Title: Evaluation of influenza dynamics in exhibition swine at jackpot shows – **NPB #16-082**

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Scientific Abstract:

Pigs play a critical role in the ecology and epidemiology of influenza A viruses (IAVs) by serving as a source of novel reassortant viruses infecting humans. Agricultural fairs and livestock exhibitions create an environment conducive to zoonotic IAV transmission by commingling pigs and people for a prolonged period, resulting in a dramatic increase in the number of documented variant influenza A cases in people during 2011-2016. The epidemiological investigations into the 306 reported human cases of variant H3N2 influenza A (H3N2v) that occurred in 2012 linked the majority of them to human-swine exposure occurring at fairs. Research conducted by this study team provided molecular confirmation of zoonotic H3N2v transmission at county fairs in addition to evidence that IAV infections are common among apparently healthy swine at agricultural fairs.

H3N2v outbreaks in 2011-2016 show that swine infected with IAV at fairs and livestock exhibitions are a public health threat. Reducing zoonotic transmission of IAV between pigs and people is crucial to both agriculture and public health. Swine industry leaders and public health officials are seeking strategies to reduce intra- and inter- species transmission of IAV at swine exhibitions. The ultimate objective of this proposal is to provide new knowledge and insight into the dynamics of IAVs circulating in exhibition swine that can be used to make evidence based recommendations to prevent cases, outbreaks, epidemics, and/or pandemics caused by swine-to-human transmission of IAV occurring at agricultural fairs and livestock exhibitions.

In order to estimate the prevalence of IAV among swine at jackpot shows, nasal wipes were collected from 85-600 pigs per show at 21 selected jackpot shows, resulting in a total of 3,754 samples representing pigs from 37 states.

Overall, 3% of samples tested from swine at jackpot shows were positive for influenza A virus. In comparison, 12.3% of exhibition swine tested during the 2016 agricultural fair season were shedding active influenza A virus. The reduced prevalence of IAV in pigs within the jackpot circuit as compared to agricultural fairs could be due to the shortened period of

time in which the pigs are co-mingled. A majority of jackpot shows are one to two days, with many pigs being housed within trailers rather than exhibition barns to minimize contact with other animals and their infectious diseases. A decrease in IAV prevalence due to the shortened show duration could be extrapolated as the effects of implementing a 72 hour rule at agricultural fairs, as is recommended in the “Measures to Minimize Influenza at Swine Exhibitions” document. Disseminating related data through relationships built through sample collection activities could elicit change throughout the swine exhibition network as individuals see the impact paradigm shifts could have on animal and public health at their local swine exhibitions.