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Clinical efficacy of a sow rotavirus vaccine on piglet neonatal diarrhoea

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Background and objectives

In France, Rotavirus type A (RVA) is identified in approximately 50% of neonatal diarrhoea cases (1), and the presence of this pathogen is correlated to clinical signs (2, 3); until now, prevention only dealt with risk factors and coinfections management. The objective of this study was to assess efficacy of a new sow vaccine (SUIGEN® ROTA COLI, combining *E. coli* F4/F5/F6/F41 and RVA) in the prevention of piglet neonatal diarrhoea and subsequent antimicrobial use.

Materials & Methods

The study took place in a 600-sow-farrow to finish farm with a history of neonatal diarrhoea due to RVA, in spite of good biosecurity management and health status. Twenty-three pregnant sows from the same batch were randomly allocated to T or C group according to parity. Tested vaccine was administered twice at 6 and 3 weeks before farrowing in all sows of the T group. In C group, farm vaccine (combining *E. coli* F4/F5/F6 and *Clostridium perfringens* type C toxoid) was administered once at 3 weeks before farrowing on sows and twice on gilts (6 and 3 weeks before farrowing). Issued piglets were individually examined daily during the first week of life then weekly till weaning at 3 weeks (Figure 1). Fecal consistency and general health were scored (Table 1). When required, diarrhoeic piglets were individually treated orally with an amoxicillin 10% powder until diarrhea stopped (20 mg/kg/d). Amoxicillin use was calculated per litter by dividing the used amount of amoxicillin by total litter weight (mg amoxicillin per kg biomass) (4). Groups were compared by GLM statistical model.

Table 1: Clinical scores definition

Score	Fecal	General
0	Solid, well formed	Normal
1	Soft, well formed	Depressed without wasting
2	Soft, pasty, non-formed	Depressed, wasted
3	Loose, watery	Poor prognosis

Figure 1: Study design

Results

The estimated probability of diarrhoea was lower in the T than in the C group ($p < 0.005$). Most of diarrhoea cases occurred during the first week of life. The estimated probability of mortality was not different between groups (Table 2).

The mean fecal and general scores were not significantly different between groups, though they were numerically lower in the T group at peak occurring 4 to 5 days after birth (Figures 2-3).

The mean and standard error of administered amoxicillin per kg biomass were 36.6 ± 8.00 mg/kg in C group and 23.9 ± 4.05 mg/kg in T group, respectively. The means were not significantly different (though a relative decrease of 24.7% was noted in T group) but the variances were different ($p < 0.05$).

Table 2: Probabilities of diarrhoea and mortality

Group	C	T
Diarrhoea	0.808^{a}	0.669^{b}
Mortality	0.089	0.098

^{a,b}Values in the same row with different superscripts differ significantly ($p < 0.005$)

Figure 2: Mean fecal scores over time

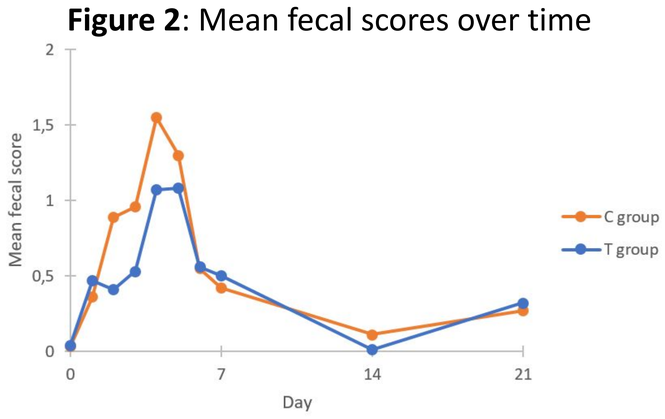
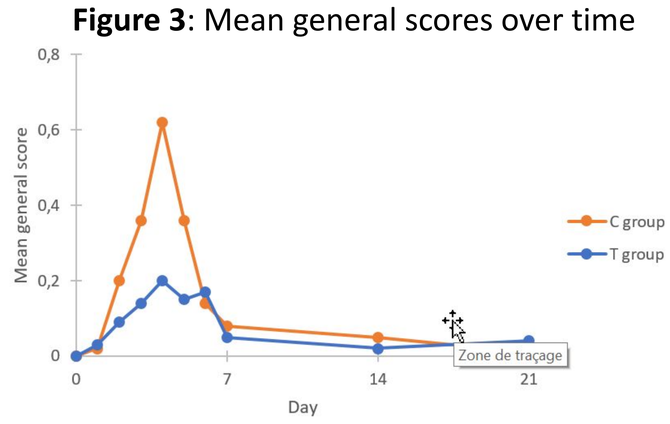


Figure 3: Mean general scores over time



Discussion and conclusion

The tested vaccine induced a significant decrease of diarrhoea incidence, though it remained high in both groups. As both groups were housed in the same farrowing rooms, pathogen may have circulated between crates, due to high infection pressure. The antimicrobial usage decrease can be linked to reduction of diarrhoea incidence and severity. Monitoring of following batches in the same farm after use of the tested vaccine confirmed that decrease (5).

References

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