SELECTED HIGHLIGHTS FROM APHA PIG DISEASE SURVEILLANCE REPORTS
AUGUST 2015

- Outbreaks of salmonellosis – some complex with multiple pathogens
- First diagnosis of *Klebsiella* septicaemia in the Thirsk VIC region
- Erysipelas in small unvaccinated herd
- Mulberry heart disease after weaning

**Reproductive Disease**

**Bacterial cause for stillbirths**

Piglets were submitted from a sow from a single parity herd (actually ranging from parity 6-8) that delivered her whole litter stillborn. In the previous batch of 90 sows farrowing, three or four stillborn litters occurred and three sows were found dead prior to farrowing, these were not investigated. The stillborn piglets submitted had fibrin plaques on the epicardium and testing for infectious agents of abortion identified only pure moderate to profuse growths of *Escherichia coli* which, when histopathology confirmed fibrinous pericarditis and epicarditis, was considered likely to be responsible for the stillbirths in this case. Further submissions would be required to investigate the sow deaths and whether metritis, mastitis, pyelonephritis, other systemic infection or disease was involved.

**Alimentary Disease**

**Rotaviral enteritis and enteric colibacillosis in preweaned piglets**

An increasing number of scouring piglets, aged between one and three weeks, was reported on a small breeding farm with 40 sows. The pigs were all housed and the piglets were reported to recover after a few days without treatment, but were subsequently stunted. K88 positive *E.coli* and rotavirus were detected in faecal samples and the combined enteric insult was likely to be leaving the intestinal damaged resulting in malabsorption resulting in poor growth.

Rotavirus infection was also confirmed by Starcross in faeces samples from four to seven-day-old piglets with a history of watery orange-yellow coloured scour, vomiting and low mortality.

**Deaths and illthrift due to salmonellosis with PRRSv**

Fifteen deaths were reported from a group of 35 seven-week-old replacement gilts with a further five affected with wasting and diarrhoea. Three markedly underweight dead pigs were submitted to Bury St Edmunds with necrotic typhlocolitis from which monophasic *Salmonella* variant 4,5,12:i:- phage type 193 (*S. Typhimurium* -like) was isolated. The pigs also tested positive for porcine reproductive and respiratory syndrome virus (PRRSV) and the strain was identified as not vaccine-like and similar to the strain detected in other submissions to Bury St Edmunds in February, April and May 2015.

**Monophasic *Salmonella* variants and *S. Typhimurium* isolated from multiple cases of diarrhoea**

*Salmonella* Typhimurium Copenhagen phage type 193 or monophasic *Salmonella* variant, (4,12:i:- or 4,5,12:i:-) phage type 193, were also isolated by direct culture from multiple submissions consisting of pig colons, faeces or swabs. In an example of one of these, samples were submitted to investigate colitis and wasting affecting 30 of 1200 nine-week-old housed pigs, four of which had died. In another incident, 20 of 750 twelve-week-old housed pigs were wasting and when on-farm post-mortems were undertaken, thickened large intestines were found with diptheresis, no *Brachyspira* species were detected. In two
incidents in younger pigs with diarrhoea and wasting, aged four or five weeks old, rotavirus was detected in addition to the *Salmonella* and, although enteric colibacillosis might be expected at this age, the *Escherichia coli* isolated were not typeable as pathogenic strains. As only intestinal samples were submitted from these cases, testing for other non-enteric diseases which may have been contributing to the clinical problem was not possible.

**Complex disease involving salmonellosis and bacterial systemic and respiratory pathogens**

Salmonellosis due to monophasic *Salmonella* variant 4,12:i:- phage type 193 was part of more complex disease diagnosed in eight-week-old housed pigs affected with diarrhoea and wasting over a two-week period; 50 of 1000 pigs were affected with 15 deaths. In two of three pigs submitted to Bury St Edmunds there was a typical necrotic typhlocolitis which was considered the cause of death and both pigs also had patchy cranioventral consolidation with *Streptococcus suis* type 2 being isolated from the lungs of one of these pigs. In the third pig, there was a polyserositis and pneumonia and *Haemophilus parasuis* was isolated confirming Glässer’s disease together with *Bordetella bronchiseptica* from the lungs although no respiratory disease was reported from the farm. No swine influenza or PRRS viruses were detected at the time of submission.

**Monophasic *Salmonella* 4,5,12:i:- causing acute enterocolitis**

Sudden onset diarrhoea was reported in seven to eight-week-old pigs on a nursery-finisher unit. The unit receives batches of 400 pigs every four weeks from a single source. The pigs were moved within the unit and diarrhoea was seen the following day. Eight in the batch died over a weekend and about 5% were scouring although the diarrhoea was very watery and the proportion affected may have been higher. On-farm post-mortem examination confirmed watery diarrhoea with little pathology visible while examination of two pigs at Thirsk confirmed the presence of severe enteritis and also some gastritis and early lesions of colitis in one of the pigs. The history and findings suggested the possibility of acute salmonellosis but, due to the acute onset and watery nature of the diarrhoea, at an early stage porcine epidemic diarrhoea virus was tested for and was not detected. A monophasic *Salmonella* variant 4,5,12:i:- phage type 193 was isolated from intestinal contents from both pigs by direct culture, confirming the diagnosis of salmonellosis.

**Respiratory Disease**

**Swine influenza with Glässer’s and salmonellosis in growers**

Three dead seven-week-old pigs were submitted to Bury St Edmunds from an outdoor grower-producer on which sudden deaths were occurring in growers with three deaths from the batch of 100 pigs. Gross findings were suggestive of salmonellosis in two of the pigs (one of which was in poor body condition) and of Glässer’s disease in the third which had a fibrinous polyarthritis and polyserositis. Isolation of *S. Typhimurium* Copenhagen phage type U302 and *H. parasuis* confirmed these two diagnoses and interestingly, pandemic H1N1 2009 virus was detected in the pig with Glässer’s disease and *S. suis* type 8 was isolated from the lung, likely secondary to the swine influenza infection.

**Systemic Disease**

**Typical summer outbreak of *Klebsiella* septicemia in East Anglia**

A further typical case of *Klebsiella pneumoniae* subsp. *pneumoniae* (Kpp) septicemia was diagnosed in the East Anglian region. There was unexpected late preweaning mortality at 20 to 25 days of age on a large outdoor breeding herd with 15 good pigs being found dead without clinical signs being seen. Three were submitted, two of which had blotchy reddening of the ventral skin and marked peritonitis with fibrin and excess fluid in the peritoneal cavities. Lymph nodes were reddened and there was patchy haemorrhage over the cortical surface of the kidneys in two piglets. Kpp was isolated in pure growth from multiple sites from all three piglets, fulfilling the case definition for an outbreak of Kpp septicemia. The Kpp isolate was sensitive to antimicrobials tested except ampicillin to which Kpp shows innate resistance. The isolate will be typed together with others from outbreaks this year to confirm whether they are typical of the ST25 Kpp outbreak isolates seen causing disease since 2011.
First diagnosis of Klebsiella septicaemia in the Thirsk VIC region
The first outbreak of Klebsiella pneumoniae subsp. pneumoniae septicaemia in the Thirsk VIC region since emergence of this disease four years ago was diagnosed in August. The outbreak was typical of those seen previously in East Anglia and in Devon (one outbreak) regions with rapid death of well grown preweaned pigs on an outdoor unit. Gross post mortem findings were consistent with bacterial septicaemia and included reddened carcases, fibrin stranding in peritoneal and pericardial cavities, generalised reddening of lymph nodes and pronounced reddened Peyer’s patches (see Figure 1). A VIO farm visit was undertaken to obtain clinical and epidemiological details and investigate possible links with other affected farms.

Figure 1: Pronounced Peyer’s patches in Klebsiella septicaemia case

Erysipelas in small unvaccinated herd
Acute Erysipelothrix rhusiopathiae septicaemia was diagnosed by Penrith in a four-week-old Tamworth cross Gloucester Old Spot piglet which was one of two that died in a small unvaccinated outdoor herd. The pig presented with red-purple discolouration of the ear pinnae, scrotum and ventral body. The pig had not eaten recently and both kidneys had petechiation over the cortices. E. rhusiopathiae was isolated in systemic distribution with pure growths from kidney and liver.

Mulberry heart disease after weaning
Four five-week-old weaners were submitted to Shrewsbury for postmortem examination from a unit reporting a few sudden deaths and lameness affecting 30 pigs out of a group of 900. Two of the pigs had severe joint infections from which Trueperella pyogenes was isolated. The other two had copious amounts of fluid within the pericardium and haemorrhage on the surface of the heart raising suspicion of mulberry heart disease (MHD) which was supported by histopathology showing lesions consistent with this diagnosis. Histopathology also revealed hepatic necrosis supporting the additional diagnosis of hepatosis dietetica which is linked with MHD as a disease associated with an imbalance between free radicals and free radical (antioxidant – vitamin E and selenium in particular) scavengers resulting in oxidative damage of tissues. Borderline levels of vitamin E and selenium were found on biochemical analysis. As well as examining dietary factors, predisposing factors in pigs for MHD include rapid growth, activity, stress and intercurrent disease.
Nervous Diseases

Ataxia and hindlimb paresis due to polioencephalomyelitis
A fourteen-week-old Berkshire cross Saddleback pig appeared drunk and lost the use of its hind limbs over a three-day period. It was initially still able to eat and drink but then became recumbent and was and submitted to Thirsk. The pig was one of two of that age with a further two 11-week-old pigs on the premises, this pig was the only one affected. Postmortem findings were unremarkable but histopathology revealed polioencephalomyelitis, progressing to panencephalitis with multifocal neuroparenchymal necrosis in the rostral medulla. The histological appearance of the central nervous system was consistent with neurotropic viral infection with sapelovirus infection being the most likely cause. Unfortunately no fresh tissue was available for PCR testing, so nucleic acid was extracted from fixed tissues which is not ideal and this tested negative for both sapelovirus and teschovirus.