

Estimating Scrapie Susceptibility using PrP Genotype of Ovine Genetic Material Donors

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Australia is free from ruminant transmissible spongiform encephalopathies, including BSE and scrapie. Australia's current quarantine policy for importation of genetic material from sheep in Europe and North America restricts eligibility of donors according to the scrapie prion protein (PrP) genotype, age and breed of sheep. Only donors susceptible to scrapie and over 5 years of age are eligible as donors. If infected, disease expression in donors should occur before embryo or semen collection.

There have been requests to vary the conditions and import genetic material from previously ineligible breeds and PrP genotypes. Assessment requires data on scrapie prevalence in different PrP genotypes of the breed of interest. Estimated expected cases of scrapie are matched with observed cases of known PrP genotype. A reasonably close match can justify classification of donors of a PrP genotype as susceptible to scrapie and thus eligible as donors. Unfortunately, this type of data is infrequently available and is population specific. Also, the proportion of different PrP genotypes in flocks varies between flocks and countries. This arises in part because the US, Canada and many European countries aggressively select resistant PrP genotypes. Thus, estimates of probability made in the short term may be unreliable.

If research underway in the UK confirms that the risk of scrapie transmission by genetic material is negligible, consideration of PrP genotypes should become unnecessary.