

A Case of Bovine Spongiform Encephalopathy in Denmark

Bovine spongiform encephalopathy (BSE), a transmissible spongiform encephalopathy in cattle, was first described in England by *Wells et al.* (1987). The infection occurs mainly due to digestion of feedstuffs containing ruminant derived protein in form of meat and bone meal contaminated with a scrapie-like agent (*Wilesmith et al.* 1991). Later, cases of BSE were diagnosed in the Republic of Ireland, Oman, France, and Switzerland (*Marinovic & Senn* 1991). This report describes the first case of BSE in Denmark.

In July 1992, a 5-year-old cow of the Scottish Highland breed suspected of BSE was reported to the Danish Veterinary Service according to the Danish Animal Disease Act. The cow, which had been imported from UK in 1988 as a 1-year-old heifer, originated from a Highland breed stock of 9 adult animals and 4 calves. On clinical examination the cow was found to have reduced bodyweight. She was apprehensive, almost constantly gnashing her teeth and salivating. During the last week before euthanization, she developed an aggressive behaviour. Furthermore, she had abnormal gait including hind limb ataxia and incoordination. In several instances she lifted her head high and in periods cutaneous muscular fasciculation could be observed. Hyperaesthesia was not present. The cow had difficulties in both drinking and eating. The owner stated, that the cow progressively had developed clinical symptoms during the last months.

The cow was euthanized by intravenous injection of pentobarbital sodium, the head was removed, and the carcass was buried. At necropsy no macroscopic changes were detected in the brain. Histopathological brain examination was performed after fixation in 10% buffered neutral formalin, paraffin embedding and haematoxylin-eosin staining.

The histopathological examination showed bilateral symmetrical vacuolization of both grey matter neuropil and neuronal perikarya (Fig. 1 and 2). The vacuolization was mainly present in the brain stem, where it was widely distributed. In the cerebellum and cerebral hemispheres relatively few vacuoles could be observed, however pronounced vacuolization was present in the hippocampus area.

The clinical symptoms and progression of the disease are highly indicative for BSE and similar to those described in other cases (*Wells et al.* 1987, *Wells & McGill* 1992). Although hyperaesthesia was not present, the symptoms were indicative for BSE, as hyperaesthesia is only present in 75% of confirmed BSE cases (*Wilesmith et al.* 1992). The pathological lesions were pathognomonic for spongiform encephalopathy, and identical to those described in other cases of BSE (*Wells et al.* 1987, *Wells & McGill* 1992). Following the confirmation of the diagnosis, the whole herd including a neighbouring flock kept separately but belonging to the same owner—in total 25 cows, bulls, heifers and calves—were transported to the State Veterinary Institute for Virus Re-

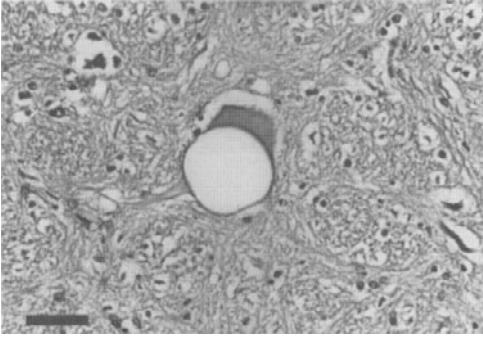


Figure 1. Vacuole in the neuronal perikaryon ("signet ring structure"). Brain stem. Haematoxylin and eosin. Bar = 50 μ m.

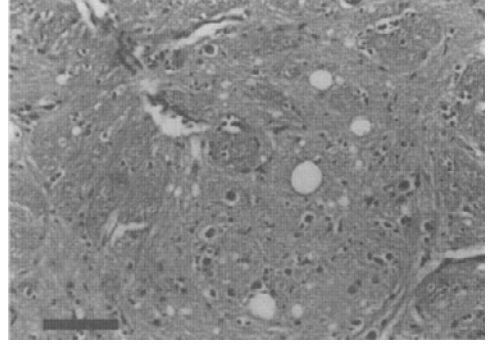


Figure 2. Vacuoles in grey matter neuropil. Brain stem. Haematoxylin and eosin. Bar = 100 μ m.

search, euthanized and incinerated. Thorough cleaning and disinfection was carried out on the premises and the grazing areas were ploughed.

Based on information from the veterinary authorities in UK, it has been established that the cow prior to exportation had access to meat and bone meal containing ruminant protein. The ban on feeding ruminant protein to ruminants was not introduced in UK until July 1988, and the exportation took place in June 1988. Moreover, scrapie has never occurred in Denmark, and meat and bone meal has not been imported from UK for many years. Since June 1990 a ban on feeding ruminant protein to ruminants has been in force in Denmark. Therefore, the occurrence of BSE in Denmark is without doubt due to importation of an already infected cow, and the Danish cattle population is still considered free of BSE.

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