Finishing pigs were fed distillers dried grains with solubles (DDGS) to evaluate the effects on pig performance, manure characteristics, and odorous emissions. Three isocaloric, isonitrogenous diets containing 0, 5, or 10% DDGS were fed during six 4-wk feeding periods. Week 1 served as a diet adjustment period. Animals were housed in feeding rooms (6 pigs/room) with one treatment per room. Each room was equipped with a 2.4 m × 2.4 m pen, a self-feeder, a nipple waterer, and an individual manure pit. A new group of animals (average initial BW = 86 kg) was used for each feeding period. Diets were replicated four times. Pits were cleaned once weekly (d 7). Samples collected weekly on d 4 and 7 from each room were manure pit samples, air samples for electronic nose evaluation (1-L Tedlar bags), air samples for olfactometry analysis (10-L Tedlar bags), and air samples adsorbed onto solid phase microextraction fibers for gas chromatography-mass spectrometry analysis (GC-MS).

No differences in animal performance (P > .05) or manure characteristics (P > .10) were observed. Increasing dietary content of DDGS increased odor intensity non-significantly (P = .16). Sixteen compounds, primarily non-sulfur protein metabolites, were quantified in room air samples by GC-MS. Using these compounds, an equation was generated to predict odor dilution threshold. Poor prediction capability (R² = .23) indicates that additional analytes require consideration, although repeated occurrence of other analytes in air samples was not evident from GC-MS analyses. Electronic nose evaluation of room air samples was not strongly correlated to olfactometry measures (r = .18). The equation developed from GC-MS analyses was capable of predicting the electronic nose response to air samples (R² = .81). Results suggest that human responses may be based on detection of compounds not included in GC-MS quantification procedures and not well detected by the electronic nose. Variation in response within and among panelists may account for some of the discrepancy between human assessment and chemical and instrumental methods of odor evaluation.