Association between biosecurity, productivity and antimicrobial use in Danish pig herds

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Biosecurity is a key element of good farming practice and considered important to prevent disease spread within and between pig herds. Increased prevalence of disease in a pig herd usually results in decreased productivity and increased use of antimicrobials. One prevention strategy is to increase the focus on biosecurity. However, how effective is this?
This study aimed at elucidating the association between biosecurity, productivity measures and antimicrobial usage at farm-level. In total, 159 Danish conventional pig herds with sows and weaners (7-30 kilos) were included in the study.
For assessment of biosecurity on these farms, each farm owner or responsible operator was phone-interviewed in August-November 2015, using the questions from the online biosecurity scoring system Biocheck.ugent®. Biocheck provided assessment of both internal and external biosecurity, using pre-weighted questions about the practices and procedures in a farm, divided into different sub-categories. Productivity data (e.g. average daily gain, feed conversion ratio, and mortality) from 2014 from each of these herds were kindly provided by SEGES in Denmark. In line, the total antimicrobial prescription in the same year was extracted from the Danish VetStat Database, and used as a measure of the antimicrobial usage, given in Animal Daily Doses (ADD).
The assessment of the biosecurity in Danish pig herds revealed that the average level of external biosecurity was higher (86% out of max 100%) than the internal biosecurity (67% out of max 100%). This is probably a result of the Danish SPF (Specific Pathogen Free) system; a health and production system with high focus on external biosecurity. Today, 78% of Danish sow herds are enrolled in the SPF system and the experience is that the remaining herds are also following many of these rules regarding for example purchase of animals, transportation, pest control and supply of water and feed. Furthermore, the level of external and internal biosecurity was higher in Denmark compared to other EU countries that have also been using Biocheck.
The association between the productivity and antimicrobial usage outcomes and the biosecurity scores from Biocheck will be evaluated using linear regression models including potential confounders such as herd size and herd health status. The results from the on-going statistical modeling will show to which extent the biosecurity measures were associated with the level of antimicrobial use and productivity in herds.
All results from this study will be ready for presentation at the IPVS 2016.

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