

# ABSCESS

## What is the condition?

Abscesses are localised pockets of pus, which are walled off from body tissues, containing dead cell material and bacteria. Abscesses that are visible externally can be an indicator of a larger internal infection.

## How are they caused?

The formation of abscesses can be caused by a range of factors. This could include traumatic injuries such as fighting or tail biting, skin conditions (e.g. dermatitis) and poorly administered injections. Abscesses could also occur as a secondary infection following conditions such as pneumonia.



Source: MINTRAC

## Carcass impacts

Abscesses found on the carcass can be trimmed off the carcass (along with its associated lymph node) provided that no other signs of disease or infection are found. Abscesses found in the lungs and liver may result in only the affected organ being condemned, if no other lesions are found. When an infection has spread through the bloodstream (a condition called pyaemia) and caused lesions to develop in multiple organs, the spine or in multiple muscles, the entire carcass will be condemned.

## Treatment

If the abscess is small, keep the area and environment clean and monitor for changes. If the abscess is large, move the animal to a hospital pen and consult a veterinarian for treatment and care advice. When there is a high incidence of pigs with abscesses, identify the source of the problem. If no improvement is seen in severe cases within several days, euthanasia may need to be considered.

## Prevention

Ensure good hygiene practices are followed during vaccinations and other injectable medication procedures. Change needles regularly, ensure pens and pigs are clean and dry, store medications according to vet recommendations, and use correct needle sizes for different classes of pigs.

Ensure pens are free from any sharp objects that could cause injury. Minimise fighting and tail biting behaviours to reduce injuries and subsequent potential for infections.

# ANAEMIA

## What is the condition?

Anaemia is a condition associated with either a reduction in the number of red cells in the blood or a lack of haemoglobin, which transports oxygen throughout the body in blood. This can be due to loss of blood or a reduction in the level of haemoglobin in red blood cells. Anaemia can have wider implications on pig health, including a suppressed immune system, slower growth, and increased mortality and morbidity.

## Cause of the condition

While iron deficiency anaemia occurs as a syndrome in sucker pigs, this is not the cause of anaemia in slaughter age pigs. In slaughter age pigs, anaemia usually occurs through blood loss which can be brought on by severe trauma or diseases e.g. gastric ulcers, ileitis, swine dysentery, or severe whipworm and lice infestations.

## Carcass impact

Anaemia associated with systemic conditions or marked anaemia and poor carcass condition will lead to the carcass, being entirely condemned. If there is no active generalised condition, then the carcass may be used for animal food. If the anaemia is slight and there are no other signs of disease, then the carcass may be passed for consumption.

## Treatment

Consult with your veterinarian on the cause of the anaemia in the herd before instituting any treatment.

## Prevention

Managing any of the diseases mentioned above, as well as ensuring there is enough iron in the diet is key to prevention.



Source: MINTRAC

# ANTE MORTEM

## What is this?

Ante mortem refers to the veterinary inspection prior to animals being slaughtered. An animal may be condemned or separated at this stage if disease or an injury is identified.

Ante mortem inspectors are required to identify sick or injured pigs unfit for human consumption prior to slaughter. Suspect animals are separated for slaughter to reduce the risk of any contamination of healthy carcasses occurring. After slaughter the inspectors are required to conduct a post-mortem to verify carcass condition and provide advice on further carcass processing.

## What conditions are identified at ante mortem?

The main conditions that are identified at ante mortem are limited to those that can be easily identified visually such as:

- injuries
- lameness
- swelling
- enlarged testicles (orchitis)
- abscesses
- tail bite
- hernia
- prolapses
- skin conditions (erysipelas)
- diarrhoea
- emaciation
- fever (more difficult to identify).

One area where the ante mortem inspection can identify illness that might be missed post-mortem is nervous signs such as a head tilt and abnormal movement (e.g. stumbling, can't walk straight), which can indicate conditions such as meningitis. Animals suffering from severe injury or illness are required to be humanely euthanased immediately.

## Emergency euthanasia

In some instances where the welfare of an animal has been compromised, but emergency euthanasia is not required they may be processed as an emergency kill at the abattoir. Downer pigs, or pigs that are unable to walk unassisted, are required to be euthanased as soon as they are identified. This can be caused by obvious injury or illness (e.g. fractures, dislocations), or can be due to reasons not identified until post-mortem, such as a broken back.

## Prevention

Careful inspection of pigs before they are put on the truck and exclusion of any that are not fit to load. See the '[Fit for the Intended Journey Guide](#)' for more information.



A pig with a large hernia • Source: MINTRAC

# ARTHRITIS

## What is the condition?

Arthritis is inflammation of a joint. It is caused by trauma to the joint or through bacteria entering the joint via the bloodstream, resulting in inflammation of the joint tissue. This leads to a build-up of fluid, causing swelling, which can lead to lameness.

## Disease on farm

Arthritis is somewhat common in suckling pigs, growing pigs and sows. In well-managed herds, very few piglets will require treatment for arthritis, but this could increase to 15% if there are problems with husbandry or hygiene practices.

## How is it spread?

Arthritis that is caused by trauma cannot be spread between pigs, however arthritis that is caused by bacterial infections has the potential to be spread. These infections can enter the body via the respiratory tract. It is important to identify the agent causing the arthritis to enable treatment or prevention.

## Carcass impacts

Where arthritis is noted in only one or a small number of joints, then only the affected limb will be trimmed off from above the affected joint. In severe cases where arthritis is noted throughout the body or is present with signs of other disease, the whole carcass is condemned.

## Treatment

Treatments used can vary with the disease so consult your veterinarian to determine the causal agent and the best course of action.

Antibiotics may be used to treat the bacterial infection at the recommendation of a veterinarian, however once an infection has caused damage to the joint(s) this may be irreversible. Anti-inflammatory medication may be prescribed for pain relief and to improve recovery time.

## Prevention

Determining the cause of the arthritis is key to managing the condition. If arthritis is linked to swine erysipelas, consider implementing a vaccination program within the breeding herd.

Where arthritis is linked to poor flooring or handling, implement management practices that prevent injury to pigs to reduce the likelihood of arthritis occurring following a bacterial infection.



Source: MINTRAC

# ASCARIDS

## What is the condition?

Ascarids are large roundworms (*Ascaris suum*) that are found in the small intestines of pigs. The roundworm can reach lengths of 40cm and be 7mm thick at full maturity. They cause inflammation of the lungs and the appearance of 'milk spots' (with inflammation) on the liver due to the presence of migrating larva. Heavy infestation of ascarids can lead to loss of appetite, vomiting and death. Symptoms in heavy infestations can include:

- difficulty breathing
- weight loss (can be slow)
- jaundice
- ill thrift
- passing of whole worms in manure
- death, if the small intestine is ruptured.

In smaller infestations, a loss of appetite, slow growth and poor feed efficiency can occur.

## How common is it on-farm?

The large roundworm is the most common and economically important internal parasite of pigs. Improved control methods have reduced its effect - now only approximately 3% of pigs slaughtered in Australia show signs of having been affected by this parasite (as indicated by the Pig Health Monitoring Scheme).

## How is it spread?

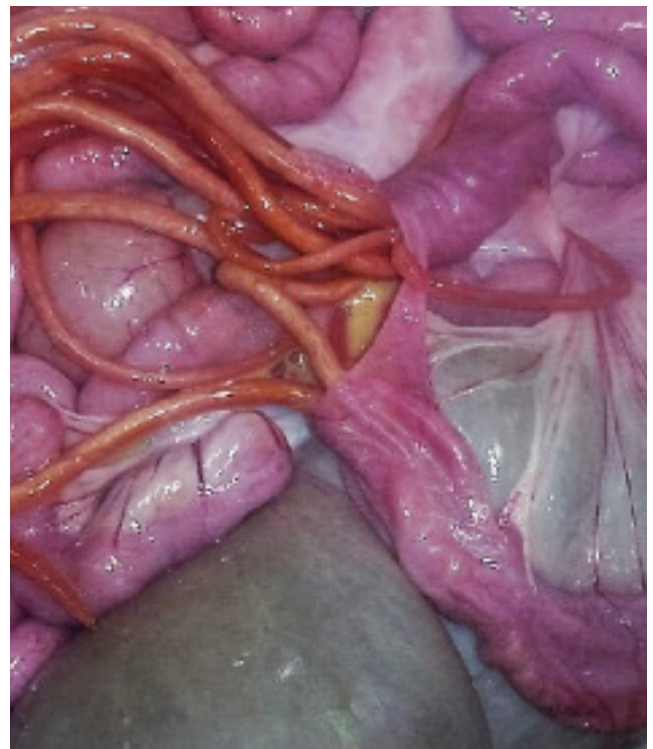
The roundworm is transmitted via the oral-faecal transmission of eggs containing infected larvae. A female roundworm is estimated to produce more than 300,000 eggs per day. Roundworm eggs can survive outside the host for years and can remain viable in soil

in dry and hot conditions. They can also be dispersed in the environment by wind, water and insects.

The pig ingests roundworm eggs, which quickly hatch larvae that migrate through tissues to the liver which results in 'white spots.' Following this, they invade the blood/lymph, entering the lungs where they are coughed up and then swallowed. They then mature in the small intestine before being excreted. The cycle from egg ingestion to egg production is 43 days. The lifecycle of the roundworm in the host can cause damage to the liver causing white spots and can also lead to the development of pneumonia.

## Carcass impacts

The liver of effected animals is usually condemned with the rest of the carcass passing, pending the presence



Source: MINTRAC

of additional disease. Ascarids can be found in the intestines, bile ducts and gall bladders of infected pigs at slaughter. This, in addition to damage to the liver and kidneys caused during the ascarid lifecycle, can result in these parts being trimmed or condemned at slaughter.

## Treatment

There are registered wormers that can be used to treat roundworm infections. Treatment along with good sanitation and nutrition are important to managing worms. Treatment plans can be developed with your veterinarian.

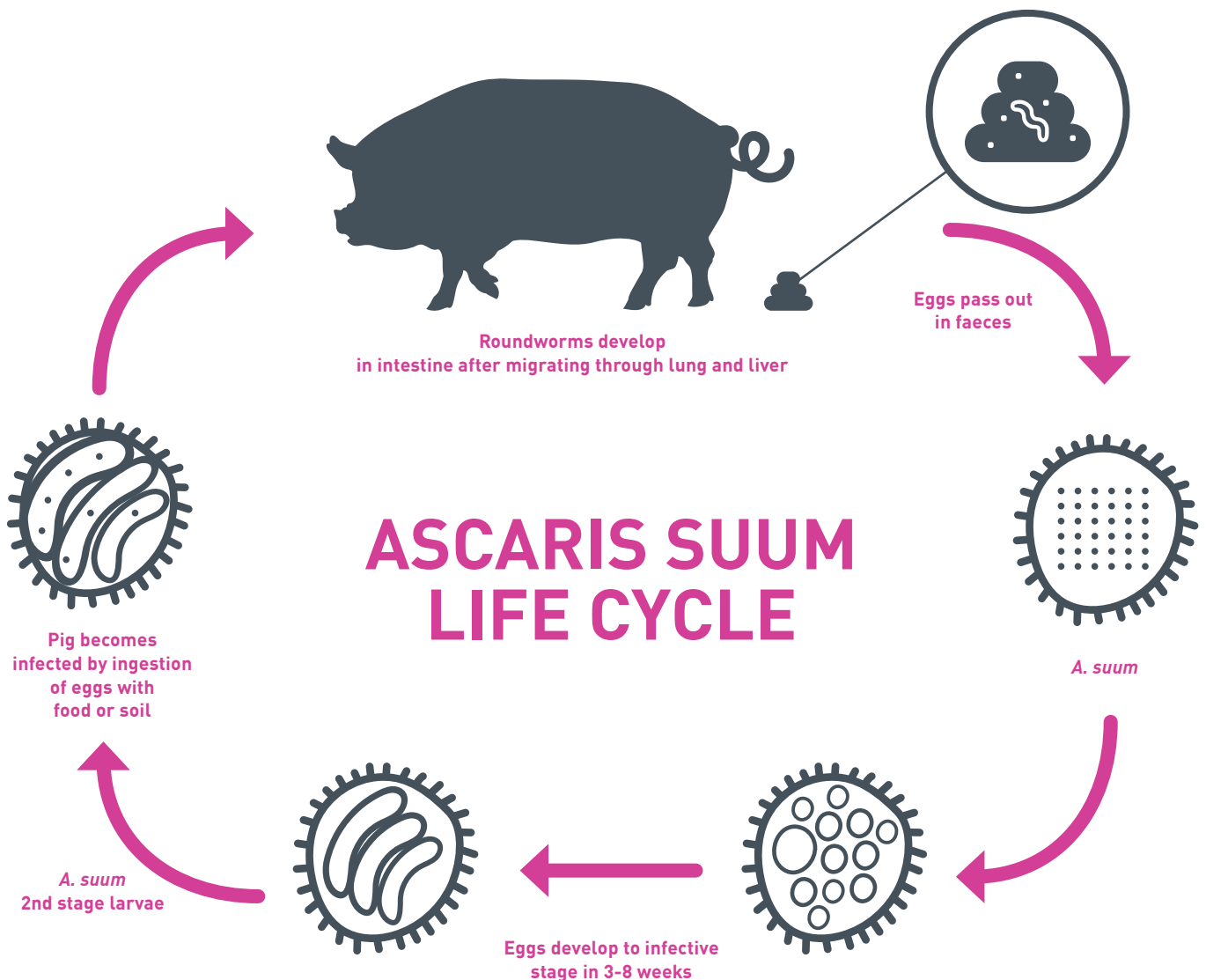
## Prevention

Prevention is managed through implementation of a regular worming regime and good biosecurity

practices. Due to the long lived and hardy nature of the roundworm egg, the disinfestation of pig housing may be required. Effective disinfection is problematic, however methods to eliminate ascarid eggs and larvae include:

- thorough cleaning of housing and all equipment with detergent and steam
- burning of surfaces with a flame gun on areas that permit. Only to be completed by a trained professional with personal protective equipment (PPE).

If pigs are housed outdoors, worm egg needs careful consideration, as they can remain infective for over 10 years in the environment. In this situation, consider regular strategic worming combined with movement of pigs to clean areas.



# BRUISING

## What is the condition?

Bruising is damage to the flesh of the carcass. It can be a serious commercial problem, since it decreases the grade and subsequently the value of the carcass. This damage requires the affected area to be trimmed. Depending of the severity of the bruising this can have a negative impact on meat quality as well.

## Disease on-farm

Typical behavioural responses in pigs prior to slaughter may include 'flight or fight' resulting in aggression towards other pigs. These behaviours can make pigs difficult to handle and cause trauma, particularly on shoulders, loins and hams, which can lead to damage and bruising to the carcass.

## How is it caused?

Major factors responsible for bruising of carcasses include fighting among mixed groups of pigs and poor handling pre-slaughter. Possible causes of bruising prior to slaughter can include issues with:

- handling on farm
- mixing with unfamiliar pigs
- fasting and subsequent aggression
- handling at loading/unloading
- transport to the abattoir
- handling in lairage.

## Carcass impacts

Affected tissues are usually trimmed from the carcass. Severe bruising will lead to downgrading of the carcass.

## Prevention

Good management practices pre-slaughter can assist in preventing bruising to carcasses. This includes reducing the mixing of pigs to prevent fighting pre-slaughter, as well as good transport and handling procedures prior to and at the abattoir.

# COLITIS

## What is the disease?

Colitis is inflammation of the large bowel and is a common cause of diarrhoea in growing pigs. It can be caused by a range of factors, from infections (i.e. bacterial, parasitic and viral agents) to feed associated causes and immunosuppressive diseases.

Colitis is a cause of financial loss due to delays in pigs reaching finishing weight and mortality. Colitis causes erosion and inflammation of the large bowel, which increases the risk of bacteria colonising this tissue, putting affected animals at an increased risk of developing further infections. This is expressed as scours, with faeces being like 'cow pat' in appearance. As the disease progresses diarrhoea become waterier in appearance, with dehydration and loss of body condition occurring.

## How common is it on-farm?

Colitis is most common in young pigs between 6 – 14 weeks of age. It is less common in older pigs or pigs that are still sucking. Colitis has been linked to diet, with the disease being more common in pigs on pelleted diets and on diets that have a high content of soluble fibre in grains. Facilities that have a continuous flow of pigs can lead to animals being predisposed to the disease through exposure to pathogens.

## How is it spread?

Diet has been identified as a factor in the development of this condition, as have the presence of other bacterial, viral and parasitic infections. It is important to determine what is causing the colitis to implement effective control. Reservoir hosts such as in wild birds or rodents also have the potential to spread the bacterial agents.

## Carcass impact

Intestines will be condemned. Colitis can cause watery diarrhoea, which can lead to skin becoming contaminated with faecal matter.

## Treatment

Consult with your veterinarian to determine the cause of the colitis. Treatment will depend on the cause of the colitis. For dietary-induced colitis, changes can be made to the feed, feed amount and form (pellets to meal). If the causal agent of the colitis is infectious, your veterinarian will determine the pathogen and recommend a suitable treatment.

## Prevention

Good hygiene practices with regular washing of pens between groups and disinfection is essential to managing bacterial causes of this condition. Additionally, managing buildings on an all-in-all-out basis can help to control this disease. Determining the causes of colitis is essential to preventing further cases.



*Chronic inflammation of the serosal surface of the colon wall, indicating long term colonic disease • Source: R Fogarty*



# CONTAMINATION

## What is the condition?

Contamination refers to the contamination of the carcass before or during processing. It often refers to gut content contamination but may also be related to contact with skin or other contaminants. This could include physical contamination from broken needles, antibiotic or chemical residue and contamination from the environment. As contamination can have impacts on human health, it needs to be managed appropriately.

## How common is it?

The most likely contamination pathway is through issues with evisceration (gut removal) during processing. Feeding the pigs too soon before slaughter will increase the gut "load" and increase the risk of spillage during slaughter. Disease conditions such as peritonitis and pleurisy can affect the ease of evisceration, as can adhesions, volume and fluidity of gut contents. Gut friability can also result in carcasses being contaminated if ruptured. Health conditions that

require extra handling, such as removal of skin lesions, bruises, abscesses, and arthritis can also increase the risk of contamination.

## Carcass impacts

Carcasses with minor contamination may only require trimming of affected areas. If carcasses are chemically contaminated this could result in the whole carcass being condemned.

## Prevention

Making sure that pigs are not overly full when they are placed on the truck may help to reduce this issue through reduced gut volume. Ensuring that pens are relatively clean can help to reduce buildup of environmental contaminants on the skin, although processing will normally remove this. Managing diseases, antibiotic withholding periods and chemical residues within a herd can also reduce the risk of contamination occurring.



Source: MINTRAC



Source: MINTRAC

# DERMATITIS

## What is the disease?

Dermatitis is inflammation of the skin. Dermatitis in slaughter age pigs can be bacterial (e.g. erysipelas, staphylococcal), fungal (i.e. ringworm), viral (i.e. porcine dermatitis and nephropathy syndrome (PDNS)) or parasitic (i.e. sarcoptic mange). Other conditions of note impacting on carcass quality include injuries (from fighting, travel etc.), melanoma and abscess. Separate factsheets are available for erysipelas, melanoma and abscess.

PDNS presents as spotty skin haemorrhages, most commonly over the hind limbs and perineum, and is less often seen over the flanks, around the front legs and abdomen, and occasionally around the head and ears. Animals may appear lethargic and mortalities in affected pigs can be approximately 15%, with death typically seen in the first few days of infection.

## How common is it on-farm?

Dermatitis caused by parasitic, fungal and bacterial infections has become much easier to control with piggery intensification but may still be present. PDNS is rarely seen and a pig with severe PDNS would be unlikely to make it to slaughter.

## How is it spread?

Most pathogens or pests causing dermatitis are spread by pig to pig contact or arise from bacteria that are commonly found on the skin.

## Carcass impacts

In the absence of other disease, affected skin will be either trimmed off in localised infections. Where lesions are widespread, all skin is condemned, or the carcass is downgraded.

## Treatment

The cause of the dermatitis must first be determined; consult with your veterinarian or consider using the Pig Health Monitoring Scheme, if available.

## Prevention

Vaccination programs will reduce the prevalence of PDNS and erysipelas, pesticide treatments can either control or eradicate mange or lice, correct stocking, density pen hygiene, and reducing fighting, will generally reduce the prevalence of bacterial dermatitis.



Lesions seen in bacterial skin infections • Source: Holyoake & Fahy, Pig Research Centre

# ERYSIPELAS

## What is the disease?

Swine erysipelas is an infectious disease caused by the bacterium *Erysipelothrix rhusiopathiae*. It is seen mainly in growing pigs and characterised clinically by sudden death, fever, red blotchy 'diamond like' skin lesions, reluctance to move and pain on movement. In surviving animals, chronic infections may be seen as arthritis and heart lesions. The fever caused by this infection can induce abortion in pregnant gilts and sows.

This bacteria is also zoonotic and can be transferred to humans through open wounds. In humans, infection

causes an erysipeloid, a local skin lesion, which occurs mainly as an occupational hazard of abattoir workers, veterinarians and laboratory workers. The organism is occasionally isolated from cases of endocarditis in humans and rarely causes acute septicaemic disease.

## How common is it on-farm?

The bacteria *E. rhusiopathiae* is part of swine flora found in the upper respiratory and intestinal tract of healthy pigs. It is considered that greater than 50% of pigs are carriers of this bacteria. The bacteria are also capable of surviving for prolonged periods in the environment and may also be found in other mammals and birds.

## Signs & symptoms

Clinical signs of swine erysipelas can be divided into acute, subacute and chronic forms. Pigs with the acute septicaemic form may die suddenly without showing any clinical signs. Signs in acutely infected pigs could include:

- fever (temperature greater than 40o C)
- stiff gait
- reluctance to move (lying down)
- isolating themselves
- anorexia and thirst are common
- skin lesions may vary from red to purple widespread discolouration of the ears, snout and abdomen, to diamond-shaped skin lesions almost anywhere on the body.

Clinical signs of the subacute form include characteristic skin lesions, loss of appetite and a mild fever. In this form, the skin lesions may not persist for more than a few days.



Source: MINTRAC

The chronic form may follow acute, subacute or subclinical infection and is characterised by chronic disease, most commonly as arthritis. Endocarditis due to infection of the heart valves and lining may be evident occasionally and will be most obvious after stress, which may lead to sudden death.

Acute erysipelas cannot be easily differentiated clinically from other septicaemic diseases such as that caused by *Actinobacillus suis*, but the combination of previously mentioned symptoms is highly suggestive of Erysipelas.

## How is it spread?

This disease is transmitted through oral-nasal exposure and subsequent invasion of the bloodstream. Causes of stress such as overstocking, mixing pigs after weaning and sudden changes in temperature, particularly on hot summer days, can trigger clinical erysipelas. Environmental contamination is common because bacteria are excreted via saliva, nasal secretions, faeces and urine. *E rhusiopathiae* can survive for weeks outside a host. Eco shelters with deep litter bedding on earth bases can allow an environmental build-up of bacteria.

## Carcass impact

If an animal is affected by the acute form of the disease with erythema or if skin lesions or other disease

(arthritis, necrosis) is present the carcass is condemned. If only localized skin lesions are present in the absence of other disease, then carcass trimming of the affected area will occur. If lesions are present with some joint inflammation, the carcass may still be accepted after trimming if the remaining carcass is heat treated.

## Treatment

Consult with your veterinarian before instigating treatment. Antibiotics will likely be required. Treatment early in the course of disease usually produces a dramatic improvement within 24-36 hours. There is no practical treatment for chronic swine erysipelas. Pigs affected by the disease and all animals within direct contact should also receive treatment; this is an effective method of control during acute outbreaks of this disease.

## Prevention

Farms should have an erysipelas vaccination program for breeding stock and consider a program for progeny if there is a high challenge.

If disease breakdown occurs despite a vaccination program, review hygiene and management practices and consider changing to all-in-all-out production systems in consultation with your veterinarian.



Small raised, red diamond shaped lesions in a pig with erysipelas • Source: Holyoake & Fahy, Pig Research Centre

# FEVER

## What is the condition?

Fever is characterized as an abnormal increase in body temperature. Fever can be described as either septic (caused by viruses, bacteria, protozoa, fungi) or aseptic (caused by tissue necrosis, chemicals, surgery, anaphylaxis) depending on whether an infection is present or not. A fever can also indicate a range of diseases. Fever induced by stress can occur, but this is less common.

A fever can present as reddening of the skin, increased respiratory rate and a temperature range of 39-40°C. These signs are also common with heat stress.

## How is it spread?

Fever does not spread however the causal agent, if it is viral or bacterial, has the potential to be spread between pigs and within the environment. Fever in pigs can cause:

- chills and sweating
- dehydration
- increased body temperature
- elevated pulse and respiration
- depression and dullness
- anorexia and severe constipation
- diarrhoea and vomiting
- breath that is urine- or phenolic-like in odour
- shock, convulsion and coma.

## Carcass impacts

Fever will result in carcasses being condemned.

## Treatment

The cause of the fever will determine the treatment. A single affected animal in an inspected line may mean that no treatment is required. Multiple affected animals need to be investigated by a veterinarian. For bacterial infections antibiotics may be used. Isolate any animals with a fever in hospital pens to reduce the potential for spread.

## Prevention

To prevent potential spread of disease, ensure good hygiene and biosecurity practices are followed on farm. When animals present with fever, isolate until a diagnosis is established by your veterinarian and treatment implemented.

# ILEITIS

## What is the disease?

Ileitis is inflammation of the small intestine where the intestinal walls thicken and can form lesions, negatively impacting pig growth. It is also known as proliferative enteropathy and is usually caused by the bacterium *Lawsonia intracellularis*. The disease may present in three stages of acute, subclinical, and chronic. Symptoms of the disease range from reduced weight gain and diarrhoea, to weakness, depression, bloody or black diarrhoea and even sudden death in acute cases.

## How common is it on-farm?

Ileitis is common, with *Lawsonia* likely to be present on over 90% of farms, but the incidence of disease varies.

## How is it spread?

Ileitis is spread primarily through faecal shedding, is highly transmissible, and can be shed for up to 12 weeks after clinical signs have ceased.

## Carcass impact

Intestines will be condemned. Ileitis can also cause the guts to become overfull. This can be a problem at slaughter as it may lead to carcasses becoming contaminated if the intestine is punctured during the removal process. This can then lead to the carcass being condemned.

## Treatment

Veterinary consultation is recommended. Antibacterial therapies have been found to be effective in the treatment of the disease.

## Prevention

A prevention plan should be developed in consultation with your veterinarian. Vaccination and medications (antibacterials are recommended). Apart from medication, general farm biosecurity measures are recommended to prevent the occurrence of disease including:

- avoiding stress
- not over-stocking and mixing pigs
- maintaining clean feed
- water and living conditions
- isolating sick pigs in hospital pens; and
- ensuring proper disinfection of pens and equipment between different groups of pigs.



*Blood clots and thickened gut wall in the ileum associated with black faeces, pale pigs and sudden death • Source: R Fogarty*

# LIVER ABSCESS

## KEY MESSAGES

1. Liver abscesses can cause significant production losses.
2. Liver abscesses are predominantly caused by dietary issues.

## What is liver abscess?

Liver abscess is a disease of the liver marked by inflammation, infection and necrosis of the liver. Lesions that occur on the liver are pale yellow, often spherical with necrosis of the liver cells and the surrounding area which leads to inflammation of the liver.

*Fusobacterium necrophorum*, an anaerobic bacterium, is the primary agent of the disease leading to liver abscess. This bacterium is found in rumen lesions caused by acidosis and subsequently escapes into the blood stream before being filtered by the liver, which results in the formation of abscesses.

Abscesses are found in all ages and breeds of cattle and under all types of management, but most cases are found in beef cattle from feedlots due to a high grain content diet. Specific breeds such as Holsteins are also predisposed to a high risk of liver abscess.

## How are liver abscesses caused?

The disease is initiated by a physical opening in the rumen outer layer, allowing normally contained bacteria to enter the blood stream.

Acidosis is often the first step in creating an entrance point for bacteria in the rumen. It involves excessive lactic acid produced in response to a diet with increased levels of high carbohydrate and low fibre, grain-based feeds or introducing new feed too quickly. This excessive acid production in the rumen leads to a weakening of the overall structural strength of the outer wall, creating a higher risk of bacteria being able to enter the blood.



Liver abscess

Source: MINTRAC

## Disease at the feedlot

Abscess is the primary liver abnormality presented in feedlot cattle at slaughter. There is an increased rate in feedlots due to acidosis from high grain diets. Up to 10-20% of feedlot cattle can have abscesses, dependant on type of feed and feed management processes and level of monitoring of the cattle.

Feedlot cattle with abscessed livers have reduced feed conversion efficiency, and those with severely abscessed livers gain significantly less per day than cattle without abscesses, reducing production rate and the resulting carcass weight.

## Picture at the abattoir

An abscess in the liver will lead to the condemnation of the whole liver.

## Treatment

The disease often goes untreated as there can be a lack of visible signs. The disease is found at slaughter

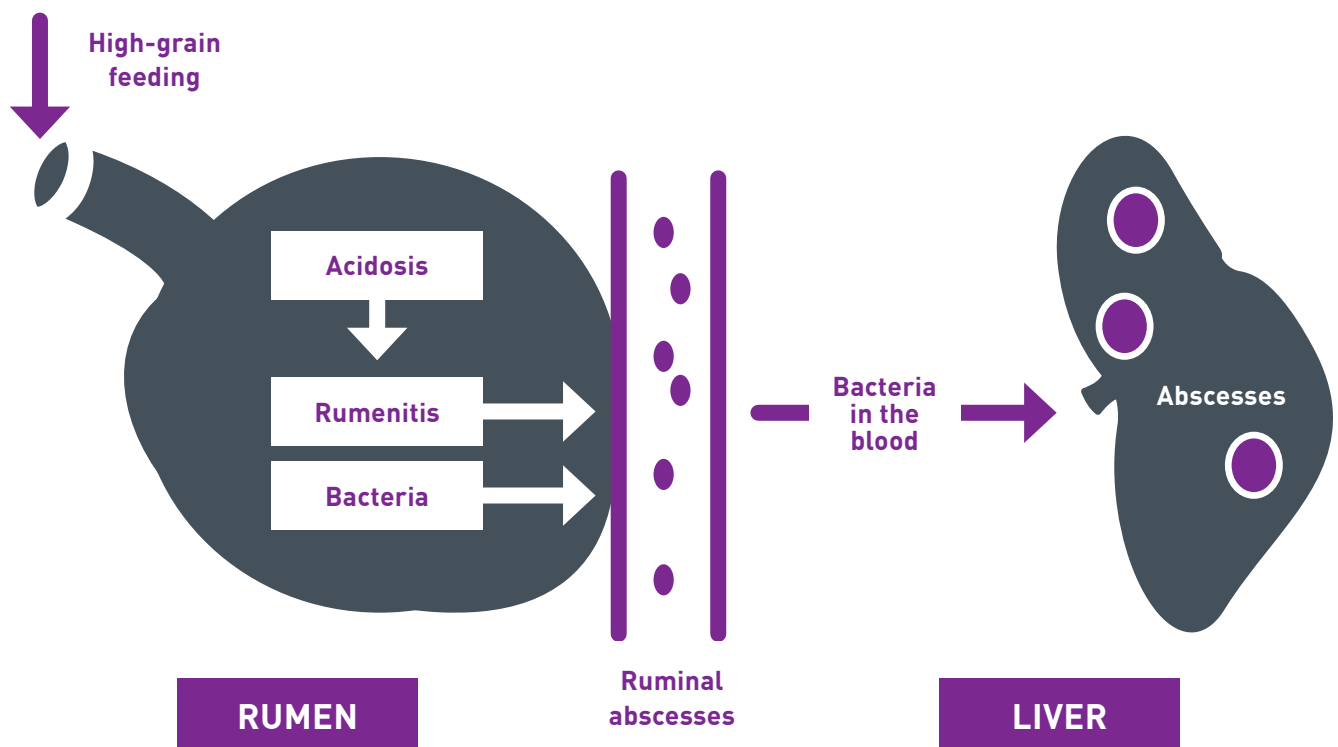
or suspected with reduced production efficiency, which is a common sign for a broad range of illnesses and diseases that affect beef cattle. Because it can be difficult to diagnose liver abscess, but a significant amount of cattle may have it, preventative measures are often undertaken rather than treatment.

Treatment usually involves antibiotics, but these should be only be used in consultation with your veterinarian.

## Prevention

Change of diet is key to preventing the acidosis that leads to liver abscesses occurring. An increase in fibre and a decrease in the amount of carbohydrate-rich grain provided should minimise of the incidence of liver abscesses in cattle. Consult with your veterinarian and/or nutritionist about nutritional management and other preventative measures (e.g. managing ration transitions leading up to a finishing diet).

# FORMATION OF LIVER ABSCESSSES





# LIVER FLUKE

## KEY MESSAGES

1. Liver fluke costs the cattle industry tens of millions of dollars every year.
2. Losses occur on farm due to lower growth rates in young cattle and occasionally deaths.
3. Losses at the abattoirs are due to condemnation of affected livers.

## What is liver fluke?

Liver fluke is a large flat worm parasite that infects sheep and cattle in 'flukey' areas throughout the higher rainfall areas (>600mm) and irrigated areas of south eastern Australia. Liver flukes require permanent water and specific snails for the life cycle to occur.

## Disease on-farm

Liver fluke have a complex life cycle that requires a definitive host (usually sheep or cattle), specific freshwater snails and permanent water to maintain the snails. Cattle become infected when they ingest fluke larvae on pasture. The immature flukes leave the gut and migrate through the liver for 6-7 weeks causing damage and subsequent scarring. At about 8-10 weeks after ingestion the now fully mature adult liver fluke starts to produce eggs in the bile duct. If suitable wet conditions are present, larvae hatch, then they must find a specific snail species to complete their life cycle. After 3-4 months in the snail, the larvae transform into an infective cyst on pasture.

Most of the costs of liver fluke are due to the direct effects of the fluke and occur on-farm (or in feedlots when cattle are later moved to them). The signs can include ill thrift, anaemia (pale mucous membranes), bottle jaw and in severe infestations, or sudden death. Liver fluke also make cattle more susceptible to one of the clostridial diseases, black disease.

## Disease picture at the abattoir

Livers which are affected by active liver fluke or scarring, are condemned.

## Treatment

Liver fluke is best prevented through an Integrated Parasite Management (IPM) approach with a mixture of strategic drenches and grazing management. The drenching regime will depend upon the seasonal conditions, level of infection and pasture contamination on farm. Strategic drenching aims to reduce pasture contamination and build-up of infective larvae.

Most infections are picked up over summer and early autumn. A triclabendazole based drench is usually recommended for the late autumn drench for its ability to target both mature and immature fluke. However, resistance to fluke drenches has been documented and drench groups should be rotated where possible. Consult with your veterinarian or local animal health officer on developing a drenching program.

## Prevention

- Good biosecurity with stock introductions
  - » Avoid introducing sheep or cattle infected with fluke onto your property.
  - » Quarantine and drench all cattle that come from a liver fluke area with an effective drench.

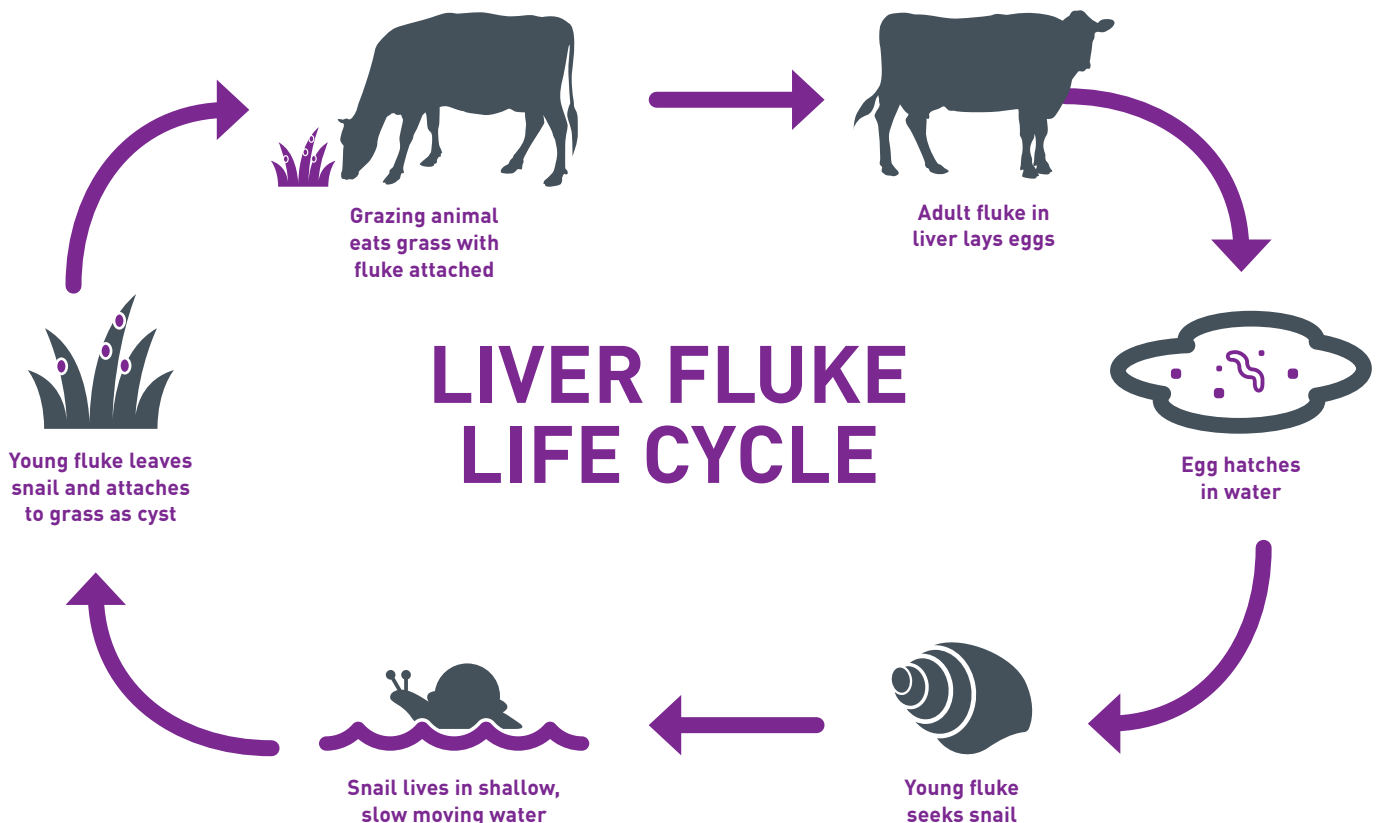
- Snail habitat control
  - » Minimise snail habitat by improving drainage where possible.
  - » Alternatively convert areas to deeper, faster moving water and keep drains clean so water can flow freely.
  - » Fix broken pipes/leaking troughs to stop permanent wet areas.
- Grazing management
  - » Exclude stock from swampy areas. Fencing off or improving drainage in areas that have potential to have snails such as wet marshes.
  - » Provide clean trough water as an alternative to drinking from dams, swamps and drains.
  - » If infested paddocks must be used, consider using more resistant adult cattle or graze uninfected sheep over contaminated areas, moving them to a snail-free paddock after 8-10 weeks and drench. This prevents fluke eggs from reaching the snails and continuing their life cycle.
- Monitor fluke status
  - » Utilise fluke egg counts (or blood tests for early infections) and abattoir surveillance reports.



Source: MINTRAC

- Vaccination to prevent black disease
  - » Ensure stock are fully vaccinated, including correct timing of boosters, against black disease. Commercial 5-in-1 and 6-in-1 vaccines cover black disease.

See [www.wormboss.com.au](http://www.wormboss.com.au) or talk to your veterinary advisor.



# MELANOMA

## What is the disease?

Melanoma is a form of skin cancer impacting melanocytes, which normally produce melanin to protect the skin from UV radiation. Melanoma can be either malignant or, more commonly, benign (melanocytoma). It occurs mostly in pigs with black skin, most often in Duroc and Duroc crossbreeds. Black pigmentation of the draining lymph node can also be seen.

## How common is it on-farm?

In domestic pigs, melanoma is fairly uncommon and limited to blood lines based on Duroc pigs.

## How is it spread?

The Duroc (and its crosses) and the Vietnamese pot-belly swine have been known to inherit a predisposition to melanoma. Other occurrences of melanoma are generally considered to be rare and sporadic.

## Carcass impacts

Where melanoma in pigs has not progressed beyond the immediate draining lymph node, depending on the extent, the lesion is trimmed and condemned, or the affected carcass part is condemned. Lesions vary in size from a few millimetres to over 10 cm in diameter.

## Treatment

Melanoma in pigs has frequently been seen to self-regress. In breeds used for researching melanoma, removal of the infected tissue has been the only successful method of treatment to date.

## Prevention

Spontaneous melanoma is not able to be prevented, however, inherited melanoma can be prevented by not breeding with any animals found to have melanoma.



Source: MINTRAC



Source: APL

# NEPHRITIS

## What is the disease?

Nephritis is an inflammatory, degenerative disease of the kidney that is often referred to as 'white spotted kidney'. It is one of the most common causes of condemnation of pig kidneys in abattoirs and is reported to be caused by a variety of bacterial and viral pathogens. Affected pigs may appear clinically normal or can also appear to be wasting, taking longer to reach slaughter weights.

Nephritis has long considered to be associated with the bacteria *Leptospira interrogans*, however, more recent research has not been able to identify a consistent association between the two conditions. Other common conditions include porcine dermatitis and nephropathy syndrome (PDNS) and bacterial nephritis.

## How common is it on-farm?

A study in 1990 found that 71% of herds in Western Australia recorded cases of nephritis, and that within those herds, approximately 10% of individuals were affected. Another study in 2019 found that 2% of slaughtered pigs destined for export had nephritis.

## How is it spread?

If the nephritis affects multiple pigs, then it is spread through the transmission of bacteria and viruses. However, the cause is not well understood and can be related to a variety of viral or bacterial infections.

Other contributing factors can include poor pen cleanliness, low water intake, stress, inactivity and the age of the animal.

## Carcass impacts

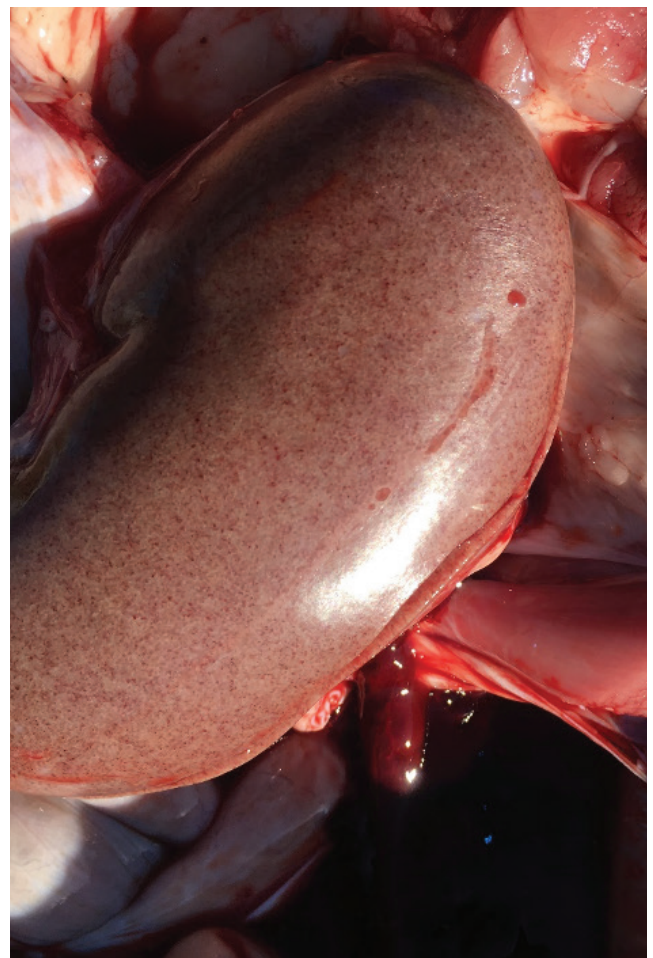
Kidneys of affected pigs are condemned.

## Treatment

Treatment will depend upon the cause, severity and presence of other disease. It is advisable to seek veterinary advice to conduct tests for identification of the cause, target treatment and identify if the treatment is working.

## Prevention

Maintain good biosecurity practices including the supply of sufficient clean water and maintenance of pen hygiene.



*Nephritis with PCV 2 associated disease* • Source: R Fogarty

# NEPHRITIS

## KEY MESSAGES

1. Nephritis will lead to condemnation of the kidneys but may also have other effects on production.
2. The cause of the nephritis should be identified and prevented, if possible.

## What is nephritis?

Nephritis is an inflammatory, degenerative disease of the kidney that is often referred to as 'white spotted kidney.' This is commonly found in clinically healthy cattle at slaughter in Australia. Leptospirosis, a bacterial disease, is thought to be the most predominant cause of the nephritis in beef cattle, but ascending infections from the bladder may also cause it.

Nephritis is characterized by scattered, greyish-white foci in cattle kidneys measuring between 1-5 mm. This disease is predominately found in beef cattle under extensive management, i.e. on pasture.

## How is it caused?

The most common cause of white spotted kidney is thought to be leptospirosis. The causal bacteria can be spread through contaminated urine entering cuts, abrasions or mucus membranes of cattle from contaminated water, soil or mud. Exposure to flood water can spread the bacteria quickly and over a vast area. Bacteria can enter through abrasions in the mouth when eating or drinking water contaminated with them. Bacteria can also travel up from the bladder into the kidneys. Animals that recover can develop a carrier condition where the bacteria continue to develop in renal tubules for periods of days to years.

## Disease on farm

Nephritis likely has effects on cattle health on the farm that may not be obvious (sub-clinical). It can lead to a potential loss of production, trouble passing urine, excessive urination and can lead to further infection and loss of appetite, leading to decreased weight. Leptospirosis is a serious disease of pregnant cattle, potentially leading to abortion. It is also a serious zoonosis (i.e. it can be passed to humans) and people should always take precautions when handling animals to minimise any risk of infection.

## At the abattoir

Kidneys will be condemned.

## Treatment

The cause of the nephritis first needs to be determined and this will require testing by a veterinarian. If an infectious cause is found, then antibiotics may be prescribed. Treatment involves the removal of infected cattle from the rest of herd, often moving them to an area where bacteria do not thrive, including dry soils or increased soil acidity.

Protective clothing and gloves should be worn if leptospirosis is suspected as it is a zoonotic infection.

## Prevention

Providing clean water and feed sources to cattle. Undertaking biosecurity measures such as changing clothing, cleaning shoes and not cross contaminating equipment often can ensure prevention of the disease spreading.

If leptospirosis is diagnosed, introducing an effective vaccination program offers the best protection against it. Consult with your veterinarian before commencing a vaccination program.



Source: MINTRAC

# PERICARDITIS

## What is the disease?

Pericarditis is inflammation of the pericardium (heart sac) which is usually due to an infectious agent. Pigs suffering from pericarditis may be seen to be reluctant to move, have shallow breathing or show other signs of pleurisy, pneumonia or other heart disorders.

In young pigs, signs can include stunted growth, and general dull looking animals with no clear patterns of coughing or diarrhoea.

Finisher pigs suffering from *Actinobacillus pleuropneumoniae* infection (APP) may have pneumonia, pleurisy and pericarditis. Other causative bacterial infections are haemophilus, mycoplasma, pasteurella, streptococcus and staphylococcus.



Pig Pericarditis • Source: MINTRAC

## How common is it on-farm?

Pericarditis is relatively uncommon in pigs of slaughter age.

## How is it spread?

Pericarditis is generally a blood borne infection of endemic diseases in the piggery, so general disease control programs, vaccinations and hygiene are important in reducing the prevalence.

## Carcass impacts

Animals affected at slaughter will often result in the carcass being condemned if the inflammation is acute, diffuse or purulent and associated with abnormalities in other body systems. A carcass absent of abnormalities to other body systems can be passed; however, organs and viscera are still condemned.

## Treatment

Consult with your veterinarian. For bacterial infections an antibiotic may be prescribed.

## Prevention

Good biosecurity and hygiene practices – including cleaning and decontaminating pens and equipment between groups, isolating sick animals and implementing isolation periods for any new stock entering the piggery. Complying with PigPass NVD requirements and having a Herd Health Plan – can help manage the risk of infectious diseases. As pericarditis can be caused by a range of infectious agents it is important that the causal agent is identified to prevent further cases.

# PERITONITIS

## What is the disease?

Peritonitis is an infection of the peritoneum, which is the membrane lining of the abdomen. Signs of the disease can be sudden or appear gradually and usually involve abdominal pain, reluctance to move, weight loss and a 'tucked up' appearance. These signs may also be accompanied with an elevated temperature and/or a depressed appetite, however, these symptoms are not always seen.

## How common is it on-farm?

Peritonitis is rarely diagnosed clinically in pigs, but it is not uncommon to identify signs of peritonitis in pigs after slaughter.

## How is it spread?

Peritonitis may be the primary disease or secondary to another condition involving infections or non-infectious agents. A ruptured gastric ulcer or a perforated bowel can be the cause of the infection, external trauma, secondary to colonic serositis caused by bacterial enteritis or colitis, and parasitic migration. Other diseases that can cause peritonitis include pleuropneumonia, mycoplasmosis and Glasser's Disease.

## Carcass impacts

Carcasses with peritonitis may have gastroenteritis, enlarged lymph glands, degeneration of tissue or organs and have fluid accumulated in the abdomen. This can lead to the removal and trimming of the effected parts from the carcass.

## Treatment

After identification of the cause of the infection by a

veterinarian, treatment of peritonitis is commonly through treatment of the cause, rather than the actual case. Any response to treatment can be poor and euthanasia may be required in severe cases.

## Prevention

Prevention of peritonitis directly is difficult, as it often occurs as a result of another disease. The best way of preventing peritonitis is to maintain good biosecurity and animal health practices to prevent the spread of bacteria and viruses. Treatment of other primary disease that has the potential to develop into peritonitis should also lower the risk of infection.



Peritonitis • Source: APL



# PLEURISY

## What is the disease?

Pleurisy is inflammation of the pleura, which is the lining of the inside of the chest wall and on the surface of the lungs. It is almost always associated with fluid in the chest cavity and inflammation of the lungs, i.e. pneumonia.

The identification of pleurisy in live animals may be through symptoms including shallow breathing, dullness and inappetence.



*Pleurisy with fibrinous sheets on the reflected ribcage, with large volumes of pleural fluid and fibrinous material in the chest cavity • Source: R Fogarty*

## How common is it on-farm?

The occurrence of pleurisy can vary widely on-farm and is influenced by various management practices, the presence of specific diseases, as well as general hygiene practices and climate control.

## How is it spread?

The presence of other lung diseases such as pneumonia will increase the susceptibility of an animal to pleurisy, as will poor management practices around the stocking density of animals, climate control, nutrition, biosecurity and the mixing of animals.

## Carcass impact

Pleurisy may require removal of part of the pleura in mild cases right through to removal of ribs in severe cases. If there is evidence of acute systemic infection, then the carcass will be condemned.

## Treatment

The cause of the pleurisy needs to be determined by your veterinarian before treatment is implemented. Pleuropneumonia caused by APP or Glasser's disease may be treated individually or as group treatments with antibiotics and anti-inflammatories.

## Prevention

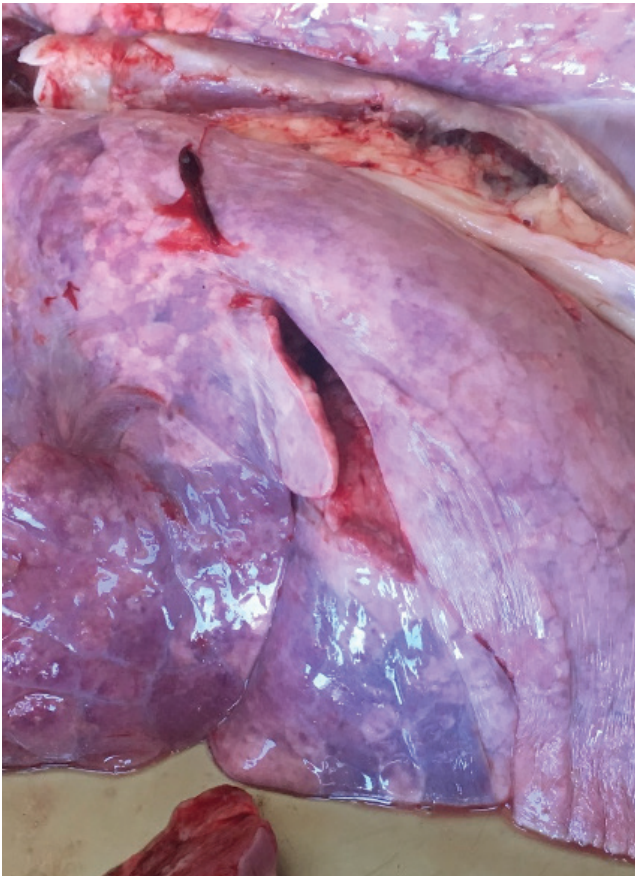
Prevention is achieved through maintaining good biosecurity practices, including control of other respiratory diseases that have the potential to develop into pleurisy. Vaccination against respiratory disease, as recommended by a veterinarian, will also be of benefit for infectious causes.

# PNEUMONIA

## What is the disease?

Pneumonia is an infection that causes damage and inflammation of the alveoli in one or both lungs. Depending upon the cause of the pneumonia, infection can also be present in the tonsils, trachea and/or bronchi (bronchopneumonia) leading to the accumulation of fluid and pus.

When pneumonia first impacts on a herd, widespread coughing may be seen, with more developed cases showing severe signs of respiratory distress including rapid breathing, loss of body condition, dehydration, inappetence, fever, poor circulation and discharge from the eyes.



Bronchopneumonia in the anterior ventral lobes • Source: R Fogarty

## Disease on farm

Pneumonia is not common in mature animals; however, it is common in progeny pigs with 80% of herds in Australia having mycoplasmal pneumonia as a primary lung pathogen. Leading bacterial causes are *mycoplasma*, *actinobacillus*, *pasteurella*, *haemophilus*, with porcine circovirus also a primary viral pathogen.

## How is it spread?

Pneumonia is caused predominately by bacteria and is spread by coughing pigs. Vaccines do not eliminate the disease or stop its spread but reduce its severity. After an animal becomes infected, the disease is most likely to spread from pig to pig through direct contact or through airborne means but may also be spread by contaminated feed, water, clothing and other shared implements.

Factors increasing the risk of disease spread include overcrowding, poor ventilation, incorrect temperature/humidity, dust, stress, poor nutrition, animal movements, bringing in new animals and the presence of other diseases or infections.

## Carcass impact

The lungs will be condemned and if there is pleural involvement, the pleura and/or ribs may also be trimmed/condemned. If there are signs of acute systemic involvement, then the whole carcass will be condemned.

## Treatment

As pneumonia can be caused by a variety of different bacteria or viruses, consult a veterinarian for treatment.

All-in all-out production flows and age segregation are useful in managing the impact of this disease, and depopulation programs have proven to be a successful approach to eliminating the disease from a production system.

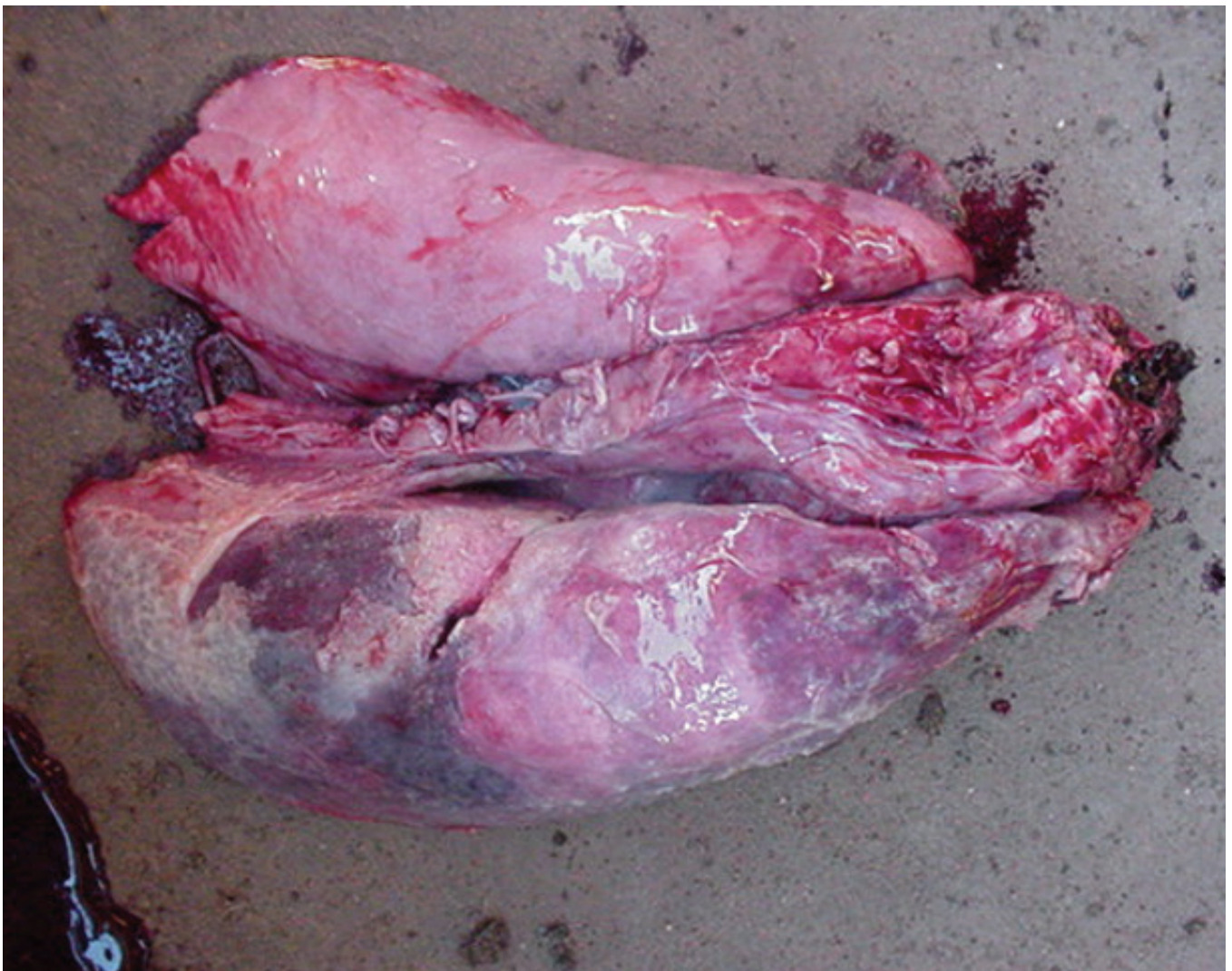
## Prevention

To prevent pneumonia occurring within a herd it is important to develop and implement biosecurity practices that will prevent the spread of pathogens i.e. avoid introductions of live pigs into the herd. Operating practices need to incorporate the maintenance of high levels of hygiene, appropriate stocking densities, strict environmental control and good handling practices.

Vaccines for certain types of pneumonia are available at the advice of a veterinarian. They tend to reduce the clinical severity of the disease but will not eliminate it.



*Resolving lung abscess often associated with pleuropneumonia • Source: Holyoake & Fahy Pig Research Centre*



*Typical pleuropneumonia affected ling during the acute stage ie only one side of the lungs affected, extensive pleurisy over the lesions, evidence of haemorrhage and necrosis in the affected lobes • Source: Holyoake & Fahy Pig Research Centre*

# PNEUMONIA

## KEY MESSAGES

1. Pneumonia is a complex disease syndrome involving infectious pathogens, commonly bacterial and viral, changing environmental conditions, co-mingling and poor immune system as a result of stress.
2. It is the largest cause of morbidity and mortality in beef feedlots.

## What is pneumonia?

Pneumonia is an infection and inflammation of the lungs caused by both viral and bacterial pathogens that interact with each other to create disease. Pneumonia in cattle is a complicated disease with multiple factors that can impact its onset and/or course. Pneumonia often occurs following the interaction of stress (i.e. handling, transport) and an infectious agent (bacteria, virus). Pathogens that cause pneumonia in cattle are not transmissible to people and are in fact normal flora of the oropharynx of cattle.

Inflammation and infection can spread to the chest cavity lining; this is referred to as pleurisy. However, the most common presentation is bronchopneumonia.

## How is it caused?

The presence of pathogens alone is often not enough to cause the disease. Stress from the animal's environment often initiates pneumonia, including transport, dietary change, mixing of new cattle into the

herd, changes in weather, weaning and respiratory irritants such as dust, ammonia or reduced ventilation. These animals therefore have a suppressed immune system, allowing bacteria or viruses to overcome it.

Common pathogens are bacterial, such as *Mycoplasma*, *Mannheimia* and *Pasteurella* and viral, such as bovine herpesvirus 1 (BHV-1 or IBR), pestivirus (BVDV) and parainfluenza virus type-3 (PI-3).

## Disease on farm

Types of pneumonia on farm:

- 'Summer' pneumonia: slow onset pneumonia and often has no outward signs other than a decline in weight, growth rate and a potential mild cough. It is most commonly seen during warmer months.
- Rapid onset pneumonia: will show signs of fever (>39.5C), depression, reduced feed intake, shallow and rapid breathing, coughing, extended head and neck and mucus from the nose. Animals that do survive often continue to grow poorly as a result of bronchopneumonia or subsequent pleurisy.

The economic consequences of pneumonia are due to weight loss (often rapid), reduced growth in weaners, death or permanent lung damage and cost of treatment. It lowers cattle daily weight gain by an average of 100 grams a day, creating potential high production losses if not diagnosed and treated early.

## Picture at the abattoir

Chest cavity and valuable rib meats may be condemned with severe pneumonia or pleurisy, therefore resulting in a loss of carcass weight. In some cases, whole carcass condemnation may occur if there is evidence of the disease still being in the acute stage as evidenced by septicaemia, haemorrhaging of blood capillaries

(petechial haemorrhage) and polyserositis (inflammation of the lining of the lung cavity and abdomen). There may also be contamination of other carcass parts by spillage from abscesses or pleurisy, leading to increased trimming.

## Treatment

Animals suspected on-farm with pneumonia should be isolated in a well-ventilated area that is protected from excessive hot or cold temperatures, with easy access to water and feed. Consultation with a veterinarian is recommended. They will recommend appropriate treatment for the animal which may include antibiotics and anti-inflammatory drugs.

## Prevention

Strategies for prevention should be aimed at minimising the negative effects of stressors that may increase susceptibility to infection, as well as reducing pathogen exposure and transmission.

No single management practice can prevent pneumonia, due to its complex factors impacting onset. Many points that should be taken into consideration to prevent pneumonia include:

- Avoid moving stock in extreme conditions: heat, cold, very dusty
- Avoid overcrowding in all situations: grazing, stockyards, transportation
- Avoid immediate and sudden diet changes
- Minimise the mixing of herds
- Provide appropriate shelter from extreme conditions
- Ensure continual access to clean water
- Separating affected animals from non-infected.

There are vaccines available for the pathogens (both bacterial and viral) that are thought to contribute to bovine respiratory disease. These are more likely to be used in feedlot situations than on farm.



Source: MINTRAC