Ante mortem comparative evaluation of different ELISA systems for diagnosis of porcine *Salmonella* Infantis infection.

Roesler, U.*, Matthies, C., and Truyen, U.

Institute of Animal Hygiene and Veterinary Public Health, An den Tierkliniken 1, 04103 Leipzig, Germany
corresponding author: roesler@vetmed.uni-leipzig.de

Introduction

Salmonellosis is one of the most important enteric infections in man and in livestock. Various serotypes of *Salmonella enterica* can cause a variety of clinical and subclinical infections, which are mainly self-limiting gastroenteritis or systemic diseases. Beside *Salmonella* (*S.*) Typhimurium, *S.* Derby and *S.* Infantis are the most important cause of porcine *Salmonella* infections. Although pigs usually do not develop clinical salmonellosis, they become carriers and shedders resulting in a substantial disease-causing potential for humans via meat and faeces.
Salmonella infections can be directly diagnosed in the piggery or at the slaughterhouse by isolating salmonellae with various established cultural methods or by serodiagnosis using lipopolysaccharide (LPS)-based ELISA-systems or a whole-cell-lysate based standard ELISA test. These serological results are used to classify pig herds in one of three categories. Category 3 has the highest prevalence of *Salmonella* infection, defined as at least 40 percent of the pigs examined being seropositive. Cateory 2 herds have a moderate number of antibody-positive pigs, whereas, herds of category 1 have no or only a low prevalence of antibody-positive pigs.

Material and Methods

The object of this study was the comparative evaluation of four indirect *Salmonella* ELISA tests approved in Germany to detect *Salmonella* Infantis infection of pig. Three tests are based on a LPS-antigen mix and directed against specific IgG antibodies. The fourth test is based on a purified *S.* Typhimurium whole-cell-lysate antigen and discriminates between *Salmonella* specific IgM-, IgA-, and IgG- antibodies. In a longitudinal study sixteen 6 weeks old hybrid piglets were orally infected with *Salmonella* Infantis. During an observation period of 120d clinical and bacteriological parameters were weekly monitored and serum samples were in parallel investigated by the respective ELISAs.

Results and discussion

During the comparing evaluation (sensitivities) of the four ELISA tests it became obvious that the tested LPS-based ELISA systems failed to detect *S.* Infantis infected pigs (which shed the pathogen in high amounts throughout the study) until day 80 after infection. The isotype specific *Salmonella* whole-cell-lysate based ELISA showed the best results in detection of *S.* Infantis infected pigs. Furthermore, it became obviously that the often used cutoff value of 40 OD% is not suitable for *intra vitam* detection of *S.* Infantis infected pigs. In contrast, the cutoff values given by the suppliers of the ELISAs would result in a eminent higher detection rate.
Our findings indicate that the most of the currently used ELISA systems have diagnostic uncertainties in detection of porcine *S.* Infantis infection when combined with the cutoff of 40 OD%. Therefore, future *intra vitam Salmonella* control measures should use the cutoff of 20 OD% or alternatively use a protein based ELISA system like the isotype specific *Salmonella* whole-cell-lysate based ELISA used in this study.