BSE - EPIDEMIOLOGY AND TRANSMISSION MECHANISMS IN ANIMAL PRODUCTION SYSTEMS

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In 1986, a new clinical disease in cattle was recognized in the UK. It was classified as a progressive neurological condition in cattle similar to scrapie of sheep and goats, and was named bovine spongiform encephalopathy (BSE). Epidemiological studies on clinical cases diagnosed in 1986 and 1987 highlighted the increased risk of BSE on farms that had fed cattle concentrates containing meat-and-bone meal (MBM). The addition of MBM to cattle concentrate feed at that time was common practice in the UK and other countries (but with varying percentages). As a consequence, the use of MBM in ruminant feed was banned in the UK in 1988. This ban resulted in a significant reduction of new infections in cattle born after this ban, thereby highlighting the importance of controlling this exposure route. Further studies in the UK and other countries confirmed that BSE is predominantly, if not exclusively, transmitted by inclusion of ruminant CNS material - brain or spinal cord from BSE-infected cattle - in cattle rations. BSE cases born after these MBM bans (denoted BAB cases) documented the presence of other infection routes besides routine inclusion of MBM in cattle concentrates. Cross-contamination of cattle feed with feed produced for pigs and poultry, and cross-exposure of cattle to pig or poultry feed on mixed-species farms were identified as additional infection routes. The Scientific Steering Committee (SSC) of the European Commission listed several risk factors for BSE propagation including the structure and intensity of the cattle population and other livestock populations, production and use of ruminant-derived meat-and-bone meal (including feed bans), the use of specified risk material (SRM) and carcasses (including SRM bans) and the rendering industry (structure, technology, rendering parameters). Prevention of these known and suspected feed-related routes of BSE transmission has resulted in a decline in the number of new infection in subsequent birth cohorts in several countries. Due to the long incubation time of BSE, however, it takes several years until the effectiveness of implemented measures to prevent new BSE infections can be assessed.

BSE is a food-transmitted disease, and exposure to the infectious agent is strongly associated with the cattle feed production and management practices within specific cattle production systems. The disease can be controlled by changes in these feed production systems and cattle farming practices, however, it will take time for countries that have detected domestic BSE cases to completely eliminate all circulating BSE infectivity.