



University of Minnesota
SWINE EXTENSION
Update

November 29, 2005

Volume 9

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1. Partitioning of Hydrogen Sulfide and Ammonia Emissions into Wall and Pit Exhaust from a Deep-Pit Pig Finishing Barn

Many pig-finishing buildings in the Midwest store manure in concrete pits (8 ft. deep) directly beneath the buildings. These so-called deep-pit barns are often mechanically ventilated and have from as low as 1/10 up to 1/2 of the barn's total ventilation air exhausted from the pit area. To manage and/or control gas and odor emitted from these barns, producers need to not only know the total emissions but also the distribution of these pollutants between the pit and the wall air streams. The distribution is important since control technologies such as biofilters that are very effective at reducing gas and odor emissions, have generally been applied to the pit portion of the ventilation exhaust stream rather than the wall exhaust stream.

Ammonia (NH₃), hydrogen sulfide (H₂S), and odor emissions were measured from a 2000-head tunnel-ventilated deep-pit finishing barn in southern Minnesota for 45 days during August and September 2004. Gas and odor concentrations were measured at pit and wall exhaust fan locations along with indoor and background locations.

The data collected in this study showed that for a deep-pit finishing barn, the gas emissions are much higher from the pit ventilation fans than for the wall ventilation fans. The results of this short-term study indicate that additional pit ventilation has little impact on pit fan emissions of NH₃, H₂S, and odor and did not improve indoor air quality. Further research has just begun at another deep pit finishing barn this fall (2005) to determine the minimum amount of pit ventilation required to maintain a majority of the NH₃, H₂S, and odor emissions in the pit exhaust stream. This would allow producers to minimize the size of “catch and treat” control technologies like biofilters, their installation and operating costs. To read the full text of this article, access the U of MN Swine Extension website at: www.extension.umn.edu/swine.

2. Remove Solids in Pig Manure to Save Aeration Energy

Recent research at the University of Minnesota Southern Research and Outreach Center at Waseca has indicated that the manure solids content plays an important role in affecting oxygen transfer into the treated liquid. Results from the study indicate that it will take 15, 20, 40, and 60 minutes, respectively, to reach saturation for fresh manure with a solids content of 0.5, 1.0, 2.0, and 4.0%. Additionally, when aeration stops after dissolved oxygen has reached saturation, the dissolved oxygen level decreases much faster in the manure slurry when solids content is higher. Finally, the energy consumption for 4.0% solids in manure slurry is nearly four times higher than that for 0.5% solids. Consequently, the energy consumption for the former will be nearly four times that for the latter in order to achieve the same dissolved oxygen level in the treated liquid.

It thus follows that the more solids are contained in manure, the worse is the aeration efficiency, which subsequently drives up the aeration cost because of the increased running time needed. Therefore, in practice, it is highly recommended that the solids level in manure be reduced prior to aeration treatment to help reduce aeration cost. To read the full text of this article, access the U of MN Swine Extension website at: www.extension.umn.edu/swine.

3. Pull the Plug Out of Rising Energy Costs

- Simple practices can help pork producers reduce fuel, gas and propane costs without adversely affecting production. Dr. Jay Harmon of Iowa State University and Dr. Mark Boggess of the National Pork Board have put together a list of things producers can do to save money in the face of rising energy costs. Key points include:
- Understand that most of the heat loss from a livestock building occurs through ventilation
- Keep a maintenance schedule on all environmental and ventilation equipment
- Check your curtains

- Understand your ventilation controllers
- Determine the appropriate set points for environmental controllers
- Evaluate costly energy drainers
- Identify and recycle your valuable byproducts

Access the entire article at: http://www.iowapork.org/rscinfo/energy_costs.html

4. A Comparison of Methods for Extending Semen

At the recent annual meeting of the American Association of Swine Veterinarians in Toronto, Canada, Deborah Murray and three colleagues at the University of Minnesota: Darwin Reicks, D.V.M.; Chris Kuster, D.V.M., M.S., Ph.D.; and Bob Morrison, D.V.M., Ph.D., compared pre-extended semen to semen that was not pre-extended. Many boar studs currently pre-extend semen to reduce cold shock. Pre-extension, however is time-consuming. Fully extending in a single step would save time and reduce the potential for error since the semen is handled only once.

Farrowing rate and total born were not shown to be different between the pre-extended and non-pre-extended semen. Therefore, no benefit was obtained with pre-extension of semen samples prior to full extension in this study. Costs should decrease with a reduction in worker time spent measuring extender and handling semen if pre-extension of semen were removed. There should also be a reduction of error with less overall handling of the semen, including measuring errors, semen spillage, and samples that are possibly pre-extended twice or even miss pre-extension. However, the total born of sows inseminated with semen that was not pre-extended was shown to be more variable than total born from sows inseminated with semen that was pre-extended, warranting further study. Access a full summary of the results at www.extension.umn.edu/swine.

5. Compounds May Help Produce Juicier Meat

Getting a juicy cut of meat isn't always the easiest of tasks. Juiciness is governed by how much fat--called marbling fat--is woven within the muscles. But the likelihood of getting a juicy steak or chop may increase in the future, thanks to Agricultural Research Service (ARS) scientists who are studying a class of compounds that increase marbling fat in livestock.

ARS physiologist Gary Hausman and his colleagues at the Animal Physiology Research Unit in Athens, Ga., in collaboration with University of Georgia researchers, developed a method that can increase marbling fat by as much as 3.5 percent by adding the compound as a feed supplement for swine. Some of the compounds, called thiazolidinediones, are currently approved by the Food and Drug Administration for use in diabetic people to control glucose levels. However, none are currently approved by FDA for use in livestock with the intent of changing food composition. Enhanced marbling fat would increase carcass value, benefiting the livestock industry and possibly providing increased profitability for producers. Access the full article through the U of MN Swine Extension website at: www.extension.umn.edu/swine.

6. Professional Swine Managers Conference a Great Success

About 30 managers and owners of swine units attended the Professional Swine Managers Conference in Mankato, MN on November 17 and 18, 2005. Sponsored by the National Pork Board and University of Minnesota Extension Service, the 2-day event provided information on a variety of topics from speakers throughout the United States, including:

- Gilt Pool Management (Dr. Todd See, NCSU)
- Induction & Control of Estrus (Dr. Sam Baidoo, UMN)
- The Electrical Network of a Livestock Farm (Jacques Deiones, Nuvolt Corp.)
- Ventilation Management (Dr. Steve Pohl, SDSU)
- Biosecurity and Sanitation (Dr. Scott Dee, UMN)
- Feeding Management during Gestation (Dr. Mark Whitney, UMN)
- Employee Management & Training (Dr. Bob Morrison, UMN)
- Troubleshooting: Farrowing Rate & Litter Size (Dr. Rob Knox, U IL; Butch Baker, NSCU)
- Factors Affecting Sow Longevity (Dr. Ken Stalder, ISU)
- How to Post Pigs (Dr. Chad Stahl, F.A.C.T.S.)
- Emerging/Re-emerging Disease Problems (Dr. Barbara Straw, MSU)
- Preparing for a Welfare Evaluation (Dr. Chad Stahl, F.A.C.T.S.)

Comments were extremely positive from participants, indicating that information provided was relevant, timely, and useful to take back to individual swine operations. Special thanks to Paul FitzSimmons, Jim Merritt, Mark Schwartz, and Sheila Schmid for participating in the producer panel for the Employee Management and Training session.

Questions?

It is our goal to bring University research to the Minnesota Pork Industry, ensuring the continued sustainability and competitiveness of producers and allied industry. Periodically check our events calendar on the U of MN Swine Extension website (www.extension.umn.edu) for upcoming workshops and seminars. Please email or call me if I can be of assistance:

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