Abstract Title
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Marker Vaccine Potential of a Partial VP1 Deleted Foot-and-Mouth Disease Virus

Abstract:

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- Your abstract must use Arial 10 font.
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**Background:** Recent research has provided some evidence that the highly immunogenic region of foot-and-mouth disease virus (FMDV), known as the VP1 G-H loop, may have some redundancy. This is an important finding and prompted further investigation using a naturally selected FMD vaccine virus, A Iran 87, lacking a large proportion of the VP1 G-H loop. Preliminary laboratory analysis with this deleted G-H loop antigen revealed it to be potentially valuable as a marker of vaccination since animals immunised with it could be readily discriminated from animals which had generated an antibody response to the VP1 G-H loop, such as those animals that become infected naturally.

**Aim:** To see whether a vaccine lacking a portion of the VP1 G-H loop could protect cattle against homologous virus challenge.

**Methods:** Two groups of 5 cattle were vaccinated one with FMDV A Iran 87 with the G-H loop (A+) and the other with FMDV A Iran 87 without the G-H loop (A−) and both groups were challenged with virulent FMDV A Iran 87 with the loop (A+). Two cattle were used as unvaccinated controls.

**Results:** Vaccines prepared from A+ and A− protected cattle against virulent A+ whereas a control group of unvaccinated cattle developed foot lesions of FMD. The feet of all the cattle vaccinated with A− never showed any clinical lesions confirming that the vaccine had prevented generalisation of disease. Serological and virological tests verified these clinical findings.

**Conclusions:** These results support our previous findings, that despite its obvious immunogenicity, the VP1 G-H loop is not as important for protection in cattle as had previously been considered.

A companion DIVA test has been developed and when used in conjunction with this loop deleted vaccine provides the possibility to determine the vaccination and disease status of individual animals. Further studies are envisaged to examine the level of attenuation conferred by such constructs and the broadness of cross-specificity compared to the same virus with the loop.

Such loop deleted seed virus can be developed using in vitro molecular technologies from vaccine and field strains of all FMD serotypes enabling better management and control of FMD in both the disease free and endemic situation.