Test heartwater attenuated Welgevonden stock vaccine in cattle

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Testing of various formulations of an attenuated heartwater vaccine in Friesian cattle

Industry Sector: Cattle and Small Stock

Research Focus Area: Animal Health and Welfare

Year of completion: 2015

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The Research Team

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EXECUTIVE SUMMARY

Ehrlichia ruminantium is the causative agent of heartwater and it is transmitted to ruminants by the *Amblyomma hebraeum* tick. An experimental cell-derived attenuated *E. ruminantium* (Welgevonden) vaccine was developed at ARC-OVI. This attenuated Welgevonden does not cause heartwater in sheep and goats but induces complete protection when administered either intravenously (IV) or intramuscularly (IM) (subcutaneous route was less effective) against a lethal needle challenge dose with the homologous stock. Previously a preliminary experiment indicated that when the attenuated Welgevonden vaccine was tested in Friesian cattle with the IV route only one animal required treatment after challenge with the Gardel stock. Further optimisation of the attenuated vaccine regarding dose, route and challenge was thus required for use in cattle. This project showed that a dose of 1x10e6 CFU/2ml of the attenuated vaccine via the IM route can induced 100 % protection when administered to cattle (n=5) challenged with ten ticks infected with the Welgevonden strain. Accurate, reproducible and immediate determination of the attenuated vaccine dose after thawing and before administration is however required before this vaccine can be taken to the next level.

Project Aims

1. To formulate an effective attenuated heartwater vaccine for cattle which is easy to administer

2. To determine the optimum dose and route of attenuated Welgevonden vaccine in Holstein cattle
3. To determine duration of immunity
4. To field challenge the immunized cattle in a heartwater endemic region.

Please contact the Primary Researcher if you need a copy of the comprehensive report of this project at: steynh@arc.agric.za