AN ANALYSIS OF POTENTIAL RISK FACTORS FOR PORCINE COLONIC SPIROCHAETAL DISEASES

Corona BE[1*], Chase-Topping M[2], Strachan D[3], Edwards SA[4], Smith WJ[3], Gunn G[3], Smith DGE[1] and Thomson JR[3].
[1]Zoonotic and Animal Pathogens-University of Edinburgh, Scotland, UK [2]CTVM-University of Edinburgh, Easter Bush, Midlothian, Scotland, UK, [3]Scottish Agricultural College-Veterinary Science Division, Scotland, UK, [4]Department of Agriculture, University of Newcastle, Newcastle, UK

Introduction. Epidemiological studies have found factors associated with high incidence of enteric diseases such as swine dysentery (SD) and proliferative enteropathy (PE) (4,5,6). Carrier pigs present high risk of introducing SD into herds (1) and mixed pathogen infections commonly occur (3,7). The aim of this study was to determine risk factors for porcine colonic spirochaetosis (PCS) and swine dysentery (SD) by analysing epidemiological data from two case-control studies.

Material and Methods. Study 1 included 44 farms with *Brachyspira pilosicoli* infection and 44 control farms. Study 2 included 20 farms with PCS or SD and 27 control farms. Data collection included the variables: disease history, type of herd, herd size, source of pigs, origin of breeding replacements, type of feed, nutrition, flooring type, production system, hygiene, and general management. In study 2, diagnostic investigations for enteropathogens per farm included postmortem examinations on 3 grower pigs with diarrhoea and laboratory testing of faecal samples from 9 in-contact pigs. Univariate analyses of the categorical variables were analysed by odds ratios using χ^2 or Fishers exact test. A multivariable analysis by logistic regression was performed on SAS statistical computer package (version 8.0).

Results and Discussion. Where possible, variables for both studies were merged. Risk factors associated with PCS/SD are shown in Table 1. Variables of main significance were source of gilt replacement stock from one particular company, a history of *S.suis II* in the herd, and the use of solid-floored pens with bedding. Risk factors approaching significance were a history of other infectious disease agents present on the farm (PRRS virus and/or *Actinobacillus pleuropneumoniae*), poor hygiene, and natural ventilation (as compared with fan ventilation). The strong positive association with solid floored bedded pens ($p<0.007$) is of interest in relation to current welfare trends and the recent EU directive advocating bedded systems and provision of manipulable materials. Maintaining pigs free from PCS and SD is of increasing importance in the light of disease free herds. A significant association with bowl and trough drinkers (as compared to nipple drinkers) is not surprising considering the extent of faecal contamination that could occur in poorly designed troughs. Our findings on floor and drinker types are in contrast to a previous study on PE (6). Interestingly, factors such as all-in, all-out movements, cleaning and disinfecting pens between batches did not emerge as significant in this study. However, investigators could not verify the farmer's answers so whether or not these practices were truly carried out remains uncertain. The results of a previous study (4) indicating that cleaning and disinfecting pens are protective for colitis could be more relevant. It was performed before the severe economic downturn in the UK pig industry, when staffing levels on farms were more optimal. Although restricted feeding has been used to control

post-weaning diarrhoea in Sweden (2), this is counter-productive to the aim of maximising growth rates and production efficiency. Feed-associated non-specific colitis could have predisposed to infectious colitis on our farms and further investigation of this factor would be warranted. Co-infections with other enteropathogens were identified as *B. pilosicoli* was found as single pathogen in 20.0 % of IC farms and in 40.0 % in mixed infection, and *B. pilosicoli* and *L. intracellularis* plus other pathogen in 25.0 %. *B. hyodysenteriae* as single pathogen in 5.0 %, and in 35.0 % in mixed infections of IC farms. *B. hyodysenteriae* and *L. intracellularis* plus other pathogens in 20.0 %, as in agreement with previous studies (3,7).

In conclusion, several risk factors for porcine colonic spirochaetal diseases have been identified in this study. However, the power of the study was limited by the wide variations in housing and other management-related factors, which reduced the numbers within individual categories.

Table 1. Risk factors identified to be associated with porcine colonic spirochaetal diseases

Variables	Significance level*
gilt source (company A)†, solid floors (study 2)	P (<0.05)
A. pleuropneumoniae, PRRS, *Streptococcus suis II* †, , ventilation (natural)	P (<0.10)
Respiratory diseases, dirty pens, drinker (open), solid floors (study 1)	P (<0.25)
fully slatted floors, type of feeder (hopper)	protective factors p (<0.05)*

*Fisher's exact test; † significant in multivariate logistic regression (p<0.05)

References

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