

Towards a commercial vaccine for wireworm: efficacy studies with Dorpersheep in South Africa.

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Applications have been submitted to the South African regulatory authorities seeking authorisation to launch a novel vaccine to control *Haemonchus contortus*. This vaccine was registered in Australia in October 2014.

Wirevax[®] will provide farmers with a completely novel way to control Wireworm. The vaccine can be integrated with anthelmintics and other interventions for preventing gastroenteritis caused by other nematode genera. It can also be used with *Clostridial* vaccines and other commonly used sheep remedies.

It is considered highly unlikely that worms resistant to the vaccine will emerge. Therefore the vaccine should offer a more sustainable method for controlling *Haemonchus* than existing methods based on anthelmintic drugs.

Wirevax[®] is made at the Department of Agriculture and Food laboratory in Albany, Western Australia. Vaccine antigens are purified from adult *Haemonchus* obtained from deliberately infected donor sheep. The antigens are formulated with adjuvant and bottled. The complete manufacturing process has a Good Manufacturing Practice licence.

Wirevax is a killed vaccine with a refrigerated shelf life of at least two years. It provokes little reaction in the host and can be given safely to heavily pregnant ewes or to month old lambs.

The vaccine is easy to use, each dose being a one ml subcutaneous injection irrespective of the weight of the sheep. However, repeated vaccination is needed to maintain protective immunity.

The efficacy trial conducted in South Africa undertaken for registration purposes, rendered promising results comparable to studies done in other countries. After three vaccinations, given three weeks apart, Wirevax[®] stimulated a strong circulating antibody response. The immune response was associated with reductions in faecal egg counts and worm burdens in vaccinated sheep when compared to unvaccinated control sheep. After the third vaccination, the efficacy of the vaccine was 86.93% and

faecal egg counts were reduced by 95.59%. Thirty days after the last vaccination, the efficacy of the vaccine was 80.66% and faecal egg counts were reduced by 80.6%. It can be concluded that three vaccinations given at three-week intervals will aid in the control of *H.contortus* infections in sheep and will prevent new infections for a period of 30 days.

When Australian field trial protection data was modelled, simulations of vaccinated lambs grazing alone with historical weather data over 20 years, indicated that the vaccine offered better *Haemonchus* control than a “best practice” anthelmintic regime consisting of 5 short acting drenches over the high risk period.