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Evaluation of current feeding and management practices in Irish pig production and future strategies for improvement



Key external stakeholders:

Pig farmers, nutritionist and veterinarians, Teagasc advisors, meat processors, DAFM

Practical implications for stakeholders:

- The main areas affecting productive performance of pig farms (feeding practices, biosecurity and health status) were investigated and their effect on productive performance was quantified. The main factor affecting production efficiency is respiratory disease, while feeding practices and biosecurity are less important in terms of improving performance.
- Presence of PRRS and high levels of pleurisy is related to important reductions in efficiency in Irish pig farms and should be the main focus to improve farm economic sustainability.

Main results:

- The external biosecurity score was higher than most EU countries and the internal biosecurity score was similar to those. Practices related to the environment and region, feed, water and equipment supply, and the management of the different stages need to be particularly addressed in poor performing farms to improve productivity.
- There is a wide variety of feeding practices in Irish pig farms with 42.9% of the farms home-milling at least one diet and 51.8% of the farms feeding wet diets at some stage from weaning to slaughter. Only 21.4% of the farms are phase-feeding. Feeding practices from weaning to slaughter explain 39% of feed cost variability.
- The prevalence of SIV, PRRSv, MHyo and APP in Ireland is similar or lower than in other EU countries. The national average prevalence of pleurisy and pneumonia is one of the lowest compared to those reported in peer-reviewed publications.
- Productive performance was more affected by respiratory disease when compared to the impacts of biosecurity and feeding practices. The studied biosecurity and feeding strategies are directly manageable by farmers, while respiratory disease is not.

Opportunity / Benefit:

Controlling respiratory disease and increasing health status is deemed to impact on productive performance the most with up to 50% of variability between farms explained and around 100g/pig/day average potential improvement. Record keeping and monitoring is essential to diagnose production losses.

Collaborating Institutions:

UCD, DAFM, UAB (Spain), CIT, University of Minnesota (USA).



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1. Project background:

In Ireland, pig production is the third biggest agricultural activity in economic output (DAFM, 2016), and there are approximately 149,900 breeding sows producing an estimate of 4,000,000 pigs per year (CSO, 2017). While these figures are small compared to other countries, the average herd size (number of sows) is one of the largest in the European Union (EU; Eurostat, 2014) and the Irish pig industry is self-sufficient by 219%.

High production costs and a low level of technical development dictate the need to improve efficiency. The Irish industry identified nutrition, animal health and management as key inputs for productivity (DAFM, 2016). The feed cost in Ireland is one of the highest among the twenty countries belonging to the InterPIG network (AHDB, 2017) and the current price fluctuations mean that farmers must reduce their production costs to remain in the market. On the health side, the control of endemic diseases (i.e. PRRSv), the prevention of introduction of exotic diseases, such as Porcine Epidemic Diarrhoea virus (PEDv), and the reduction of the use of antimicrobials are the main challenges (DAFM, 2016).

Gathering and using information is the key for the fast progress of any industry. Teagasc Pig Development Department holds a national database (Teagasc e-ProfitMonitor [ePM]) for production performance, comprehending data from more than one third of the Irish pig farms. However, no other farm information (i.e. feeding system, age of the facilities, herd health status and pig health protocols) is recorded in the system and would produce a significant amount of information for decision making if combined with operational data from farms as proposed in this project.

2. Questions addressed by the project:

- What are the main factors affecting pig production in Ireland?
- What is the effect of these factors on productive performance in Irish pig farms?

3. The experimental studies:

The objective of this study was to assess the main factors affecting pig production in Ireland and its effect in productive performance in Irish pig farrow-to-finish farms. A cross-sectional study was designed to gather data on biosecurity and feeding practices (with on-farm interviews), and on respiratory health (through slaughterhouse assessments and sample collection). Farms providing data to the e-ProfitMonitor were recruited through the Teagasc advisory service and their productive performance for the years 2016 and 2017 was collated. A total of 56 farrow-to-finish pig farms, representing approximately 30% of the national breeding herd, were enrolled in the study. The effects of biosecurity practices, feeding practices, and respiratory disease on productive performance on farm were analysed.

4. Main results:

- The level of biosecurity in Irish pig farms is similar to that of other European countries. The external biosecurity score, was higher than most countries and the internal biosecurity score was similar to those, although it has great variability among farms. Practices related to the environment and region, feed, water, and equipment supply and the management of the different stages, need to be particularly addressed in poor performing farms to improve productivity.
- There is a wide variety of feeding practices in Irish pig farms with 42.9% of the farms home-milling at least one diet and 51.8% of the farms feeding wet diets at some stage from weaning to slaughter. Only 21.4% of the farms are phase-feeding. Sow culling and mortality is associated with sow and gilt feeding practices. Feeding practices from weaning to slaughter explain 29 and 27% of the variability in ADG (g/day) and finisher mortality (%), and 39% of feed cost variability.
- The prevalence of SIV, PRRSv, MHyv and APP in Ireland is similar or lower to those in other European countries. The prevalence of lung lesions at slaughter was variable, with the national average prevalence for pleurisy and pneumonia figuring as one of the lowest compared to those reported in peer-reviewed publications. The prevalence of milk spots in the liver is higher than in other countries.
- Productive performance was more affected by respiratory disease when compared to the impacts of

biosecurity and feeding practices. The studied biosecurity and feeding strategies are directly manageable by farmers, while respiratory disease is not.

- There needs to be more coordination in the team responsible for each farm (farmer, employees, veterinarians, nutritionists and advisors). The data collection at farm and at slaughter is useful at many levels and should integrate larger databases, providing meaningful advice and feedback to farmers.

5. Opportunity/Benefit:

The current study has demonstrated that respiratory disease greatly affects productive performance in Irish pig farms. Improving the farm health status, using good biosecurity practices to safeguard it and optimizing feeding strategies to increase feed efficiency, will lead to increased productivity and financial returns.

6. Dissemination:

During the life time of this project, key findings of the study were presented to the Irish pig farmers and industry representatives at the Teagasc Pig Research Dissemination Days in 2016, 2017 and 2018. The findings of the research conducted were also compiled in three scientific publications, two of which have already been submitted to peer-review. The communication of the results was further disseminated through communications in national and international conferences. In addition, popular press articles (Teagasc Pig Newsletter) and discussion groups moderated by Teagasc advisors also met the purpose of disseminating the results. The research results were also disseminated via in-service training to Teagasc Advisory staff.

Main publications:

Rodrigues da Costa M, Gasa Gasó J, Calderón Díaz JA, Postma M, Dewulf J, McCutcheon G, Manzanilla EG, 2018. Using the Biocheck.UGentTM scoring tool in Irish farrow-to-finish pig farms: assessing biosecurity and its relation to productive performance. *Porcine Health Management* (In press).

Rodrigues da Costa M, Gasa J, Calderón Díaz JA, McCutcheon G, Manzanilla EG, 2018. Describing feeding practices on Irish farrow-to-finish pig farms and its effects on productive performance: results of a cross-sectional sample at country level. (In preparation).

Rodrigues da Costa M, Rovira A, Torremorell M, Fitzgerald R, Gasa J, O'Shea H, Manzanilla EG. Use of vaccination status, serology and slaughterhouse checks to predict the effect of respiratory disease on productive performance in pig farms. *Journal of Animal Science* (Submitted)

Popular publications:

Rodrigues Da Costa M, O'Neill L, Calderón Díaz JA, Gasa J, McCutcheon G, Boyle LA, Manzanilla EG, 2018. Main factors affecting efficiency in Irish pig farms: overall conclusions from a representative sample. Teagasc Pig Research Dissemination Day.

Rodrigues Da Costa M, Calderón Díaz JA, McCutcheon G, Manzanilla EG, 2017. Main management practices in Irish pig farms and their effect in performance. Teagasc Pig Research Dissemination Day.

Rodrigues da Costa M, Calderón Díaz JA, Manzanilla EG, 2016. Biosecurity in farrow-to-finish Irish pig herds. Teagasc Pig Research Dissemination Days.

Rodrigues da Costa, M. 2016. National Biosecurity: A look into the best practices of biosecurity in other countries and recommendations for the Republic of Ireland, Irish Pig Health Society Symposium.

7. Compiled by: Dr Edgar Garcia Manzanilla / Dr. Maria Rodrigues da Costa