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VIDA diagnoses are recorded on the APHA FarmFile database and SAC Consultancy: Veterinary Services LIMS database and comply with agreed diagnostic criteria against which regular validations and audits are undertaken.

The investigational expertise and comprehensive diagnostic laboratory facilities of both APHA and SAC C VS are widely acknowledged, and unusual disease problems tend to be referred to either. However recognised conditions where there is either no diagnostic test, or for which a clinical diagnosis offers sufficient specificity to negate the need for laboratory investigation, are unlikely to be represented. The report may therefore be biased in favour of unusual incidents or those diseases that require laboratory investigation for confirmation.

APHA VICs have UKAS Accreditation and comply with ISO 17025 standard. SAC C VS have UKAS accreditation at their central diagnostic laboratory and at the Aberdeen, Edinburgh, Perth, Ayr, Dumfries, Inverness, St Boswells and Thurso Disease Surveillance Centres which comply with ISO 17025 standard.

From September 2014 APHA contracted the services of partner Post Mortem providers. From April 2015, these services were provided by the Royal Veterinary College, the University of Bristol, University of Surrey, Wales Veterinary Science Centre and SACCVS. These providers contribute to the VIDA diagnoses recorded on the APHA FarmFile database and comply with agreed diagnostic criteria. To achieve a VIDA diagnosis, all testing must be carried out by a laboratory with ISO 17025 accreditation.
INTRODUCTION

This report contains analysis of animal health and scanning surveillance data and information from APHA, SAC Consulting Veterinary Services (SAC CVS) and non-APHA partner post mortem providers (SAC CVS, University of Bristol, Royal Veterinary College, University of Surrey (four sites), Wales Veterinary Science Centre, Aberystwyth) from the fourth quarter of 2016 compared to data in previous quarters and years. The network of partner post mortem providers is developing, and the current providers and sites have commenced activity at various times between September 2014 and July 2015. The report is compiled by the APHA Pig Expert Group, and is based on diagnostic submissions as well as on surveillance data and information from other sources. It is planned for the latter two to be expanded with time as other sources of complementary information are included. These scanning surveillance activities aim to provide timely detection of animal-related new and re-emerging diseases and threats. The information contained in this report, and other linked outputs, is used by government, the livestock industry, farmers and vets to maintain awareness and take action to manage risks that may be associated with the identified threats. Further information can be found at: http://ahvla.defra.gov.uk/vet-gateway/surveillance/index.htm.

OVERVIEW

Diagnostic pig submission trends

Total diagnostic submissions from pigs in October to December 2016 were 4% higher than the same period in the previous two years, and 9% lower than the same period in the previous five years. There are regional differences in submission levels with those from Northern England being prominent this quarter as indicated in Table 1. It is encouraging that pig diagnostic submissions are being maintained overall and the recent expansion of areas (APHA, 2017a) offering free carcase collection to post-mortem examination sites within the APHA network may influence the lower submission levels in some geographic regions.

Table 1: GB Pig Diagnostic Submissions from VIDA October to December (Q4)

<table>
<thead>
<tr>
<th>Country</th>
<th>Carcase Submissions</th>
<th>Foetus/Stillborn Submissions</th>
<th>Other Submissions</th>
<th>Total Submissions</th>
</tr>
</thead>
<tbody>
<tr>
<td>------------------</td>
<td>------------</td>
<td>----------------</td>
<td>----------------</td>
<td>------------</td>
</tr>
<tr>
<td>England</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Northern England</td>
<td>39</td>
<td>166%</td>
<td>156%</td>
<td>5</td>
</tr>
<tr>
<td>The Midlands</td>
<td>5</td>
<td>63%</td>
<td>48%</td>
<td>13</td>
</tr>
<tr>
<td>Eastern England</td>
<td>22</td>
<td>70%</td>
<td>75%</td>
<td>3</td>
</tr>
<tr>
<td>Southern England</td>
<td>7</td>
<td>100%</td>
<td>47%</td>
<td>3</td>
</tr>
<tr>
<td>Wales</td>
<td>1</td>
<td>200%</td>
<td>71%</td>
<td>2</td>
</tr>
<tr>
<td>Scotland</td>
<td>12</td>
<td>73%</td>
<td>63%</td>
<td>7</td>
</tr>
<tr>
<td></td>
<td>86</td>
<td>102%</td>
<td>86%</td>
<td>12</td>
</tr>
</tbody>
</table>

Other = non-carcase/non-foetus submissions. Unknown = region not given by submitter

The data in the above table show total submissions, then submissions by country and sample type for Q4 of 2016 with a comparison with the same quarter in the previous two (2016 v prior 2) or previous five (2016 v prior 5) years’ submissions.

Figure 1 shows that overall annual submissions in 2016 were similar to those in 2013 and 2015. Carcase submissions represented 31% of total diagnostic pig submissions during 2016 which is broadly similar to previous quarters and years. In 2016, non-APHA partner post-mortem providers examined nearly 9% of carcases submitted from premises in England and Wales. The maintenance of submission levels of carcases in particular to near the levels of prior years is considered important for detection of new and emerging disease and maintenance of expertise. Most commercial pigs are attended by specialist pig veterinarians, many of whom undertake on-farm post-mortem examinations and make diagnoses on the basis of their findings, sometimes supplemented with laboratory testing on samples they collect and often without involving APHA submissions. APHA pig submissions, particularly carcase submissions, are
thus already filtered and tend to be from disease outbreaks which are severe, unusual or unresponsive, thus suited to detection of new and emerging threats.

Figure 1: Pig Diagnostic Submissions to APHA and SAC CVS, Annual numbers 2012-2016

[Diagram showing annual numbers of pig diagnostic submissions by disease syndrome for 2012-2016.]

Diagnostic pig submissions by disease syndrome

Each diagnostic submission is allocated a disease syndrome based on clinical history and diagnostic findings. Figure 2 shows the syndromes represented in this quarter’s GB diagnostic submissions compared to the same quarter in prior years. As usual, systemic and miscellaneous, respiratory and enteric syndromes were the three main disease syndromes from which submissions were received.

Figure 2: Throughput of GB pig diagnostic submissions as % by syndrome for Q4 2012-2016

[Diagram showing percentage of submissions by syndrome for 2012-2016.]

Respiratory syndrome submissions are a higher proportion in this quarter than in the same period in previous years; this may relate to the changes in trends of certain diseases described later in this report. The October to December period is traditionally one when more viral respiratory disease is diagnosed and more respiratory disease is reported from the field and that has held true for this fourth quarter in 2016. Enteric syndrome submissions have shown an upward trend this quarter since 2013 which may...

reflect awareness about porcine epidemic diarrhoea stimulating submissions to establish a diagnosis in cases of diarrhoea.

NEW AND RE-EMERGING DISEASES AND THREATS

Monitoring the trends in diagnoses of known diseases cannot, by definition, detect either new diseases or changes in endemic diseases that would prevent a diagnosis from being reached (for example a change in the pathogen that compromised the usual diagnostic test). Such new or emerging diseases would probably first be detected by observation of increased numbers of submissions for clinical and/or pathological syndromes for which a diagnosis could not be reached in the normal way. Submissions for which no diagnosis is reached (DNR) despite testing deemed to allow reasonable potential for a diagnosis to be reached are regularly analysed to look for increases in undiagnosed disease which could indicate the presence of a new or emerging disease. Undiagnosed disease submissions are summarised broadly by the clinical presentation of disease and, once this has been determined by further investigation, the body system affected. Both groups are investigated and trends in the levels are compared over time.

Data recording by APHA and SAC CVS was harmonised from 2007. The Species Expert Group reviews trends in VIDA DNR data each quarter with the aim of providing information on potential new or emerging diseases or syndromes. ‘Prior years’ refers to pooled data for 2011-2015 for GB VIDA data. Supplementary analysis of APHA DNR data is also undertaken using an early detection system (EDS). This uses a statistical algorithm to estimate an expected number of DNR reports and a threshold value. If the current number of DNR reports exceeds the threshold (i.e. exceedance score>1), this indicates that the number of reports is statistically higher than expected. When this EDS identifies categories of submissions where the threshold DNR has been exceeded, the Species Expert Group reviews the data to investigate further. This review may involve assessment of individual DNR submissions. Where this DNR analysis finds no evidence of a new and emerging threat or other issue, the detail of these reviews in response to thresholds being exceeded may not be reported here.

Analysis of Diagnosis Not Reached (DNR) by syndrome and presenting sign

- A total of 16.4% of GB pig submissions in the 12 months of 2016 did not reach a diagnosis following reasonable testing. This was not significantly changed compared to the overall DNR for prior years of 18% for the same period in prior years. The overall DNR rate for APHA (17.9%) was not significantly different compared to 19.1% for January to December 2016 in prior years. The overall DNR rate of 12.3% for this period for SAC CVS was not significantly different compared to 14.8% for this period in prior years.

- No individual presenting sign or syndrome showed a significant increase in DNR to this quarter in GB, APHA or SAC CVS submissions compared to the same period in prior years.

Analysis of undiagnosed submissions in and up to the second quarter of 2016 has not revealed evidence of a new and emerging syndrome in GB pigs.

ONGOING NEW AND RE-EMERGING DISEASE INVESTIGATIONS

Antimicrobial resistance pig scanning surveillance findings

In November 2016, the UK Veterinary Antibiotic Resistance and Sales Surveillance report for 2015 was released by VMD. This report contains antimicrobial resistance data derived from testing pathogens, including those from pigs, isolated during diagnostic investigations submitted to APHA’s scanning surveillance network (VMD, 2016). The report makes it clear that the resistance levels found in isolates from scanning surveillance are not indicative of actual prevalences of resistance as diagnostic submissions are often biased towards disease outbreaks which are severe, unresponsive and unusual. However, for pathogens isolated with reasonable frequency the report show interesting patterns and
trends and it is useful for veterinary practitioners prescribing antibiotics for use in pigs to be aware of these.

During the last quarter of 2016, an unusual resistance to ampicillin (putative beta-lactam resistance) was detected in *Pasteurella multocida* isolated from the lungs of indoor finisher pigs with chronic necrotising pneumonias. Unusually, the isolates were all resistant to ampicillin. Amoxicillin had been used in pigs on the unit to treat outbreaks of respiratory disease and finishers are not managed on an all-in, all-out basis so there were risk factors for the development of resistance on-farm. The disease problem was subsequently reported to have resolved with alternative treatment; and follow-up bacteriology with antimicrobial sensitivity testing has been offered if there is a recrudescence. Although this is not the first time such resistance has been detected at APHA, it is not common; three *P. multocida* isolates were found to be resistant in 2013, one in 2014 and none in 2015 (VMD, 2016). Beta-lactam resistance has been detected in a low number of *Haemophilus parasuis* (APHA, 2016a) and *Actinobacillus pleuropneumoniae* (APHA, 2015) from pigs in England and can be plasmid-encoded. As these pathogens can cohabit within the pig’s respiratory tract, particularly during the growing period, there is opportunity for transfer of resistance genes between them which is exacerbated if respiratory disease is not controlled and there is selective pressure from relevant antimicrobial treatment use. The detection of resistant isolates will be kept under review.

Surveillance for colistin resistance in *Escherichia coli* and *Salmonella* isolates from pig diagnostic submissions has continued since colistin-resistant *E. coli* and *Salmonella* isolates were identified in pigs with post-weaning diarrhoea and mortality in 2015 (Anjum and others, 2016). Encouragingly, no further colistin-resistant isolates have been detected in diagnostic submissions from pigs to APHA; over 3000 *E. coli* isolates from diagnostic submissions were tested in 2016. The Pig Veterinary Society has classed colistin as an antibiotic of last resort only to be used with supporting evidence from antimicrobial sensitivity testing and colistin use in pigs in the UK remains low, helping to minimise the selective pressure for development of colistin resistance in bacteria in pigs.

**Atypical porcine pestivirus and congenital tremor**

The detection of atypical porcine pestivirus (APPV) in pigs affected with congenital tremor (CT) type AII in England in both contemporary and historic outbreaks of the disease has been reported (APHA, 2017b). A survey of practitioner members of the Pig Veterinary Society was undertaken to obtain practitioners’ opinions on CT and raise awareness of the association of CT type AII with APPV infection. Nearly 65% of respondents indicated that they had either seen, or had reported to them by a client, at least one herd affected with CT in the previous 12 months. Affected herds were widely reported across the UK, perhaps not surprisingly most in East Anglia and North East England but none in South East England, North West England and Wales. Affected piglets were reported mainly, but not exclusively to be in gilt or younger sow litters. Disease control of CT type AII has long been based on empirical measures as illustrated in Figure 4. Most incidents are not investigated by laboratory submissions and most practitioners consider CT type AII to be of low impact as a disease of GB pigs.

Figure 4: Measures to control congenital tremor identified in practitioner survey
A focus article was published in the Veterinary Record to raise awareness about APPV and CT. and APHA is keen to examine further cases of CT to obtain more material for APPV testing. Veterinarians in England or Wales with cases can contact their nearest APHA Veterinary Investigation Centre for further information.

UNUSUAL DIAGNOSES OR PRESENTATIONS

There were a number of unusual diagnoses or presentations this quarter; details of these have been included in monthly APHA or SAC CVS reports; http://www.defra.gov.uk/APHA-en/publication/pig-survreports-monthly/. These will be kept under review to assess whether they justify initiation of emerging disease investigations.

A second case of disease associated with Streptococcus galolyticus

Streptococcus galolyticus was described in association with a case of endocarditis in the last quarterly report (APHA, 2016b). The same organism was isolated from a septicaemic seven-week-old pig, one of two submitted from a rearing unit linked to the rearing unit on which the endocarditis case occurred. The pigs were submitted to investigate sudden deaths in a group of 800 pigs. The second pig had been seen fitting prior to death and no significant bacteria were isolated but histopathology confirmed likely streptococcal meningitis. S. galolyticus is an uncommon pathogen in pigs, but is sporadically detected. This organism was formerly known as S. bovis biotype 1 and has been isolated from sporadic cases of endocarditis (Kongsted and others, 2016) and septicaemia in pigs. Its presence in two linked cases has been noted and further detections will be kept under review.

Incident of pig mortality with skin lesions

An unusual and unexplained transient incident of mortality in pigs with epidermal necrosis occurred in eight-week-old pigs on an indoor straw-based, all-in, all-out nursery unit. The pigs had been treated a week earlier for oedema disease (confirmed by laboratory testing). Treatment stopped the deaths but the veterinarian still had concerns about the pigs’ health and the possibility of concurrent streptococcal meningitis and they were prescribed amoxicillin-clavulanate in the water. About 15% percent of the treated pigs rapidly developed diarrhoea with skin reddening and discomfort affecting the perineum and caudal aspects of their hindlimbs and as a precaution the antimicrobial treatment was withdrawn. Deaths of pigs with these focally extensive skin lesions (Figures 5 and 6) occurred over about five days and then gradually resolved resulting in cumulative mortality of about 4%. Pigs without skin lesions were unaffected.

Figures 5 and 6: Focally extensive areas of epidermal necrosis
Post-mortem examination and extensive laboratory testing including histopathology on a wide range of tissues and brains did not identify a specific cause of death. Although the skin lesions were significant, they were considered unlikely, on their own, to have caused death. Cultures from the small intestines pointed to dysbacteriosis. *Clostridium difficile* enterotoxaemia can develop as a sequel to dysbacteriosis but culture and toxin testing did not support clostridial involvement. The sparse growths included a haemolytic *E. coli* isolate which underwent whole genome sequencing and revealed a large number of virulence genes (fimbrial, toxin, adhesion, haemolysin and invasion). Metabolic disease secondary to the epidermal necrosis, earlier diarrhoea and dysbacteriosis with possible involvement of a virulent *E. coli* were amongst possible explanations for the deaths.

Skin histopathology revealed focally extensive epidermal necrosis with no inflammatory cell component. These lesions suggested that the primary problem was a contact dermatitis leading to epidermal necrosis, for which mechanical, chemical or physical causes were considered. No issue was identified with respect to mixing or dosing with antibiotic and the condition of the straw bedding was reported to be satisfactory. The focally extensive distribution of lesions over the perineum and hindquarters supported a contact problem either from the environment or faeces. Adverse reaction to some antibiotics (e.g. tiamulin) can lead to epidermal necrosis and inflammation in areas coming to contact with faeces and urine and a fatal necrotising dermatopathy has been described in the literature (Jubb, Kennedy and Palmer, 2015; Taylor, 2013). This has not been described with the antimicrobials used in these pigs, however as a precaution, the veterinary practitioner reported the incident as a suspected adverse reaction to the Veterinary Medicines Directorate. **This will be offered as a clinical club case at the Pig Veterinary Society Spring 2017 Conference to see if others have seen similar clinical presentations and have ideas on the pathogenesis and cause.**

**Septicaemia in weaners due to *Streptococcus suis* type 6**

Serotype 6 of *Streptococcus suis* was identified as the primary cause of septicaemia in five-week-old weaners on an indoor nursery-finisher unit. Seven sudden deaths occurred over a weekend from the group of nearly 2000 pigs. The pigs submitted had reddened lymph nodes, reddened intestinal serosal surfaces and non-specific lesions consistent with septicaemia and *S. suis* serotype 6 was isolated from the meninges and/or liver of all three submitted pigs. This serotype is rarely isolated in APHA submissions, and was last detected at APHA in 2012. Table 2 shows the serotypes identified at APHA in 2016, these are kept under review.

Table 2: Numbers of *Streptococcus suis* serotypes identified at APHA in 2016
The above cases were included in APHA Veterinary Record surveillance reports to increase awareness of their occurrence and their clinical and pathological presentations.

**CHANGES IN DISEASE PATTERNS AND RISK FACTORS**

This section of the report gives information on occurrence of selected diseases. The data originate from submissions and are summarised and presented according to the diagnosis reached and assigned as a VIDA code. Our charts show the number of diagnoses (numerator) as a proportion of the number of submissions in which that diagnosis was possible (denominator), for all of GB, England & Wales and for Scotland. The bars indicate the 95% confidence limits. Note that the y-axis of the charts varies and therefore care must be taken when comparing individual charts.

**Porcine reproductive and respiratory syndrome diagnoses reach a quarterly high**

The diagnostic rate for PRRS in GB in the fourth quarter of 2016 was the highest in the last 12 years as shown in Figure 7. The annual diagnostic rate for 2016 is also the highest in the last 12 years (Figure 8). Whilst the seasonality pattern with a peak in diagnoses in winter months is familiar (APHA, 2016c), there was only a shallow dip in the rate over summer months in 2016 compared to usual. This data supports anecdotal reports from pig practitioners of continued clinical problems associated with PRRS. The majority of diagnoses were made on submissions from England.

**Figure 7: Seasonality of GB PRRS diagnoses as a % of diagnosable submissions**

**Figure 8: Annual trend in GB PRRS diagnoses as a % of diagnosable submissions 2004-2016**
Analysis of diagnostic data shows that most disease is diagnosed in post-weaned pigs in which respiratory disease remains the common sign with wasting and found dead as second and third most frequently reported. These three signs were also the most common for diagnoses in 2014 and there is no evidence that disease is manifesting significantly differently. The three most common concurrent diagnoses with PRRS are streptococcal disease (mainly *Streptococcus suis*), pneumatic pasteurellosis and salmonellosis. Gastric ulceration and *Haemophilus parasuis* disease were the next most common concurrent diagnoses.

The increasing diversity over time of PRRSV detected in APHA submissions in which PRRS is diagnosed has been reported previously (APHAC, 2016c). No PRRSV genotype 2 has been detected to date in GB pigs and the genotype 1 strains sequenced to date remain within GB clusters. APHA will be sequencing PRRSV from recent diagnostic submissions as a batch for surveillance purposes to monitor PRRS diversity and results may also assist veterinarians with epidemiological investigations. These surveillance findings related to PRRS have been highlighted in presentations in meetings with veterinarians and pig producers, including the recent APHA Roadshows.

**Vitamin E and selenium-associated disease in growing pigs**

Mulberry heart disease (MHD) and hepatosis dietetica (HE) are disease manifestations associated with vitamin E and/or selenium deficiency in pigs, MHD being the more common of the two. Disease results from an imbalance between free radicals and free radical scavengers (antioxidants – selenium and vitamin E) leading to oxidative damage in tissues and is mainly seen in rapidly growing post-weaned pigs. An increase in the diagnostic rate of vitamin E/Se associated disease in the last quarter of 2016 to the highest rate for several years was noted (Figure 9), although the increase in Q4 reflects just four cases of MHD and one of HE. All the 2016 diagnoses were in post-weaned pigs with “found dead” as the most common clinical sign, as expected.

![Figure 9: Annual trend in MHD/HE diagnoses as a % of diagnosable submissions 2004-2016](image)

The single diagnosis of HE was made when sudden deaths in seven-week-old pigs on an indoor nursery-finisher unit prompted a submission to Bury St Edmunds for post-mortem examination. The liver was swollen with a mottled appearance (Figure 10) and there was excess serosanguinous fluid in the abdomen. The hepatopathy raised concern that coal tar toxicity was involved and when pathology of this nature is observed, it is important to rule out toxicity. However concerns were allayed as the mortality was limited, there were no signs in the other pigs apart from mild coughing and the attending veterinarian indicated that there was no possibility of access to tarmac or other source of coal tar. Histopathology confirmed massive liver necrosis which, given the clinical and epidemiological details, was consistent with hepatosis dietetica.
Where cases of either manifestation are diagnosed, assessment of the vitamin E and selenium status is merited in the affected cohort, collecting clotted bloods and heparin bloods. Absolute deficiency is not always identified and rapid growth, activity, stress and intercurrent disease can also predispose to disease, as well as dietary factors or food storage issues influencing the availability of antioxidants in the diet. Incidents have been precipitated in pigs on inadequately supplemented home-mix diets, sometimes containing brewer’s grains (SAC Consulting: Veterinary Services (2015). The diagnostic rate will be kept under review.

HORIZON SCANNING

Seneca Valley Virus update
There have been further publications on Seneca Valley Virus and the vesicular disease with which it has been associated in the US and Brazil in recent years. Joshi and others (2016) described the pathogenesis and pattern of SVV infection in experimentally infected finishers in which the most obvious signs were lethargy and lameness starting four days post-infection and lasting two to 10 days. Virus excretion was detected for up to four weeks post-infection, beyond the resolution of clinical signs and there is useful virological data in the publication. A number of US breeding herds affected with clinical disease due to SVV were investigated to assess potential routes of introduction. The investigation details are reported by Baker and others (2016). As further information about SVV becomes available it will be used to re-evaluate and update the preliminary outbreak assessment from early 2016 https://www.gov.uk/government/publications/senecavirus-a-in-the-americas.

African Swine Fever outbreaks persist in Eastern Europe
African Swine Fever has persisted over the winter months in Eastern Europe. Two commercial pig units of 5000 and 10000 pigs under the same ownership in Latvia were found to be affected with ASF in January and February respectively within the current Part II control zone (Figure 11). The description on the first unit suggests that suspicion was reported early in the course of disease after eight sows were found dead. One small backyard holding in Lithuania with three fattening pigs was also affected within the Part II control zone. The western spread of ASF has continued in the Ukraine with more outbreaks being reported near the Moldovan border, although no further ASF has been reported in Moldova itself since the two backyard pig premises were affected close to the border with Ukraine as shown in Figure 12. Moldova has a high proportion of backyard pigs. Measures such as enhanced wild boar surveillance, border inspections and lorry washing are place in bordering countries. Information on ASF was included in the APHA Roadshows describing the situation in Eastern Europe, emphasising the need for stringent biosecurity including staff training and measures to prevent pigs being fed meat, and raising awareness of the clinical signs of ASF. The APHA also recently disseminated information into the public domain warning farmers and smallholders not to feed catering or kitchen waste to livestock including
pigs, even if they are being kept as pets. This is to prevent the introduction and spread of potentially devastating notifiable animal diseases, such as African and Classical Swine Fever, and Foot and Mouth disease. This can be found on this link: [https://www.gov.uk/government/news/apha-warns-not-to-feed-kitchen-scrapsto-farm-animals-because-of-disease-risk](https://www.gov.uk/government/news/apha-warns-not-to-feed-kitchen-scrapsto-farm-animals-because-of-disease-risk)

Figure 11: Wild boar ASF cases (purple) and outbreaks in commercial (yellow) and backyard (green) domestic pigs in Latvia (figure prepared 08/02/2017 by International Disease Monitoring Team, APHA)

![Map showing wild boar ASF cases in Latvia](image1.png)

Figure 12: Wild boar ASF cases and outbreaks in domestic pigs in Eastern EU countries and Ukraine (figure prepared 07/02/2017 by International Disease Monitoring Team, APHA)

![Map showing wild boar ASF cases in Eastern EU](image2.png)

**Porcine epidemic diarrhoea update**

There have been no reports of suspect porcine epidemic diarrhoea (PED) since it was made notifiable. A desk top PED contingency exercise was undertaken on January 18th 2017 using a simulated outbreak and proved very useful in highlighting issues which are being addressed. Surveillance of non-suspect routine diagnostic samples to APHA has continued and, between June 2013 and December 2016, 516 submissions from non-suspect outbreaks of diarrhoea have tested negative for PEDV by PCR in surveillance funded at APHA by AHDB Pork. Over the current winter period, the number PED reports in the US has followed a similar pattern to 2014 and 2015 but involving a lower number of premises
compared to the corresponding cooler months of 2014 and 2015 as illustrated in Figure 3, likely to reflect both herd immunity and successful control and elimination strategies for PED.

Figure 3: New PEDV case reports by week in the US as accessed from AASV website on 08/02/2017 https://www.aasv.org/Resources/PEDv/PEDvWhatsNew.php

The chart also contains the number of confirmed and presumptive positive premises by week since June 2014.

A publication by Niederwerder and others (2017) of experimental infection of four-week-old weaned pigs with virulent PEDV reported that vomiting was the first sign followed by diarrhoea and lethargy of about five days duration without mortality and these signs coincided with peak virus shedding. Transmission of PEDV occurred to a group of pigs in direct contact but not to a group of pigs with which there was only aerosol contact. Seroconversion was detected by two weeks post-infection. Virus shedding was detected for up to 28 days post-infection, after the clinical signs had resolved; however it is not known whether virus being detected by PCR at this stage was still infectious.

No outbreaks involving virulent PED virus strains similar to the US/Asian strains have been reported in Europe apart from the outbreak described in 2014 in the Ukraine. More information about PED is given on this link: https://www.gov.uk/guidance/porcine-epidemic-diarrhoea-how-to-spot-and-report-the-disease. Further opportunities to highlight the clinical signs and notifiable status of PED were taken during presentations given to producers and vets at APHA Roadshows in East Anglia and Yorkshire regions.

**Syndromic Surveillance Roundtable report**

A Pig Health and Welfare Council Syndromic Surveillance (SS) Roundtable meeting was held in September jointly organised by APHA and AHDB Pork. Forty two delegates attended the event incorporating pig practitioners, epidemiologists, academics, vets from diagnostic laboratories, a few producers and industry and Defra/APHCA representatives. Collection of syndromic surveillance (clinical disease incident) data is being explored within the pig sector to complement diagnostic GB VIDA data and increase coverage (sensitivity). It is accepted that such data will be less specific with respect to diagnoses. Discussions are in progress to develop a proposal to seek funding for a pilot study to assess collecting data using a mobile app in real time from veterinarians attending pigs. Sustainable and effective SS needs motivated engaged providers of data and motivated engaged funders (audiences/users) and the Roundtable meeting explored the reasons and incentives for SS data sources to participate. The observations of participants are detailed in the Roundtable report which is available on the following link together with the presentations given on the day: http://pork.ahdb.org.uk/health-welfare/pig-health-welfare-council/phwc-disease-surveillance-sub-group/
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