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Swine Day Report Foreword and Acknowledgments

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Swine Day Report Foreword and Acknowledgments

Cover Page Footnote

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

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Foreword

It is with great pleasure that we present the 2020 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.

2020 Swine Day Report of Progress Editors

Bob Goodband
Jordan Gebhardt
Mike Tokach
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	s = 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 750,000 IU vitamin A, 300,000 IU vitamin D3, 8,000 mg vitamin E (dl-alpha-tocopherol acetate or 4,000 mg d-alpha-tocopherol acetate), 600 mg menadione, 1,500 mg riboflavin, 5,000 mg pantothenic acid, 9,000 mg niacin, and 6 mg vitamin B12.

Sow add pack: Each pound of premix contains 750,000 IU vitamin A, 100,000 mg choline, 40 mg biotin, 400 mg folic acid, 180 mg pyridoxine, 4,000 mg vitamin E (dl-alpha-tocopherol acetate or 2,000 mg d-alpha-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

acidification	growth performance	piglet performance
administration	growth rate	pigs
African swine fever virus	hemoglobin	Porcine Epidemic Diarrhea Virus
amino acid	high amylase	Porcine Reproductive and Respiratory Syndrome Virus
amino acid digestibility	high amylase corn	power calculation
animal welfare	high protein distillers dried grains	premix stability
antibiotics	insoluble fiber	protein source
AviPlus	iron	PRRS
branch chain amino acids	isoleucine	real-time PCR
castration	KNB-E2	reducing sugars
cellulose	lactation	refinement
classical swine fever	late finishing	release value
CO ₂ surgical laser	lignosulfonate	sample preparation
compensatory growth	lysine	sample size
conditioning temperature	maillard reaction	sample storage
copper	manganese	slow-down program
corn	manganese hydroxychloride	steam conditioning
corn protein	meal	stomach ulcers
crude protein	moisture content	subunit vaccine
crystalline amino acids	mortality	survival
CSF	nursery pigs	swine
culture approach	pain	timing
distillers dried grains with solubles	particle size	transition sow
E. coli serogroups	pellet	tryptophan
environmental contamination	pellet die thickness	valine
farrowing duration	pellet quality	vitamin stability
fecal dry matter	pelleting	vitamin storage
feed mill	pellets	wheat bran
feed safety	phosphorus	yellow dent corn
fiber	phytase	zinc
finisher pigs	phytase activity	zinc acidification
formic acid	phytase stability	zinc oxide
gleptoferron	pig	
growth	piglet	

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CJ America, Downers Grove, IL
DNA Genetics, Columbus, NE
DSM Nutritional Products, Parsippany, NJ
Feedlogic Corporation, Willmar, MN
Feed One Co., Ltd., Yokohama, Japan
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Holden Farms, Northfield, MN
Hord Family Farms, Bucyrus, OH
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Iowa Select Farms, Inc., Iowa Falls, IA
J. Rettenmaier USA, Schoolcraft, MI
JBS Live Pork, Greely, CO
JYGA Technologies, St. Nicolas, Quebec, Canada
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Kansas Swine Alliance, Abilene, KS
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SVC Research, LLC, St. Peter, MN
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Syngenta Seeds, Inc., Minnetonka, MN
Bob and Karen Thaler, Brookings, SD
Tech Mix, LLC, Stewart, MN

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Vetagro, Chicago, IL

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Swine Industry Day Committee

Joel DeRouchey
Jordan Gebhardt
Bob Goodband
Mike Tokach
Jason Woodworth

The Livestock and Meat Industry Council, Inc.

The Livestock and Meat Industry Council, Inc. (LMIC) is a nonprofit charitable organization supporting animal agriculture research, teaching, and education. This is accomplished through the support of individuals and businesses that make LMIC a part of their charitable giving.

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Since its inception in 1970, LMIC has provided student scholarships, research assistance, capital improvements, land, buildings, and equipment to support students, faculty, and the industry of animal agriculture. If you would like to be a part of this mission or would like additional information, please contact the Livestock and Meat Industry Council/Animal Sciences and Industry, Weber Hall, Manhattan, Kansas 66506 or call 785-532-1227.

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