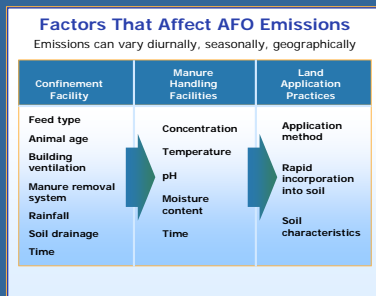
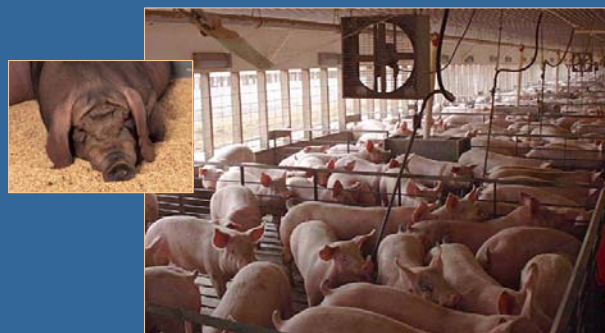
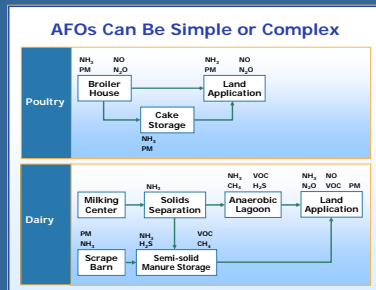


# Ammonia Emissions from Animal Agricultural Operations: 2002 and Beyond

## What Is the Problem?

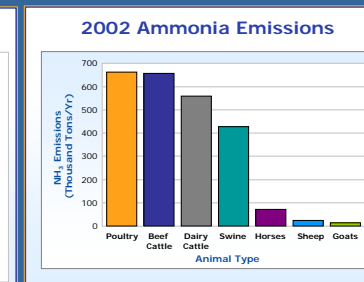
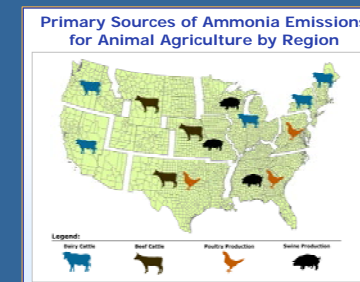
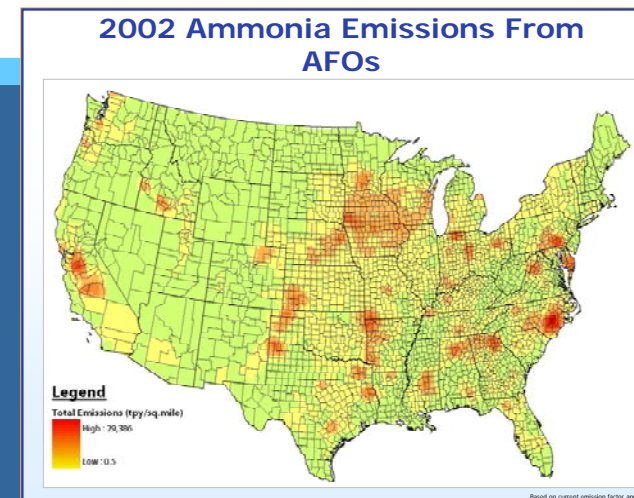


- Animal Feeding Operations (AFOs) are the most significant category of ammonia emissions in the U.S.
- Emissions from AFOs are highly variable and difficult to estimate.



## Where Are We Now?

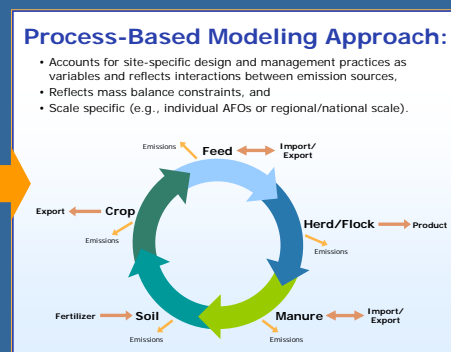
- EPA developed a national ammonia emissions inventory for 2002 using:
  - County-level animal population data,
  - Predominant farm configurations and land application practices by animal type and geographic region,
  - Nitrogen excretion rate and animal live weight data from the USDA, and
  - Emission and percent nitrogen loss factors developed from published data.



## Where Are We Heading?

**National Academy of Sciences (NAS) Recommendations:**

- Development of standardized measurement protocols,
- Process-based modeling approach should replace emission factors, and
- Implementation of a long-term research plan.



**National Air Emissions Monitoring Study (NAEMS) for AFOs**

- Monitoring study of emissions from barns and lagoons/corrals (2-year study beginning in Spring of 2007).
- Monitoring sites represent predominant farm configurations and climate regions.
- Continuous measurements taken to account for diurnal and seasonal variations in emissions.
- Standardized emission measurement methods used at all sites.
- The NAEMS is being conducted through the Animal Feeding Operations Consent Agreement and Final Order (announced 01/21/05).

**What Parameters Are Being Monitored?**

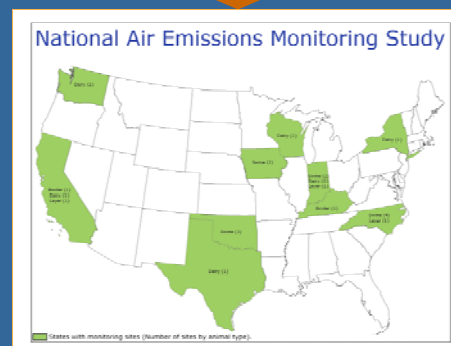
- Gaseous emissions (hydrogen sulfide, ammonia, nitrous oxide, volatile organic compounds) and particulate matter,
- Manure characteristics (e.g., pH, ammonia content),
- Process parameters (e.g., animal inventory, feed composition, lagoon temperature), and
- Meteorological conditions (e.g., wind speed, temperature).

**Who Is Participating in the Study?**

- Oversight and quality assurance review provided by EPA.
- Sites and funding provided by AFO industry (voluntary participation through the AFO Consent Agreement and Final Order).
- Monitoring conducted by researchers from eight universities.

**How Will the NAEMS Data Be Used?**

- EPA intends to develop an improved method for estimating AFO emissions.
- The AFO industry can also use the data to evaluate emission mitigation and control strategies.



**Participating Universities:**

- Purdue University,
- University of California-Davis,
- Cornell University,
- Iowa State University,
- University of Minnesota,
- North Carolina State University,
- Texas A&M University, and
- Washington State University.

### Where Can I Find More Information?

- General information regarding AFOs and Air- and Water-related regulations and programs can be found at:
  - <http://www.epa.gov/agriculture/anafoidx.html>
- EPA will provide periodic summaries of NAEMS data.