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Swine Nutrition and Odor Management

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There is a great deal of concern regarding swine manure in terms of odor and nutrient management. However, by controlling what goes into a pig, great strides can be made in reducing odor and decreasing the nitrogen and phosphorus content of the manure. Currently, there are several management and nutritional programs we can use to negate some of the concerns.

Nitrogen

Nitrogen excreted by the pig is one of the main causes of ammonia associated with swine barns. Things that reduce nitrogen intake should also reduce nitrogen excretion and ammonia production. Some of the more common management options available to pork producers:

- **Using synthetic amino acids**

Pigs require amino acids, not protein, and when we feed on a protein basis, we are overfeeding nitrogen. By replacing 100 lbs of the soybean meal with 3 lbs of synthetic lysine and 97 lbs of corn, nitrogen excretion can be reduced 22%. With the lower nitrogen levels in the manure, there is then a significant reduction in ammonia levels in the system.

- **Phase feeding and split-sex feeding**

Gilts have a higher protein requirement than barrows. By feeding the barrows a lower protein diet than gilts, there is a 5% reduction in nitrogen excretion. Also, if a producer feeds 5 diets in the grow-finish phases instead of two, nitrogen excretion will be reduced by an

additional 5 to 8%. When just looking at feed savings, these two programs can save pork producer \$3 per pig.

- **Commonly used antibiotics**

There is some preliminary indication that some commonly used antibiotics may have protein sparing properties. This will allow for reduced amino acid levels, and consequentially, less nitrogen excretion.

- **Balance diets on an available amino acid basis**

This will greatly decrease the amounts of amino acids we add to our diets, and cut down on nitrogen excretion and ammonia levels.

Phosphorus

Phosphorus (P) is the other nutrient with which swine producers are concerned. The following are methods to reduce phosphorus excretion by swine:

- **Phytases**

About 70% of the P in grain is in the phytate form and is unavailable to the pig. By adding the enzyme phytase to the diet, more of the phytate P can be utilized by the pig, and less is excreted. One commercially available enzyme can reduce P excretion by 30%.

- **Balance diets on an available P basis**

By doing this, we can add less P to the diet, resulting in less P in the manure.

Additives

There are also additives that can be used to control odor. Unfortunately, most of them are in the testing stages, and the data is preliminary. Some of those findings include:

- **Decreasing the amount of copper sulfate added to starter diets will decrease odor.** A good replacement for copper sulfate at 250 ppm would be zinc oxide at 2000 ppm.
- In one study at North Carolina State University, **5 compounds were tested and 2 reduced odor intensity** (a counteractant and potassium permanganate).
- **Addition of certain counteractants** (block sensing of odors), **masking agents** (override offensive odors), **and odor absorption compounds** (alter odor-producing compounds) **can be very effective in reducing odor.**

Summary

While odor and nutrient management are concerns, science is on the side of the producer. In the few years that researchers have been looking at odor control, several advances have been made. As odor control becomes more of an economic issue, even more research will be focused in that area.

However, by just using the technologies available today, we can significantly reduce the odor and manure management concerns associated with hog production.



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