A BREED DIFFERENCE BETWEEN ROMNEYS AND MERINOS IN THE INCIDENCE OF JOHNE'S DISEASE ON A NEW ZEALAND FARM

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SUMMARY

Eight years of health records for ovine Johne's disease (OJD) were analysed from a long-term breeding trial with Romneys and Merinos at AgResearch's Tokanui Station to test for any breed difference in animal resistance/susceptibility to OJD. Survival and OJD records were analysed from a total of 2348 Romney ewes (3 selection and 4 control lines) and 1297 'Merino' ewes (5 breed groups: purebred Merinos imported from Victoria and Tasmania in 1969 (superfines), purebred Merinos from South Island New Zealand farms (predominantly Peppin origin), half-breds derived from crosses of Romneys with Merinos (both sources), and superfine Merino backcrosses), comprising animals born at Tokanui between 1971 and 1978. Few males were retained past two years of age, so survival and disease data on males were excluded. The Romney ewes, retained potentially to their fifth lambing (6.4 years of age), had a mean lifetime incidence of OJD (based on necropsy records on ewes which died or had low condition/severe weight loss) of 3.49% (range, by year of birth: 2.11 to 5.00%). The Merino ewes, retained potentially to their seventh lambing (8.4 years of age), had a mean lifetime incidence of OJD of 4.78% (range, by year of birth: 0.0 to 7.74%). The Romney vs. Merino OJD contrast was not significant ($P < 0.051$). Differences among Romney lines were not significant, but differences among Merino crosses were significant ($P < 0.001$), with superfine purebred Merino, NZ purebred Merino, ¾ superfine, NZ half-bred Merino, and superfine half-bred Merino having means for OJD of 11.3%, 5.6%, 5.5%, 2.9%, and 0.9%, respectively. The mean age at OJD incidence was 3.44 ± 0.09 years for Romney females, compared with a mean for all surviving Romneys of 5.04 ± 0.02 years ($P < 0.001$). Corresponding means for Merinos were 3.38 ± 0.13 and 5.00 ± 0.04 years, respectively ($P < 0.001$). The heritability of lifetime incidence of OJD, considered as a binomial trait and using animal-model restricted maximum likelihood methods (Gilmour, 1999), had a pooled-within-breed value of 0.14 ± 0.09; the heritability appeared to be higher in Merinos ($h^2 = 0.18 \pm 0.11$). Applying traditional breeding methods to reduce the incidence of OJD would be slow or unsuccessful in Romneys. Selection against OJD in Merinos could begin to reduce the incidence, but ranking later generations would become more difficult, and a gene marker test would be of great assistance.