Gro Master

The effects of improving air quality on performance and mortality in 8 groups of finishing pigs challenged with PRRS

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Airborne dust (potentially carrying infectious agents) and ammonia negatively impact the environment inside swine barns. In the past, improving air quality required increased air movement. With the recent introduction of barn-friendly electrostatic particle ionization devices (EPI Air®), improving air quality inside swine barns has become more feasible. When EPI Air® is implemented, particles in the air are charged causing them to settle and "stick" to surfaces in the barn (Vansickle, 2013; Rosentrater, 2004). As a result, EPI Air® may improve pig performance by reducing health issues caused by poor air quality (coughing, respiratory- and gastrointestinal irritation, etc.; Colina et al., 2000). Additionally, reduction of airborne dust may reduce transmission of infectious agents like PRRS. One preliminary study found that PRRS positive air samples from finishing barns were reduced approximately 24% in EPI Air® equipped over those not equipped (Vansickle, 2013).

To test the efficacy of using EPI Air® to improve performance and reduce mortality in finisher pigs with PRRS, pigs were placed in curtain-sided, quad-room barns with tunnel ventilation. The first replication began April 6, 2012 and the last finished September 25, 2012. Four replications (rep.; head = 4,754) were placed in barns equipped with EPI Air® (EPI) and 4 replications (head = 4,389) were placed in barns not equipped with EPI Air® (Control). At the start of test, pigs in the EPI group averaged 78.0 lbs. and the control group averaged 73.7 lbs. At the time of marketing, pigs in the EPI group averaged 250.9 lbs. (average days on test = 138) and pigs in the control group averaged 264.4 lbs. (average days on test = 150).

The ADG was better in the EPI group than for pigs in the control group across all replications.

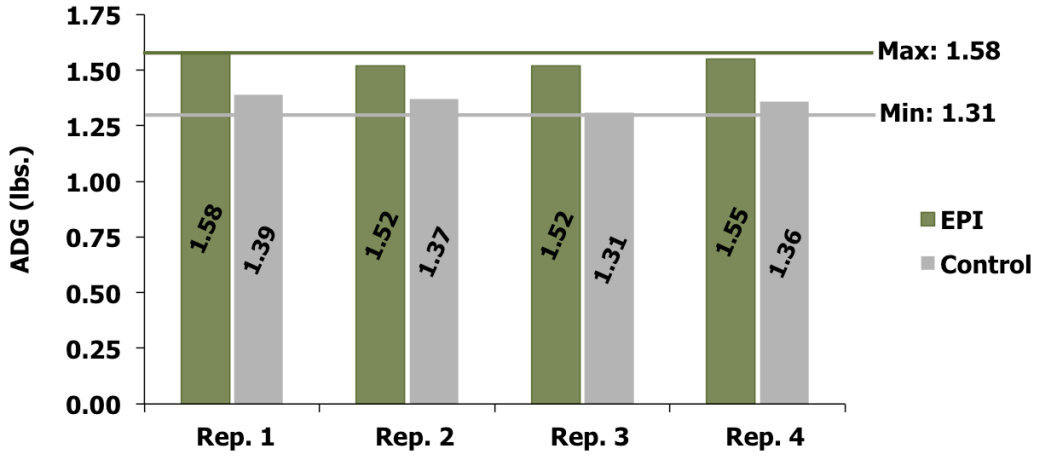

Figure 1. Average daily gain for 4 replications of each EPI and control groups (total head = 9,143)

Across all replications the feed conversion was consistently better for pigs in the EPI group than for the control pigs.

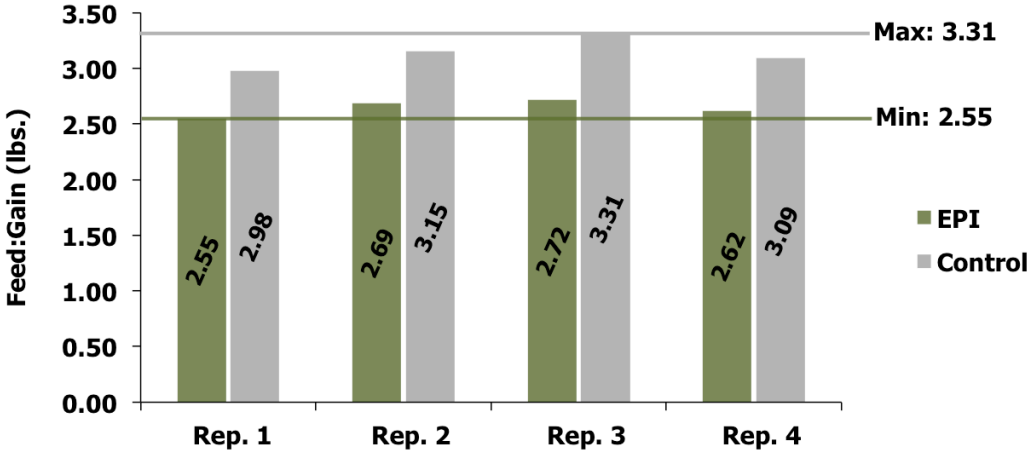

Figure 2. Feed conversion for 4 replications of each EPI and control groups (total head = 9,143)

The EPI group had approximately 49 % the mortalities of control groups across all replications.

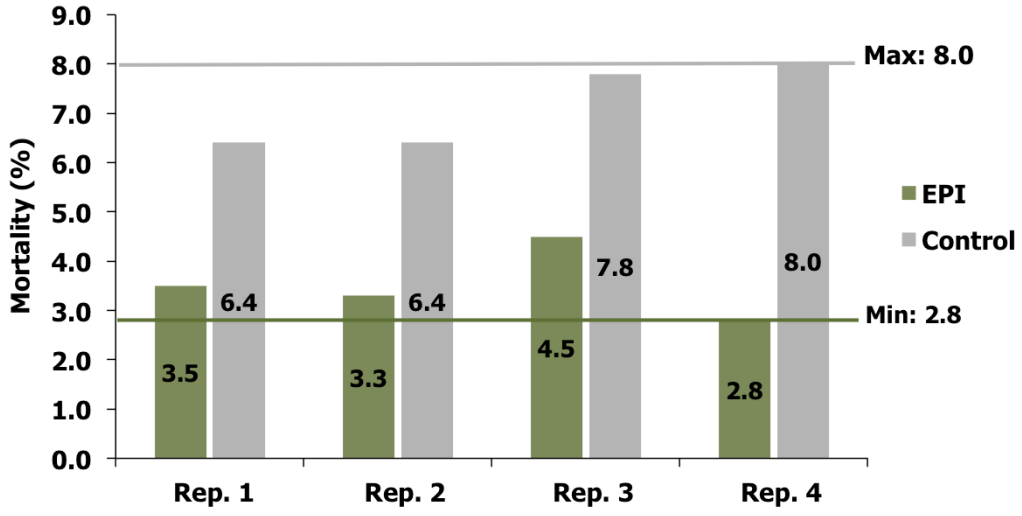

Figure 3. Mortality for 4 replications of each EPI and control groups (total head = 8,388)

It is important to note that there are several sources of variation in this data. First, since EPI and control were not conducted within the same barn at the same time it is not possible to rule out barn and management variation. Although each treatment within a replication-started test on the same day, the end test date differed as much as 21 days. Ending weight within replications differed as much as 17 lbs. Despite these potential sources of variation, EPI Air® seems to hold promise that, by improving air quality in the barn, disease can be reduced and performance enhanced.

Literature Cited

Colina, J.J., A.J. Lewis, and P.S. Miller. 2000. A Review of the Ammonia Issue and Pork Production. 2000 Nebraska Swine Report. p 24. Accessed 6 Jan 2014. http://pork.org/filelibrary/A%20Review%20of%20the%20Ammonia%20Issue%20and%20Pork%20Production.pdf

Rosentrater, K.A. 2004. Laboratory Analysis of an Electrostatic Dust Collection System. Agricultural Engineering International: the CIGR Journal of Scientific Research and Development. V6.

Vansickle, J. 2013. Stopping dirty air may stymie PRRS. National Hog Farmer. Nov. 15, 2013. Accessed: 8 Jan. 2013. http://viewer.zmags.com/publication/67fff8ad#/63979928/1