

Reduction of winter scours in sheep through continuous exposure to worm antigens to prevent the development of hypersensitivity.

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Background

It is now well-established that winter scours in sheep are not due to high-moisture pasture plants, nor are they due to high worm burdens. Rather, it is the initial re-exposure to small numbers of worms at the break of the dry season, which causes an overreaction of the immune system leading to hypersensitivity diarrhoea. This hypersensitivity reaction following an extended worm-free period is somewhat analogous to the hygiene hypothesis in humans, in that the lack of exposure to worms results in increased hypersensitivity, allergic, and inflammatory diseases. This hypersensitivity diarrhoea in sheep leads to the development of dags, and dagginess in sheep is highly related to the development of fly strike.

Aims and Significance

The Aim of this project is to test the hypothesis that a continuous exposure to worm antigen will prevent the development of hypersensitivity diarrhoea in sheep following infection after an extended worm-free period. If continuous exposure to worm antigen can prevent the development of hypersensitivity diarrhoea, this strategy could be applied to preventing the development of hypersensitivity diarrhoea in the field following sudden exposure to worms in the autumn and winter and thus significantly reduce the development of dag and fly strike.

Techniques to be used

Sheep previously infected with nematode parasites will be treated with an anthelmintic and placed in individual pens to prevent them from reacquiring infectious 3rd stage larvae (L3s). During the experiment, half the sheep will be continuously exposed to parasite antigens by oral administration of killed and macerated L3s. All sheep will then be challenged with infectious L3s and monitored for the development of hypersensitivity and scours. Changes in haematology (differential cell counts, haematocrit, Hb, immunoglobulins), faecal consistency, wool production, growth rate, and fecal egg counts will be monitored. A subset of sheep in each group will be killed to allow gut sections to be taken for histology.