Prevalence & risk factors of *Brachyspira* spp. in European pig herds with a history of diarrhea

M. Arnold^a, A. Crienen^b, H. Swam^b, G. Schüpbach-Regula^c, S. v. Berg^d, H. Nathues^a

^A Clinic for Swine, Department of Clinical Veterinary Medicine, Vetsuisse Faculty, University of Bern, Switzerland; ^b Center for Diagnostic Solutions, MSD AH Boxmeer, Boxmeer, The Netherlands; ^c Veterinary Public Health Institute, Vetsuisse Faculty, University of Bern, Bern, Switzerland; ^d MSD Animal Health, Munich, Germany

Objectives

Brachyspira (B.) hyodysenteriae and B. pilosicoli are pathogens known to be related with diarrhea in growing and fattening pigs worldwide. Thus, a disease outbreak can lead to economic losses and reduced animal welfare, which is why the pathogens are of worldwide importance and interest [1]. To provide an overview of the current European situation, this study determined the prevalence of both pathogens in six European countries and identified associated risk factors.

Material & Methods

Conclusions



Universität Bern Universität Zürich

vetsuisse-fakultät

- Fecal samples of 6355 nursery to finishing pigs were sampled in 2017/2018 in six European countries, namely:
 - Denmark, France, Germany, the Netherlands, Spain & United Kingdom
- Samples were taken from 24 herds per country.
- Herd inclusion criteria:
 - Clinical signs of diarrhea within twelve months prior to sampling
 - Closed production system like farrow-to-finish herd, or nursery-/fattening- herd, receiving all their animals from one single origin
 - No antimicrobial treatment up to four weeks prior to sampling
- A questionnaire on herd data and last occurrence of diarrhea was filled in each herd.
- Fecal samples were analyzed using a polymerase chain reaction. Questionnaires were evaluated and risk factors identified using a multivariable model.

- Significant difference in *B. hyodysenteriae* & *B. pilosicoli* prevalence between European countries.
- Comparatively high prevalence for both pathogens were found in United Kingdom and Denmark.
- Such differences should be considered in animal trade between European countries and the probability of disease.
- Known risk factors could be confirmed and supplemented by new ones.

Figure 1: Prevalence of *B.hyodysenteriae*

Figure 2: Prevalence of *B. pilosicoli*

- Color of a country: Indicates the respective herd prevalence for each pathogen per country.
- Proportion of pigs in red within a country: Indicates the respective within- herd prevalence for each pathogen per country. One pig completely red= 10 %.



Results

Prevalence of *B. hyodysenteriae:*

- Overall, 21.5 % of all herds and 13.0 % of animals in these herds were *B. hyodysenteriae* positive.
- With a herd- and within-herd prevalence of 45.8 % and 15.4 % respectively, significantly more herds (p<0.02) and more samples (p<0.01) were *B. hyodysenteriae* positive in United Kingdom than in France (herd prevalence of 4.2 %, within-herd prevalence of 2.2 %) (Figure 1).
- Overall, 58.7 % of *B.hyodysenteriae* positive samples, were simultaneously positive for *B. pilosicoli*. In Denmark, this was the case for 95.9 % of *B.hyodysenteriae* positive samples.

Prevalence of *B. pilosicoli*:

- Overall, 28.5 % of all herds and 37.2 % of animals in these herds were *B. pilosicoli* positive.
- B. pilosicoli was significantly more often detected in Danish herds compared to all other countries excluding United Kingdom (p<0.001). It was also significantly more often detected in Danish samples compared to all other countries (p<0.001).
- Overall, nursery pigs were significantly less often positive for one of the pathogens than growing or finishing pigs (p<0.001).
- Risk- and protective factors associated with *Brachyspira* spp.
- More than 30 nursery pigs per pen was a risk factors for both pathogens associated with a higher number of animals positive/ herd (p<0.03).



Herd prevalence: 10 20 30 40 50 60 70 80 90 100 %



- Weaning age of more than 26 days was associated with more *B. pilosicoli* positive nursery-, growing-, finishing- pigs and overall positive pigs (p< 0.04).
- Deworming of growing or finishing pigs on the other hand was associated with less positive animals per age category or overall, likewise for both pathogens (p<0.05).
- Slatted floor of more than 78.0 % in nursery units was associated with less *B. pilosicoli* positive nursery-,
 finishing pigs and overall positive pigs.

References

[1] Hampson, D.J., Burrough, E.R., Zimmermann, J., Karriker, L., Ramirez, A., Schwartz, K., Stevenson, G., Zhang, J., 2019. Swine Dysentery and Brachyspiral Colitis, in: Diseases of Swine 11th Edtion. pp. 951–970.

Funding This work was funded by MSD Animal Health Dr. med. vet. Mirjam Arnold
Dipl. ECPHM
Clinic for Swine,
Vetsuisse Faculty
University of Bern, Switzerland
mirjam.arnold@vetsuisse.unibe.ch



Clinic for Swine Vetsuisse-Faculty, University of Bern Bremgartenstrasse 109 a, CH-3012 Bern http://www.schweineklinik.unibe.ch

your competence center for livestock health



accredited training center of the ECPHN



