



Diagnostic of post-weaning diarrhoea on the farm level

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Introduction

Post-weaning diarrhoea (PWD) is a multi-factorial disease. Clinical symptoms are often linked to a combination of different factors such as specific pathogens, low feed intake after weaning, low hygiene, low age at weaning, low piglet live weight at weaning, and a high number of piglets per pen (Madec et al., 1998). Although organically reared piglets are, in general, six weeks of age at weaning, and are kept with a high space allowance, post-weaning diarrhoea is a severe problem in organic pig production (Bonde & Sørensen, 2006; Sundrum et al., 2010). Due to restrictions in the use of antibiotics in organic livestock production, there is a need to focus primarily on the implementation of preventive measures. When health problems are recognised, it is of high importance to make an accurate diagnosis and identify the farm-specific causes. The objective of this study was to identify the presence of pathogens and enterotoxins in weaners with PWD in comparison to clinical healthy weaners within the same group.

Materials and Methods

Case studies were performed on six organic sow herds in Germany, affected with PWD problems. Clinical examinations and data on Critical Control Points (CCPs) regarding performance data, hygiene management, feeding regime, and medicine usage were assessed on the farms. Piglets were housed in stables with outdoor runs. Weaning age averaged 44.8 days. To assess the bacteriological infection status, faecal swabs were taken per rectum from five clinical healthy and five piglets suffering from postweaning diarrhoea on each farm, respectively. Faecal samples were bacteriologically examined for the content of non-haemolytic and haemolytic *E. coli* which were subsequently tested for the presence of virulence genes for heat-labile (LT) and heat-stable (STa and STb) enterotoxins, Stx toxins and fimbriae using a multiplex polymerase chain reaction (PCR) (Casey & Bosworth, 2009).

Results

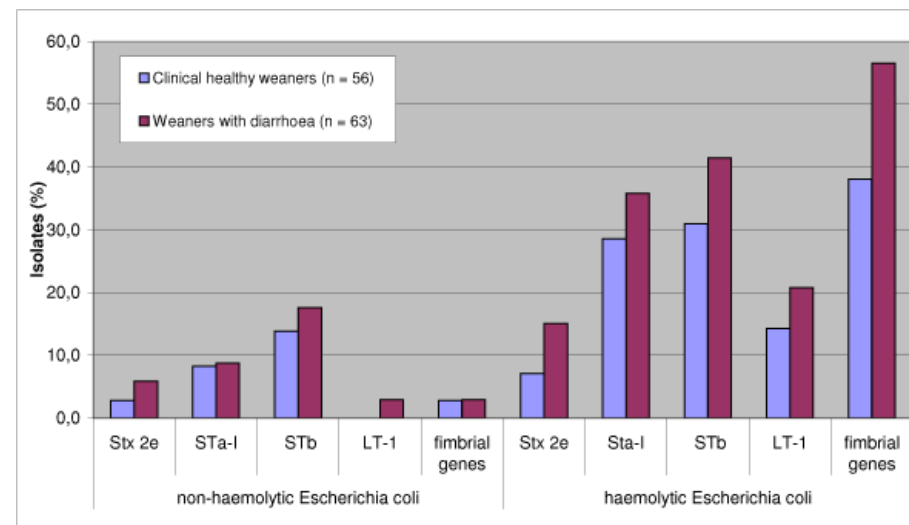
Concerning the CCPs, all farms showed more or less severe deficits in the hygiene management and in the nutrient regime, although varying in their details considerably between the farms.

Table 1: Presence of *Escherichia coli* in faecal samples from weaners in relation to their health status

Bacteria	Clinical healthy weaners (n = 56)		Weaners with diarrhoea (n = 63)	
	Number affected	%	Number affected	%
non-haemolytic <i>Escherichia coli</i>	36	64.3	34	54.0
haemolytic <i>Escherichia coli</i>	42	75.0	53	84.1

Laboratory analyses provided proof for the presence of different strains of *E. coli* (Tab. 1) and their associated enterotoxins. Non-haemolytic and haemolytic *Escherichia coli* were detected to a high degree in weaners with diarrhoea and clinical healthy weaners within the same group (Fig. 1). There was, however, no significant difference between healthy and diseased piglets neither in relation to the presence of pathogens nor in relation to the associated enterotoxins ($p > 0.05$), whereas the toxin pattern (LT = heat-labile; ST = heat-stable) differed markedly between the farms.

Figure 1: Distribution of virulence genes from non-haemolytic and haemolytic *Escherichia coli* strains depending on health status of weaners



Conclusions

Identification of pathogens and their virulence genes provides only little diagnostic information when striving for appropriate preventive measures. Investigations should be directed in the first place towards the impact of hygiene management and feeding regime on piglet susceptibility to GIT disorders and enteric infections. The development of adequate diagnostic tools to be used on the farm level should be enforced to enable appropriate and promptly counteractive measures.

[References and Acknowledgement](#)