2018 Swine Day Foreword, Etc.

R. D. Goodband

*Kansas State University, Manhattan, goodband@k-state.edu*

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2018 Swine Day Foreword, Etc.

Abstract
It is with great pleasure that we present the 2018 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.

Keywords
swine

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Foreword

It is with great pleasure that we present the 2018 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.

2018 Swine Day Report of Progress Editors
Bob Goodband
Mike Tokach
Steve Dritz
Joel DeRouchey
Jason Woodworth
### Standard Abbreviations

| Abbreviation | Definition                        | Abbreviation | Definition                        |
|--------------|-----------------------------------|--------------|-----------------------------------|
| ADG          | average daily gain                | mEq          | milliequivalent(s)                |
| ADF          | acid detergent fiber              | min          | minute(s)                         |
| ADFI         | average daily feed intake         | mg           | milligram(s)                      |
| AI           | artificial insemination           | mL           | cc (cubic centimeters)            |
| avg          | average                           | mm           | millimeter(s)                     |
| bu           | bushel                            | mo           | month(s)                          |
| BW           | body weight                       | MUFA         | monounsaturated fatty acid        |
| cm           | centimeter(s)                     | N            | nitrogen                          |
| CP           | crude protein                     | NE           | net energy                        |
| CV           | coefficient of variation          | NDF          | neutral detergent fiber           |
| cwt          | 100 lb                            | NFE          | nitrogen-free extract             |
| d            | day(s)                            | ng           | nanogram(s), .001 µg              |
| DE           | digestible energy                 | no.          | number                            |
| DM           | dry matter                        | NRC          | National Research Council         |
| DMI          | dry matter intake                 | ppb          | parts per billion                 |
| F/G          | feed efficiency                   | ppm          | parts per million                 |
| ft           | foot( feet)                       | psi          | pounds per square inch            |
| ft²          | square foot( feet)                | PUFA         | polyunsaturated fatty acid        |
| g            | gram(s)                           | SD           | standard deviation                |
| µg           | microgram(s), .001 mg             | sec          | second(s)                         |
| gal          | gallon(s)                         | SE           | standard error                    |
| GE           | gross energy                      | SEM          | standard error of the mean        |
| h            | hour(s)                           | SEW          | segregated early weaning          |
| HCW          | hotcarcassweight                  | SFA          | saturated fatty acid              |
| in           | inch(es)                          | UFA          | unsaturated fatty acid            |
| IU           | international                     | wk           | week(s)                           |
| unit(s) kg   | kilogram(s)                       | wt            | weight(s)                         |
| kcal         | kilocalorie(s)                    | yr           | year(s)                           |
| kWh          | kilowatt hour(s)                  |               |                                   |
| lb           | pound(s)                          |               |                                   |
| Mcal         | megacalorie(s)                    |               |                                   |
| ME           | metabolizable energy              |               |                                   |
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 $2.5 \pm 0.1$. 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

administration route  
antimicrobial resistance  
*Bacillus subtilis*  
bacteria  
blending  
bone ash  
calcium (Ca)  
Calsporin®  
cellulose  
chloride  
chlortetracycline (CTC)  
color  
compensatory growth  
conditioner temperature  
consumer  
consumer preference  
corn  
crude protein  
deoxynivalenol  
diarrhea  
dietary electrolyte balance  
digestible phosphorus  
distillers dried grains  
dried distillers grains with solubles (DDGS)  
drinker  
economic analysis  
efficacy  
enterotoxigenic *Escherichia coli* (ETEC)  
enzyme  
fat inclusion  
fecal consistency  
feed additive  
feed-grade amino acids  
feed processing  
feeding regimen  
ferrous carbonate  
finishing feed  
finishing pigs  
gestation  
gilt  
gleptoferron  
growing-finishing pigs  
growth performance  
heavy weight pigs  
high-lysine sorghum  
histidine  
hot carcass weight  
isoflavone  
iron (Fe)  
iron sulfate  
lactation  
lysine  
marbling  
medium chain fatty acid (MCFA)  
microbiome  
minimum inhibitory concentration  
modeling  
monolaurin  
nursery feed  
nursery pigs  
nutrition
| oat groats       | salt        |
|-----------------|-------------|
| oats            | shear force |
| palatability    | sodium (Na) |
| particle size   | sodium metabisulfite |
| pellet binder   | sow         |
| pellet durability index | soybean meal |
| pellet quality  | space requirements |
| pelleting       | sugar beet pulp |
| phosphorus (P)  | swine       |
| phytase         | tenderness  |
| phytase stability | timing     |
| pig             | tylosin     |
| pork            | vaccination |
| pork quality    | visual      |
| post-weaning    | vitamins    |
| preservative    | water       |
| probiotic       | weanling pig |
| retention time  | withdrawal  |
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Hubbard Feeds, Mankato, MN
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