

7. Summary

Development and immunologic assay of a recombinant vaccine strain of *Salmonella enterica enterica*, Serovar Typhimurium, with the expression of *Eimeria tenella* antigens

The current study discusses the development of recombinant *Salmonella typhimurium* constructs with the expression of heterologous *Eimeria tenella* antigens. The vaccine *Zoosaloral H* was used as *Salmonella typhimurium* strain. The *Salmonella* vaccine candidates TA4, 3Etmic und SO7 were serologically investigated in animal experiments. Two differing vaccination strategies were assessed in two animal experiments. Application intervals and types of presentation varied. In the animal experiment "Budapest", one of the recombinant *Salmonella* vaccine candidates was orally administered. In the experiment "Stuttgart", purified, recombinant antigen together with CFA was subcutaneously administered, and also a combination of both applications was investigated. Finally, the immune response of the animals was assessed by investigations of the isolated sera and bile. The (IgA and IgG) antibody response against *Eimeriae* was determined with a specially developed ELISA. In addition, the antibody response of the animals against the *Salmonella* antigen LPS was determined.

The following results were obtained:

- The specific *Eimeria* antigens TA4, 3Etmic, and SO7 were expressed by the respective developed *Salmonella* vaccine candidates. The expression of the recombinant *Eimeria* antigens was demonstrated with SDS-PAGE and Western blotting.
- For the "Stuttgart" experiment, the recombinant *Escherichea coli* constructs were purified under denaturing conditions to isolate the recombinant *Eimeria* proteins TA4, 3Etmic and SO7.
- For the investigation of the immune response (IgG) against the specific *Eimeria* antigens in the sera of the "Stuttgart", higher absorption values were obtained from the groups treated subcutaneously with purified, recombinant antigens and treated subcutaneously and orally at the same time than from the control groups. The absorption values of the sera of the orally treated group were within the control groups range.
- No positive results were obtained in the "Stuttgart" experiment in the investigation of bile for the presence of immunoglobulin A against *Eimeria*-specific antigens and

in the investigation of sera and bile for the presence of immunoglobulin G against the *Salmonella* antigen LPS.

- The investigation of sera and bile in the "Budapest" experiment for the presence of immunoglobulin G and A against *Eimeria*-specific antigens gave no positive results. However, positive results were obtained in sera and bile for immunoglobulins G and A against the *Salmonella* antigen LPS.

The study succeeded in inducing an immune response against the recombinant *Eimeria* antigens in the experimental animals. Further studies need to be performed to find out to what extent the developed vaccine candidates will protect the animals against *Eimeria* infections.