Economic evaluation of air filtration in large sow herds in North America
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Air filtration systems implemented in large sow herds have been demonstrated to decrease the probability of having a PRRSV outbreak. However, a large economic study comparing real production data from both filtered and non-filtered farms has been never been completed in order to assess the profitability of this investment. In 2010, the 14 filtered and 6 control participant herds were enrolled from a contemporaneous PRRSV epidemiological study. Repeated measures of quarterly production data, weather, PRRSV outbreak in the period together with air filtration status and number of different pig sites within 3 miles, were the variables analyzed in the longitudinal mixed model. Data management and statistical analysis was performed with a Statistical Analysis System (SAS) version 9.1. The retrospective and prospective timeline study was Oct 2004 to June 2011. For the cost analysis, three scenarios were compared in a spreadsheet model of weaned pig cost on a representative 3,000-sow non-filtered farm with feed cost of $278/sow/year: (1) control; (2) filtered conventional attic; and (3) filtered tunnel ventilation. Scenario 1 was based on the data from control and pre-filtration periods of the future filtered farms. Scenarios 2 and 3 were identical except that the initial filtering equipment cost $150/sow for the conventional versus $200/sow for the tunnel. Filtration was assumed to change pigs weaned/sow/year, farrowing rate, female replacement rate, female death rate, veterinary expenses, and the annualized cost of replacing pre-filters every six months and replacing filters every three years. Filtered farm produced 6,028 more piglets than non-filter farm and the payback period for the investment was estimated in the model as 5.5 years for scenario 2 and 6.4 years for scenario 3. However, this could be considered a conservative estimation because no value penalty in selling PRRSV positive piglets was accounted for.