Evaluation of the immunogenicity and protective efficacy of an experimental *Streptococcus suis* autogenous vaccine formulated with six different adjuvants

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Background

- *Streptococcus suis* is a swine pathogen responsible for economic losses to the swine industry worldwide. The use of autogenous vaccines (bacterins) to control *S. suis* outbreaks is a frequent preventive measure in the field, although scientific data on efficacy, immunogenicity, and reduction in mortality and morbidity are scarce.
- Autogenous vaccines are prepared with different *S. suis* serotypes, adjuvants, and formulations which further complicates the evaluation of not only their efficacy in the field but also their cost-benefit for producers.
- The goal of our study is to experimentally evaluate the immunogenicity and protective efficacy in weaned piglets of a *S. suis* serotype 2 autogenous bacterin vaccine formulated with one of six different adjuvants.

Results and discussion

Survival rate

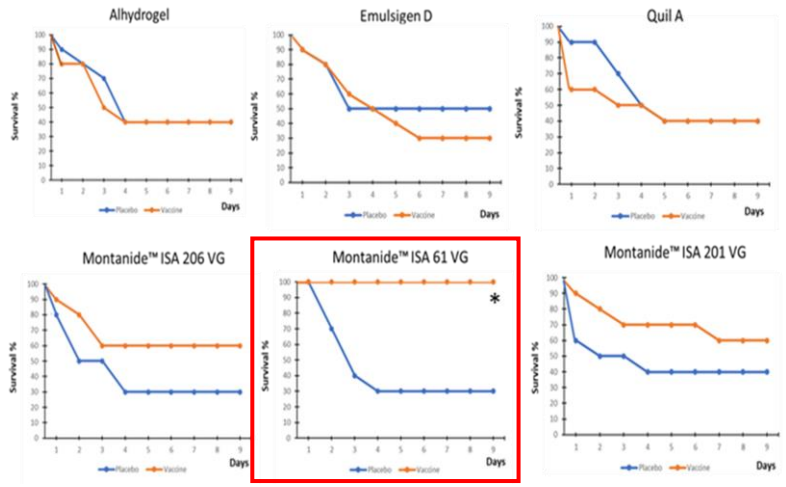


Fig 1. Kaplan-Meier survival rate diagrams of piglets vaccinated with autogenous bacterin formulated with Alhydrogel , Emulsigen D , Quil A , Montanide™ ISA 206 VG , Montanide™ ISA 61 VG , or Montanide™ ISA 201 VG. Each vaccine formulation group of piglets (red line, n=10) had a corresponding placebo group of piglets (blue line, n=10) challenged at the same time. *, p < 0.05.

Clinical scores

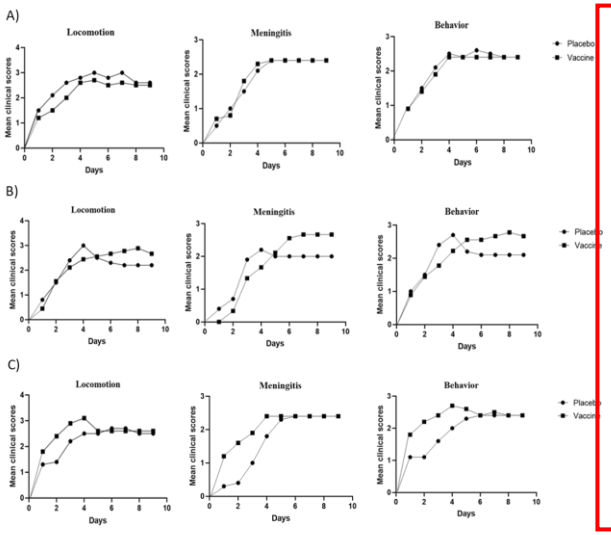


Fig.2. Kaplan-Meier diagrams of mean clinical scores of piglets vaccinated with autogenous bacterin formulated with Alhydrogel (A), Emulsigen D (B), and Quil A (C). There is no difference in mean clinical scores between vaccinated and placebo piglets in these three autogenous vaccine formulations.

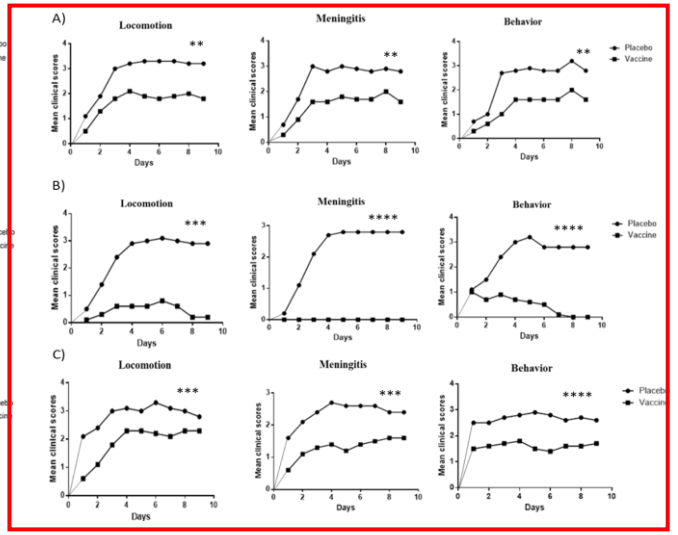


Fig.3. Kaplan-Meier diagram of mean clinical scores of piglets vaccinated with autogenous vaccine formulated with Montanide™ ISA 206 VG (A), Montanide™ ISA 61 VG (B), and Montanide™ ISA 201 VG (C). **, P<0.01; ***p<0.001; ****, p<0.0001.

Total IgM + IgG levels after two doses of vaccine

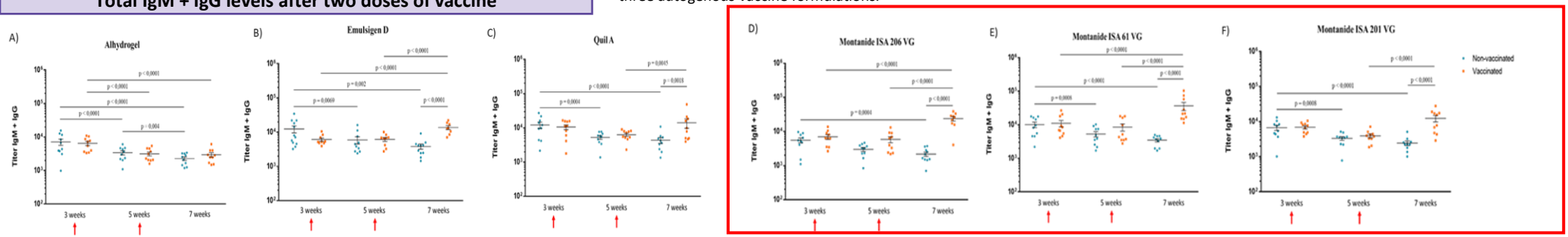


Fig.4. Total Ig (IgM+IgG) levels against *S. suis* serotype 2 in weaned piglets determined by ELISA. Piglets were vaccinated with 1 ml vaccine (red square) and corresponding placebo (blue square) Alhydrogel (A); Emulsigen D (B); Quil A (C); Montanide™ ISA 2016 VG (D); Montanide™ ISA 61 VG (E); and Montanide™ ISA 201 VG (F). Antibody titers for individual piglets are shown with horizontal bars representing mean ± SEM. Values significantly different are shown in the graph with the corresponding p-value.

Conclusions

- There was a significant effect of the type of adjuvant on immunogenicity and protective efficacy of the experimental autogenous vaccine (bacterin) used.
- Our experimental results indicate that an autogenous bacterin formulated with Montanide™ ISA 61 VG provides the highest immunogenicity and protection of vaccinated piglets against a homologous challenge.

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