

## True Fear of Porcine Actinobacillus Pleuropneumonia

Similar to cows, pigs have a small lung volume relative to their body volume. As a result, a great burden is placed on their lungs. Therefore, pigs are prone to suffer from respiratory disease. Factors such as stress are complexly involved, and also, in some cases one type of pathogen causes respiratory disease, however in many cases, mixed infection of multiple types of pathogens causes respiratory disease. Therefore, a condition called porcine respiratory disease complex (PRDC) is frequently observed, especially porcine pleuropneumonia (*Actinobacillus pleuropneumoniae*; APP) is the disease which causes the greatest damage among PRDC, and the total damage may correspond to approximately 10 billion yen a year. The larger the pigs grow, the more increase in feed expense, sanitation expense, etc. will result. If there is an accident, a great loss of profit will occur.

Pigpen environment, rearing density, and climatic conditions are closely involved in APP. Especially, climatic conditions are the major factor for APP. In Japan, summer is characterized by high temperature and high humidity, and winter is characterized by low temperature and low humidity. Such climatic conditions are the cause of great damage due to occurrence of APP in Japan. In fact, occurrence of APP has not become a major problem in American and European countries. After visiting pig farms in American and European countries, I too have realized this difference. Next, we would like to briefly review a disease of APP.

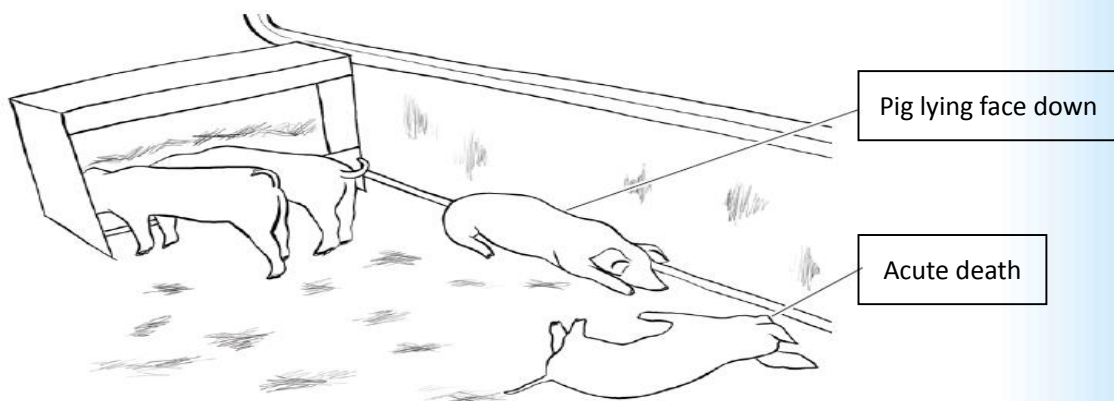
**Cause:** *Actinobacillus pleuropneumoniae* is the causative agent. Because it was originally classified into *Haemophilus* sp., some pig farmers call this disease "Hemo". Currently, it is classified into serotypes from type 1 to type 15. In Japan, type 2 is the main type, but type 1 and type 5 are sometimes isolated as well. This bacterium produces exotoxins called Apx I, II, and III and shows a high virulence. Currently, vaccines which contain toxoids of this toxin are mainly used.

**Symptoms:** The course after infection with this bacterium is rapid, and experimentally infected pigs may die in about 10 hours. Symptoms of the acute form include loss of spirit, loss of appetite, increased respiratory rate, fever of 40°C or above, vomiting, and cyanosis, and such pigs may die suddenly in about 1 to 3 days after the onset. When symptoms have become severe, pigs will take a dog-sitting posture and lie face down (Schematic diagram 1), so that they can be detected easily. However, it is not easy to make a diagnosis based on increased respiratory rate or increased body temperature. When a person goes into the pigpen, pigs may rampage in the pigpen. Symptoms such as increased respiratory rate may be observed, and piglets may have fever above 40°C.

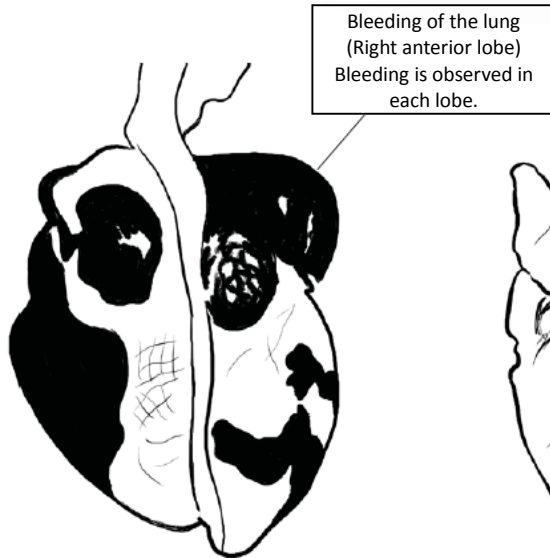
Nevertheless, because early detection will lead to early treatment, careful observation is extremely important. In the chronic form, on the other hand, coughing and underdevelopment are observed.

**Pathological findings:** In the acute form, increase in and turbidity of pleural effusion and pericardial effusion as well as hyperemia and bleeding of the lungs are observed (See the schematic diagram 2 on the next page). In the chronic form, fibrinous adhesions of the lungs and pleura (See the schematic diagram 3 on the next page) as well as formation of nodules containing pus in the lungs is sometimes observed.

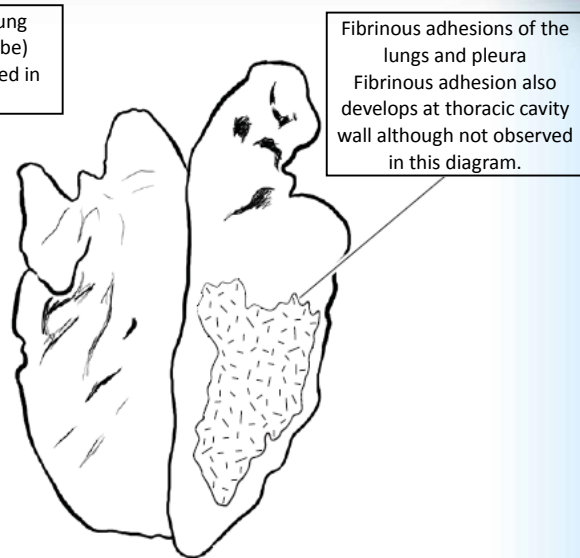
**Countermeasures:** Countermeasures consist of prevention by vaccines and treatment by drugs. Vaccines consist mainly of those containing Apx I, II, and III. Drugs such as penicillin injections, feed additives, drinking water additives, and injections made from florfenicol, and feed additives made from doxycycline are being utilized.



Schematic diagram 1 Clinical symptoms of APP



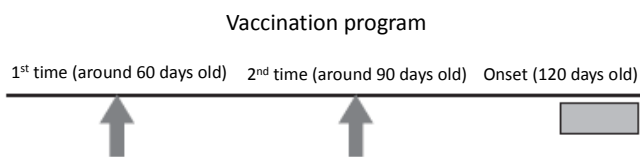
Schematic diagram 2 Acute lesion Bleeding of the lung



Schematic diagram 3 Chronic lesion Adhesions of the lung and pleura

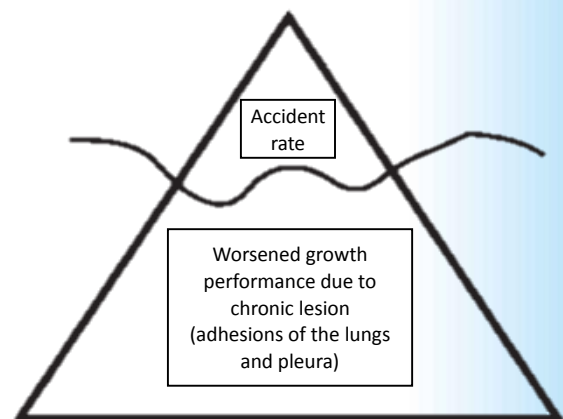
### Vaccination Program

Onset of APP is frequently observed at around 60 to 70 days old (body weight has reached 30 kg) and at 110 to 130 days old (around 1 month after transfer to the fattening pigpen). During the former period of onset, it is difficult to use vaccines, and therapeutic agents are used. For occurrences of APP during the past several years, APP has occurred more frequently in the latter period, and vaccines are usually injected targeting this period. Booster is applied at the second vaccine so that 3 to 4 weeks later will be the time of onset. The program is shown below. If the activity of *Mycoplasma hyopneumoniae* is observed during the fattening period, it may be advisable to use a combined vaccine of APP and mycoplasma for one of the two vaccine injections.



### True Fear of Porcine Pleuropneumonia

Speaking of porcine pleuropneumonia, accident rate (death, disuse) is highlighted and becomes the subject for evaluation of vaccines and drugs. Actually, however, it is just the tip of the iceberg, and adhesions of the lungs and pleura due to pleurisy, which are observed in the chronic form, become a major problem (Schematic diagram 3). This would restrict lung movement. Because the lungs inhale oxygen and excrete carbon dioxide, restricted lung movement will have a negative impact on growth performance and result in worsening of feed conversion ratio. Vaccines have great importance in decreasing such lesions.



Fear of APP chronic lesions