

Brief Communication

PRELIMINARY EXPERIMENTS ON VACCINATION AND
SERUM TREATMENT IN THE PROPHYLAXIS OF
E. COLI O149:K91:H10 INFECTIONS IN NEWBORN PIGLETS

In a preliminary experiment two sows were vaccinated, respectively a fortnight and seven weeks before expected farrowing, with a vaccine consisting of equal parts of a suspension of *E. coli* strain A₁ serotype O149:K91:H10 and Freund's incomplete adjuvant, final concentration 5×10^9 organisms/ml, dose 4 ml, administered subcutaneously behind the ear. The vaccine gave rise to an immediate local reaction and left a fibrous nodule of walnut-size, but no systemic reaction was noticed. This agrees with experience from experimental work with vaccination of cows (*Dam* 1968) with a vaccine of the same composition, but representing the calf-pathogenic types of *E. coli*, and with experiences from the widespread use of vaccine of the same strength, but with the complete Freund adjuvant, in the prophylaxis of bovine colibacillosis in Belgium (*Schoenaers & Kaeckenbeeck* 1963). In none of these studies were systemic reactions ever observed.

Newborn piglets from the vaccinated sows were challenged 24 hrs. after birth with a 20 hr. broth culture of strain A₁ in doses varying from 0.1 to 10 ml. Such doses will usually provoke fatal colibacillosis in newborn piglets with no antibodies to serotype O149:K91:H10 (*Dam* 1971). The first challenge experiment comprised eight piglets all of which were allowed colostrum; none of them showed any symptoms at all. Bacteriological examination was made of daily faeces samples and, when the animals were sacrificed 11 and 12 days after challenge, of various organs and parts of the intestines. No *E. coli* O149:K91:H10 was demonstrated.

In the second experiment eight piglets were left with the sow, while four control piglets were deprived of colostrum. All piglets were challenged 24 hrs. after birth with varying doses of strain A₁ (see Table 1) and bacteriological examination performed on daily faeces samples and on organs and intestinal contents after

Table 1. Newborn piglets, serum treated or from vaccinated sows, challenged orally with *E. coli* O149:K91:H10

Pig no.	Colo- strum	Ml of immune serum orally	Challenge, ml of broth culture O149 orally	Result	Bact. examin. post mortem
34	+	—	0.1	killed in a healthy state day 3	<i>E. coli</i> O149 not demonstrated
35	+	—	0.1	" " " " " "	" " " " " "
36	+	—	1	" " " " " "	" " " " " "
37	+	—	1	" " " " " "	" " " " " "
38	+	—	5	" " " " " "	" " " " " "
39	+	—	5	" " " " " "	" " " " " "
40	+	—	10	" " " " " "	" " " " " "
41	+	—	10	" " " " " "	" " " " " "
42	—	—	0.1	" " " " " "	" " " " " "
43	—	—	1	" " " " " " died day 3	<i>E. coli</i> O149 in all parts of the intestines <i>E. coli</i> O149 in all parts of the intestines and some organs
44	—	—	5	killed in a healthy state day 5	<i>E. coli</i> O149 in jejunum and ileum
46	—	—	10	died day 1	<i>E. coli</i> O149 in all parts of the intestines
45	—	5	2	died day 6	coliseptis O78 (O149 not demonstrated)
47	—	10	2	died day 6	coliseptis O78 (O149 not demonstrated)
48	—	3	2	killed in a healthy state day 6	<i>E. coli</i> O149 not demonstrated
18	+	10	10	died on day 2	<i>E. coli</i> O149 in all parts of the intestines and some organs
19	+	10	10	killed in a healthy state day 10	<i>E. coli</i> O149 in ileum and intestinal lymph nodes
20	+	10	10	died on day 3	<i>E. coli</i> O149 in all parts of the intestines and some organs

* The sow not vaccinated.

death or sacrificing. The eight colostrum-fed piglets (Nos. 34—41) showed no symptoms at all, and the challenge strain was not recovered from faeces samples, organs or intestinal contents. Of the colostrum-deprived piglets, three had watery diarrhoea. *E. coli* O149:K91:H10 was recovered from faeces samples of all of them. One died on the first day after challenge and one on the third day (Nos. 46 and 43). Both had pure culture of *E. coli* O149:K91:H10 in all parts of the intestines. Two were sacrificed five and six days after challenge, and *E. coli* O149:K91:H10 was isolated from the intestinal contents of both.

In preliminary serum protection experiments (see Table 1) with varying doses of a monovalent O149 horse serum, just one out of three piglets (Nos. 18—20) survived challenge with 10 ml of broth culture O149. With a challenge dose of 2 ml of broth culture (Nos. 45-47-48) it is true that two out of three piglets died, but they died from colisepsis O78, and the challenge strain was recovered neither from those two nor from the surviving piglet.

A. Dam

The State Veterinary Serum Laboratory,
Copenhagen, Denmark.

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