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PRION INFECTION

The demise of vCJD?

An investigation into the oral transmission of bovine spongiform encephalopathy (BSE) to primates indicates that existing public-health measures to prevent human exposure to this disease are protecting the human food chain.

Some of the crucial areas of uncertainty regarding the link between BSE and variant Creutzfeldt–Jakob disease (vCJD) include an accurate understanding of the amount of BSE material that constitutes an oral infectious dose and the magnitude of any bovine-to-human biological barrier to transmission. To shed light on these questions, Jean-Philippe Deslys and colleagues investigated the oral transmission of BSE to macaques — non-human primates, the BSE disease of which resembles the pathophysiology of vCJD. In their study, recently published in *The Lancet*, two adult macaques were orally dosed with 5 g of BSE-infected bovine brain. Five years after exposure, one of the animals developed a disease that closely resembled vCJD in pathology. Six years on, the other animal still shows no signs of infection. Data from an ongoing investigation indicate that the oral infectious dose for cattle is 0.1–1.0 g of BSE-infected bovine brain and, on this basis, the authors estimate the magnitude of the ‘protective’ species barrier between bovines and primates to be in the range of 7 to 20. From this analysis, Lasmézas *et al.* conclude that if humans were to consume central

nervous system (CNS) tissue from cattle with preclinical BSE that is not detectable by the sensitive screening tests that were used in their investigation, they would need to ingest an unlikely 1.5 kg of this tissue to reach the degree of exposure equivalent to the 5 g of brain used for oral transmission in this study.

In a worse-case scenario, the authors also considered the absence of a protective species barrier between cattle and primates, a situation in which 0.5 g of BSE-infected bovine brain would be sufficient to infect humans by the oral route. However, even in this case, 150 g of CNS tissue from a negatively tested BSE-infected animal would be

required — an improbable occurrence in light of current regulations relating to cattle CNS tissue and mechanically recovered meat.

This study does offer reassurances that current BSE screening procedures, in combination with CNS tissue removal, do offer effective protection of the human food chain. However, before firm conclusions can be drawn regarding the future of vCJD, more data from more animals will be crucial.

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References and links

ORIGINAL RESEARCH PAPER Lasmézas, C. I. *et al.* Risk of oral infection with bovine spongiform encephalopathy agent in primates. *The Lancet* 27 Jan 2005 [epub ahead of print]

