THE EPIDEMIOLOGY OF SCRAPIE IN AFFECTED FLOCKS - PRELIMINARY RESULTS

A. Hoek, L. Hoinville, M. Dawson

Epidemiology Department, Virology Department, Central Veterinary Laboratory, Weybridge, Veterinary Laboratories Agency.

The aetiology and ways of transmission of scrapie are still not known. It is not clear what role genetic susceptibility plays compared to transmission, which route of transmission is used and whether transmission of the scrapie agent is horizontal and/or maternal. It has recently been shown that polymorphism's of the PrP-gene at codons 136, 154 and 171 are associated with differences in susceptibility to scrapie. We need to do more research on this subject to establish which genotypes are susceptible in which breed and whether this knowledge can help us to control scrapie on farms. The aims of this study are

1. to assess the within-flock incidence of scrapie in affected flocks,
2. to look at different risk factors for scrapie in individual animals in these flocks (e.g. genotype, parental scrapie status and lambing management) and
3. to look at the impact of introducing less susceptible rams into the flock.

Methods used included data collection from flock records, post mortem examination of all scrapie suspects and PrP genotype determination of all scrapie suspects and two age-matched controls, at least one whole birth cohort and the rains used for breeding once we have established the frequency of alleles in the flock. So far we have 25 farms from England and Wales in the study with a total of 10,000 breeding sheep of over eight different breeds. The average annual incidence of scrapie in these flocks is 2 % (varying from 0.2 to 8.3 %). Here are some preliminary results.

We looked at retrospective data from a large crossbred flock to determine the annual age specific incidence. It was found to vary from 0.9 cases per 100 sheep years in 1990 to 6.5 cases per 100 sheep years in 1995. The highest incidence was found in the two-year age group, followed by the three-year-olds. In the same flock we looked at the influence of having either a dam or a sire that died of scrapie on the risk of the offspring getting scrapie. It was found that the risk of getting scrapie was 1.7 times higher in offspring of one scrapie-affected parent. It did not make much difference whether it was the dam or the sire that had died of scrapie. This would suggest that we have a genetic effect rather than maternal transmission.

Regarding the association between genotype and disease occurrence, different results are found in different breeds, but in general the ARQ and VRQ alleles are found to be associated with increased susceptibility to scrapie and the ARR allele with decreased susceptibility.

We are still recruiting flocks if they have a scrapie incidence of at least 1 %, breed their own replacements, have tagged their animals or would be prepared to do so and are willing to keep detailed records of lambing, replacements and movements on and off the farm. Benefits to the farmer of joining the study

would be £15 payment per live scrapie submission, free pathological diagnosis for all clinically suspect animals, free genotype results for all cases and controls sampled and advice about future breeding programmes.