

The effects of Core Antigen Bacterin with an Immunostimulant on Piglet Health and Performance Outcomes when Challenged with Enteric and Respiratory Pathogens.

INTRODUCTION

Colibacillosis and Pneumonic Pasteurellosis are commonly known gram-negative diseases in swine.¹ Historically dairy and beef cattle are protected from numerous gram-negative diseases with ENDOVAC-Beef® and ENDOVAC-Dairy®. Therefore, viable possibilities may exist to immunologically protect swine from a broad spectrum of gram-negative pathogens. ENDOVAC-Porci®, a single core antigen common to all gram-negatives combined with an immunostimulant, was tested to determine its ability to deliver such broad spectrum protection.

Gram-negative bacteria have thousands of serotypes making it difficult to make effective commercial or autogenous vaccines that protect against a broad spectrum of gram-negatives. Thus, there is a paramount need for a single unique bacterin providing protection against virtually all gram-negative pathogens.

This study determines if ENDOVAC-Porci, a core antigen vaccine with an immunostimulant, provides piglets broad-spectrum protection against the enteric and respiratory effects of gram-negative bacteria.

MATERIALS AND METHODS

Study Location

Midwest Veterinary Services, Inc. (MVS)
Site Manager: Kelly Lechtenberg, DVM, PhD
Investigator: Charley Cull, DVM, PhD

Study Design

Single-site, randomized, prospective, blinded, comparative placebo-controlled.

Vaccine

ENDOVAC-Porci: (ENDOVAC Animal Health, Columbia, MO, USA). Piglets were vaccinated IM with 1ml of either the vaccine or saline placebo at ≤ 3 days of age (study day 0) and boosted at weaning: ≤ 24 days of age (study day 21). The following were also given at study day 21: mlv PRRS, PCV2 and mycoplasma.

Animals

90 commercially-sourced, healthy piglets weighing > 2.6 lbs. (From a PRRS stable herd)

Challenge

All pigs were challenged on study day 23. Gram-negative organisms included: Escherichia coli K-88 orally (5ml of 1×10^{10} CFU/mL) and Pasteurella multocida intranasally (2ml of 1×10^9 CFU/mL)

Statistical Methods

Experimental Unit: Individual (farrowing phase) and Pen (nursery phase).

Number of Replicates: 45 per treatment group (farrowing phase) and 15 per treatment group (nursery phase).

Statistical analysis performed by the Center of Outcomes Research and Epidemiology at Kansas State University.

REFERENCES

1. Swine Disease Manual; Fourth Edition; E.J. Neumann, A. Ramirez and K.J. Schwartz

Results

Body Weights

Day 0 by Treatment Group

Treatment	Pigs	Mean kg	Mean lbs
Saline	45	1.61	3.54
ENDOVAC-Porci	44	1.69	3.72

Effect of treatment (P = 0.17)

Day 21 by Treatment Group

Treatment	Pigs	Mean kg	Mean lbs
Saline	40	6.04	13.29
ENDOVAC-Porci	44	6.52	14.34

Effect of treatment (P < 0.01)

Day 42 by Treatment Group

Treatment	Pigs	Mean kg	Mean lbs
Saline	24	11.00	24.20
ENDOVAC-Porci	36	12.50	27.50

Effect of treatment (P < 0.01)

Mortality

Day 0-21 – Farrowing Phase by Treatment Group

Treatment	Pigs	Mortalities	%
Saline	45	5	11.1%
ENDOVAC-Porci	44	0	0.0%

Effect of treatment (P = 0.06)

Day 21-42 – Nursery Phase by Treatment Group

Treatment	Pigs	Mortalities	%
Saline	40	16	40.0%
ENDOVAC-Porci	44	8	18.2%

Effect of treatment (P = 0.03)

Day 0-42 – Overall by Treatment Group

Treatment	Pigs	Mortalities	%
Saline	45	21	46.7%
ENDOVAC-Porci	44	8	18.2%

Effect of treatment (P = 0.01)

CONCLUSION

Pigs vaccinated with ENDOVAC-Porci exhibited a decisive advantage in both health and performance providing a compelling return on investment opportunity for swine production systems. This study indicates that broad-spectrum protection from multiple gram-negative pathogens can be achieved with this product. ENDOVAC-Porci shows it is much more than just a salmonella vaccine.

Morbidity

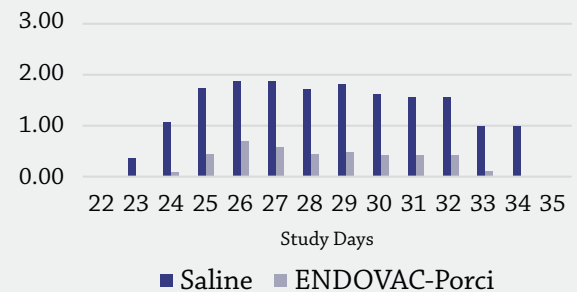
Study days 22-35:

Clinical Scores: 0 Normal, 1 Mild, 2 Moderate, 3 Severe

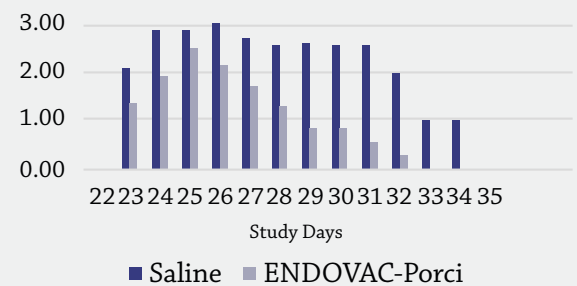
Fecal Scores: 0 Normal, 1 Soft, 2 Loose, 3 Watery

Treatment	Saline	ENDOVAC-Porci®	P-value
Clinical	1.19	0.29	.05
Fecal	1.95	0.96	.05

Clinical Scores: 0 Normal, 1 Mild, 2 Moderate, 3 Severe



Fecal Scores: 0 Normal, 1 Soft, 2 Loose, 3 Watery



SUMMARY OF RESULTS

ENDOVAC-Porci vaccinated pigs outperformed the control pigs in every metric.

- 11.1% pre-wean survivability advantage
- 7.9% (1.05 lbs) higher average weaning weight
- 13.6% (3.3 lbs) higher final 42-day weight
- 61.9% less mortality over the entire study
- 75.6% better clinical scores
- 50.8% better fecal score