**Tennessee One Health Meeting**

5/23/19

**Update on CDC One Health Priorities**

*Kate Varela, DVM, MPH, DACVPM*

1. General overview
   1. Coordination, collaboration, communication
   2. CDC One Health Office: 2009
   3. ~14 staff; vets, disease ecologist, lawyer, loaned experts (OIE, FAO)
   4. Focus areas: zoonotic and emerging infectious diseases; global health security; influenza/pandemic preparedness; advancing one health in the US and globally; prevent zoonotic diseases between people & pets; one health issues and emergencies
   5. 60% of existing human infectious diseases are zoonotic; 70% emerging ID are zoonotic
      1. 5 new human disease appear every year – 3 are of animal origin
2. Global health activities
   1. TA to >20 countries around the world; partner with WHO, OIE (World Organization for Animal Health), FAO (Food and Agriculture Organization of the United Nations)
   2. Tripartide Zoonoses Guide
   3. Support GHSA activities
   4. Lead One Health zoonotic disease prioritization process
      1. Excel-based tool, brings together human/animal/environmental health sectors to prioritize zoonotic diseases together; have used in >20 countries; helps build capacity
      2. EID paper: <https://wwwnc.cdc.gov/eid/article/23/13/17-0418_article>
      3. Rabies is #1 disease (19/20 countries had on list); zoonotic influenza, VHF, anthrax, brucellosis, zoonotic TB also on list …
      4. December 2017: US workshop (Department of the Interior, USDA, CDC; EPA, NOAA, State Vets). Workshop summary: <https://www.cdc.gov/onehealth/domestic-activities/us-ohzdp.html>
         1. Top zoonotic diseases of national concern = zoonotic influenza, salmonellosis, WNV, plague, emerging coronavirus (SARS, MERS), rabies, brucellosis, Lyme
         2. Key themes and needs: formal one health coordination mechanism, leadership engagement, national one health framework for US, opportunities to improve collaboration/communication for surveillance and data sharing; strengthening of joint outbreak investigations; joint discussions on research needs
         3. One Health Federal Interagency Network (DOD, State, USAID, EPA, HHS, DOI, USDA, NASA)
3. Domestic activities
   1. Address IHR core capacities
   2. Partner with industry, professional organizations, etc. (NASPHV, Youth in Ag, PIJAC)
   3. Distribute zoonoses prevention messaging and One Health updates to stakeholders
      1. ZOHU calls
      2. Healthy People, Healthy Pets calls (~80k views annually from >50 countries): <https://www.cdc.gov/healthypets/index.html>
      3. New NASPHV compendium anticipated on non-traditional pet species (reptiles, backyard flocks, etc.)
4. Q&A
   1. US interagency work mainly at federal level, role for state? Hope that states can align with similar process in the future … Mainly support states through NASPHV.

**Brucellosis Strain RB51**

*Leslie Seraphin, DVM, MPH (USDA/APHIS-VS)*

1. Brucellosis: gram negative coccobacilli
   1. Zoonotic: cattle, bison, goats, pigs, dogs, cetaceans
   2. *B. abortus, B. meletensis, B. suis =* category B bioterror agents
   3. Bang’s disease in cattle (Denmark, Dr. Bang 1897)
   4. Humans: 2-3 week incubation period; flu-like illness (intermittent/irregular, “undulating” fever); chronic infection can occur (endocarditis, spondylitis, etc.)
   5. Animals: infertility, stillbirth, abortion; joint swelling; asymptomatic infection COMMON
2. US eradication efforts in cattle started in 1934; eradicated by early 2000 from US cattle herds
   1. Still exists in bison, elk with occasional spillover into cattle
   2. Strain 19 vaccine = modified live vaccine; can result in abortions; cattle test (+) by serologic tests – led to new vaccine
   3. RB51 vaccine = modified live vaccine, negative serology on traditional brucellosis surveillance tests; less abortion; vaccinate at 4-12 months of age; get ear tags or ear tattoo
      1. Only category 2 accredited vets can receive vaccine; should only vaccinate if sold to states that require vaccination (i.e. Yellowstone area) or in greater Yellowstone Area
      2. After 2017 cases, PA State Vet strongly encouraged cessation of vaccination, especially in calves intended to produce raw milk
   4. Both vaccine strains can cause brucellosis in humans
3. Texas August 2017: RB51 infection in humans traced to TX dairy (Jersey cow herd, 2 shedding RB51 in milk)
4. NJ October 2017: RB51 vaccine strain isolated from human case; admitted raw milk from NY distributor
   1. Co-op with drop offs in NY and NJ (NY law sell only directly from farm; NJ cannot sell or distribute raw milk); advertised milk was from Amish Farms in PA and NJ (no Amish farms? Couldn’t locate) 🡪 Udder Milk
   2. Legal jurisdiction complicated
      1. FDA: dairy products
      2. USDA: animal health, vaccine
      3. CDC: human health
      4. State Ag: sale and distribution of product
      5. FBA, CIA: BT agent
   3. Ongoing investigation of Udder Milk: all milk tested negative for RB51
5. NY November 2018: ill child who drank milk from farm in PA; family initially uncooperative; quarantine placed in late December
   1. Miller’s Biodiversity Coop: 48 cattle (46 jersey / 2 Dutch belted): owner stated he did not brucellosis vaccinate
      1. 2015: 14 jersey cattle purchased and added (some had vaccination tattoos)
      2. Previously SOLD TO UDDER MILK
      3. Milk samples from all 4 quarters from all 14 purchased cattle: 1 (“Felicity”) detected brucellosis from all 4 quarters
         1. Isolate from RF and RR matched 2017 NJ human case
         2. Isolate from LF and LR matched the 2018 NY human case
      4. Lessons in tracing: took PHOTOS of tags rather than writing down … 840 tag has chip and can be scanned (FDX) – initial tag record traced to Iowa; veterinarian that vaccinated Felicity still had records of such (vaccinated at 11M)
      5. Felicity removed from milking stream, biologically separated; all lactating cow’s milk tested twice – all negative; milk from entire herd discarded (owner did not have a processing dairy buyer available and was not approved to sell raw milk)
         1. Purchased by CDC; moved to GA for RB51 shedding research
6. State raw milk laws: <https://www.farmtoconsumer.org/raw-milk-nation-interactive-map/>
7. Why does this seem to be more common in Jersey cows?
   1. Often used by raw milk producers
   2. Produce milk higher in fat than Holsteins
   3. Their immune system may allow for RB51 infection to become persistent
   4. Mature earlier than Holsteins (puberty 10 months vs. 15 months)
8. Regulatory follow-up ongoing: <https://emergency.cdc.gov/han/han00417.asp>
9. Q&A
   1. RB51 is shed in milk; no clear transmission among cattle as with *B. abortus*; multiple strains within vaccine; may be shed in abortion tissues

**Recent Raw Milk Legislative Efforts in TN**

*John Dunn, DVM, PhD*

1. Raw milk in TN: inherently risky product due to possible manure contamination
   1. Availability
      1. Initially labeled “For Pet Consumption Only”
      2. Cow-share programs (since 2009)
2. TN Outbreaks
   1. Prior to 2009: 1 outbreak (*Campylobacter –* 4 Bradley county residents ill)
   2. 2009–2018: 3 outbreaks
      1. 2 STEC O157: 26 Knox and other ETR county residents ill
         1. 10-15% of children who are infected with O157 develop HUS; 5% mortality rate
         2. 1st outbreak: 2013 🡪 n=9; age 1–7 years; 33% HUS
            1. Substantial resistance from farm; Health Officers in County/Region got Court Order; HD staff escorted by Sheriff
            2. Environmental testing: less likely to isolate from bulkhead, milk samples (time lag), but possible to find in manure/environment 🡪 in both outbreaks, found same *E. coli* match in cow manure to clinical isolates
         3. 2nd outbreak: 2018 🡪 n=17; 1–39 years; 35% HUS
      2. 1 *Cryptosporidium*: 2 Hamilton county residents ill
         1. Less clear evidence; environmental testing difficult for Crypto
3. Real Raw Milk facts website: <https://realrawmilkfacts.com/>
4. Legislative efforts this season: family of child with neurologic deficits from drinking raw milk approached local legislator in East TN
   1. Initially tried to strike cow shares 🡪 huge backlash from raw milk community
   2. Tried to establish some protocols / regulation for cow shares – “certified” cow share dairies 🡪 can never truly protect / prevent possible contamination with raw milk production
   3. Both bills rolled to next years
5. Q&A
   1. Camel milk restrictions? Dr. Balthaser to check into it … Farm in Missouri (?) selling …
   2. Dr. Seraphin commented that Udder Milk sells raw camel milk; some state regulations are specific to raw milk

**Updates**

1. Dr. Balthaser: Asian Longhorned tick ID’d in Tennessee in an animal shelter; also a cow at UT Vet School that is also suspect – sending to NVSL