



VLA Monthly Surveillance Report for PIGS

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

Highlights

- Incidence of Swine Dysentery continues to be high.
- Porcine Proliferative Enteritis identified as a cause of both acute and chronic disease.
- Mulberry heart Disease diagnosed in a group of four week old weaners.
- Scour associated with *E. coli* O149 (formerly known as Abbotstown) in pre- and post weaned piglets.

Enteric Diseases

Swine Dysentery

An outbreak of swine dysentery was confirmed on an indoor all-in all-out 1,800 pig finisher unit receiving pigs at approximately 12 weeks old from three sources. At the time of submission one shed was affected at around 19-weeks-old with scour and wasting, with blood and mucus occasionally being

seen. Approximately 100 of 460 pigs were affected with 30 dying over a week and the problem was worsening. Two dead pigs were submitted with severe colitis which, in one, was associated with mucus although no blood was evident. *Brachyspira hyodysenteriae* was identified by FAT, culture and PCR. This unit had no recent history of swine dysentery and it was suspected that the source of infection was a finishing unit approximately half a mile away.

A faecal sample was submitted to investigate the cause of colitis and dysentery affecting adult sows. No further history was provided. *Brachyspira hyodysenteriae* was confirmed following isolation of the organism on specific culture media along with a positive FAT result.

Faeces samples were submitted as part of an investigation into increased incidence of clinical signs of bloody mucoid scour affecting approximately 20% of 8-week-old grower pigs on a 100-sow farrow to finish indoor unit, despite in-feed medication with tiamulin at 100 ppm. The unit was known to have swine dysentery. Tylosin had been used in-feed in the past with limited success. Enrichment cultures for *Brachyspira* species enabled isolation of *B. hyodysenteriae*, as expected, and MIC testing revealed values of >200 µg/ml for tylosin (no inhibition), 32-64 µg/ml for tiamulin (acceptable control range 0.062-0.125 µg/ml) and lincomycin 200 µg/ml (acceptable control range 25-50 µg/ml). These results suggest full or partial resistance to three commonly used antimicrobials for the treatment of swine dysentery, all of which are above previously reported mean MIC values for the organism¹. Given that *B. hyodysenteriae* has the potential to spill over into reservoir hosts such as rodents and other mammals, and transport hosts such as birds, this represents a worrying trend. Depopulation is not at present being considered.

1. Karlsson, M.; Fellstrom, C.; Gunnarsson, A.; Landen, A. & Franklin, A. (2003) Antimicrobial susceptibility testing of porcine *Brachyspira* species isolates. *Journal of Clinical Microbiology* **41** (6), pp. 2596-2604.

Porcine Intestinal Spirochaetosis (*B. pilosicoli*) mimicking salmonellosis
Brachyspira pilosicoli was confirmed in 14-week-old growing gilts which were suspected clinically of having salmonellosis.

Wasting caused by proliferative ileitis

PIA was diagnosed as the cause of chronic wasting in a 12-week-old pig. The ileum showed typical thickening and histopathology confirmed the diagnosis. Tissues were submitted from a 40-sow outdoor breeder finisher unit with a small number of chronic wasting pigs resulting in an estimated 0.5% mortality.

Severe ileitis in high health gilts associated with abortions

A live gilt was received from a newly established high health herd (enzootic pneumonia and PRRSV negative). A number of gilts have been affected with a dark bloody scour. Some gilts had aborted and four had died. Following euthanasia by barbiturate injection, post-mortem revealed mainly enteric changes which included prominent velvety mucosa of the terminal ileum,

principally dark brown to bloody contents of the large intestine, affecting all of the caecum and the spiral colon. There was a diphtheritic fibrinous membrane overlying the mucosa, which was thickened and in places was ulcerated. Mesenteric lymph nodes were also enlarged with prominent follicles. MZN stains of the intestinal contents demonstrated acid-fast intracellular organisms suspect for *Lawsonia intracellularis* and this was confirmed by PCR for *Lawsonia*. This would appear to be an unusual manifestation of PPE (Porcine Proliferative Enteropathy) in much older animals than usual. No cause for the abortions could be determined, and it was surmised that these may have been secondary to the *Lawsonia* infection

Colibacillosis in suckling and weaned pigs

Eight of 50 neonatal piglets on a small 40 sow outdoor breeder finisher unit weaning piglets at six to seven-weeks-old died following profuse watery diarrhoea. The problem had also recently moved into weaned pigs. Three 12-day-old piglets from one litter and a six-week-old piglet submitted were dehydrated and scouring and pure and profuse growths of *E.coli* serotype 0149: K91, K88ac (formerly known as Abbotstown strain) were isolated, consistent with enteric colibacillosis.

Faecal samples were submitted from ten day old sucking pigs to investigate a scour problem in neonatal piglets in a 350 sow herd. Laboratory examinations indicated this to be a mixed problem. *E. coli* (Abbotstown, rotavirus and *Isospora*) were identified from the four faecal samples submitted, although not all were identified in each sample.

Type A enteritis in suckling piglets

Clostridial enterotoxaemia due to *Clostridium perfringens* type A infection was diagnosed in one of two piglets submitted live to investigate the cause of scouring in piglets from 24 hours old. In one batch of 30 farrowing sows, seven litters had problems with the number of piglets affected per litter varying from one to the whole litter. One submitted piglet was small with a mild enteropathy and scour and alpha toxin of *Clostridium perfringens* was detected in small intestinal contents. The second piglet had a severe peritonitis and colisepticaemia. The serum gammaglobulin concentration indicated good colostral antibody uptake in both piglets and no PRRSV was detected by PCR on serum.

High worm burdens in diarrhoeic pigs

Ascaris suum was diagnosed in four-month-old pigs with diarrhoea. Faecal egg counts demonstrated between 4,000 and 17,000 epg. High coccidial oocyst counts were also seen. The significance of these latter results is unclear, as coccidiosis is not usually seen in pigs of this age. It is more commonly seen in 1-2-week-old piglets, caused by *Isospora suis*. Nevertheless, rare case reports of the disease have been made in older animals (C M Gaudie, R J Evans and S H Done, 2005. 'Coccidiosis in replacement gilts'. Veterinary Record 157, 517).

Gastric Ulceration in gilts

The carcase of one 15-week-old growing gilt intended as a breeding replacement was submitted for post-mortem examination as part of an investigation into 7 sudden deaths among gilts over a period of 10 days on a gilt rearer unit. This represented a sharp spike in mortality on this unit where post-weaning mortality is usually exceptionally low. Externally the conjunctival mucous membranes were congested. There was one large perforating gastric ulcer (approximately 20 cm in diameter) present in the *pars oesophagea* of the stomach. There was extensive erosion of the gastric mucosa in this region, which was swollen, uneven and exhibited some fibrosis. The stomach contents were extremely dark brown/black. Blood clots were present in the stomach, up to 5 cm in diameter and small intestinal contents were tarry. Adhesions between gastric serosa and omentum were extensive. Tests for predisposing causes including *Brachyspira*, *Salmonella*, *Lawsonia* and PCV2 all proved negative, although PRRSv RNA was identified by PCR from heart blood, implying that the animal was PRRSv viraemic when it died. No management or nutritional factors were identified to account for the sudden increase in incidence of gastric ulceration, and it is speculated that PRRSv may have led to transient anorexia with incidental damage to the gastric mucosa, which was made worse when acid secretion resumed on resumption of appetite.

Respiratory Diseases

Chronic Pneumonia associated with multiple agents.

The carcase of a fourteen-month-old Large White boar that had been on the unit for 14 months was submitted for postmortem examination having died after a short illness. There had been respiratory signs over the past few days, although weight loss had been noted over the previous week. This boar was maintained in a pen at one end of a building which also housed approximately 70 weaner pigs. Only one group of weaners in the building had shown similar but short-lived respiratory signs. The aim of this submission was not only to establish a cause of death, but also to identify any particular pathogens that would require a long-term strategy to be put in place on this unit. Stable froth containing mucopurulent debris was present in the larynx extending into the trachea and bronchi. Both cranial lung lobes were completely consolidated with miliary small white foci throughout. Frank pus oozed from the cut surface of the cranial lobes and the medial lobes were completely consolidated with the caudal lobes containing areas of consolidation in approximately 60% of the tissue. A marked interlobular septa was present in the caudal lobes. Small areas of pleuritic adhesion were noted over both cranial lobes. The cause of death in this pig was considered to be a terminal respiratory insult following a protracted period of pneumonia. The congestion noted in the liver and the pericardial effusion were consistent with a cardiorespiratory problem. The gastric ulceration noted during the necropsy is a common finding in pigs but was incidental in this case. Marked lung consolidation was identified on postmortem examination and *Haemophilus parasuis*, *Pasteurella multocida* and *Mycoplasma hyorhinis* were all isolated from lung tissue. *Pasteurella multocida* was recovered from the heart and therefore consistent with

septicaemia. *M hyorhinis* can cause lesions and disease indistinguishable from that caused by *M hyopneumoniae*. The pig was previously reported as PRRS negative.

Reproductive Diseases

Sow mastitis due to *Klebsiella*

Acute mastitis caused by *Klebsiella pneumoniae* infection was the cause of death of two sows approximately 36 hours after farrowing. The organism was isolated from milk in pure and profuse growth and affected all glands causing rapid death, in one sow before she could be treated. *Klebsiella* species infection is one of the two most common causes of sow mastitis and is a coliform mastitis, thus environmental in origin. *Klebsiella* species are present in faeces and urine and can build up in water bowls, pipes, header tanks, in standing water or liquid on floors and in wet bedding. The organism showed in vitro resistance to ampicillin, trimethoprim/sulphonamide and tetracycline.

Clostridial mastitis in a sow

Clostridial mastitis caused by *Clostridium septicum* was diagnosed in an 18-month-old breeding sow. The post-mortem findings revealed that the caudal mammary glands were markedly distended with extensive swelling extending into the surrounding tissues, which were markedly oedematous and red/purple in colour. It was advised to investigate the bedding and flooring to look for possible causes of teat damage that may have resulted in bacterial colonisation of the mammary gland. Poor clipping of piglets' teeth may also be a contributing factor in this type of disease.

Systemic Diseases

Septicaemia due to *Streptococcus suis* serotype 2

Two outbreaks of *Streptococcus suis* serotype 2 meningitis and septicaemia were diagnosed. One of these occurred on a small 8-sow breeder finisher unit with late weaning at six to seven –weeks-old. Here two sudden deaths occurred over four days from a litter of 8-week-old pigs. The second incident was in a newly established 200 sow indoor herd restocked with “high health” breeding stock. Problems were reported of nervous signs including fits in weaners and eight pigs were treated in the first batch, two of which died. In the second batch one of 19 six-week-old pigs was affected with nervous signs and was submitted. A polyarthritis and septicaemia was present and *Streptococcus suis* serotype 2 was identified by culture and FAT on a meningeal smear.

Swine Erysipelas

Erysipelas septicaemia was confirmed as the cause of malaise and death in a three-week-old Gloucester Old Spot piglet which was submitted for post mortem examination. Erysipelas was isolated from joint fluid, spleen, liver and brain. This piglet was maintained in a group comprising three sows and

their litters and was the fifth piglet to die. The group was part of a small herd of ten breeding sows on a mixed livestock farm supplying products for a local farm shop. Piglets were regarded as doing well until they got to approximately two to three weeks of age when they become ill.

Porcine Dermatopathy and Nephropathy Syndrome (PDNS)

The carcase of one 7-month-old maiden gilt was submitted for post-mortem examination after the animal was found dead following a short illness featuring severe malaise and multifocal macules and haemorrhagic papules distributed over the medial hindlimbs, flanks and face. Gross post-mortem features included superficial inguinal lymph nodes enlargement with red/white mottled discolouration. Bronchial (approximately 7 cm in diameter) and mesenteric (approximately 10cm in diameter) lymph nodes were enlarged with red/white mottled discolouration. Both kidneys were grossly enlarged, measuring 21 cm by 10 cm. Light tan discolouration of the cortices was present overlain diffusely with multifocal beige and dark brown/red areas (up to 2 mm in diameter). These multifocal areas extended well into the cut surface of the cortices of both kidneys. Histopathology of skin and kidney confirmed a multifocal, moderate, necrotising dermatitis and severe, chronic, exudative glomerulonephritis. Lymph node changes included mild/moderate granulomatous lymphadenitis with a moderate, acute, haemorrhagic and suppurative lymphadenitis. It is interesting that the farrow-finish unit purchasing the gilt had suffered from severe PCVAD affecting 14-16 week old pigs, manifesting as wasting. The exact pathogenesis of PDNS has yet to be fully elucidated but the pathology is thought to be immune-mediated and PCV2 has been implicated as a 'triggering' antigen. It may be that this gilt met a large PCV2 challenge on arrival at this farm, which led to antibody: antigen ratios conducive to the development of PDNS.

Mulberry heart Disease associated with low dietary vitamin E

The carcasses of three by four-week-old piglets were submitted with a history of the sudden death of eight over the previous two days. These deaths were occurring approximately one week after weaning on this batch-farrowing unit. There were no ongoing treatments and no other problems identified on the farm. All three pigs had similar findings of spectacular pathology of the pericardial sac distended with serofibrinous fluid with fibrin clots. In all three pigs the hearts were dilated and the epicardial surface was pale and streaked, and this extended into the cut surface. In addition, two of the three pigs had unclotted blood present in the peritoneal cavity and the livers were enlarged, friable and dark in colour with attached blood clots. Mulberry heart disease was confirmed histologically. This is a diagnosis that has not been made at VLA Thirsk for some time, and discussions with the farm veterinarian raised the issue of reduced vitamin E supplementation by nutritionists trying to keep costs down at a time when the industry is going through a period of very tight margins due to the high cost of feed.