AgriLIFE EXTENSION
Texas A&M System

Practical Approached to Improve Air Quality of Animal Feeding Operations with Facility and Manure Management

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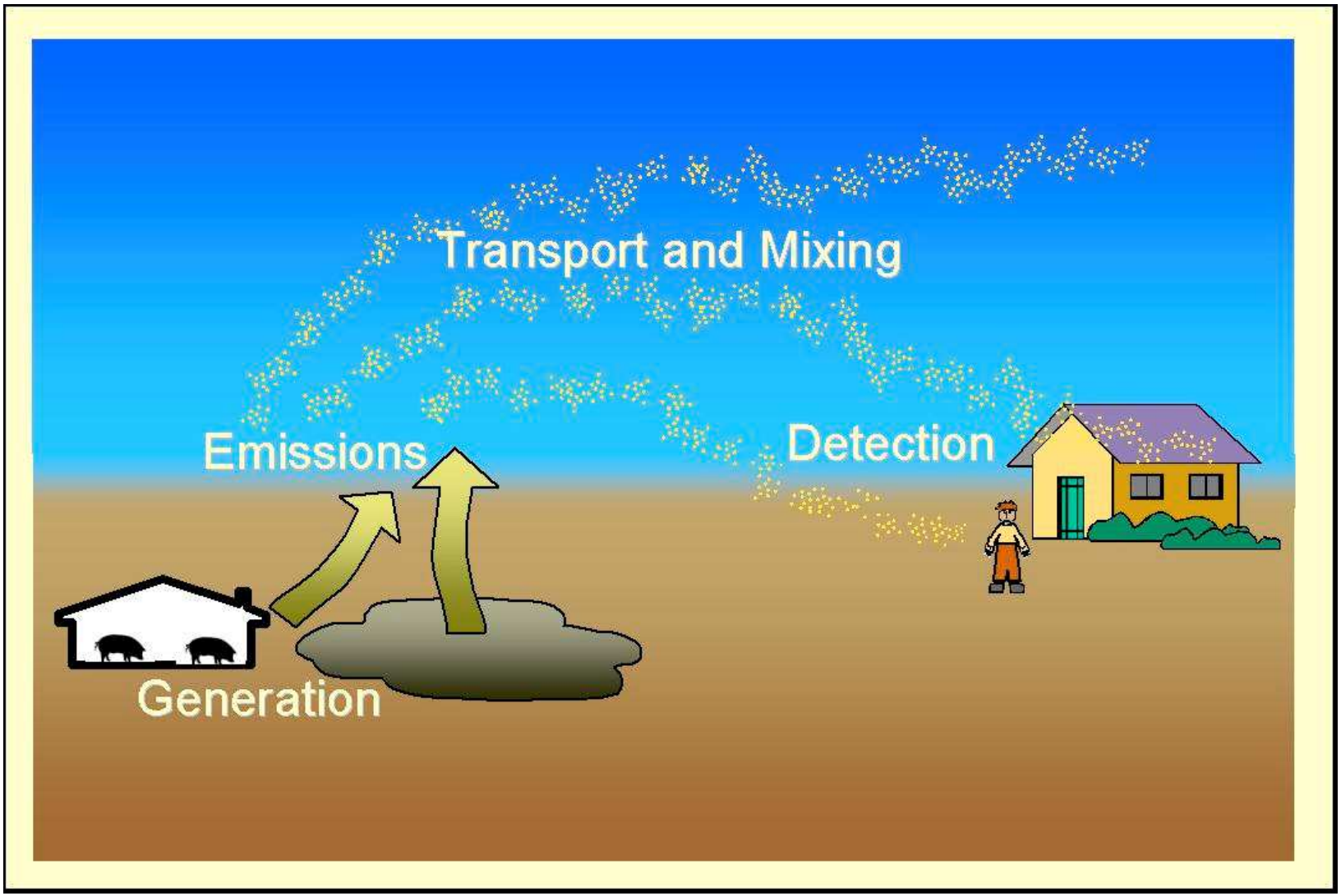
Content

- Engineering and science-based information on Air Quality improvements at animal feeding operations (AFOs)
- Siting new AFOs
- Best Management Practices for existing AFOs
- Questions and answers

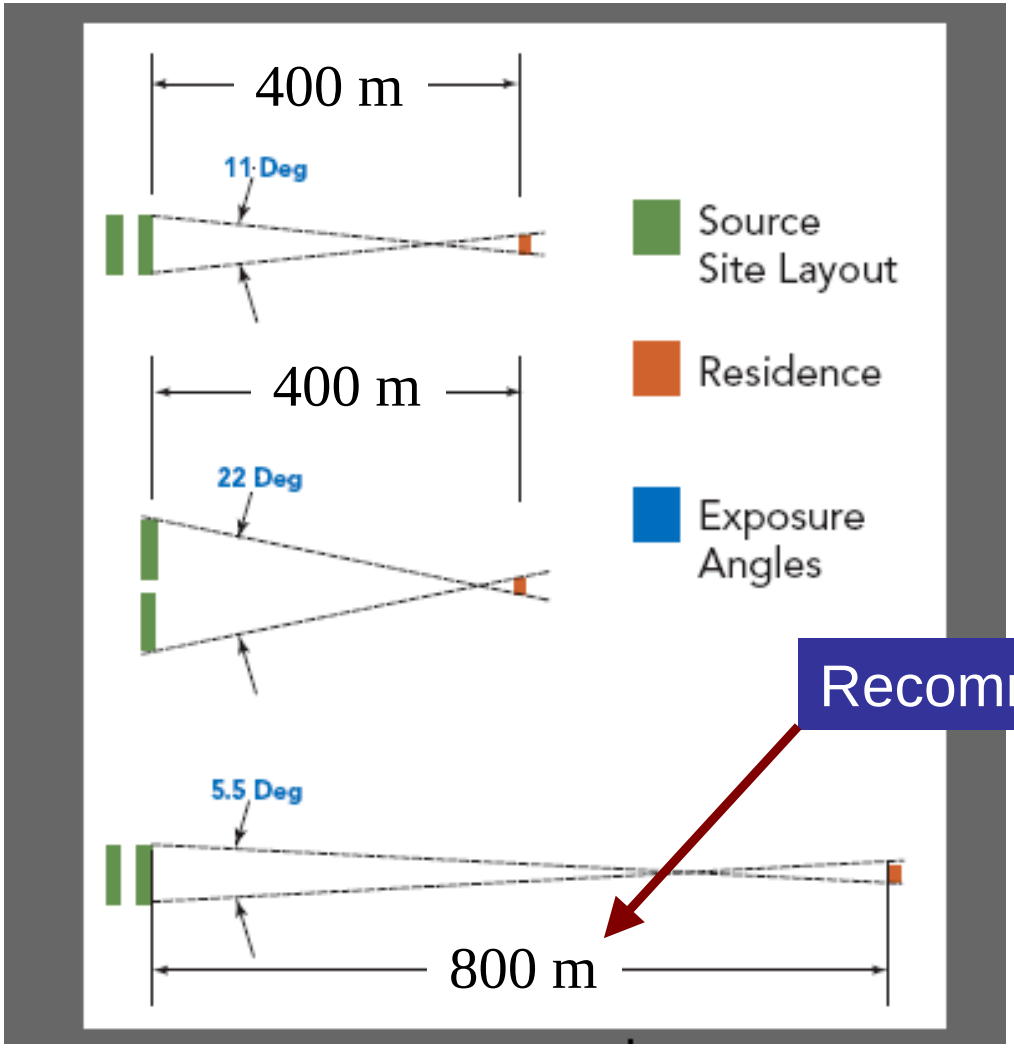
An Environmental Steward:

- **Is aware of farm's environmental risks.**
- **Has *minimum dust and odor potential*.**

Odor and Dust…The two most common sources of public complaints



Siting New AFOs
Set-backs and Source Exposure Angle



Recommended Set-back distance

Siting New AFOs

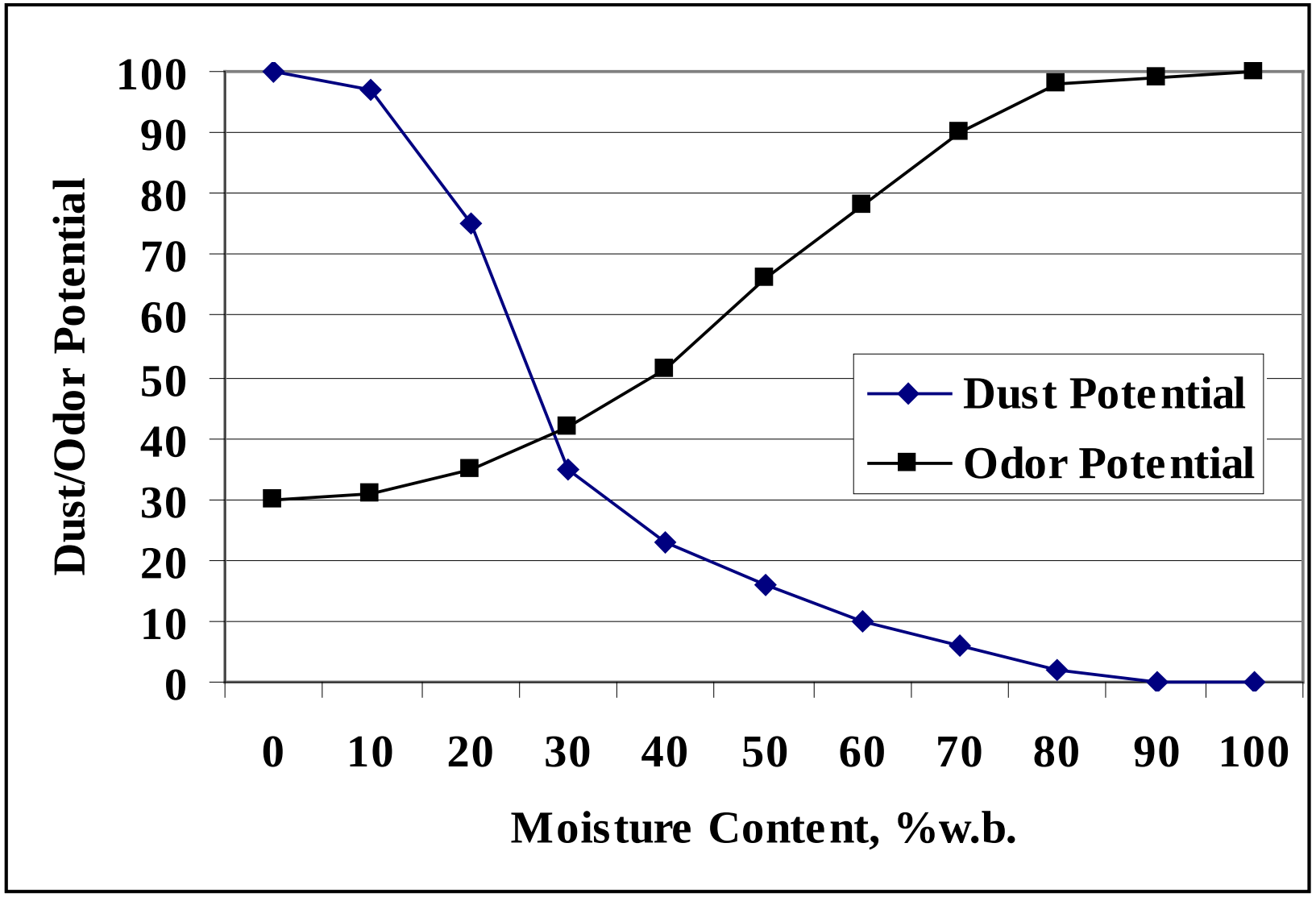
- Topographic Features Influence Odor and Dust Transport
  - Locate on flat terrain with trees for good air mixing and camouflage
  - Avoid hilltops and large water bodies
- Use available models and tools to minimize odor exposure of AFO to community
  - CAM tool is being used in the USA to evaluate odor exposure from planned and existing sites and for predicting effect of odor-control technologies

Best Management Practices to Minimize Dust and odors from Existing AFOs

What causes excessive odors and dust?

- **Poor facility and manure management**
- **Very wet or anaerobic conditions**
- **Very dry conditions**

Qualitative Relationship between dust and Odor as a function of moisture content



Cattle Feedlot Operations

- Poorly drained, thick, loose soil and manure lead to odors
- Maintain 4 to 6% feedlot surface slope
- Maintain surface moisture between 25-40%
- Keep surface compacted to avoid excessively loose manure and soil

Dust from Open Feedlots

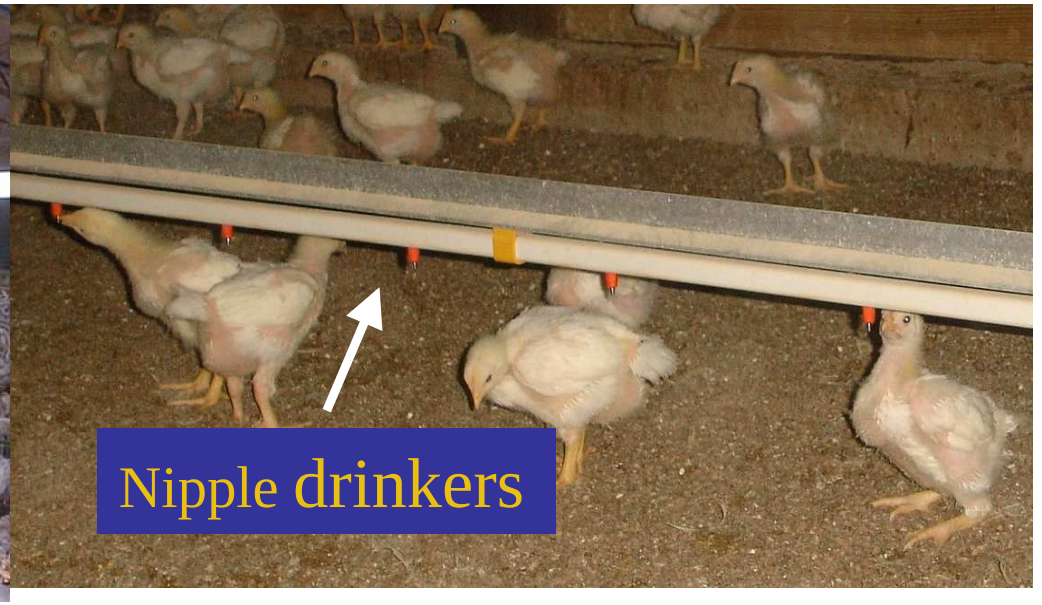
Manure not yet removed, > 5 cm deep

Manure removed within previous 3 days, < 2.5 cm deep

Dust Management

Poultry Facilities

- Maintain litter moisture content 30-35%
- Ventilation system should run at or above minimum rate
- Dirty fans, shutters and fan belts reduce air flow by > 30%
- Prevent water leaks from various systems in the facility
- Compost litter before land application



Transport and Application of Litter and Manure

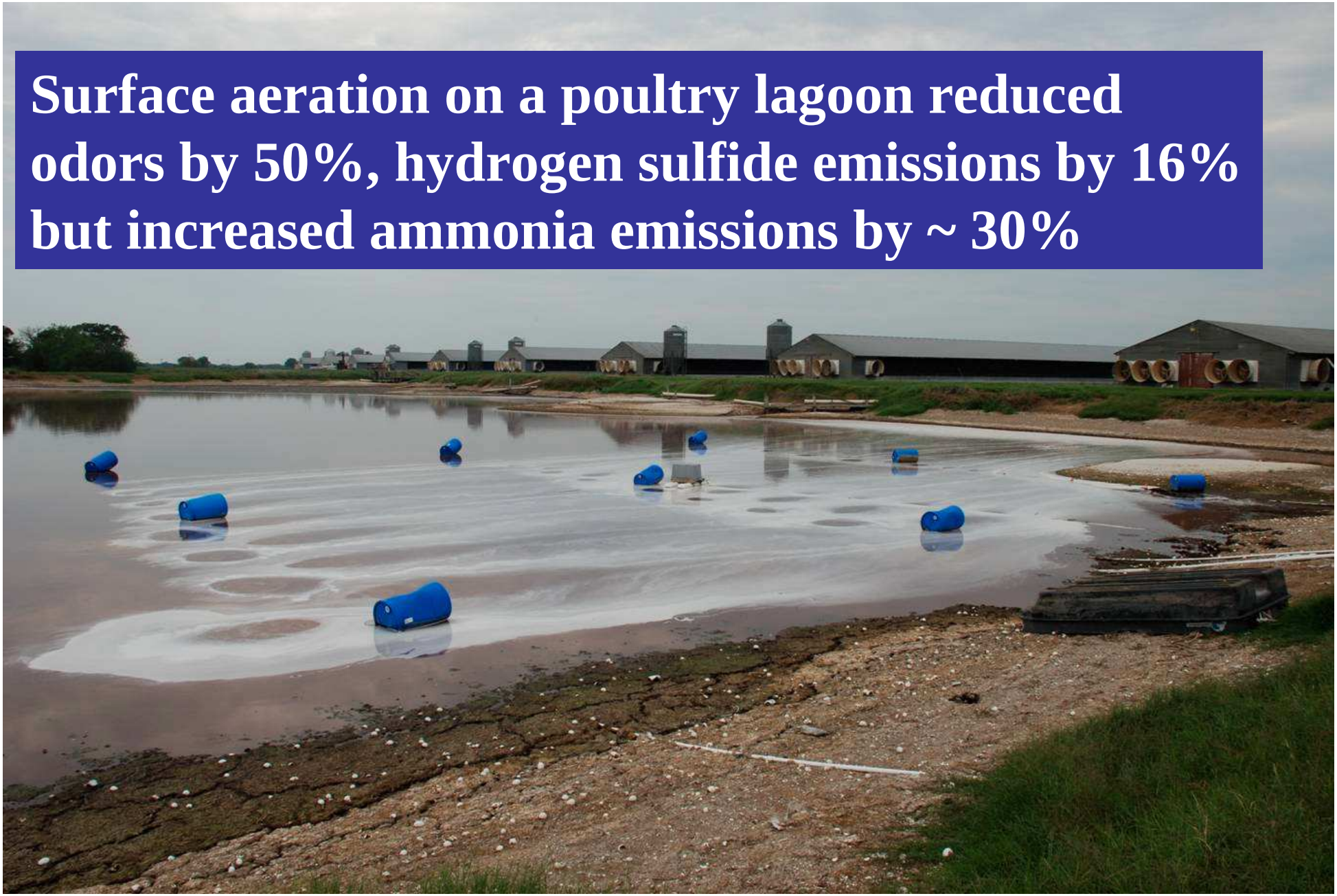
Litter and Manure Transport and Application BMPs

- Properly covered and spill proof vehicles during transportation
- Apply at correct amounts in tons/ha
- Watch for wind directions, temperatures and rain
- Inject or incorporate when possible
- Use low-trajectory manure application systems

-Windbreaks-
Hide facility from public view
Filter dust and dissipate odors quickly

Lagoon Overloading

Surface aeration on a poultry lagoon reduced odors by 50%, hydrogen sulfide emissions by 16% but increased ammonia emissions by ~ 30%



Mortality Management
Vulture and Varmint Restaurant

Isolate and dispose dead animals properly within 24-48 hours

Do not dump them in waste storage structures, ditches and fields

Mortality is a Waste Management Issue

- A carcass is a concentrated source of organic matter
  - it is a source of odors, undesirable critters, and pathogens
  - it is also a source of nutrients
- Mortality problems are similar to manure Issues

Disposal Methods

- Thermal Destruction
- Composting
- Burial
- Rendering
- Alkaline Hydrolysis
- Emerging and Innovative Methods
  - Gasification
  - Plasma technology (artificial lightning)

Conclusions

- Education of proper waste management to protect the environment is an absolute need for researchers, scientists, technical service providers and most importantly, producers, the Stewarts of land, food and fiber.
- Simple, commonsense BMPs do exist to reduce odor and dust from AFOs but commonsense is hard to implement sometime.
- A conference such as this one is an excellent beginning to the end of environmental pollution by AFOs in Brasil and beyond

Muito Obrigado!

Perguntas?