lambing School. February 23, 2019. Mabton WA. For registration (Class size limited to 20), go to: https://docs.wixstatic.com/ugd/d9e392_df1851e7a49d43a19298bb2f6da91437.pdf

Washington State Beginning Shearing School; April 2 to 6, 2019, in Moses Lake, Wash. An Advanced Shearing School is April 7, 2019, also in Moses Lake. For information, contact Sarah Smith at 509-754-2011, ext. 4313, smithsm@wsu.edu, or visit www.wssp.org

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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