Contagious bovine pleuropneumonia

Contagious bovine pleuropneumonia (CBPP) is a highly infectious septicaemia of cattle, characterized by severe respiratory disease. It is one of the major destructive diseases of cattle, and causes heavy losses in many parts of the world. CBPP is caused by Mycoplasma mycoides.

Geographical distribution

CBPP does not occur in any country of the Americas or Oceania. During the 1980s it was reported from a number of countries in Africa and Asia, and in Europe from France, Portugal and Spain. In 1991 it has occurred also in Italy. Most African countries vaccinate regularly against CBPP. CBPP was introduced to Australia in 1858 and spread through six states. It was finally eradicated, the last clinical case occurring in 1967, and freedom from the disease declared in 1973.

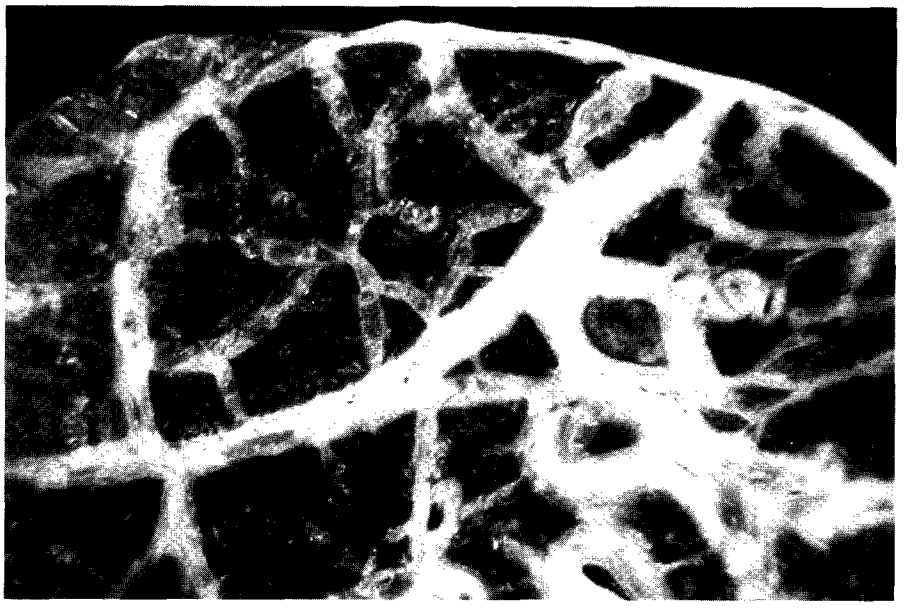

Fig 6: Interlobular septae are prominent in the lung in contagious bovine pleuropneumonia.

Cause

Mycoplasma mycoides subsp *mycoides* produces two serologically indistinguishable but different sized colonies on solid media. The colony types differ biochemically. The small colony (SC) type is the causative agent of CBPP, and can also affect goats and possibly sheep. Infection does not spread between the species. The large colony (LC) type is pathogenic for sheep and goats, but not for cattle.

The CBPP agent is sensitive to heat and drying, but in contaminated hay it can survive for 6 days in the sun and for 9 days in the shade, in contaminated clothes for 15 days and in pleural oedema fluid (at 3-15°C) for 6 months.

Disinfectants based on formalin, phenol or cresol, even in low concentrations, will destroy the organism.

Host species

Cattle are the main hosts, but the disease has also occurred occasionally in water buffaloes, yaks, reindeer, bison and antelopes. Younger cattle (less than three years of age) are more susceptible to CBPP than older ones which have a certain age resistance.

Transmission

The CBPP agent is highly adapted to cattle which become infected by inhalation of infective droplets from active or carrier cases of the disease. Because of the method of spread, outbreaks tend to be more extensive in housed animals and in those in transit. Cattle which have recovered from CBPP (carrier animals) constitute a reservoir of infection.

Clinically affected cattle shed large quantities of the organisms from the respiratory tract, and it is also shed in the urine and is transmitted across the placenta. Transmission over distances as great as 45 m has been suspected to occur, although 6m is usually considered to be sufficient separation between animals.

The organism can survive for up to three years in fibrously encapsulated necrotic areas in the lungs of recovered animals. These carrier animals shed the agent only sporadically, but in large quantities, from the respiratory tract when there is rupture of sequestra. It is not clear how the agent is released from sequestra and spread, though stress and coughing play an important part.

Inanimate vectors, such as feedstuffs, litter or clothes, contaminated by infective droplets or urine, are a potential source of infection.

Recovery probably leads to lifelong immunity in cattle.

Clinical signs

After an incubation period of 3-6 weeks, there is a sudden onset of fever (41-42°C), with subsequent fall in milk yield, severe depression, anorexia, cough, nasal discharge, and painful respiration. Morbidity can reach 100% and mortality 30-50%, death usually occurring within three weeks of the onset of clinical signs. However, in enzootically infected territories morbidity is usually low, and many subclinical cases occur.

Animals that recover are extremely weak and emaciated. Approximately 25% of affected animals remain as recovered carriers with or without clinical signs. In the lungs of some a sequestrum forms, with a necrotic centre which produces a toxaemia with illthrift, chronic cough and mild respiratory distress on exercise.

Diagnosis

Lesions are confined to the chest cavity. The pleura is thickened and large amounts of fluid are present in the thorax. The lungs are consolidated and the interlobular septa prominent and filled with sero-fibrinous exudate so that the cut surface of affected areas of the lung presents a typical marbled appearance.

Diagnosis can be confirmed by serological tests, particularly the complement fixation test. Blood samples are taken from a representative sample of animals from the herd, including animals in poor condition and those showing respiratory symptoms.

Risk of introduction

The risk of CBPP being introduced to New Zealand is considered to be relatively low.

Effects of introduction

On introduction into naive populations, CBPP can be expected to produce high morbidity (up to 100%) and high mortality (up to 50%), so initial losses could be very severe. The long (3-6 week) incubation period could mean that CBPP could become widespread before its presence was recognised. To ensure that CBPP did not become endemic, any outbreak would be handled by a rigorous stamping-out policy. Comprehensive traceback and trace forward would be necessary to locate all animals

which had had contact with affected herds during the long incubation period.

In enzootically infected countries enormous losses occur each year from deaths of animals, and the loss of production during convalescence. The highly fatal nature of the disease, the ease of spread and the difficulty of detecting carriers mean that close restriction must be placed on the movement of animals from enzootic areas.

Exports likely to be affected by an outbreak of CBPP in New Zealand could include the following species and some of their products: cattle, camelids, deer, goats and sheep.

Meat inspection certificates for meat exported to a number of countries certify that New Zealand is free of CBPP, so would require renegotiation in the event of an outbreak in this country.

Prevention

Serological testing and quarantine procedures are designed to ensure that CBPP is not introduced into this country in animal imports.

Control

Control measures, should the disease occur in New Zealand, would include the following:

- the complete quarantine of infected premises and the issuing of an Infected Place Notice;
- the tracing of susceptible animals, people and animal products coming on to and leaving the infected premises;
- the defining by the Chief Veterinary Officer of an Infected Area around the Infected Place(s). This area will be subject to strict quarantine, surveillance and movement control procedures;
- the slaughter of all affected and in-contact animals;
- the adequate disposal of carcasses;
- the cleaning and disinfection of Infected Premises;
- the re-stocking of farms under strict surveillance;
- the use of strategic vaccination as an alternative strategy if the 'stamping-out' approach fails.

A number of different living vaccines are in use, but the use of live vaccines is subject to the suspicion that they may spread the disease.

Further reading – *refer page 27*

4, 5, 10, 19, 21

To report a suspected exotic disease to MAF:

During business hours, ring local MAF office.

If no reply, after hours, weekends or public holidays,

Free Phone (0800) 809-966

Further reading

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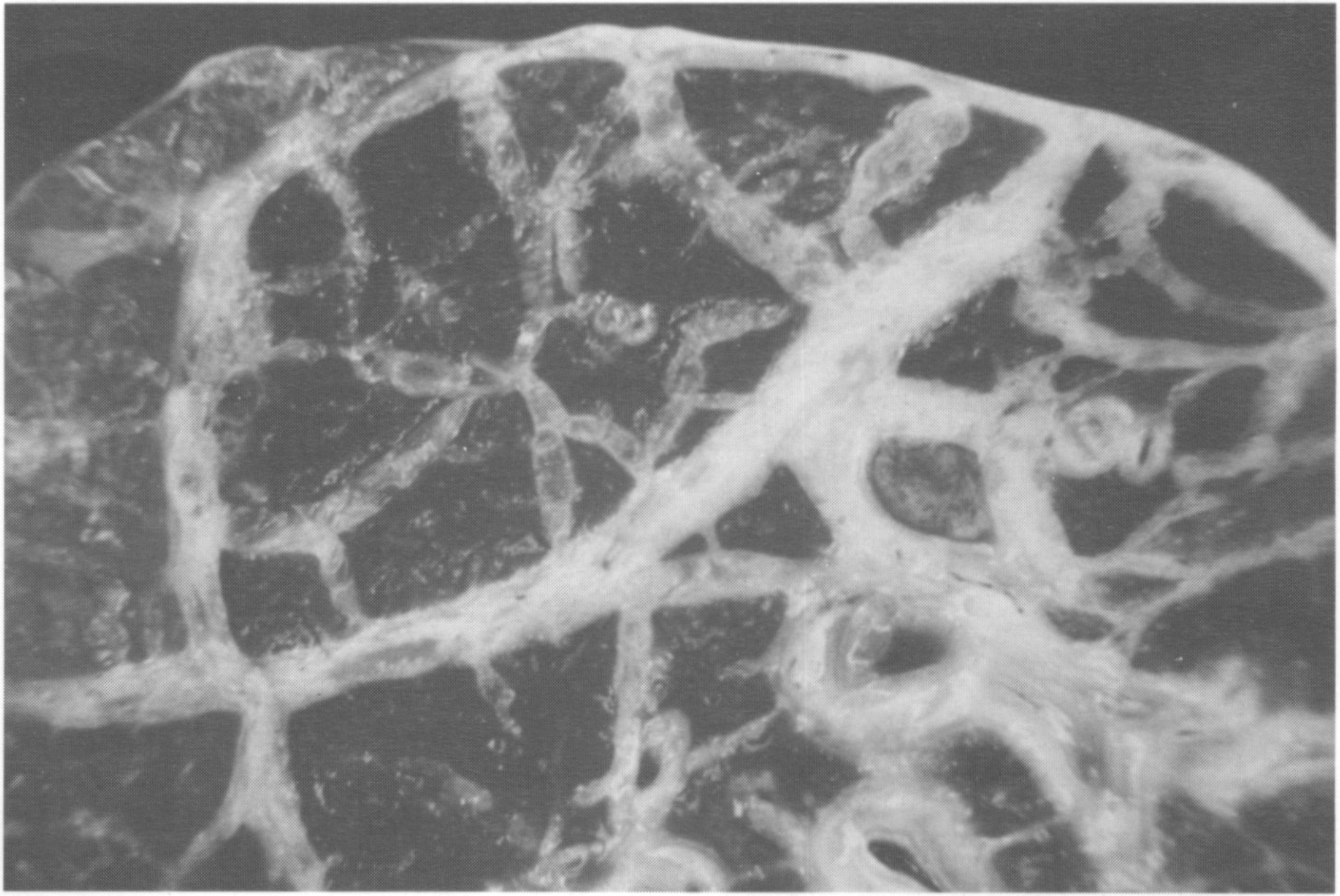

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