NEW FASHION PORK

"Dr. Hastad's unconventional approaches to nutrition for improved pig performance and profitability."

Chad Hastad, Ph.D.

Director of Nutrition, Research and Support Operations, New Fashion Pork

dsm-firmenich

About NFP

Farm Family Values

- Celebrated 30 years in business this year.
- NFP is the 20th largest producer in the United States:
- Integrated pork production enterprise
- People-centered business employing over 400 people
- Produce over 1.40 million head of market hogs per year
- We have over 58,000 sows in 12 locations across Minnesota, Iowa, Indiana, South Dakota, Wyoming, Illinois and Wisconsin.
- Operate four feed mills located in Minnesota, Iowa, South Dakota and Indiana
- Over 200 nursery, grow-finish sites encompassing 650,000 grow-finish spaces
- Own and operate two A.I. Centers, housing a total of 400 boars
- Based out of Jackson, Minnesota

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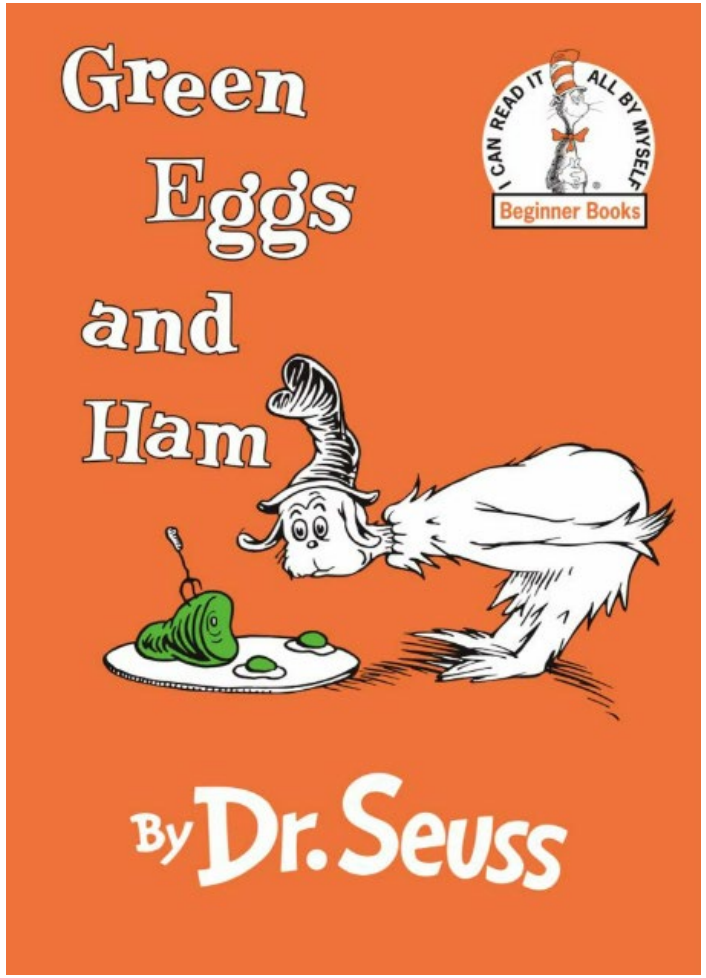
Kerri Hopkins said….

“That’ll be like a Dr Seuss book but in swine a presentation”



Slide from Lawyer

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Who
Why
What
When
Where

The Process

Size

Size of problem

What is the “size” or “level” of the problem
- Number of pigs, single barn, entire flow, system
- *Subjective vs Measurable – very important*

Timing

Timing

Is it a consistent & presentient problem that occurs that you know when it will occur?

Solution

Stump the Chump

Is there a solution, if not who do you call.
- “I may not know the answers but I might know someone who does” Wayne R Cast

Economics

$$$

What does the “problem” cost
- Time, revenue reduction, performance

What does the “solution” cost
- Time, revenue improvement, performance

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What are we often taught or told ?

What are we often taught or told ?

Consider a simple wean pig group

Nutrition			
Energy Level			
Protein Level			
Vitamin Level			
Mineral level			
Fiber Level			
Micro Mineral Level			
Ingredient tolerances			
Particle Size			
Product quality			
Mycotoxins			
Fiber type			
Pro / Prebiotic			

Consider a simple wean pig group

Nutrition	Sow		
Energy Level	Sow farm / Unique "bugs"		
Protein Level	Sow Partity		
Vitamin Level	Wean Age		
Mineral level	Staging Room		
Fiber Level	Litter Size		
Micro Mineral Level	Sow Feeder design		
Ingredient tolerances	Piglet Proccessing		
Particle Size	Birth Order		
Product quality	Scour/ No Scour		
Mycotoxins	Heat mat / lamps		
Fiber type	Brooder / No Brooder		
Pro / Prebiotic	Crate flooring type		

Consider a simple wean pig group

Nutrition	Sow	Housing	
Energy Level	Sow farm / Unique "bugs"	Feeder Design	
Protein Level	Sow Partity	Pen size/shape	
Vitamin Level	Wean Age	Grueling mats or bowls	
Mineral level	Staging Room	Water cup size	
Fiber Level	Litter Size	Water cup placement	
Micro Mineral Level	Sow Feeder design	Flooring type	
Ingredient tolerances	Piglet Proccessing	Lighting type	
Particle Size	Birth Order	Light duration	
Product quality	Scour/ No Scour	Ventilation	
Mycotoxins	Heat mat / lamps	Pen stock	
Fiber type	Brooder / No Brooder		
Pro / Prebiotic	Crate flooring type		

Consider a simple wean pig group

Nutrition	Sow	Housing	Health
Energy Level	Sow farm / Unique "bugs"	Feeder Design	PRRS Vaccine
Protein Level	Sow Partity	Pen size/shape	E Coli Vaccine
Vitamin Level	Wean Age	Grueling mats or bowls	Water vitamin supplementation
Mineral level	Staging Room	Water cup size	Circovirus Vaccine
Fiber Level	Litter Size	Water cup placement	HPS Vaccine
Micro Mineral Level	Sow Feeder design	Flooring type	Ileitis Vaccine
Ingredient tolerances	Piglet Proccessing	Lighting type	Salmonella
Particle Size	Birth Order	Light duration	K88
Product quality	Scour/ No Scour	Ventilation	Mycoplasma Hyopneumoniae
Mycotoxins	Heat mat / lamps	Pen stock	Erysipothrix
Fiber type	Brooder / No Brooder		Iron
Pro / Prebiotic	Crate flooring type		Grazix
			A. Suis Vaccine
			Mycoplasma hyorhinis Vaccine

Consider a simple wean pig group

Nutrition	Sow	Housing	Health
Energy Level	Sow farm / Unique "bugs"	Feeder Design	PRRS Vaccine
Protein Level	Sow Partity	Pen size/shape	E.C[illegible]cine
Vitamin Level	Wean Age	Grueling mats or bo[illegible]	[illegible]lementation
Mineral level	Staging Room		[illegible]cine
Fiber Level	Li[illegible]		[illegible] Vaccine
Micro Mineral [illegible]			Ileitis Vaccine
Ing[illegible]		Lighting type	Salmonella
	[illegible] Order	Light duration	K88
P[illegible]	Scour/ No Scour	Ventilation	Mycoplasma Hyopneumoniae
Mycotoxins	Heat mat / lamps	Pen stock	Erysipothrix
Fiber type	Brooder / No Brooder		Iron
Pro / Prebiotic	Crate flooring type		Grazix
			A. Suis Vaccine
			Mycoplasma hyorhinis Vaccine

495 Combinations!!

Consider a simple wean pig group

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Protein Level	Sow Partity	Pen size/shape	E.C[illegible]cine
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Fiber Level	Li[illegible]		Vaccine
Micro Mineral [illegible]			Ileitis Vaccine
Ing[illegible]		Lighting type	Salmonella
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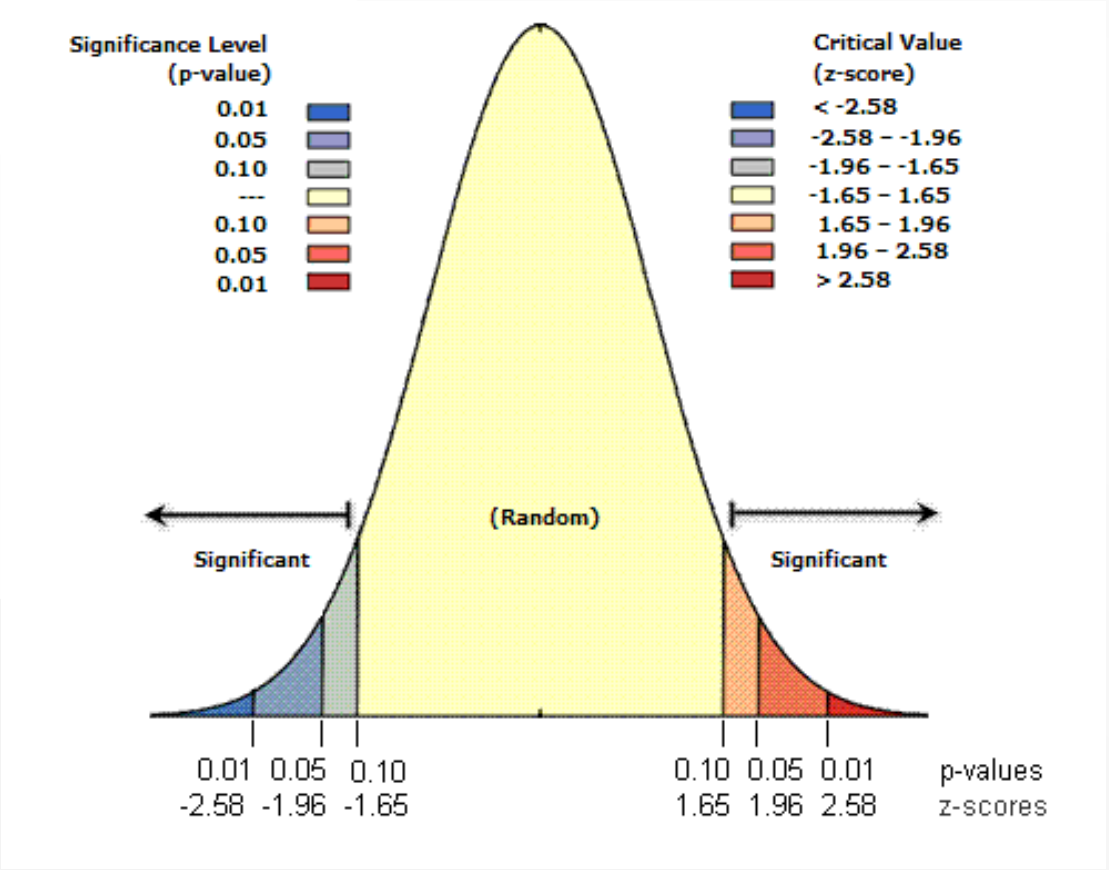
			Mycoplasma hyorhinis Vaccine

495 Combinations!!

That's BEFORE we even talk about herdsmenship


level
water
vaccine
mycoplasma
cup
feeder
size
sizeshape
lamps
vitamin
room
scour
type
sow
design
fiber
flooring
brooder
pen
salmonella
iron
energy
protein
unique
supplementation
circovirus
crate
piglet
particle
grind
hyopneumoniae
ventilation
staging
prrs
lighting
bowls
mal
product
farm

Getting better…



https://desktop.arcgis.com/en/arcmap/latest/tools/spatial-statistics-toolbox/what-is-a-z-score-what-is-a-p-value.htm

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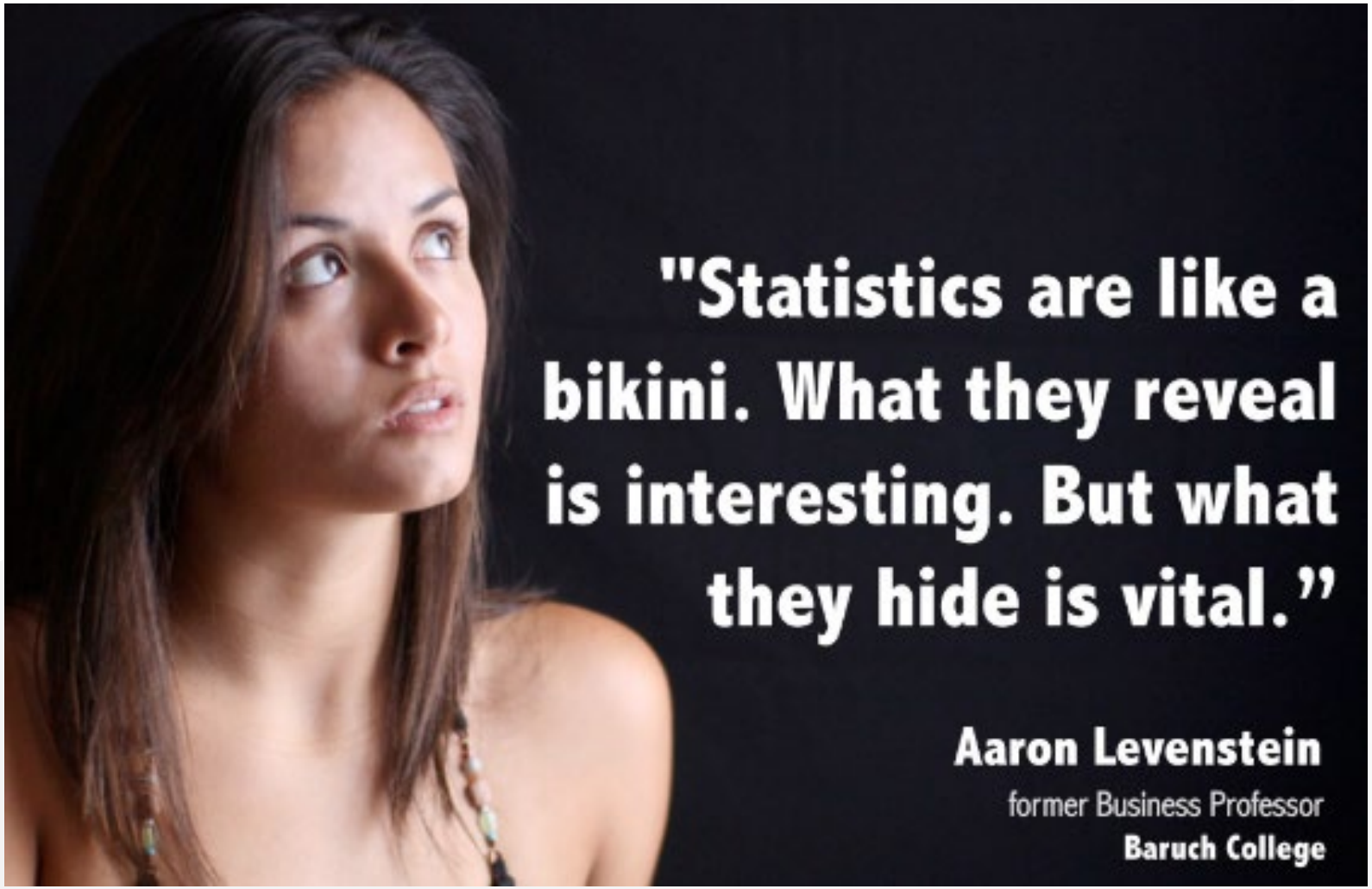

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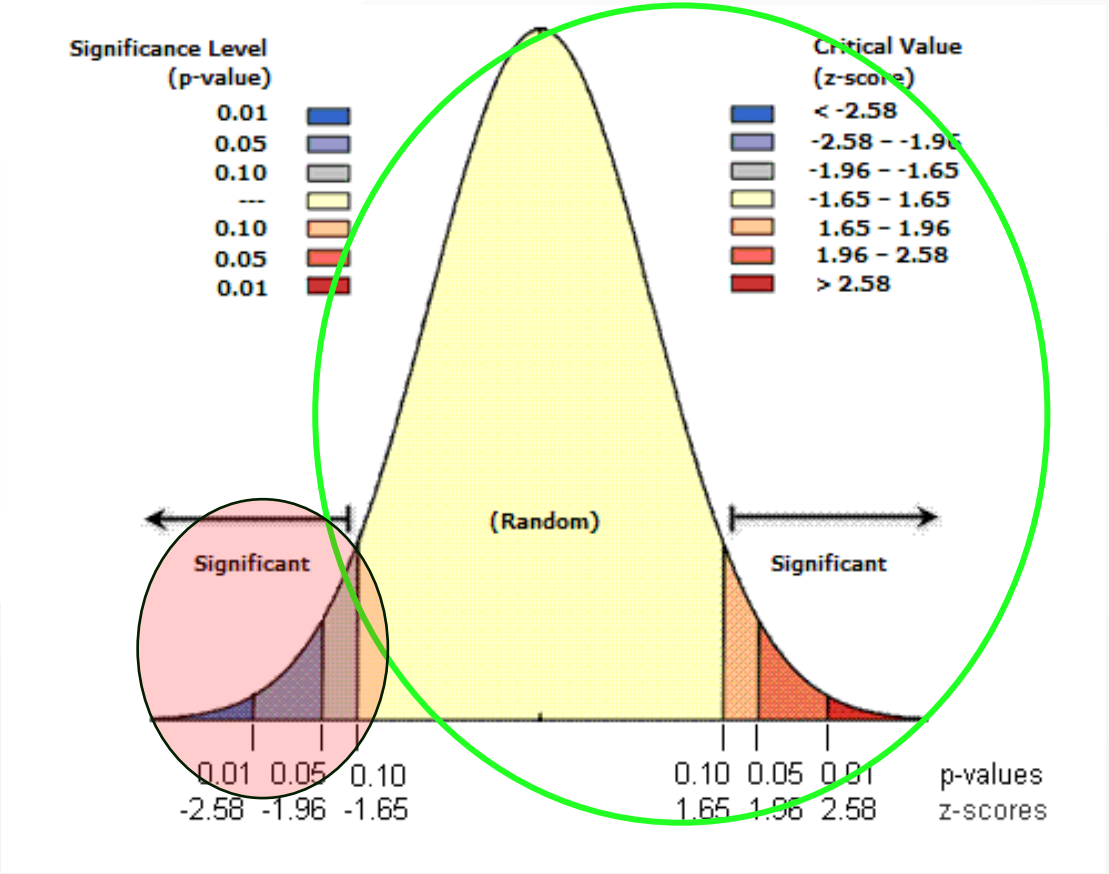
Getting better…



Has anyone considered that our swine *livability* is *similar* to how we set level of significance in many requirement studies?

https://desktop.arcgis.com/en/arcmap/latest/tools/spatial-statistics-toolbox/what-is-a-z-score-what-is-a-p-value.htm

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Chad what is something you do that is “Unconventional”

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The *Unconventional* things we do…

Dr. Knauer….. I'm sorry

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The *Unconventional* things we do…

Dr. Knauer….. I'm sorry

ORIGINAL RESEARCH

PEER REVIEWED

A survey of current feeding regimens for vitamins and trace minerals in the US swine industry

Josh R. Flohr, PhD; Joel M. DeRouchey, PhD; Jason C. Woodworth, PhD; Mike D. Tokach, PhD; Robert D. Goodband, PhD; Steve S. Dritz, DVM, PhD

Summary

Objective: To describe added vitamin and trace-mineral concentrations used in the US swine industry for breeding and growing pigs.

Materials and methods: A convenience sample survey of nutritionists from 18 US swine production systems representing approximately 2.3 million sows or 40% of the US sow herd was conducted to characterize added vitamin and trace-mineral concentrations in swine diets. Data were compiled by dietary phases to determine descriptive statistics. Nutrients evaluated were vitamins A, D, E, and K; biotin; choline; folic acid; niacin; pantothenic acid; pyridoxine; riboflavin; thiamin; vitamin B12; betaine; vitamin C; carnitine; copper; iodine; iron; manganese; selenium; zinc; cobalt; and chromium. Questions about supplementation of vitamin D from a cross-linked vitamin AD3 beadlet, potential use of natural (d-alpha-tocopherol) vitamin E as a source of vitamin E, and the use of chelated trace minerals were included.

Results: Results indicated variation, but most vitamins and trace minerals were included at concentrations above the total dietary requirement estimates reported by the National Research Council (2012). Chelated sources for partial or complete supplementation of copper, manganese, or zinc ranged from none to 46% and none to 77% for chelated selenium across diet type. The chelated sources were more prevalent in breeding-herd and nursery-pig diets.

Implications: Adding a margin of safety for vitamin and trace-mineral supplementation appears to be standard practice in US swine diets. This survey provides a baseline for supplementation rates of the vitamins and trace minerals used in the US swine industry.

Keywords: swine, trace minerals, vitamins, swine industry, survey

Received: February 19, 2016
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The *Unconventional* things we do…

Dr. Knauer….. I'm sorry

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Materials ar
sample surve
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added vitam
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statistics. Nu
mins A, D, E
acid; niacin;

riboflavin; thiamin; vitamin B12; betaine; vitamin C; carnitine; copper; iodine; iron; manganese; selenium; zinc; cobalt; and chromium. Questions about supplementation of vitamin D from a cross-linked vita-

zinc ranged from none to 46% and none to 77% for chelated selenium across diet type. The chelated sources were more prevalent in breeding-herd and nursery-pig diets.

Selenium (mg/kg)	17	0.29	0.29	1.9	0.04	0.14	0.30	0.30	0.30	0.30
Zinc (mg/kg)	17	112.9	123.0	1.2	28.3	56.7	108.0	125.0	147.2	165.0
Conditionally essential nutrients										
Carnitine (mg/kg)	2	50.0	50.0	NA	0.0	50.0	ND	50.0	ND	50.0
Chromium (mg/kg)	9	0.20	0.20	NA	0.0	0.20	0.20	0.20	0.20	0.20
Cobalt (mg/kg)	1	0.39	0.39	NA	ND	0.39	ND	0.39	ND	0.39
Vitamin C (mg/kg)	1	250.0	250.0	NA	ND	250.0	ND	250.0	ND	250.0

* Seventeen producers' nutritionists provided information for gestation diets, totaling approximately 2,223,600 sows (38.6% of the US sow herd). All reported values are on a complete-feed basis.

Flohr JR, DeRouchey JM, Woodworth JC, et al. A survey of current feeding regimens for vitamins and trace minerals in the US swine industry. *J Swine Health Prod.* 2016;24(6):290–303.

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Consider the Swine Show Industry

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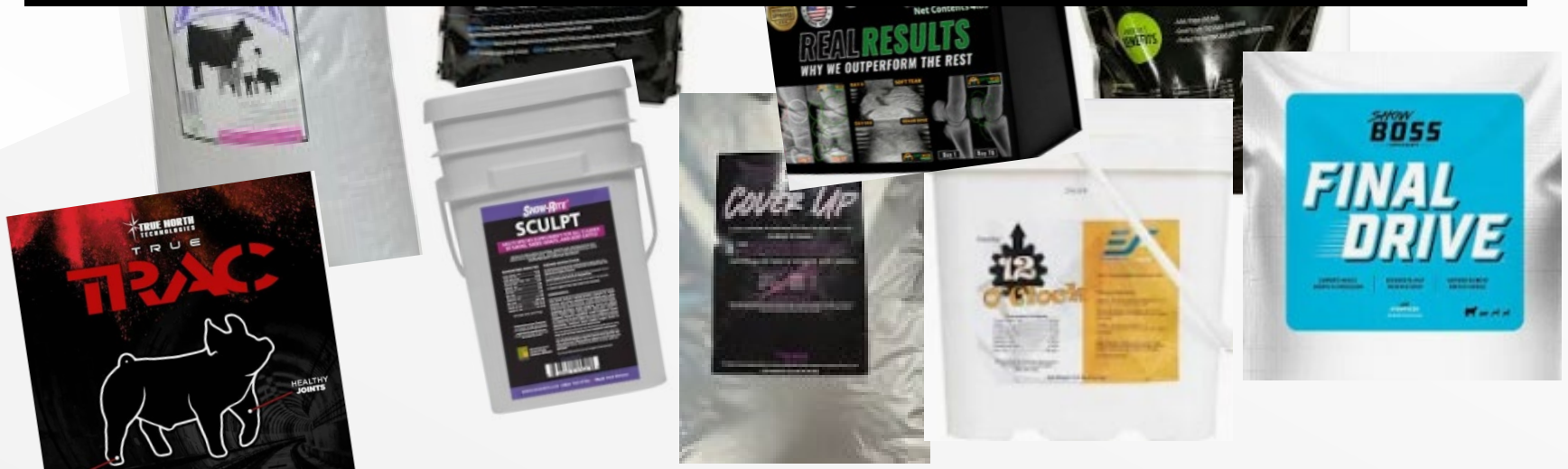
Consider the Swine Show Industry

Who is learning from whom ???



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Belling the Cat

Mice in Council

- The fable about a group of mice and dealing with a new cat.
- One of them proposes placing a bell around cat's neck
- Everyone loves and thinks a good idea
- Then, one mouse asks..

  "who will volunteer to place the bell on the cat"

- Evaluate a plan on not only the desirable the outcome, *but also how it can be executed*.

https://en.wikipedia.org/wiki/Belling_the_Cat

Using the research

Lots of good published research shows the benefit of different nutrition “interventions” on health & productivity.

- MCFA
- Fiber Types
- Amino Acid Levels
- Vitamin Levels
- Fatty Acids
- Mineral Ratio

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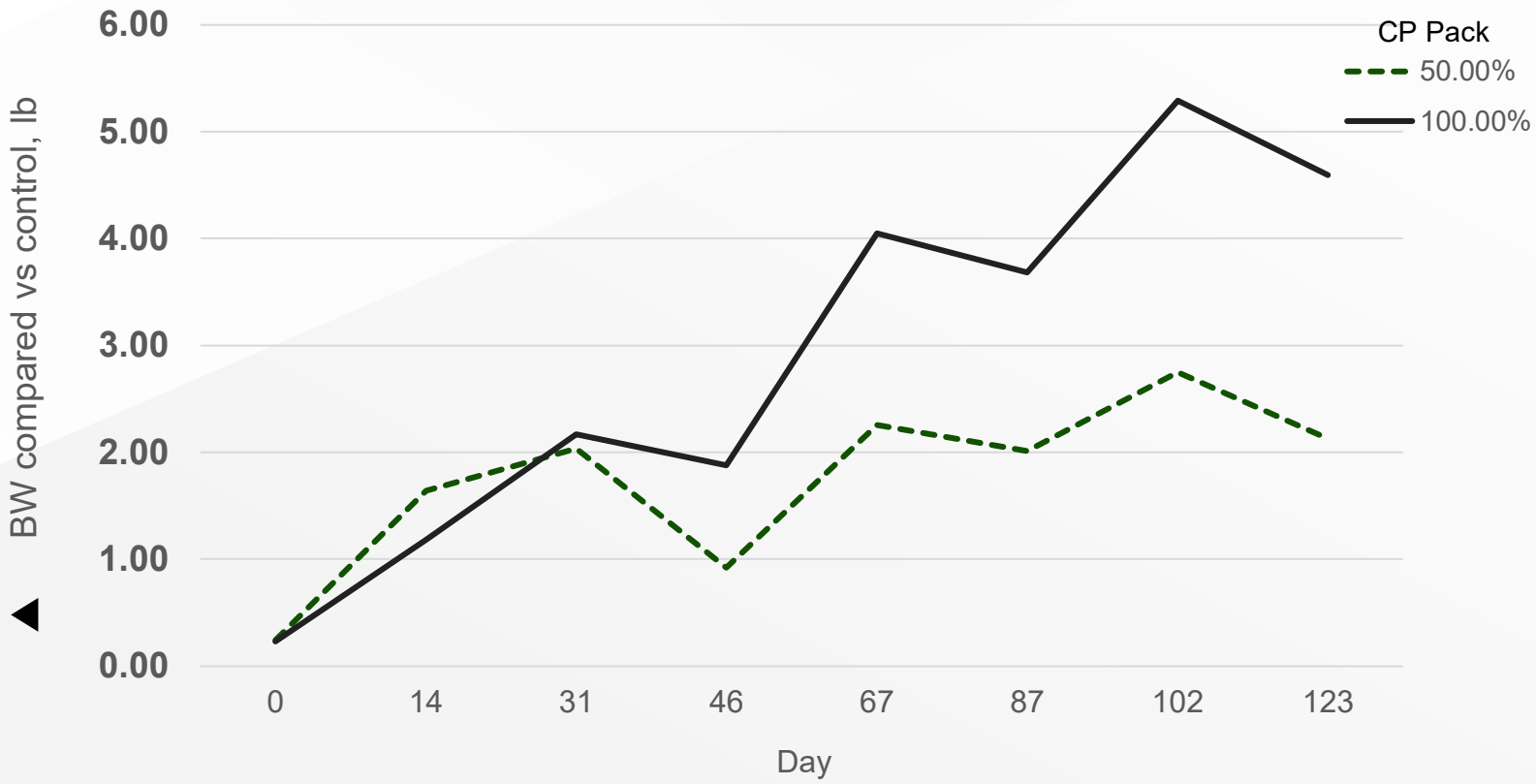
Impact of "*CP Pack*" on Finishing Pig Wt



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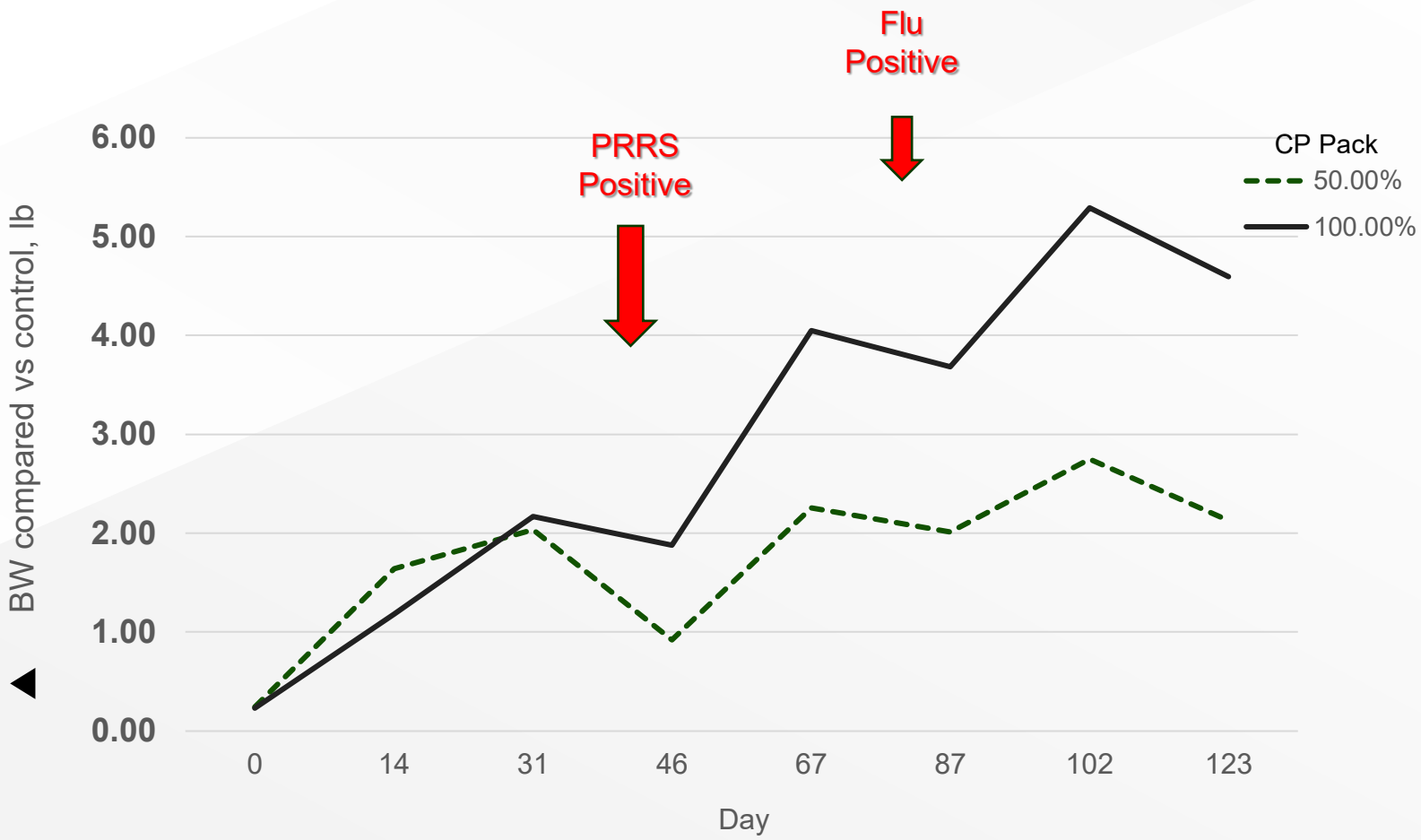

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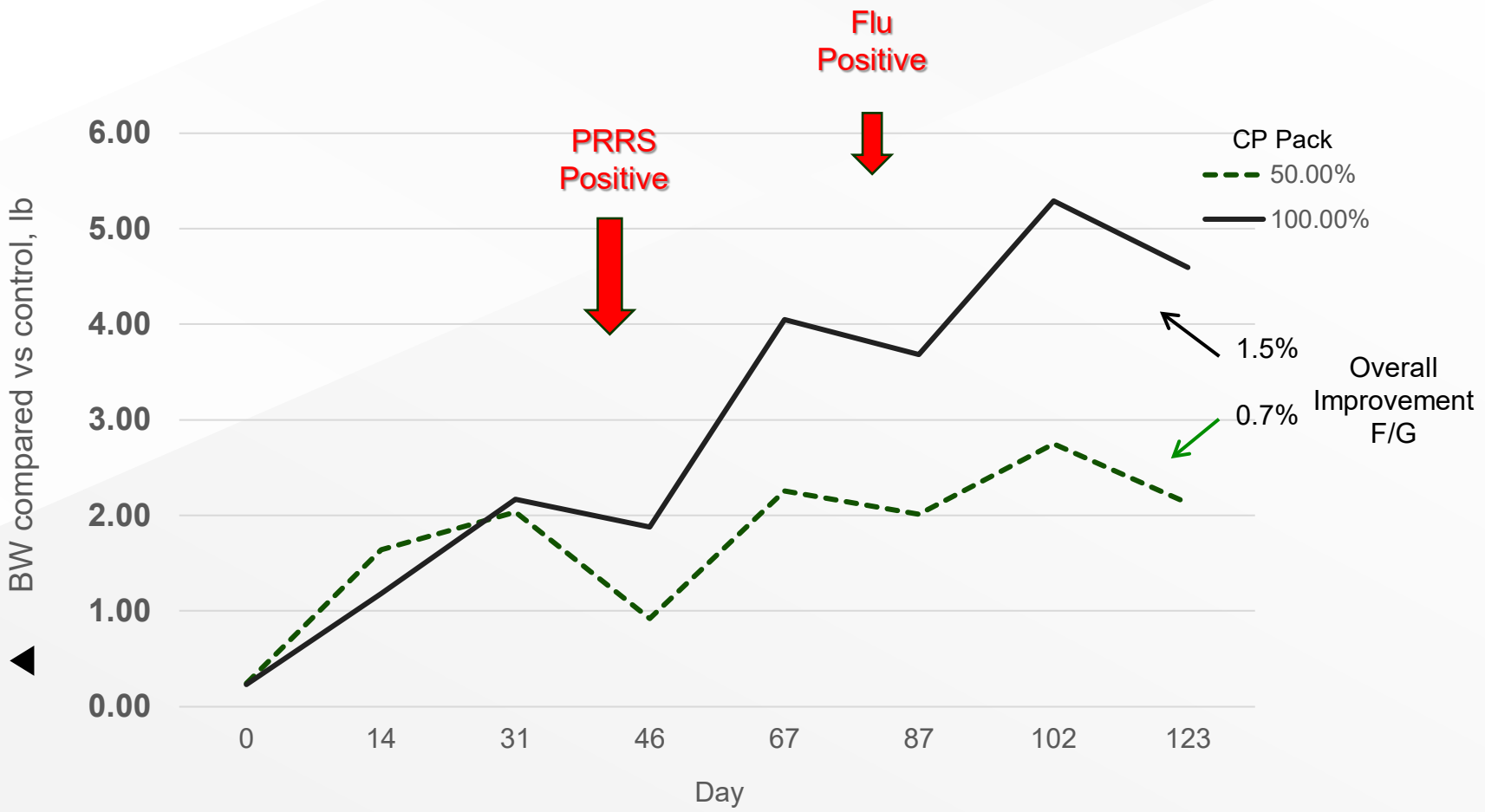

1. Eliminate “hand adds”
2. “Made to order” feed
3. Easy to use nomenclature
4. Understand “batching system”
5. Know when & when *not to* “just sub” corn

What does the data tell you..

Vitamin D, ng/mL	Control	Trt 1	Trt 2	Trt 3	P-value
1st	7.15 ± 0.808	6.78 ± 0.932	6.47 ± 0.817	6.68 ± 0.833	***0.945***
2nd	19.6 ± 0.92	20.4 ± 1.13	20.0 ± 0.92	20.3 ± 1.01	***0.926***
3rd	19.8 ± 2.09	20.0 ± 2.34	23.8 ± 1.88	21.6 ± 2.13	***0.446***

Vitamin E, ppm	Control	Trt 1	Trt 2	Trt 3	P-value
1st	4.31 ± 0.254	3.94 ± 0.296	3.97 ± 0.249	3.56 ± 0.260	***0.228***
2nd	1.24 ± 0.113	1.02 ± 0.140	1.14 ± 0.113	1.20 ± 0.123	***0.626***
3rd	1.53 ± 0.205	1.95 ± 0.226	1.75 ± 0.182	1.72 ± 0.206	***0.463***

Vitamin A, ppm	Control	Trt 1	Trt 2	Trt 3	P-value
1st	0.071 ± 0.0069	0.071 ± 0.0080	0.076 ± 0.0068	0.062 ± 0.0071	***0.530***
2nd	0.189 ± 0.0125	0.184 ± 0.0157	0.192 ± 0.0124	0.200 ± 0.0134	***0.863***
3rd	0.231 ± 0.0202	0.265 ± 0.0221	0.248 ± 0.0185	0.232 ± 0.0200	***0.517***

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What does the data tell you..

	Control	Trt 1	Trt 2	Trt 3	SEM	Control
ADG, lb	0.53	0.53	0.59	0.59	0.025	0.139
ADFI, lb	0.82	0.84	0.88	0.86	0.028	0.414

What does the data tell you..

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ADG, lb	0.53	0.53	0.59	0.59	0.025	0.139
ADFI, lb	0.82	0.84	0.88	0.86	0.028	0.414
F/G	1.56^{ab}	1.60^{a}	1.50^{ab}	1.47^{b}	0.029	0.007

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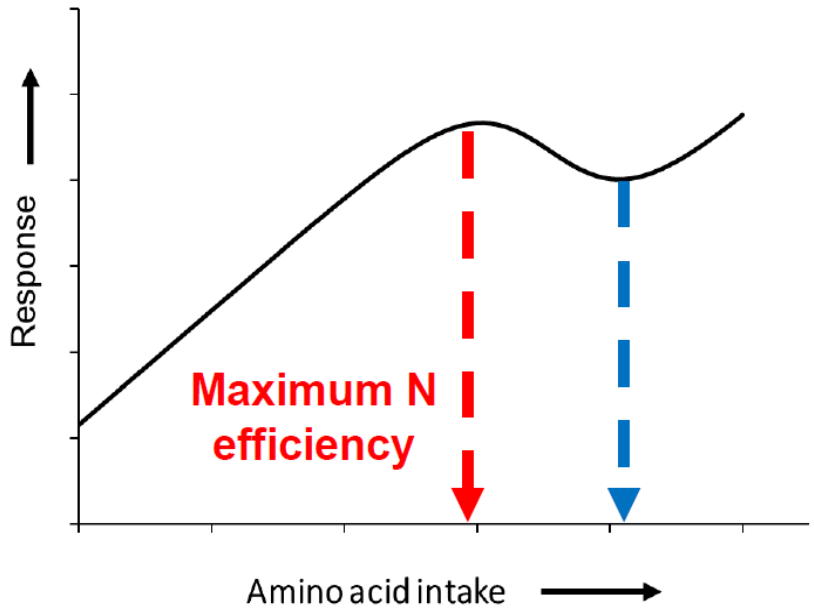
Removals, %	27.4	30.5	21.4	22.5	≤ 3.02	0.056

My hope for the future….

Complex models

Linear-Logistic model



↑ Fetal growth and development

↑ Milk production

↑ Gut health

↑ Immune system

↑ Survival

↑ Sow longevity

Ramirez-Camba, C. D., & Levesque, C. L. (2023). The linear-logistic model: a novel paradigm for estimating dietary amino acid requirements. *Animals*, *13*(10), 1708.

Take Home

To *look* is one thing

To *see* what you look at is another

To *understand* what you see is a third

To *learn* from what you understand is something

But to **ACT** on what you learn is all that really matters.

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THANK YOU

Special Thanks

AJ Warner
Keegan Hastad
Zach Post
Linette Freking
Kerri Hopkins
Carson Hastad

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