
Foreword

It is with great pleasure that we present the 2015 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.

2015 Swine Day Report of Progress Editors

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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 12 g Mn, 50 g Fe, 50 g Zn, 5 g Cu, 90 mg I, and 90 mg Se.
- Vitamin premix: Each pound of premix contains 2,000,000 IU vitamin A, 300,000 IU vitamin D₃, 8,000 IU vitamin E, 800 mg menadione, 1,500 mg riboflavin, 5,000 mg pantothenic acid, 9,000 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, and 900 mg pyridoxine.

Note

Some of the research reported here was carried out under special 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

adsorbents	floor space	phytase stability
amino acid	formaldehyde	pig
amino acid ratio	gene expression	pork
analysis	gilt	prediction equation
antibiotics	grain	protein quality
bacon	grinding cost	Ractopamine
bioassay	growth	roller mill
birth weight	growth performance	sequencing
boar exposure	intermittent suckling	sodium metabisulfite
by-product	iodine value	sorghum
carcass fat quality	lactational estrus	sow
chemical treatment	litter separation	sow nutrition
conditioning temperature	lysine	space allowance
copper	lysine requirement	split-weaning
copper sulfate	mash	spray-dried bovine plasma
corn	meal	stocking density
creep feeding	method	survey
crystalline AA	methodology	swabs
decontamination	minimum infectious dose	swine
deoxynivalenol	mycotoxins	swine industry
dried milk	nursery pig	thermal mitigation
energy	oregano	topping
extrude	particle size	trace minerals
feed	particle size analysis	tribasic copper chloride
feed line	PCR	tryptophan
feed matrix	PDI	ulcer
feed mill	PEDV	valine
feed preference	pellet	vitamins
feed safety	pelleting	vitamin D
feed truck	pellet size	zinc
finer	performance	25(OH)D ₃
finishing pig	phosphorus	3-sieve
fish meal	phytase	

Acknowledgments

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

Abilene Animal Hospital, Abilene, KS	Kansas Swine Alliance, Abilene, KS
Advanced Ag Products, Hudson, SD	Kemin Industries, Inc., Des Moines, IA
Ajinomoto Heartland LLC, Chicago, IL	Livestock and Meat Industry Council, Manhattan, KS
Anitox Corporation, Lawrenceville, GA	Micronutrients, Indianapolis, IN
Dave and Lois Baier, Abilene, KS	Midori USA, Cambridge, MA
Biomim USA, San Antonio, TX	Midwest Livestock Systems, Inc., Beatrice, NE
DFS Inc., Newell, IA	National Pork Board, Des Moines, IA
DNA Genetics, Columbus, NE	Natural Foods Holdings, Sioux City, IA
DSM Nutritional Products, Parsippany, NJ	New Fashion Pork, Jackson, MN
Elanco Animal Health, Indianapolis, IN	New Horizon Farms, Pipestone, MN
Farmland Foods LLC, Crete, NE	Novus International, St. Charles, MO
Feedlogic Corporation, Willmar, MN	Nutraferma, Dakota Dunes, SD
Gourley Bros., Webster City, IA	PIC USA, Hendersonville, TN
Holden Farms, Northfield, MN	Purco, Edgerton, MN
Hord Livestock Company, Bucyrus, OH	Tech-Mix, Stewart, MN
Hubbard Feeds, Mankato, MN	Triumph Foods, St. Joseph, MO
ILC Resources, Urbandale, IA	United Sorghum Checkoff Program, Lubbock, TX
International Ingredient Corporation, St. Louis, MO	USDA National Institute of Food and Agriculture, Washington, D.C.
JYGA Technologies, St. Nicolas, Quebec, Canada	Zinpro Corp., Eden Prairie, MN
Kalmbach Feeds, Upper Sandusky, OH	Zoltenko Farms Inc., Hardy, NE
Kansas Pork Association, Manhattan, KS	

We especially appreciate the assistance and dedication of Kansas State University employees Duane Baughman, Frank Jennings, Mark Nelson, Terry Gugle, Joel McAtee, Chance Fiehler, and Theresa Rathbun.

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

Appreciation is expressed to Triumph Foods LLC, St. Joseph, MO, for collecting jowl fat and conducting the iodine value analysis and to Jerry Lehenbauer, David Donovan, Ann Smith, Brad Knadler, and Brittany Kimler for technical assistance.

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