



VLA Monthly Surveillance Report for PIGS **JULY 2008**

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

Highlights

- **3 reports of Swine Influenza, due to 3 different strains: H1N1, H1-like A/SW/195852/92 & H1N2. All diagnosed by Virus isolation. This may represent a changing seasonality for this pathogen.**
- **Swine Dysentery continues to be diagnosed.**
- **Bracken Poisoning in outdoor pigs found dead in woodland.**
- **Rotavirus in piglets up to 5 weeks old.**
- ***Streptococcus suis* type 2 continues to be the major serotype, mostly associated with meningitis this month.**

Enteric Diseases

Swine dysentery (*B. hyodysenteriae*)

Swine dysentery was confirmed by culture and PCR as the cause of diarrhoea and wasting in an unspecified number of finisher pigs over a three week period, with scour containing mucus and blood.

Intestinal Torsion

Three five to six-month-old pigs in a small four-sow outdoor herd were found dead over a three month period. The affected pigs had been the largest of litters and in good body condition. Pigs were fed concentrate once a day. The submitted pig was in good body condition and post mortem examination revealed a clockwise intestinal mesenteric torsion to be the cause of death. The fact that the daily concentrate was fed once a day to a group of growing pigs of different sizes was considered likely to predispose to torsion and dividing the daily concentrate into several smaller feeds with changes in management to avoid competitive and over feeding was suggested to reduce the risk.

Rotavirus

Diarrhoea was reported in three to five-week old piglets on a 620-sow unit. There had been a poor response to Aureomycin therapy. Two piglets were submitted to investigate the problem. Both were in poor condition and there was gross evidence of an enteritis. The intestinal contents of one were particularly yellow. Rotavirus was detected by ELISA confirming rotaviral enteritis. No other enteropathogens were identified.

A problem of scour in four-day-old piglets prompted the submission of three live piglets for investigation. All had received antibiotics at birth and a coccidiosis treatment at four days of age. The scour appeared to start between three to six days of age and was unresponsive to Clamoxyl. Post-mortem examination of all three pigs revealed congested mucosa of the small intestine, oedema of the spiral colon and a watery scour with yellow floccules. Rotavirus was detected by PAGE in faeces from all three pigs confirming a virological aetiology to the problem.

Enteritis due to *E. coli* following dietary change

Three live 10-week-old pigs were submitted for post-mortem examination as part of an investigation into clinical signs of diarrhoea and uneven growth in a group of 120 pigs on a 500-sow farrow to finish unit. Routine vaccination of pigs against PCV2 at weaning had recently been implemented, with excellent results, which had led to withdrawal of the previously used live attenuated vaccine for porcine proliferative enteritis (which was also formerly administered at weaning). It was suspected that a recurrence of ileitis was responsible for the currently observed signs of scour in these pigs. Gross appearance of the distal jejunum, ileum and caecum of the pigs was not suggestive of PPE however, and MZN smears of mucosa proved negative for organisms resembling *Lawsonia intracellularis*. Gross findings, which were centred on the ileum, caecum and proximal colon, consisted of mucosal oedema with some necrotic foci and mild diphtheritic colitis. There was no evidence of *Brachyspira hyodysenteriae* or *Salmonella*. Routine faecal culture revealed growths of (non-typeable) beta-haemolytic *E. coli*, which together with the histological findings of lamina propria infiltration with lymphocytes, plasma cells and eosinophils as well as villus fusion and stunting, suggested a diagnosis of enteric colibacillosis. There was no histological evidence of porcine proliferative enteropathy. It later transpired that feed

specifications had been changed and in-feed medication removed, which might have created changes in the intestinal flora which allowed proliferation of *E. coli*. It was suggested that a search for causes of villus atrophy occurring earlier in the pigs' life (rotavirus, *Isospora suis*, *Cl. Perfringens* type A), which might have reduced the absorptive capacity of the small intestine, could be made.

Respiratory Diseases

Bronchopneumonia due to PRRSv complicated by prior salmonellosis

A fresh pluck was submitted to investigate the cause of coughing in 60% of 18-week-old pigs on an indoor nursery finisher unit with eight deaths in the 10 days prior to submission. The pigs were reported to have suffered respiratory disease since an outbreak of salmonellosis at six-weeks-old, pigs were vaccinated for *Mycoplasma hyopneumoniae* and PRRS virus at weaning. A severe bronchopneumonia and pleurisy was identified in the pluck; *Streptococcus suis* serotype 2 was isolated and PRRSV RNA was detected by PCR. Histopathology revealed a severe active bronchointerstitial pneumonia and immunohistochemistry for PRRS virus confirmed the involvement of this virus in the pneumonia. Live vaccination at PRRS is not licenced for administration with other vaccines and no predictions can be made about its efficacy when administered in this way. Also the bout of salmonellosis may well have compromised the acquisition of immunity following vaccination. Vaccination has been shown in numerous to reduce viraemia and therefore virus spread from pig to pig. Reduced morbidity due to PRRSv infection and improved growth performance will result. In any situation the level of environmental challenge is important and high enough levels of challenge will overcome any immunity. PRRSv is a highly mutable virus and the extent to which this mutability allows it to evade vaccinal immunity is open to question. However published papers generally show a reduced duration of viraemia in pigs vaccinated with the MLV vaccine even when challenged with a heterologous strain. It is possible that disease would have been even more severe if vaccination had not been practised in this case.

Pneumonia due to PRRSv and bacterial agents including *M. hyorhinis*

Three live pigs belonging to a group of 100 were submitted for investigation into coughing affecting 50% of the group, 24 animals had died. Post-mortem examination confirmed pneumonia and polyserositis. PCR detected the presence of PRRS virus within mediastinal lymph nodes in one pig, and *Streptococcus suis* and a *Haemophilus parasuis* were isolated from lung cultures. The confirmation of *Mycoplasma hyorhinis* in lung tissue further extended the multifactorial aetiology, presumably as a result of the PRRS infection causing immunosuppression.

Swine Influenza

A gilt and three piglets were examined following an outbreak of respiratory disease in a 700 sow-breeding unit. Pneumonia was observed grossly and confirmed histologically in the gilt and two of the piglets. Immunohistochemistry and virus isolation revealed infection with Influenza virus H1N2 in all three, with *A. pyogenes* also isolated from the gilt's lung.

On another outdoor farm, respiratory disease was characterised mainly by coughing with high (100%) morbidity and low mortality. Gross examination of four weaners/growers identified diffuse pulmonary consolidation with enlargement of associated lymph nodes and white focal lesions of the liver (milk spot lesions characteristic of migrating ascarids). A dual

respiratory problem of swine influenza and enzootic pneumonia was suspected on histopathology with ulcerative lesions in the airways and lymphoplasmacytic coughing. The diagnosis was confirmed by immunohistochemical demonstration of swine influenza viral antigen, and avian-like H1 influenza virus similar to A/SW/195852/92 was isolated. *Mycoplasma hyopneumoniae* was demonstrated by DGGE.

An investigation was undertaken into a respiratory disease outbreak on a finisher unit, and this resulted in the isolation of *Streptococcus suis* type 7 from lung tissue along with *Haemophilus parasuis*. In addition, an H1N1 influenza virus was also isolated.

Pleuropneumonia due to *Actinobacillus pleuropneumoniae*

Actinobacillus pleuropneumoniae was isolated from a finishing pig with a multifocal necrotising pneumonia. This was the first indication of infection on the rearing unit.

Six grower pigs from an outdoor farm were submitted to investigate sudden deaths and pneumonia. The main pathological finding was severe pulmonary consolidation and a purulent reaction affecting either the airways, pleural cavity or pericardium. A necrotising bacterial pneumonia was identified histologically and *Actinobacillus pleuropneumoniae* was isolated as the primary pathogen. *Mycoplasma hyopneumoniae* was also isolated from one pig which showed characteristic enzootic pneumonia histological lesions of lymphoplasmacytic cuffing, and K88-positive *E.coli* was isolated from one of the pigs which had diarrhoea.

Reproductive Diseases

Abortion associated with PRRSv

Five one-day-old piglets from two litters were received in a herd with a sudden onset of early farrowing with a high rate of stillbirths and non-viable piglets. The herd was regularly vaccinated against parvovirus and erysipelas. No diagnostic lesions were found on post mortem examination, but the European strain of PRRS virus was detected by PCR in spleen from all five pigs, strongly suggesting this was the cause of reproductive failure. A profuse pure growth of *E. coli* isolated from the liver of one piglet was likely to be consistent with terminal septicaemia

Disease of the Nervous System

Meningitis due to *Streptococcus suis*

Sporadic deaths in weaned pigs prompted an on-farm post mortem examination by the PVS. *Streptococcus suis* type 2 was isolated from a brain swab, indicating *Streptococcus suis* type 2 meningitis.

Streptococcal meningitis was also suspected as the cause of neurological signs in a 14-week old large white pig from another unit. The animal became recumbent with paddling and opisthotonos before being euthanased on welfare grounds. Gram-positive cocci were seen in brain stem smears and histology confirmed the presence of a subacute to chronic meningoencephalitis typical of streptococcal infection. However, no bacteria were cultured from the meninges but this was likely to have been due to prior antibiotic treatment.

Ongoing problems with signs of meningitis in 50 kg fattening pigs prompted the submission of a carcass for investigation. Post-mortem examination revealed a small increase in peritoneal fluid and moderate meningeal congestion. Culture of liver and lung remained sterile, but *Streptococcus suis* type 2 was cultured in pure growth from brain tissue confirming a diagnosis of streptococcal meningitis.

Skin diseases

Greasy pig Disease (*Staphylococcus hyicus*)

Twenty of a group of 120 six-week-old weaner large white x landrace pigs developed scabby, crusty skin lesions on the shoulder, neck and around the eyes (Figure 1). One week following weaning the piglets were vaccinated with a PCV 2 vaccine and two days later skin lesions appeared. Swabs were submitted from two pigs. *Staphylococcus aureus* was the predominant growth from one swab but the second comprised 86% *S. hyicus* consistent with a diagnosis of exudative dermatitis or greasy pig disease. The condition was successfully treated with Penicillin.



Figure 1: Six-week-old weaner Large White cross Landrace with *Staphylococcus hyicus* infection.

Picture: Richard Knight
MRCVS, Chipping Norton

Skin lesions of uncertain cause

Two of ten British Lop pigs developed skin lesions at approximately 12 weeks of age. The condition has occurred previously on this farm and is generally seen in pigs between 10 and 14 weeks of age. There is no loss of condition or mortality associated with the disease. The lesions first appear as small red raised spots (5 to 10mm) on the abdomen and hindquarters and then spread cranially and dorsally over the chest, shoulders, and back and towards the head. The lesions scab over and resolve completely within about eight weeks. In some individuals the condition can resolve and then reoccur. The submission was a live male castrate pig weighing 43kg. It had a severe generalised skin lesion that was most apparent and chronic over the hindquarters, flanks, and the abdominal skin (Figure 2). There was some excoriation of the skin over the left shoulder and marked hyperkeratosis of both ears particularly on the dorsal surface. On the hindquarters where the lesion appeared to be more chronic, there was marked hyperkeratosis around the base of the tail. Crusts coalesced and in places the crusts had lifted off to reveal fresh epidermis

beneath. On touching the lesions or the non-affected skin, on the dorsal surface the pig did not appear to be pruritic. On close examination the most acute lesions on the dorsal surface were characterised by hyperaemic raised rings with pale centres that ranged in size up to 15mm diameter (Figure 3). The inguinal lymph nodes were enlarged and oedematous but there were no other significant internal findings. Skin scrapings for ectoparasites were negative. Only *Staph. aureus* was isolated from the skin but there were no bacteria isolated from the pre-scapular or inguinal lymph nodes. Liver was collected for determination of zinc levels and tissues submitted for histopathology and electron microscopy. Differentials which were excluded, included swine pox, exudative dermatitis, pityriasis rosea, parakeratosis, and porcine dermatitis and nephropathy syndrome (swine pox occurs in GB red macular spots with a scabby centre are typical – ruled out by histopathology in this case).



Figure 2: 12-week old British Lop Ear pig with severe generalised dermatitis.
Picture: [Padraig Duignan MRCVS, VLA Luddington](#)



Figure 3: 12-week old British Lop Ear pig with hyperaemic raised rings up to 15mm in diameter.
Picture: [Padraig Duignan MRCVS, VLA Luddington](#)

Musculoskeletal Diseases

Osteomyelitis

Osteomyelitis of the lateral humeral condyle was found to be the reason for apparent acute lameness in a twenty-week-old pig, the only affected in a group of 118. *Arcanobacterium pyogenes* was isolated from the large amount of thick purulent exudate seen in the joint, which had also filled the 1cm deep area of lysis in the humerus. This infection was likely associated with previous trauma such as a penetrating wound or trauma to the distal humeral growth plate.

Systemic Diseases

Aero-chocolate liver: Sudden death due to hepatic infection with *Cl. novyi*

A diagnosis of *Clostridium novyi* infection was made following postmortem examination of a 3-year-old Tamworth sow which had died suddenly. The liver was particularly autolysed with an “Aero chocolate” appearance due to accumulation of gas. Smears from liver tissue later tested positive for *Clostridium novyi* by FAT.

Bacterial Endocarditis and septicaemia

Widespread haemorrhages were seen in the carcass of a 13-week-old pig that was euthanased after a history of lethargy, reluctance to move and a hunched back, worsening over 48 hours. It was the only pig out of a group of 124 affected. Post mortem findings included vegetative endocarditis of the left AV valve, peritonitis, haemorrhages in the heart, spleen, kidney, bladder, throughout the peritoneal cavity together with excess joint fluid in the elbow joint. Discussion with the referring veterinarian and Animal Health, together with rapid histological examination of a range of tissues, led to a diagnosis of acute septicaemia. Identification of bacteria isolated and full histological reporting is awaited and will be reported in next month's newsletter.

PDNS

A 20-week old pig was found dead. It had developed diarrhoea approximately 6 weeks earlier but appeared to respond to antibiotic treatment. Three days prior to death multiple circular raised red-coloured spots appeared in the skin especially concentrating around the hind legs, the perineal area, the ventrum and the ears. The pig was in a poor body condition with only very small fat deposits around the heart. On post mortem examination a peritonitis, bronchopneumonia, polyarthritis and ulceration of the stomach were found. Unfortunately, bacterial culture was overgrown with post mortem invading organisms. The generalised lymphadenomegaly, the skin lesions, the interstitial pneumonia and the small black spots in the kidneys raised the suspicion of PDNS (Porcine Dermatitis and Nephropathy Syndrome) as the major factor. Histopathology is being carried out for confirmation.

PCoV2-Associated disease suspected to have been exacerbated by PRRSv

Three 12 to 14-week-old live pigs were submitted from an indoor 250-sow breeder finisher unit where, in the last month, two to three pigs per batch of 100 were coughing, scouring and wasting with poor response to antibiotic treatment. Vaccination of sows for PCV2 was ongoing for one year with a good response. The farmer selected three typical early cases which had reduced growth for one week. All were in fair body condition, one was pyrexia

and coughing. Bronchopneumonias and scour were present in two of the pigs; *Pasteurella multocida* and *Streptococcus suis* 2 were isolated from the lungs of both pigs and PRRS virus was detected in the pig with the most severe lung lesions. Histopathology revealed lymphoid changes typical of PCV2 together with intracytoplasmic viral inclusions confirming a diagnosis of PCV2 associated disease, with lung lesions also indicating PCV2 associated respiratory disease. In the pig with less severe pneumonia there was no clear evidence of PCV2 involvement, the pneumonia was chronic and bronchointerstitial and there was also a nephritis. Histopathology is in progress on the intestines of this pig which had a necrotic ileitis to investigate whether PIA was involved. In the third pig which was scouring without lung lesions, *Brachyspira pilosicoli* was isolated and histopathology suggested past PCV2 activity, in this pig there was also a moderately severe interstitial nephritis. Thus complex multifactorial disease was diagnosed in which PCV2 associated disease was a component. The reasons for a rise in incidence of disease in the finishers were speculated to be PRRS virus infection playing a role in the respiratory disease; the herd had been considered to be stable for PRRSV; and the fact that recent larger litter sizes (up to 15 live born) may have meant that some piglets received inadequate colostrum protection on which efficacy of sow vaccination for PCV2 depends.

Bracken Poisoning

A 6 month old saddleback pig was found dead in woodland, the second such death in a group of 5 pigs running together. Lungs were heavy and oedematous with approximately 1¹/₂ litres of clear yellow coloured fluid in the thoracic cavity. Mulberry heart disease was initially suspected, but histological examination showed lesions more suggestive of **bracken toxicity**, and this has been confirmed in this area previously (Harwood, Palmer and others Vet Rec, 2007, 160, 914).