



Porcine reproductive and respiratory syndrome diagnoses in GB: 2016-17

Introduction

Porcine Reproductive and Respiratory Syndrome (PRRS) is an economically important disease of pigs also known as blue-ear pig disease which occurs world-wide. PRRS is caused by PRRS virus (PRRSV), and was first seen in Great Britain in 1991, since when PRRS due to PRRSV-1 has become one of the most important endemic diseases targeted for control in GB pigs. PRRSV is not a pathogen of public health concern as it is not transmissible to humans either directly from live pigs or indirectly from their meat/products. The disease has significant effects on pig health and welfare, contributing to porcine respiratory disease complex, neonatal piglet mortality, infertility and occasional abortion and stillbirth storms. It has an immunosuppressive effect and exacerbates other diseases including those due to bacterial pathogens and thus acts a driver for antimicrobial use.

PRRS in the UK

Disease due to PRRSV-1 emerged in UK in the early 1990s and has become endemic here, as it has in most pig-producing countries globally. PRRSV-2, a related but different virus, has never been detected in the UK pig population to date. The introduction of PRRSV-2 or PRRSV-1 strains differing from UK-resident strains, from outside the UK, is considered a potential threat to the UK pig population. Cross-immunity to PRRSV-2 would be minimal and to newly-introduced PRRSV-1 strains may be incomplete. Furthermore, some PRRSV-2 and PRRSV-1 detected in Eastern Europe have been shown to have greater virulence.

As PRRSV is a non-statutory pathogen in the UK the pig industry must make efforts to ensure that suitable precautions, including testing, are taken if live pigs or germplasm are imported so they do not risk introducing any new PRRSV strains to the UK.

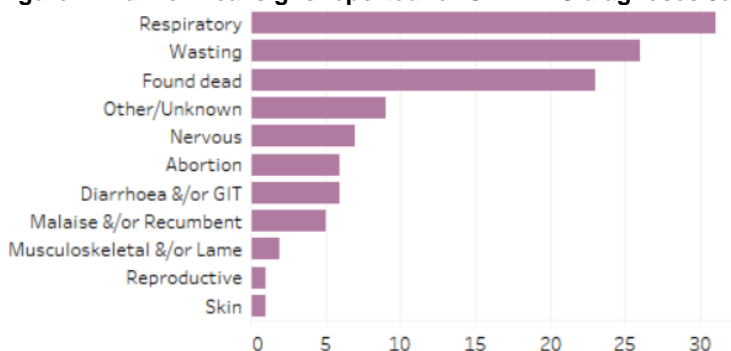
Diagnoses of PRRS in GB

All diagnoses of PRRS in GB pigs in 2016-17 were caused by PRRSV-1; this diagnostic work provides supportive evidence that PRRS-2 is absent from UK pigs.

The Veterinary Investigation Diagnosis Analysis (VIDA) database recorded 128 diagnoses of PRRS in Great Britain in 2016-2017. The majority of these outbreaks involved post-weaned pigs with systemic and/or respiratory disease. About 6% of PRRS diagnosed was of reproductive disease with histories of an upsurge of variable severity in late abortions, early farrowings, stillbirths and weak piglets at birth. Pre-weaning mortality also often increases in association with the birth of poor viability piglets, and possibly also due to the malaise and inappetence that can affect sows.

The clinical signs most commonly reported in 2016-17 PRRS diagnosed cases were respiratory, wasting and found dead (Fig. 1) which is similar to previous years. Surveillance information about GB PRRS diagnoses in this and past years back to 2012 can be found using the interactive pig disease surveillance dashboard online, which is freely available on the APHA's Vet Gateway: <http://ahvla.defra.gov.uk/vet-gateway/surveillance/scanning/disease-dashboards.htm>.

Figure 1: Main clinical signs reported for GB PRRS diagnoses January 2016-November 2017 (VIDA)



Genetic sequencing of PRRSV

PRRS virus has a high mutation rate and, over time, the genetic diversity of the virus has increased. This can lead to reduced ability of natural and vaccinal immunity to provide full protection, and a proportion of the PRRS diagnosed through the GB surveillance network in 2016-17 were reported to be in PRRSV-vaccinated pigs. Where this occurs, it is important that compliance with the vaccination protocol advised by the veterinary surgeon and timing of vaccination in relation to likely exposure to field challenge are assessed; protective immunity to PRRSV after infection or vaccination may take up to three weeks to develop.

Genetic sequencing of PRRSV can provide useful information about possible links to other diagnosed cases, or evidence of a different PRRSV strain from that previously identified on a farm. The degree of genetic difference of a field PRRS virus from current live vaccine strains cannot, in isolation, be used to predict the degree of protection that would be afforded by a vaccine to infection by the field isolate. However, in general terms, as genetic diversity increases, the probability that corresponding antigenic differences could affect immunity also increases.

PRRS may predispose to other infectious diseases

Another feature of PRRSV is its immunosuppressive effect. This and the slow development of effective immunity to PRRSV are likely to be reasons for the concurrent diseases commonly diagnosed together with PRRS which extend the range, and exacerbate the severity, of clinical signs. In 2016-17, the most common diagnoses made together with PRRS were streptococcal disease (mainly *Streptococcus suis*), *Pasteurella multocida*, swine influenza and salmonellosis. Proactive testing for PRRSV is important; sometimes gross lesions may arouse suspicion of PRRS involvement (Figure 2A), but sometimes they do not, as illustrated in Figure 2B where PRRS involvement in the pneumonia was confirmed together with *Haemophilus parasuis*.

Veterinarians are aware that PRRS can act as a driver for antimicrobial use as bacterial disease is prominent amongst the concurrent diagnoses. Controlling or better, if possible, eliminating PRRS is an important component of current initiatives to reduce antimicrobial use in pigs. Full diagnostic testing allows identification of pathogens present and causing disease on individual farms, and helps veterinarians develop targeted disease control, including vaccination where appropriate. The APHA diagnostic handbook provides guidance on sampling and testing:

<http://apha.defra.gov.uk/documents/surveillance/sub-handbook.pdf>.

The Pig Veterinary Society (<http://www.pigvetsoc.org.uk/>) held a discussion session on PRRS control at its meeting in November 2017 at which support was demonstrated for funded regional or national initiatives for PRRS control. Updates on the findings from PRRS diagnoses in the GB surveillance network and any changes in diagnostic trends are included periodically in the quarterly pig disease surveillance reports: <https://www.gov.uk/government/collections/animal-disease-surveillance-reports#pig>.

Figure 2: Lungs of weaned pigs with disease due to confirmed PRRS together with (2A) *Pasteurella multocida* or (2B) *Haemophilus parasuis* infections

