The Ins and Outs of IFAP: A Public Health Perspective

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- PhD from JHSPH
- Co-authored publications for FAO on avian influenza
- Consultant to the Pew Commission on Industrial Farmed Animal Production
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- Associate Professor, Environmental Health Sciences
- Director, Johns Hopkins Center for Water and Health
- Joint appointments in the Department of Molecular Microbiology and Immunology and the Johns Hopkins University Department of Geography and Environmental Engineering
- Interests focus on transport of pathogens in the environment
- Collaborations with CDC on investigations of foodborne outbreaks of viral gastroenteritis
Section A: Managing Food Animal Waste in the United States: A Public Health Perspective

Jay P. Graham, PhD, MBA
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Topics in This Lecture

- Industrial food animal production (IFAP)
- Feed inputs
- Waste outputs from IFAP: changes in quantity, quality, and distribution
- Waste management policies
- Public health implications (Dr. Kellogg Schwab)
- Potential solutions
Semi-vertically integrated industry

- Example: broiler industry
  - Integrators, i.e., companies
    - Control hatcheries, breeder flocks, feed mills, and processing plants
    - Determine feed inputs
  - Farmers
    - Generally receive a one-year contract to raise the broilers
    - Heavily mortgaged
    - Own the waste (excreta and mortalities)
    - Paid a set amount per pound live weight
Growth of Industrial Food Animal Production

Change in Hog Industry Structure 1965 - 2001

- Number of Hog Operations (million farms)
- Hogs per Operation

Source: National Agriculture Statistics Service and US Census of Agriculture
High-Density Confinement

- Fecal-oral route of disease very important here!

Image source: USDA.
Geographic Concentration of Chicken Production

- Chicken processing plants, 1949

Dots represent plants processing 50,000 or more chickens annually

- Major chicken production areas, 1982

1 dot = 750,000 or more broilers

Source: USDA.
AFOs and CAFOs

- Animal feeding operations (AFOs)
  - Lot or facility where animals will be stabled or confined
  - No sustained forage growth

- Concentrated animal feeding operations (CAFOs)
  - Have an equivalent of 1,000 animal units
    - Animal unit is 1,000 pounds of live weight
    - 125,000 broiler chickens, 2,500 swine, 700 dairy cattle
    - 15,500 AFOs out of 238,000 are now CAFOs
  - CAFOs provide 43 percent of animals raised for food in the U.S.
## Total Annual U.S. Food Animal Production

<table>
<thead>
<tr>
<th>Animal</th>
<th>Quantity</th>
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</thead>
<tbody>
<tr>
<td>Cattle</td>
<td>32,734,000</td>
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<tr>
<td>Calves</td>
<td>847,000</td>
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<tr>
<td>Sheep</td>
<td>2,844,000</td>
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<tr>
<td>Hogs</td>
<td>103,584,000</td>
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<tr>
<td>Broilers</td>
<td>8,788,281,000</td>
</tr>
<tr>
<td>Turkeys</td>
<td>254,455,000</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>9,182,745,000</strong></td>
</tr>
</tbody>
</table>

Summary of Important Considerations

- Number of animals
- Location of production facilities
- Methods of production, including density of animals
- Animal welfare issues
- Disposal of waste