

See p 789, 790, 795, 855

Creutzfeldt-Jakob disease and bovine spongiform encephalopathy

Study so far provides no evidence for maternal and horizontal transmission

EDITOR,—R W Lacey admonishes us for failing “to provide any of the evidence supporting the occurrence of vertical and horizontal transmission of the infectious agent for bovine spongiform encephalopathy under farm conditions.”¹ The data from commercial farms regarding the occurrence of bovine spongiform encephalopathy in the offspring of cows that themselves developed the disease can be found in Hoinville *et al*'s paper.²

These veterinary epidemiologists carried out a case-control study of 477 animals with bovine spongiform encephalopathy and 1294 matched, unaffected animals all born after the ban on feed containing recycled animal remains was introduced in 1988 and retained in the same 349 farms. The results showed that 94.4% of the animals with bovine spongiform encephalopathy and 95.7% of the control animals were born to dams that did not subsequently develop the disease. This difference is not significant, and the data provide strong evidence that maternal transmission is not a risk factor. The possibility of horizontal transmission is being assessed by looking for bovine spongiform encephalopathy in the indigenous members of herds that have never been exposed to the foodborne source of infectivity but into which purchased animals that subsequently developed bovine spongiform encephalopathy have been introduced. This assessment is incomplete but to date provides no evidence for horizontal transmission.³

Readers might be forgiven for thinking that the data on conjunctival transmission of scrapie provided by Janet R Fraser and colleagues imply that scrapie could be eradicated if sheep were fitted

with goggles.⁴ In 1794 Crook of Tytherton argued that the best way to get rid of the goggles (an archaic name for scrapie) is to buy a new ram.⁵ We agree with him.

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- 1 Lacey RW. Creutzfeldt-Jakob disease and bovine spongiform encephalopathy. *BMJ* 1996;312:180-1. (20 January.)
- 2 Hoinville LJ, Wilesmith JW, Richards MS. An investigation of risk factors for cases of bovine spongiform encephalopathy born after the introduction of the “feed ban.” *Vet Rec* 1995;136:312-8.
- 3 Wells GAH, Wilesmith JW. The neuropathology and epidemiology of bovine spongiform encephalopathy. *Brain Pathol* 1995;5:91-103.
- 4 Fraser JR, Foster JD, Fraser H. Creutzfeldt-Jakob disease and bovine spongiform encephalopathy. *BMJ* 1996;313:181. (20 January.)
- 5 Davis T. *General view of the agriculture of Wiltshire*. London: Richard Phillips, 1811:140-9.

Cohort study of cows is in progress

EDITOR,—R W Lacey's letter makes no reference to any scientific paper on the epidemiology of bovine spongiform encephalopathy.¹ As a result it contains too many omissions, errors, and misconceptions to pass into the literature unchallenged.

Lacey's description of the cohort study to examine the risk of maternal transmission is incorrect. This study is comparing the incidence of bovine spongiform encephalopathy in offspring of dams that developed clinical signs of the disease and in offspring of dams that reached at least 6 years of age without developing clinical signs. Three hundred pairs of animals are involved, and the members of each pair were born in the same calving season and herd. The criteria for purchase, between July 1989 and February 1990, were that the animals had been weaned, females were virgin, males had been castrated, and documentation for the animals' provenance was available. Age at purchase ranged from 2 to 24 months; most of the animals were yearlings. The study population therefore comprises some animals born before the ban on ruminant feed containing recycled animal remains in July 1988. The animals are being kept until 7 years of age; the youngest will reach this age in November this year. The sample size of the study precludes interim analyses because of the inevitable loss of statistical power. The results of the study will be reported in due course; in the meantime not even Lacey can draw any conclusions.

Susceptibility to bovine spongiform encephalopathy is independent of age, but the risk of infection has undoubtedly declined as a result of the feed ban.² Using a crude, inappropriate comparison of the age at which bovine spongiform encephalopathy has occurred in cattle born before and after the feed ban, Lacey claims that vertical and maternal transmission has occurred. He ignores a large case-control study that examined the risks of maternal and horizontal transmission in cattle born more than three and a half months after the feed ban, which provided substantial evidence against such means of transmission.³

Furthermore, the low incidence of the disease in animals and the relatively constant incidences within herds⁴ are consistent with exposure to a low dose of infectious material and the occurrence of

contamination in “packets.”⁵ In these packets the titre of the agent would vary, but there would not be any change in the infective dose with a change in the prevalence of infected cattle as Lacey infers. The mean age at clinical onset in cattle born after the feed ban has fallen as expected. Lacey will have to accept that there has been an incomplete observance of the feed ban.

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- 1 Lacey RW. Creutzfeldt-Jakob disease and bovine spongiform encephalopathy. *BMJ* 1996;312:180-1. (20 January.)
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- 4 Wilesmith JW. The epidemiology of bovine spongiform encephalopathy. *Seminars in Virology* 1991;2:239-45.
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Incidence of bovine spongiform encephalopathy is higher in cows born after feed ban

EDITOR,—R W Lacey could have made more of the data on the ages of cattle with bovine spongiform encephalopathy that he discusses.¹ The ban on the inclusion of recycled animal remains in agricultural feeds came into force in July 1988. Many calves born before this date might be expected eventually to develop the disease; those born later should have a greatly reduced, and diminishing, incidence of the disease. In his table Lacey compares two sets of data. The second column breaks down by age the numbers of cattle that were born before the ban in which the disease was diagnosed in 1989. The third column shows the breakdown for cattle that were born after the ban in which the disease was diagnosed in 1990-5. Assuming that each column gives a fair representation of the age structure for the development of the disease, Lacey infers that this structure has changed little as a result of the ban.

The problem is that, for cattle born after the ban, there are many more animals that might develop the disease when young than that might

Table 1—Numbers of cattle with bovine spongiform encephalopathy born before and after food ban was introduced in July 1988

Age (years)	Born before ban, disease diagnosed 1989*	Born after ban, disease diagnosed 1990-5	Born after ban (per annual cohort of calves)
1-	1	1	0.2
2-	28	81	16.8
3-	586	2 824	737.3
4-	2 138	9 820	3 470.0
5-	1 874	7 966	4 353.0
6-	667	2 008	2 419.3
7-8	125	9	52.9
Total	5 419*	22 709	11 049.5

*England and Wales. Total number of British cases in 1989 was 7627.²

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