

Polioencephalomalacia (PEM)

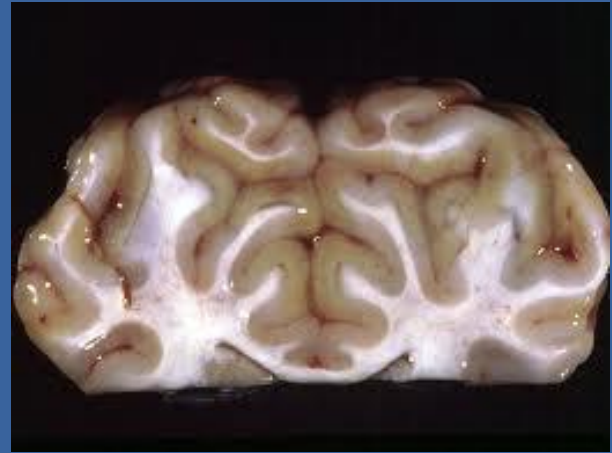
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Pathology

- Literally means softening of the cerebral cortical grey matter of the brain.
- Disease characterized by a disturbance in the central nervous system.
- Brain of the infected animal becomes inflamed and swollen, and eventually becomes necrotic.

Pathology cont'd

- Diagnosis is usually done by performing a necropsy on the brain of the dead animal.
- Dead grey matter will fluoresce under a wood's lamp.



Causes

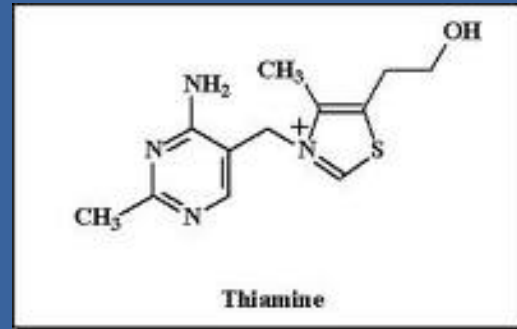
- PEM sometimes occurs on high grain diets, and diets that include plants high on thiaminases and sulfur.
- Thiaminases are enzymes found in a few plants, such as bracken fern.
- When ingested these enzymes split thiamin (Vitamin B1), an important compound in energy metabolism, and render it inactive.

Causes cont'd

- Normally ruminants are fairly resistant to thiamin deficiency since rumen microbes provide the animal with sufficient amounts of thiamin.
- However, the ingestion of thiaminases will lead to deficiency.
- young growing ruminants, especially cattle and sheep, fed high-grain diets are especially susceptible.

Causes cont'd

- Diets high in grains can encourage the growth of certain thiaminase-producing bacteria in the rumen.
- These bacteria can produce enough thiaminases to induce thiamin deficiency.
- When thiamine is deficient, key tissues that require large amounts of thiamine, such as the brain and heart, are the first to show lesions.



Clinical signs

- Usually occurs suddenly
- Affected animals sit or stand alone, are blind and arch their necks back and stare upwards and become "star gazers" (opisthotonus).
- They are disoriented, lose their appetite, and they do not want to drink
- Temperature and respiratory rate are usually normal but the heart rate may be depressed.

Clinical signs cont'd

- Excitement may be seen but is usually replaced with dullness.
- The animal may go down on its side with its head thrown back.
- The legs may be rigidly extended and convulsions may occur.
- If not treated on time, most animals with PEM will die within 48 hours.



Treatment and Prevention.

- Sheep suffering from polioencephalomalacia generally respond very well to treatment if caught early.
- They can be successfully treated with 200 to 500 mg of thiamin injected intravenously, intramuscularly, or subcutaneously.
- Because thiamine is water-soluble, it is quickly eliminated from the body through the kidneys and, therefore there is little risk of overdosing.

Treatment and Prevention cont'd

- Dexamethasone is often administered along with thiamine to reduce brain swelling.
- Although recovery is usually quick, if significant brain damage has occurred, the recovered sheep rarely regain satisfactory levels of productivity. Therefore, very early treatment is critical.

