Antibody response in serum and colostrum after pre-farrowing vaccination with a multivalent ETEC *E. coli* vaccine on a multiplying farm

O. Merdy[1], F. Joisel[2]
[1] Boehringer Ingelheim Animal Health, Lyon, France; [2]Consultant, France

INTRODUCTION

This study aimed to evaluate the antibody profiles in serum and colostrum in gilts vaccinated with NEOCOLIPOR®, an hexavalent *E. coli* vaccine registered for the passive immunization of piglets against neonatal enterotoxicosis.

MATERIALS AND METHODS

The study was carried out on a multiplying farm where no noticeable mortality or clinical signs due to enteric disease in neonates had been reported. The routine vaccination program in force on the farm included the immunization of breeders with another *E.coli* vaccine.
Eighty-one healthy gilts from 9 consecutive breeding batches were randomly allocated into two experimental groups: vaccinated (n = 41) and unvaccinated (n = 40). Within each farrowing batch, the same number of gilts were allocated to each experimental group (Table 1).
Vaccinated gilts were primo-immunized in their first gestation 5 and 2 weeks before farrowing and boosted 2 weeks before second farrowing.
Blood samples and colostrum samples were taken throughout the study and assayed for antibody levels by specific agglutination antibody tests against K88-F4 (F4ab, F4ac, F4ad); K99-F5; 987P-F6 and F41.

RESULTS

Fifty-three gilts were monitored until the completion of their second gestation (Table 2). Culling was mainly due to selection and was balanced between groups (Table 3).

Table 1: Number of gilts included in the study in each of the 9 consecutive batches

Farrowing batch	A	B	C	D	E	F	G	H	I	Total
Vaccinated	3	7	6	2	4	3	5	3	8	41
Unvaccinated	5	5	3	4	4	4	4	2	9	40

Table 2: Number of gilts reaching the end of the experimental period in each of the 9 consecutive batches

Farrowing batch	A	B	C	D	E	F	G	H	I	Total
Vaccinated	3	6	1	1	3	3	2	3	7	29
Unvaccinated	1	2	2	4	3	3	4	1	4	24

Table 3: Reason for exclusion before the termination of the study

Group	Abortion	Mortality or pathological problem	Selection	Total
Vaccinated	0	2	10	12
Unvaccinated	1	4	11	16

Average sera and colostrum antibody levels are shown in Table 4.
At the beginning of the study, the gilts showed low anti-K88 antibody titers contrary to the other valences.
Serum: Vaccinated gilts showed for each valence a antibody increase as early as after the first injection ($p < 0.01$) and remained higher that unvaccinated animals at first farrowing ($p < 0.01$). Following booster injection, K88-, K99- and 987P- antibody levels were higher ($p<0.01$) and a numerical difference was observed in F41 antibody response ($p > 0.05$) at second farrowing.
Colostrum: A definite increase of colostral antibody levels was observed in vaccinated breeders at both farrowings for all tested valences ($p < 0.05$).

Table 4: Sera and colostrum antibody levels (IHA units)

Component	Group	First reproductive cycle				Second reproductive cycle		
		V1	V2	Farrowing		V3	Farrowing	
		Serum	Serum	Colostrum	Serum	Serum	Colostrum	Serum
K88	V	1.2^{a}	1.7^{b1}	3.3^{b3}	2.0^{b1}	1.8^{b1}	3.5^{b2}	2.4^{b1}
	UnV	1.3^{a}	1.2^{a}	3.1^{a}	1.4^{a}	1.5^{a}	3.0^{a}	1.4^{a}
K99	V	2.7^{a}	3.0^{b1}	3.4^{b1}	3.1^{b2}	3.0^{a}	3.4^{b2}	3.1^{b2}
	UnV	2.6^{a}	2.7^{a}	2.8^{a}	2.8^{a}	3.0^{a}	2.8^{a}	2.8^{a}
F41	V	2.9^{a}	3.0^{b2}	3.2^{b1}	3.1^{b2}	3.0^{a}	3.1^{b3}	2.9^{a}
	UnV	2.8^{a}	2.9^{a}	2.8^{a}	2.9^{a}	3.0^{a}	2.9^{a}	2.8^{a}
987P	V	2.2^{a}	2.5^{b1}	3.1^{b1}	2.6^{b1}	2.4^{a}	2.9^{b1}	2.4^{b2}
	UnV	2.1^{a}	2.2^{a}	2.5^{a}	2.3^{a}	2.2^{a}	2.3^{a}	2.2^{a}

Different superscripts between treatment groups at a specific protocol timeline and for a specific sample nature indicate statistical difference. b1: $p < 0.001$; b2: $p < 0.01$; b3: $p < 0.05$.
V: vaccinated; UnV: Unvaccinated.

DISCUSSION AND CONCLUSION

The evidence of NEOCOLIPOR potency for a significant colostral immunity increase was demonstrated towards various components of the vaccine.