## Manure vs Sewage SEC 6-17-2009

Anette Rink, DVM, PhD
Laboratory Supervisor
Animal Disease and Food Safety Laboratory
350 Capitol Hill Avenue
Reno NV 89502-2923
Phone: (775) 888-1182, Ext. 232
Fax: (775) 888-1198
Email: arink@govmail.state.nv.us



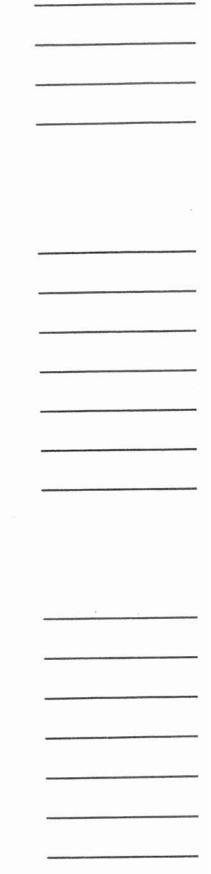
## **Basic Considerations**

#### Manure:

- Including but not restricted to CAFOs (Concentrated Animal Feeding Operation)
- Organic material including feces, bedding material, byproducts of reproduction
- Mostly single species (bovine or porcine or poultry, animals stay in place) determines → pathogens
- Single origin/limited number of origins (geographically, one or a small number of CAFOs)
- Controlled feed & H<sub>2</sub>O
- High in Nitrogen, phosphate and potassium
  - Results in high BOD (Biological Oxygen Demand)

### Sewage:

- sanitary, commercial, industrial, surface runoff
- multiple species (human, companion animals, wildlife)
  - Large variety of pathogens
- Multiple origins due to general mobility, tourism etc.
- 'uncontrolled' food & water sources
- Anthropogenic waste indicators (AWIs)
  - Drug residues
  - Petro-chemicals
  - Disinfectants, fragrances, detergents
  - Radio-isotopes



# Microbiological Composition Manure vs Sewage Zoonotic pathogens of concern in cow manure: Viruses: - none Bacteria: - E. coli O157:H7 - Salmonella typhimurium - Mycobacterium avium paratuberculosis - Listeria monocytogenes Parasites (Protozoa): - Cryptosporidium parvum Giardia lamblia Zoonotic pathogens of concern in Sewage\*: Viruses: unknown number – viral 'swarms' ('Norwalk-like' - Noroviruses, hepatitis A) Bacteria: 17 • Fungi: 2 (Aspergillus, Candida) Parasites: - Protozoa: 5 - Helminths: 10 Why the difference matters Affordability of food of animal origin would be seriously compromised Properly treated manure has clear benefits, biosolids are highly variable and final assessment is pending Farm: On site manure and waste water management law and guidelines address nutrient and pathogen management efficiently (>90% reduction in pathogens in most systems) Manure contains significantly less hazardous substances (AWIs, etc.) and organisms than sewage Biosolids from sewage are often burned or land filled Population dense regions (EU) make clear distinction between manure and sewage No precedence for equal treatment of manure and