Evaluation of low dose immunization with gut membrane glycoproteins of *Haemonchus contortus* against nematode infection in grazing lambs

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A vaccine containing integral membrane proteins from *Haemonchus contortus* intestinal cells has been shown to be effective for lamb immunisation at a 50ug dose. However, in order to develop a viable commercial product, lower doses of vaccine were tested in two-month old grazing Corriedale lambs. The animals were kept in a single paddock and allocated to five groups according to their liveweight, sex and faecal egg counts (FEC). Vaccinates received 50, 10, 5, 2 or 0 ug of the antigen diluted in QuilA adjuvant. Vaccine shots were given at days 0, 21, 49 and 91 and all lambs were weaned at day 56. Lambs were weekly sampled for FEC, packed cell volume (PCV), and plasma was stored for subsequent serological analyses. Logarithmic transformation was used for FEC (logFEC+25). Lambs with PCV equal to or less than 15% were drenched with levamisole as a salvage treatment. After the second vaccine injection there was a significant reduction in FEC in the higher dose group. Natural infection levels were low due to drought, therefore 21,000 L3 mainly *H. contortus* field isolate, originated from contemporary lambs, was orally administered during a five-week period, starting at day 70. Post-artificial challenge responses (from day 91-112), showed that vaccinates had lower FEC counts and higher PCV than controls (p<0.0001) and salvage treatment was needed in 9/17, 1/16, 1/18 lambs for controls, 2 and 5ug, respectively, while none of the animals treated with 10 and 50ug reached PCV<=15%. Animals treated with 50ug had the lowest FEC and the highest PCV value and the results suggested a dose-dependent effect for both FEC and PCV responses in the vaccinates. If the salvage criteria is taken into consideration, a minimum suitable vaccine dose for field application would be 10ug, but 5 and 2 ug doses were also effective in the great majority of lambs. Serological analysis may reveal whether these exceptions were “non-responders”.

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