

36TH ANNUAL SWINE CONFERENCE

Two Decades of Swine Nutrition

The Biggest Changes and Their Impact

Casey Neill - CISS



Just a few Notes:

- **Sow Nutrition – Amnio Acids in lactation and how to feed the sow**
- **Nursery Nutrition – Livability and feed intake**
- **Grow-Finish Nutrition – Amnio Acids, Ractopamine, DDGS**
- **Feed Mills gave way to new ingredients and formulation**
- **20+ years ago: base mixes leaned on heavy soybean meal, with little to no synthetic inclusion.**
- **Automated mills made formulation cheaper and more precise — opening the door to synthetics.**

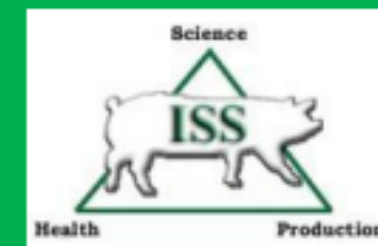


Update on Cooperative Amino Acid Lactating Sow Research

2010 Swine Summit

L. Greiner, G. Allee, J. Connor, J. Usry,
C. Neill, and N. Williams

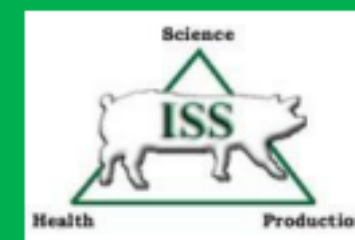
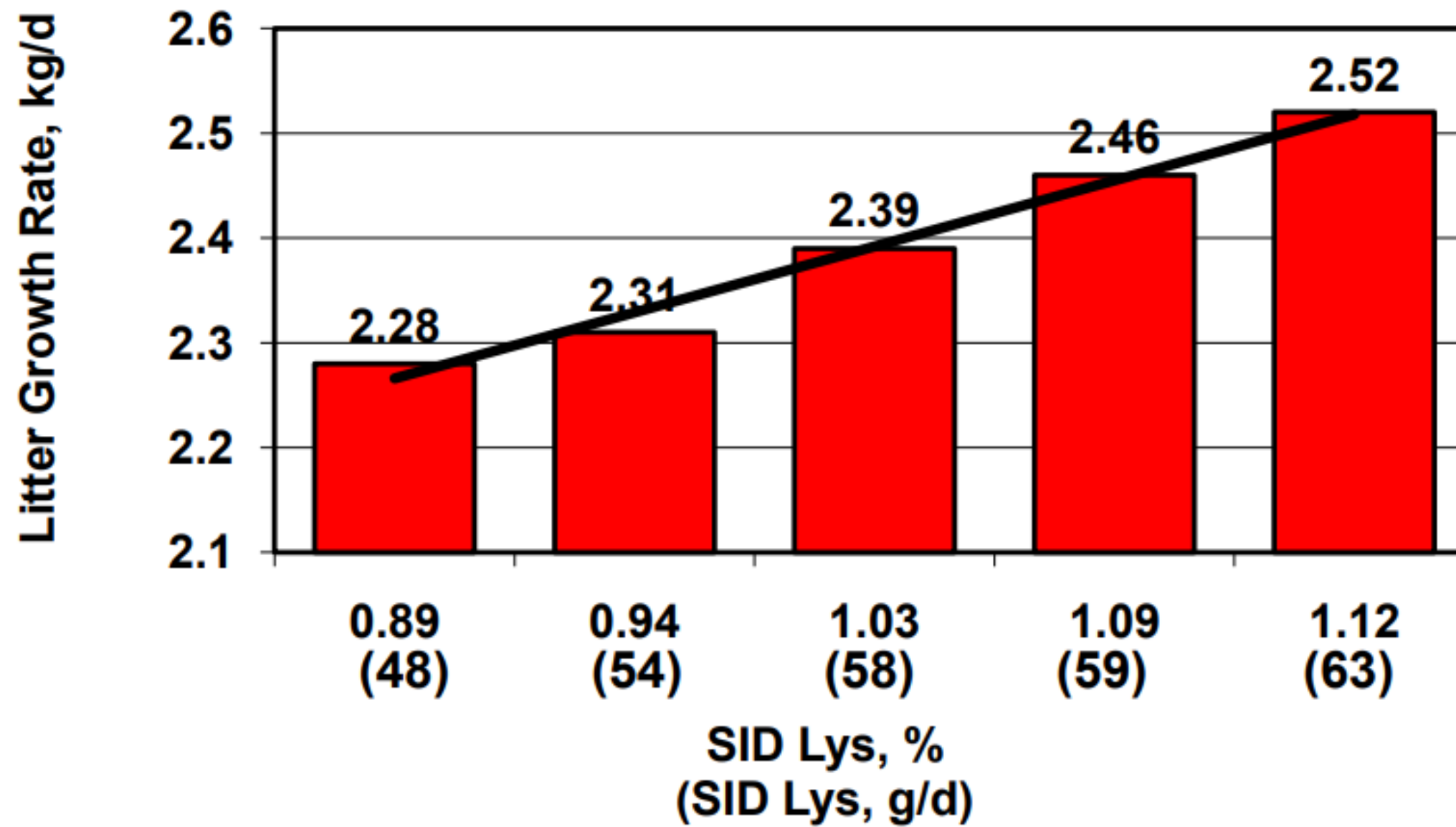
Innovative Swine Solutions, LLC
Carthage Veterinary Service, Ltd



Lactation Feed Intake = Weaning Weight



Effect of dietary lysine intake on P1 litter growth rate:
Linear $P < 0.05$; SEM = 0.07



Quick!

Pick the most productive milker



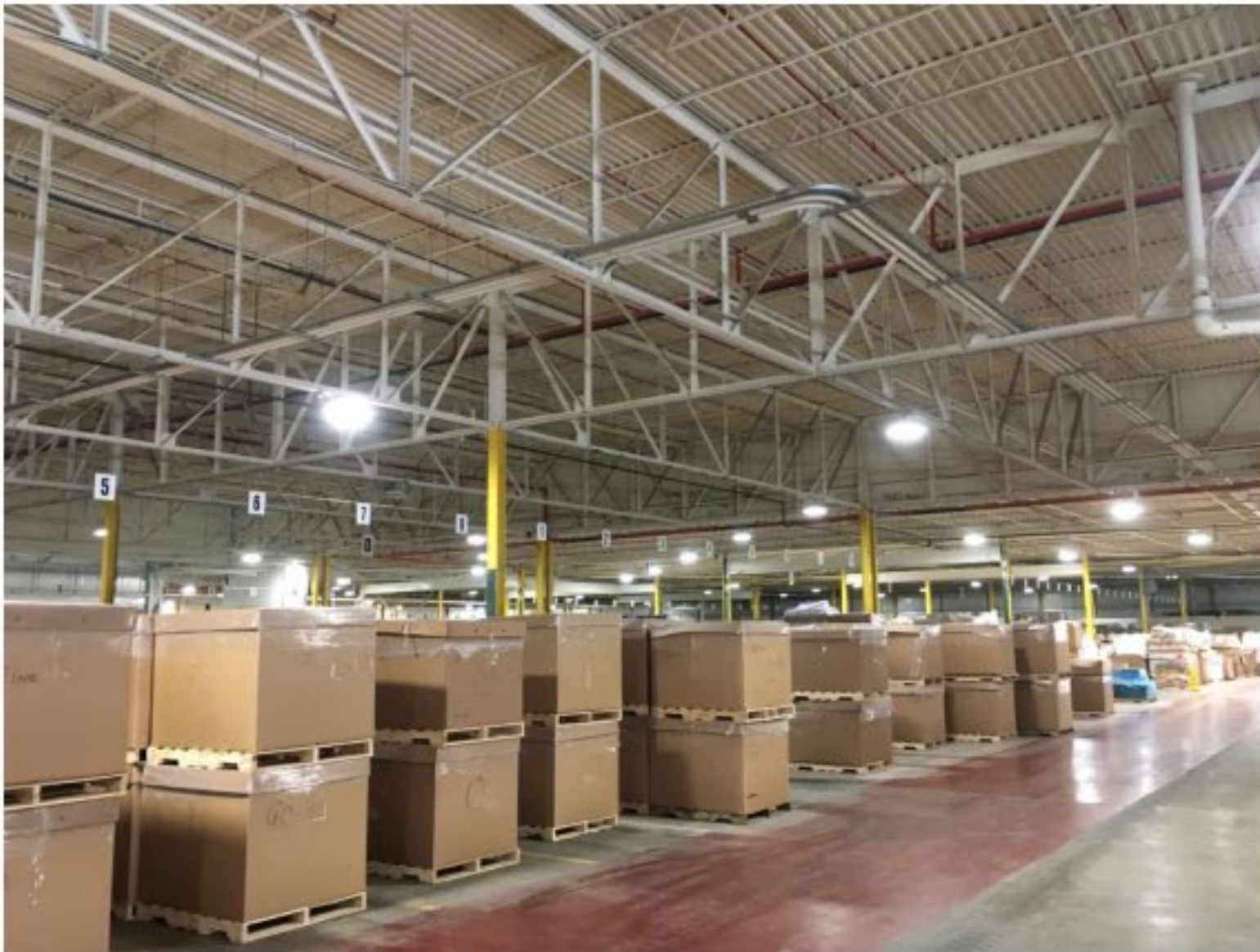
Feeding Health Challenged Wean Pigs

- Don't settle for cheap formulated nursery diets that the pigs will not eat.
- Use cost effective formulation to reduce morality and fall behinds.
- Use the right ingredients.



CARTHAGE
INNOVATIVE SWINE
SOLUTIONS

New Nursery Ingredients from the Food Grade Human Side



Confidential

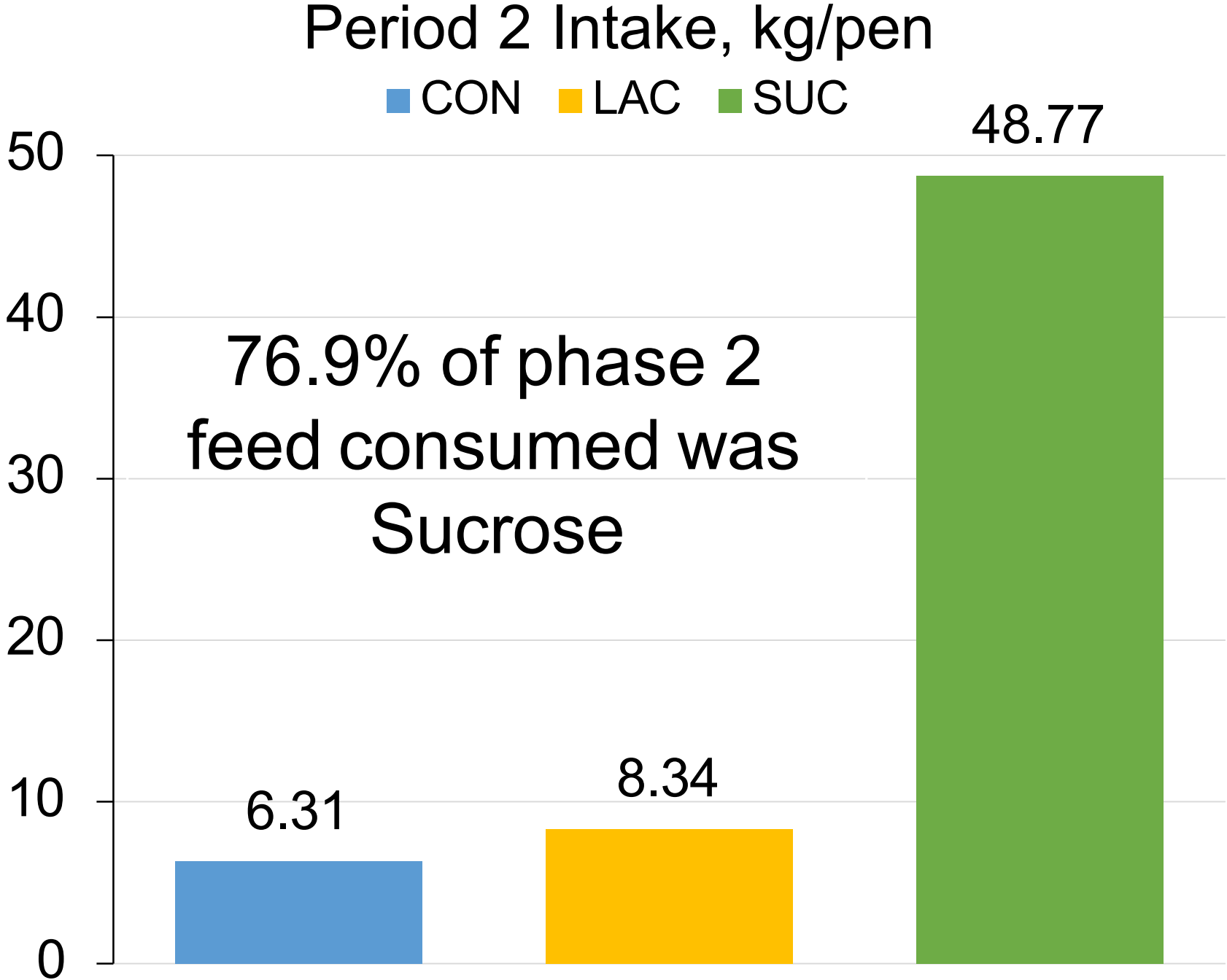
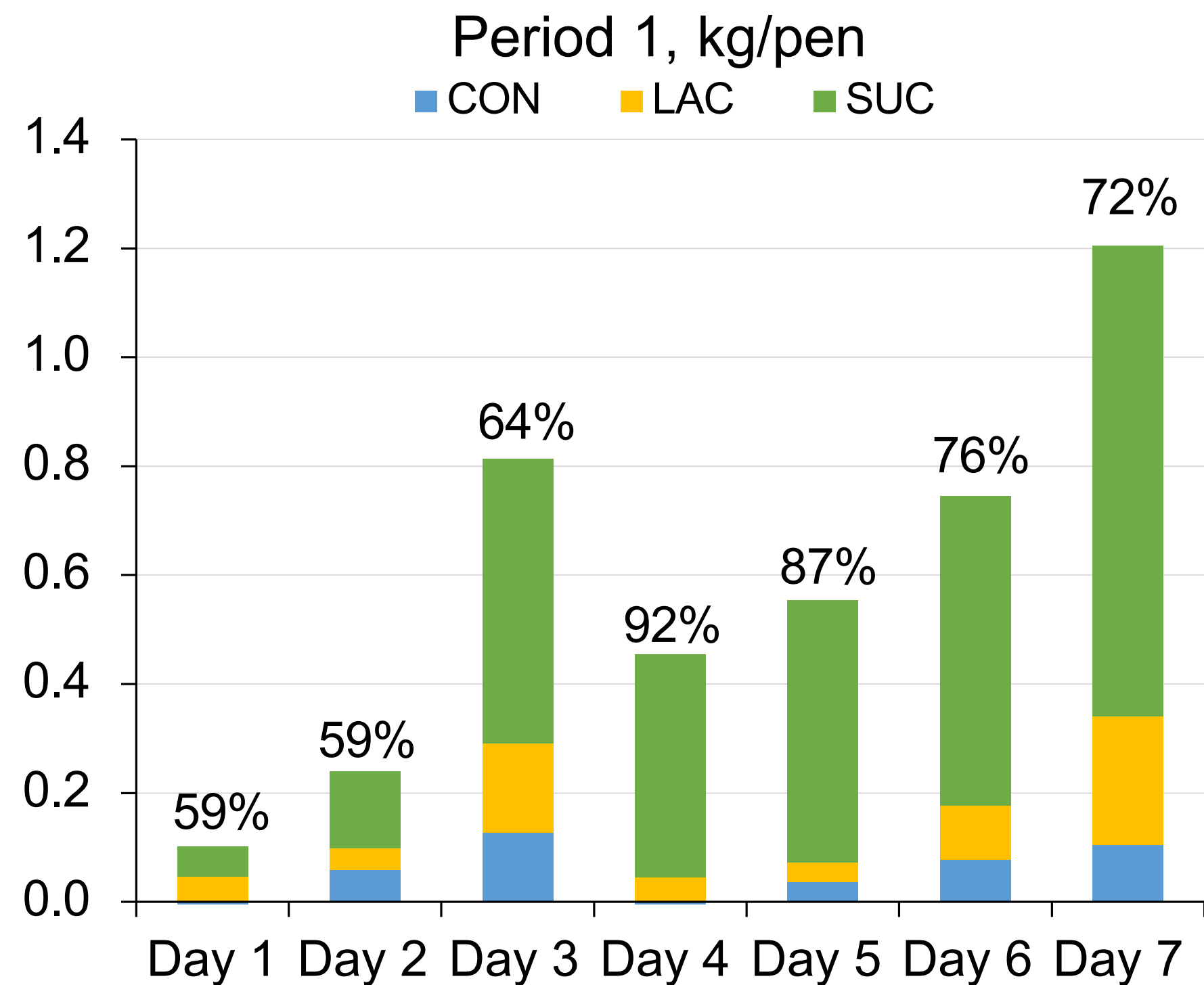


Steam Rolled Oats



Descriptive Analytics: Preference Test

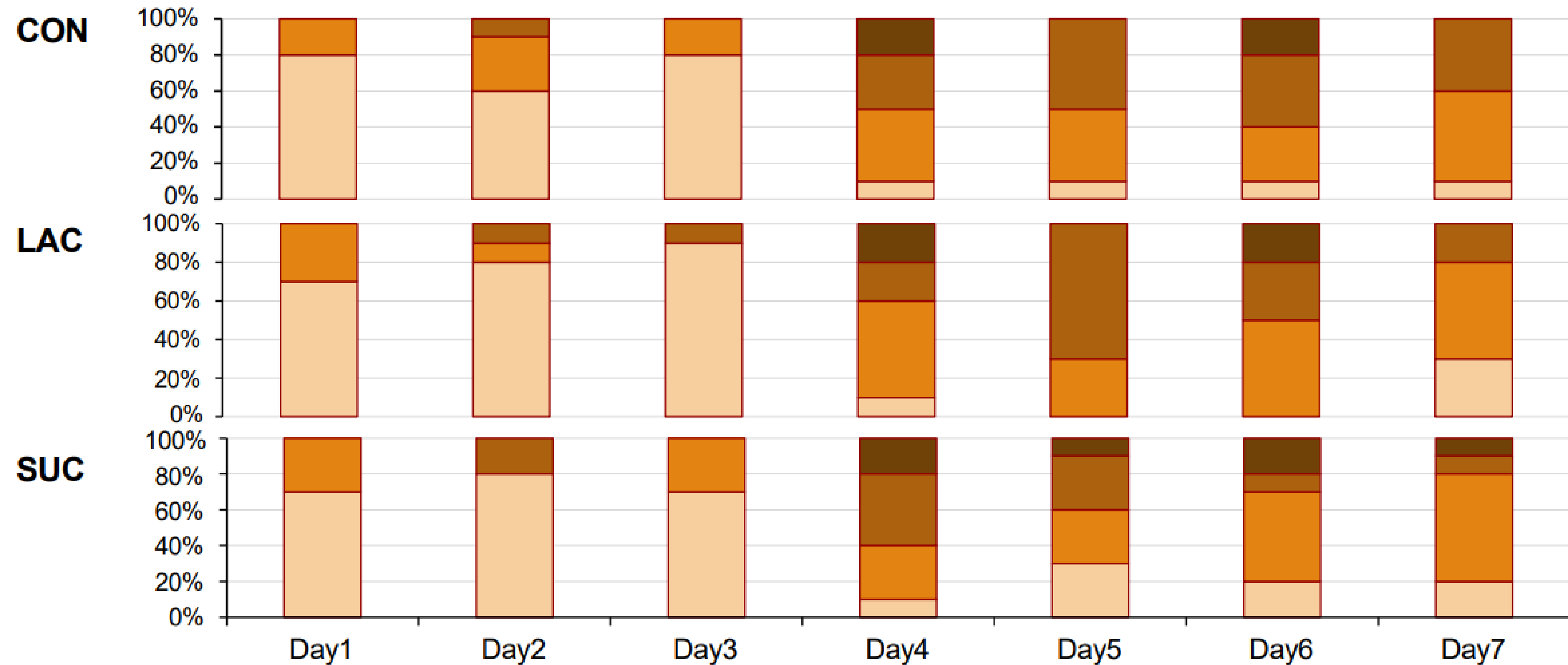
- Pigs consistently preferred sucrose feed



Results: Fecal Scores during the first week post-weaning

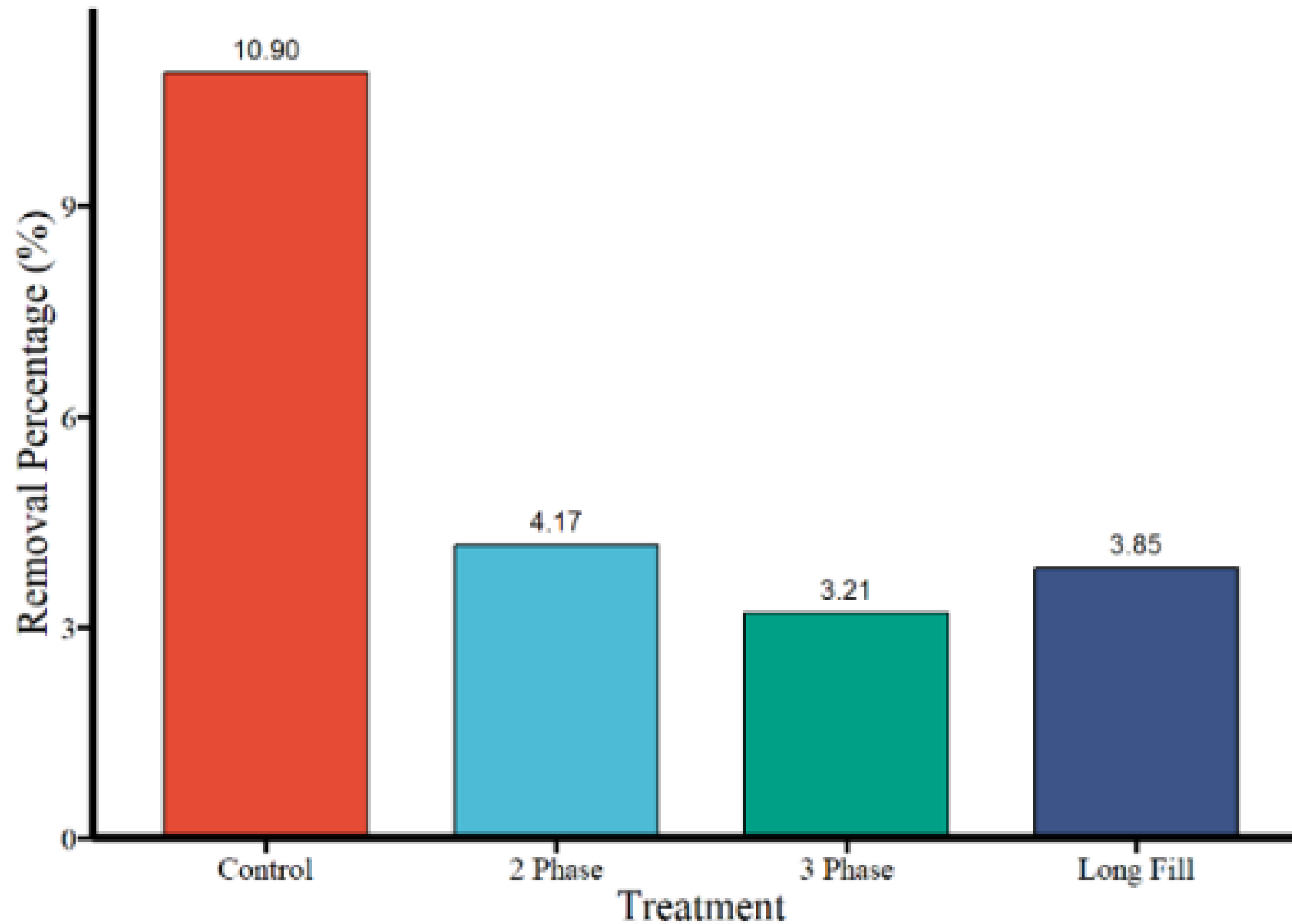
% Pens by Fecal Score

Fecal Score Severity
0 1 2 3

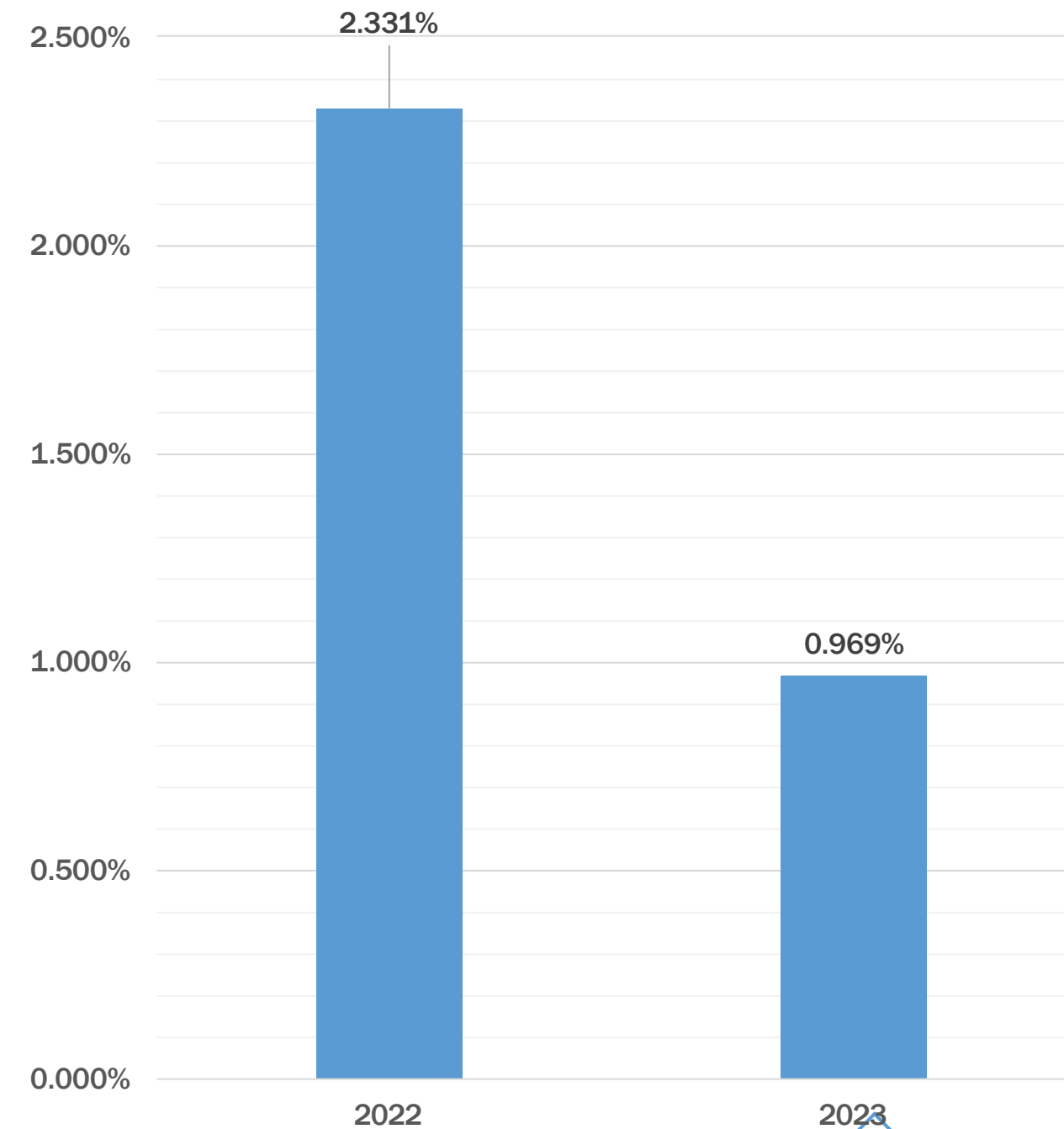
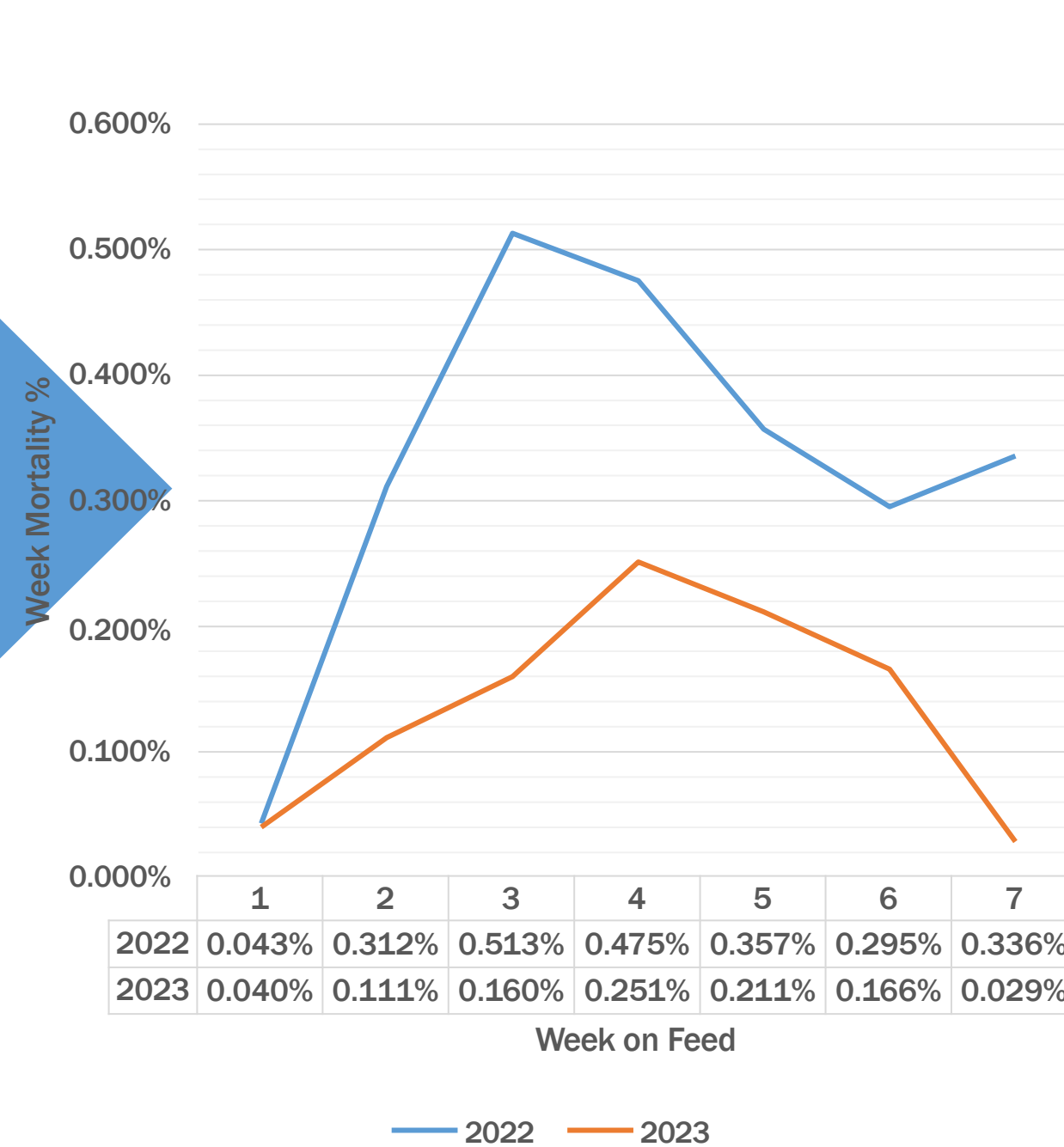


Overall Removals by treatment

Figure 4. Cumulative removals



Nursery Mortality in Commercial System



Life as a U.S. nutritionist

Dr. Tokach

2009

Previous life

- Corn-soy diets
 - 3 lb L-lysine/ton
- Relatively few changes
- High energy
- Mono or dicalcium P
- All diets looked alike
- Low risk for deficiencies
 - Phos, vitamins, minerals

New life

- Corn-soy base???
 - DDGS, high synthetics, etc
- Frequent changes
- Low to moderate energy
- Phytase
- Many different approaches
- Higher risk for deficiencies
 - Lower margin of safety

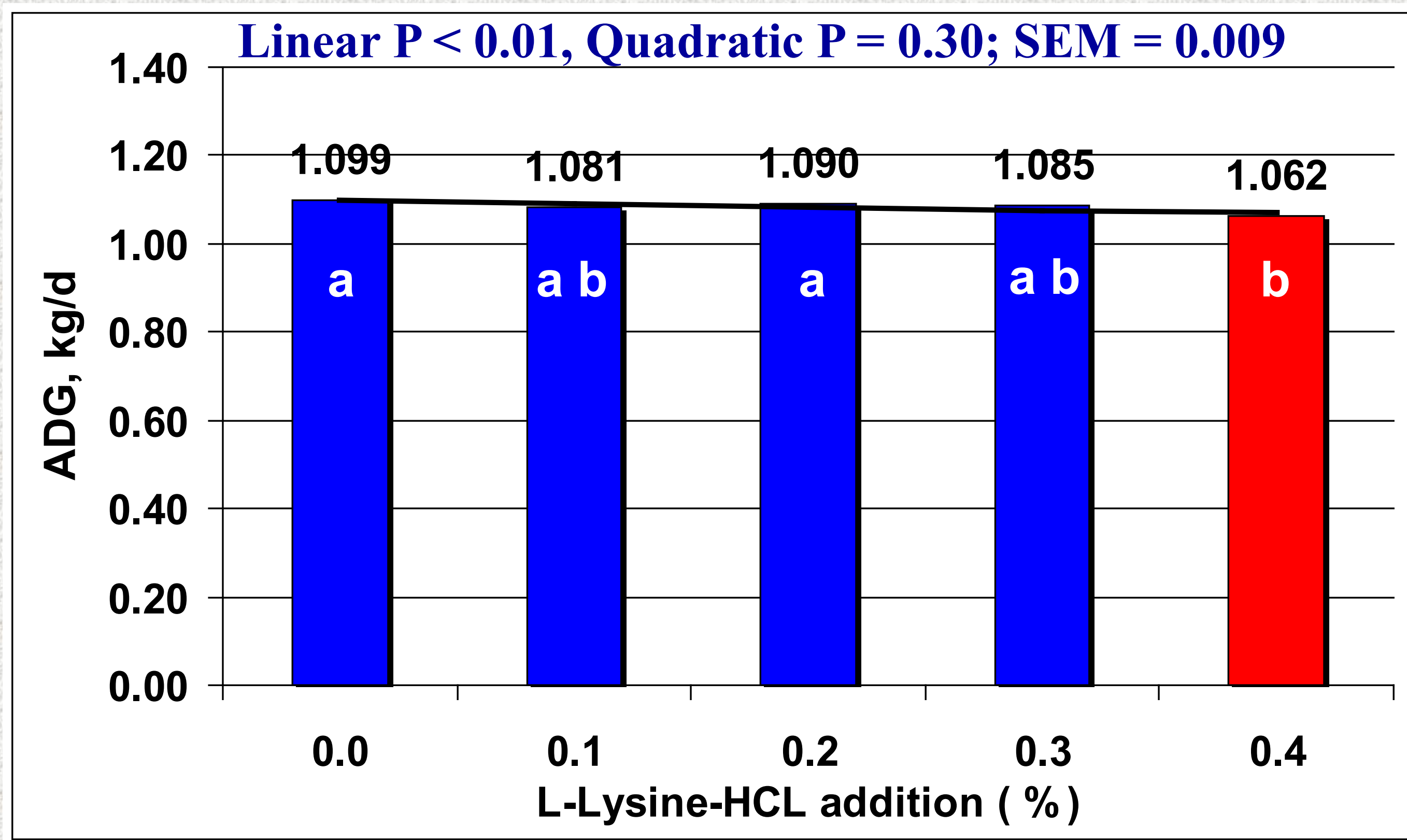
Effect of L-lysine HCL addition in early and late finishing pigs

**P. Srichana^{*1}, A.M. Gaines¹, B.W. Ratliff¹,
G.L. Allee¹, and J.L. Usry²**

¹University of Missouri-Columbia, MO

²Ajinomoto Heartland LLC, Chicago, IL

Exp. 1 Day 0-24: ADG (kg)

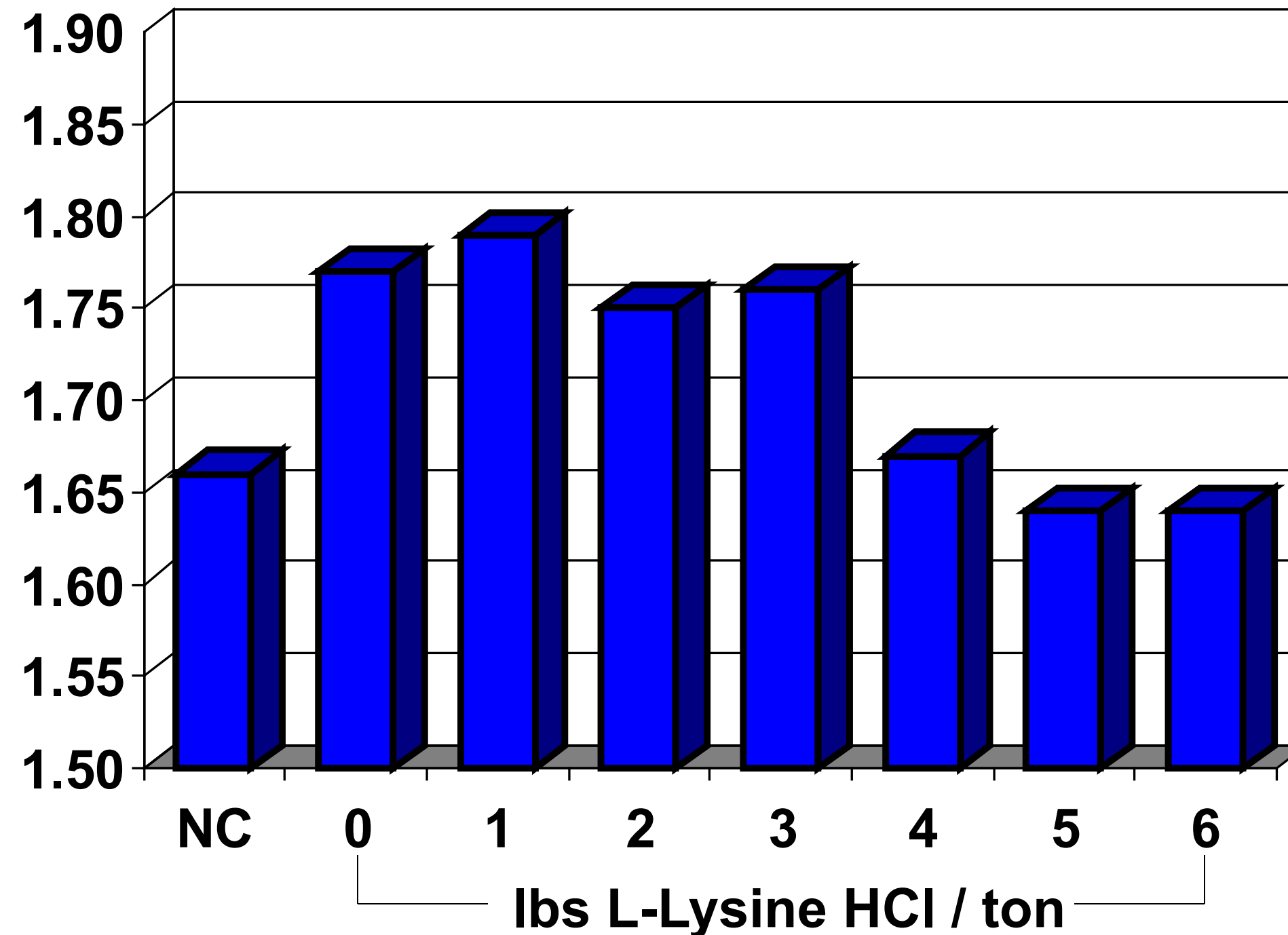


Data represents 1680 pigs (16 replications/trt)

KSU L-Lysine HCl Titration

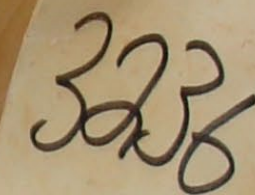
De La LLata et. al, 2000

Cumulative ADG 65-265 lbs



PIC

- # 1980



NC STATE UNIVERSITY

Summary of Paylean Benefits

- When fed to finishing pigs, Paylean:
 - Improves growth performance traits
 - Average daily gain
 - Feed efficiency
 - No effects on ADFI
 - Improves carcass traits
 - Carcass yield
 - Percent lean
 - Does not adversely affect meat quality traits



Serial Harvest Study

- Conducted by Dr. Gary Allee, University of MO
- Utilized 1,552 pigs in a commercial research barn

Measurement	Days of Paylean compared to NRC Control				
	7	14	21	28	35
Average Daily Gain	18.3%	27.9%	17.4%	16.6%	17.5%
Feed Efficiency	19.9%	35.7%	15.3%	17.8%	18.6%
Lean % (percentage points)	0.04%	0.49%	0.68%	1.00%	0.83%
Yield % (percentage points)	-0.25%	0.07%	0.45%	0.29%	0.32%

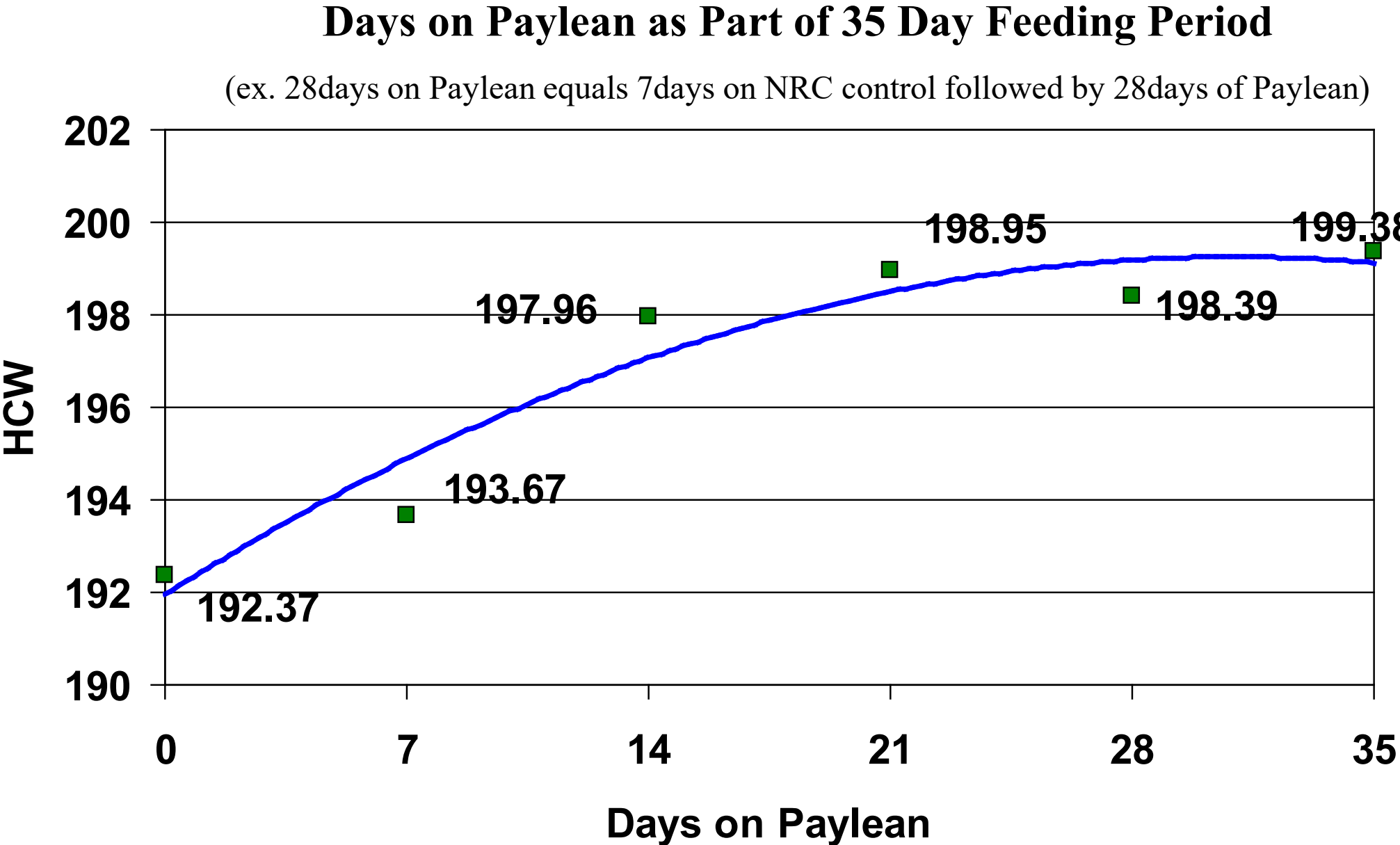
There were no statistical differences for any of the growth or carcass traits between Paylean 4.5 g/ton and 6.75 g/ton

The effects of Paylean (average dose = 5.63 g/ton and average duration = 21 days) were evaluated vs. NRC control

Note: maximum Paylean responses are highlighted in red



Effects of Paylean Duration on HCW Response



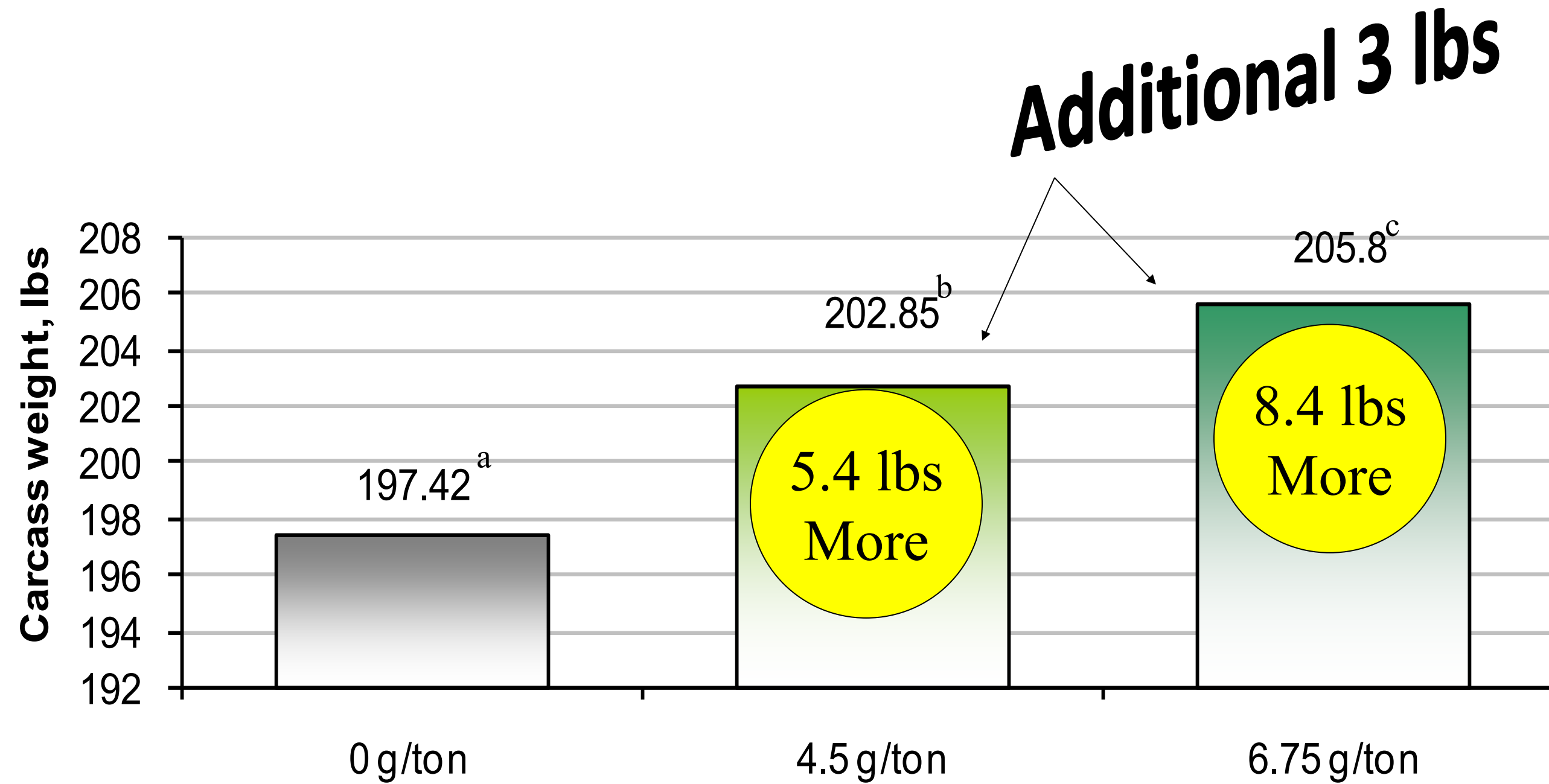
NRC Control vs. All Paylean Groups: $P = 0.0023$

<i>Paylean 4.5 Contrasts</i>	<i>P-value</i>	<i>Paylean 6.75 Contrasts</i>	<i>P-value</i>
NRC Control vs. Paylean 4.5	0.0069	NRC Control vs. Paylean 6.75	0.0018
Linear duration: Paylean 4.5	0.07	Linear duration: Paylean 6.75	0.0107
Quadratic duration: Paylean 4.5	0.15	Quadratic duration: Paylean 6.75	0.2600



Carcass Traits of Pigs Fed Paylean¹

Carcass Weight, lbs



¹ Least squares means.

abc Means with differing superscripts differ significantly (P<0.05).



Ethanol (DDGS) Boom

Boom

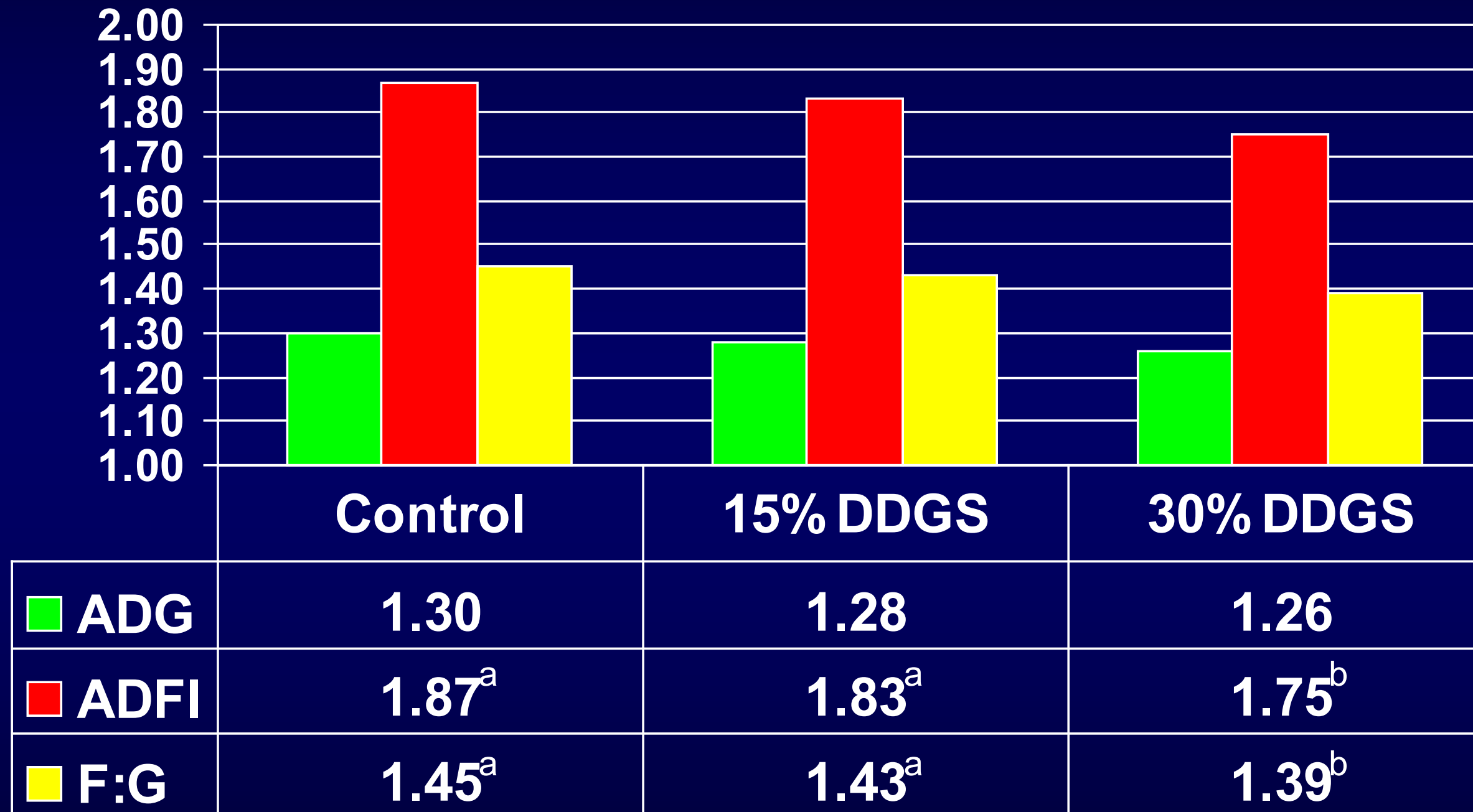


Effect of Processing Method on DDGS Quality



Nursery: Performance 25-50 lbs

Exp. 4



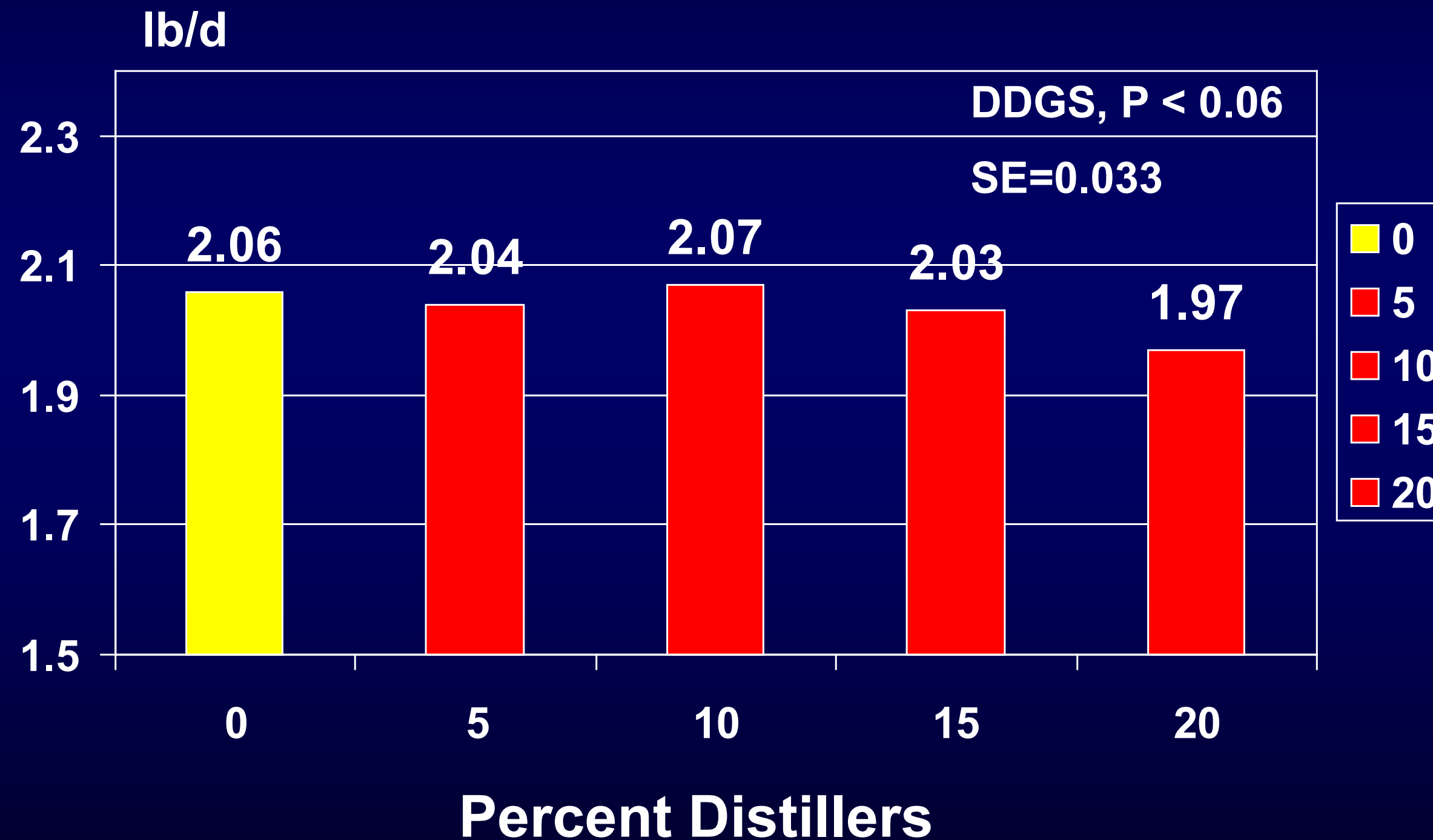
Gain $P = 0.39$

Feed Intake $P < 0.01$

F:G $P < 0.05$

Gaines et al. 2006

Increasing levels of DDGS on Grower pig ADG



Linneen et al., 2007; KSU

From the Farm Grinder to the Feed Mill



Independent producers ground their own feed — corn, soybean meal, and a base mix. Simple diets, done on the farm.

01 · MANUFACTURING
Stationary Mill



Grinding and mixing moved into a shed — still small, but a step toward dedicated infrastructure.

Today's Feed Mills



**Large, automated mills —
enabling more precise, cost-
effective formulation at
scale.**

From the Farm Grinder to the Feed Mill



On-Farm Grinder

Independent producers ground their own feed — corn, corn, soybean meal, and a base mix. Simple diets, done on the farm.



Stationary Mill

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Today's Feed Mill

Large, automated mills — enabling more precise, cost-effective formulation at scale.

Owning the Mill Again



Producers moved from grinding their own feed to relying on toll mills as the industry scaled up.

Now, some producers are building and operating their own mills again — a full-circle moment, just at a very different scale.

NEVER SETTLED

Genetics, health, and feed manufacturing have never stood still for long.

What we do today may be commonplace in five years — what will the next chapter of swine nutrition look like?

Thank You

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