



Implementing biosecurity practices in intensive animal production systems

TEAGASC researchers are using risk-based scoring indexes to quantify biosecurity measures on pig and poultry farms.

Background

Biosecurity can be defined as the implementation of measures that reduce the risk of introducing infectious disease agents (i.e., external biosecurity) and minimise the spread of those already present in the farm (i.e., internal biosecurity).

Infectious agents cause significant health problems and contribute substantially to the use of antimicrobials, compromising sustainability of animal production. Implementation of biosecurity practices ensures healthier animals, high standards of food safety and food security, and reduces the environmental impact of animal production.

Although some biosecurity principles apply to all farming systems and infectious diseases, biosecurity plans tailored for specific farming systems are important to target particular diseases. While factors such as perceived costs and labour requirements could influence the decision to implement certain biosecurity practices, producers are

more inclined to implement those that can be expected to improve animal performance and increase profit. Risk-based scoring indexes (e.g., Biocheck.UGent) have been developed to provide an objective way to quantify biosecurity status and harmonise recommendations. Such scoring systems are good for benchmarking, and to provide useful information to farmers, veterinarians and pig advisors on which areas of biosecurity could be improved.

The Department of Agriculture, Food and the Marine- (DAFM) funded project Surveillance Welfare and Biosecurity of Farmed Animals (SWAB) is investigating biosecurity practices implemented in Irish pig and poultry farms, and their associations with animal performance and antimicrobial use.

To date, we have analysed biosecurity practices in 56 farrow-to-finish pig farms, and we are getting ready to start the biosecurity assessment of 50 broiler farms.

Biosecurity in pig farms

Pigs are raised mostly indoors in buildings that are specialised for each age (i.e., sows, piglets, growing pigs). Implementation of biosecurity in pig farms is associated with better growth, improved health, and reductions in the use of antimicrobials. This is particularly important since pigs are the main farm species to which antibiotics are administered, especially in-feed antibiotics for preventive purposes. Results from the Biocheck.UGent questionnaire in Ireland showed that in pig farms, external biosecurity practices are implemented more often and internal biosecurity practices seem to be regarded as less important (Rodrigues da Costa *et al.*, 2019). Implementing biosecurity practices related to feed, water and equipment supply, and practices related to disease management and hygiene between buildings, was associated with lower growing pig mortality.

When examining associations with antimicrobial usage, our results highlight the usefulness of cleaning, disinfection, and farm compartmentalisation to reduce the use of antimicrobials in pig farms. We observed lower antimicrobial use in farms where farm staff wore farm-specific clothing and shoes, washed their hands before entering the stables, and in farms where footbaths were installed at the entrance to each building. Antimicrobial usage was also lower in farms where pigs were kept with higher space allowance during the growing stage.

Regularly cleaning the storage bin for casualty pigs (i.e., dead and euthanised pigs), and wearing gloves when manipulating casualty pigs, were associated with lower antimicrobial usage. The good news is that many of these practices could be easily implemented on farms with relatively low costs.

Biosecurity in poultry farms

Poultry production is a highly organised and intensive operation where large numbers of birds are kept in proximity. It differs from pig farms because different ages are located in different locations and so the main risk is bringing disease into the farm (external biosecurity). The importance of specific biosecurity measures in the control of particular diseases such as *Campylobacter* spp. in poultry farms has long been recognised, including those with implications for public health. Outbreaks of endemic diseases result in decreased animal performance and economic losses for producers, while epidemic diseases could affect the entire poultry production sector by necessitating the implementation of mandatory preventive measures such as quarantine or mass culling of poultry. This is particularly important in the wake of the avian influenza H6N1 outbreak we are experiencing this year in Ireland, where culling of birds has occurred in all affected flocks as per the decision of flock owners.

Nowadays, broiler chickens are produced in short production cycles (approximately 42 days) with limited treatment options and leaving little recovery time in the aftermath of a disease outbreak. In this situation biosecurity becomes key. Flock owners need to be vigilant, implement strict biosecurity practices, and review their biosecurity plans with their veterinary practitioners regularly, especially during

periods of heightened risk. Thus, we are aiming to identify easily implemented and cost-effective biosecurity practices associated with improved animal performance and reduced antimicrobial usage in broiler farms. We plan to survey at least 50 farms using the Biocheck.UGent questionnaire in the coming months, once the avian influenza H6N1 outbreak is under control.

Benefits to the industry

Biosecurity is a public good; it can benefit everybody involved in the food production chain from animals and producers to consumers of animal products. Characterisation of farm-level biosecurity practices in pig and poultry farms will result in disease prevention and reduction in antimicrobial usage, thereby improving farm sustainability.

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References

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