

## SWINE SOLUTIONS

### Improving piglet performance with polyphenols

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Gut health in pigs continues to be a focus area for producers and veterinarians. Growing consumer concerns, along with an increased frequency of resistant pathogen challenges, are demanding that our industry explore options beyond the conventional use of antibiotics to address these challenges. Interest in phytobiological products continues to grow in the veterinary community, as they have the potential to serve as a valuable tool to meet these increasingly common challenges.

Polyphenols are a part of the innate immune system of many plants.<sup>1</sup> Disruptions of the plant cell integrity release these polyphenols, which interact with intercellular fluids and enzymes to produce molecules that form protein cross-linkages, which seal the injury site, interfere with microbial growth and neutralize toxins that may delay the healing of the injured site.<sup>2</sup> These interactions also take place when certain plant polyphenols interact with the epithelial cells in the intestinal tract and skin of swine. As a result, plant polyphenols offer a great potential alternative to addressing the injury, inflammation, microbial growth and resulting presence of toxic compounds that develop as a result of skin issues or enteric challenges in pigs.

To learn more about polyphenols, we conducted a trial in partnership with [Precision Health Technologies](#) in Brookings, South Dakota, who continue to refine the extraction and quantification process and evaluate various implementation and delivery techniques to maximize the potential benefits of plant polyphenols in livestock production. The goal of this project was to evaluate the effect of a proprietary blend of plant polyphenols on the performance of piglets in a relatively high-health farrowing environment. Our [PhytoCare GI-Revive™ product](#) emerged as a result of this continued partnership and evaluation of the needs of producers.

I conducted this trial at our 340-head farrow-to-finish family operation in Southwest Minnesota. The trial included all litters from two consecutive batches that were weaned in September and October 2022. At processing, piglets from each litter were individually ear-notched, weighed, sorted by sex, and randomly assigned to treatment or control groups so that both treated and untreated pigs were present in every litter. Treated pigs were administered 1 mL of GI-Revive orally, while control pigs received no additional treatment. Following their weighing and allocation into study groups, all piglets then went through the standard processing procedure, which includes an oral *E. coli* vaccine and a 200-mg injection of iron fortified with ampicillin. All of their tails were docked, and the boars were castrated as well. Four percent of piglets also showed signs of mild scouring at this time, so rectal swabs were collected for the further diagnosis of any pathogens present at the time of processing. The farm staff were unaware of which piglets were treated and which were in the control group in each litter.

The treatment protocol for scours on the farm included the application of a proprietary powder product on the mat at the first sign of scours, continuing for up to three days or until the scours had subsided. Besides the injection of fortified iron, no additional antibiotics were given to the piglets until they were creep-fed for the last five days before weaning. Pigs were cross-fostered at 24 to 48 hours of age using the standard farm protocol to average the number of pigs per litter and were moved only once, if at all. The creep feed, which consisted of Hubbard Feeds' [Powerstart Solo](#) pellets containing 50 g/ton Mecadox, started being fed five days prior to weaning.

The diagnostic results of the rectal swabs that were collected identified multiple non-hemolytic, non-Shiga-producing *E. coli*, along with *Clostridium perfringens* type A. PCR-testing for porcine epidemic diarrhea (PED), transmissible gastroenteritis (TGE) and rotavirus types A and C came back negative, and the processing fluids also tested negative for porcine reproductive and respiratory syndrome (PRRS).

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The results of the trial are outlined in the tables below. We evaluated the benefits of utilizing the PhytoCare GI-Revive product in all pigs as part of the processing protocol, but we dug deeper to evaluate where the maximum benefits were realized. The greatest advantage was seen in pigs that weighed 2.5 pounds or less at processing; a significant return was achieved, and there were also nine fewer grade-out light pigs at weaning in the treated group as a result of this gain. There was also a slightly higher advantage seen in the gilt and young sow litters. The scouring pigs in this trial recovered very well on their own, so the advantage in that category was somewhat muted in this case. Bear in mind that these are the results in otherwise healthy pigs; we have seen very positive responses in maternal litters, young sow litters and startup/repop herds, cross-fostered pigs, low-birthweight pigs, and particularly in the presence of *rotavirus A* and *C*, as well as some positive early results reported in the presence of *coccidia* and the emerging Sapovirus as well. Based on our understanding of the way polyphenols are proposed to work in the gut, the expectation is that the pigs will continue to gain and maintain body condition throughout the challenge — but they cannot “cure” the scours.

## Overall Trial Results

Treatment group	Avg. age in	Avg. wt. in	Avg. wean age	Avg. wean wt.	Avg. ADG	Avg. wt. gain	Diff.	n
P1-2 -	2.24	4.16	18.83	14.67	0.63	10.50		200
P1-2 +	2.25	4.19	18.84	14.88	0.64	10.68	0.18	199
P3-5 -	2.14	4.20	18.94	14.97	0.65	10.77		92
P3-5 +	2.15	4.26	18.91	15.08	0.65	10.82	0.05	95
P6-8 -	2.12	4.05	18.74	13.73	0.59	9.68		228
P6-8 +	2.2	4.06	18.85	13.84	0.60	9.77	0.10	226
							<b>Total:</b>	<b>1,040</b>

## Scouring Pig Results (*C. perf A*)

Treatment group	Avg. age in	Avg. wt. in	Avg. wean age	Avg. wean wt.	Avg. ADG	Avg. wt. gain	Diff.	n
Untreated	2.00	4.05	19.00	14.33	0.61	10.28		17
Treated	2.25	4.31	18.82	14.70	0.63	10.39	0.10	23

## Small Pig Results (2.5 lbs. or smaller at start of trial)

Treatment group	Avg. age in	Avg. wt. in	Avg. wean age	Avg. wean wt.	Avg. ADG	Avg. wt. gain	Diff.	n
Untreated	2.00	2.10	18.38	9.09	0.43	6.99		20
Treated	1.69	2.19	18.06	10.13	0.49	7.94	0.95	22

## Big Pig Results (over 2.5 lbs. at start of trial)

Treatment group	Avg. age in	Avg. wt. in	Avg. wean age	Avg. wean wt.	Avg. ADG	Avg. wt. gain	Diff.	n
P1-2 -	2.23	4.18	18.81	14.69	0.63	10.51		196
P1-2 +	2.27	4.26	18.88	15.03	0.65	10.77	0.27	189
P3-5 -	2.14	4.25	18.95	15.07	0.65	10.82		90
P3-5 +	2.15	4.28	18.91	15.08	0.65	10.80	-0.02	94
P6-8 -	2.14	4.18	18.79	14.07	0.60	9.89		214
P6-8 +	2.25	4.16	18.93	14.06	0.60	9.90	0.01	215
							<b>Total:</b>	<b>998</b>

For more information on PhytoCare GI-Revive and our other PhytoCare products, please contact your [Hubbard Feeds representative](#) or Dr. Andrew Bents at [swineteam@hubbardfeeds.com](mailto:swineteam@hubbardfeeds.com).

## References:

1. Simonson, R. “Alternative scour prevention and control: History and science of options” AASV lecture, Hilton Orlando Buena Vista Palace, Orlando, Florida. March 2015.\
2. Huang, Alex. Harnessing the biology of plant immunity. June 20, 2014.
3. Bents, A. “High-health herd response to activated phenolic molecules, APMTM (GI-Revive™)” AASV lecture, Gaylord Rockies Resort & Convention Center, Aurora, Colorado. March 5, 2023