OVINE EXPERIMENTAL POLIOENCEPHALOMALACIA ASSOCIATED WITH HIGH CARBOHYDRATE DIET, LOW IN LONG FIBER AND ELEVATED SULPHUR INTAKE

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Introduction: Polioencephalomalacia (PEM) is a neuropathologic condition of ruminants that can be induced by a variety of neural metabolic disruptions. These include altered thiamine status, water deprivation, sodium ion toxicosis, lead poisoning and high sulfur intake.

Objectives: The aim of this study was to induce PEM in sheep fed a diet high in carbohydrate and low in long fiber content associated with a high sulphur concentration (0.70% dry matter).

Methods: Two crossbred two month old sheep were fed an experimental diet during three weeks with sodium sulfate. The protocol for induced PEM was constituted by three phases.

Phase 1: they were fed coast-cross hay twice daily during one week adaptation period.

Phase 2: during one week the diet of the animals was gradually changed by decreasing the hay and increasing the high sulfur diet.

Phase 3: the animals were fed the experimental diet at a rate of 1Kg/animal/day for three weeks (phase 3).

The animals were examined twice daily. Rumen hydrogen sulfide gas concentration was measured using a sulfide detector tube method once a week during all phases. Post mortem examination was undertaken on all animals at the end of the experimental period.

Results: Neurologic signs consisted on diminished response to external stimuli and lethargy, followed by twitching of the ears and facial muscles. Neurologic signs were first observed after day 10 of feeding the experimental diet (phase 3). The ruminal hydrogen sulfide gas concentration mean in each phase was: 520 ppm (before started the phase 1), 4850 (end of phase 1), 8,700 ppm (end of phase 2), 4,250 ppm (seven days from phase 3), 3,500 ppm (fourteen days from phase 3) and 5,000 ppm (twenty one days from phase 3). Clinical signs were associated with ruminal hydrogen sulfide gas concentration increase. At necropsy, macroscopic lesions weren't observed. Histologically there were cortical neuronal necrosis particularly in the occipital and parietal lobes.

Conclusions: Despite the small sheep number used this model showed us that this experimental model can induced PEM in sheep.

Keywords: Cerebral necrosis, sulphur, sheep, experimental model, ruminal hydrogen sulfide.

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