11th Annual

Applied Animal and Public Health Research and Extension Symposium

Sponsored by the American Association of Extension Veterinarians

Saturday, October 24, 2015

3:00 – 6:00pm

Room: Bristol/Kent

Omni Hotel, Providence, RI

Coordinators:

Dr. Kerry Rood, Utah

Dr. Tom Hairgrove, Texas Agrilife

Kerry Rood Moderating

3:00-3:20: Whalen/Rood: Leptospirosis in the Arid Western United States

3:20-3:40: R. Dewell et al : Simplification of Optimal Point of Entry for Gunshot and Captive Bolt Euthanasia in Bovines

3:40-4:00: Haberman, Friend, Hairgrove: Biological significance of reflective calf hutch covers during hot condition

4:00-4:20: Trock: H5N1, H5N2 and H5N8 Viruses in the United States & Public Health

4:20-4:40: Break

Tom Hairgrove Moderating

4:40-5:00: Britten et al: Evaluation of casein hydrolysate as an intramammary infusion for cessation of lactation at the quarter level in dairy cows

5:00-5:20: Johnson, Smith, Huston: A Characterization of services offered by food animal veterinarians in the southeast United States

5:20-5:40: G. Dewell: Enhancing Continuing Education with Clickers

5:40 – 6:00: Barham: Development of collaborative animal health networks to improve surveillance and emergency preparedness in Ontario, Canada

Leptospirosis in the Arid Western United States

Tara Whalen[1] and Kerry A. Rood[2]

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Leptospirosis is an environmentally derived zoonotic family of bacterium that is multitudinous in forms and geographic locations. In the western United States, there are several prevalent serovars that are currently of concern for cattle producers: *Leptospira hardjo, Leptospira pomona, Leptospira icterohemorrhagica, Leptospira grippotyphosa,* and *Leptospira canicola,* however, cattle are the maintenance species for the *Leptospira hardjo* serovar. Oftentimes *Leptospira* serovars are transmitted through natural breeding of infected bulls or urine contaminated water sources contacting mucosal surfaces and most commonly associated with high moisture areas and concentrated animal feeding operations. One of the common ramifications of the various strains of the *Leptospirosis* family is spontaneous abortions in bovines and may be one of the only clinical manifestations of a *Leptospira* infection. One case in particular has highlighted the difficulties presented to producers in the western United States. On this operation, cattle are placed on summer Utah high-mountain public grazing allotments and wintered on an arid (average annual precipitation = 2.25 cm) strip of land between the Utah border and Colorado River (i.e., Grand Canyon) referred to as the "Arizona Strip." The producer began noting a significant reduction in reproductive performance as well as a dramatic increase in abortions beginning in 2012, with the calving crop decreasing from nearly 90% to below 50% in 2015. Serum samples were taken from six open cows and bovine abortion screening tests were performed. Titers of *Leptospira pomona* and *Leptospira icterohemhorrhagica,* 1:100 and 1:200 respectively, were reported. *Leptospira* serovars are still being considered above other abortion causing pathogens including Bovine Viral Diarrhea Virus (BVDV) and Infectious Bovine Rhinotracheitis (IBR) as the reproductive failure has persisted across a three year span and the serum samples are producing characteristic low titers for *Leptospira* while yielding negative results for BVD and IBR. Because of the semi-arid landscape, samples were taken from common water catch tanks used by cattle and wildlife to determine if these limited, stagnant water sources were contaminated with *Leptospira* spp. Results are pending. While rare, these water tanks can be used by ranchers to bath in. The owner was informed of the zoonotic concern and the recommendation for implementing a commercial Leptospirosis vaccine was presented. This case illustrates that Leptospirosis can surface in arid regions and should be considered in spontaneous abortions regardless of geographical location.

Simplification of Optimal Point of Entry for Gunshot and Captive Bolt Euthanasia in Bovines

RD Dewell[1], GA Dewell[2], DA Bear[3], W Weber[4], DD Griffin[5], EW Rowe[4]

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The use of gunshot or captive bolt devices to cause lethal brain damage are practical and common euthanasia methods for compromised cattle and calves that, when properly conducted, cause a rapid onset of unconsciousness and death. When using physical methods of euthanasia, brainstem destruction is the primary goal because of its importance in regulating both respiratory and cardiac function and is of vital importance in maintaining consciousness. Several methods have described the optimal point of entry when using gunshot or captive bolts for bovine euthanasia. Although accurate, some techniques for determining the point of entry may be difficult to remember, may require more than one step to ascertain the point of entry, may need to be adjusted based on breed type, and may be challenging to ascertain in polled cattle if the suggested protocol uses horns as a landmark. A simple, reliable and predictable description of the optimal point of entry for a bullet or captive bolt is to aim the trajectory towards the base of the tongue or spinal cord at the midpoint of a line drawn between the base of each ear (specifically where ear canal can be seen in the base of the ear). The orientation of the brainstem and ear is not altered by variables considered in some other protocols such as breed, presence or absence of horns, and age. A simple and reliable description for the optimal point of entry increases the likelihood that bovine euthanasia will be conducted quickly and humanely.

Biological significance of reflective calf hutch covers during hot conditions.

Jade Haberman, Ted Friend and *Tom Hairgrove

Previous research found reflective hutch covers reduced hutch temperature during hot weather, but the biological significance is unknown. The study was conducted from June to August, on two farms: one near Stanfield, AZ and one near Plainview, TX. Agriplastic hutches were used at AZ and CalfTel at TX. Covers were 3.0 mil (aluminized on the external side) white LDPE overlaying the top, sides, and back of the hutches; leaving the front exposed. Biological parameters were used to compare unweaned calves housed in reflectively covered hutches with calves in uncovered hutches. Average daily maximum temperature was 7.78 ºC warmer ($P < 0.01$) at AZ than at TX throughout the study. Internal hutch temperature of the reflective covered hutches were 2.16 ºC cooler ($P < 0.05$) at AZ, and 2.57 ºC cooler ($P < 0.05$) at TX than control hutches during the hottest 4-h portion of the day. Respiration rates at AZ were lower ($P < 0.01$) for reflectively housed calves than for control calves. While housed in reflective hutches, fewer ($P < 0.05$) calves were treated for ear infections than control calves and at 4 months of age, fewer calves that had been housed in reflective hutches were treated for pneumonia than control calves, possibly indicating long-term benefits. Reflective covers did not affect ($P > 0.05$) weight gain or immune response to an IBR vaccination at either farm. Reflective hutch covers moderate internal hutch temperature to a degree that can affect biological function. Absence of persistent infected calves with BVD, and high antibody titers to IBR indicate the farms' vaccination and biosecurity practices against BVD and colostrum programs were successful.

Key words: Heat, Stress, Dairy

H5N1, H5N2 and H5N8 Viruses in the United States & Public Health

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Highly pathogenic avian influenza (HPAI) H5N1, H5N2 and H5N8 infections have been reported in U.S. domestic poultry (backyard and commercial flocks), captive wild birds, and wild birds. Between December 2014 and mid-June 2015, USDA reported H5 bird flu virus detections in 21 U.S. states (15 states with outbreaks in domestic poultry or captive birds and 6 states with H5 detections in wild birds only).

No human infections with these viruses have been detected at this time, however similar viruses have infected people in other countries and caused serious illness and death in some cases. While the health risk posed to the general public by domestic HPAI outbreaks is low, it is possible that human infections with these viruses could occur. The response of public health engaged both field and laboratory effort.

Working with State Health Departments, USDA and other agencies, the CDC issued guidance which included monitoring and preventive treatment for those individuals with exposure or potential exposure to these HPAI viruses. Monitoring guidance focused on persons having contact with infected birds or contaminated environments from the time of initial contact to 10 days after the last such contact. State Health Departments and/or local health departments were asked to assess exposure status of individuals associated with each positive bird report. Exposed persons having new onset of signs and symptoms of illness during this time period were asked to submit swabs for testing. State Departments of Health Laboratories then tested the specimens for influenza.

In addition, guidance regarding antiviral use was modified to permit use of stockpiled antiviral drugs for use in states affected by the avian outbreaks. Consideration for this modification included that appropriate use of antivirals may help reduce the risk of human cases and subsequent person-to-person spread.

Prompt sharing of the avian viruses by the USDA with the CDC allowed the laboratories to determine if the available diagnostic tests would identify this virus if present in human samples. Transmission studies involving ferrets showed that these H5 viruses did not spread to naïve ferrets placed in direct contact with challenged ferrets. Also illness in infected ferrets was generally mild. Antigenic characterization of these viruses allowed comparison of these viruses to vaccines in the global stockpile to determine if a new vaccine virus should be developed. Antiviral resistance testing was able to determine if genetic markers for resistance to FDA-approved influenza antivirals were present.

Evaluation of casein hydrolysate as an intramammary infusion for cessation of lactation at the quarter level in dairy cows

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Treatment options for dairy cows that have one persistently inflamed mammary quarter are limited. Cessation of milk production in only one quarter, without permanent damage, is difficult and unpredictable. This project investigates the efficacy of treating one mastitic quarter in any eligible cow (total-cow somatic cell count substantially increased only by that quarter) using casein hydrolysate. Cows will be screened and enrolled based on case definition parameters for total cow and quarter-level somatic cell count, stage of lactation, milk production data and milk culture results. There will be a total of three treatment groups: active casein hydrolysate, an inactivated casein hydrolysate placebo and a negative control. The experimental design is a completely randomized block; cows will be blocked by lactation and culture results into one of 4 blocks. Cows from multiple dairies will be enrolled and randomly assigned to one of the three treatment groups within each block. Cows will be assessed for pre- and post-treatment milk production, somatic cell count and bacteriological culture. Percentage of total-cow milk production from the infused mastitic quarter will be measured before involution and following the next calving to assess recovery of production postpartum in the infused quarter. Bacteriological cure rate based on multiple cultures, % culled and % mortality will also be compared among treatment groups. This will be the first well controlled study evaluating the creation of a three-quartered cow as a potential milk quality management tool.

A characterization of services offered by food animal veterinarians in the southeast United States

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ABSTRACT

Veterinarians are important to protecting the safety and security of the food supply. Consequently, a shortage of food animal (FA) veterinary practitioners or in the availability of services they provide to livestock producers could pose a significant threat to the food supply. The objective of this study was to characterize the services offered by FA and mixed-animal veterinarians in order to evaluate the availability and variety of those services offered to livestock producers. A telephone survey of 645 veterinarians licensed to practice in AL, AR, GA, LA, and MS well self-identified FA or mixed animal practice activities was conducted in the spring of 2015. Respondents were asked questions regarding individual/practice demographics, advertising practices, services offered and willingness to offer services as well as distances they were willing to travel to provide services. The response rate was 38% (245/645). Seventy percent (163/245) were practice owners, 29% (71/245) were associate veterinarians, 4% (10/245) had a board certification, and the average length of time in practice was 21 $\pm$ 1.93 years (range=1-52 years). Fifty-two percent (109/245) of respondents stated that their practice had a website, 58% (123/245) had a practice Facebook page, and 34% (71/245) advertised in the phonebook. Eighty-six percent (211/245) of respondents stated they were currently providing FA veterinary services (FAVS). The most common services offered were sick animal calls (93%), emergency services (92%), and pregnancy diagnosis by palpation (91%). Fetal sexing (14%), economic records analysis (14%), and carcass evaluation via ultrasound (9%) were the least offered services. Additionally, respondents stated they currently did not but were willing to offer emergency preparedness consultation (37%), economic records analysis (37%), fetal sexing (31%), performance records analysis (28%), and animal welfare/handling training (26%). Of those no longer providing FAVS, the primary reason given for the change was that their local economy could no longer financially support their practice. From these data we hope to develop targeted educational opportunities for practitioners and students with regards to those services which they were willing to offer in order to increase services available to livestock producers to ensure sustainability for FA veterinarians and FA producers in the Southeast US.

Enhancing Continuing Education with Clickers

GA Dewell

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Continuing education lectures for veterinarians are traditionally didactic and interaction can be difficult. Flipping the classroom has been promoted as way to increase interaction between participants and the teacher and improve learning. However, since flipping usually requires participants review materials prior to the classroom it is difficult to implement in a typical CE setting. Nonetheless, clickers can be used during CE presentations to obtain demographic information, basic knowledge levels and to guide the presentation. Data collected from an audience of approximately 50 veterinarians indicated that most (76%) had used clickers before even though many (60%) had been in practice for 30 or more years. Additionally, 88% of participants had a positive opinion of clicker based presentations and 77% believed they learned more with the clicker format compared to a traditional slide presentation. Lastly, 65% would prefer to have a future CE presentations utilize interactive measures such as clickers. More specifically during a CE presentation on fertility issues in beef cattle 80% of respondents reported that they were seeing same amount of fertility issues as normal while 20% indicated they were seeing more fertility issues. Sixty-five percent of participants believed that nutrition was the biggest cause of fertility issues while 20% indicated that sexually transmitted diseases were the biggest cause. Regarding preputial scrapping to collect samples for trichomoniasis testing, 44% of participants were capable of collecting samples while 17% were pretty good and 6% considered themselves professionals. However, 33% of participants indicated that they were not comfortable with the procedure and 68% had only collected 10 or less preputial scrapping samples. This trial usage of clickers during a CE presentation identified that not only did participants appreciate the interactive format but valuable information can be collected to guide the presentation and topics for future CE offerings can be identified.

Development of collaborative animal health networks to improve surveillance and emergency preparedness in Ontario, Canada

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Surveillance systems to detect and prepare for new and emerging threats in animal health can take a variety of forms. In Ontario, a collaborative approach has been developed, involving veterinarians from private practice, the Animal Health Laboratory (AHL), the Ontario Veterinary College (OVC), and the Ontario Ministry of Agriculture, Food and Rural Affairs (OMAFRA), to build relationships and trust through collecting and interpreting data and clinical impressions from each major species group. Expert networks have been developed for bovine, swine, small ruminants, equine, poultry, bees, fish, companion animals, and alternative species. The Ontario Animal Health Network (OAHN) model is based on a successful approach that has been employed in Quebec, Canada, for the past 22 years.

Quarterly online surveys are used to determine practitioners' clinical impressions, and this information is combined with laboratory data from the Animal Health Laboratory, and in some cases, private laboratories, and provincial slaughter data. Groups meet to discuss data and cases, but this is not the only reason for gathering.

OAHN network objectives are to obtain a current picture of disease in the species at regular intervals, while building trust within and between groups. During outbreaks, the groups may be called upon to collaborate to help provide perspective and practical advice. Additionally, the discussions allow for a unique opportunity for the AHL, OVC, and OMAFRA to strengthen relationships with those in the field, and increase awareness of services, issues encountered at the organization (e.g., how risk assessments work within government, or how laboratories process samples), and showcase their expertise in candid, collegial conversations, focused on animal health. Cross-sector discussions are also an important part of the network, allowing good contact between similar groups to tackle similarly themed issues. Networks allow veterinarians to remain central to conversations within industry. Reports and products of the networks focus on providing veterinarians and producers with tools to make better animal health decisions together. The group uses current tools and technology to communicate information (e.g., podcasts, Twitter, Facebook, infographics) as well as traditional reports. As networks grow, the group is focusing on producer engagement, asking for input from engaged producer groups to increase important conversations about disease management, antimicrobial use, welfare and other pressing concerns. Engaging veterinarians and producers in the use of cutting edge tools to succeed at disease management and staying current in animal health issues is an ongoing goal. For more information, please visit www.oahn.ca