VLA Monthly Surveillance Report for PIGS February 2009

Defra Food and Farm Group funds the VLA's pig surveillance work as part of the Veterinary Surveillance Strategy

Highlights

- PRRS identified as a significant contributor to systemic disease on at least four occasions
- Multifocal lymphoma raises suspicions of Classical Swine Fever on the basis of gross post mortem examination.
- Lungworm diagnosed in an outdoor large black pig
- Neck abcesses suspected to be associated with vaccination at weaning.
- Salmonellosis continues to cause clinical disease on some units

Enteric Diseases

Swine Dysentery

Swine dysentery was diagnosed by PCR on the faeces of 17-week-old housed finishers in which looseness began a week prior to submission and gradually got worse with blood and mucus appearing in some faeces. Five per cent of 400 pigs were affected.

Porcine Proliferative Enteritis

A 250-sow breeder finisher unit was experiencing a problem of scour with 10% morbidity affecting 8 to 12 week-old piglets following moving out of the flat decks. Affected pigs became poor-doers and eventually had to be shot. Two live pigs were submitted and post-mortem examination revealed increased clear peritoneal fluid, a thickened terminal ileum where the mucosa was roughened and hard, and in one pig the caecum and colon were also grossly thickened, tubular and rigid. Both pigs had a brown watery scour, and MZN stains of ileum and faeces showed acid-fast intracellular organisms resembling *Lawsonia intracellularis*. No other enteric pathogens were detected and a diagnosis of porcine proliferative enteritis was made.

Salmonellosis

Forty of 230 five-week-old pigs were affected with diarrhoea, wasting and 30 deaths. On farm post mortem examination revealed diphtheritic colitis and *Salmonella* Typhimurium U288 was isolated from two colons submitted. Despite efforts to improve cleaning and disinfection between batches, subsequent weaned pigs suffered a similar problem and pigs submitted for post mortem examination at five to six-weeks-old were in poor body condition with enteric colibacillosis and, in some, salmonellosis. A post cleaning and disinfection visit was made to the unit and high levels of residual salmonella were cultured from swabs of the floor and feeders of cleaned and disinfected flat decks although visually a good standard of cleanliness had been achieved. Advice was given on improving efficacy of disinfection and preventing recontamination of disinfected areas.

Three six-week-old pigs were submitted with an ongoing herd history of post weaning diarrhoea. They were all in poor body condition. Alongside diarrhoea, significant post mortem findings included bloody intestinal contents, diptheresis of the large intestine, peritonitis and enlarged congested mesenteric lymph nodes. Significant laboratory findings included multi-drug resistant *Salmonella* Typhimurium *U288* and *Haemolytic K88 E.coli*. *S* Typhimurium *U288* is the most common phage type isolated from British pigs, and is associated with human disease. Therefore, zoonotic advice was discussed through the private veterinary surgeon attending the herd.

Six, approximately 14-week-old pigs, were submitted for necropsy from a finisher unit. Four of the pigs were from one breeder unit; animals from this unit had been lethargic with lameness, swollen joints and poor weight gain. An animal necropsied on-farm had lesions suggestive of a polyserositis. The

other two pigs were from a different breeder unit and were decribed as ‘poor doers’. In all six animals were necropsied and a variably severe necrotising and ulcerative colitis often with a diptheritic membrane was seen. *Salmonella* Typhimurium phage type U288 was isolated from pooled faecal samples from both groups of pigs. In addition, *Brachyspira pilosicoli* was recovered from the large intestines, but the severity of the colitis was more consistent with salmonellosis. The two pigs from the group with wasting had enlarged mesenteric and inguinal lymph nodes and one had multifocal areas of pallor within the renal cortex (interstitial nephritis). Several of the pigs from the large group had enlarged mesenteric lymph nodes. Histopathology and immunohistochemistry were initiated, but only the two pigs from the group with a history of poor doing were diagnosed with PMWS.

Colibacillosis

A four-week-old preweaned pig was submitted for post mortem examination from an outdoor organic herd. The piglet was the second to have died over several days from a group of four litters in a shared paddock. It was dehydrated and sunken eyed with dry subcutaneous tissues. Small intestinal contents were fluid and somewhat excessive and, although there was no scour, the isolation of a profuse growth of haemolytic *E.coli* type O45:K,E65 was considered consistent with enteric colibacillosis.

The carcase of a live five-day-old piglet was presented for post-mortem examination. Pre-weaning diarrhoea had been a problem in a number of litters over the previous four months in piglets ranging from one to ten days of age. On post-mortem examination the mucosa of the small intestine was reddened and there was moderate dilation of the intestine with yellow liquid. Laboratory findings included detection of haemolytic coliforms that were K88 (F5) antigen positive and histopathological findings included moderately severe sub-acute enteritis associated with attached bacillary bacteria typical of K88 *E. coli* infection. Vaccination of sows with a suitable vaccine was recommended.

Neonatal scour caused by *Clostridium perfringens*

A flare-up of scour affecting 25% of neonatal piglets with 10% mortality on a 1500-sow breeder finisher unit, which has had historical problems with clostridial scour in neonatal piglets, prompted the submission of three live one-day-old piglets for investigation. The farm had recently begun a vaccination policy using a multivalent clostridial vaccine but the vaccine would not have yet had a chance to totally filter through the herd. Examination of the piglets revealed yellow bubbly intestinal content along the entire length of the intestines and *Clostridium perfringens* was cultured from the faeces of each piglet. Alpha toxin was detectable in the small intestinal contents of one piglet. Histopathology identified a neutrophilic infiltrate in the lamina propria of the intestinal villi in the small intestine with increased severity in the ileum. Gram-positive rods tightly associated with enterocytes were noted in the jejunum

and ileum, these findings being consistent with a diagnosis of clostridial enteritis.

In another case, the carcases of seven piglets aged between two and three days were submitted as part of an investigation into increased mortality affecting litters on a unit with 250 breeding sows. Post mortem examination showed the presence of milk clot within the stomach together with liquid yellow blood-stained small intestinal contents. One of the piglets showed evidence of subcutaneous haemorrhages and oedema and two of the piglets showed the presence of ruptured livers with free blood within the abdomen. *Clostridium perfringens* toxin ELISA testing of intestinal content confirmed the presence of alpha and epsilon toxins in one of three samples tested. The presence of both of these toxins confirms the presence of either type B or type D *Clostridium perfringens* enterotoxaemia in the sampled piglet. This is a somewhat unusual finding since clostridial enterotoxaemia in neonatal piglets is more commonly associated with type C and occasionally type A enterotoxaemia, the former causing classic 'port wine' haemorrhagic diarrhoea.

Respiratory Diseases

Swine Influenza

Rapidly spreading coughing on a large continuous nursery finisher unit with a total of 11,000 pigs began on New Year's Eve and prompted submission of a dead pig to investigate possible swine influenza. In the rearing shed which was worst affected, approximately 700 of 3,500 pigs were coughing, but appeared bright and, with five deaths in two days. Pigs were vaccinated for *Mycoplasma hyopneumoniae* and PCV-2 at weaning. The submitted pig had a severe fibrinopurulent tracheitis with a significant bronchopneumonia and unilateral fibrinous pleurisy from which *Pasteurella multocida and Streptococcus suis* type 2 were isolated. Swine influenza was confirmed by isolation of H1N2 influenza virus and immunohistochemistry. The virus isolated is being compared to the H1N2 virus also isolated in East Anglia from an outbreak of swine influenza on a breeding unit described in November's monthly report.

Severe mortality, wasting and respiratory signs associated with Porcine Circo Virus Associated Disease (PCVAD), Porcine Reproductive Respiratory Syndrome virus (PRRSv) and Streptococcus suis type 3 in growing pigs.

An on-going problem of wasting, coughing and death in finisher pigs from approximately 16-weeks-old which had not been substantially alleviated by PCV2 vaccination of first sows and later piglets, was investigated. In the current batch of 300 16-week-old pigs, 20 were affected and died. The problem had decreased in the last few weeks from a peak of 25% postweaning mortality to 8 to 9%. Mortality was particularly associated with a finishing building with noticeably poorer ventilation than other buildings. The breeding herd and preweaning pig performance was reported to be good.

The unit is an indoor 200 sow breeder finisher batch farrowing every three weeks. All growing pigs were vaccinated for *Mycoplasma hyopneumoniae* and PCV2. Gross findings in three submitted pigs were similar with marked lymph node and splenic enlargement, tonsillar abscessation, pulmonary consolidation and, in two pigs, fibrinous pleurisy. One pig also had a mucopurulent rhinitis. *Streptococcus suis* type 3 was the only bacterial pathogen isolated from the lung and lymph node of one pig. European strain PRRSv was detected by PCR in the spleen of all three pigs and cohort serology revealed PRRSv challenge by the time they were seven weeks of age. Histopathology and immunohistochemistry provided unequivocal evidence of PCV2 associated chronic pathology in lymphoid tissues and lungs supported by extensive PCV2 IHC labelling in lymph nodes and tonsil. The accompanying bronchointerstitial pneumonia was typical of that seen in late onset PCV2 associated disease. IHC did detect some specific labelling for PRRS virus antigen in the lungs but the overall impression was that PRRSv infection was a minor component of the pneumonic changes present, although this does not preclude earlier immunosuppression due to PRRSv being involved in the PCV2 associated disease problem. Further analysis of the PRRSv strain present is in progress.

Respiratory Disease due to PRRSv on an outdoor unit.

PRRSv associated respiratory disease was diagnosed in outdoor weaned pigs. Over a period of six to eight weeks, dyspnoea and coughing were noticed in each batch of weaners from four weeks of age after moving to outdoor nursery finisher sites. In one batch, 25% of pigs became affected with 7% mortality over three weeks. In a batch of 1000 four-week-old pigs, 30 were reported to be affected on arrival. Pigs were outdoors in tents with paddocks and with no mixing of sources or ages. Two four-week-old unvaccinated pigs were submitted within 18 hours of arrival on the rearing site. One was bright with a slightly elevated rectal temperature of 103°F and mild generalised lymph node enlargement. The second pig was in poorer body condition and was hairy with multiple encapsulated intra-abdominal abscesses from which *Arcanobacterium pyogenes* was isolated. PRRS virus was detected in serum from the first pig by PCR and histopathology revealed a diffuse severe interstitial pneumonia with features typical of those seen in uncomplicated PRRS associated pneumonia, IHC confirmed PRRSV involvement. Three six-week-old pigs with respiratory disease were also submitted for necropsy. These had been on the site about 10 days and were vaccinated for PRRSV on entry. One of the pigs had clinical salmonellosis and the other two had pneumonia, all three were positive for PRRSV and *Mycoplasma hyopneumoniae* was detected in the lung of both pneumonic pigs. Histopathology revealed severe subacute to chronic and chronic bronchointerstitial pneumonias in which PRRSV involvement was confirmed by IHC. There was no evidence of PCV2 involvement. The pigs were from a breeding unit using live PRRSV vaccine in sows. Further analysis of the PRRS virus involved is in progress.

Lungworm and enzootic pneumonia in a growing large black pig.

A Large Black piglet, reported to be 3 months of age was presented after 4 deaths in a group of piglets in recent weeks. Clinical signs prior to death included hyperpnoea, terminal ataxia and bloating of the abdomen. On post mortem examination, numerous *Metastrongylus* sp. nematodes were found in the lumen of the distal trachea and bronchi and approximately three-quarters of the lungs were consolidated. *Mycoplasma hyopneumoniae* was detected by DGGE in lung. Histopathology confirmed the diagnosis of metastrongylosis and concurrent enzootic pneumonia and furthermore cerebellar and cerebral microthromboses were detected, the likely cause of the ataxia observed. The cause of the microthrombosis was uncertain but was not typical of that seen with oedema disease. There has been some debate concerning the pathogenic potential of PCV-2 in the cerebellum as well as being a cause of vascular changes such as observed in PDNS. The lack of any other evidence of PCV-2 associated disease suggested it was unlikely to be involved in this case but it was advised that, if PMWS or other PCV-2 associated disease emerges, it would be worthwhile revisiting the case.

Reproductive Diseases

PRRSv detected in aborted piglets.
PRRS virus was considered the possible cause of several litters being born near full-term with both stillborn and viable piglets in a 330 sow indoor herd. Sows were vaccinated with live PRRSV vaccine in mid pregnancy. Four freshly dead piglets with good birth weights were submitted in which lung inflation and variable slippering indicated death during or soon after farrowing. PRRSv was detected by PCR in pooled piglet blood. The importance of this to the herd problem is uncertain but this detection of foetal PRRS viraemia indicates active PRRSV infection in this sow in late pregnancy which is of significance.

Parvovirus confirmed as the cause of abortion in a Gloucester old spot herd.
Foetuses and placental tissues were submitted from one of two Gloucester Old Spot sows which had farrowed two weeks early. Examination of liver tissues by ELISA and PCR for porcine parvovirus was positive, consistent with parvovirus as the likely cause of the premature farrowing.

Disease of the Nervous System

Neurological investigation hampered by inappropriate dispatch of specimen
A single pig was submitted to investigate weakness, hind limb ataxia and death in 20 of 2000 finishers around 20-weeks-old. The problem had been on-going for approximately two weeks and pigs showed a poor response to antibiotic treatment. Affected pigs were found in different sheds and in different pens scattered over the unit and no problems with water supply were

reported. Unfortunately the submitted pig had been shot and examination of the central nervous system was therefore restricted to the spinal cord in which a prominent perivascular cuffing with mononuclear cells and occasional eosinophils was present. There was also frequent neuronal necrosis with chromatolysis, gliosis and neuronophagia. Findings were consistent with a subacute non-suppurative poliomyelitis and ganglionitis and was considered to be of viral aetiology. No further cases were available for investigation, however if younger pigs coming through the same or other fattening units show similar signs they will be investigated.

Meningitis associated with *Streptococcus suis* types 1 & 2
A twelve-week-old piglet was submitted from a small unit that breeds and finishes pigs with a history of anorexia, walking in loose circles, and later in the day it was found recumbent. At necropsy a heavy infestation of Haematopinus lice was present, along with a polyserositis affecting the right hock, left elbow and peritoneum. *Streptococcus suis* type II was isolated from the affected joints.

In another case, increasing mortality in 12-week-old pigs was investigated. Some cases seen alive showed neurological signs. Both pigs subjected to post mortem examination showed meningeal blood vessel engorgement and a fibrino-purulent meningitis and *Streptococcus suis* Type 2 was isolated**.**

Also this month, piglets aged 10 – 14 days that were reportedly “going off their legs” and showing vague neurological signs were submitted for post mortem examination. There was a suppurative poly-arthritis, with fibrino-purulent deposits over the brain and abdominal viscera. On this occasion *Streptococcus suis* Type 1 was isolated.

Musculoskeletal Diseases

Subcutaneous abcessation suspected to be associated with vaccination.
Neck swelling was reported in approximately 100 of 300 pigs at the point of weaning, one pig died and was submitted. The first case was seen three days prior to submission. Pigs were injected with iron at three days of age and vaccinated in the neck for *Mycoplasma hyopneumoniae* and *Haemophilus parasuis* when seven days of age. One needle was used per litter. In some litters all pigs were affected, in others just the occasional pig. No different technique was reported to have been used for vaccination. In the submitted pig a fluctuant swelling was located deep to superficial muscles of the neck and dorsal to the cervical vertebrae, the swelling was due to an encapsulated abscess which was dissected out intact from other tissues. The fibrous appearance of the abscess would fit with infection being introduced at the time of vaccination, which would explain the high prevalence of the condition. Enquiries were made as to whether a previously open bottle was used and whether the order of injection matched which pigs were affected,

however no further explanation was available and no problems with subsequent batches were reported. *Arcanobacterium pyogenes* was isolated from the abscess and the lateral ventricles of the brain, which contained purulent material.

Systemic Diseases

Bacteraemia/ septicaemia with *Streptococcus suis* type 2

Ten per cent of 1050 nine-week-old housed growers were affected with lameness, background coughing, meningitis and sudden deaths; seven pigs died. Two sources were mixed in one shed and disease was affecting both sources. Pigs were vaccinated for *Mycoplasma hyopneumoniae* and PCV2. Streptococcal disease was diagnosed in both submitted pigs; in one which had endocarditis, pericarditis and polyarthritis, *Streptococcus suis* type 9 was isolated from lesions. In the second pig, there was a mild bronchopneumonia and polyarthritis, and *Streptococcus suis* 2 was isolated. No viral involvement was identified.

In another case, post mortem examination of a 60 kg pig that had died after developing respiratory signs identified the presence of a vegetative endocarditis. The endocardial lesions were such a size they were nearly occluding the atrioventricular opening. *Streptococcus suis* Type 2 was isolated from the heart valves and also from splenic tissue.

Multicentric lymphoma grossly resembling Classical Swine Fever

A 26-week old Gloucester Old Spot boar developed lethargy, anorexia and terminal respiratory distress prior to dying 36 hours later. Pyrexia was not an apparent feature during the clinical course of the disease. There were only two similar aged pigs on the holding in arks and fed finisher pellets together with table scraps. The remaining pig was reported as normal. Post mortem revealed extensive petechiation in the subcutis and subcutaneous fat but with no skin haemorrhage evident. The liver was enlarged with discrete areas of haemorrhage. Haemorrhage was also evident in the large intestine, thymus, peripheral lymph nodes with occasional petechiae in the laryngeal mucosa. Both kidneys exhibited extensive haemorrhage beneath the capsule and within cortex giving a distinct turkey egg appearance. There was extensive haemorrhage on the exterior but not interior of the bladder. The extent and location of the haemorrhages and history of feeding table scraps necessitated notification of suspect Swine Fever. On further consideration it was agreed to proceed with the post mortem and for a VO to visit the holding in the near

future. The laboratory findings were of a terminal colisepticaemia with histology confirming multifocal lymphoma and no changes suggestive of concurrent PDNS. In Large Whites lymphoma can have a familial predisposition but also occurs sporadically in other breeds.

PRRSv breakdown on a previously free unit confirmed by PCR

A 600-sow PRRS free breeder finisher unit experienced a sudden increase in mortality in its neonatal piglets over one weekend. In total, 50 piglets became recumbent and died. Three carcases were submitted for examination. Gross pathological examination revealed an inconsistent picture between all three carcases with an enteritis in one, rubbery slightly reddened lungs in a second, and trauma consistent with being trodden on by a sow in a third. Bacterial cultures were unrewarding but PCR detected the presence of the European strain of PRRS virus within the lymph node of one pig unfortunately confirming a PRRS breakdown on the unit.