



**Feel free to contact your nearest state/private veterinarian/  
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# BOVINE SPONGIFORM ENCEPHALOPATHY (BSE)

*Infamously known as Mad Cow Disease*



**agriculture,  
forestry & fisheries**

Department:  
Agriculture, Forestry and Fisheries  
REPUBLIC OF SOUTH AFRICA

### What is BSE?

- BSE is a neurological disorder of cattle that develops slowly, doesn't respond to treatment and is fatal. Cattle can become infected by ingesting infected material (classical BSE) or they may spontaneously develop the disease (atypical BSE)
- It is linked to variant Creutzfeldt-Jakob disease (vCJD) in humans

### What animals may contract it?

- Cattle
- Human (variant Creutzfeldt-Jakob disease)
- Other (e.g. cats)

### What causes BSE and why?

- The causative agent is a modified form of normal proteins known as "prion proteins" in the nervous system
- For reasons that are not yet properly understood, the normal prion proteins change into a harmful form that then damages the central nervous system of cattle

### How is it contracted?

- Cattle contract the disease by ingesting BSE-contaminated cattle feed. The main source is meat and bone meal made from other infected cattle
- Humans can contract the disease by ingesting products from infected cattle that are contaminated with central nervous system tissue (brain and spinal cord)

### What are the signs of BSE in cattle?

- Changes in behaviour and temperament
- Hyper-reactivity (over-sensitive to touch and sound)
- Posture and movement changes, incoordination
- Early signs may be vague but get worse and progress

over time

- Nervous system signs = mad cow disease!



*(Fig 1: picture of Posture and movement changes, incoordination)*

### How do you test for BSE?

- There are no definitive diagnostic tests in the live animals
- Cattle diagnosis is done on post-mortem samples of the brain – immunohistochemistry (IHC) and detection of misfolded prion proteins in the brain
- In humans, the disease is hard to diagnose until the final stages of the disease. Magnetic Resonance Imaging (MRI) may show brain pathology at advanced stages



*(Fig 2: post-mortem samples of the brain)*

### What are the signs in humans?

- Behaviour and emotional changes, incoordination, memory loss, etc.
- Develops slowly over time
- Symptoms are non-specific and require medical investigation and testing

### Prevention

- Cattle showing signs of BSE need to be reported to the State Veterinarian of the area. The animal must be tested and if positive they should be properly destroyed (not eaten)
- Banning the use of ruminant meat and bone meal supplements in ruminant feed (do not feed cattle ruminant products!)
- Eliminating BSE infected cattle from entering both the cattle and human food chains
- Prohibit the importation of cattle and their products from countries that have an undetermined risk of BSE

### IMPORTANT FACTS ABOUT MAD COW DISEASE IN CATTLE

- The disease can develop spontaneously in older cattle
- There is no vaccine available
- There is no effective treatment
- It has a long incubation period of 4–5 years (the period from infection to onset of clinical signs)
- No clinical cases have been reported in South Africa
- In South Africa, the feeding of any protein of ruminant origin (except milk and milk products) to any animals other than predators and carnivores has been prohibited under Section 24 of the Animal Diseases Act, 1984 (Act No. 35 of 1984)
- Act 36 of 1947 addresses the handling of risk materials in feed manufacturing facilities.