



Biological and Agricultural Engineering

Introduction to NAEMS

Recently, many Animal Feeding Operations (AFOs) have increased in size ----- AFOs emissions have been attacked under federal regulations;

2003, Report: "Air Emissions from Animal Feeding Operations" (AFOs) from National Academy of Science (NAS). Highlights the AFOs air quality issues: Incomplete/erroneous emission factors for AFOs with respect to compliance with EPA regulations.

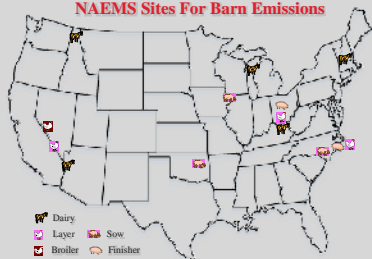
Must need: Scientific data on livestock air emissions-----> to properly regulate AFOs under federal regulations.

2006, National Air Emission Monitoring Study (NAEMS) established

- (1) Under a voluntary Air Compliance Agreement between the EPA and the pork, dairy, egg and broiler industries,
- (2) led by Purdue University;
- (3) Overseen by the EPA Office of Air Quality Planning and Standards (OAQPS).

- Objectives: (I) Accurately assess emissions from livestock operations;
- (II) Compile a database for estimation of emission rates;
- (III) Promote a national consensus for emissions-estimation methods/procedures from livestock operations.

NAEMS Sites For Barn Emissions



Southeast Layer Site: NC2B



Three ventilated barns with 17-40' fans or both ends of each barn

Why was NC2B selected:

- Typical design and operation for high-rise layer houses in the Southeastern U.S.;
- The cages in the barns employ the use of dropping boards, which is featured in most new high-rise layer barns.
- The speed of each fan is monitored by the farm using magnetic rpm sensors.
- Adjacent to barns 3 and 4 are barns 5 and 6, which utilize dropping board cages and cross ventilation systems. While these barns are not being monitored in the NAEMS plan, they offer the potential for being monitored in an additional add-on study, or in a modification to the plan such that barns 4 and 5 could be monitored, one of each type of barn

NC2B Characters

- Six high rise barns, Five shallow-pit naturally ventilated barns.
- High Rise barn: 175 m long X 18 m wide
- Each Barn: 100, 000 hens;
- Birds are raised in low-density conditions (1.5 m²/bird =61 in²/bird)

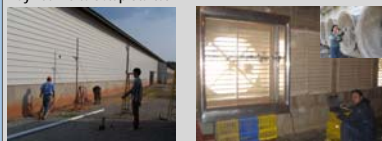


High rise layer barns with 100-000 hens

Southeast Layer Site (NC2B) Set Up



May 2007: Site Setup Started



Jeff, Zifeng, YuSun

Lingjuan Wang running the FANS



Mike, YuSun, and Jeff

Great Helper from the Farm



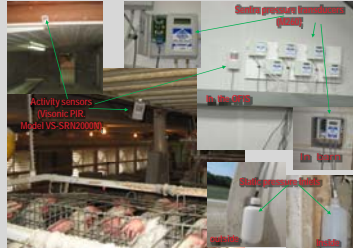
Roberto, Mike and Jeff

Set up continue



Lingjuan Wang Zifeng Liu Yu Sun Qianfeng (Jeff) Li

On-Farm Instrument Shelter (OFS)



Set up continue



September 2007: Valid Data Collection Started. Congratulations!



Every second data from 146 Channels - Great Quality Control!

What 's going on?

- Data collection 24/7;
- Data analysis every day;
- Maintain whenever;
- Quality control: 24/7.

Contact information

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