53. The UK Voluntary Monitoring Schemes for Pig Health and Welfare: working towards improved health status

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Abstract

A pork industry with high health status will have less disease, use fewer antibiotics and present less risk to public health. The United Kingdom has three voluntary pig health schemes (PHS); Wholesome Pigs Scotland (WPS) in Scotland, the BPEX Pig Health Scheme (BPHS) in England and Wales and the Pig Regen health and welfare checks (NIH&W). They capture information on different macroscopic conditions detected in slaughter pigs. In this study, the prevalence, seasonal variations and year trends of eight conditions as assessed by these PHS were compared and evaluated. Data collected between July 2005 and December 2012 were used. In total 2,061,779 pigs, from 4,420 pig units in 46,321 batches of pigs supplied to 25 abattoirs were examined. The respiratory conditions assessed were: enzootic pneumonia-like lesions, pleurisy, pleuropneumonia, abscesses in the lung; while the non-respiratory conditions were: pericarditis (PC), milk spots (MS), papular dermatitis (PD) and tail biting. The shape of year and seasonal effects among schemes were visualised and the effects were quantified across schemes. The shapes of year trend differed between the PHS for respiratory conditions but were similar for non-respiratory conditions. WPS and NIH&W had a lower prevalence of respiratory conditions than BPHS. This was also observed for PC and PD; however, BPHS had a lower prevalence for MS compared to the other schemes. Non-respiratory lesions showed marked seasonal effects. Continuous standardised monitoring of lesions at slaughter is an effective tool for monitoring disease incidence. Early detection of changes, when combined with comparison of similar schemes in countries with a similar profile of pig production and management, could enable prompt investigation and ultimately lead to 'safer' pork.

Introduction

Coordinated industry-wide pig abattoir lesion scoring has been implemented in the United Kingdom (UK) with the development of health schemes: Wholesome Pigs Scotland (WPS) commenced in 2003, and the BPEX Pig Health Scheme (BPHS) and health checks in Northern Ireland (NIH&W) both commencing in 2005. These pig health schemes (PHS) report the presence of macroscopic conditions detected in the slaughtered pigs, many of which have been associated with a reduction in performance traits and consequent increases in production costs. The cornerstone of these health schemes' success has been the frequent feedback of benchmarked results from routine abattoir inspections to the participating producers and their herd veterinarians, helping to increase their awareness of the occurrence of subclinical diseases in their farms (Sanchez-Vazquez et al, 2011). Scheme data is considered useful at producer level as it can be used to assess the presence, severity and response to interventions for different diseases over time, using macroscopic lesions as a proxy for disease (Jager et al, 2012). This study compares the prevalence of four respiratory (enzootic pneumonia (EP) like lesions, pleurisy, pleuropneumonia and abcesses in the lungs) and four non-respiratory (milks spots (MS), papular dermatitis (PD), tail bite and pericarditis (PC)) conditions assessed by the three PHS in UK, assessing the seasonal variations and year trends associated with the conditions in each scheme. The aim is to highlight and draw the attention of respective stakeholders to conditions that may not have responded to control efforts, conditions that may be the target of future control measures and areas where further research is needed. The study also highlights the differences in prevalence for each condition across the countries covered by the schemes – England and Wales, Scotland and Northern Ireland (NI). The

shapes of year trend differed between the PHS for respiratory conditions but were similar for non-respiratory conditions. WPS and NIH&W had a lower prevalence of respiratory conditions than BPHS. This was also observed for PC and PD; however, BPHS had a lower prevalence for MS compared to the other schemes. Non-respiratory lesions showed marked seasonal effects.

Material and Methods

Data sources

The BPHS, the WPS, and the Northern Ireland (NI) health and welfare surveillance scheme gather information on several pig health and welfare conditions assessed at abattoirs. Data collected by these schemes between July 2005 and December 2012, from 4,420 slap marks in 46,321 batches of pigs supplied to 28 abattoirs spread across the UK, were used in this investigation. In total 2,061,779 pigs were examined.

The WPS scheme commenced in 2003 in Scotland and monitors the incidence of post-mortem pathologies in slaughtered pigs. Twelve conditions are assessed at the abattoir. Data were gathered in this scheme by independent assessors who assess every other pig on the slaughter line up to a maximum of 150 per batch. The detailed operation of the scheme has been described previously (Sanchez-Vazquez et al, 2011). Between July 2005 and December 2012, the scheme examined about 170,233 pigs in seven abattoirs supplied by 347 slap marks in 3,087 batches.

The NI Pig Regen Ltd. health and welfare checks were performed in selected abattoirs on average quarterly since 2005. Data were not available for 2007. The scheme assesses eight conditions. Within the 7.5 years period 189,172 pigs were examined in Northern Ireland. These pigs were slaughtered in four abattoirs, supplied by 498 slap marks in 2718 batches.

The BPHS started in July 2005 with the aim of monitoring the occurrence of post-mortem gross pathology in clinically healthy pigs in England and Wales. The scheme monitors the same conditions as the WPS. A sample (up to a maximum of 50 pigs) is selected from each batch by assessing every other pig on the slaughter line. The detailed operation of BPHS has been described previously (Sanchez-Vazquez et al, 2011). Within the seven and half years of the scheme's operation, a total of 1,702,374 pigs supplied to 17 abattoirs from 3,575 slap marks in 40,516 batches were examined.

Data analysis

Two approaches were used to study the temporal patterns of the conditions assessed in the three schemes. The semi-parametric generalised additive model was used to obtain the smooth effects of season and trend for each condition in order to visualise the shape or pattern of these effects and compare overall prevalence estimates among schemes. The generalised linear mixed model was then used to quantify these effects and compare differences between annual trend and seasonal effects across schemes. Further details about the methods used and the results can be found in Eze et al (2015).

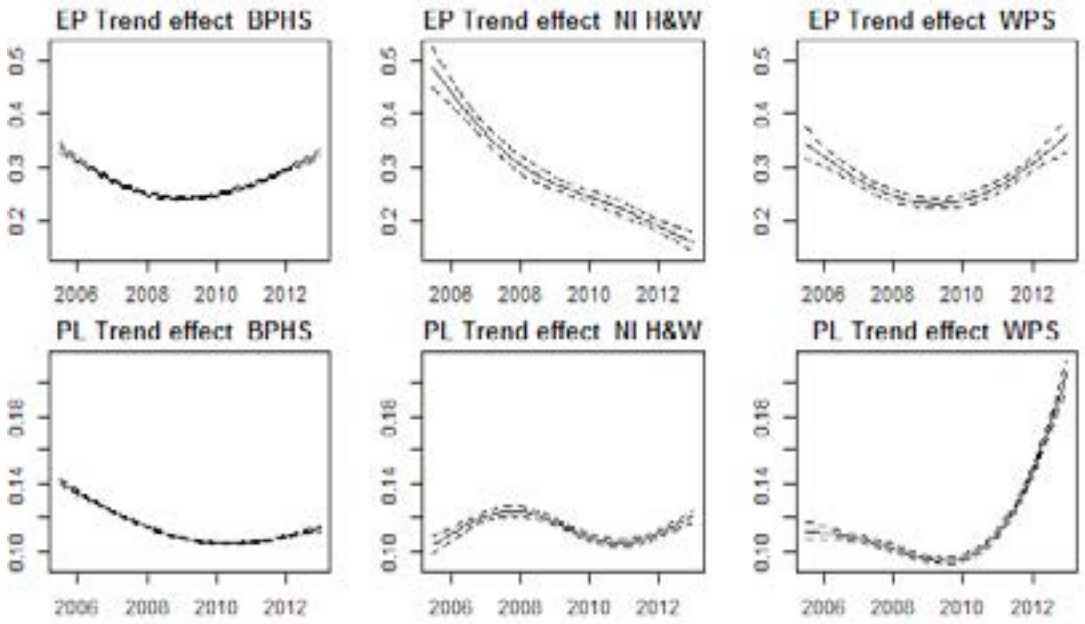
Results

Respiratory disease

Enzootic pneumonia-like lesions was the most prevalent condition in the three schemes with the highest prevalence observed in BPHS followed by WPS. The trend in prevalence of EP-like lesions was similar for BPHS and WPS but differs for NIH&W (Figure 1). The pleurisy prevalence trend pattern was similar to that of

EP-lesions in BPHS while in WPS a marked increase in trend was apparent since 2010 (Figure 1). In NIH&W, the trend for pleurisy peaked in 2008 with evidence of a recent smaller peak in 2012 (Figure 1). Seasonal patterns for prevalence of EP-like lesions were similar in BPHS and NIH&W where prevalence was highest in winter and lowest in summer. For WPS, the lowest prevalence was observed in winter and highest in autumn. There is a high degree of uncertainty around the seasonal estimates of EP-like lesions in NI H&W and WPS schemes due to the low frequency and timing of data collection compared to BPHS. The seasonal shapes of pleurisy prevalence were similar in the three schemes. Prevalence was highest in winter and lowest autumn. Lower odds of respiratory conditions were observed in NIH&W and WPS when compared to BPHS. This was statistically significant for all respiratory conditions in WPS and for EP-like in NIH&W.

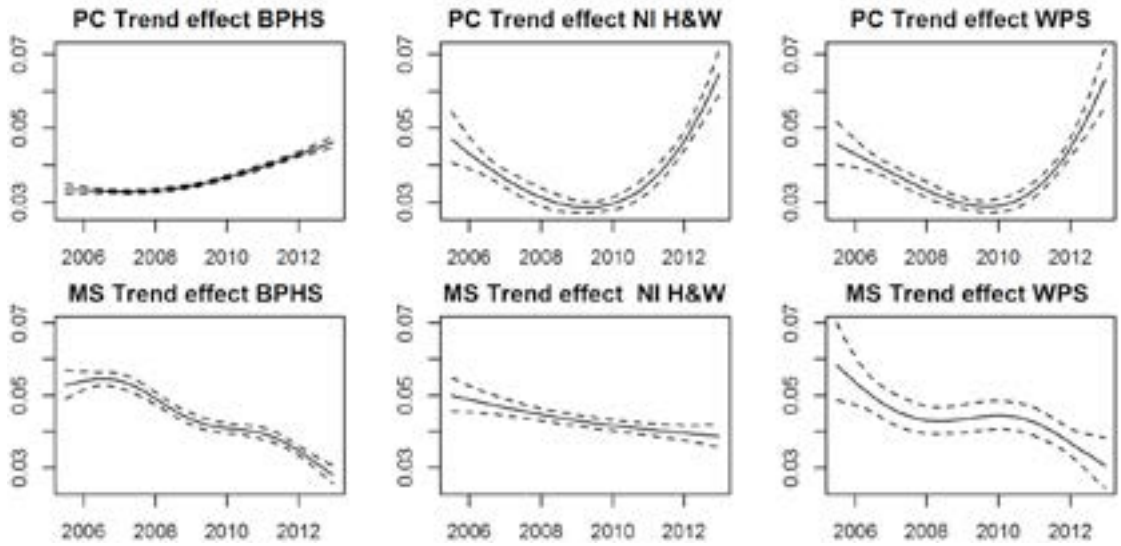
Figure 1 : Annual trend for enzootic pneumonia-like lesions (EP) and pleurisy (PL). The dotted lines are the 95% confidence interval.



Non-respiratory disease

A declining annual trend in the prevalence of liver MS was observed in the three schemes (Figure 2). Although annual prevalence was higher in NIH&W, prevalence decreased over the years in all the schemes but at different rates. The prevalence of PC rose in all three schemes from 2008-9 onwards (Figure 2). The annual pattern of prevalence was similar in NIH&W and WPS where prevalence declined between 2005 and 2010 but had increased on average between 2010 and 2012. The proportion of cases of PD decreased in the three schemes between 2005 and 2012 but there was evidence for resurgence in WPS in the period 2008-2010 before resuming the declining trend. The annual trends for tail damage were similar in WPS and NIH&W where prevalence steadily increased since 2008. For BPHS, the prevalence of tail damage cases declined through the study period. The seasonal shapes of liver MS were similar in the three schemes with prevalence peaking in the autumn and lowest in the spring. Also, the pattern of seasonal influence on PC prevalence was similar in the three schemes where prevalence peaked between spring and summer with troughs in the winter. Significantly fewer cases of PC and PD were observed in BPHS than was seen in NIH&W and WPS. Liver MS lesions were significantly more prevalent in NIH&W compared with the BPHS and WPS.

Figure 2: Annual trend for pericarditis (PC) and milk spots (MS). The dotted lines are the 95% confidence interval.



Discussion

For Scotland, there was an overall increase of respiratory conditions since 2009. England and Wales have shown the same increasing trend on respiratory conditions since 2009 mainly due to EP-like and pleurisy lesions. While Northern Ireland shows a decrease over time, except for pleurisy. Further research is needed to investigate the reasons for these divergent trends observed between schemes particularly for EP-like lesions and pleurisy. The prevalence of liver milk spots and papular dermatitis decreased over the years in the three schemes, while pericarditis prevalence increased in most recent years and tail damage appeared to increase in a subset of the schemes. This evidence, gained from integrating farm data with abattoir monitoring, provides a good example of how such data may be taken forward to result in positive health and welfare outcomes, both at farm and regional level.

Conclusion

Continuous standardised monitoring of lesions at slaughter is an effective tool for monitoring disease incidence. Early detection of changes, when combined with comparison of similar schemes in countries with a similar profile of pig production and management, could enable prompt investigation and ultimately lead to 'safer' pork.

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