

*Worth knowing about*



*Porcine Pleuropneumonia (APP)*



## Introduction

The Pleuropneumonia (APP) is a severe and highly contagious pneumonia, which causes serious damage to the infected lung tissue. The disease is widely spread in conventional herds, while SPF herds in principle are not infected. However, many SPF herds do get infected with one or more types of pleuropneumonia. In 2007 17% of the SPF herds were re-infected with Ap2, 39.7% were re-infected with Ap6, and 66% of the herds were re-infected with Ap12. The disease can attack pigs of all ages, and can result in the great loss in terms of modern pig production.

Pleuropneumonia is caused by the bacteria *Actinobacillus pleuropneumoniae*. So far 15 different types of the bacteria have been determined, however, only ten of the types

have been detected in Denmark. Of these, the most common types present are Ap2 (70% of cases) and Ap6 (25 % of cases)

All types of APP create toxins, and these toxins are the main cause of the very characteristic changes in the lungs. The type of APP infecting a herd indicates the severity of the illness and the impact on the herd. For instance Ap2 and Ap5 usually result in a severe out-break with many ill pigs and a high mortality rate. On the other hand, an Ap6 infection often results in a milder course for the disease, without clear symptoms – a hidden disease.

## Symptoms

### Acute Disease

It usually takes only one to three days from the time the pig becomes infected until it shows signs of the illness, however, in some cases the illness occurs already six hours after being infected. With an acute disease out-break, a sudden emergence of seriously ill animals in one or more pens is observed. The pig's temperature can rise to somewhere between 40 to 42° C, and they refuse to eat. Furthermore, severe breathing difficulties can be observed as well as coughing, and breathing through the mouth. The pigs may begin to sit down, they may also show foaming bloody secretion from their mouth and nose, and individual animals may show a blue colouring of the skin on the ears, snout and legs. With such an acute disease out-break there is a high rate of disease as well as a high mortality rate, and the pigs can die during the course of 12 to 24 hours.



### Chronic Disease

In a chronically infected herd a certain balance may develop between the infection pressure and the general immunity in the herd. During these periods the disease will most likely not be noticeable, however, out-breaks may appear in cases where the animals are stressed, for instance due to viral infection of the respiratory tract, mycoplasma infection, overcrowding, continuous production, failure of the ventilation system and the use of poor quality feed.

## Epidemiology

The spread of APP mainly occurs through direct contact between infected and non-infected animals. The pig acts as host for the bacteria, but the bacteria has proven to be able to survive in a humid environment for up to two months. Airborne transmission has been suspected, but so far its existence has not been proven. However, there is a widespread consensus that airborne transmission happens over short distances.

## Diagnosis

A presence of APP in a herd should be considered when cases demonstrate the characteristic symptoms of the disease. Such a suspicion is strengthened in cases where the characteristic lung changes are found, when performing an autopsy of dead or euthanized pigs.

When performing an autopsy on pigs during the acute phase of the disease, you see that the attacked parts of the lungs are filled with a dark red accumulation of blood and inflammation products. The surface of the lungs is covered with a yellowish sticky exudate, and the lungs are swollen and hard in the affected areas. The tissue at the affected area is dead.

The easy way to obtain a diagnosis is to submit lungs for laboratory testing, at a time when the disease is at an acute stage. In the laboratory, the bacterium is cultivated, and the type of APP can be determined. Blood samples can also be used, but not until two weeks after an acute out-break, and you must ensure that you take samples from several animals in order to get reliable test result. Furthermore, you need to test for all types of APP, which is costly.



## Treatment and Prevention

APP is associated with breathing difficulties and pain arising from the inflamed pleura membranes. For this reason, infected animals must be treated immediately with an efficient antibiotic and with pain-killers. In a number of cases it is necessary to place the infected animals in a special pen for diseased pigs, or even better in a disease section, where they can not infect the healthy pigs in the barn.

Treatment of acutely ill animals has to be done by injection, as the pigs in general neither drink nor eat in the acute phase of infection. It is always wise to determine antibiotic resistance, and this must always be done in cases where the

treatment do not have the desired effect. If the treatment cannot entirely control the infection, a chronic condition of inflammation will develop within less than a week. Such pigs slowly become unthrifty and pale. It is usually best to euthanize chronically ill animals, both with regard to production economy and also with regard to animal welfare.

Preventing out-breaks in chronically infected herds can be achieved by adopting the following measures:

- Optimization of the interior of the barn (dry pens with no draught)
- Optimization of the environment (ventilation)
- Batch operation "all-in all-out"
- Reduce stocking density
- Vaccination
- Management, aimed at counteracting animal stress factors
- Special pens for diseased pigs
- SPF - eradication



## ***Economic impact***

APP can have a serious impact on a production economy as the disease can reduce the daily gain by up to as much as 20%, and in cases of an acute out-break the mortality rate can reach 10-20%, while it usually remains lower than 1% in chronically infected herds.

In cases of an outbreak in the finisher unit, there is a risk that 10-20% of the pigs delivered to the slaughter house will be rejected, owing to the fact that the animals have an acute level of inflammation at the time of slaughter.

## ***Vaccination***

It is possible to vaccinate against APP, but owing to the fact that there are various types of APP, it is important for the individual herd to regularly determine the type of APP present, hereby ensuring that an appropriate vaccination is used.

Through vaccination, the mortality rate connected with APP can be greatly reduced.

A vaccination program can be established and adjusted in consultation with the herd's vet. Generally, the first vaccination takes place at six weeks of age, and the second vaccination follows after two to four weeks. If you absolutely have to place young stock in a unit which is under a high infection pressure, it is recommended that the second vaccination is carried out no later than a week before introducing the new stock.

## ***Complications in connection with other illnesses in the herd***

A condition for an out-break of APP is infection with *Actinobacillus pleuropneumoniae* (APP). The out-break can be due to an isolated APP infection or a mixed infection where APP is combined with one or more infections also known to attack the lung tissue. The pure infection causes classic changes in the affected lung, and well-delineated changes of the pleura. The change include a clearly demarcated pleurisy and a well defined red or greyish inflammation.

Common experience shows that a simultaneous infection of *Mycoplasma hyopneumoniae* (Myk) and PRRS-virus, and probably also the PCV2-virus, increases the risk of an out-break of APP. A common denominator for the three afore-mentioned infections is their shared ability to modify the immune system in the pig's lungs. As a consequence, an APP infection is more easily established in the pig's lungs, leading to an increased risk of an out-break of APP. When performing an autopsy, a case involving mixed infection usually presents with widespread lung changes, which are red or bluish red with severe pleurisy and diffuse constrictions of the lung tissue. Due to the frequent incidents of APP and the other infections pleuropneumonia will often be a part of the PRDC complex.