

Kansas Agricultural Experiment Station Research Reports

Volume 3
Issue 7 *Swine Day*

Article 56

2017

Foreword, Appendices

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Recommended Citation

Goodband, R. D. (2017) "Foreword, Appendices," *Kansas Agricultural Experiment Station Research Reports*: Vol. 3: Iss. 7. <https://doi.org/10.4148/2378-5977.7509>

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Foreword

It is with great pleasure that we present the 2017 Swine Industry Day Report of Progress. This report contains updates and summaries of applied and basic research conducted at Kansas State University during the past year. We hope that the information will be of benefit as we attempt to meet the needs of the Kansas swine industry.

2017 Swine Day Report of Progress Editors

Bob Goodband
Mike Tokach
Steve Dritz
Joel DeRouchey
Jason Woodworth

Standard Abbreviations

ADG	=	average daily gain	Mcal	=	megacalorie(s)
ADF	=	acid detergent fiber	ME	=	metabolizable energy
ADFI	=	average daily feed intake	mEq	=	milliequivalent(s)
AI	=	artificial insemination	min	=	minute(s)
avg	=	average	mg	=	milligram(s)
bu	=	bushel	mL	=	cc (cubic centimeters)
BW	=	body weight	mm	=	millimeter(s)
cm	=	centimeter(s)	mo	=	month(s)
CP	=	crude protein	MUFA	=	monounsaturated fatty acid
CV	=	coefficient of variation	N	=	nitrogen
cwt	=	100 lb	NE	=	net energy
d	=	day(s)	NDF	=	neutral detergent fiber
DE	=	digestible energy	NFE	=	nitrogen-free extract
DM	=	dry matter	ng	=	nanogram(s), .001 Fg
DMI	=	dry matter intake	no.	=	number
F/G	=	feed efficiency	NRC	=	National Research Council
ft	=	foot(feet)	ppb	=	parts per billion
ft ²	=	square foot(feet)	ppm	=	parts per million
g	=	gram(s)	psi	=	pounds per square inch
µg	=	microgram(s), .001 mg	PUFA	=	polyunsaturated fatty acid
gal	=	gallon(s)	SD	=	standard deviation
GE	=	gross energy	sec	=	second(s)
h	=	hour(s)	SE	=	standard error
HCW	=	hot carcass weight	SEM	=	standard error of the mean
in	=	inch(es)	SEW	=	segregated early weaning
IU	=	international unit(s)	SFA	=	saturated fatty acid
kg	=	kilogram(s)	UFA	=	unsaturated fatty acid
kcal	=	kilocalorie(s)	wk	=	week(s)
kWh	=	kilowatt hour(s)	wt	=	weight(s)
lb	=	pound(s)	yr	=	year(s)

K-State Vitamin and Trace Mineral Premixes

Diets listed in this report contain the following vitamin and trace mineral premixes unless otherwise specified.

- Trace mineral premix: Each pound of premix contains 10 g Mn, 33 g Fe, 33 g Zn, 5 g Cu, 90 mg I, and 90 mg Se.
- Vitamin premix: Each pound of premix contains 1,600,000 IU vitamin A, 400,000 IU vitamin D3, 8,000 mg vitamin E (dl- α -tocopherol acetate or 4,000 mg d- α -tocopherol acetate), 800 mg menadione, 1,500 mg riboflavin, 5,000 mg pantothenic acid, 15,000 mg niacin, and 7 mg vitamin B12.
- Sow add pack: Each pound of premix contains 100,000 mg choline, 40 mg biotin, 300 mg folic acid, 400 mg pyridoxine, 4,000 mg Vit E (dl- α -tocopherol acetate or 2,000 mg d- α -tocopherol acetate), 9,000 mg L-carnitine, and 36 mg Cr.

Note

Some of the research reported here was carried out under special U.S. Food and Drug Administration (FDA) clearances that apply only to investigational uses at approved research institutions. Materials that require FDA clearances may be used in the field only at the levels and for the use specified in that clearance.

Biological Variability and Chances of Error

Variability among individual animals in an experiment leads to problems in interpreting the results. Animals on treatment X may have higher average daily gains than those on treatment Y, but variability within treatments may indicate that the differences in production between X and Y were not the result of the treatment alone. Statistical analysis allows us to calculate the probability that such differences are from treatment rather than from chance.

In some of the articles herein, you will see the notation " $P < 0.05$." That means the probability of the differences resulting from chance is less than 5%. If two averages are said to be "significantly different," the probability is less than 5% that the difference is from chance, or the probability exceeds 95% that the difference resulted from the treatments applied.

Some papers report correlations or measures of the relationship between traits. The relationship may be positive (both traits tend to get larger or smaller together) or negative (as one trait gets larger, the other gets smaller). A perfect correlation is one (+1 or -1). If there is no relationship, the correlation is zero.

In other papers, you may see an average given as 2.5 ± 0.1 . The 2.5 is the average; 0.1 is the "standard error." The standard error is calculated to be 68% certain that the real average (with unlimited number of animals) would fall within one standard error from the average, in this case between 2.4 and 2.6.

Using many animals per treatment, replicating treatments several times, and using uniform animals increase the probability of finding real differences when they exist. Statistical analysis allows more valid interpretation of the results, regardless of the number of animals. In all the research reported herein, statistical analyses are included to increase the confidence you can place in the results.

Index of Key Words

added trace minerals	feed-grade antibiotic	phosphorus (P)
alternative	finisher	phytase
amino acid	finishing pig	phytogenics
amino acid ratios	fish meal	polymerase chain reaction (PCR)
AminoGut	fish solubles	Porcine circo virus (PCV)
antibiotic	formaldehyde	PCV2
<i>Bacillus subtilis</i>	gestation	PCV3
benzoic acid	gilt	Porcine Epidemic Diarrhea Virus (PEDV)
bone mineralization	glutamate	Porcine reproductive and respiratory syndrome virus (PRRS)
calcium (Ca)	glutamine	post-weaning diarrhea (PWD)
carbadox	growing pigs	preservatives
carcass yield	growing-finishing pigs	probiotic
chloride	growth performance	ractopamine HCl
chlortetracycline (CTC)	hammermill	regression equations
choline	HP 300	reproduction
chromium propionate	K88	salt
cold pelleting	lactation	screenings
colostrum intake	lactation crate size	sodium
computerized feeder	linear programming	sodium metabisulfite
copper (Cu)	low birth weight pigs	sow
copper chelate	Luminex	soybean meal
corn	lysine	split suckling
creep feed	lysine requirement	supplementation
crude protein	maternal growth	swine
deoxynivalenol	medium chain fatty acid (MCFA)	thermal processing
diarrhea	mitigation	tip speed
diet sampling	mixed models	tri-basic copper chloride
duration	modeling	tryptophan
Elarom SES	molecular diagnostics	vaccine
electronic sow feeder	monosodium glutamate	vomitoxin
enterotoxigenic <i>Escherichia coli</i> (ETEC)	mycotoxin	weanling pig
epitopes	net energy	<i>Yucca schidigera</i>
essential oil	neutral detergent fiber	zinc (Zn)
FaeG	nursery	
fecal consistency	nursery pig	
feed	particle size	
feed additive	pelleting	
feed efficiency	phase-feeding	

Acknowledgments

Appreciation is expressed to these organizations for assisting with swine research at Kansas State University.

Abilene Animal Hospital, Abilene, KS	Kalmbach Feeds, Upper Sandusky, OH
ADM Co., Decatur, IL	Kansas Pork Association, Manhattan, KS
Ajinomoto Heartland LLC, Chicago, IL	Kansas Swine Alliance, Abilene, KS
Biowish Technologies, Cincinnati, OH	Kemin Industries, Inc., Des Moines, IA
Ceva Animal Health, LLC, Lenexa, KS	Livestock and Meat Industry Council, Manhattan, KS
Dave and Lois Baier, Abilene, KS	Micronutrients, Indianapolis, IN
Daybrook Fisheries Inc., New Orleans, LA	National Pork Board, Des Moines, IA
Distributors Processing, Inc., Porterville, CA	Natural Foods Holdings, Sioux City, IA
DNA Genetics, Columbus, NE	New Fashion Pork, Jackson, MN
DSM Nutritional Products, Parsippany, NJ	New Horizon Farms, Pipestone, MN
Feedlogic Corporation, Willmar, MN	PIC USA, Hendersonville, TN
Feed One Co., Ltd., Yokohama, Japan	Pipestone Applied Research, Pipestone, MN
Gourley Research Group, LLC, Webster City, IA	Purco, Edgerton, MN
Hamlet Proteins, Findlay, OH	Quality Technology Internatinoal, Inc., Elgin, IL
Haverkamp Brothers, Bern, KS	SVC Research, LLC, St. Peter, MN
Holden Farms, Northfield, MN	Swine Health Information Center, Ames, IA
Hubbard Feeds, Mankato, MN	Bob and Karen Thaler, Brookings, SD
ILC Resources, Urbandale, IA	Thomas Livestock Company, Broken Bow, NE
International Ingredient Corporation, St. Louis, MO	Triumph Foods, St. Joseph, MO
INTL FCStone Financial Inc., Kansas City, MO	Trouw Nutrition USA, Highland, IL
Iowa Select Farms, Inc., Iowa Falls, IA	USDA National Institute of Food and Agriculture, Washington, D.C.
JYGA Technologies, St. Nicolas, Quebec, Canada	Zinpro Corp., Eden Prairie, MN

We especially appreciate the assistance and dedication of Kansas State University employees Duane Baughman, Frank Jennings, Mark Nelson, Chance Fiehler, Caitlin Evans, Ashton Yoder, and Theresa Rathbun.

Appreciation is also expressed to: Allan Morris, Heath Houselog, Marty Heintz, Craig Steck, Whitney Adler, and Bob Taubert, New Horizon Farms, Pipestone, MN, for their dedicated support.

Appreciation is expressed to Triumph Foods LLC, St. Joseph, MO, and Jerry Lehenbauer, Brad Knadler, Dr. Emily Arkfeld, and Dr. Barry Wisemann for technical assistance.

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