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Health Quiz

NADIS Pig Health – November 2007

Erysipelas

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On farm disease monitoring of pigs is undertaken on a daily basis by 14 pig veterinarians reporting under the NADIS surveillance scheme. Reports regularly highlight incidents of Erysipelas either in growing pigs in various forms or in sows causing reproduction problems including abortions. It should be regarded as one of the more common pig diseases in all types of farm (indoor/outdoor, intensive/extensive including smallholding and 'hobby' farms).

The causative organism of Erysipelas in pigs is the ubiquitous bacterium *Erysipelothrix rhusiopathiae*, formally known as *Erysipelas insidiosus*. The bacterium can survive in soil or dung for 6 months or more but probably more significantly is carried by a wide range of wild birds as well as rodents, especially mice. Pigs are particularly susceptible to disease with this organism and the classical manifestations are the acute, septicaemic form producing sudden deaths or in milder cases "diamonds". These forms of the disease can be controlled by a combination of hygiene, medication and vaccination.

Additionally, chronic (long term) changes can occur in pigs challenged with Erysipelas and presents in 3 forms:

- a) Endocarditis – the development of 'cauliflower' like lesions on heart valves that leads to death (often sudden) due to heart failure.
- b) Arthritis – a complicated form of the disease which can be very difficult to control. The difficulties arise because, in most cases, it is not the direct result of infection in joints with the organism. Erysipelas arthritis is what is termed as immune mediated or hypersensitivity reaction.

Whenever a mammal is challenged with a novel organism which it recognises as being potentially harmful, it will mount an immune reaction in which antibodies will be produced against the organism (antigen). In most "normal" infections, these antibody/antigen complexes will be "eaten" by scavenging immune cells and thus, the organism is rendered harmless. Unfortunately, in some instances, and Erysipelas is a case in point, the initial reaction against the organism is excessive (i.e. hypersensitive) and the antibody/antigen complexes flood the system.



Fig 1: Sloughing of the skin secondary to necrosis following Erysipelas infection



Fig 2: Sloughing of the skin secondary to necrosis following Erysipelas infection



Fig 3: Classic 'diamonds' in a growing pig

These circulate around the body and settle out primarily in the joints occasionally also blocking blood supply through the tiny capillaries.

The end result is damage to the joint which is both progressive and irreversible.

The most significant factor clinically is that because the arthritis results from an immune mediated condition, it is not necessarily the case that the acute form of the disease will be seen prior to it. Moreover, it can occur in partially immune animals (i.e. pigs that are already sensitised to the organism) and, thus, can even be as a result of prior vaccination.

c) Skin necrosis – developing in a similar way to the arthritic form in which ischaemic damage to the skin occurs, leading to death of the tissues and sloughing of the skin. It can lead to loss of extremities, especially the ears (figs 1 & 2).

In adult breeding animals all of these forms of the disease can be seen although the arthritic form is rare in sows other than those at the beginning of their breeding life. Additionally, infertility can occur in affected sows (particularly those showing other clinical signs around serving time) and in established pregnant animals abortion can occur without any other clinical signs presented. Rarely piglets may be born infected and affected if the sow has been challenged in late pregnancy.

At least 24 different strains/types of the bacteria have been characterised but most outbreaks of the disease are associated with types 1 & 2.



Fig 4: 'Cauliflower' growths on heart valves (Endocarditis)



Fig 5: Crippling, irreversible arthritis in a growing pig

Clinical signs

In a completely naïve population it is possible for all manifestations of the disease to become evident in different animals or sequentially.

- 1) **Peracute disease** – sudden death due to acute septicaemia.
- 2) **'Diamonds'** – the classic form of the disease. This is also a septicaemic form, albeit milder, in which raised red 'diamond' shaped lesions appear particularly over the back of the pig (fig 3). It may have a very high temperature (42 C+), be depressed and inappetant. Pigs so affected or those in contact can develop chronic signs such as skin sloughing (figs 1 & 2) or may be found dead 4 – 10 days later (possibly having appeared to recover) as a result of endocarditis (fig 4).
- 3) **Arthritis** -The animal will rarely have a temperature and classical diamonds may not have been seen in the individual or pen mates. The arthritis produces a very severe lameness - particularly evident in the hind legs but rather than producing a pig that is "off its legs", the legs stiffen and become very upright. The joints in the spine may also be affected, producing a hunched look where the back legs "bunny hop". Whilst appropriate treatment in the early stages – as prescribed by the

veterinary surgeon – can arrest the damage – once they reach this crippled state, recovery is unlikely. The animals may not be fit to transport to slaughter and require on farm destruction but mild cases, which can be very common, may simply produce an awkward gait – maybe not even lame – that does not preclude slaughter, although condemnation can occur.

However, when the disease occurs in future breeding stock, it can severely limit selection rates or even cause problems for the breeding gilt in future life in animals that slip through the selection process.

At post mortem examination, the joints of severe cases will reveal very obvious osteo (bony) arthritis explaining the irreversibility of advanced lesions (fig 5).

- 4) **Breeding problems.** This can be presented either as waves of return to service – possibly with preceding clinical disease such as 'diamonds' – or as a storm of abortions at any stage of pregnancy often without preceding signs in affected animals or pen mates. Boars are also vulnerable to the disease and given that very high fever can occur this may render the boar infertile for up to 6 – 8 weeks, with implications for herd fertility.

Diagnosis

As with most diseases, diagnosis would be suspected on history and clinical presentation supported by post-mortem examination by a veterinary surgeon. Confirmation can be

made by laboratory tests either isolating the organism for acutely affected pigs or aborted material, or by serological testing.

Circumstances

Erysipelas is particularly evident in systems which allow or promote:-

- 1) Contact with bird faeces
- 2) Mouse contamination
- 3) Access to solid muck

In practice, this means that the disease is most prevalent in straw based systems, particularly in open barns i.e. the supposed welfare friendly pig keeping systems and tends to peak in the summer months, although can occur at any time.

Costs

The cost of an outbreak of Erysipelas to a farm is highly variable:

- a) At the mildest level small numbers of pigs may occur with diamonds which respond well within 24 hours to penicillin based injections and make a full recovery with no discernable weight loss.
- b) Condemnation at slaughter can include:
 - i) Whole carcasses acutely affected (these should never have been presented for slaughter).
 - ii) Skinning of the carcass and subsequent downgrading when unhealed diamonds occur or skin necrosis is seen.

- iii) Partial or occasionally total condemnations due to the arthritic form. (Affected herds have been recorded as suffering condemnation of 2% of total submitted weight.)
 - c) Outbreaks of death due to endocarditis has caused 15% mortality in a population of 500 growing pigs.
 - d) Abortion storms have been recorded as affecting 18% of sows over a 1 month period in the second half of pregnancy. Death of sows due to endocarditis can also occur.
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Treatment

The acute disease (diamonds, abortion) is relatively easily and effectively treated with penicillin based antibiotics, either given by injection, in water or in feed depending on the extent and duration of the outbreak. A full course of treatment must be given – whilst a single short acting dose of penicillin by injection will often rapidly lead to apparent recovery (ie reduced temperature, return of appetite) failure to provide 3 – 5 days treatment can lead to chronic signs or re-emergence.

Where outbreaks of endocarditis are seen medication of the whole population via feed can be effective to suppress disease.

Treatment of chronically lame pigs is often disappointing – antibiotics are rarely effective against Erysipelas lameness but use of NSAID or even cortisone can give temporary relief from pain.

Control

Safe and effective vaccines, including types 1 & 2, are available and are very cheap. Considering the high risk of Erysipelas to pigs, particularly in straw based or outdoor systems, it is an essential component of any health programme to vaccinate all breeding stock (gilts, sows and boars) for the disease. A primary 2 dose course, with appropriate interval, should be followed by boosters for sows every parity and every 6 months for boars. Sow boosters are often given at weaning although protection of the offspring up to 8 – 10 weeks of age can better be achieved by vaccinating 2 – 3 weeks before farrowing.

In high risk situations, vaccination of young stock from 6 weeks of age (either with a single dose or if necessary a 2 dose course) can be necessary.

The key to preventing Erysipelas arthritis rests in limiting exposure to the organism. These can come from several sources (i.e. birds, mice and other pigs).

Bird scarers, bird netting, proximity of birds of prey and coverage of feed hoppers etc will all reduce the chances that feed will become contaminated with bird faeces. Likewise, a vigorous rodent control programme is essential. (This also has benefits for Salmonella control and other biosecurity issues).

Hygiene is also important. Cleaning of yards between batches by washing and disinfection ± lime washing will prevent a build up of organisms from batch to batch and, in particular, will avoid the pigs meeting a large challenge dose (which would be most likely to induce a hypersensitivity reaction) on arrival in yards. Moreover, whilst vaccination is not in itself effective at preventing Erysipelas arthritis, a vaccine programme applied early in life (6-8 weeks old) will mean that pigs entering the finishing stage 1 month later will be immune and, thus, limit the multiplication of Erysipelas organisms that would then constitute a heavy challenge from penmates.

Conclusion

With modern cheap vaccines available it is surprising that Erysipelas is regularly reported in breeding animals by NADIS veterinary surgeons. Neglecting this basic programme is not cost saving.

Modern systems for growing pigs with solid floors, dung recycling and high risk of exposure to birds tends to favour the persistence of Erysipelas in pig farms.

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Health Quiz

NADIS Health Bulletins are designed to improve farm income, animal health and welfare by promoting disease control and prevention.

Discuss how health planning can improve the profitability of your farm with your veterinary surgeon.

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