

COURSE CODE: VMD 809

COURSE TITLE: ADVANCED RUMINANT MEDICINE

CONTAGIOUS BOVINE PLEUROPNEUMONIA (CBPP) IS AN
ECONOMICALLY IMPORTANT RUMINANT DISEASE IN
NIGERIA. DISCUSS THE ROLE OF CHEMOTHERAPY AS A
VERITABLE TOOL IN ITS MANAGEMENT AND CONTROL.

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INTRODUCTION

Contagious bovine pleuropneumonia (CBPP) is an infectious and highly contagious disease of cattle and water buffaloes (Hutyra *et.al.*,1938) considered to be amongst the most important infectious diseases. Affected animals have difficulty in breathing due to damage to the lungs, lose condition and a proportion die. All ages of cattle are susceptible but young cattle develop joint swellings rather than lung infections. Many cattle show no disease signs despite being infected and others recover quickly after a transient mild disease, yet they can carry infection for as long as two years and may be responsible for passing on infection at a later date (Masiga *et.al.*, 1996; Regalla *et.al.*, 1996). This disease is responsible for huge economic losses in Nigeria and around the world (Egwu *et.al.*, 1996).

Aetiology

CBPP is caused by *Mycoplasma mycoides* subsp. *mycoides* Small Colony variant (bovine biotype) (*MmmSC* for short). This is a member of the 'mycoides cluster,' a grouping of six closely related mycoplasmas that are all pathogenic to a greater or lesser degree in ruminants. Members of the cluster have a high degree of serological and DNA relatedness. There is only one serotype of *MmmSC*. *MmmSC*, like other mycoplasmas, lacks a cell wall and is pleomorphic. In young cultures it tends to appear as branching filaments, and in old cultures as small coccid bodies. It requires special media rich in cholesterol (added serum) for growth. The bacterium is difficult to see even with a light microscope but growth of the organism can be seen when infectious material is cultured in the laboratory. The organism is fragile and survives poorly outside the host. It is sensitive to desiccation and disinfectants (Coetzer *et.al.*,1994)

Natural hosts

Cattle of all types (both *Bos taurus* and *Bos indicus*) are susceptible; domestic buffaloes are generally more resistant. CBPP has been reported in Asian yaks and in American bison but never in African buffaloes (*Syncerus caffer*). Sheep and goats are resistant to the disease(Provost, 1988).

There are variations in breed susceptibility in cattle, for example, trypanotolerant breeds seem to be more susceptible.

Geographical distribution

CBPP is widespread in Africa and is recognised to be present in some countries of Asia and Europe.

In Africa it is found in an area south of the Sahara, from the Tropic of Cancer to the Tropic of Capricorn and from the Atlantic to the Indian Ocean. Endemic infection extends throughout the

pastoral herds of much of western, central and eastern Africa, with Angola and northern Namibia in southern Africa. Newly-infected areas in the 1990s include much of Uganda, parts of Kenya, the Ituri Region of the Democratic Republic of Congo and most of Tanzania, where recently the disease has spread alarmingly; Rwanda (1994), Botswana (1995, now free), Burundi (1997) and Zambia (1997) were recently reinvaded but Lesotho, Malawi, Mozambique, South Africa, Swaziland, and Zimbabwe are currently free.

In Asia CBPP has been reported in recent times from Assam in India, Bangladesh and Myanmar. Sporadic outbreaks have been recognised in the Middle East most likely from importations of African cattle.

CBPP was eradicated from the USA in 1892, Zimbabwe in 1904, South Africa in 1924, Australia in 1972 and the Peoples Republic of China in the 1980s.

After virtual elimination from Europe in the 19th century the disease reappeared in Portugal and Spain in 1951 and 1957, respectively. Outbreaks have been reported in southern France on a few occasions, the latest being in 1984. In Italy the disease reappeared in 1990 but was eliminated by 1993 (Coetzer *et.al.*, 1994).

THE ROLE OF CHEMOTHERAPY

Many experts discourage the treatment of CBPP infected cattle. Although *Mycoplasma* spp. are sensitive to various antibiotics, chemotherapy is not used in the control of CBPP in order to prevent the development of a carrier state. Contrasting opinions, however, exist on the role of antimicrobial therapy in the control of CBPP. Antibiotics are used to treat postvaccine reactions (www.nda.agric.za/docs/Lungsickness2). *Mycoplasma mycoides mycoides* (SC-type) is susceptible to a variety of antimicrobials, including streptomycin, oxytetracycline, and chloramphenicol. However, antimicrobial therapy may only serve to slow the progression of the disease or may even in some cases favor the formation of sequestra. In the case of chronically affected animals or subclinically affected carriers, the organisms may be in an inaccessible location within an area of coagulative necrosis, which by definition is not served by a blood supply (Provost *et.al.*, 1987; Blood *et.al.*, 1994).

In a recent study, danofloxacin was shown to greatly reduce the spread of the mycoplasma, *MmmSC*, from cattle chronically affected with CBPP to healthy contact controls, though there was little difference between lung lesion scores of treated and untreated cattle (Hubschle *et al.*, 2004).

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