Pig Disease Identification and Diagnosis Guide

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PART 1
Management Problems on Pig Farms

1.1 Case Study

The farmer operated a nursery and finisher pig farm system, with groups of finisher pigs kept in a variety of indoor and outdoor pens. Some groups of finisher pigs were raised in open-plan sheds with canvas roofs and the floors consisting of soil and bedding materials (Fig. 1.1i). The farmer used a variety of sources of bedding materials, such as straw, cereal husks and waste horticulture materials. Pig were raised in these sheds from 25 to 100 kg bodyweight, and then sent for slaughter. The farmer obtained the weaner pigs at 25 kg bodyweight, from a modern breeder farm. The finisher pigs were generally alert and eating well, but some groups were thought to be uneven in growth. The pigs did not have any cough or diarrhoea problems. The farmer was called by the operator of the local slaughterhouse, following the delivery of a truck-load of 100–110 kg pigs. During the processing of the pigs, the slaughterhouse workers were shocked to see some enormous worms inside the small intestines (Fig. 1.1ii). They also noticed most of the livers of these pigs had multi-focal fibrotic lesions, which looked like someone had dropped some spots of milk on to the livers.

Key Features

- Pig production in settings with soil-and-bedding floors.
- Large worms in the intestines and milk spots on the liver.

1.1a. What is this problem?
1.1b. What control measures may assist the herd?

Fig. 1.1i. Finisher pigs in open-plan sheds with soil-and-bedding floors.

Fig. 1.1ii. Large worms from the small intestines at processing.

1.1 Comments

1.1a. This is intestinal parasitism due to the large pig nematode worm *Ascaris suum*. Its life cycle inside the pig includes larval worm movement through the liver and lungs, then worm maturity in the pig intestines. The larval movements of *A. suum* in the liver is the cause of the 'milk spot' liver lesions. There is a period of 4–5 weeks between the pig eating a worm egg that is contained in the residual faecal material in the soil and bedding material on the ground, until the worm becomes an adult in the pig intestines. This period is known as the pre-patent period. The overall incidence of these worms in pigs declined greatly with construction and population of modern indoor farms in the 1970s, with raised, slatted-concrete floors, which breaks the oral–faecal infection cycle. However, the incidence of pig worms is now increasing again and is significantly higher in outdoor farm systems. Infection of farm sites only requires a small number of infected pigs to enter the site, during an initial stocking with pigs from variable sources. The thick-coated *A. suum* eggs are then highly stable and infectious in the environment of soil-and-bedding farm floor systems for several years. It is also likely that farm equipment and wild birds may also act to spread the eggs around a farm site. The presence of the larval worm lesions in the liver (milk spot liver) and lungs may result in a downgrading of the price of the pigs for the farmer.

1.1b. Farms that have been infected for some time should employ ongoing medication programmes. Treatment usually involves delivery of an anthelminthic medication via the feed or water supply. Routine anthelminthic benzimidazoles (such as flubendazole) or ivermectins are adequate – resistance of the worms to drugs has not been a major issue. The timing of medication for *A suum* is generally aimed to prevent mature intestinal infection. This is achieved by medicating finisher pigs at intervals of 4 weeks apart.

The cleaning of farm sites for ascarid eggs is generally not practical. In outdoor pig systems, where pigs are kept on pastures, careful attention must be paid to stock management, with field rotations, low stocking densities and regular anthelminthic treatments.

1.2 Case Study

The farmer operated a medium-sized grower and finisher pig farm, which was constructed in an isolated and open-landscape situation. The farmer and some casual staff had installed all the electrical and mechanical ventilation systems in the farm buildings. The pigs were generally healthy and received a complete vaccination programme. The region had cold winters and warm summers, with many thunderstorms in the spring. During a large storm at night-time, the farm was hit by lightning strikes. The following day the farmer opened the doors of the unit to find a very large number of the finisher pigs were dead. Close inspection indicated that the room was very hot, and all the dead pigs were dirty and smelly (Fig. 1.2i). Many of the dead pigs were rotten and full of gas. The death rate was estimated at 90–95%, with the only surviving pigs being the smallest ones in the group. Large burns were evident on the main electrical systems controlling the mechanical ventilation systems and they did not function properly (Fig. 1.2ii).

Key Features

- Faults with the mechanical equipment used to control the indoor environment.
- Multiple deaths of larger pigs indoors.

1.2a. What is this problem?
1.2b. What are the important management systems required to prevent this problem?

Fig. 1.2i. Groups of dirty and smelly dead finisher pigs.

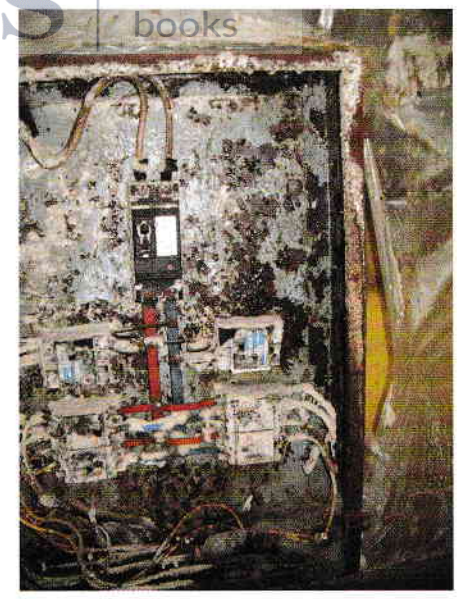

Fig. 1.2ii. Damaged farm-building electrical system.

1.2 Comments

1.2a. This death of larger pigs inside an enclosed room is due to excess heat, in a process known as hyperthermia. The housing of pigs inside enclosed rooms assists biosecurity and allows pigs to be raised throughout the year, even in regions with cold winters. However, any fault and cause of electrical or machine-related stoppage (such as a lightning strike) to the ventilation systems will result in the mechanical heating or cooling systems to cease functioning. This will lead to the consequent loss of cooling ventilation in the affected building. Heat rapidly builds up inside the building as a result of the presence of many larger pigs inside the room and will quickly result in this pig hyperthermia situation and many deaths of pigs in the enclosed buildings.

1.2b. The pig does not have many innate systems to control its body temperature, as they do not sweat (except from the snout). Therefore in hot conditions, pigs must be supplied with cooling ventilation or water cooling systems. Water cooling systems, such as drip lines, mist-spray devices or shallow pools in pens, allow the pig to lose heat via the cooling effect of water evaporation on the skin. However, in some tropical climates with high humidity, the water will not evaporate and the pigs will not be cooled. The growth performance of pigs in open buildings in tropical climates is therefore unlikely to match those in temperate climates.

In pigs housed in enclosed buildings, any fault or cause of electrical or machine-related stoppage (such as lightning strike) to the mechanical ventilation systems will result in the hyperthermia situation inside enclosed buildings. Therefore great attention must be given to correct installation of lightning rod and electrical earthing systems, and the operation of electrical- and mechanical-fault warning alarm systems on farms. These alarm systems should be tested each week on the farm. Other management factors to keeping pigs comfortable in housed accommodation include: (i) adequate insulation linings; (ii) high volumes of water flow in drinkers; and (iii) low stocking rates.

1.3 Case Study

The farmer operated an established nursery and finisher farm, with grower pigs housed in a variety of older-style buildings. The pigs had a range of general problems such as diarrhoea, coughing and lameness, but none of these problems was considered particularly serious. Some of the pens in the older buildings had older, poorly maintained floors. On some occasions, the farmer received and housed larger numbers of pigs to maintain throughput of finisher pig numbers. In some pens of grower pigs, the farmer noticed blood on the faces of many pigs, and a few pigs in these pens had bloody protrusions from their backside. Close inspection indicated that these affected younger grower pigs had a portion of their intestines protruding in a bloody mass oozing out from the anus, in a condition known as a rectal prolapse (Fig. 1.3i). Examination of the older pigs in the finisher areas on the farm also revealed that occasional pigs had a large swollen abdomen appearance, looking like a 'pot-belly'. These pot-belly pigs were small and hairy with a prominent ridged spine (Fig. 1.3ii).

Key Features

- Prolapse of rectum from anus of grower pigs.
- Pot-belly pigs noted in finisher areas.

1.3a. What is this problem?
1.3b. What control measures may assist the herd?

Fig. 1.3i. Grower pig with rectal prolapse.

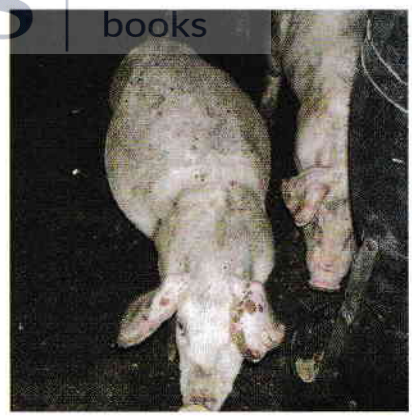

Fig. 1.3ii. Finisher pig with pot-belly appearance and thin ridged back.

1.3 Comments

1.3a. The problem in the groups of younger grower pigs is prolapse of the rectum, where the pig has pushed the terminal part of its own intestine outside of the body, via the anus. It is not an infectious problem, but it is a common event in pigs in farms around the world. There are many suggested risk factors for an increased incidence of rectal prolapse on farms, but cases often appear sporadically and it is difficult to place an exact cause and effect. The suggested risk factors include: (i) overcrowding of pigs in pens and trucks; (ii) excess feed intake and excess dietary lysine; (iii) a short tail length; (iv) diarrhoea; (v) coughing; (vi) straining to defecate; (vii) older sloping floors; and (viii) lameness problems.

If a pig suffers a rectal prolapse and the rectum is not repaired, then the protruding portion of intestine may be damaged or partially eaten by other pigs and the injury around the anus will heal by fibrous scar tissue. This will lead to a restriction of the rectal and anus openings, known as a rectal stricture. These pigs with rectal stricture will not defecate properly and will have a swollen abdomen full of poorly digested food and constipation – these are the pot-belly pigs in the older groups of finisher pigs. These pigs are generally culled from the herd.

1.3b. The management of a recently prolapsed rectum in an individual pig entails examination of the prolapse to determine if it is suitable to be replaced back into the pig. The prolapse is often swollen and bloody, but should not be replaced if it is necrotic or torn. The pig should be sedated and the hindquarters raised upwards. The prolapse should be washed and cleaned and gently re-positioned with the hands. The prolapse is then held in place with a one-finger anal opening and a purse-string circular suture placed around the anal ring. This suture should be removed after 5 days. Failure to provide surgery will lead to the cannibalism and poor healing of the prolapse, with the rectal stricture problem occurring and likely culling of the pig.

It can be difficult to address all the suggested risk factors for rectal prolapse on a pig farm. Feed supply to pigs should be steady and constant, with no surges or interruptions. When tail docking or trimming is performed, it should consist of surgical removal of only a portion of the distal tail in neonatal piglets, to no fewer than three vertebrae adjacent to the trunk. The piglet is therefore left with a reasonable length of tail muscles to assist defecation. Floors should be even and properly maintained.

1.4 Case Study

The farmer operated an established medium-sized grower and finisher pig unit, in which he had constructed various open-sided and enclosed buildings. The pen floors were concrete and the pen walls were constructed with local supplies of metal rods and sheets (Fig. 1.4i). The farmer had also installed all the farm electrical systems in open, exposed areas of the buildings (Fig. 1.4ii). The farm pigs were generally healthy and the pens were vigorously cleaned and disinfected between batches. The farm suffered periods of windy and rainy weather. The farmer entered the farm one day to find several of the grower pigs lying dead, in a group of metal-sided pens in one area of a building. Close inspection indicated that some of these dead pigs had dark linear burn marks on their skin. Many of the other pigs in these pens appeared to be severely lame, with fractures to the bones of their legs and some were paralysed in the back legs and sitting down. At autopsy of the dead pigs, the farmer and veterinarian noticed that the body organs appeared congested, with large haemorrhages on the heart and skeletal muscles.

Key Features

- Faults with the electrical circuits in the farm.
- Multiple deaths and bone fractures of pigs in one location.

1.4a. What is this problem?
1.4b. What are the important management systems required to prevent this problem?

Fig. 1.4i. Pigs raised in metal-sided pens.

Fig. 1.4ii. Electrical box for wires and fuses in an open area of the pig farm.

1.4 Comments

1.4a. This is a case study of deaths and bone fractures due to electrocution of pigs, which have come into contact with live wires and/or metal pens. This type of electrocution of pigs or humans is a relatively common event on pig farms, often due to faulty or home-made electrical wiring and plugs. Many plugs and electrical fittings can deteriorate over time, particularly in situations where they may be repeatedly exposed to powerful washing and cleaning practices for pig-farm hygiene purposes. Any lack of attention to these possible problems with electrical circuits can lead to consequent overloading and fusing of any electrical circuits, with the wires or contact metal-pen areas becoming live with electrical current. This will cause the electrocution of any group of pigs that come into contact with the electrical fault area, such as metal-sided pens with wet floors.

If it is suspected that any pig might have been subject to electrocution it is obviously vital that the local electrical power is turned off, prior to any handling of the affected electrified pigs by farm workers.

1.4b. Great attention must be given to correct installation and maintenance of the electrical plugs, wires and fittings on farms. Any indoor electrical fittings that are washed regularly must be maintained and replaced, whenever they appear damaged.