Introduction

“Anthrax” is the clinical manifestation of disease caused by a spore-bearing bacterium, *Bacillus anthracis*. Anthrax is a highly contagious disease of primarily herbivores, although all mammals are susceptible. Under natural conditions omnivores, carnivores and humans are considered incidental hosts. In herbivores it is usually characterized by sudden death and the presence of the causal agent in the body fluids towards the terminal phase of the disease. In the less susceptible hosts it can be preceded by subcutaneous swellings. The principal lesions are those of widespread oedema, haemorrhage and necrosis.

Salient features of Anthrax

Anthrax is a disease primarily of herbivores, although all mammals are susceptible. Anthrax deaths have been recorded in at least 59 mammal species, but the susceptibility of different species to anthrax varies considerably. Humans are regarded as fairly resistant to infection. Normally humans are infected incidentally, almost always acquiring the disease directly or indirectly from infected animals when handling, or eating meat from the carcasses of animals that have died of anthrax, or through occupational exposure to animal products contaminated with anthrax spores.

The anthrax cycle consists basically of: i) A biotic growth phase in a susceptible animal, where vegetative bacterial growth takes place, causing terminally a rapidly fatal septicaemia, and ii) An abiotic dormant phase, which starts with a transition into a very resistant spore form at the height of the growth phase under aerobic conditions and is carried passively and purely mechanically in carcass rests, soil, water and insects.

Where does Anthrax occur?

Even though there has been a progressive and significant global reduction in livestock cases in response to effective control programmes, anthrax still occurs virtually worldwide. However, certain areas and conditions are recognized as being more conducive to anthrax outbreaks and should be kept in mind in any
marketing and trade venture. Anthrax is considered relatively common in southern and eastern Europe, several former USSR countries in Central Asia, southern and central America and Africa, but uncommon in most of western Europe, Canada, USA and Australia.

What triggers an outbreak of Anthrax?
Natural infection of animals is usually acquired by the ingestion of spores that germinate and gain entrance to the animal’s tissues. Any epidemic is dependent on the availability of susceptible hosts, and a certain number or density of susceptible animals is necessary for an epidemic to start and progress into epidemic proportions. Because of practical difficulties encountered in vaccinating free-living wild animals, anthrax retains an endemic presence in large free-ranging wildlife areas in several regions of the world. In the Etosha National Park, Namibia, and the Kgalagadi Transfrontier Park in South Africa/Botswana, anthrax outbreaks peak in summer after the major rains, following on the availability of water in man-made dams or gravel pits that attracts large numbers of game to certain areas. On the other hand, in the Kruger National Park, outbreaks of anthrax typically occur towards late winter/early summer before the first major rains when water is scarce and animals are concentrated around the remaining watering points.

Prevention and control
Anthrax control measures are aimed at breaking the cycle of infection and consist basically of a surveillance system, prophylactic procedures (immunization, treatment and disinfection), and disease regulatory actions (quarantine, immunization, treatment, proper disposal of carcasses and disinfection). Control measures usually include:

- Effective surveillance and reporting procedures, providing an early warning system, and delineating high-risk areas.
- Routine annual vaccination of animals at risk
- Quarantine procedures, isolating an infected and contaminated area and animals until safe.
- Preventing excess sporulation of the vegetative growth form of *B. anthracis* by avoiding the opening of carcasses.
- Treatment with bactericidal antimicrobial drugs as a prophylactic measure in particularly valuable animals exposed to anthrax.

Find out more
The CPD module on anthrax provides a detailed account of the disease and the primary virulence factors of the causative organism with emphasis on the way the disease commonly behaves in southern Africa, i.e. its epidemiology. Detail is provided on the role of wildlife in the maintenance and spread of the disease. Other aspects covered by the module are the pathogenesis of anthrax, its diagnosis and differential diagnosis, including clinical signs and pathology, and methods for controlling the disease. The module concludes with a section on the effect of anthrax on trade in animals and animal products.