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Foreword, Swine Day 2021

Foreword

It is with great pleasure that we present the 2021 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.

2021 Swine Day Report of Progress Editors

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Standard Abbreviations

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

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KSU Swine Farrowing House Project

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Swine Industry Day Committee

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Jordan Gebhardt
Bob Goodband
Mike Tokach
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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.

Tax-deductible contributions can be made through gifts of cash, appreciated securities, real estate, life insurance, charitable remainder trusts, and bequests as well as many other forms of planned giving. LMIC can also receive gifts of livestock, machinery, or equipment. These types of gifts, known as gifts-in-kind, allow the donor to be eligible for a tax benefit based on the appraised value of the gift.

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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