

Salmonella

There are many different species, serotypes and strains of the family of bacteria called Salmonella, which can cause clinical disease in a variety of hosts including pigs and humans. Frequently isolated serotypes include *Salmonella typhimurium*, *Salmonella choleraesuis*, *Salmonella Dublin* and a monophasic *Salmonella typhimurium*.

Many serotypes have adapted to a specific host, however *Salmonella typhimurium* can cause clinical disease in both pigs and humans – for this reason it is at the centre of food safety initiatives to reduce the level of pork contamination with Salmonella.

Infection can be introduced to a herd through recovered carrier pigs that shed the bacteria in their faeces intermittently for up to 5 months, or in their saliva (as the bacteria can live within the pigs tonsils). It can also be introduced via contaminated feed, clothing, boots, equipment and vehicles. Birds and rodents are also carriers of infection and it can survive outside the pig for a long time – up to 14 days in wet faeces, and in dust for up to 13 months.

Clinical Signs

The bacteria can be found in many healthy pigs' intestines that do not show any clinical signs of Salmonellosis. In fact clinical disease is uncommon in pigs, but is usually seen in weaned pigs when it occurs.

The pig ingests the bacterium which passes through the pigs stomach to the intestines. Here it invades the far end of the small intestine called the ileum, the lymph nodes present in the small intestine, and the spiral colon within the large intestine, resulting in a thickening of the intestinal wall that can eventually become severely ulcerated.

Pigs with the enteric form of the disease have a watery, yellow diarrhoea which may initially affect one or two pigs in a pen, but clinical signs will spread rapidly through the pen. The affected pigs become dull, have a reduced feed and water intake, and become dehydrated and lose condition, made worse by the diarrhoea present.

Once the bacteria have invaded the wall of the intestine, it can enter the blood stream resulting in a septicaemia (a bacterial infection in the blood). This causes the pigs to become very ill, with vomiting, laboured breathing, an increased temperature and more mortality being seen.

When the body has a severe infection, it redirects blood flow away from a pig's extremities, ensuring blood flow is maintained to vital organs such as the brain, heart and kidneys. One of the areas of the body that normally has a low blood flow is the area around the pig's rectum, so a reduction in blood flow results in scar tissue forming (a fibrosis) which can cause a rectal stricture.

Diagnosis

Clinical Salmonellosis is often suspected from a farm's history and the clinical signs seen. Post mortems should be carried out, with particular attention to the intestines where haemorrhagic lesions can be seen, along with engorged intestinal vessels and enlarged lymph nodes. Confirmation of the diagnosis requires a sample of the intestine from an untreated pig to be submitted to a laboratory to culture the organism. If Salmonella bacteria are cultured, they will be serotyped and this will also provide important antibiotic sensitivity information. Salmonella in pigs is reportable when diagnosed, so samples do need to be taken when it is suspected.

In severe cases, the pig produces antibodies 6 to 28 days after the infection. Not all pigs seroconvert and produce antibodies however, so blood sampling is a less frequently used tool for diagnosis itself.

Where there are no clinical signs, to monitor the presence and level of Salmonella on farm, faecal samples taken from across the herd can be used to detect the level of shedding of the bacteria

Treatment, Control & Prevention

In an outbreak of Salmonellosis, rapid individual treatment with an effective antibiotic is needed. The bacteria can develop resistance easily, making selection of antibiotics more difficult – the antibiotic sensitivity information from the laboratory can assist this decision. Antibiotics commonly used include apramycin, potentiated sulphonamides and colistin. Colistin, in particular, is an antibiotic that stays in the gut, so septicaemic pigs will need individual treatment with a suitable systemic antibiotic as well. Water medication can also be used to treat in-contact pigs.

Clinical signs are often seen following a stress period, such as at weaning or post mixing. As the bacteria can survive in the lymph nodes, the use of antibiotics to prevent clinical disease is not effective since any stress will result in clinical signs at any point.

To prevent spread of disease from an affected pen of pigs, different overalls and wellies should be worn when in contact with these pigs, with a fresh foot dip placed outside the pen. The spreading of muck through other pens should also be avoided if possible, especially if the pigs are housed in a scrape through system. As Salmonella can infect and cause clinical disease in humans, staff are advised to wear gloves when handling these pigs and wash their hands afterwards. Staff, or their close family, who are very young, old, pregnant or with a lowered immune system should avoid direct contact with these pigs.

Rooms and/or buildings should be run as all-in all-out. To prevent introduction of disease into a clean and disinfected room/building there should be an effective rodent control plan, including the bird proofing of feed hoppers. Water and/or feed acidification can be used to lower the pH (the acidity) of the gut so that the bacteria are killed before they can invade the intestinal wall.

Please speak to your Vet to discuss any questions you may have