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## Effects of Evosure on Nursery Pig Performance

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## Effects of Evosure on Nursery Pig Performance

### Abstract

A total of 360 pigs (PIC C-29 × 359, initially 13.1 lb BW) were used in a 42-d growth trial evaluating the effects of Evosure on nursery pig performance. Evosure is a yeastbased technology designed to enhance weaned pig performance. Pigs were weaned at approximately 16 to 20 d and allotted to pens based on initial BW and gender in a completely randomized design. The 3 dietary treatments included a control diet, or the control diet with Evosure (NUTRIQUEST, Inc., Mason City, IA) fed at 1.0 lb/ton fed from d 0 to 21 followed by 0.5 lb/ton fed from d 21 to 42, or 1.0 lb/ton fed from d 0 to 42. Experimental diets were fed in 3 phases (Phase 1, d 0 to 7; Phase 2, d 7 to 21; and Phase 3, d 21 to 42 post-weaning) and in meal form. Overall (d 0 to 42), no differences in growth performance or final BW were observed among dietary treatments. In conclusion, under these experimental conditions, added Evosure, regardless of level, did not impact nursery pig performance.

### Keywords

Evosure, feed additive, growth performance, nursery pig

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### Cover Page Footnote

Appreciation is expressed to Drs. Rob Musser and Chad Hagan, NUTRIQUEST Inc., Mason City, IA for their technical and partial financial support for this study. Appreciation is expressed to Julie Salyer, Dr. Brad James, and Lorene Parkhurst, Kalmbach Feeds, Inc. for their technical support and expertise in conducting the experiment.

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## Effects of Evosure on Nursery Pig Performance<sup>1,2</sup>

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### Summary

A total of 360 pigs (PIC C-29 × 359, initially 13.1 lb BW) were used in a 42-d growth trial evaluating the effects of Evosure on nursery pig performance. Evosure is a yeast-based technology designed to enhance weaned pig performance. Pigs were weaned at approximately 16 to 20 d and allotted to pens based on initial BW and gender in a completely randomized design. The 3 dietary treatments included a control diet, or the control diet with Evosure (NUTRIQUEST, Inc., Mason City, IA) fed at 1.0 lb/ton fed from d 0 to 21 followed by 0.5 lb/ton fed from d 21 to 42, or 1.0 lb/ton fed from d 0 to 42. Experimental diets were fed in 3 phases (Phase 1, d 0 to 7; Phase 2, d 7 to 21; and Phase 3, d 21 to 42 post-weaning) and in meal form. Overall (d 0 to 42), no differences in growth performance or final BW were observed among dietary treatments. In conclusion, under these experimental conditions, added Evosure, regardless of level, did not impact nursery pig performance.

Key words: Evosure, feed additive, growth performance, nursery pig

### Introduction

Post-weaning pigs undergo physiological and environmental changes that contribute to sub-optimal growth such as low feed intake, body weight loss, and an increase in morbidity and mortality (Pluske, 2013).<sup>4</sup> Some yeast-derived feed additives are suggested to improve gut function and lessen the post-weaning lag that is commonly observed. Evosure is a yeast-based feed additive (NUTRIQUEST, Inc., Mason City, IA) recommended to be included throughout the nursery phase of production. Few published studies are available to determine the optimum level of Evosure to be used at different stages of the nursery period. Therefore, the objective of this study was to determine the influence of Evosure feeding level on growth performance of nursery pigs.

<sup>1</sup> Appreciation is expressed to Drs. Rob Musser and Chad Hagan, NUTRIQUEST Inc., Mason City, IA, for their technical and partial financial support for this study.

<sup>2</sup> Appreciation is expressed to Julie Salyer, Dr. Brad James, and Lorene Parkhurst, Kalmbach Feeds, Inc. for their technical support and expertise in conducting the experiment.

<sup>3</sup> Department of Diagnostic Medicine/Pathology, College of Veterinary Medicine, Kansas State University.

<sup>4</sup> Pluske, J.R. 2013. Feed and feed additives-related aspects of gut health and development in weanling pigs. J.A.S.B. 4:1. DOI: 10.1186/2049-1891-4-1

## Methods

The Kansas State University Institutional Animal Care and Use Committee approved the protocol for this experiment. The study was conducted at the Cooperative Research Farm's Swine Research Nursery (Sycamore, OH), which is owned and managed by Kalmbach Feeds, Inc. Each pen had slatted metal floors and was equipped with a 4-hole stainless steel feeder and one nipple-cup waterer for ad libitum access to feed and water. Pens were 5 × 6 ft to allow 3 ft<sup>2</sup> per pig.

A total of 360 pigs (PIC C-29 × 359, initially 13.1 lb BW) with 10 pigs per pen and 12 replications per treatment were used in a 42-d trial. Pigs were weaned at approximately 16 to 20 d of age and allotted to pens based on initial BW and gender in a completely randomized design. Pigs and feeders were weighed every 7 d of the trial to determine ADG, ADFI, and F/G.

The three experimental diets included a control diet, or the control diets with Evosure at 1.0 lb/ton from d 0 to 21 followed by 0.5 lb/ton from d 21 to 42, or 1.0 lb/ton from d 0 to 42. Experimental diets were fed in 3 phases (d 0 to 7, d 7 to 21, and d 21 to 42; Table 1) in meal form. All diets contained an additional 1,897 ppm added Zn from ZnO and 237 ppm added Cu from CuSO<sub>4</sub> above that provided from the trace mineral premix.

Samples of each diet were collected during manufacturing. These samples were submitted for analysis of DM, CP, ether extract, Ca, and P (Ward Laboratories, Inc., Kearney, NE; Table 2).

Data were analyzed using the PROC MIXED procedure of SAS (SAS Institute, Inc., Cary, NC) with pen as the experimental unit. Dietary treatment served as the fixed effect in the model. Means are reported as least squares means with individual treatment means used to determine differences. Significant differences between treatments were declared at  $P < 0.05$  and marginal significance defined as  $P < 0.10$ .

## Results and Discussion

Chemical analysis of complete diets revealed that analyzed values were similar to calculated values (Table 2).

There were no differences in growth performance observed among dietary treatments throughout the experimental period (Table 3).

Our results do not agree with previously conducted research where nursery pigs fed Evosure had improved growth performance. Previous research conducted by Nutriquest showed that the addition of Evosure to weaned pig starter diets improved ADG and F/G by 10.9% and 5.2%, respectively.<sup>5</sup> Additional research should be conducted to determine the optimum Evosure feeding level and duration to maximize performance and to determine if different basal diet formulations or other factors might influence the responses observed.

<sup>5</sup> Nutriquest Launches Product for Starter Pigs. NUTRIQUEST. <http://www.farms.com/news/nutriquest-launches-product-for-starter-pigs-70961.aspx>. 2013.

**Table 1. Experimental diet composition (as-fed basis)<sup>1</sup>**

Ingredient, %	Phase 1	Phase 2	Phase 3
Corn	32.10	47.82	62.05
Soybean meal, 48% CP	27.50	28.93	32.23
Spray dried whey	20.0	14.50	---
Fish meal	3.50	3.25	---
Cheese plus <sup>2</sup>	7.65	---	---
Crystalline lactose	3.55	---	---
betaGRO <sup>3</sup>	0.27	---	---
Evosure <sup>3,4</sup>	---	---	---
Tallow	2.00	2.00	2.00
Limestone	0.85	1.05	1.1
Monocalcium P, 21% P	1.05	0.95	0.85
Sodium chloride	0.25	0.25	0.5
L-Lys HCl	0.25	0.3	0.35
DL-Met	0.21	0.17	0.15
L-Thr	0.14	0.11	0.12
L-Trp	0.01	---	---
Phytase	---	---	0.01
Zinc oxide	0.26	0.26	0.26
Copper sulfate	0.09	0.09	0.09
Choline chloride, 70% liquid	0.05	0.05	0.05
Selenium, 0.06%	0.02	0.02	0.02
Trace mineral premix	0.09	0.09	0.09
Vitamin premix	0.05	0.05	0.05
Vitamin E, 20,000 IU/lb	0.06	0.06	0.06
Biotin	0.08	0.08	0.08
Total	100	100	100

*continued*

Calculated analysis

Standardized ileal digestible (SID) amino acids, %

Lys	1.52	1.35	1.25
Met:Lys	38	36	35.0
Met & Cys:Lys	58	58	58
Thr:Lys	65	65	65
Trp:Lys	18	18	18
Val:Lys	65	67	68
Total Lysine, %	1.68	1.50	1.39
ME, kcal/lb	1,588	1,538	1,533
CP, %	23.3	21.7	20.7
Ca, %	0.90	0.90	0.69
P, %	0.78	0.72	0.71
Available P, %	0.55	0.45	0.40
Cu, ppm	265	263	258
Zn, ppm	2,023	2,025	2,025

<sup>1</sup>Phase 1 diets were fed from d 0 to 7 (~13.1 to 14 lb BW), Phase 2 diets from d 7 to 21 (~14 to 24 lb BW) and Phase 3 diets from d 21 to 42 (~24 to 51 lb BW).

<sup>2</sup>International Ingredients, Inc., St. Louis, MO.

<sup>3</sup>NUTRIQUEST, Inc., Mason City, IA.

<sup>4</sup>Treatment diets included: 1.) No Evosure fed from d 0 to 42, 2.) 1 lb/ton Evosure fed from d 0 to 21 followed by 0.5 lb/ton Evosure from d 21 to 42, and 3.) 1 lb/ton Evosure fed from d 0 to 42.

<sup>5</sup>Quantum Blue (AB-Vista Americas, Plantation, FL) provided 227 phytase units (FTU)/lb of diet, with a release of 0.13% available P.

**Table 2. Chemical analysis of experimental diets<sup>1</sup>**

Item, %	Control	Evosure lb/ton,	
		1/0.5 <sup>2</sup>	1/1 <sup>3</sup>
Phase 1 Diets			
DM	90.8	90.5	90.5
CP	23.2	24.5	24.5
Ether extract	5.70	5.10	5.10
Ca	1.07	1.07	1.07
P	0.82	0.80	0.80
Phase 2 diets			
DM	89.8	89.5	89.5
CP	21.0	22.3	22.3
Ether extract	4.60	4.20	4.20
Ca	1.22	0.99	0.99
P	0.82	0.73	0.73
Phase 3 diets			
DM	88.0	87.4	87.2
CP	21.9	19.3	20.1
Ether extract	5.00	4.60	4.80
Ca	0.98	0.82	0.82
P	0.61	0.56	0.58

<sup>1</sup>Complete diet samples were obtained from each dietary treatment each week during the study and composited. Samples of diets were then analyzed for DM, CP, ether extract, Ca, and P (Ward Laboratories, Inc., Kearney, NE).

<sup>2</sup>Evosure (NUTRIQUEST, Inc., Mason City, IA) fed at 1 lb/ton from d 0 to 21 followed by 0.5 lb/ton from d 21 to 42.

<sup>3</sup>Evosure fed at 1 lb/ton from d 0 to 42.

**Table 3. Effects of Evosure on growth performance of nursery pigs <sup>1</sup>**

Item	Control	Evosure, lb/ton		SEM	<i>P</i> <
		1/0.5 <sup>2</sup>	1/1 <sup>3</sup>		
<b>BW, lb</b>					
d 0	13.69	13.71	13.72	0.019	0.466
d 7	14.46	14.35	14.51	0.076	0.331
d 21	25.77	25.51	25.78	0.247	0.680
d 42	56.19	56.07	56.21	0.549	0.980
<b>d 0 to 21</b>					
ADG, lb	0.57	0.56	0.57	0.011	0.728
ADFI, lb	0.72	0.69	0.72	0.011	0.163
F/G	1.26	1.24	1.26	0.015	0.489
<b>d 21 to 42</b>					
ADG, lb	1.45	1.45	1.45	0.019	0.986
ADFI, lb	2.18	2.17	2.18	0.023	0.954
F/G	1.51	1.50	1.50	0.018	0.861
<b>d 0 to 42</b>					
ADG, lb	1.00	1.00	1.01	0.013	0.905
ADFI, lb	1.44	1.43	1.45	0.015	0.595
F/G	1.44	1.43	1.43	0.013	0.741

<sup>1</sup>A total of 360 pigs (PIC C-29 × 359) were used in a 3-phase nursery trial with 10 pigs per pen and 12 replications per treatment. All experimental diets were fed in three phases (d 0 to 7, 7 to 21, and 21 to 42).

<sup>2</sup>Evosure (NUTRIQUEST, Inc., Mason City, IA) fed at 1 lb/ton from d 0 to 21 followed by 0.5 lb/ton from d 21 to 42.

<sup>3</sup>Evosure fed at 1 lb/ton from d 0 to 42.