

# ENDOVAC-Porci® FIELD STUDIES

Improved feed conversion ratios, fewer light weight pigs and decreased mortality resulted from recent field studies involving more than 34,000 pigs in Missouri and Arkansas using ENDOVAC-Porci.® This cross-protective vaccine reduced the endotoxic effects associated with mortality and decreases in production and further validated the positive effects of the only core-antigen vaccine approved by the USDA for use in swine against *Salmonella choleraesuis* and *S. typhimurium*.\*

## MISSOURI STUDY

This 1995 study evaluated the field efficacy of a cross-protective core-antigen Re-17 mutant *Salmonella Typhimurium* Bacterin-Toxoid, ENDOVAC-Porci.® by measuring and comparing production parameters and mortality rates following injection into grow-finish pigs. In this study 16,062 pigs at 4 separate locations were vaccinated 2 weeks following arrival at grow-finisher units with one injection while 16,101 pigs at another 6 locations served as non-vaccinated controls. All 10 locations had been identified during the previous feeding cycle to have had higher than desirable morbidity and mortality rates due to Gram negative bacterial infections.

In this study involving a total of 32,163 head of grow-finish pigs the differences in the mean feed conversion rates were significant ( $P < 0.05$ ) when corrected to 250 lbs body weight; 3.27 for the vaccinates and 3.53 for non-vaccinates, a 7.4% advantage for vaccinates. The percentage of pigs weighing less than 170 lbs at the completion

of the feeding period was significantly ( $P = 0.05$ ) in favor of the vaccinates (3.58%) compared to controls (5.1%). Average daily gain for the vaccinates was 1.24 lbs per day compared to 1.17 lbs per day for controls, a 6.0% advantage for vaccinates. The 5.3% mortality rate for the vaccinates was significantly ( $P < 0.05$ ) less than 7.1% for the non-vaccinates. There were significantly ( $P < 0.05$ ) fewer vaccinates, 4.4%, than non-vaccinates, 7.9%, classified as tailenders.

It was concluded that the cross-protective vaccine attenuated the effects of Gram negative bacterial infections caused by *Salmonella typhimurium* and *choleraesuis*, resulting in decreased mortality and increased production.

\*Reference: Garner, H.E. and Sprouse, R.F. Cross Protection of Swine Against *Salmonella choleraesuis* Endotoxin Challenge.

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Missouri MULTI-FARM Study (complete finishing period, $\geq 150$ da)		
	CONTROLS (16,101 hd)	VAC, 1 inj. (16,062 hd)
F/G	3.53	3.27
ADG	1.17 lb	1.24 lb
Mortality	7.10%	5.30%
<170 lbs.	5.10%	3.60%
Tailenders	7.90%	4.40%



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# Feed Conversion Discussion

## Missouri Study

### ENDO-VAC-Porci®

**Study:**

16,062 head vaccinated with 1 dose of ENDO-VAC-Porci®  
 16,101 head controls

Ave. 50 lbs at arrival, adjusted to 250 at finish. Resulting in **200 lbs Ave. Growth per Head.**

**Feed Conversion Rates:**

Controls                      **3.53 lbs.** of Feed / lb. of Gain  
 Vaccinates                    **3.27 lbs.** of Feed / lb. of Gain

Difference                    **0.26 lbs. of Feed / lb. of Gain**

**Results:**

(200 lbs Ave. Growth) (0.26 lbs Feed Conversion Difference) = **52 lbs of Feed**

(52 lbs of Feed) (Price per lb. of Feed) = **Economic Benefit of using ENDO-VAC-Porci® per Head**

**Schedule of Profits:**

52 lbs of Feed		Price per lb. of Feed		<b>Economic Benefit of using ENDO-VAC-Porci® per Head</b>
52 lbs	x	\$0.05	=	\$2.60
52 lbs	x	\$0.06	=	\$3.12
52 lbs	x	\$0.07	=	\$3.64
52 lbs	x	\$0.08	=	\$4.16
52 lbs	x	\$0.09	=	\$4.68
52 lbs	x	<b>\$0.10*</b>	=	<b>\$5.20* (see conclusion)</b>

**Conclusion:**

If you purchase feed at **\$0.10\*** per pound, the vaccinated group would show a **\$75,491.40** financial gain over the controls, including the cost of one dose of **ENDO-VAC-Porci®** for each member of the vaccinated group (see calculations below).

Economic Benefit of Using <b>ENDO-VAC-Porci®</b> per head at <b>\$0.10/lb*</b> of feed	Cost of <b>ENDO-VAC-Porci®</b> per head	Total Financial Gain per head with <b>ENDO-VAC-Porci®</b>
<b>\$5.20*</b> <i>(see schedule of profits)</i>	<b>\$0.50</b> <i>(1 dose)</i>	<b><u>\$4.70 per head</u></b>
-	=	

Total Financial Gain per head	Total Number Of Vaccinated Animals	Total Financial Gain with <b>ENDO-VAC-Porci®</b>
<b>\$4.70</b>	<b>16,062</b>	<b><u>\$75,491.40</u></b>
x	=	

## ARKANSAS STUDY

In 1995 a 112 day vaccine effectiveness study was conducted on a farm with 2,530 pigs, 1,347 in Barn # 1 and 1,183 in Barn # 2. These pigs averaging 54 lbs in body weight were placed in two, four airspace, compartmentalized grow-finish barns. Within each airspace 20±4 pigs were housed in each of 16 pens for

the duration of the grow-finish period. The pigs in alternating pens were all vaccinated (672 in Barn #1; 548 in Barn #2). The vaccinated pigs in Barn #1 received two injections (an initial 1 ml injection during the first week following arrival plus a 1 ml booster of ENDOVAC-Porci® during the third week following arrival) while the vaccinated pigs in Barn #2 received only one 1 ml intramuscular injection during the first week following arrival.

In Barn #1 mortality rates were 4.3% and 6.7% for vaccinates and controls, 29 hd versus 45 hd, respectively (P<0.078). Mortality rates in Barn #2 were 1.0% for vaccinates compared to 2.5% in controls, 6 hd and 16 hd, respectively (P<0.125). The mortality rates in Barns #1 and #2 combined were 2.9% for vaccinates and 4.7% for controls, 35 hd and 61 hd, respectively (P<0.025).

Pigs were individually weighed on day 112 with a Paultronics® automated scale preset to ±2 lbs accuracy. In Barn #1, 38% more vaccinates than

controls weighed 260 or more lbs, 97 hd and 73 hd, respectively (P<0.05). In Barn #2, 8.3% of the vaccinates compared to 6.9% of the controls

weighed 260 lbs. Combining the results in Barn #1 and #2, 12% of the vaccinates compared to 9.3% controls, weighed 260 lbs or more (P=0.03), 142 hd versus 116 hd,

respectively.

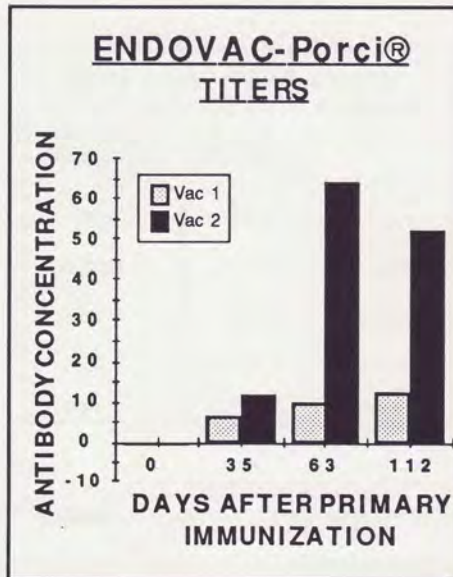
There were significantly (P<0.001) more pigs, 13.4%, in Barn #1 compared to Barn #2, 7.6%, that weighed 260 lbs or more at 112 days, 170 hd versus 88 hd, respectively. In Barns #1 and #2 combined 10.6% (258 hd) of the pigs weighed 260 lbs or more. Serum anti-endotoxin antibody levels were

significantly increased in pigs that received 2 vaccine injections compared to one, when analysed by an ELISA. The titer increase correlated with increased production.

The consistent culturing of Gram negative bacteria from the dead pigs confirmed that there was exposure to *Salmonella typhimurium* and *choleraesuis*, *Escherichia coli* and *Pasteurella multocida* of the pigs in both barns and that the cross-protective Re-

17 mutant *Salmonella Typhimurium* Bacterin-Toxoid vaccine, ENDOVAC-Porci®, significantly reduced the mortality rate and increased performance.

Arkansas SINGLE-FARM Study (finishing period 1st 112 da)						
	Barn #1 (1,347 hd)		Barn #2 (1,183 hd)		Barn #1 & #2 (2,530 hd)	
	CONT.	VAC. (2 inj.)	CONT.	VAC. (1 inj.)	CONT.	VAC. (comb.)
Mortality	6.70%	4.30%	2.50%	1.00%	4.70%	2.90%
<170 lbs.	9.20%	7.90%	3.50%	4.60%	6.40%	6.40%
>260 lbs.	11.60%	15.10%	6.90%	8.30%	9.00%	12.00%



17 mutant *Salmonella Typhimurium* Bacterin-Toxoid vaccine, ENDOVAC-Porci®, significantly reduced the mortality rate and increased performance.