



Good respiratory health improves profitability of Irish pig farms

TEAGASC research used data from the Irish national sow herd to quantify the impact of common pathogens on financial viability.

Background

Pathogens such as porcine reproductive and respiratory syndrome virus (PRRSv), swine influenza virus (SIV) and *Mycoplasma hyopneumoniae* (*M. hyo*) are common in intensive pig production systems worldwide. These pathogens are part of what is known as the porcine respiratory complex, and are responsible for the diseases commonly known as blue ear, swine flu and enzootic pneumonia, respectively. Although the presence of the pathogen does not necessarily mean the development of the disease, herds with endemic disease always suffer effects on profitability that are not well understood and might not be evident to producers. There are few reports regarding these financial losses and most of them come from the USA. Differences in production systems, costs of production, revenue streams and other assumptions incorporated into North American studies mean that the results are not easily comparable to European pig production systems. Moreover, the majority of existing reports used data from experts and/or from the scientific literature for their financial estimations, which might not reflect current market conditions. In this study we used farm data representing 30 % of the Irish national sow herd to quantify the financial impact of positive herd status for PRRSv, SIV and *M. hyo*.

Bio-economic analysis

We incorporated the effect of PRRSv, SIV and *M. hyo* on key performance indicators into the Teagasc Pig Production Model

(Calderón Díaz *et al.*, 2019), a bio-economic simulation model for farrow-to-finish pig farms. We simulated the performance of an average Irish sow farm with either negative or positive status for each of the respiratory pathogens for an entire year. The number of pigs in each production stage was calculated each week within the model based on the mortality rates for different production stages. All pigs were slaughtered once they reached 110.8 kg bodyweight. Time to reach target slaughter weight varied depending on disease status. For all scenarios, farms that had negative disease status provided the baseline data for comparison of results with farms with positive disease status.

The differences between studies may be, in part, due to the different production systems and different modelling approaches, as we used actual farm data.

Financial implications of respiratory pathogens

Feed costs during the wean-to-finisher period account for almost 60 % of the total cost of production on a pig farm. Feed costs per

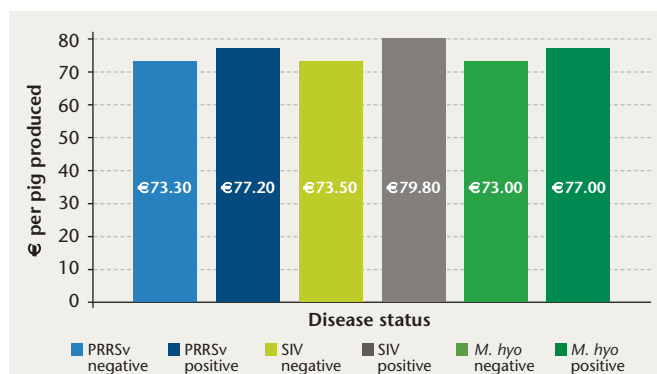


FIGURE 1: Feed costs (€ per pig produced) on farms with either negative or positive status for PRRSv, SIV and M. hyo.

pig were 5.3 %, 8.6 % and 5.5 % greater in PRRSv-, SIV- and M. hyo-positive farms, respectively, compared with negative farms (Figure 1). This was due to lower average daily gain in farms with positive disease status, and thus, pigs required more time to reach target slaughter weight. Dead animal disposal was also greater in farms with positive disease status, reflecting greater mortality rates in the different production stages. Greater mortality rates also translated into less income: PRRSv-, SIV- and M. hyo-positive farms sold 3.8 %, 1.4 % and 5.3 % fewer pigs per year, respectively, than farms with negative disease status.

Greater variable costs and smaller sales reduced net profit in farms with positive disease status (Figure 2). The financial losses observed in this study for PRRSv, SIV and M. hyo are greater than those reported in US production systems. The differences between studies may be, in part, due to the different production systems and different modelling approaches, as we used actual farm data. This demonstrates the importance of using a bio-economic model that is capable of simulating the particular Irish pig production system and market conditions. Finally, contrary to reports from the USA, greater financial losses were associated with positive disease status for M. hyo than for PRRSv in Irish pig farms. This was mainly attributed to a greater reduction in income in M. hyo-positive farms compared with PRRSv-positive farms in Ireland. Alternatively, it is possible that the North American PRRSv genotype causes more severe respiratory disease in pigs compared with the European PRRSv genotype.

Benefits to the pig industry

Our results provide information regarding the adverse effects of the presence of respiratory pathogens on farm profitability, and highlight the importance of disease prevention on Irish pig farms. Disease prevention strategies should include improved biosecurity practices (e.g., reduced stocking density, better ventilation) to avoid introducing respiratory pathogens into the herd and controlling their effects once they have been introduced.

Furthermore, our results should encourage farmers to implement disease eradication programmes to minimise the adverse economic effects of infection with respiratory pathogens, especially when prices are low.

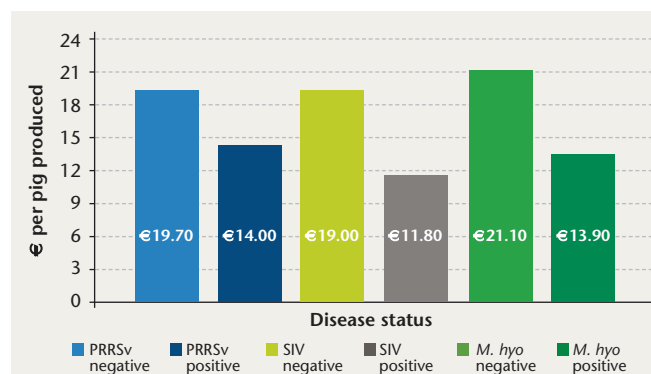


FIGURE 2: Net profit (€ per pig produced) on farms with either negative or positive status for PRRSv, SIV and M. hyo.

Acknowledgements

The project was funded by the Department of Agriculture, Food and the Marine under the Research Stimulus Fund (grant no. 14/S/832). Maria Rodrigues da Costa (Teagasc), Jarkko Niemi (LUKE), Ilias Kyriazakis (Newcastle University) and Rose M. Fitzgerald (CIT) are also collaborators on this project.

References

Calderón Díaz, J.A., Shalloo, L., Niemi, J., Kyriazakis, I., McKeon, M., McCutcheon, G., et al. (2019). 'Description and validation of the Teagasc Pig Production Model'. *Journal of Animal Science*, 97: 2867-2885.

Authors

Julia A. Calderón Díaz

Postdoctoral Research Fellow, Pig Development Department, Teagasc Animal & Grassland Research and Innovation Centre, Fermoy, Co. Cork
Correspondence: julia.calderondiaz@teagasc.ie

Laurence Shalloo

Principal Research Officer, Livestock Systems Department, Teagasc Animal & Grassland Research and Innovation Centre, Fermoy, Co. Cork

Finola Leonard

Associate Professor, School of Veterinary Medicine, University College Dublin

Edgar García Manzanilla

Head of Pig Development Department, Teagasc Animal & Grassland Research and Innovation Centre, Fermoy, Co. Cork

