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Credentials for public health / animal health issues and their interactions:

- I am a licensed veterinarian with almost 20 years of experience in animal health. My interest and experience in food animal medicine brings me into daily contact with assessing and managing the health of populations of animals. This focus on managing the health of populations is somewhat similar to the role of public health officials such as doctors and nurses with an MPH degree.
- I am board certified by the Association of Veterinary Preventive Medicine (AVPM) and by the Epidemiology sub-specialty of that board. Board certification by the AVPM is through a process of demonstration of experience and expertise in the area of veterinary preventive medicine and successfully passing a rigorous examination. To become certified by the epidemiology sub-specialty, an additional examination focused solely on epidemiology must be passed. The AVPM is composed of veterinarians who have additional training and experience in epidemiology, food safety, zoonotic disease, and public health.
- Although both human and veterinary expertises are involved with public health, the study and control of zoonotic diseases in the U.S. has historically been the primary responsibility of veterinarians rather than medical doctors. This is demonstrated by the leadership role of veterinarians within the USDA, CDC, FDA, the U.S. military, and state and local health departments for control of diseases such as rabies, brucellosis, bovine tuberculosis, and safety of food of animal origin.
- One area of additional experience and training of veterinarians compared to medical doctors is daily working with and understanding the risk of disease transmission between multiple species rather than a single species. Medical doctors work daily in an environment where the species giving care to patients with infectious and contagious disease (human) is the same species as the patient (also human). The risk of contagious disease is high within a species and stringent controls must be taught and reinforced daily to medical practitioners and care givers. Veterinarians work daily with multiple species and while specific risks of contagious disease transmission between species, including humans, are understood and emphasized, these risks are very few in number. Because of the species barrier to disease, very few diseases of one species, such as dogs, will transfer to other species, such as cats, cattle, horses, or humans.
- Because of veterinary medicine's daily contact with providing health care to multiple species, often in the same housing area, and the additional training veterinarians receive in the control of zoonotic disease, veterinary medicine has an important and unique role to play in public health.

## Affect of Livestock on Public Health

- Although veterinarians and animal care givers face a much lower risk of contracting disease-causing agents from the animals for which they provide care than the risk that medical doctors and human care givers face of contracting disease-causing agents from their patients; animals can pass some organisms that cause disease to people in direct contact.
- While it is certainly true that there are infectious diseases that pass to humans from animals such as pets, wildlife, and livestock, these risks are confined to humans in direct contact with animals, or in the case of watershed contamination, the risk is reduced from animals housed in managed environments compared to wildlife or pastured livestock.
- Livestock pose no or very limited infectious disease risk to people who are not in direct contact. It is inappropriate to extrapolate infectious disease risk of animal care givers to the general public.
- Livestock are not over-represented in human disease risk when compared to companion animals and wildlife.
- Some zoonotic diseases can affect people in direct contact with livestock (producers, veterinarians, abattoir workers, etc.)
  - Leptospirosis (*Leptospira interrogans*)
  - Non-typhoidal salmonellosis
  - Cryptosporidiosis (*Cryptosporidia parvum*)
- Two historically important zoonotic diseases are not found in Missouri due to eradication efforts by the USDA and the livestock industries.
  - Missouri is a tuberculosis-free state
  - Missouri is a brucellosis-free state
- Some food-borne illnesses are due to pathogens of animal origin
  - Non-typhoidal salmonellosis (primarily *S. typhimurium* and *S. enteritidis*)
  - *Escherichia coli* O157:H7
  - Campylobacteriosis (*Campylobacter jejuni* and *C. coli*)
  - Yersiniosis (*Yersinia enterocolitica* and *Y. paratuberculosis*) – rare in U.S., found in Europe and Japan
  - Listeriosis (*Listeria monocytogenese*)
- Non-food-borne, non-contact diseases due to pathogens of animal (wildlife and domestic) origin are rare
  - 1 drinking water-associated outbreak of Cryptosporidiosis in Canada has been reported (0 in the U.S.)
    - All cryptosporidiosis water-associated outbreaks in the U.S. and all but one in Canada that have had genotype analysis performed on parasite isolates have been associated with the H (or 1) genotype (human isolates)
  - Giardiasis (*Giardia lamblia*) water-borne outbreaks have been almost uniformly traced to human-to-human transmission. Attempts to link human giardiasis outbreaks with dogs or beavers have not been successful.
  - Leptosporidiosis contaminated water can cause disease in humans. The source can be other humans or almost any domestic or wild animal. Recent human disease outbreaks in the U.S. have been reported due to contact with rodent urine-contaminated water in densely populated urban areas.
- Non-infectious respiratory disease due to high dust levels in poorly ventilated animal housing or feed storage areas is a historically significant disease of agricultural workers (farmer's lung). These respiratory diseases have not been reported in people lacking direct contact with animal or feed storage facilities.

The Centers for Disease Control and Prevention (CDC), U.S. Department of Agriculture (USDA), Food and Drug Administration (FDA) and the Environmental Protection Agency (EPA) and other federal and state agencies all have a role in monitoring animal agriculture to assure public health.

## **Department of Health and Human Services (DHHS)**

### Centers for Disease Control and Prevention (CDC)

- Focused on human health
- Surveillance and investigation of food-borne disease outbreaks
- Surveillance and investigation of zoonotic disease outbreaks
- CDC has ongoing studies of concentrated animal feeding operations (CAFOs) and their potential impact on human health
  - These studies were instigated by citizen comment, not due to the discovery of clusters of disease associated with CAFOs
  - To date, CDC has not reported any negative public health outcomes in disease incidence or severity clustered around CAFOs.

### Food and Drug Administration (FDA)

- Focused on human health
- Enforcement of Federal Food, Drug, and Cosmetics Act
- Regulates animal feed and drugs
- Can ask or force a manufacturer to recall product and can ask courts to prosecute
- Recalls – can be conducted on a firm’s own initiative, by FDA request, or by FDA order

### Center for Food Safety and Applied Nutrition

- Assures safe, wholesome foods (plant, dairy, eggs, seafood, baby formula, dietary supplements – not meat)
- Cooperates with local and state agencies to enforce Interstate Milk Shipper List and Pasteurized Milk Ordinance (PMO)

#### **PMO (Pasteurized Milk Ordinance)**

- Application of sanitation measures throughout the production, handling, pasteurization, and distribution of milk
- Prevent infection, antibiotic residues, toxic chemicals, isotopes
- Required tests: Bacterial counts, Coliform determinations, Drug tests, Phosphatase, Cooling temperatures

### Center for Veterinary Medicine

- Consumer protection agency
- Approve safe and effective products for animals
- Regulate the manufacture and distribution of food additives and drugs given to animals
- Ensures that food from treated animals is safe for human consumption
- Sets tolerance levels for drug residues in human food
- Ensures that animal drugs are safe and effective for intended use
- Administer NARMS and AMDUCA
  - NARMS – National Antimicrobial Resistance Monitoring Service
  - AMDUCA – Animal Medicinal Drug Use Clarification Act

## **Department of Agriculture (USDA)**

### Food Safety and Inspection Service (FSIS)

- Enforce the Federal meat Inspection Act, Poultry Productions Inspection Act, Egg Products Inspection Act, and Humane Slaughter Act
- Work in meat, poultry, and egg plants
  - Inspect meat, poultry, and egg products
  - Inspect plants for sanitation and thermal processes
  - Enforcement - Can withhold inspection mark
- Import inspection and controls at points of entry (imported products must be equivalent to U.S.)
- Assure that state inspection programs are equivalent to federal
- Work with CDS (within DHHS) on epidemiologic investigations of food-borne illnesses

### Animal Plant Health Inspection Service (APHIS) – Veterinary Services

- Preventing, controlling, and/or eliminating animal diseases
- Work outside of processing plants
- Administers National Veterinary Accreditation Program
  - Certifies private veterinary practitioners to work cooperatively with Federal and State animal health officials
- Enforce Animal Welfare Act

### Animal Plant Health Inspection Service (APHIS) – Center for Veterinary Biologics

- Enforces veterinary portion of Virus-Serum-Toxin Act to ensure that veterinary biologics used for treatment, diagnosis, and prevention are pure, safe, potent, and effective
- Regulates diagnostic test kits, vaccines, bacterins, and toxoids
- Veterinary biologics for commercial use must be produced by USDA licensed facility and must be pure, safe, potent, and efficacious

## **Environmental Protection Agency (EPA)**

- Enforces Food Quality Protection Act
  - Sets tolerances for pesticides in food and water (10X safety factor for children)
- Approves pesticides and sets limits on use
- Responsible for manure management, heavy metal restrictions
- Enforces the Clean Water Act