An update of the prevalence of Postweaning diarrhea caused by *Escherichia coli* in Spain

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Introduction and Objectives

Post-weaning diarrhea (PWD) is a multifactorial disease that is becoming increasingly important for the animal health [1] . Since the ban of the use of zinc oxide in the EU in weaned piglet feed and the regulation of the responsible use of antibiotics, the disease is ever more difficult to control [2] . This study aimed to show the most prevalent *Escherichia coli (E. coli)* virulence factors that are contributing to the postweaning diarrhea.

Material and Methods

A total of 733 Spanish pig farms with acute cases of PWD were sampled between 2020 and 2023. Animals were selected based on PWD clinical signs. An average of three rectal swabs were collected from three different pigs on each farm from four- to eight-weekold pigs within the first 24 hours of the acute phase of the disease. Swabs with fecal matter were submitted to the laboratory (Exopol; Zaragoza, Spain) for diagnosis. PCR was performed to detect adhesion factor and toxin genes, including F4 (K88), F18, F41, F5 and F6 fimbriae, adhesin involved in diffuse adherence (AIDA-1), heat-stable and heat-labile enterotoxins (STa, STb, LT), shigatoxin (STx2e), enteroaggregative heat-stable toxin (EAST-1) and, E. coli attaching and effacing (eae). Rotavirus A and Epidemic diarrhea (PEDv) were analyzed as viruses due to the importance for the nursery period.

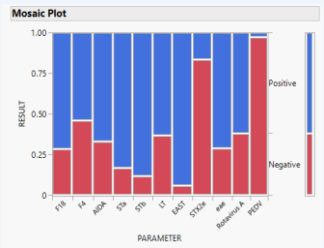
Results

Only 0.68% (5 out of 733) of farms were negative for all the E.coli's virulence factor genes. F18 gene was the most found (71.3%) followed by AIDA-1 (66.7%) and F4 (53.8%). The most prevalent toxin was EAST-1 (94.0%) followed by STb (88.1%) and STa (83.2%). Rotavirus type A was found in 61.9% of the PWD cases and PEDV in 2.8%.

Table 1. Total prevalence (%) of genes for adhesion factors and toxins of *E.coli* among 733 farms with PWD cases between 2010 and 2023.

PATHOGEN	VIRULENCE FACTOR								
	Adhesion factor			Toxins					
Percentage of *Escherichia coli*'s virulence factors	F4	F18	AIDA	Sta	Stb	LT	Stx2e	EAST-1	eae
	53.8	71.3	66.7	83.2	88.1	63.0	16.4	94.0	70.9
Percentage of Rotavirus A	61.9								
Percentage of PEDv	2.8								

Graphic 1. Contingency analysis of genes for adhesion factors and toxins of *E.coli*, Rotavirus A and PEDv.



Discussion and conclusion

The present study shows F18 *E. coli* as the main fimbria involved in postweaning diarrhea. There is a high degree of variability in the *E. coli* virulence factors within country as well as differences between countries [3,4,5]. It is necessary to conduct a rigorous diagnosis in order to characterize the *E.coli's* virulence factors and find the most appropriate solution in each PWD case, since it is described that an outbreak of F18 *E. coli* persists in nursery pigs despite antibiotic treatment in 58% of the herds studied [6].

References
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