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The standard and the better answer to *E. coli* management in sows

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Key conclusions

- ✓ ***E. coli*** **can be a serious challenge for piglet health**
- ✓ **Conventional coping strategies with antibiotics (colistin, doxycycline, enrofloxacin) could not solve the issue in a farm in Italy.**
- ✓ **A preventative approach with Aleta, Formyl and water acidification minimised the need for antibiotics.**

Introduction

E. coli in piglets

In piglets, like in humans, *E. coli* are part of the natural, healthy intestinal microbiome; some are even probiotics. However, *E. coli* are also well described as pathogens leading to diarrhoea and in extreme cases death. The present study was undertaken in a farm experiencing a severe outbreak, leading to heterogenous litters and early mortality. After a conventional solution showed poor results, an alternative solution in feed was tested on the farm

Piglet trials

The Farm

A farm in Italy with 150 sows managed in bi-weekly groups. The crossbreed sows (Large White x Landrace) typically wean 27.5 piglet per year. Piglets are weaned at 28 days and left one additional week in the farrowing room thereafter. Piglets are fed a prestarter from 10 to 28 days of age, starter 1 from 28 days to 12 kg body weight, starter 2 from 12 to 25 kg BW.

The situation

E. coli K88 outbreak in May in piglets between weaning and 15kg bodyweight.

High mortality death within hours, poor homogeneity of litters

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The conventional approach (frequent in-feed and water antibiotics)

From May to December the farm chose the conventional methods of managing *E. coli* in the piglets. Frequent treatments with colistin/doxycycline in feed or colistin in drinking water were applied. Additional parenteral treatments with enrofloxacin were also administered as needed. Despite the massive use of antibiotics (Table 1) the situation was not improved in terms of mortality or recovering the decreased performance.

The better solution (few antibiotics, organic acids, beta-(1.3)-glucans)

From the following January the farm decided to try a more preventative than reactive approach. Parenteral treatments to whole pens with enrofloxacin were continued as needed, but addition of antibiotics in feed and water were completely suspended. The piglet feed was reformulated to contain an intestinal acidifier (Formyl™) at 4 kg/t and β-(1,3)-glucan to help support the developing immune system (Aleta™) at 0.2 kg/t. Additionally a blend of organic acids was added to the drinking water. Drinking water pH was adjusted to a pH of 3.5 to 3.7; which was measured twice daily, and the acids were adjusted accordingly via a Dosatron.

Results

The numericaly results were very clear (Table 1).

Table 1: Direct comparison of the conventional and alternate *E. coli* management

	May to December	Following year January to May
Number of piglets	1.517	822
Initial age (days)	37.38	34.00
Final age (days)	78.38	72.46
Initial bodyweight (kg)	8.50	8.00
Trial period in days per piglet group (d)	41	38.5
Final bodyweight (kg)	29.96	31.36
ADG (g)	0.52	0.61
Mortality, %	11.40	6.69
AB/kg BWG*, mg	266.96	8.17

*: antibiotics administered (parenteral, feed and drinking water), mg per kg of body weight gain

Conclusions

The severe E. coli outbreak occurred and the extensive use of antibiotics (267mg AB per kg/BWG), was not able to alleviate symptoms or to decrease mortality. Even in the surviving piglets' performances were affected, impacting body weight gain.

Gastro-intestinal microflora modulation (Formyl, water acidification) and immune system support (Aleta), combined with shrewd use of antibiotics (parenteral administration), succeed to reduce mortality rates and to restore body weight gain. Consequently, the amount of antibiotic administered to the animals could be greatly reduced (8mg AB per kg/BWG). Moreover, this strategy can help maintain the efficacy of the antibiotic itself, reducing the threat of antibiotic resistance.

Additional Information

Prior to the first antibiotic applications antibiograms, an overall profile of antimicrobial susceptibility testing results of a specific microorganism (*E. coli*) to a range of antimicrobial drugs, were advised.All antibiograms showed overall good sensitivity to the commonly used antibiotics (e.g. table 2):

Table 2: Example Antibiogram:

Sample: 1	Description of Antibiotic		Result
	Aminosidin	(AN)	sensitive
	Amoxicillin and clavulanic acid	(AMC 30)	sensitive
	Ampicillin	(AMP10)	sensitive
	Apramicin	(APR 30)	sensitive
	Cefquinome	(CEQ10)	sensitive
	Enrofloxacin	(ENR5)	sensitive
	Florfenicol	(FFC)	sensitive
	Flumequine	(UB80)	sensitive
	Gentamicin	(CN10)	sensitive
	Kanamycin	(K30)	sensitive
	Neomycin	(N30)	intermediate
	Spectinomycin	(SH100)	sensitive
	Trimethoprim-sulfamethoxazole	(SXT25)	sensitive

As reported by field veterinarians previously, a good antibiogram showing little or no resistance to the common antibiotics is no guarantee for success in treatment by feed or water. The present example is a clear proof that the symptoms, apparently caused by *E. coli*, are very often complicated by other more complex causes. Alternative preventation strategies are less susceptible to hidden antibiotic resistance, and can even potentially restore suceptability in resistant microorganisms.

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