KSU Swine Day 2014

K·STATE
Research and Extension

2014 KSU Swine Day Program

- 8:00 a.m. – 3:30 p.m. - Trade Show Open
- 9:45 a.m. – Delta Coronavirus and PED by Drs. Hesse, Dritz, and Woodworth
- 11:00 a.m. – What's next for the Swine Industry by Dr. DiPietre
- 11:45 noon - Pork Lunch in Main Ballroom
- 1:30 p.m. – Improving survivability of low birth weight pigs by Drs. Nelssen, Davis, and Gonzalez
- 2:00 p.m. – Keeping up with rapidly changing ingredient prices by Drs. Tokach, DeRouchey, and Goodband
- 3:00 p.m – How retailers are changing the Australian Swine Industry by Dr. John Pluske

Recent K-State Research to aid decision making during rapidly changing feed cost

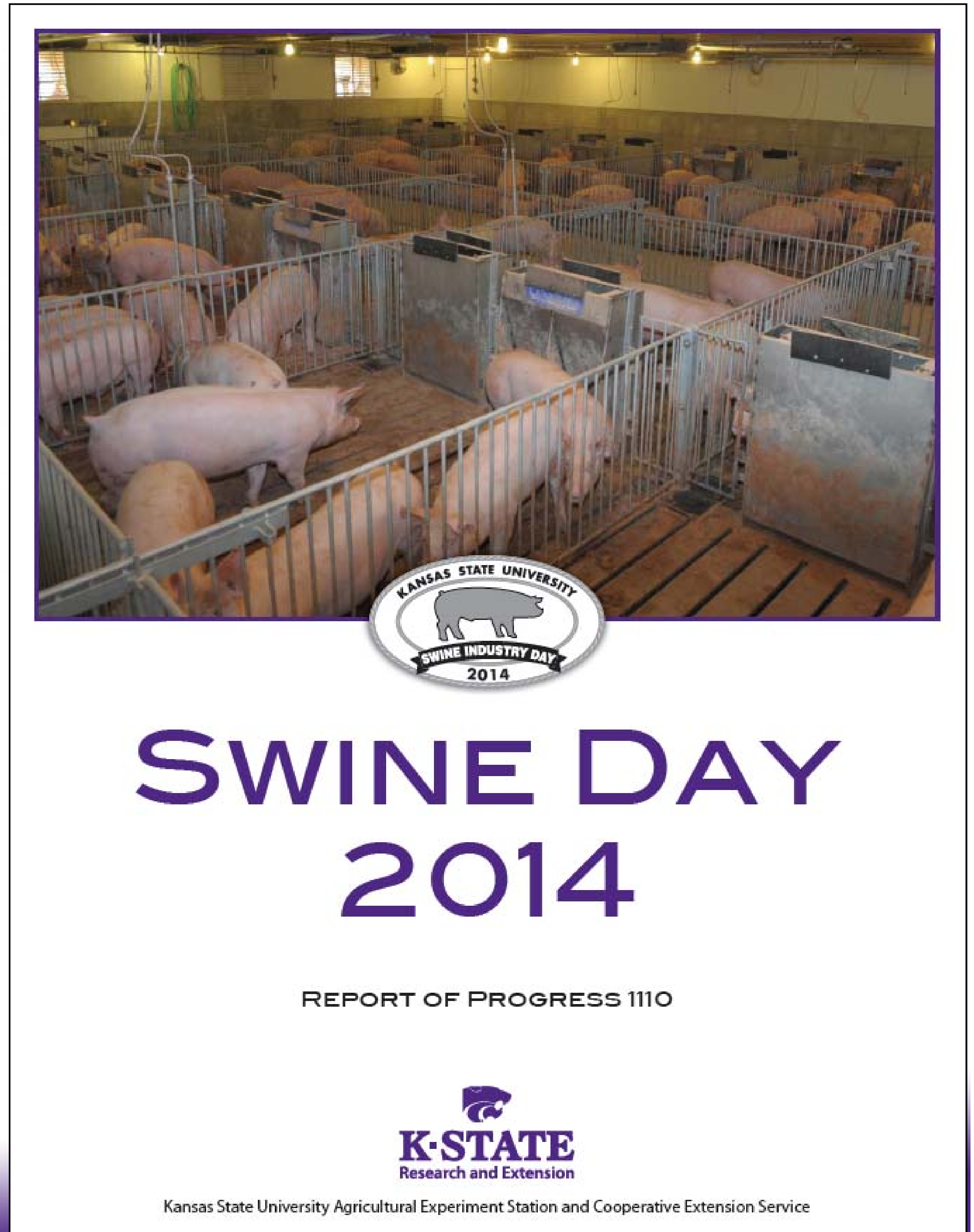
Recent K-State Research to aid decision making during rapidly changing feed cost

- The ones that do the work!

2014 Swine Day Report

available at:
www.KSUswine.org

- 32 papers
- 41 experiments
- 28,791 pigs



K-STATE
Research and Extension

KANSAS STATE UNIVERSITY

Search web, people, directories

Browse A-Z | Sign in

Animal Sciences and Industry

www.KSUswine.org

Swine Research and Extension

The Kansas State University Swine Extension program takes practical swine nutrition research and works with producers to facilitate rapid adoption of technology by the industry. The program also works with producers in the area of environmental management of swine facilities.

Swine Nutrition Resources

Nursery diet updates

- Diet options in response to PED concerns
- Premix & Diet Recommendations
- Swine Nutrition Guide, November 2007 Edition
- DDGS, Added Fat, and Amino Acid, Meat and B
- Feed Budget Calculators
- Feeder Adjustment Cards
- Gestation Feeding Tools
- Particle Size Information
- Marketing Tools
- Aflatoxin fact sheet

Premix updates

Swine Research Index

K-State swine research publications can b

Journal papers

http://krex.k-state.edu/dspace/

Peer Reviewed Publications

Abstracts

Journal Abstracts

Swine Podcasts

Podcasts

Swine Day Publications

Swine Day Presentations

Swine Day

Swine Day 2014 (pdf)

Quick Links

- Pork Information Gateway
- Kansas Pork Association
- National Pork Board (NPB)
- NPB trucker Quality Assurance
- NPB Pork Quality Assurance
- k Science
- and Meat Marketing
- Econ)
- con AgManager
- ed Efficiency
- n Science

Upcoming Events

2014 K-State Swine Industry Day, ber, 20, 2014

l Junior Swine Association al Leadership Conference ber 6, 2014

Emergency Preparedness for Livestock Operations: When Disaster Strikes
December 10 & 11, 2014

KSU Swine Profitability Conference
February 3, 2015

Kansas Junior Swine Producer Day
February 28, 2015

Swine Research Faculty

Dr. Duane L. Davis
Swine Reproductive Physiology

Dr. Joel DeRouchey
Swine nutrition & management

Dr. Steve Dritz

Dr. Robert D. Goodband
Swine nutrition & management

Dr. Joe D. Hancock
Monogastric Nutrition

Dr. Jim L. Nelssen
Swine nutrition & management

Dr. Mike Tokach
Swine nutrition

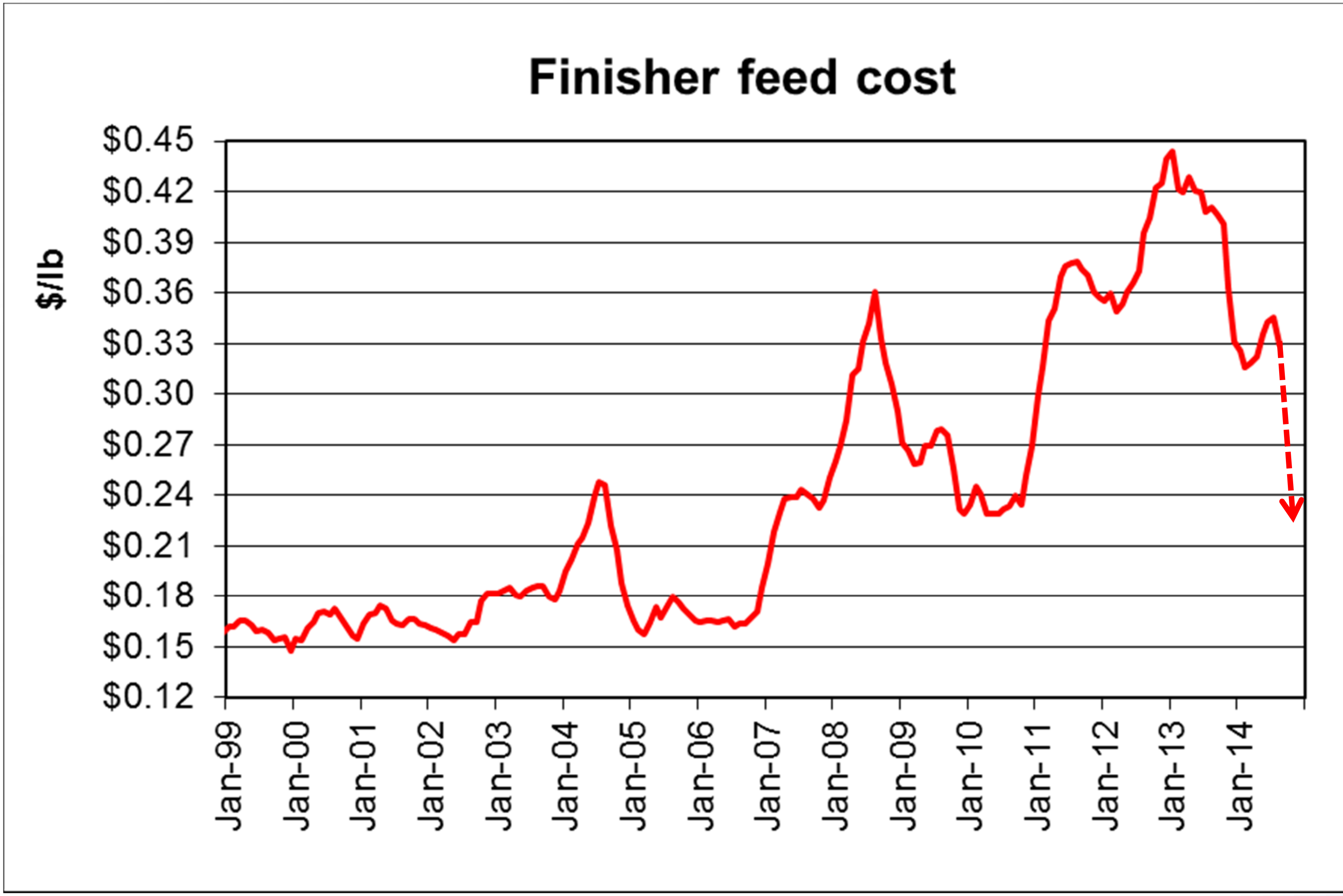
Dr. Jason Woodworth

Undergraduate research projects

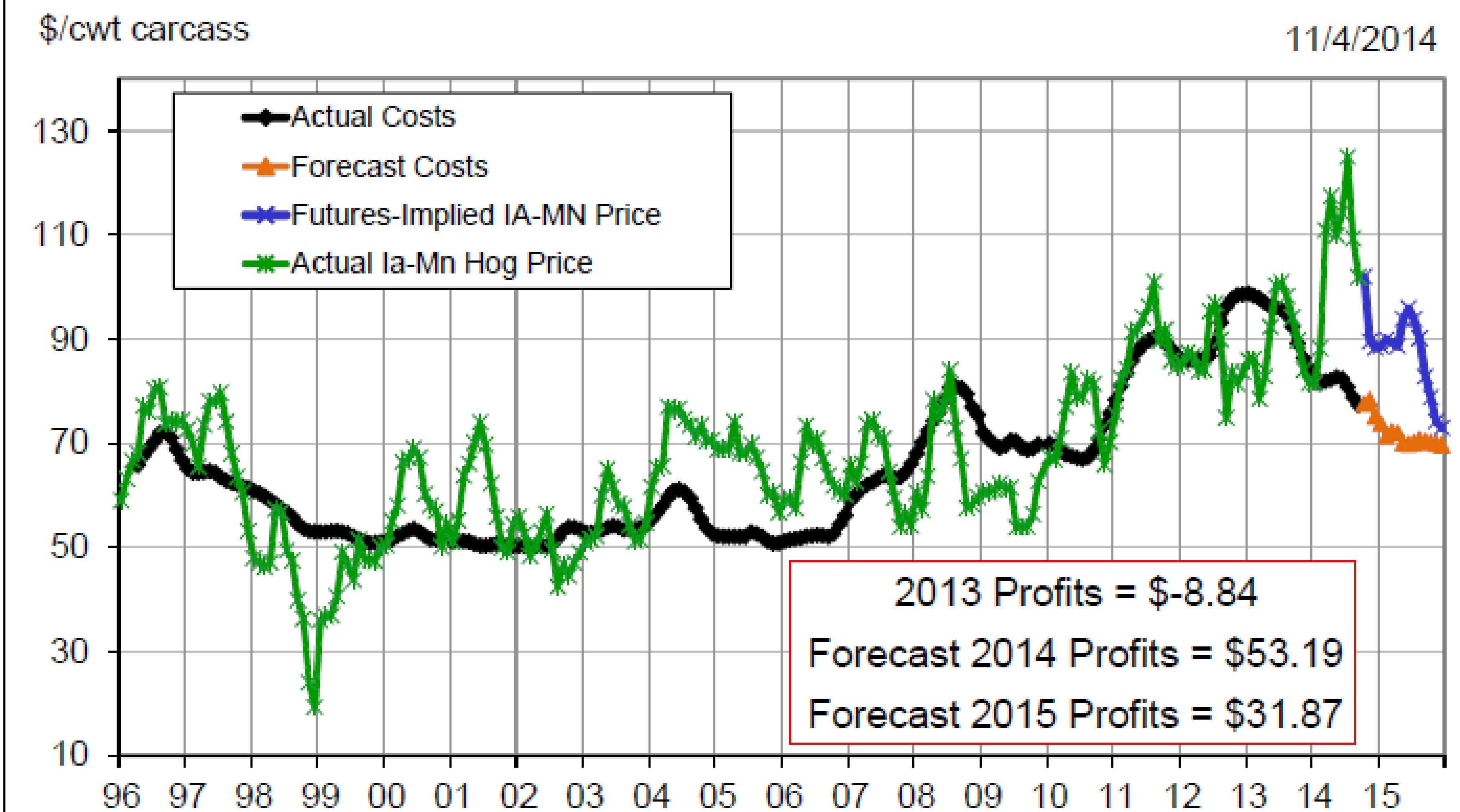
• Kiah Gourley	- Lactational estrous
• Jake Erceg	- Mycotoxins
• Annie Clark	- Pepsoygen
• Korinn Card	- EPI system
• Andrea Jeffries	- Soy proteins
• Suzy Fowler	- Mycotoxin binders
• Cheyanne Evans	- Nutrigold & bovine plasma
• Jacob Jacquez	- Late finishing amino acids

Congratulations!

- Undergraduate Student Achievements
  - Kia Gourley, Midwest ASAS 1st oral undergraduate competition and NPB Scholarship recipient
  - Jake Erceg, NPB scholarship recipient
  - Jared Mumm, NPB scholarship recipient
- Graduate Student Achievements
  - Chad Paulk, Midwest ASAS Young Scholar
  - Hyatt Frobose, 1st place Ph.D. oral abstract
  - Kyle Coble, 2nd place Ph.D. oral abstract and Pinnacle Award winner from International Ingredients Inc.
  - Marcio Gonclaves, Pinnacle Award winner from International Ingredients Inc.


Finisher feed cost
$/lb
$0.45
$0.42
$0.39
$0.36
$0.33
$0.30
$0.27
$0.24
$0.21
$0.18
$0.15
$0.12
Jan-99
Jan-00
Jan-01
Jan-02
Jan-03
Jan-04
Jan-05
Jan-06
Jan-07
Jan-08
Jan-09
Jan-10
Jan-11
Jan-12
Jan-13
Jan-14

HOG PRODUCTION COSTS* AND PRICES



*Based on relationsip between ISU Estimated Costs & Returns data and historic Omaha corn and Decatur soybean meal prices

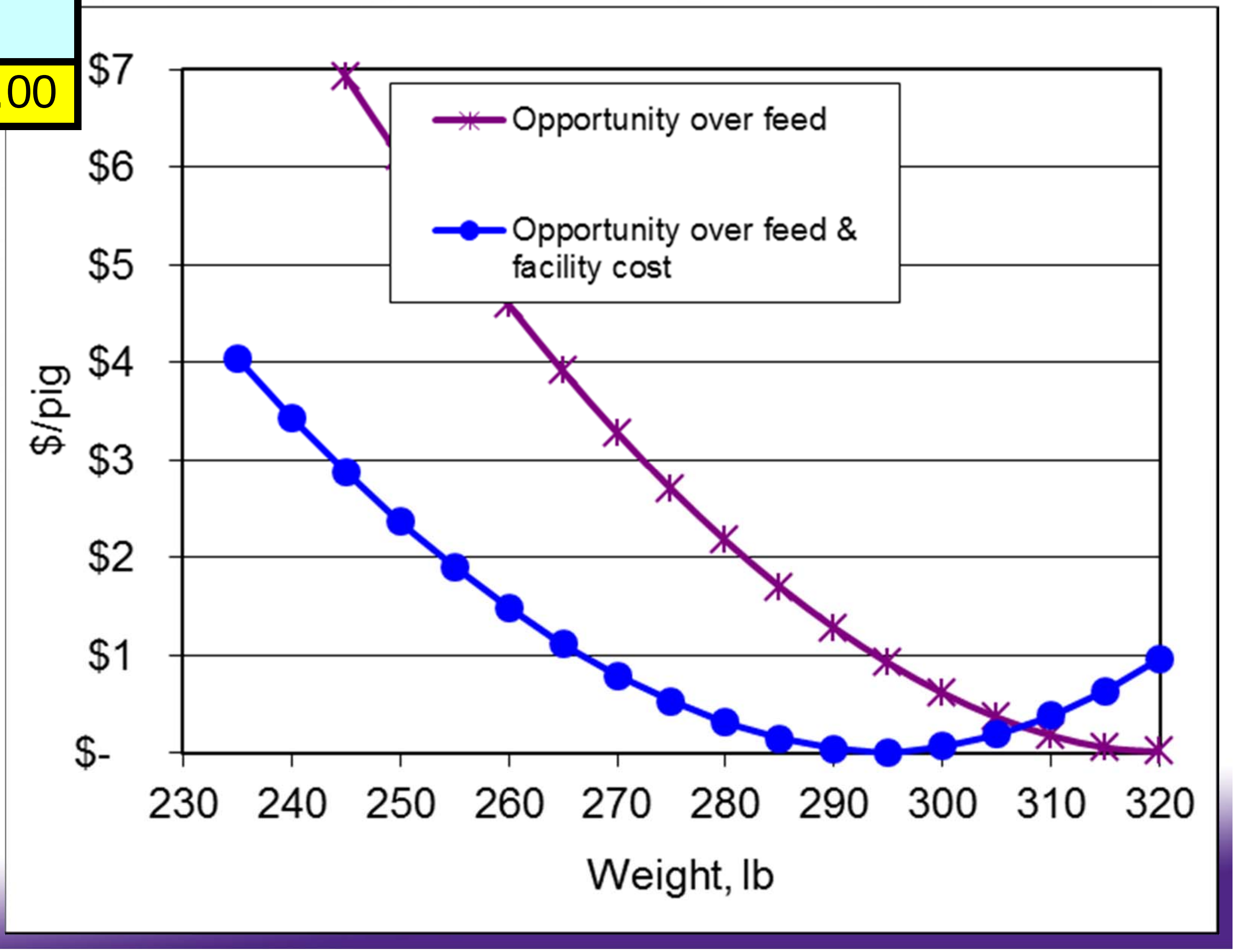
K·STATE Research and Extension

Source: DLR 11-4-2014

Knowledge for Life

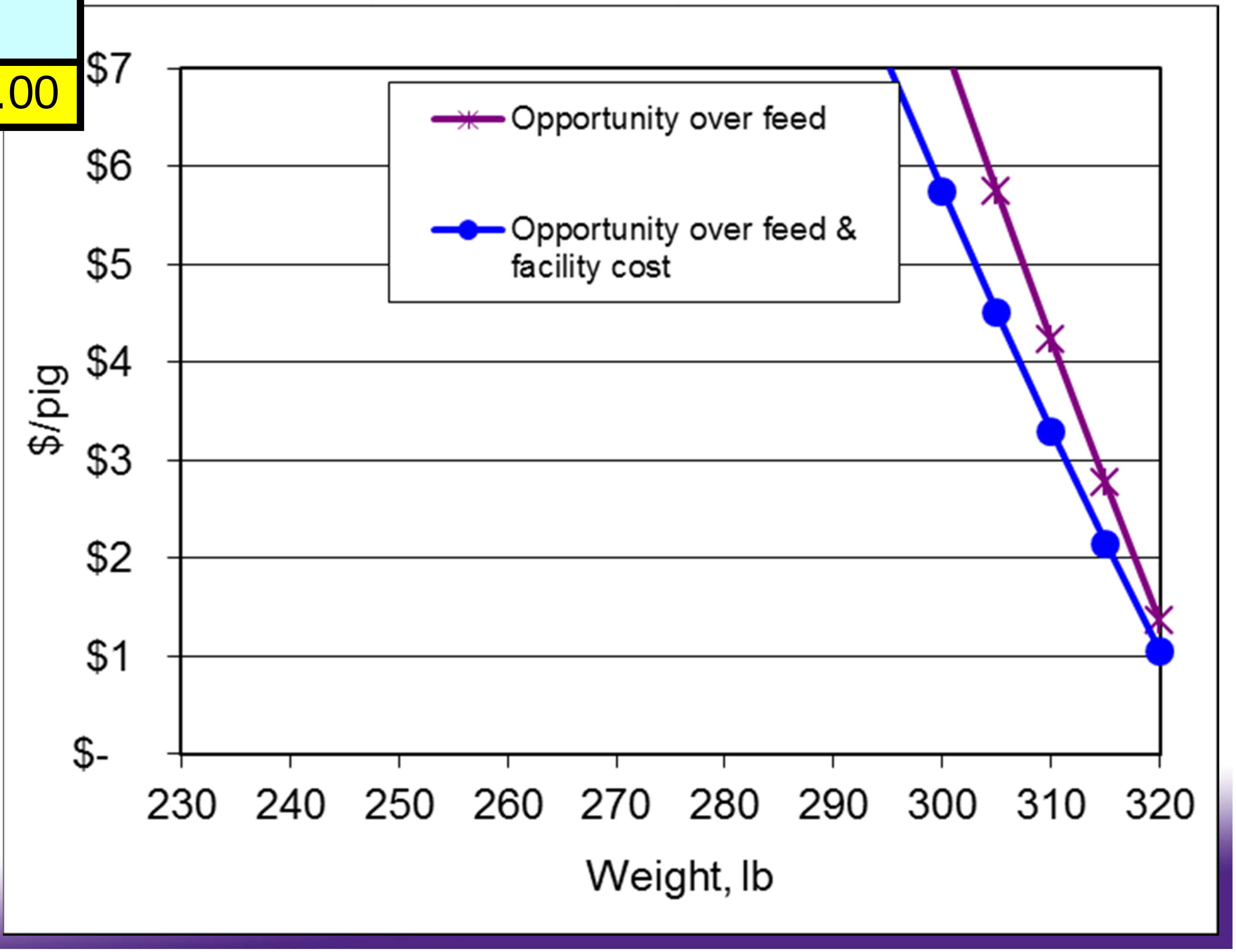
Triumph barn dump contract

Carcass base, $/cwt	Feed cost $/ton
$ 90.00	$ 300.00



Triumph barn dump contract

Carcass base, $/cwt	Feed cost $/ton
$ 90.00	$ 170.00



K·STATE
Research and Extension

Continue to focus on feed cost

- DDGS
- Amino acids
- Fat
- Avoid adding additives that don't provide benefit
  - Some additives do provide benefit
- Don't forget feed processing
- Rethink practices that cost money

K-State DDGS Calculator (Variable DDGS Energy)

Calculator attempts to consider economic return per pig from change in diet cost, feed efficiency, and growth rate. It does not account for any economic impact on yield or iodine value.

Corn, $/bu	$ 3.50	$ 151.79
SBM, $/ton	$ 400.00	
Monocal, $/ton	$ 600.00	
Limestone, $/ton	$ 36.20	
Lysine HCl, $/lb	$ 1.30	
DL-Met, $/lb	$ 3.50	
L-Threonine, $/lb	$ 2.50	
DDGS, $/ton	$ 115.00	

76% =DDGS to Corn price ratio

Use fat to equalize energy	No
Include L-Trp in diets?	Yes
Energy as % of corn or oil content	Oil, %
DDGS oil content, %	8.0%
Value of pig gain, $/lb	$ 0.70
Fat, $/lb	$ 0.30
L-Trp, $/lb	$ 13.50

DDGS N

Start weight, lb	**50**	**75**	**125**	**170**	**210**	**246**	
End weight, lb	**75**	**125**	**170**	**210**	**246**	**280**	
DDGS maximum value	**F1**	**F2**	**F3**	**F4**	**F5**	**F6**	**Total**
DDGS % at max savings	**40**	**40**	**40**	**40**	**40**	**40**	
Max savings, $/pig	**$0.73**	**$1.66**	**$1.57**	**$1.49**	**$1.44**	**$1.43**	**$8.32**
DDGS levels chosen	**30%**	**30%**	**30%**	**30%**	**25%**	**0%**	
- Savings, $/pig	**$0.55**	**$1.26**	**$1.26**	**$1.21**	**$1.00**	**$0.00**	**$5.29**

K-STATE Research and Extension

Knowledge for Life

K-State DDGS Calculator (Variable DDGS Energy)

Calculator attempts to consider economic return per pig from change in diet cost, feed efficiency, and growth rate. It does not account for any economic impact on yield or iodine value.

Corn, $/bu	$ 3.50	$ 151.79
SBM, $/ton	$ 400.00	
Monocal, $/ton	$ 600.00	
Limestone, $/ton	$ 36.20	
Lysine HCl, $/lb	$ 1.30	
DL-Met, $/lb	$ 3.50	
L-Threonine, $/lb	$ 2.50	
DDGS, $/ton	$ 115.00	

76% =DDGS to Corn price ratio

Use fat to equalize energy	No
Include L-Trp in diets?	No
Energy as % of corn or oil content	Oil, %
DDGS oil content, %	8.0%
Value of pig gain, $/lb	$ 0.70
Fat, $/lb	$ 0.30
L-Trp, $/lb	$ 13.50

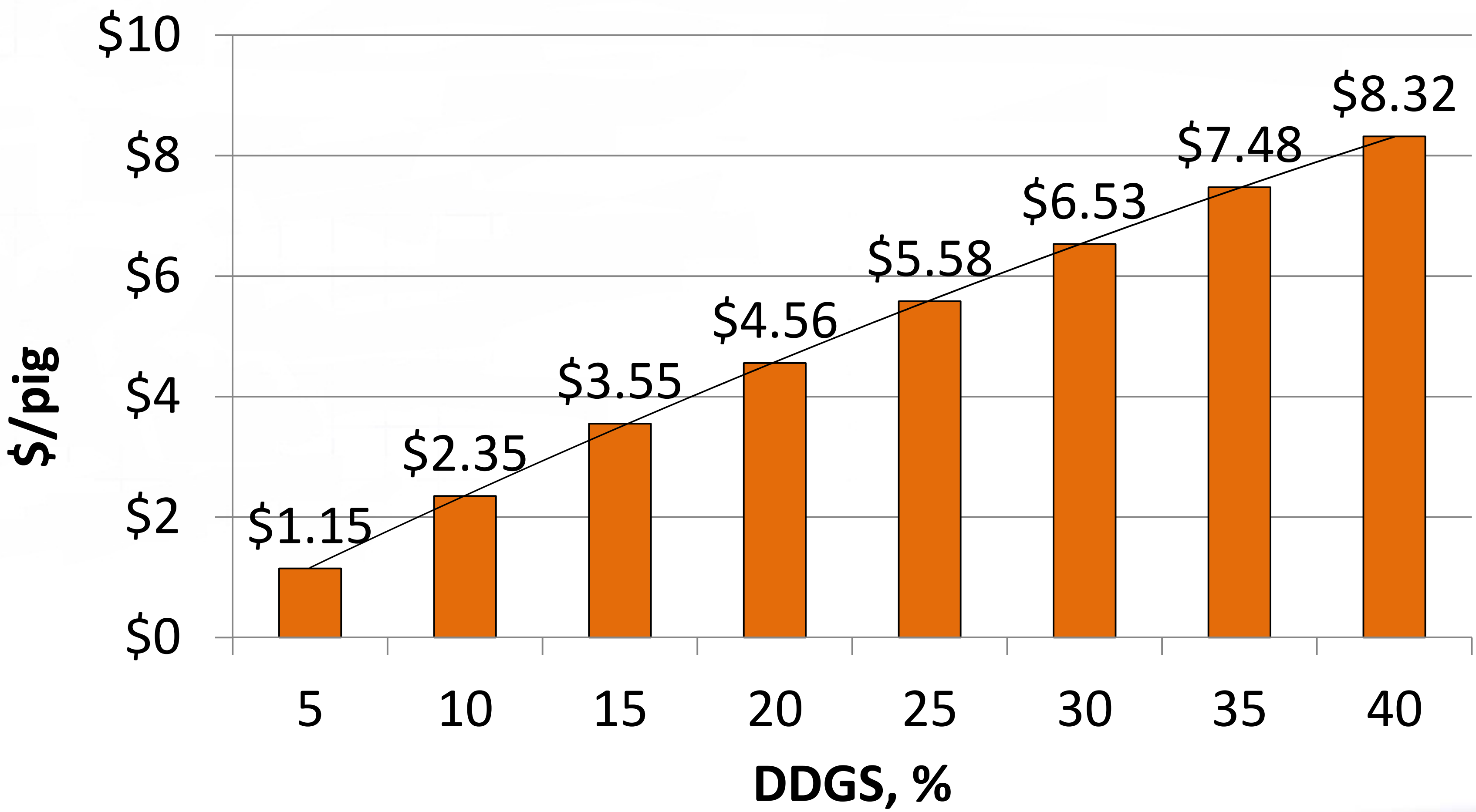
DDGS

Start weight, lb	**50**	**75**	**125**	**170**	**210**	**246**	
End weight, lb	**75**	**125**	**170**	**210**	**246**	**280**	
DDGS maximum value	**F1**	**F2**	**F3**	**F4**	**F5**	**F6**	**Total**
DDGS % at max savings	**40**	**40**	**40**	**40**	**40**	**40**	
Max savings, $/pig	**$0.73**	**$1.47**	**$1.35**	**$1.30**	**$1.28**	**$1.36**	**$7.49**
DDGS levels chosen	**30%**	**30%**	**30%**	**30%**	**25%**	**0%**	
- Savings, $/pig	**$0.63**	**$1.23**	**$1.09**	**$1.04**	**$0.88**	**$0.00**	**$4.87**

K-STATE Research and Extension

Knowledge for Life

Incremental "potential" savings with DDGS 11-17-2014

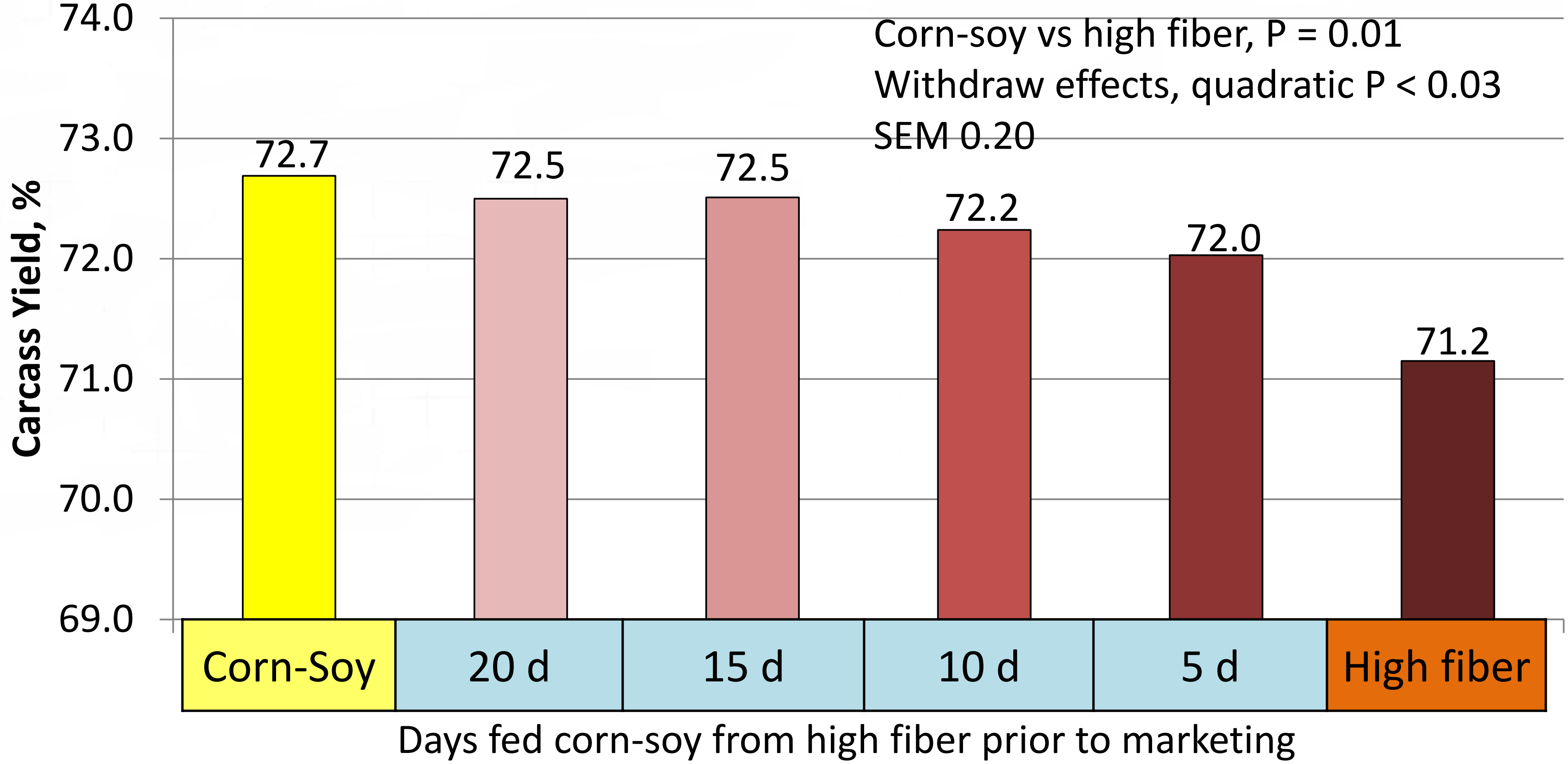


K-STATE Research and Extension

Knowledge for Life

Effect of DDGS (30%) and Midds (19%) at varied withdraw times prior to slaughter

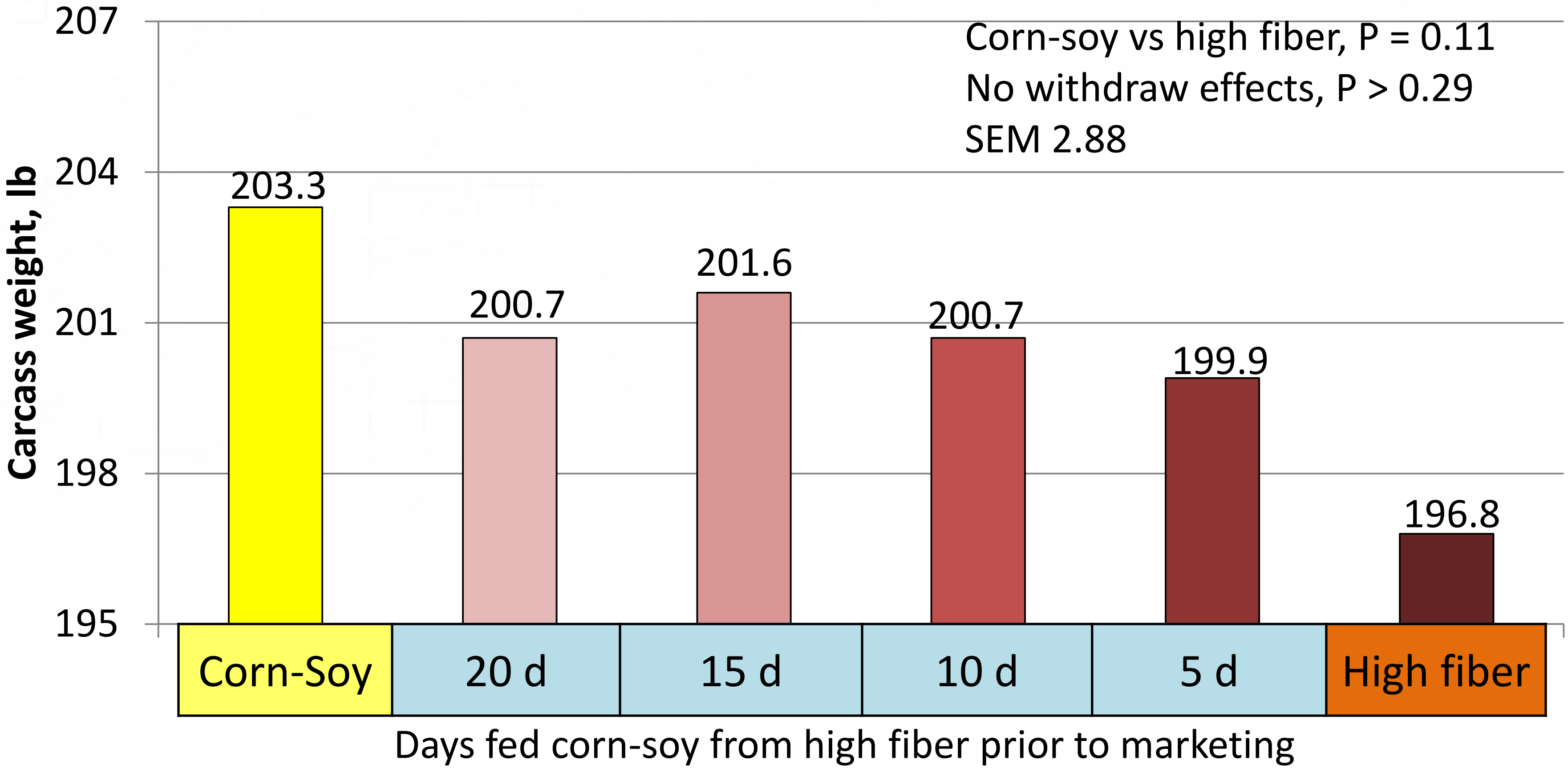
Exp. 1



Coble et al., 2013

Effect of DDGS (30%) and Midds (19%) at varied withdraw times prior to slaughter

Exp. 1



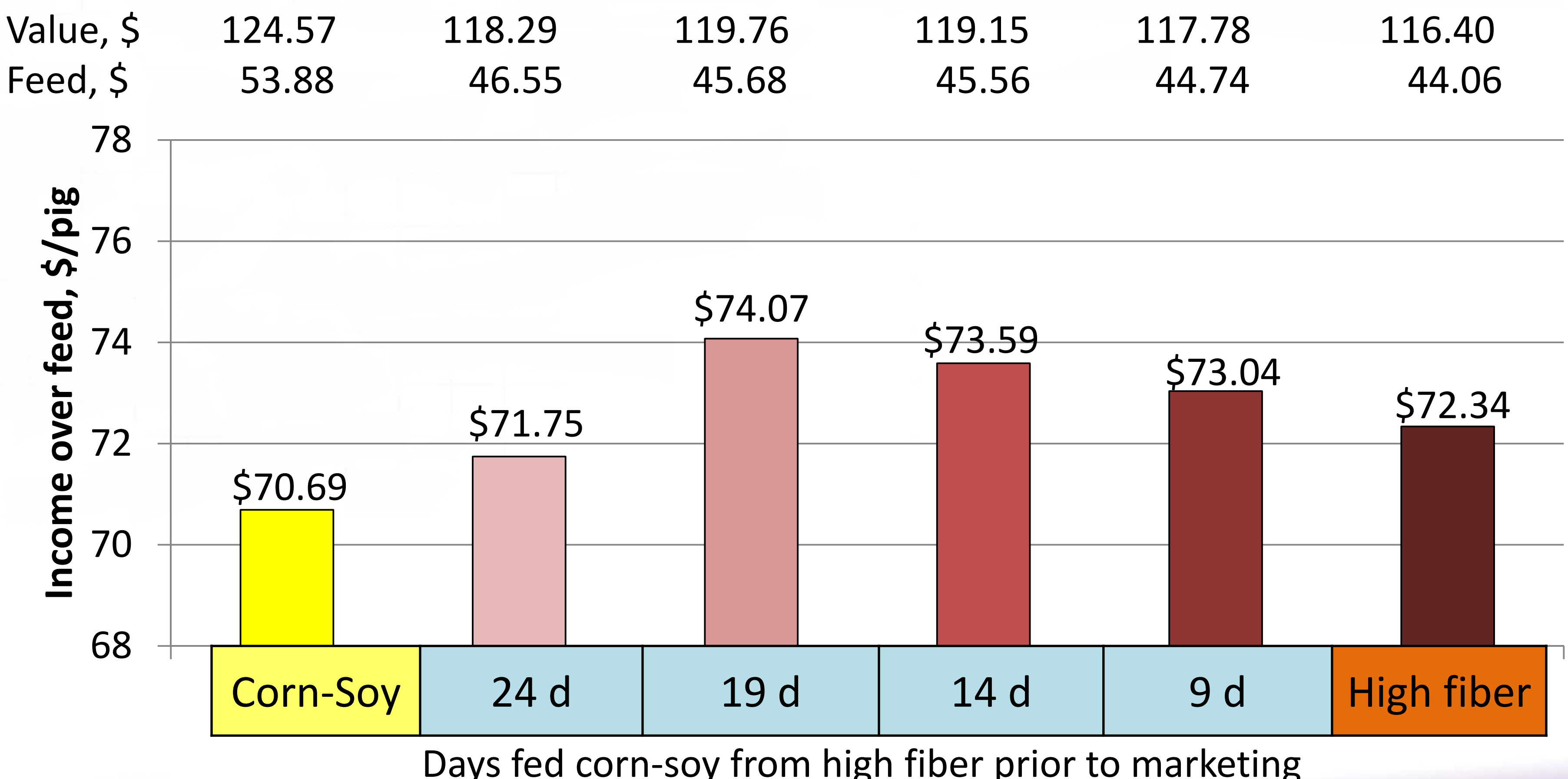
K·STATE Research and Extension

Coble et al., 2013

Knowledge for Life

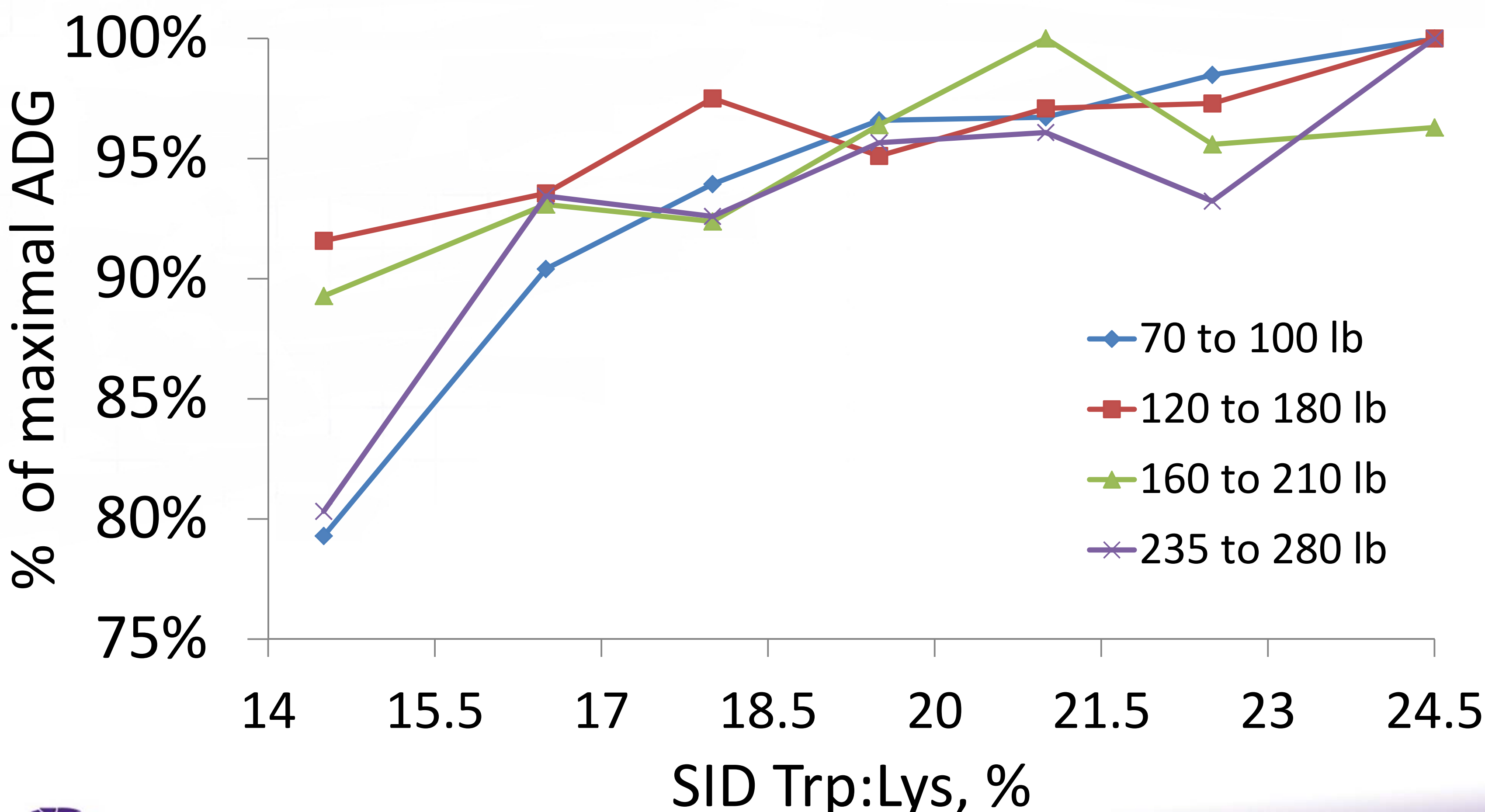
Effect of DDGS (30%) and Midds (19%) at varied withdraw times prior to slaughter

Exp. 2 (Nov 17, 2014 prices)



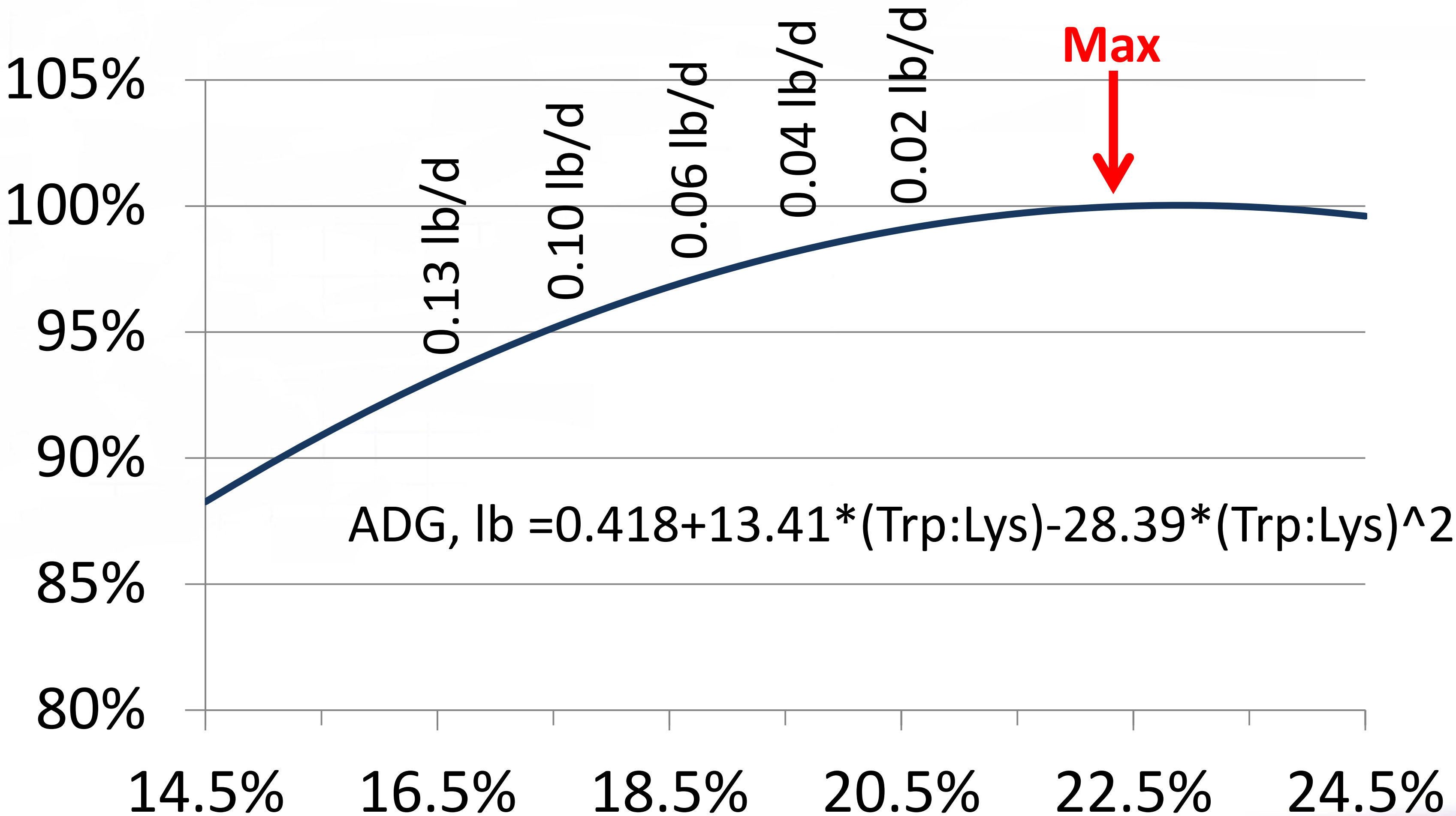
Coble et al., 2013

Influence of SID Trp:Lys ratio on ADG



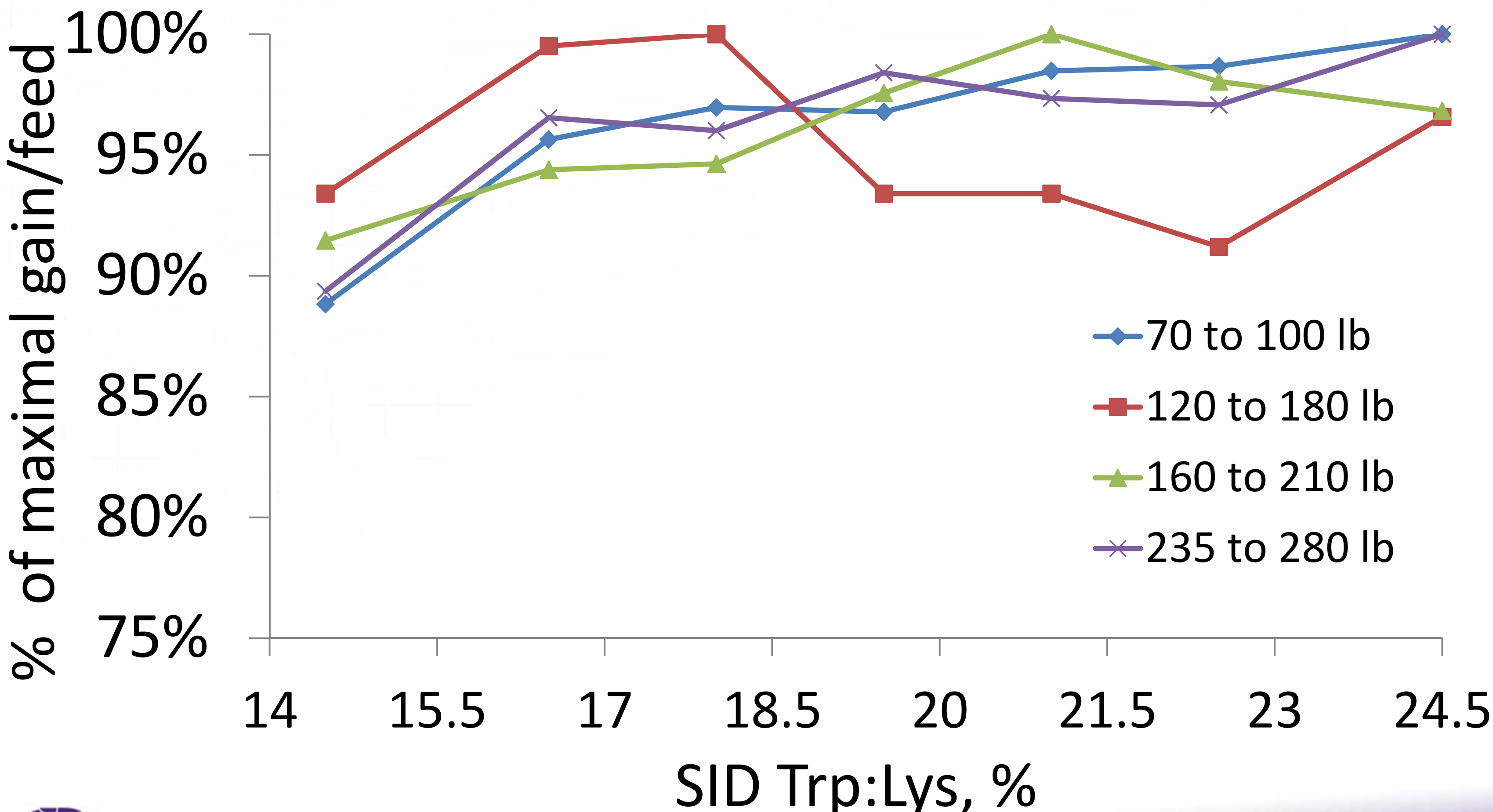
Goncalves et al., 2014

Trp:Lys ratio as a percentage of maximum ADG
Summary of all 4 GF trials



Goncalves et al., 2014

Influence of SID Trp:Lys ratio on F/G

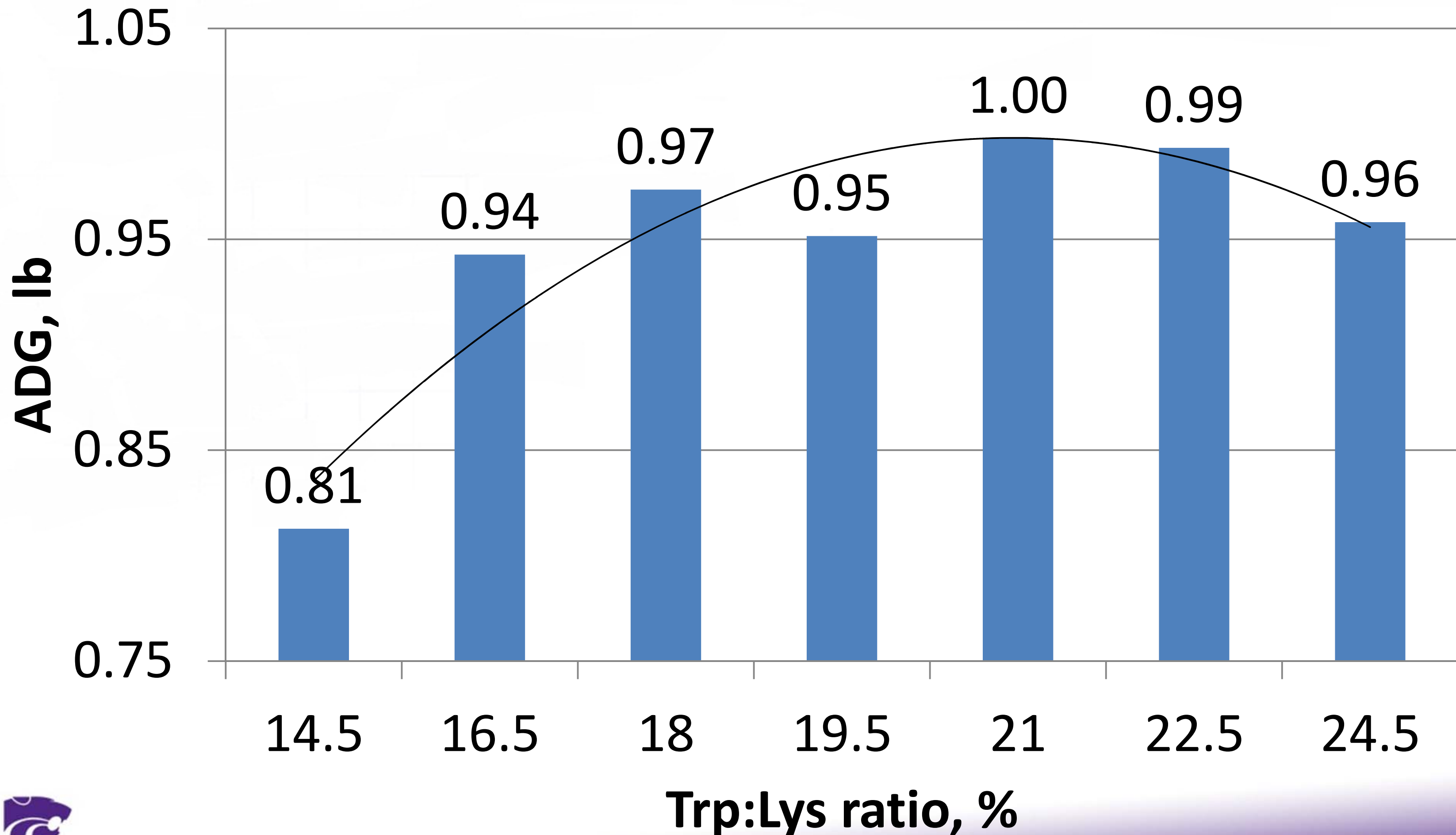


Goncalves et al., 2014

K·STATE Research and Extension

Knowledge for Life

Influence of Trp:Lys ratio on ADG of nursery pigs from 24 to 49 lb

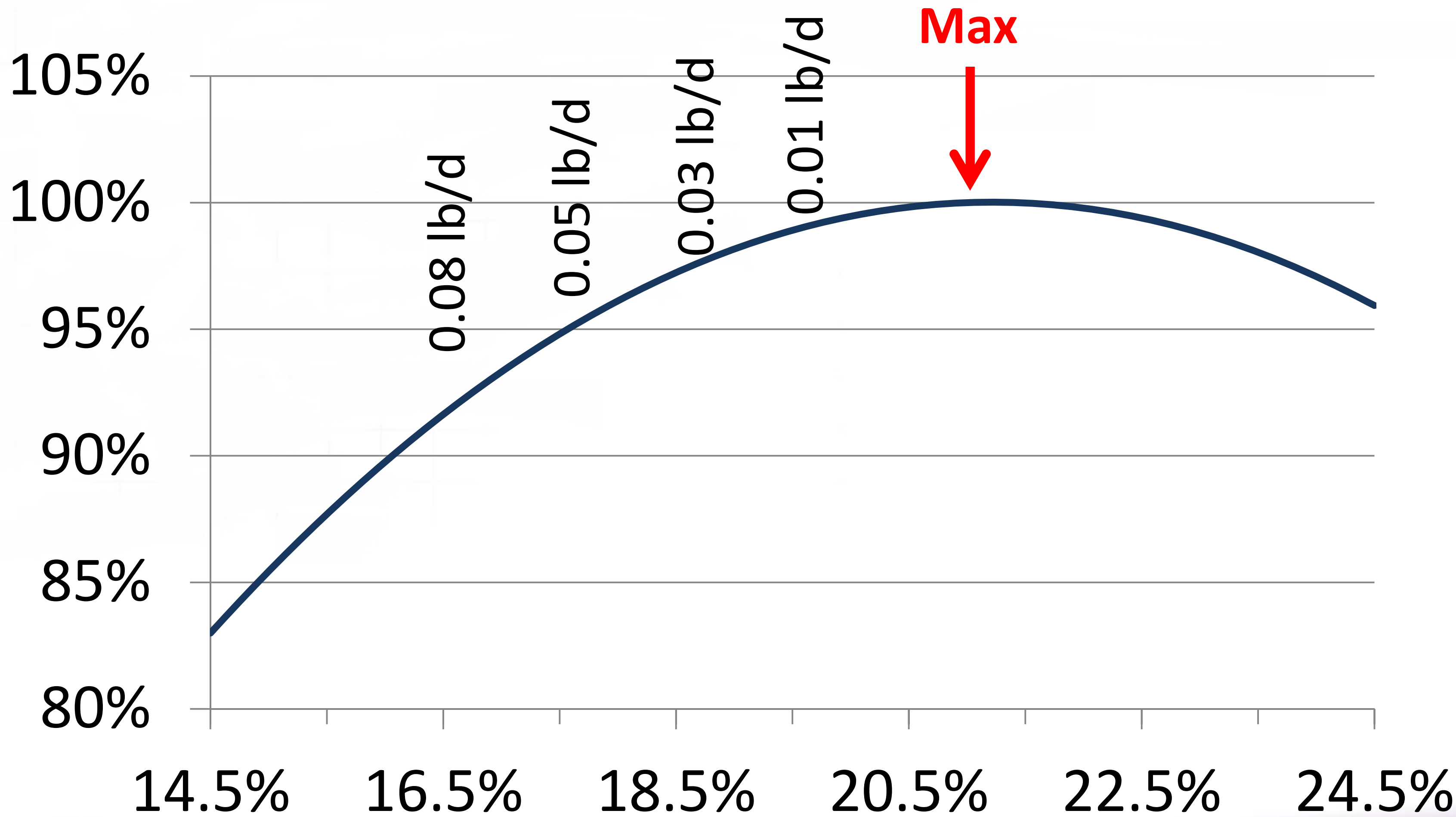


Goncalves et al., 2014

K·STATE Research and Extension

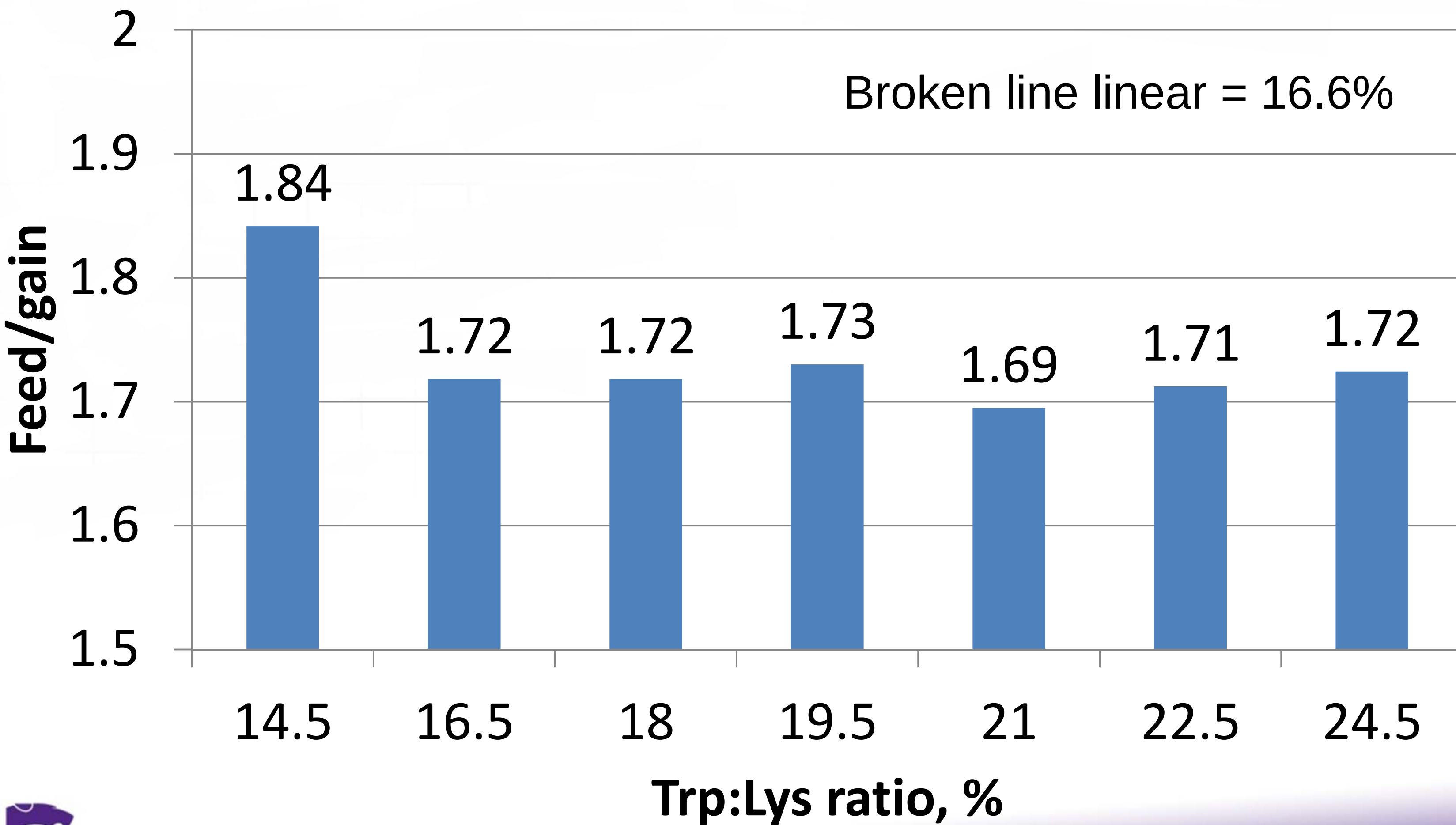
Knowledge for Life

Trp:Lys ratio as a percentage of maximum ADG
Regression analysis of nursery trial



Goncalves et al., 2014

Influence of Trp:Lys ratio on F/G of nursery pigs from 24 to 49 lb



Goncalves et al., 2014

K-STATE Research and Extension

Knowledge for Life

Continue to focus on feed cost

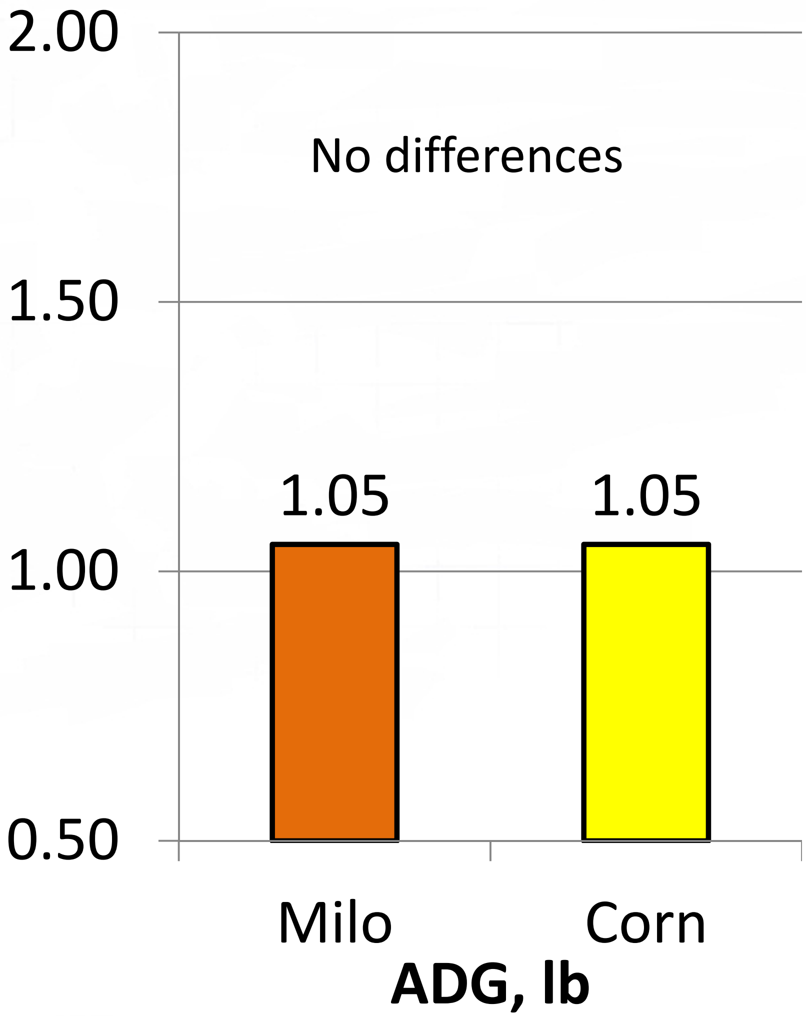
✓ DDGS

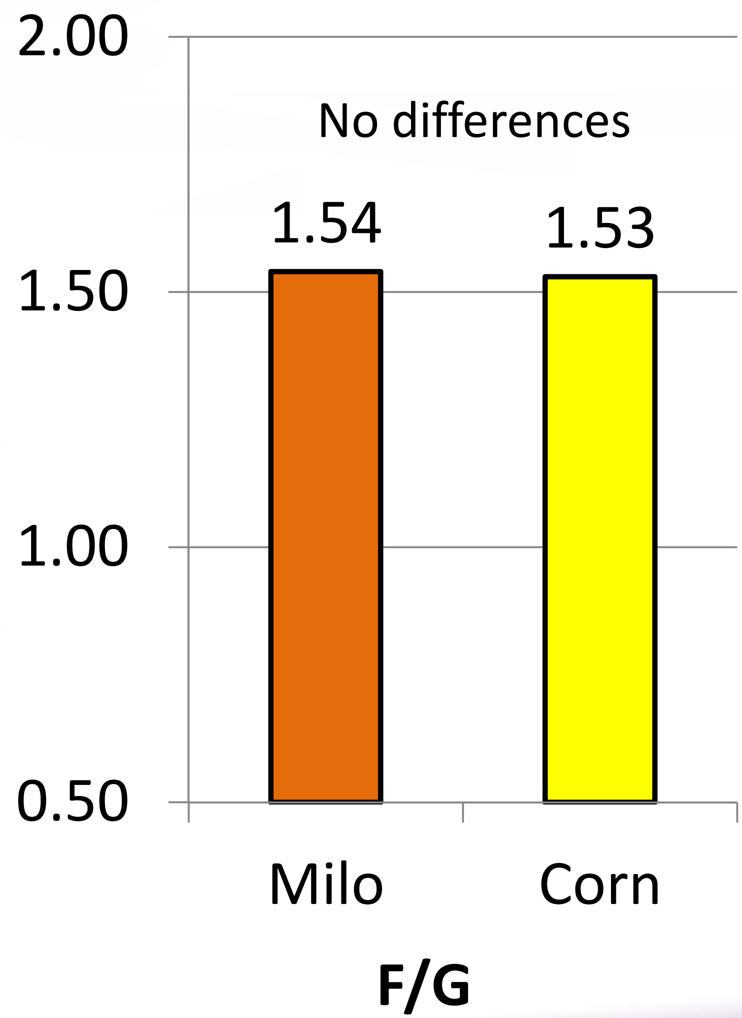
- Amino acids - Good News, Bad News
- Fat – Offers some savings
- Avoid adding additives that don't provide benefit
  - Some additives do provide benefit
- Don't forget feed processing
- Rethink practices that cost money

Low-protein, Amino Acid Diets with Corn or Milo
A Good News Bad News Story

- 25 to 50 lb and 100 to 290 lb pigs
- 2 × 3 factorials:
  - **Milo vs. corn**
  - Amino acid supplementation (low, medium, or high).
- **Low amino acids:** L-lysine HCl and DL-methionine.
- **Medium amino acids:** L-lysine HCl, DL-methionine, and L-threonine
- **High amino acids:** L-lysine HCl, DL-methionine, L-threonine, and L-valine.

Effect of Grain Source on Average Daily Gain and Feed Efficiency – 25 to 50 lb Pigs



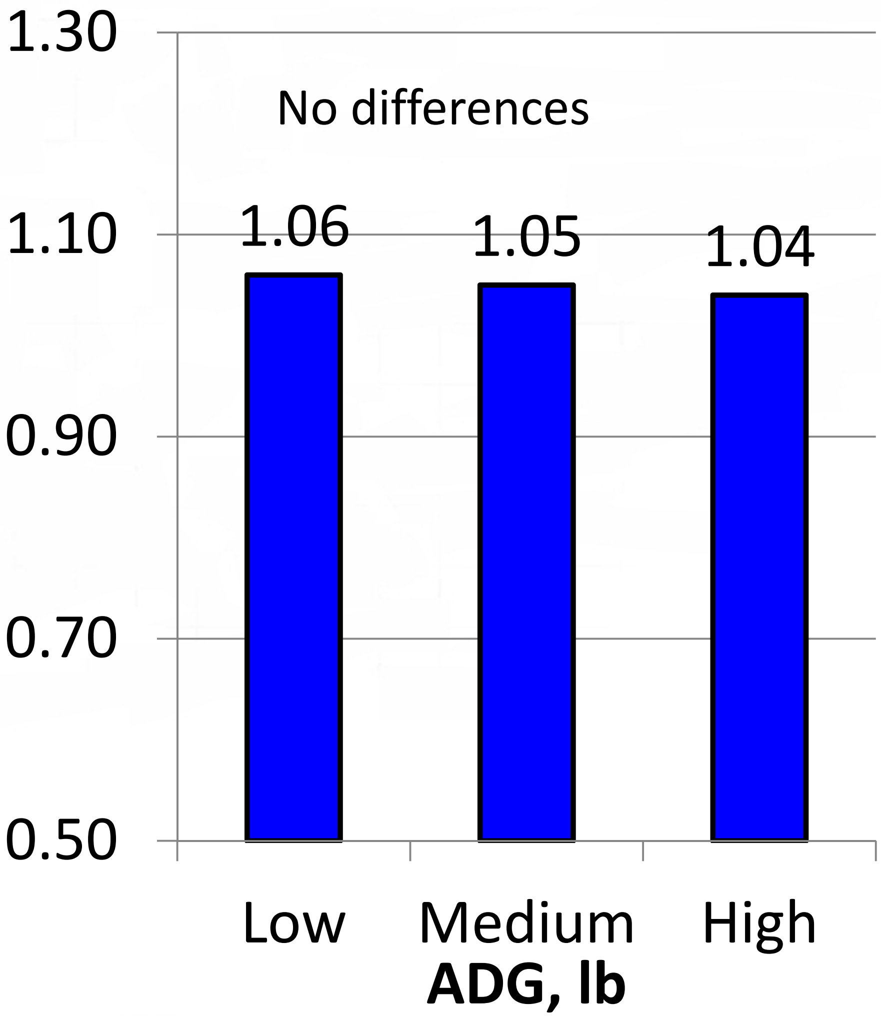


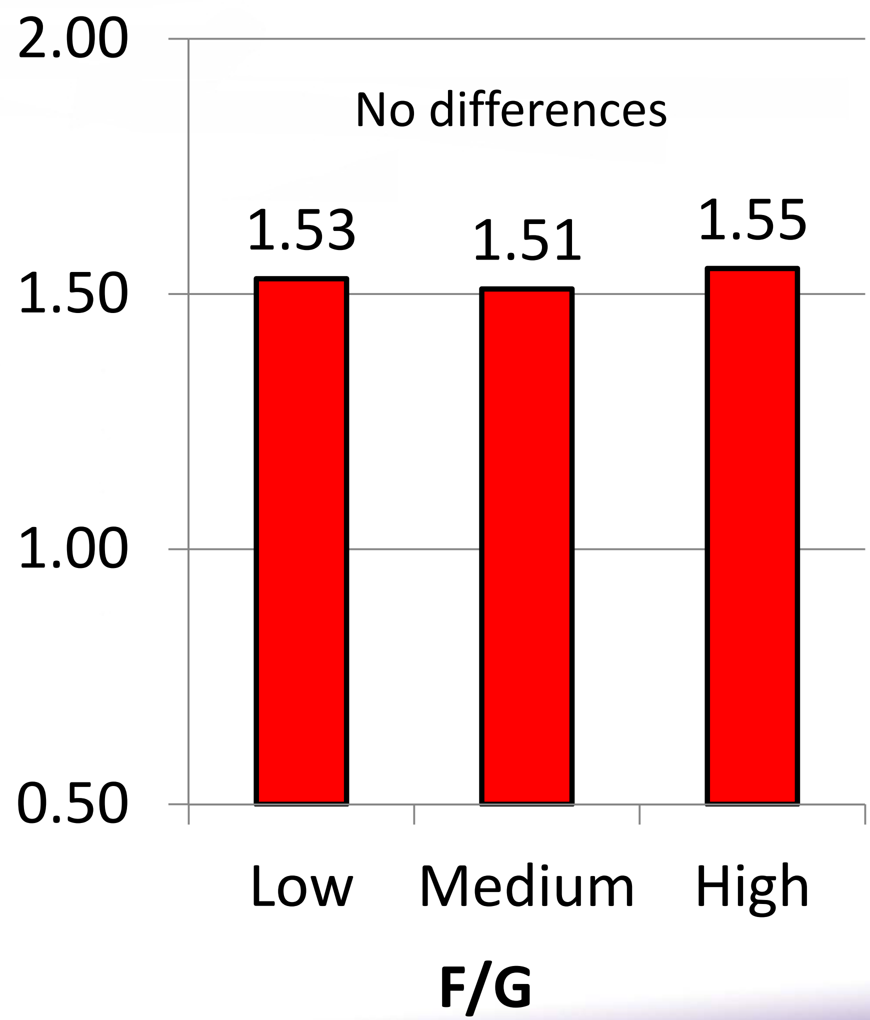
K-STATE Research and Extension

Jordan et al., 2014

Knowledge for Life

Effect of Amino Acid Supplementation on Average Daily Gain and Feed Efficiency – 25 to 50 lb Pigs



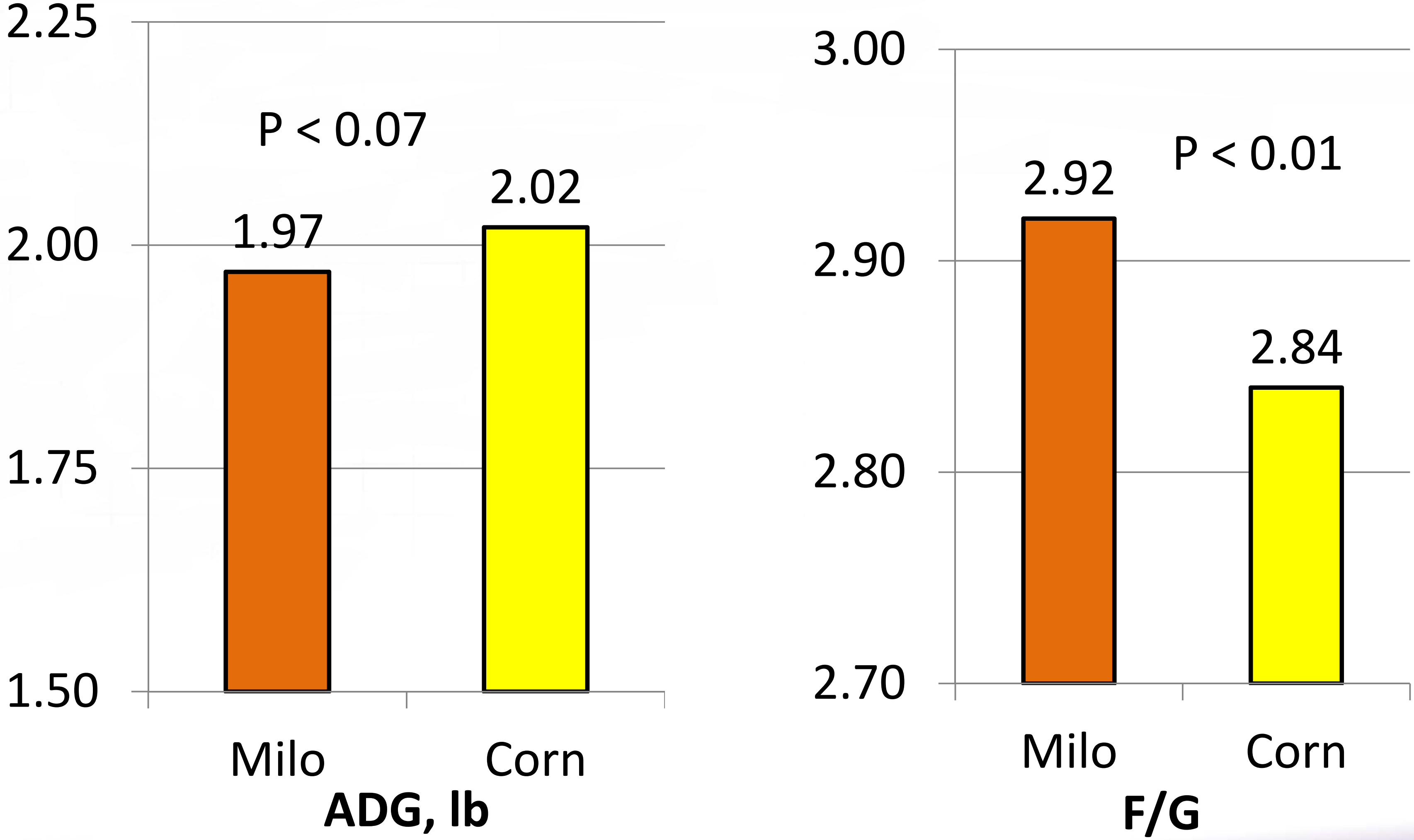


K·STATE Research and Extension

Jordan et al., 2014

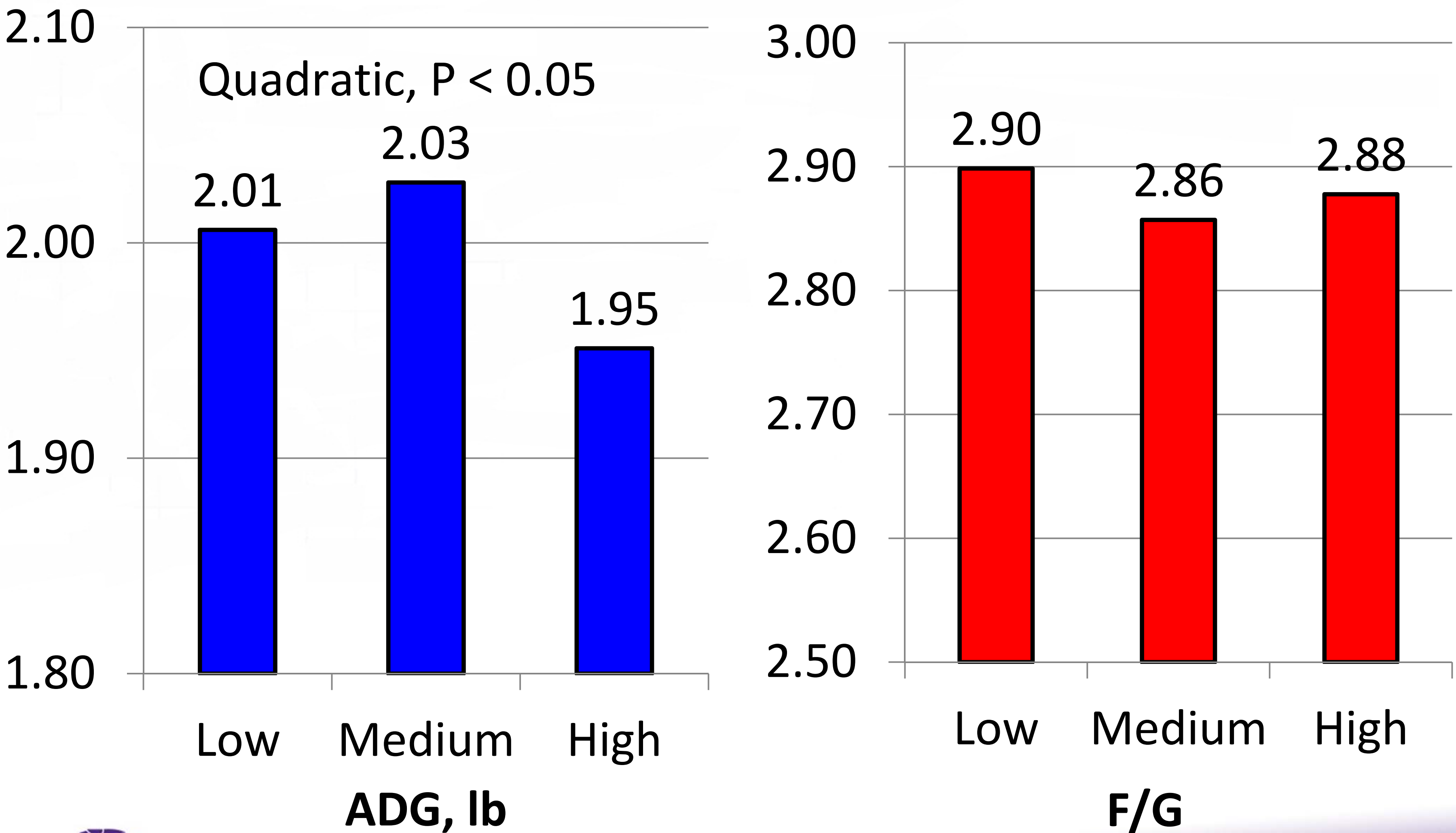
Knowledge for Life

Effect of Grain Source on Average Daily Gain and Feed Efficiency – 100 to 290 lb Pigs



Jordan et al., 2014

Effect of Amino Acid Supplementation on Average Daily Gain and Feed Efficiency – 100 to 290 lb Pigs

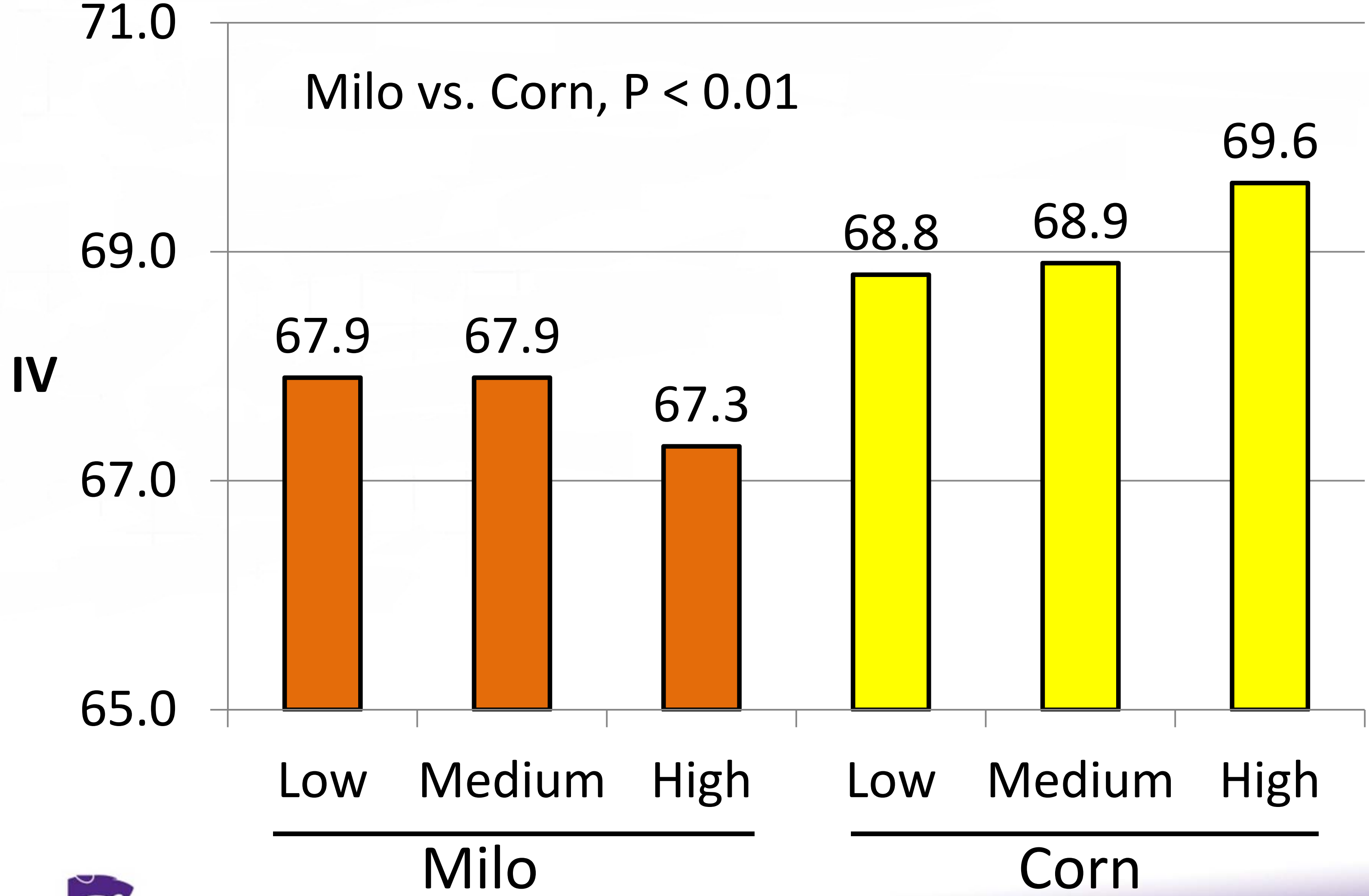


K·STATE Research and Extension

Jordan et al., 2014

Knowledge for Life

Effect of Amino Acid Supplementation on Iodine Value – 100 to 290 lb Pigs



Jordan et al., 2014

Amino Acids

	Price, $	
Corn	3.5	$/bu
Soybean meal	420	$/ton
L-Lysine	1.2	$/lb
DL-Methionine	3.5	$/lb
L-Threonine	2.5	$/lb

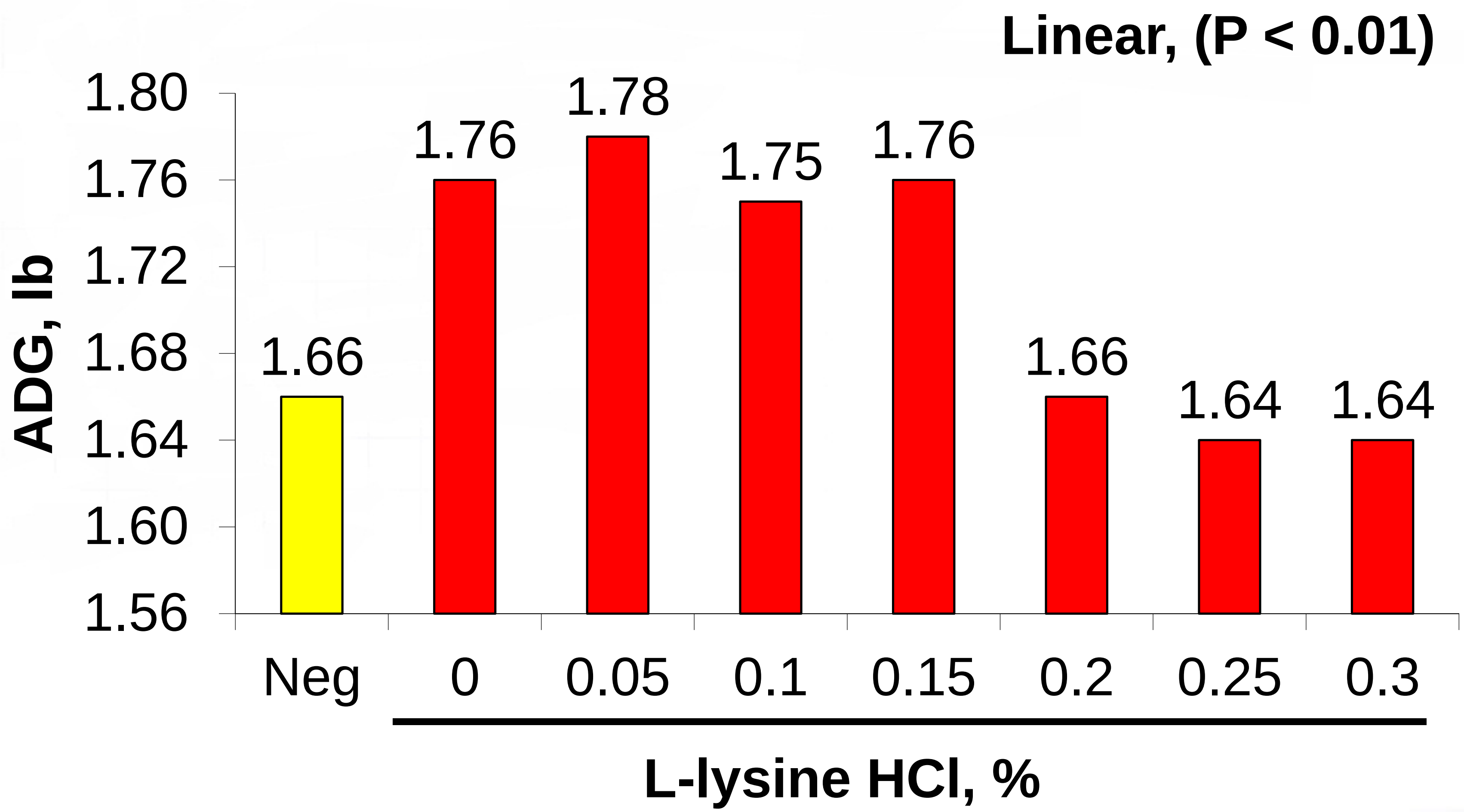
Savings per pig with AA fortified diet, $	$ 0.86

Even though crystalline amino acids can save money, its their availability that is the issue!

Amino Acid Shortages

- L-lysine HCl – shortage of HCl due to oil industry
- DL-methionine - shortage of precursors in manufacturing process
- L-threonine – economic situation for manufacturing
  - » China
- Options – corn-soybean meal with some L-lysine
- DDGS-based diets do not need much Methionine or Threonine
- Save amino acids currently on hand for starter diets

Effects of Increasing L-lysine HCl on Finishing Pig Growth Performance

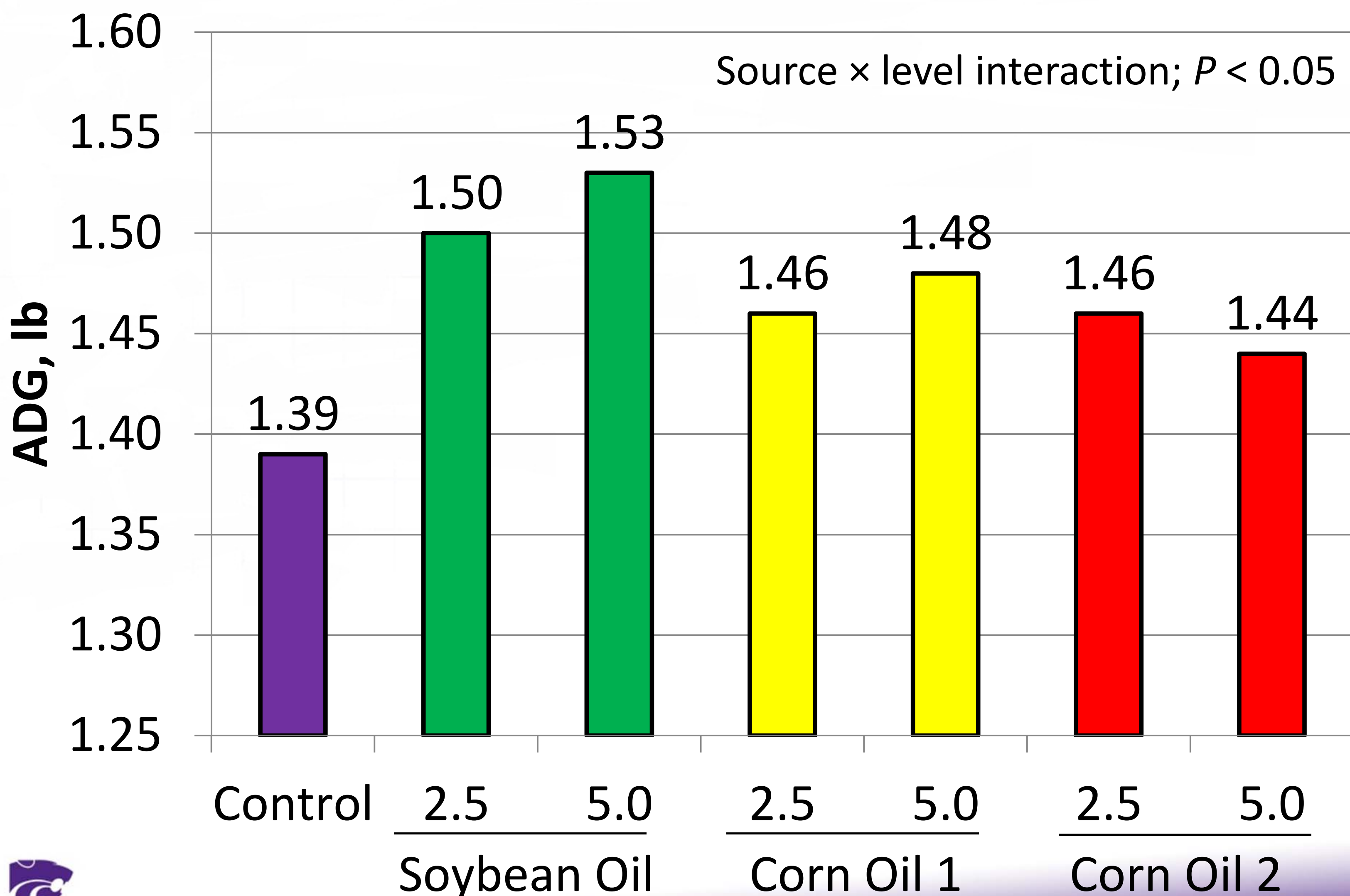


De La Llatta, et al., 2000

Economics of Added Fat in Finishing Diets

- Depends on grain and fat prices
  - Corn $3.50
    - Fat $.33 = $.66 loss
    - Fat $.30 = Breakeven
    - Fat $.27 = $.63 benefit

Comparison of Different Levels and Sources of Oil on Nursery Pig Performance

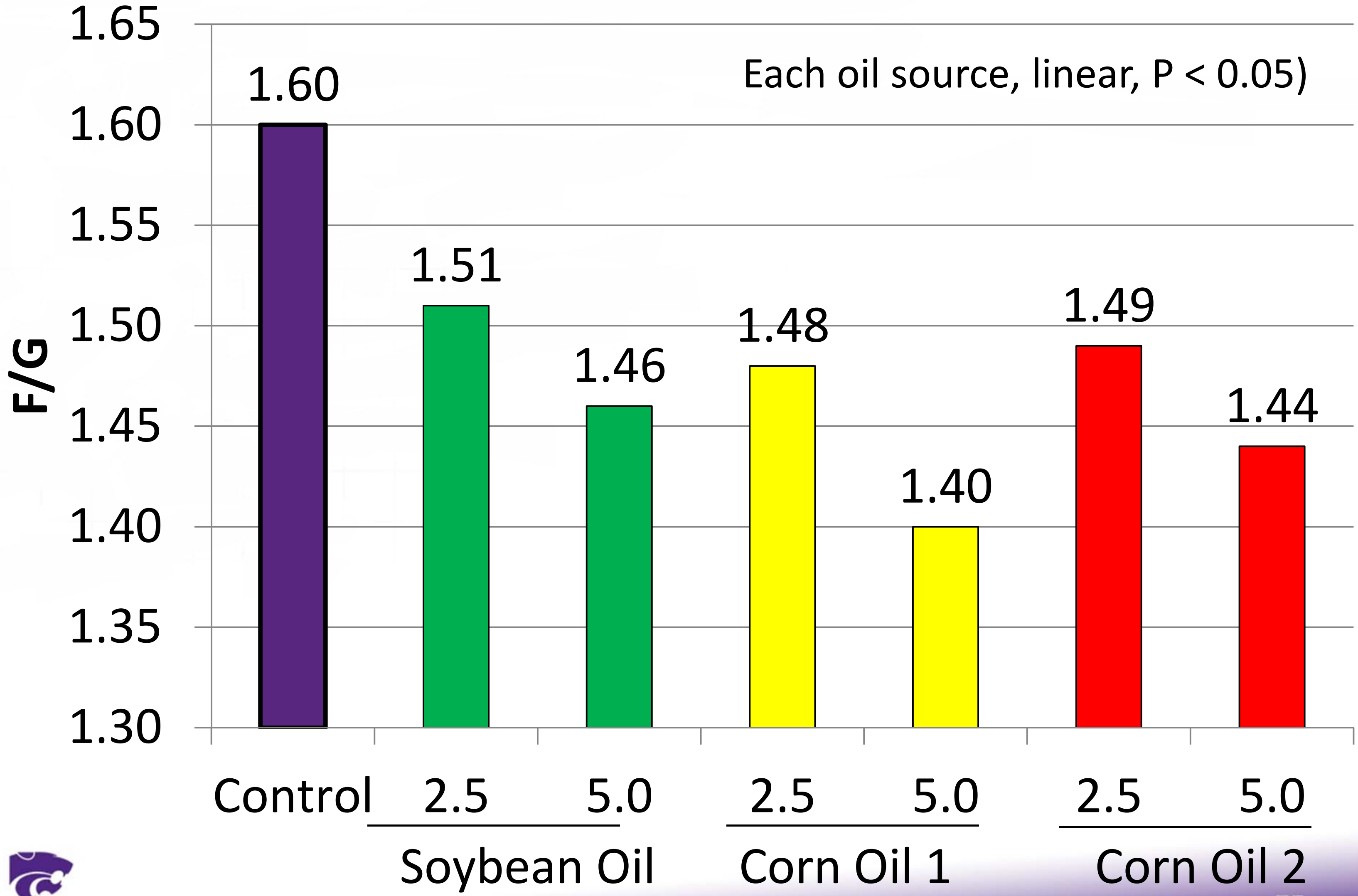


K·STATE Research and Extension

Knowledge for Life

Jordan et al., 2014

Comparison of Different Levels and Sources of Oil on Nursery Pig Performance

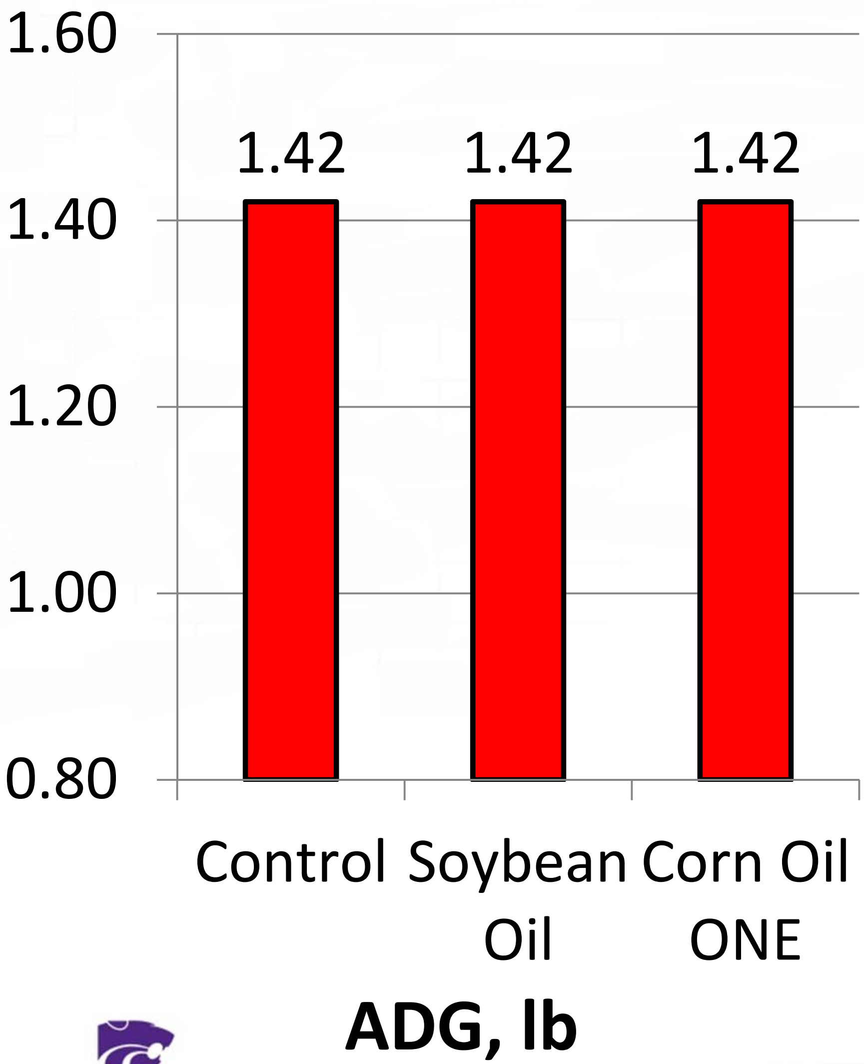


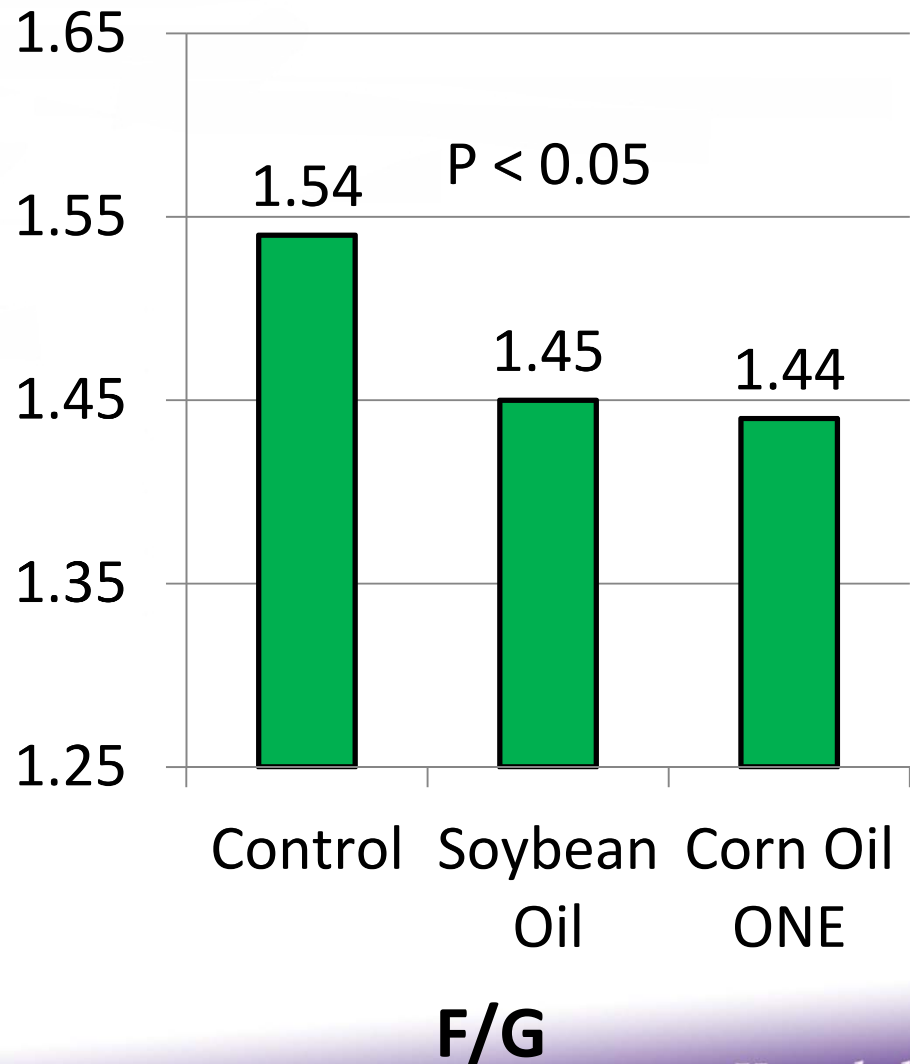
Jordan et al., 2014

K·STATE Research and Extension

Knowledge for Life

Effects of Oil Source and Level on Pig Performance – 25 to 50 lb



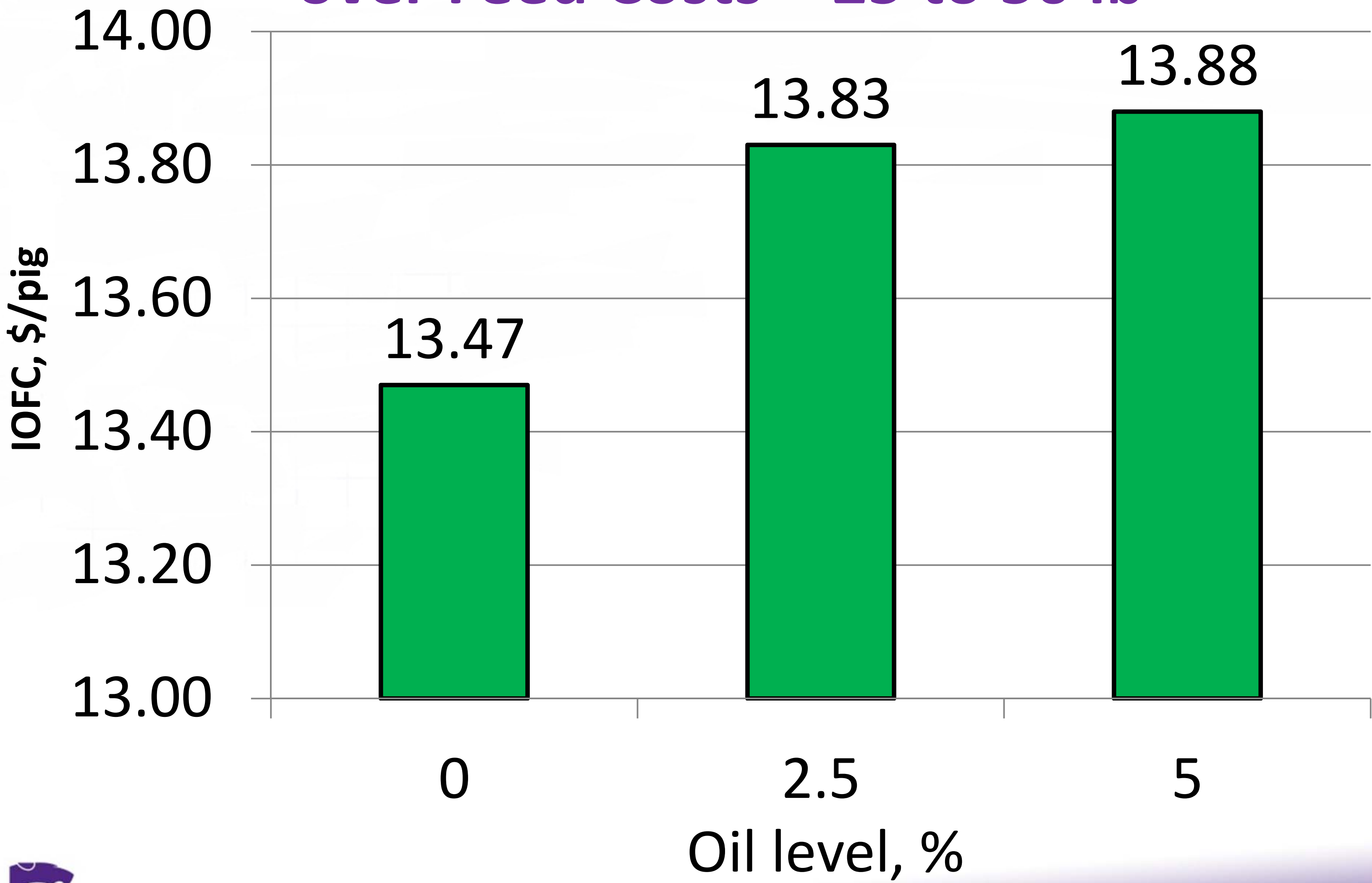


Jordan et al., 2014

K·STATE Research and Extension

Knowledge for Life

Effects of Oil Source and Level on Income over Feed Costs – 25 to 50 lb



Jordan et al., 2014

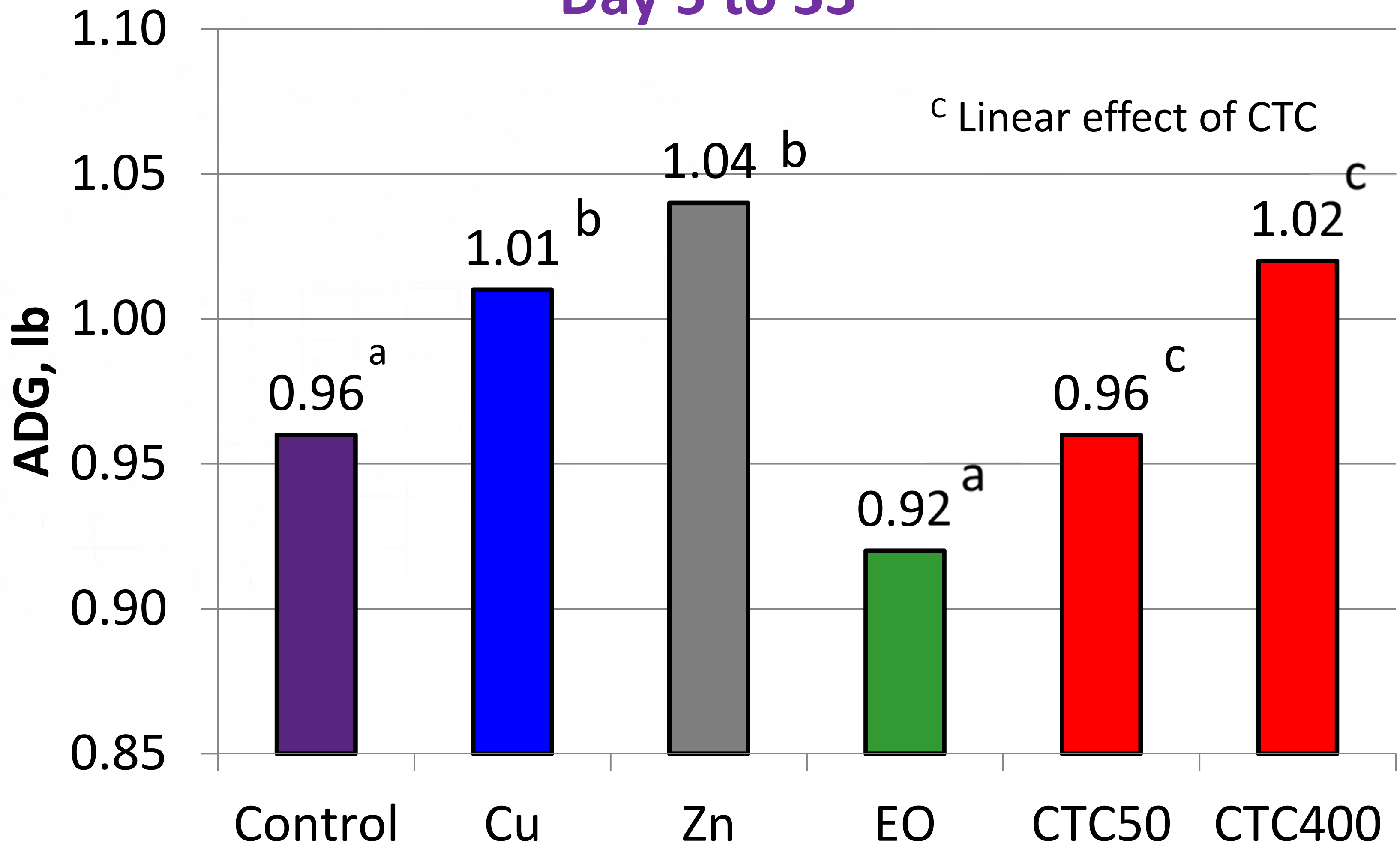
K·STATE Research and Extension

Knowledge for Life

Effects of Dietary Copper, Zinc, Essential Oils and Chlortetracycline (CTC) on Nursery Pig Growth Performance

- **Copper sulfate** ($CuSO_4$; 0 vs. 125 ppm Cu)
- **Zinc oxide** (ZnO; none vs. 3,000 ppm Zn from d 5 to 12 and 2,000 ppm Zn from d 12 to 33),
- **Essential oils blend**
- **Feed–grade medication** Growth-promoting and therapeutic levels of chlortetracycline (CTC at 50 or 400 g/ton). (CTC was removed from the diet on d 19 then added again from d 20 to 33.

Effects of Dietary Copper, Zinc, Essential Oils and Chlortetracycline (CTC) on Nursery Pig Growth Performance Day 5 to 33

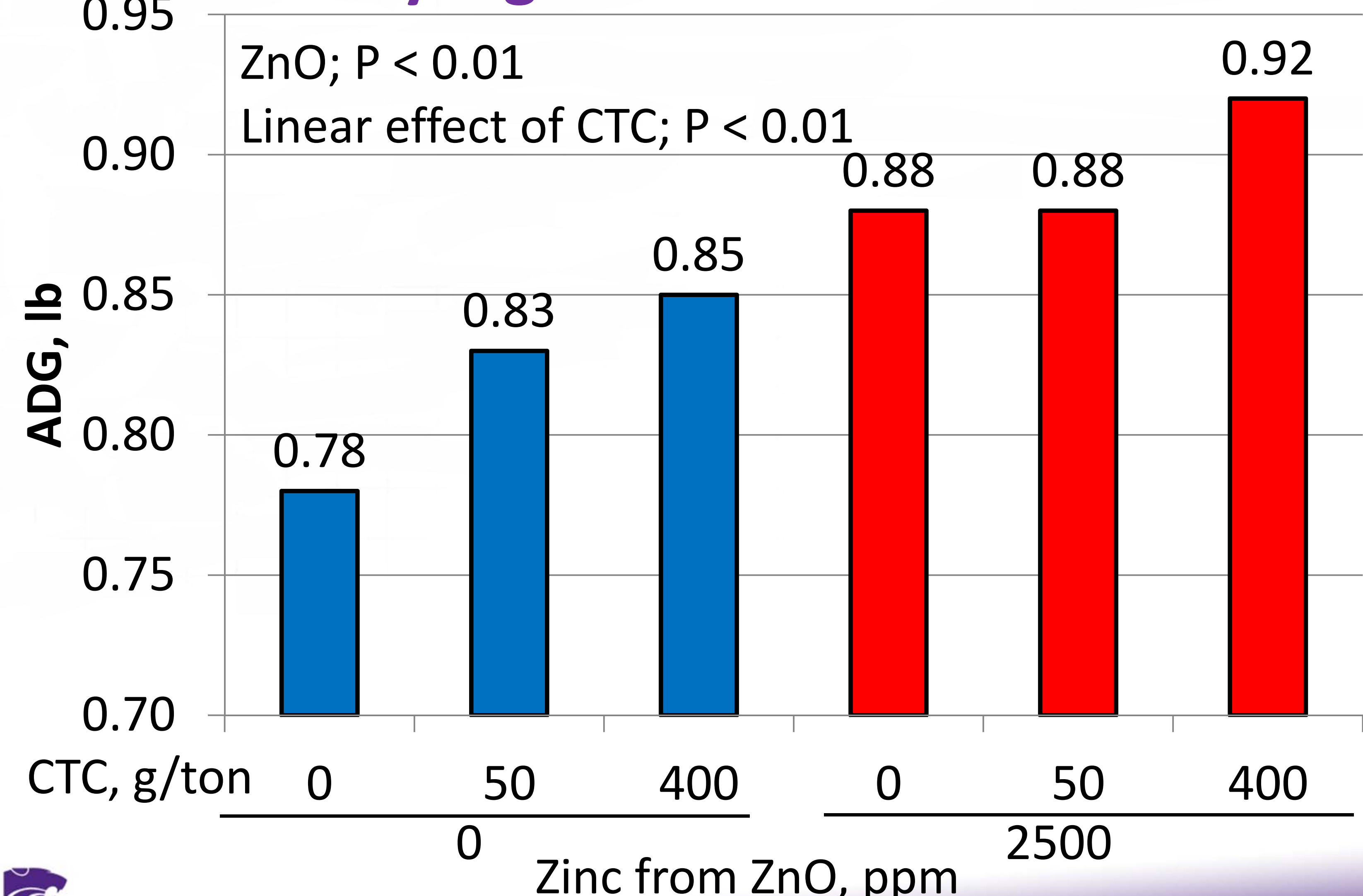


Feldpausch et al., 2014

K·STATE Research and Extension

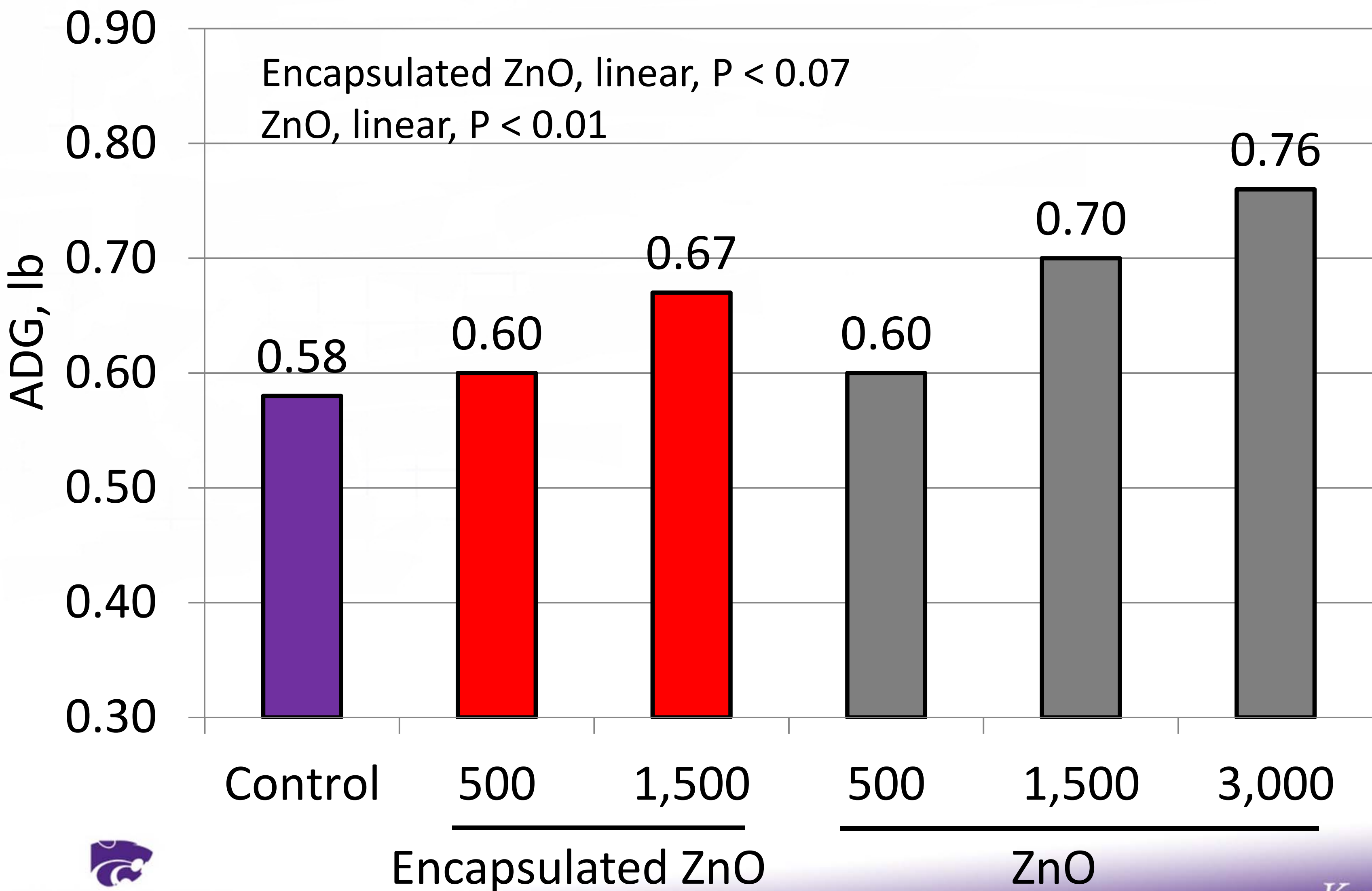
Knowledge for Life

Effects of Zinc Oxide and Chlortetracycline on Nursery Pig Growth Performance



Feldpausch et al., 2014

Effects of Dietary Zinc Source Nursery Pig Growth Performance - Day 7 to 21

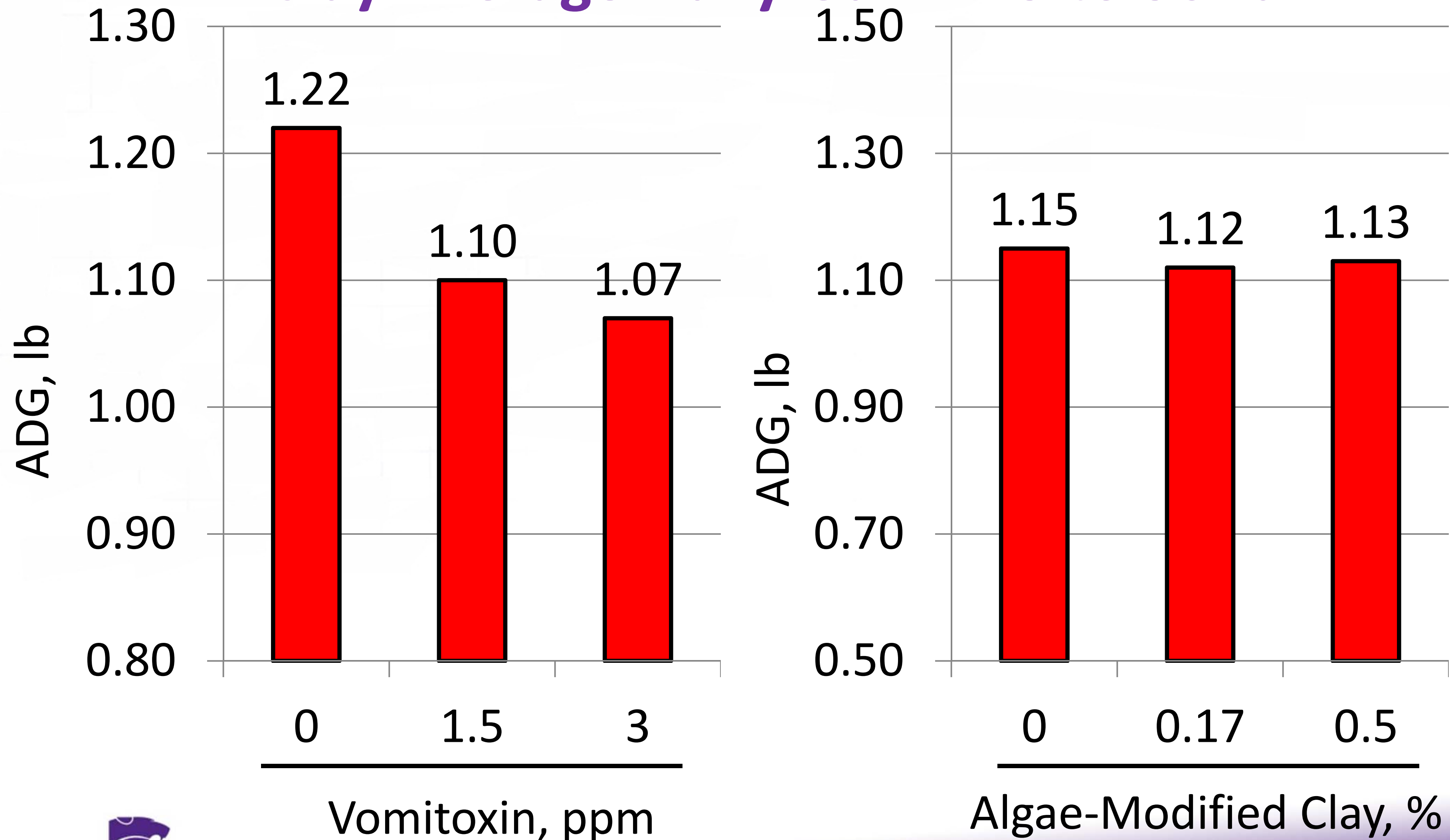


K·STATE Research and Extension

Knowledge for Life

Jordan et al., 2014

Effects of Vomitoxin (DON) and Algae-modified Clay Average Daily Gain - 25 to 50 lb



Fowler et al., 2014

Vomitoxin and Other Mycotoxins

- Some initial reports indicating some vomitoxin in DDGS (~ 3.0 ppm)
- We need to continually monitor the situation
- If you have DON-contaminated grain
  - Dilution is best solution
  - Sodium metabisulfite or Defusion for short periods provides benefit

Feed Additive Potential Opportunities

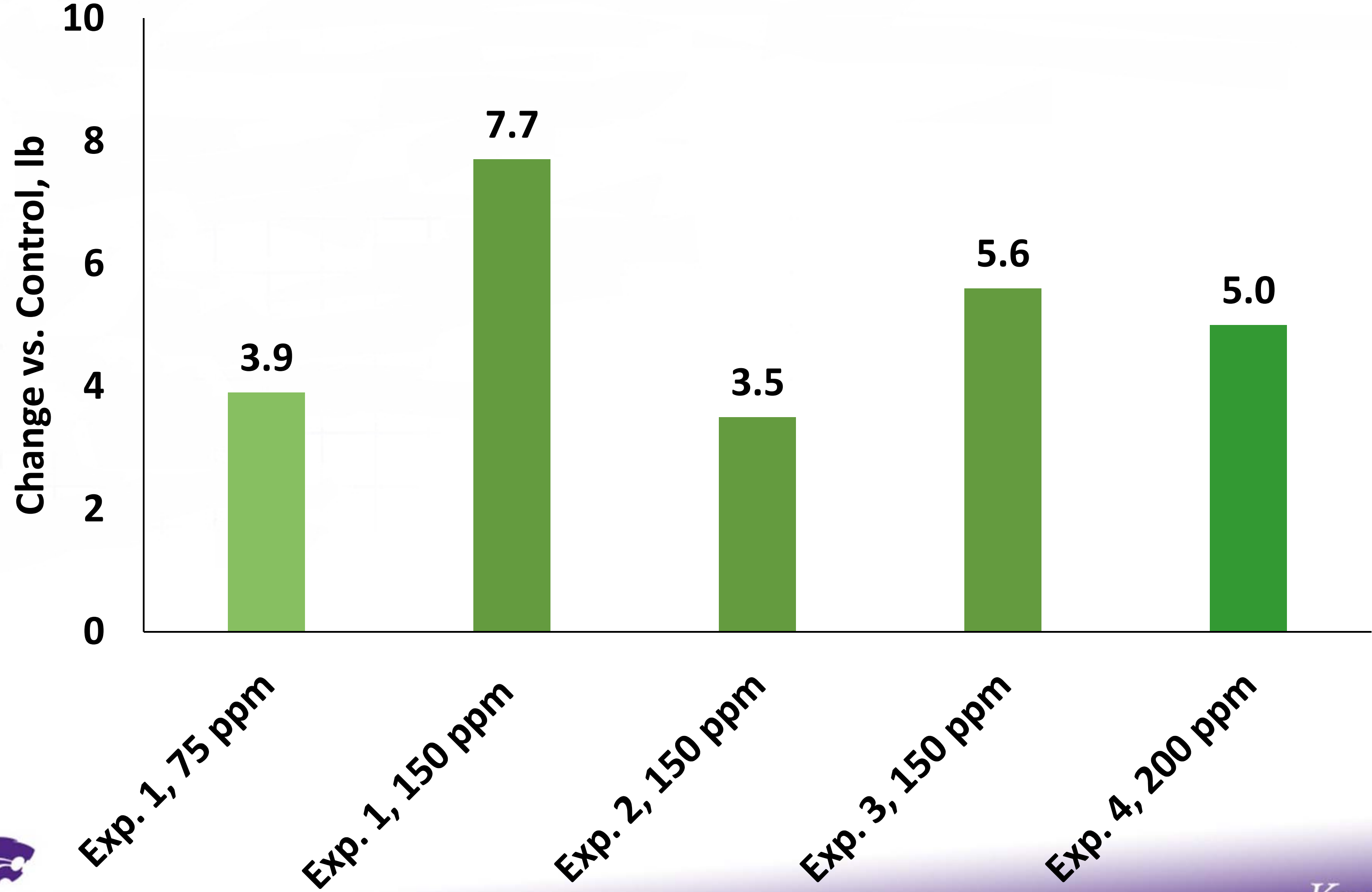
- Skycis 100 (Narasin)
- Tri-Basic Copper Chloride
- Ractopamine Hydrochloride

Skycis™ Label

Indications	Appropriate concentration of narasin in Type C Medicated feed
Increased rate of weight gain in growing-finishing swine when fed for at least 4 weeks	13.6 to 27.2 g/ton (15 ppm to 30 ppm)
Increased rate of weight gain and improved feed efficiency in growing-finishing swine when fed for at least 4 weeks	18.1 to 27.2 g/ton (20 ppm to 30 ppm)

- No withdrawal period is required when used according to the label.
- Swine being fed with Skycis (narasin) should not have access to feeds containing pleuromutalins (e.g., tiamulin) as adverse reactions may occur.

Tri-Basic Copper Chloride on HCW



K·STATE Research and Extension

Knowledge for Life

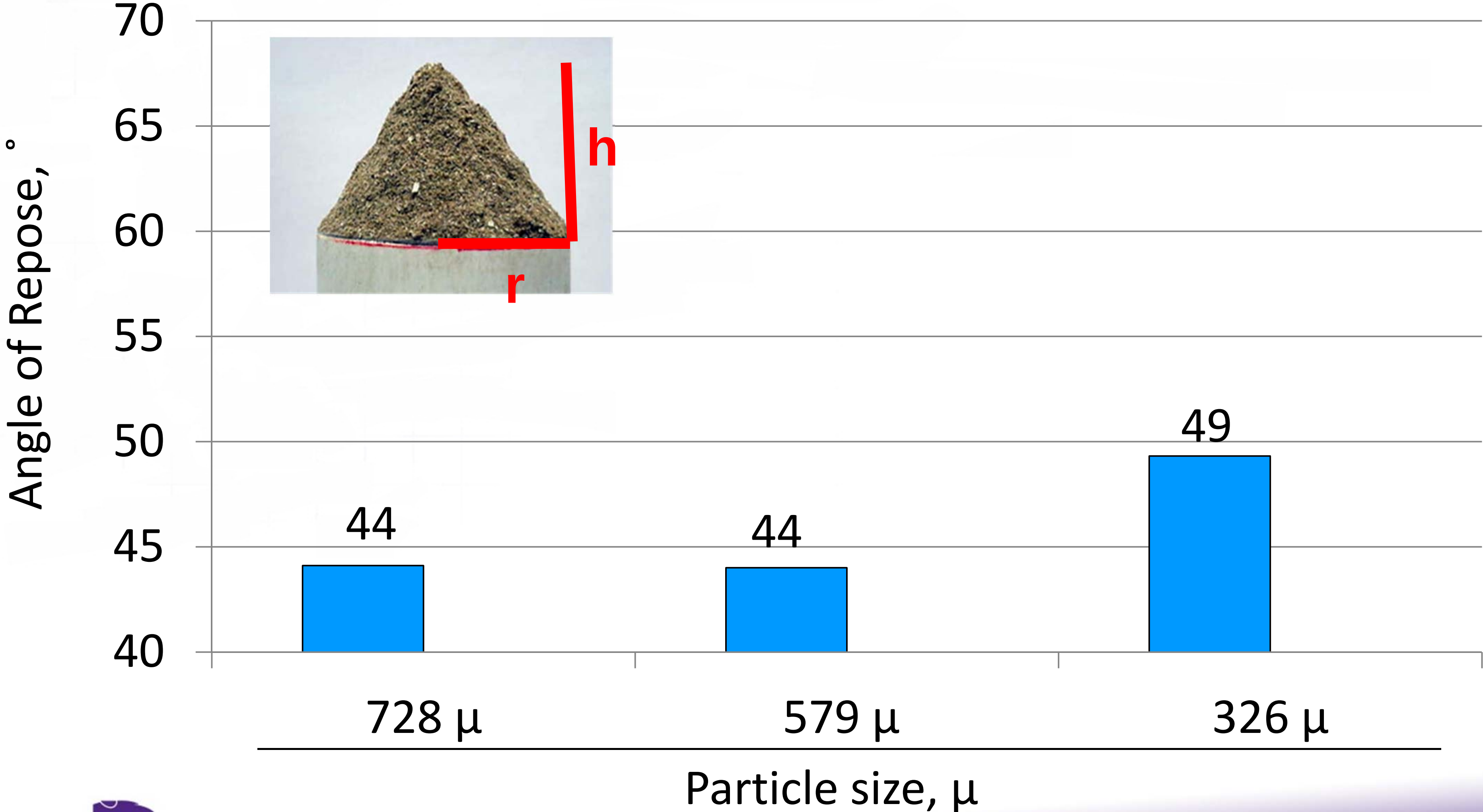
Ractopamine Hydrochloride

- Traditionally known as Paylean (Elanco)
  - This past year product concentration level changed and is now 2.25 g/ton
  - Thus, 4 lb/ton Paylean = 9 g/ton of complete feed
- Engain 9 (Zoetis) is a new commercial product
  - Product concentration level is 9 g/ton
  - Thus, 1 lb/ton Engain = 9 g/ton of complete feed
- <u>Know your product and inclusion level</u>

Wheat and Particle Size

- Surprising little research has been completed evaluating wheat particle size and finishing pigs
- Wheat is more likely to “flour” as particle size is reduced
- Do pigs respond similarly to particle size in meal and pelleted diets – no available data
- Important to further understand ground wheat in swine diets to capture value when economical to use

Effect of wheat particle size on angle of repose of meal diets

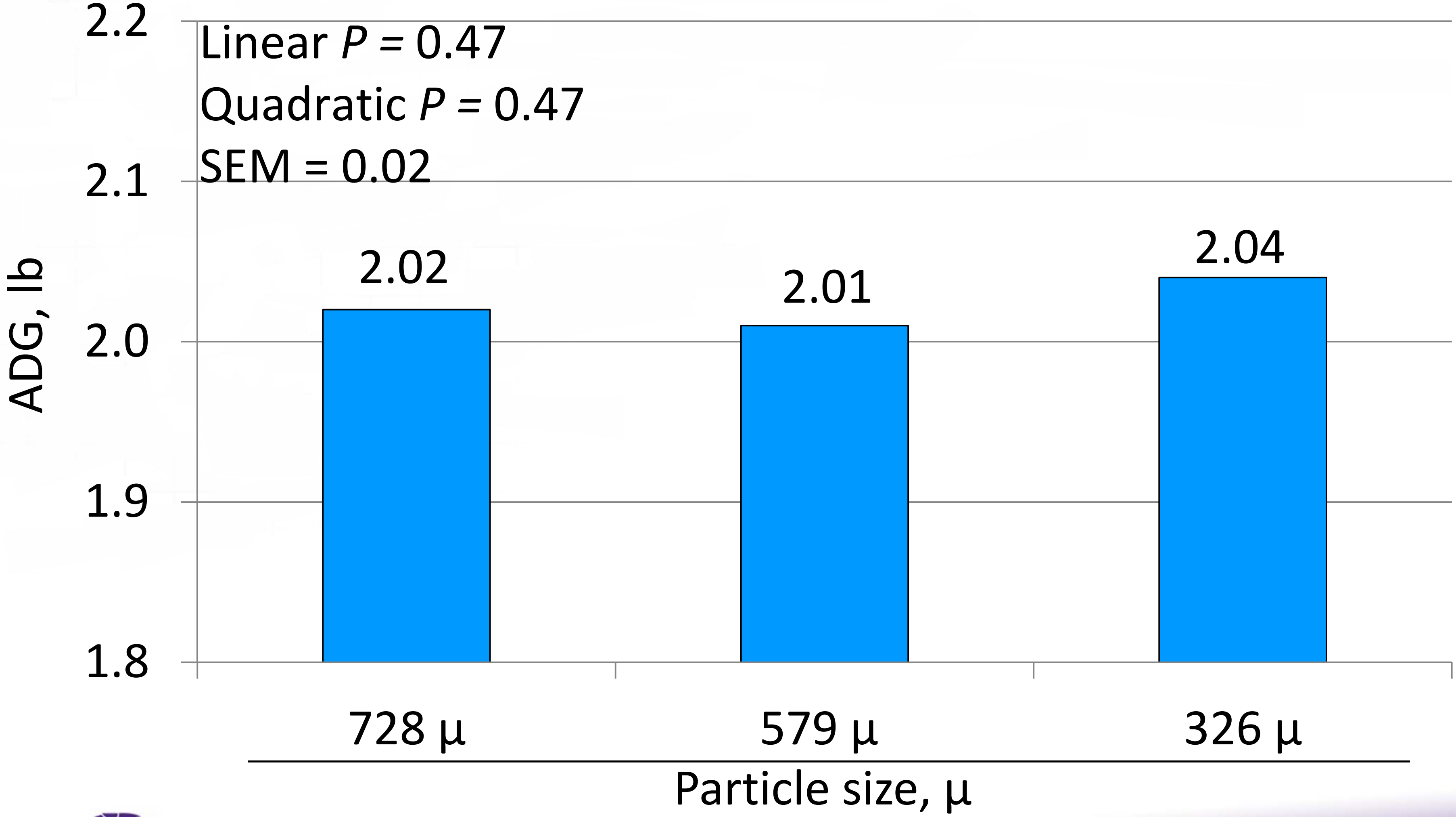


De Jong et al., 2014

K·STATE Research and Extension

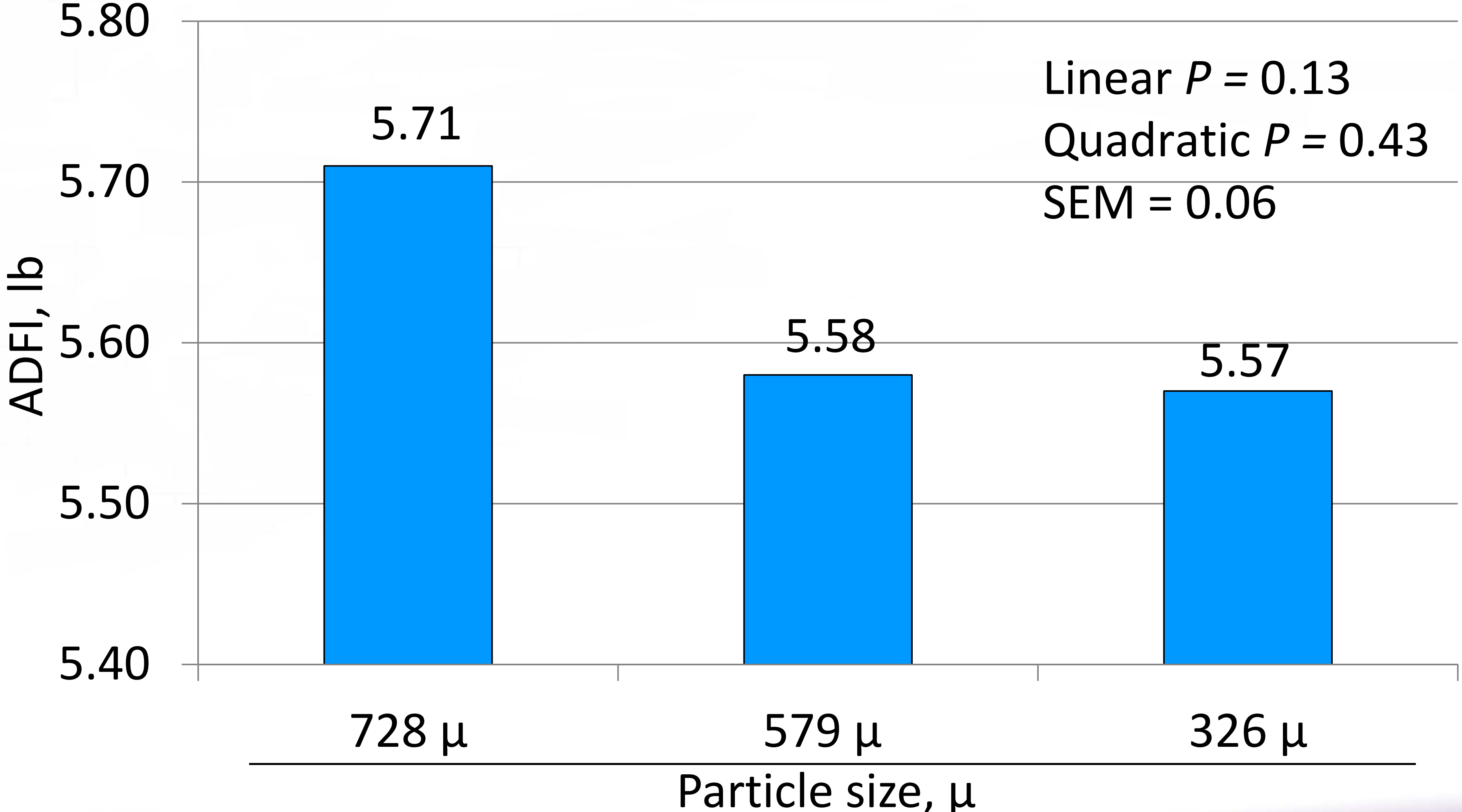
Knowledge for Life

Effect of wheat particle size on ADG (d 0 to 83; BW 97 - 265 lb)



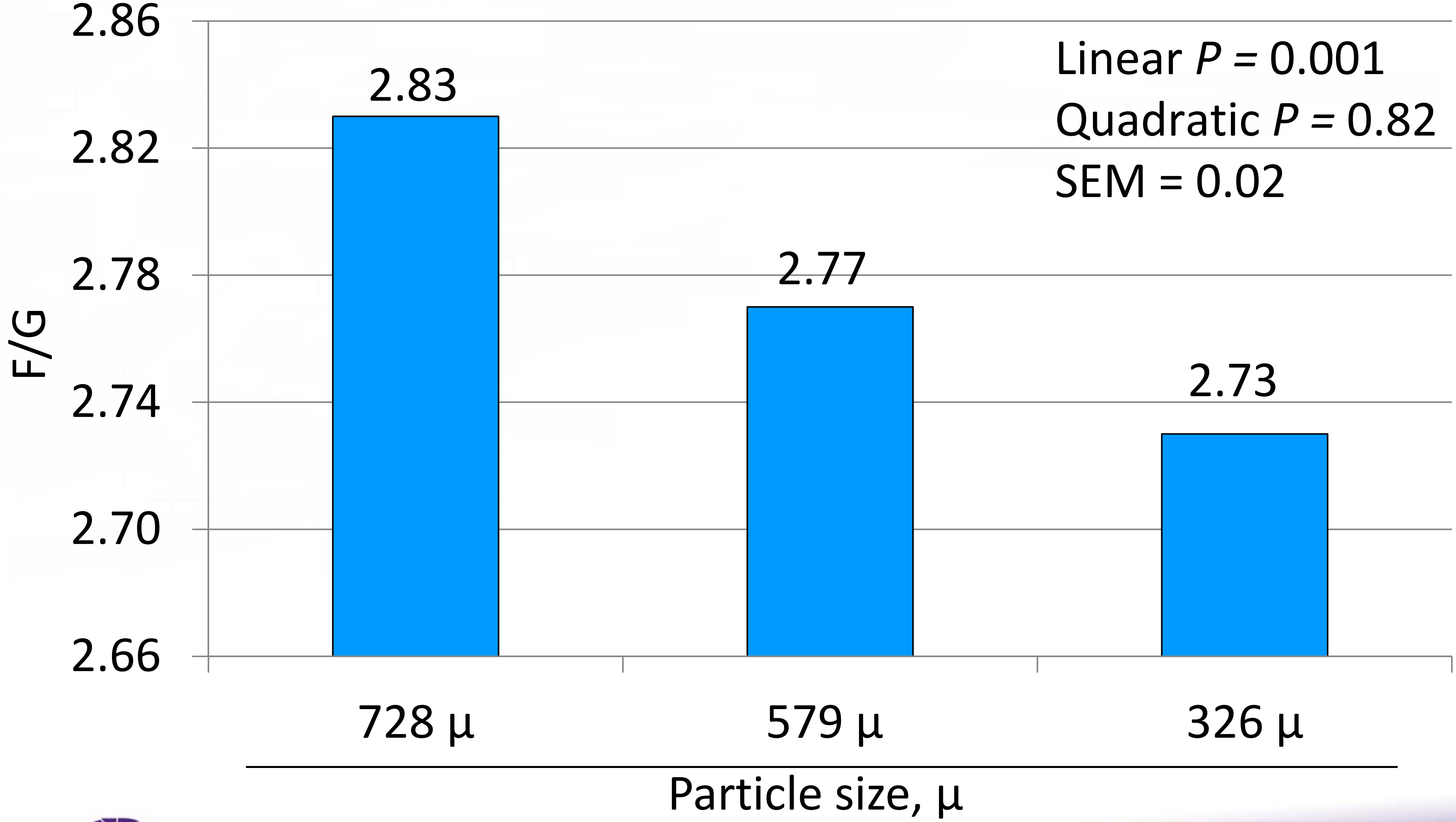
De Jong et al., 2014

Effect of wheat particle size on ADFI (d 0 to 83; BW 97 – 265 lb)



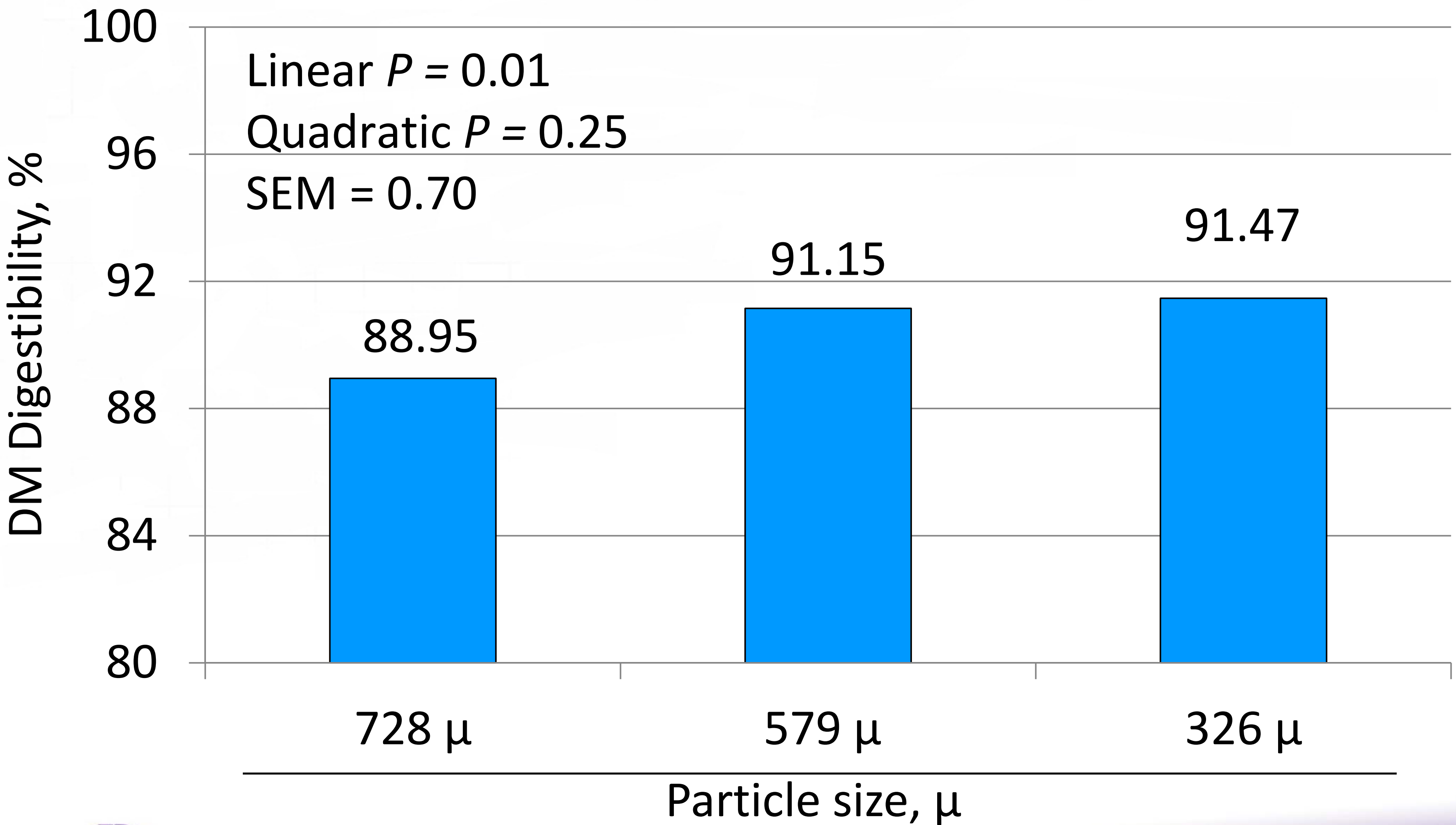
De Jong et al., 2014

Effect of wheat particle size on F/G (d 0 to 83; BW 97 – 265 lb)



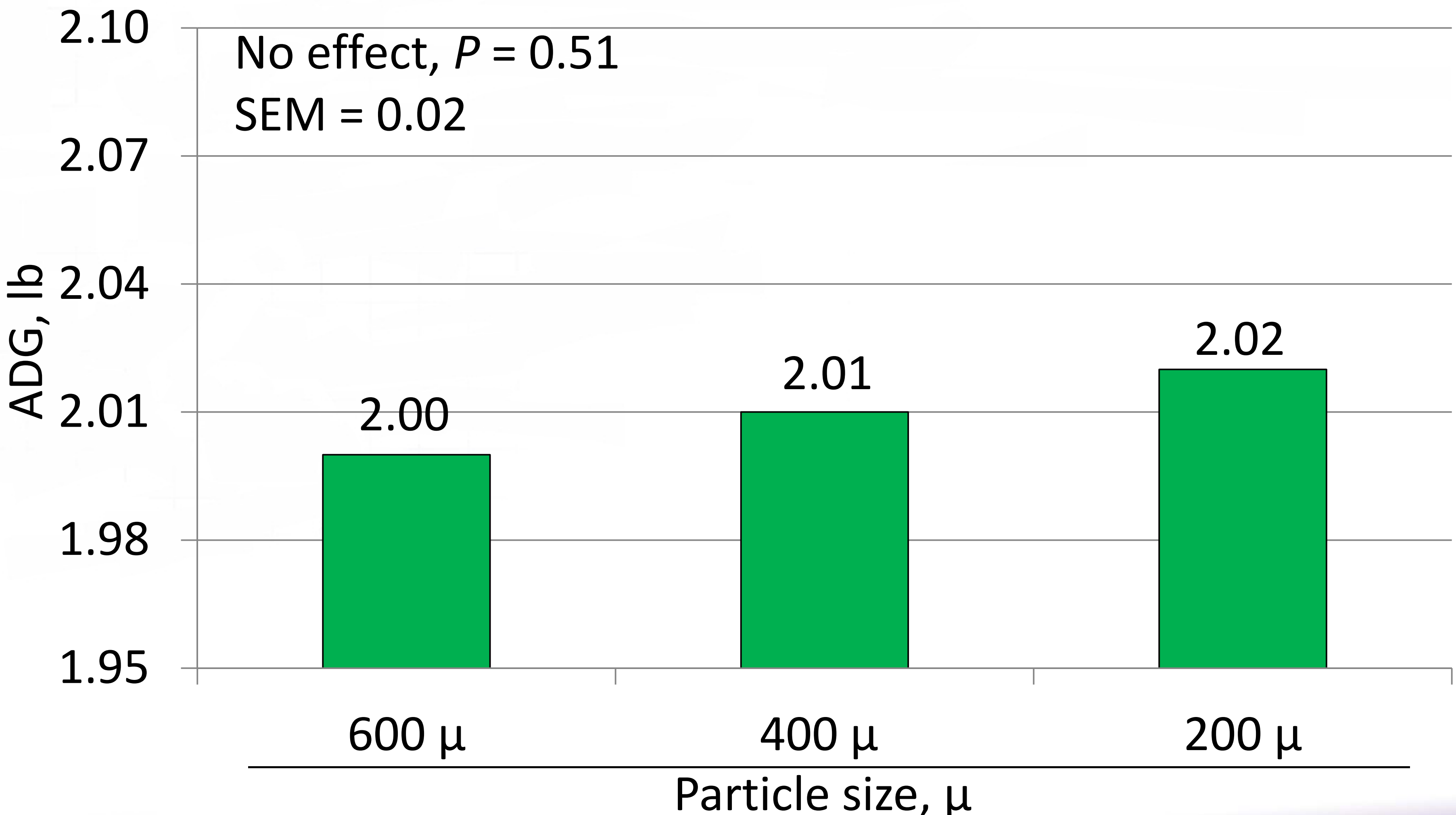
De Jong et al., 2014

Effect of wheat particle size on DM Digestibility



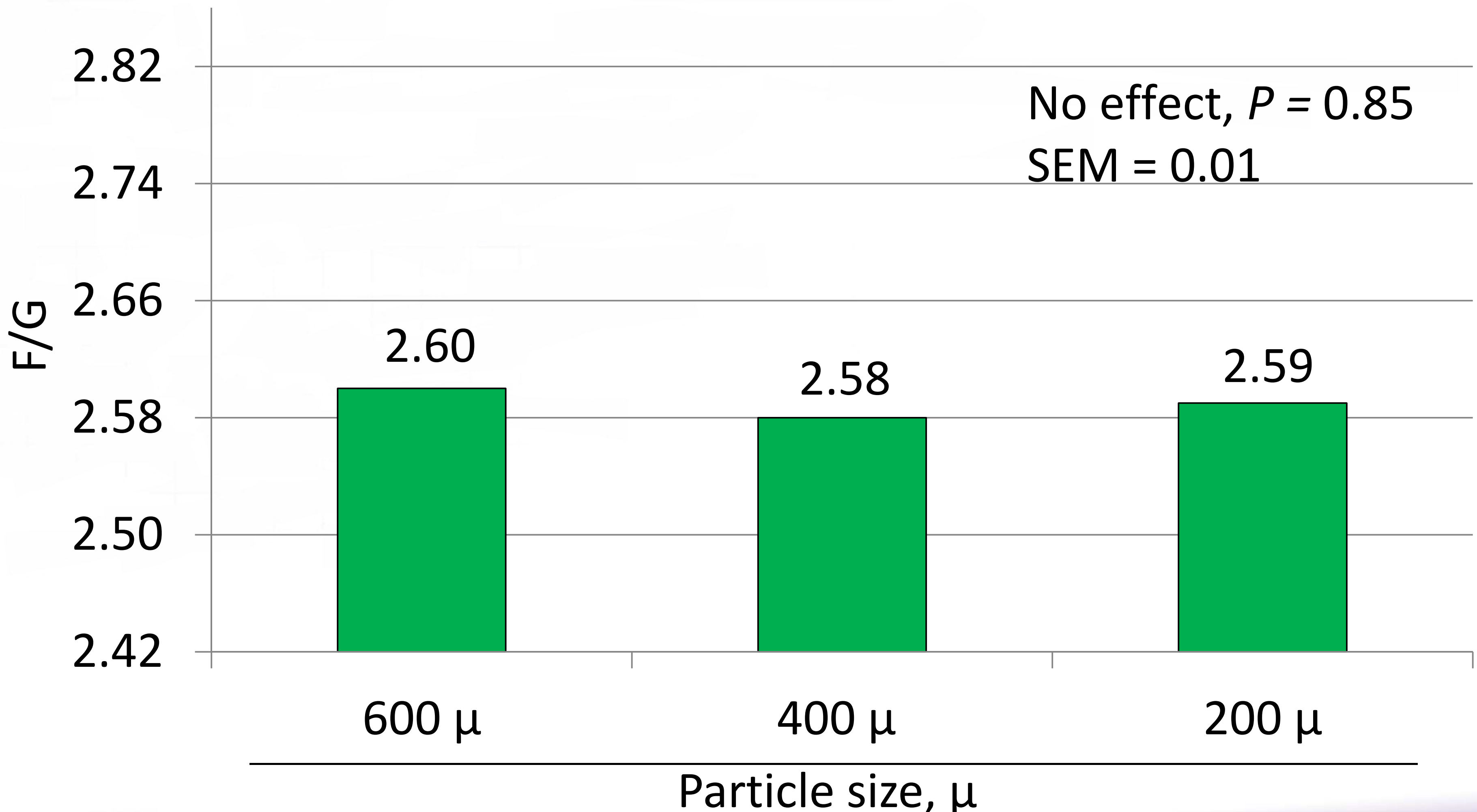
De Jong et al., 2014

Effect of wheat particle size on ADG (Pelleted Diets) (BW 96 - 277 lb)



De Jong et al., 2014

Effect of wheat particle size on F/G (Pelleted diets) (BW 96 – 277 lb)

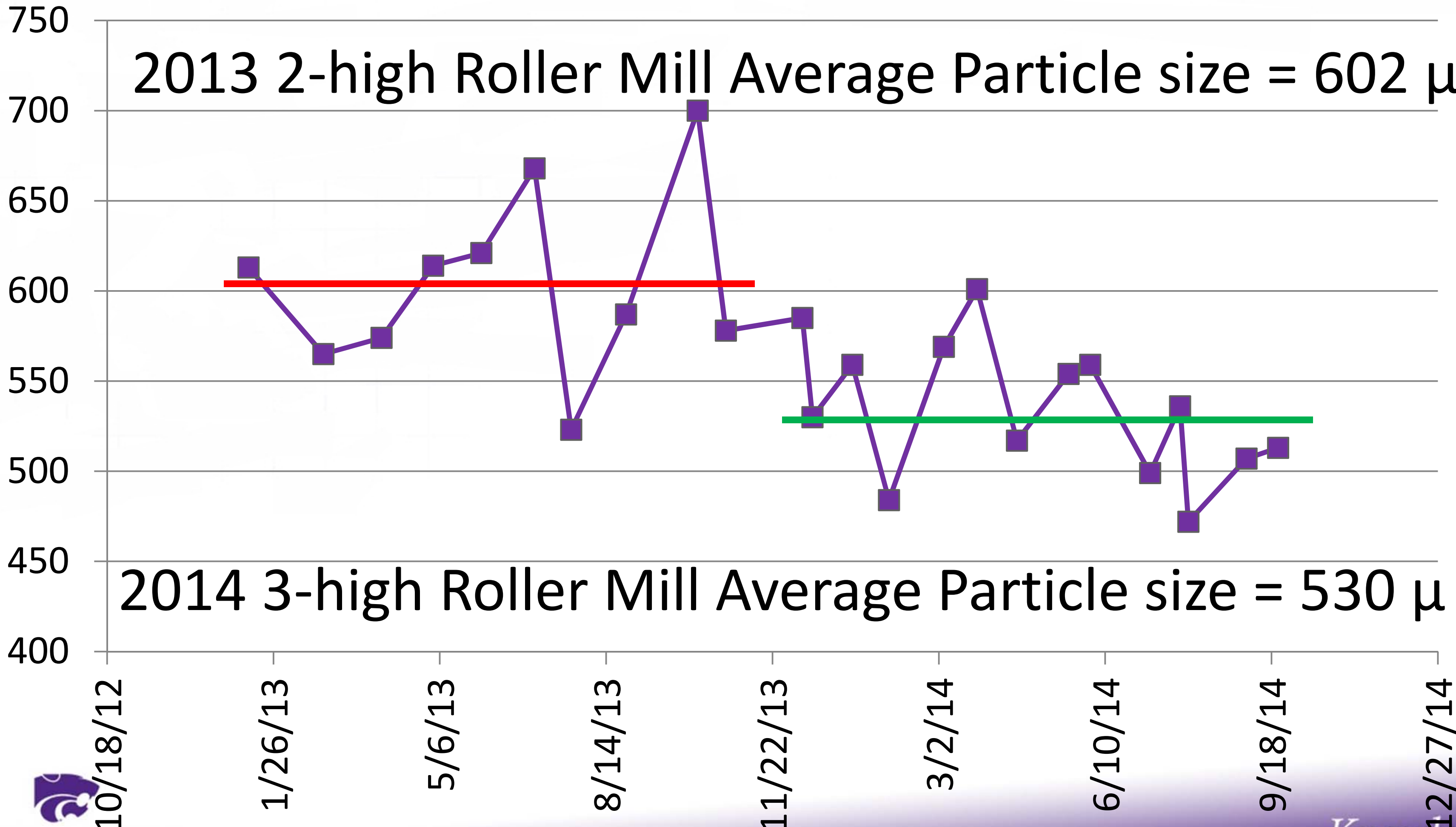


De Jong et al., 2014

K·STATE Research and Extension

Knowledge for Life

Retrospective Analysis of Particle Size by Mill Type



K·STATE
Research and Extension

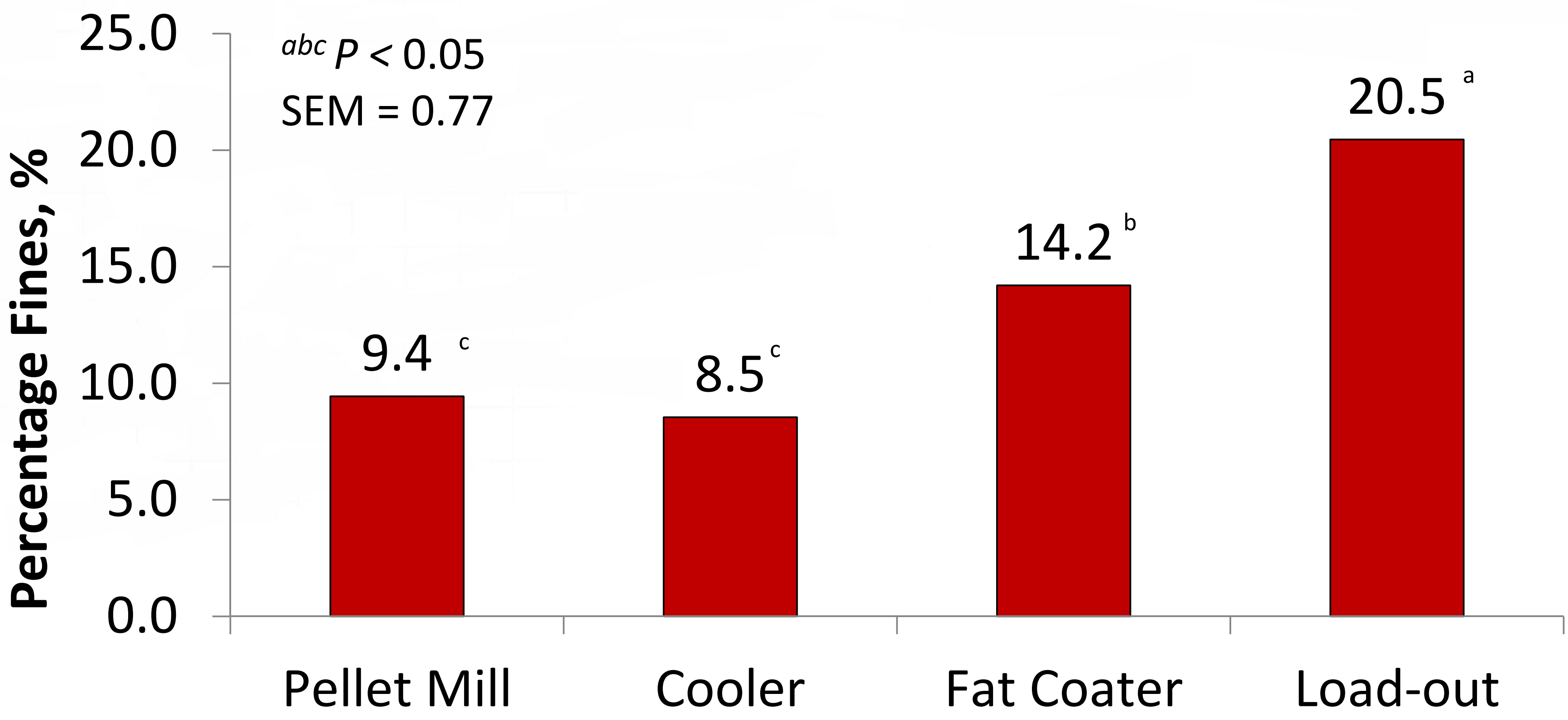
Knowledge for Life

Pellet Quality

- Past research at KSU has shown that >25% fines in pelleted feed at the feeder results in similar growth performance to feeding mash.

- No research to document where the fines are generated from the pellet mill to the feeder.

Pellet location within feed mill on percentage fines

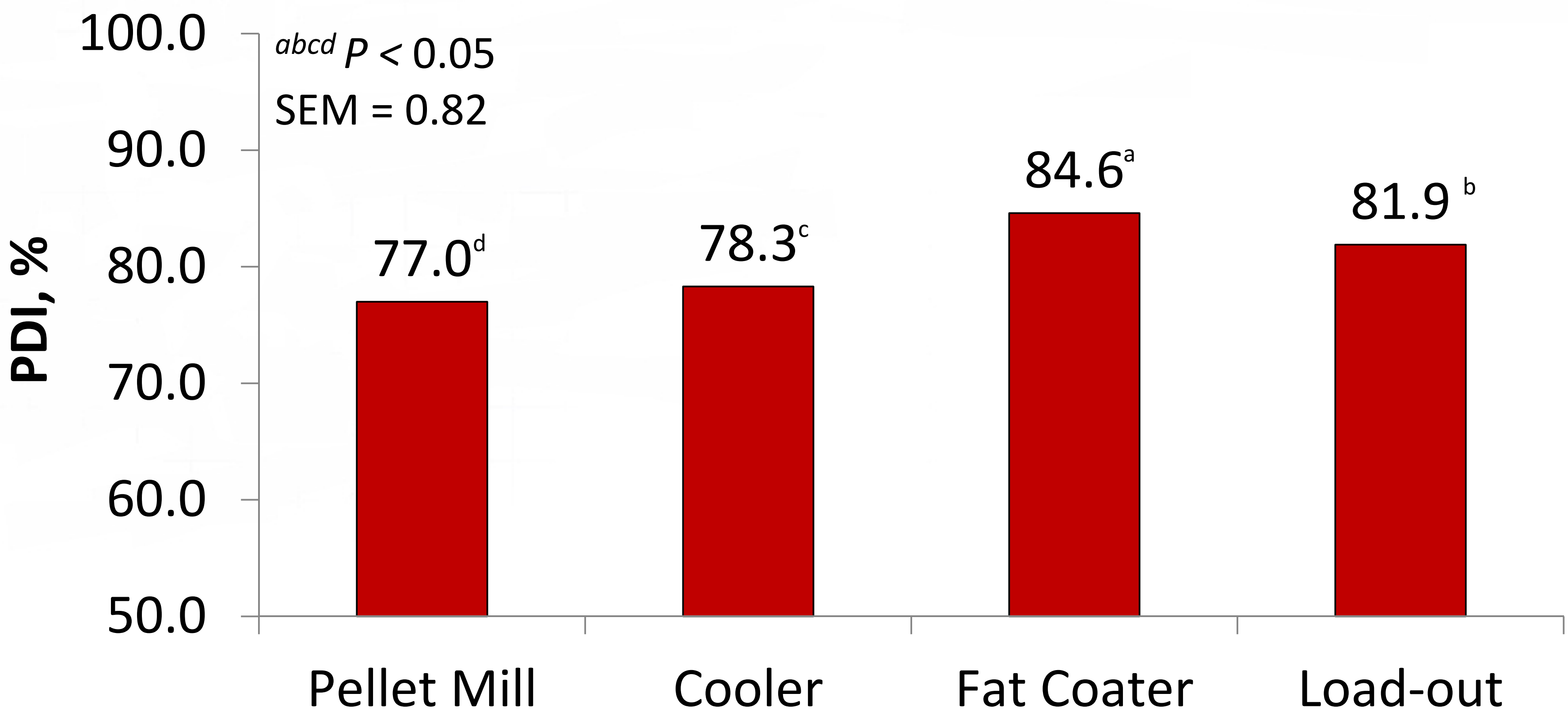


K-STATE Research and Extension

De Jong et al., 2014

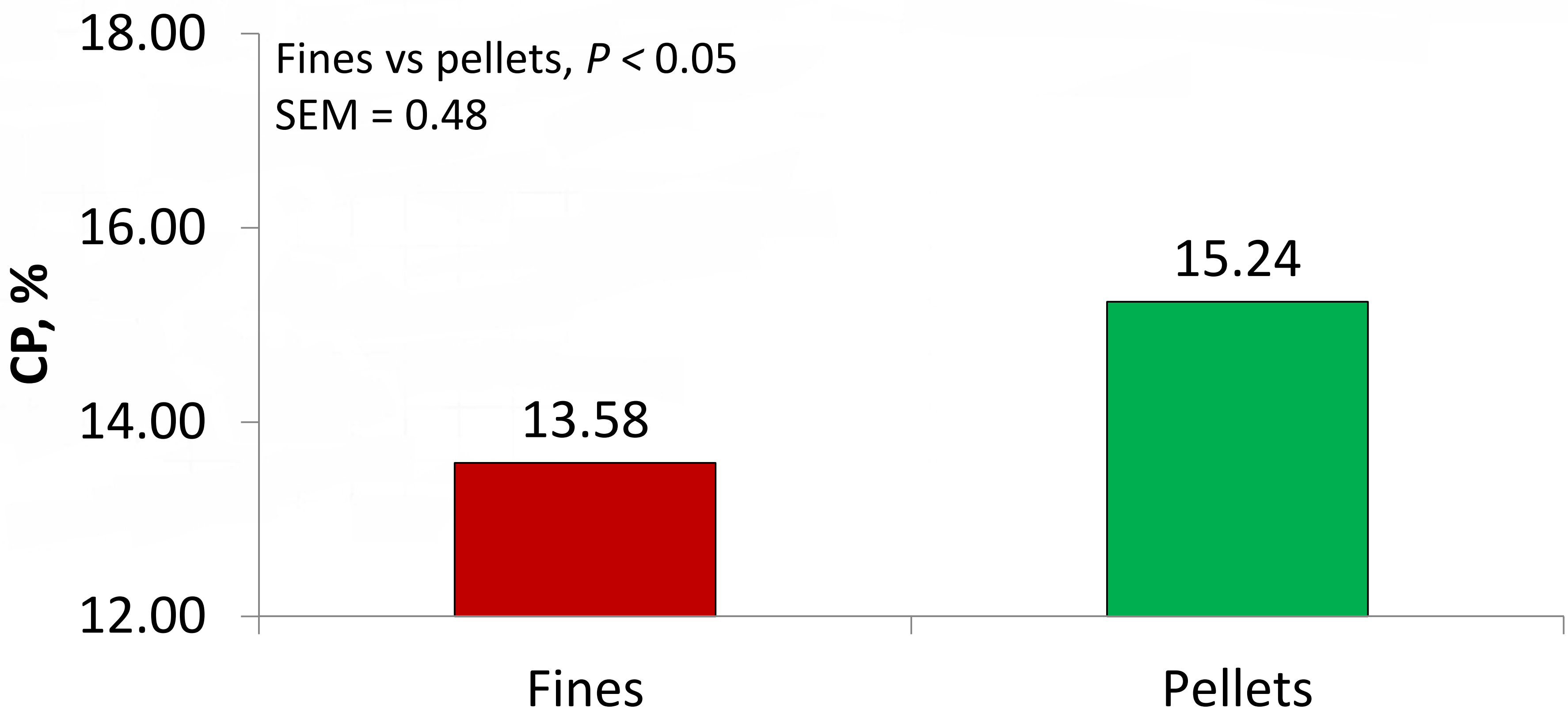
Knowledge for Life

Pellet location within feed mill on PDI



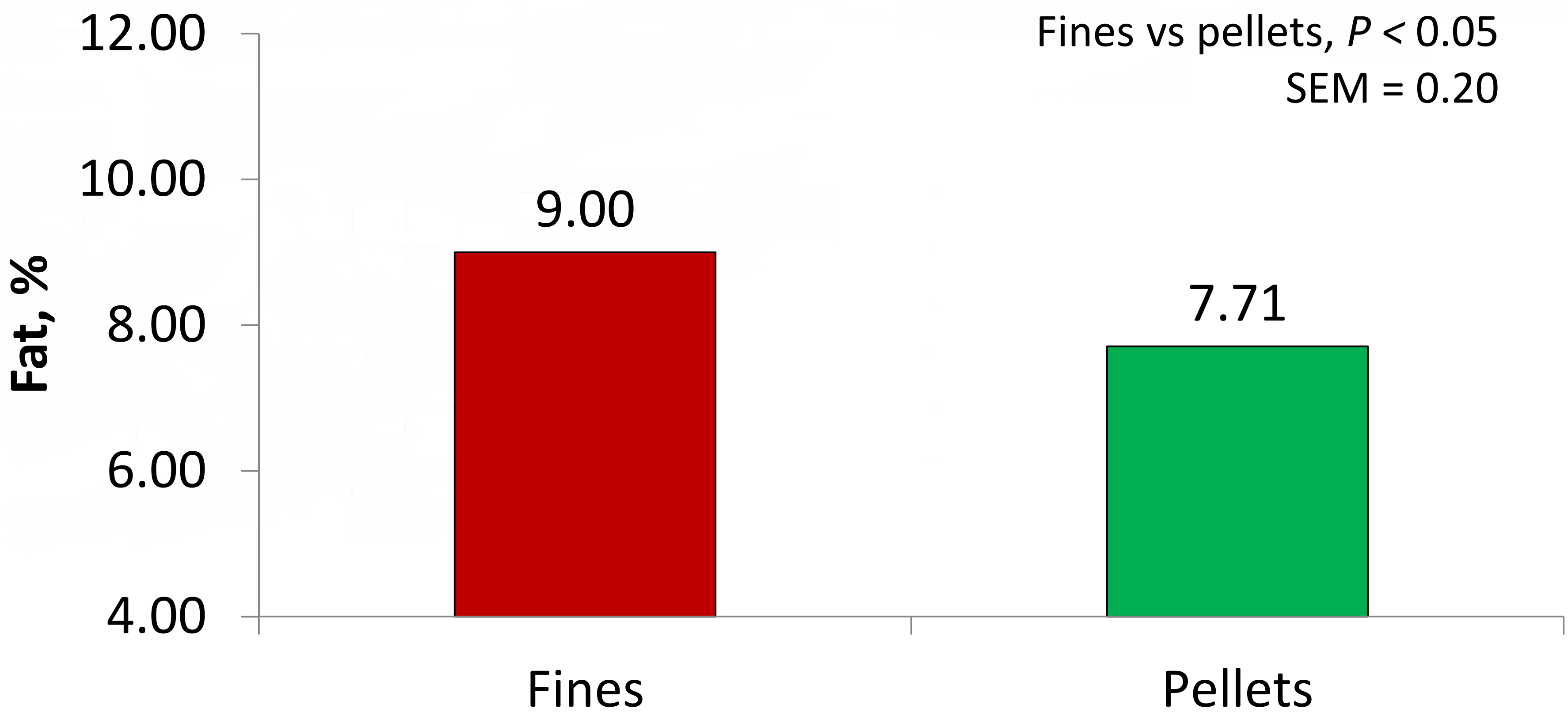
De Jong et al., 2014

Crude protein of pellets and fines



De Jong et al., 2014

Fat concentration of pellets and fines

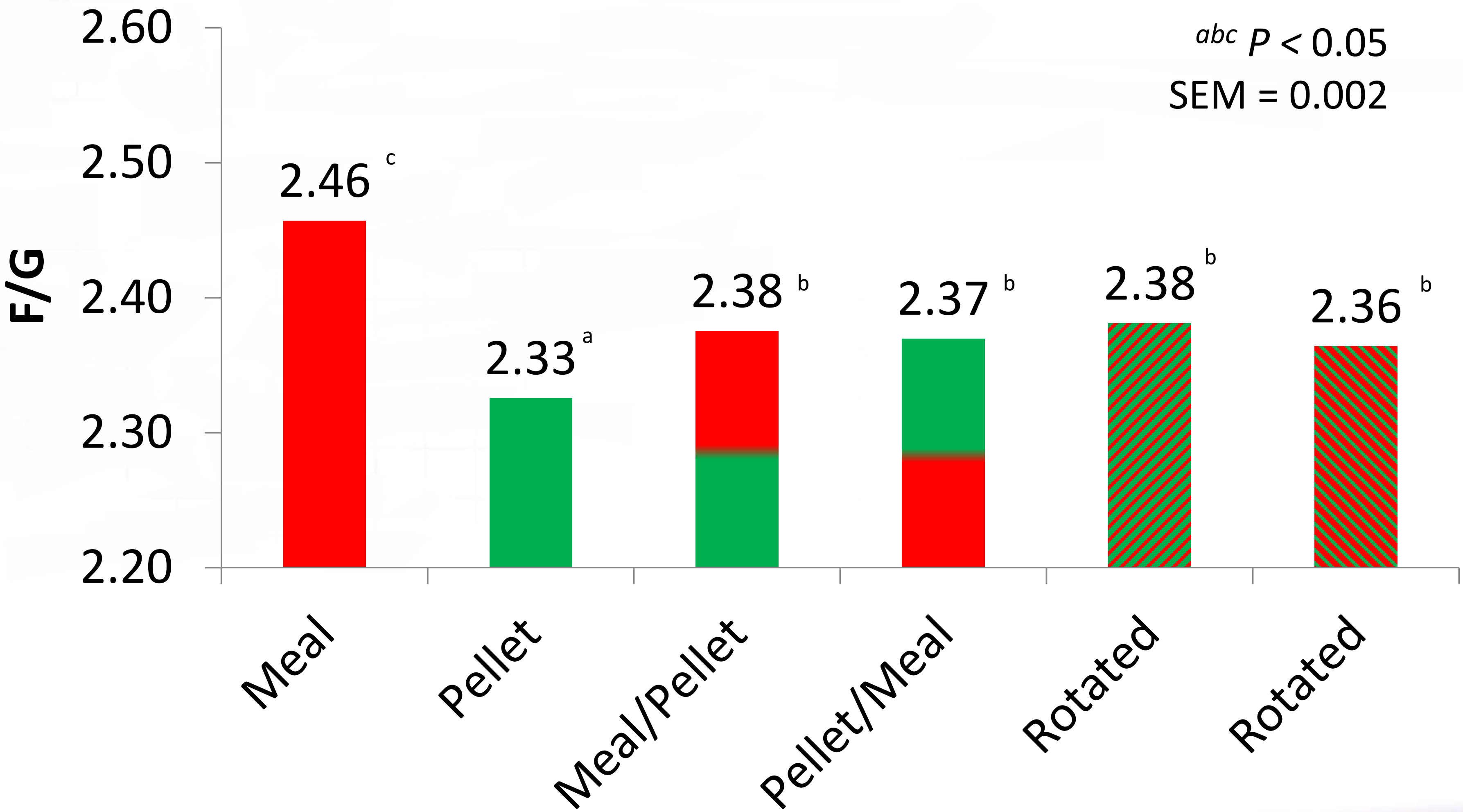


De Jong et al., 2014

K-STATE Research and Extension

Knowledge for Life

Effects of pelleting regime on F/G

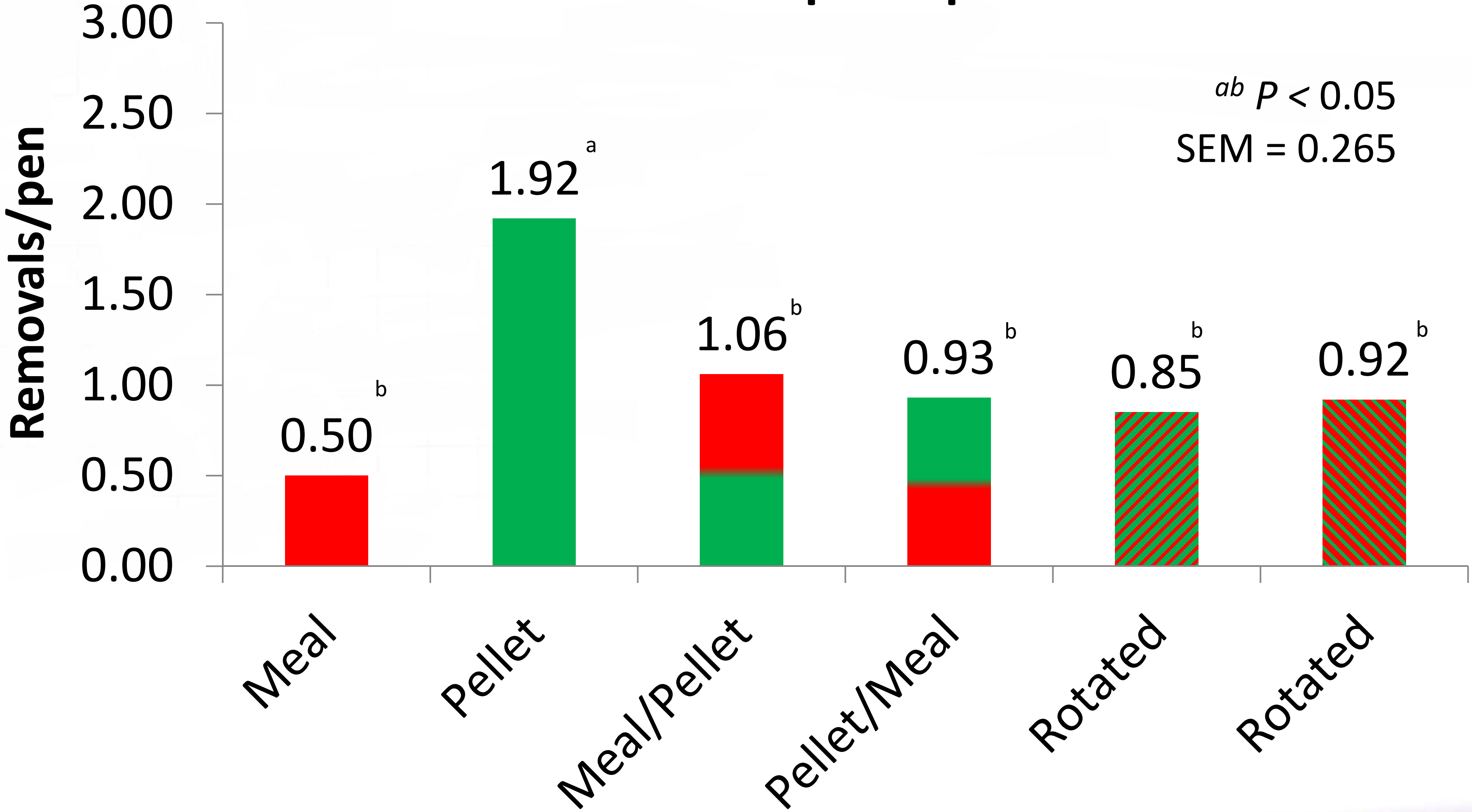


K·STATE Research and Extension

De Jong et al., 2014

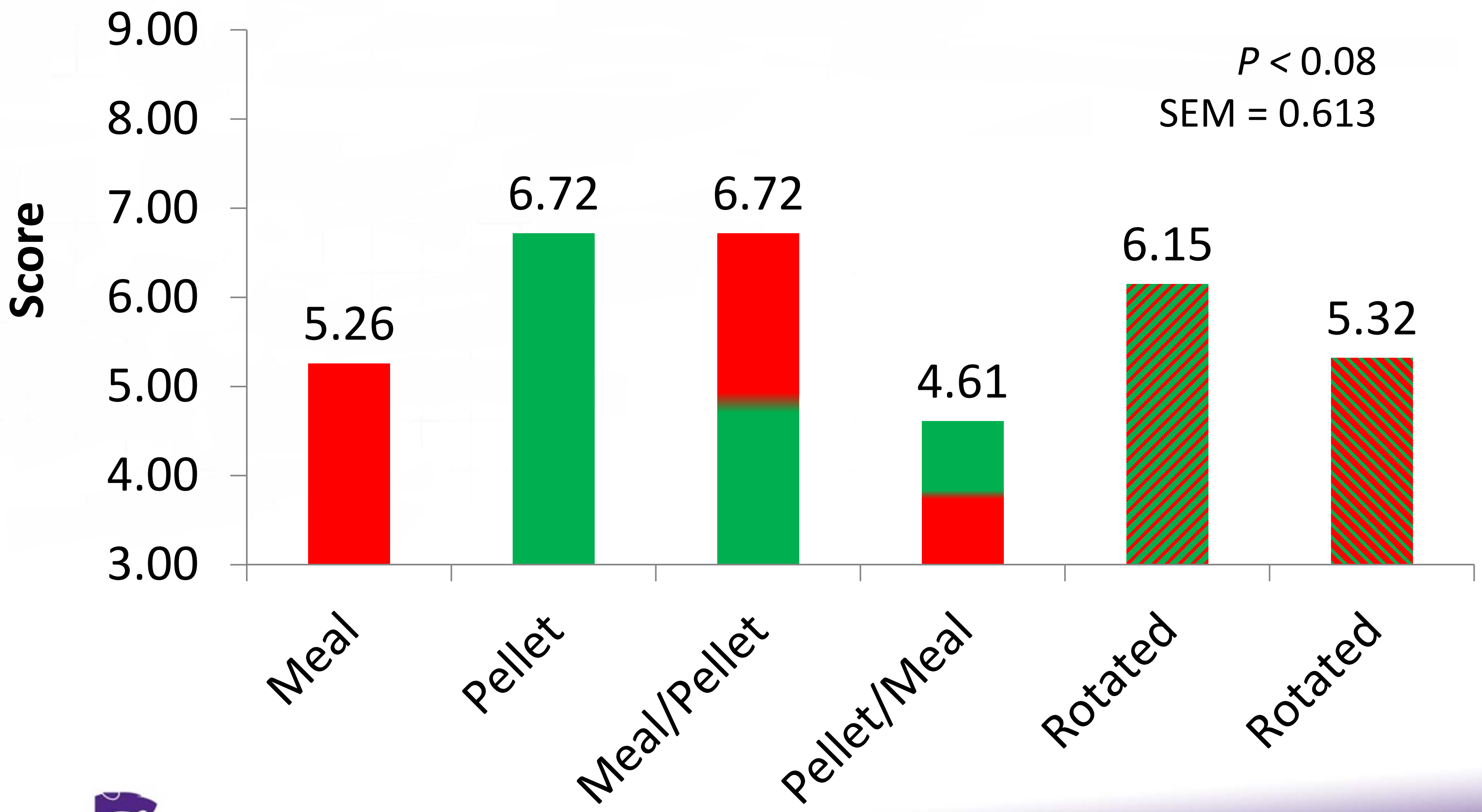
Knowledge for Life

Effects of pelleting regime on pig removals per pen



De Jong et al., 2014

Effects of pelleting regime on stomach morphology (combined ulceration & keratinization)



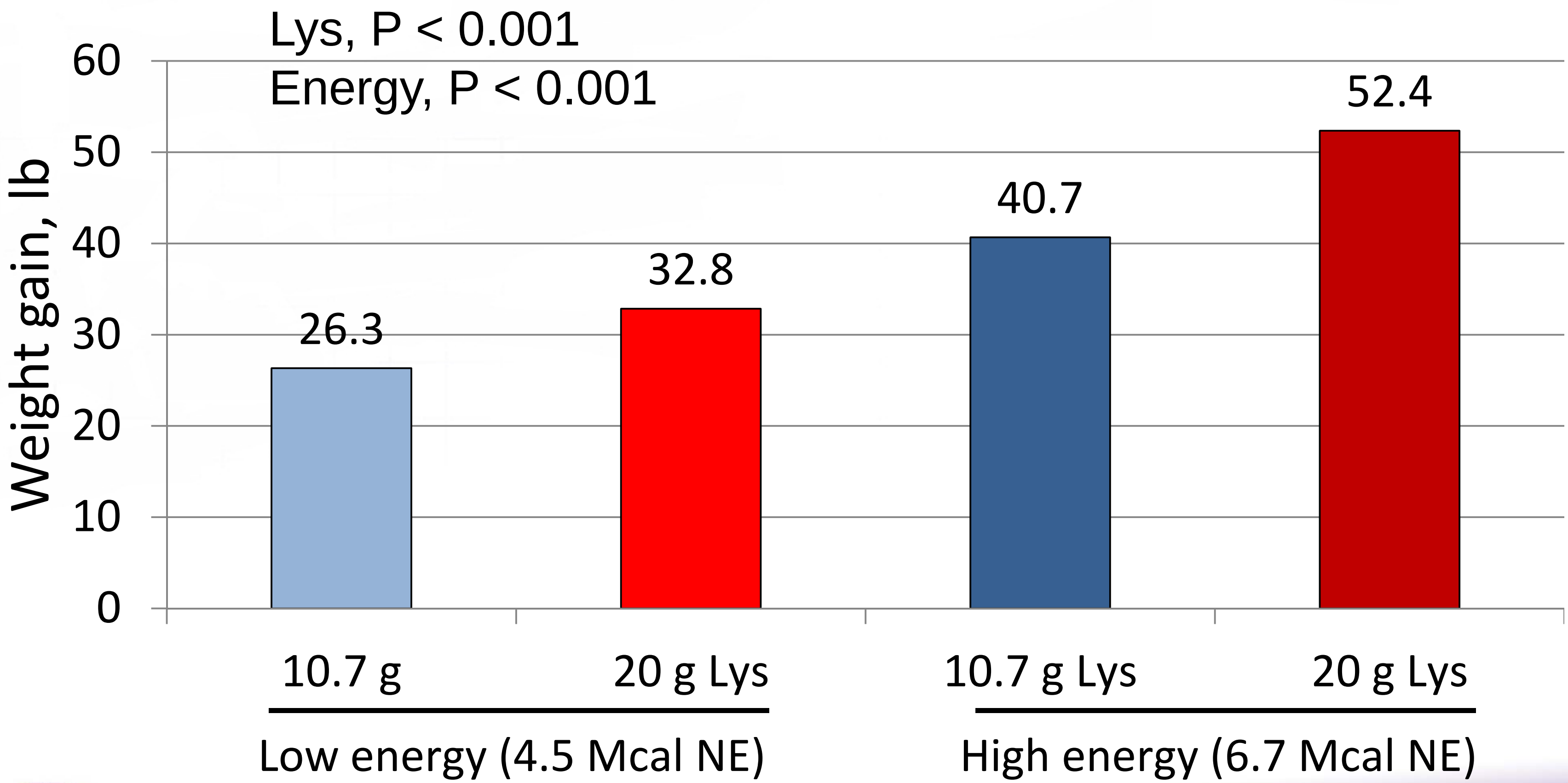
De Jong et al., 2014

Should you bump feed?

- 1105 sows
- 2 x 2 factorial
  - SID Lysine intake (10.7 vs 20.0 g/d)
  - NE intake (4.5 vs 6.7 Mcal/d)
- D 90 to farrowing

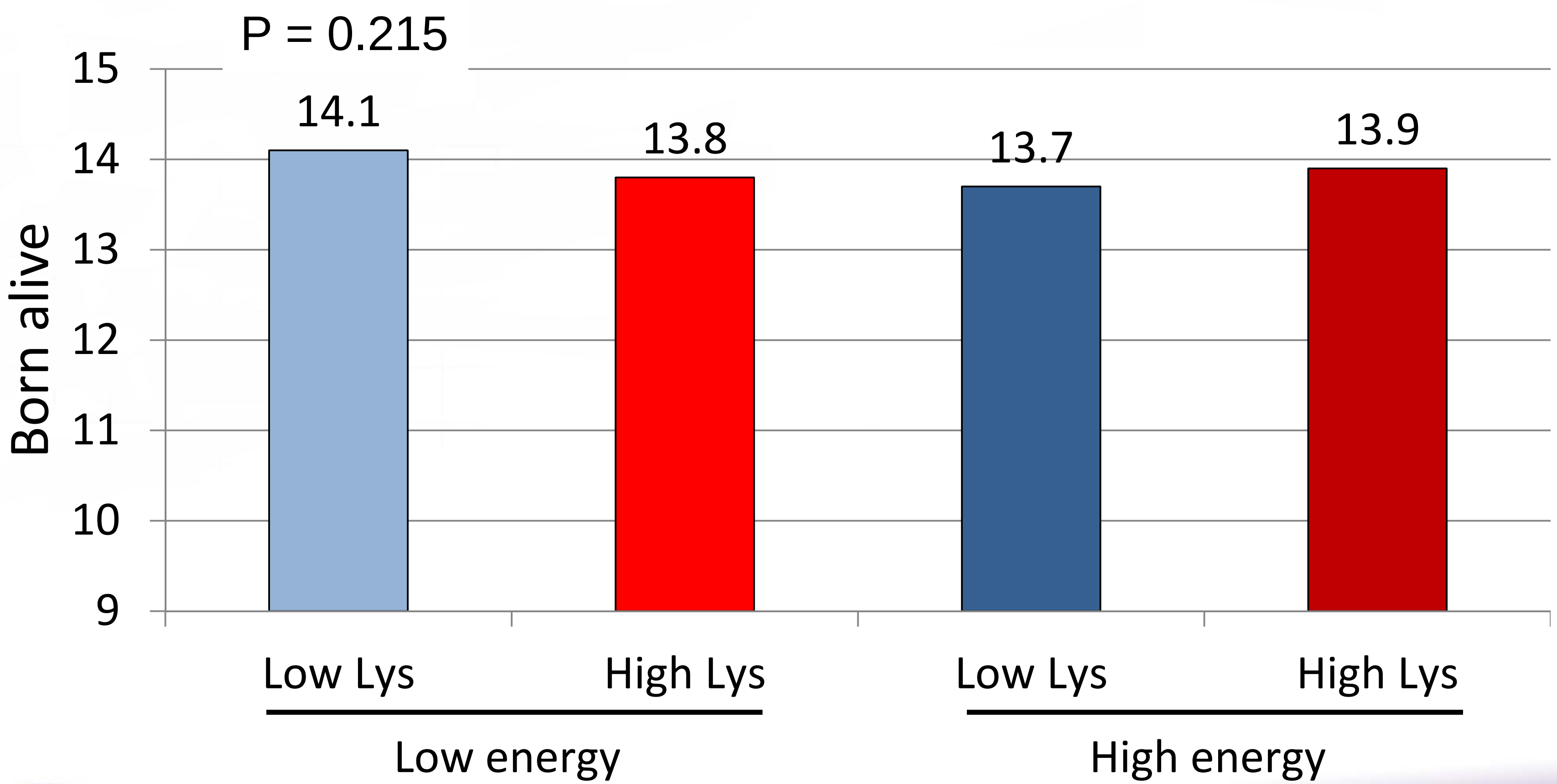
Goncalves et al., 2015

Influence of lysine and energy intake from d 90 to farrowing on sow weight gain



Goncalves et al., 2015

Influence of lysine and energy intake from d 90 to farrowing on born alive



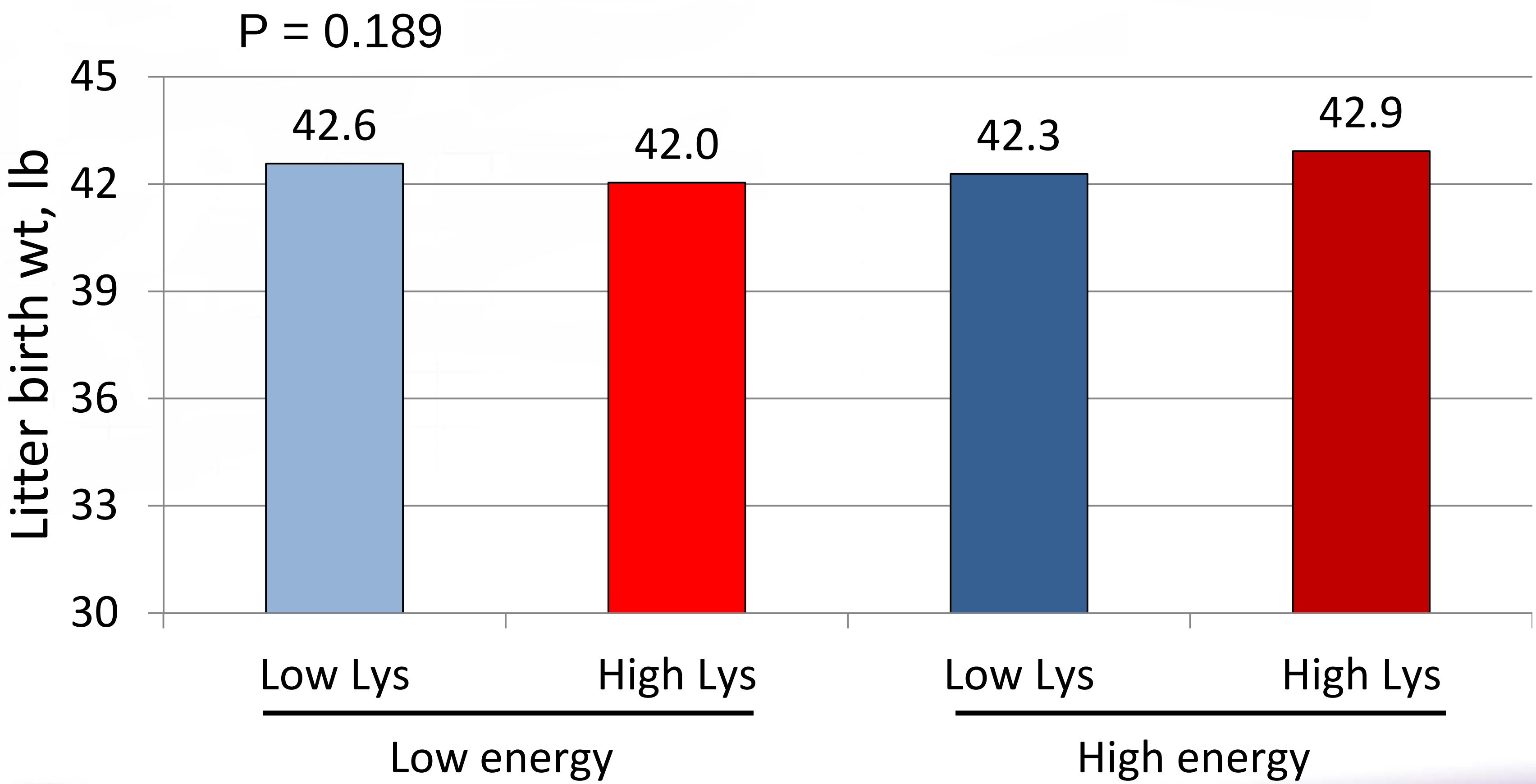
K-STATE Research and Extension

HORD LIVESTOCK CO., INC.

Goncalves et al., 2015

Knowledge for Life

Influence of lysine and energy intake from d 90 to farrowing on litter birth weight



K·STATE Research and Extension

HORD LIVESTOCK CO., INC.

Goncalves et al., 2015

Knowledge for Life

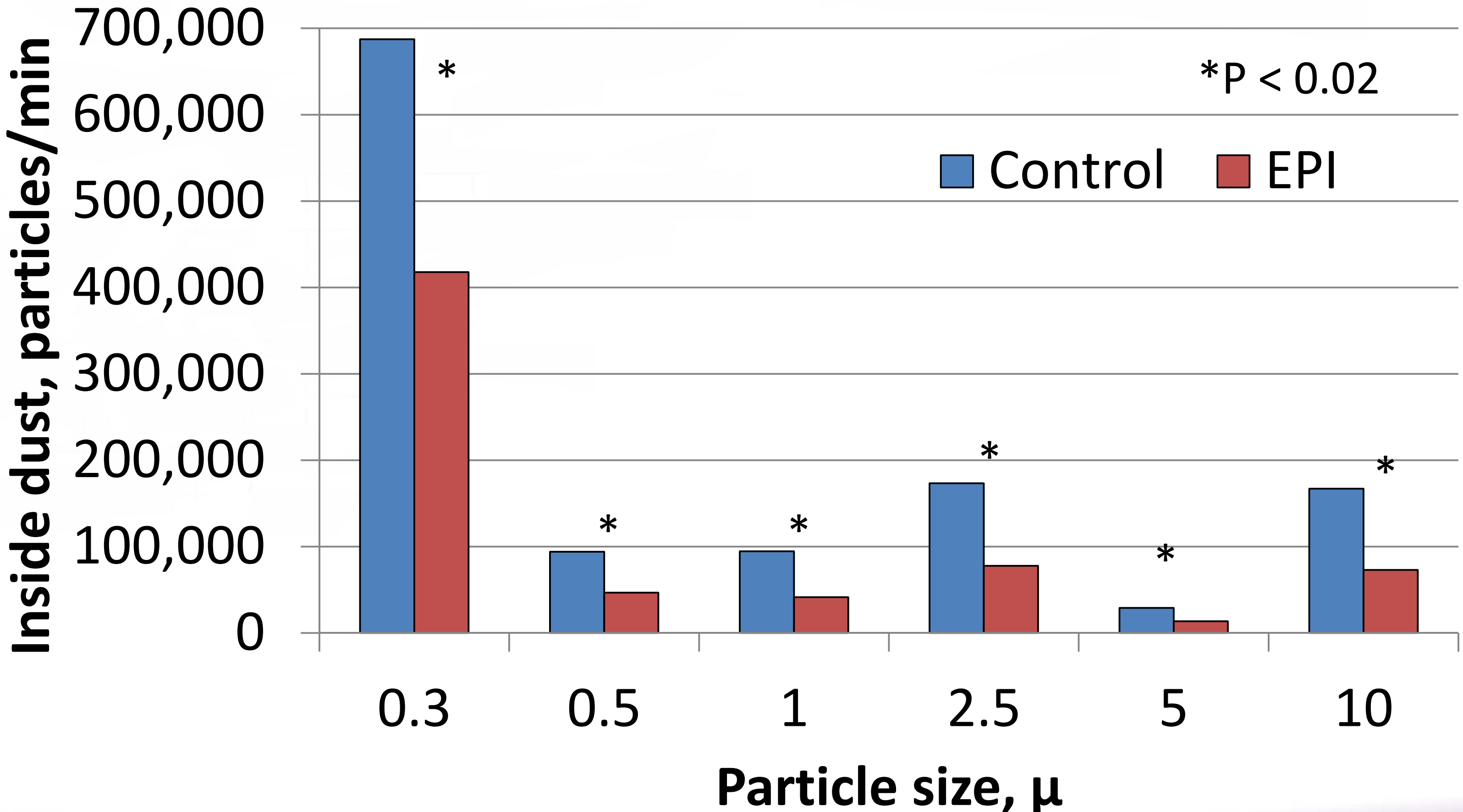
Effects of Electrostatic Particle Ionization on Hog Barn Air Quality, Emissions and Pig Growth Performance

De Jong et al., 2014

K·STATE Research and Extension

Knowledge for Life

Effect of EPI system on dust in inside air
- 39 to 56% reduction



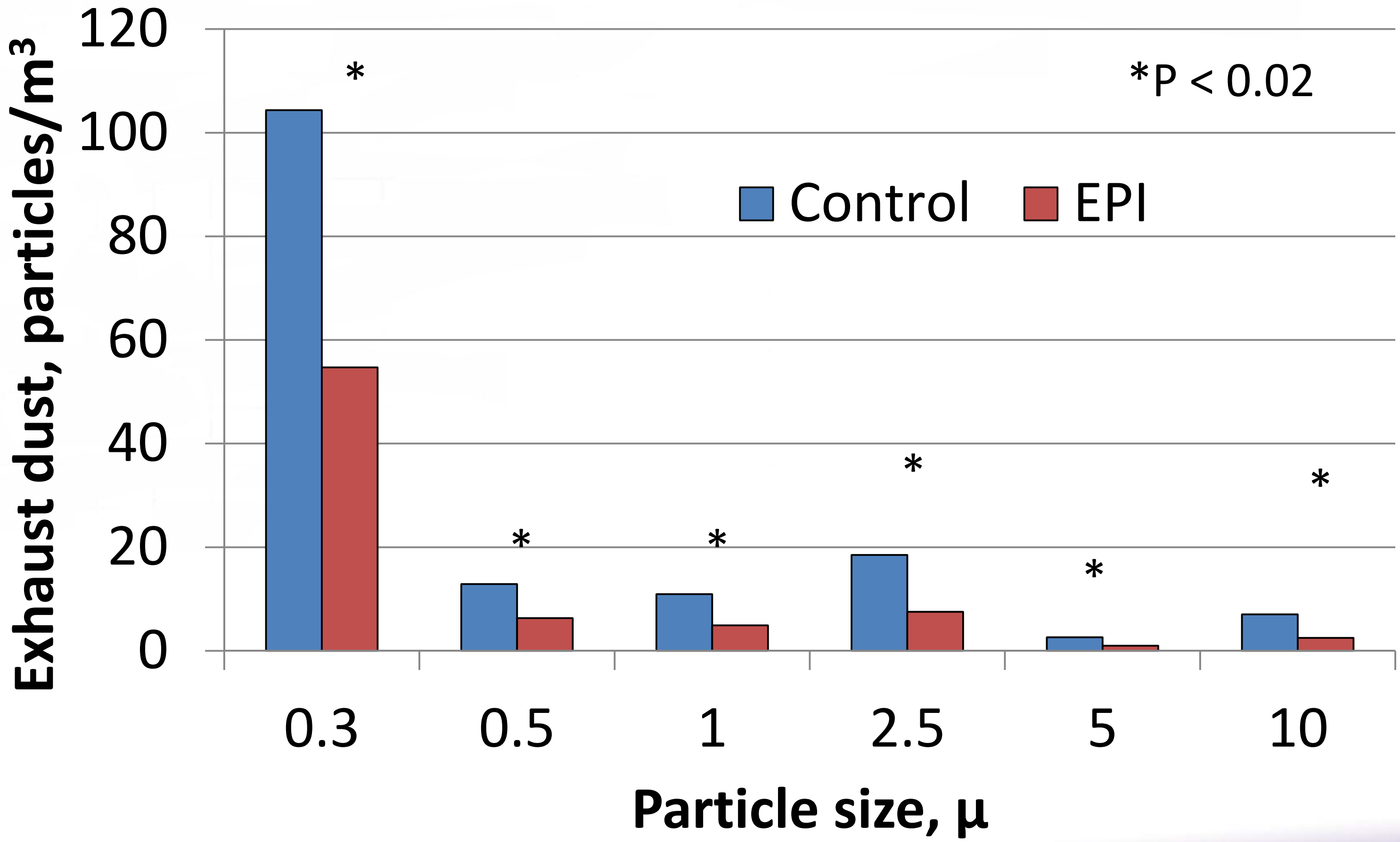
De Jong et al., 2014

K·STATE Research and Extension

Knowledge for Life

Effect of EPI system on dust in exhaust air

- 48 to 64% reduction

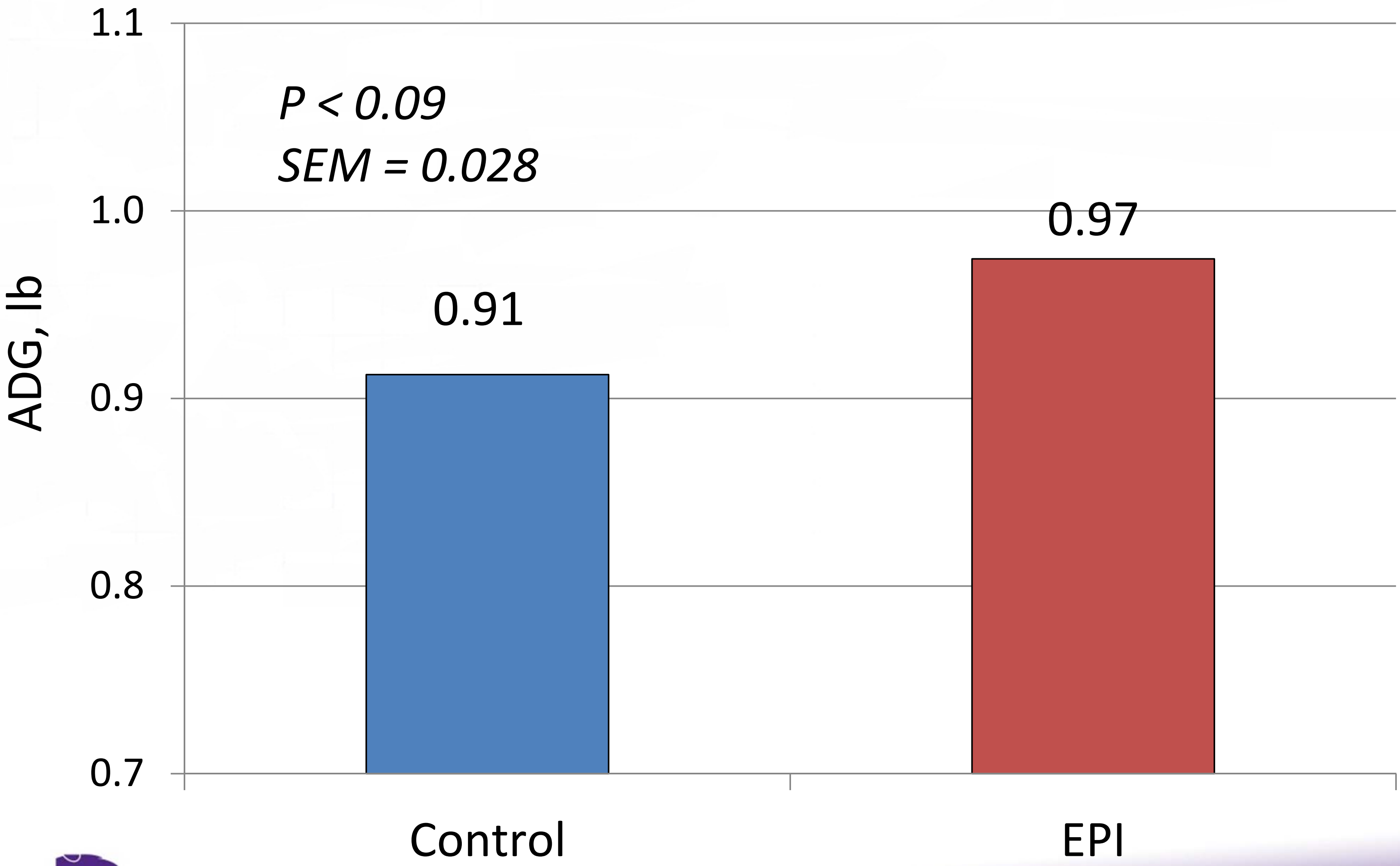


K·STATE Research and Extension

De Jong et al., 2014

Knowledge for Life

Effect of EPI system on ADG



EPI system – removes dust from the air

K·STATE
Research and Extension

Knowledge for Life

New Nursery Building at the K-State Swine Teaching and Research Center

<u>**Special "Thank You":**</u>

Kansas Pork Association

Department of Animal Sciences and Industry

Midwest Livestock Systems Inc.

KSU Campus Planning and Facilities Management

Pat Murphy

Swine Farm Crew

New Nursery Barn Information:

- Overall building dimensions = 140’ x 33’
- 86 pens with a capacity of up to 5 pigs per pen
- Connecting hallway to existing buildings for access to sow farrowing and nursery
- Feed room (16’ x 33’) for bagged research diet storage
- Two bulk feed bins to provide standard nursery feed directly to the feed room or individual pens
- Galvanized gating and flooring
- Hanging floor scale for weighing entire pens of pigs
- Multiple windows to provide natural lighting
- Easy adjust feeders and nipple waterers in each pen


GESTATION BARN


THORP
THORP

KSU Swine Day 2014

K·STATE
Research and Extension

K·STATE
Research and Extension

Knowledge for Life