Enhancing Piglet Survival as Litter Size Increases

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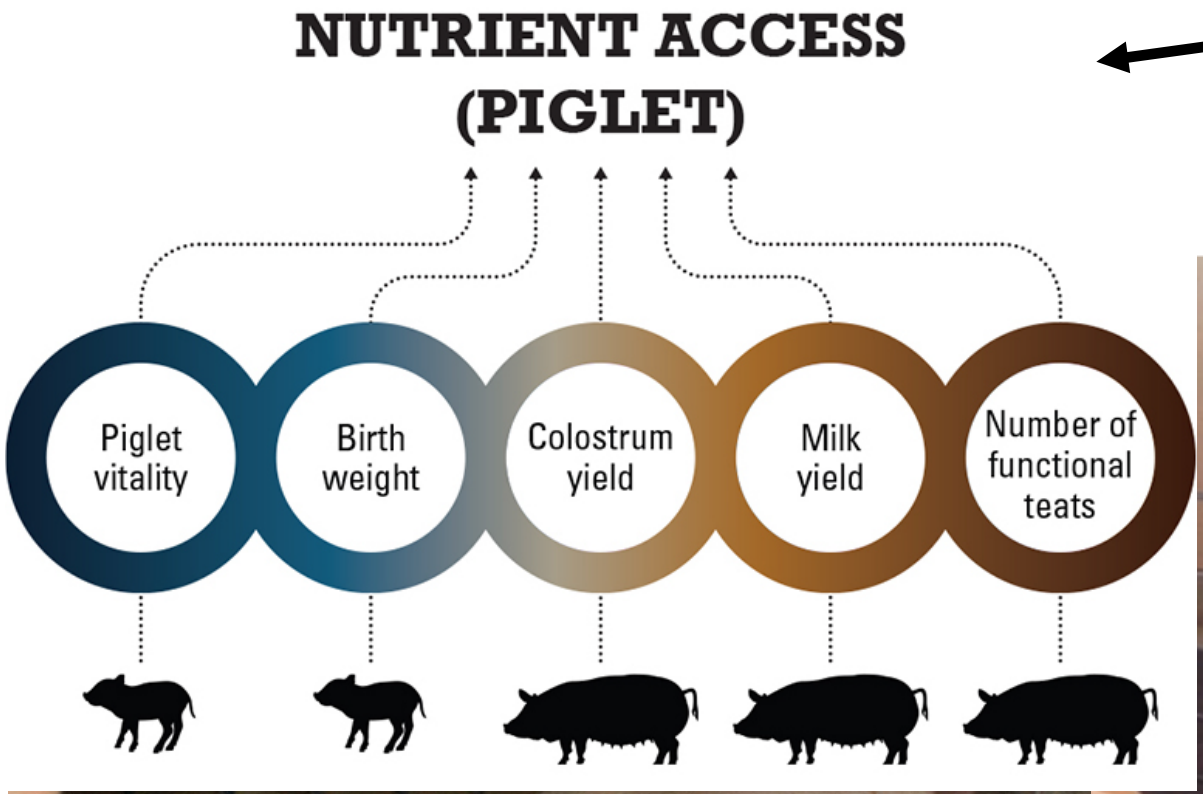
dsm-firmenich



Applied research

Basic research

sow condition & gestation management

genetic selection research lines

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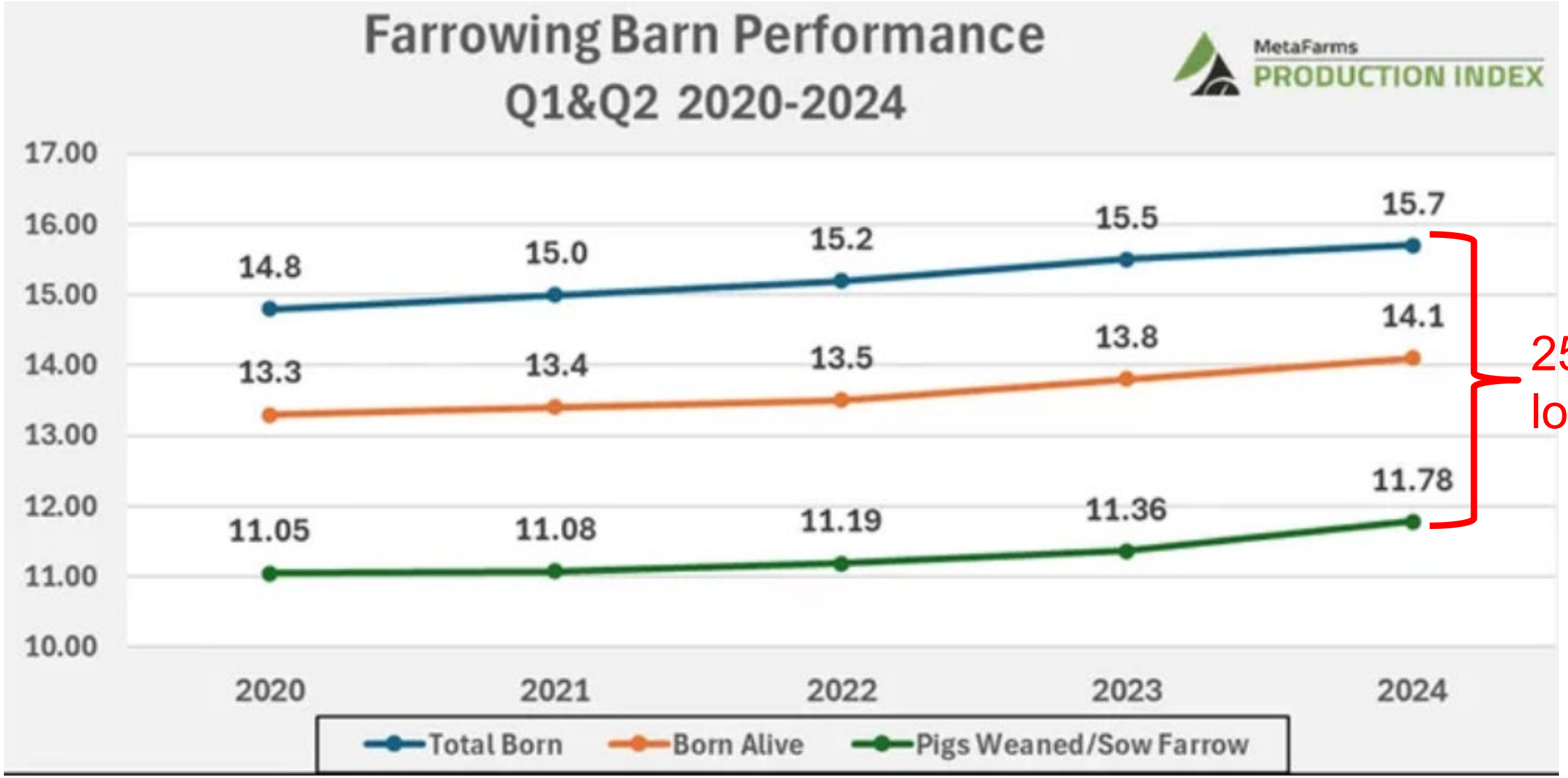
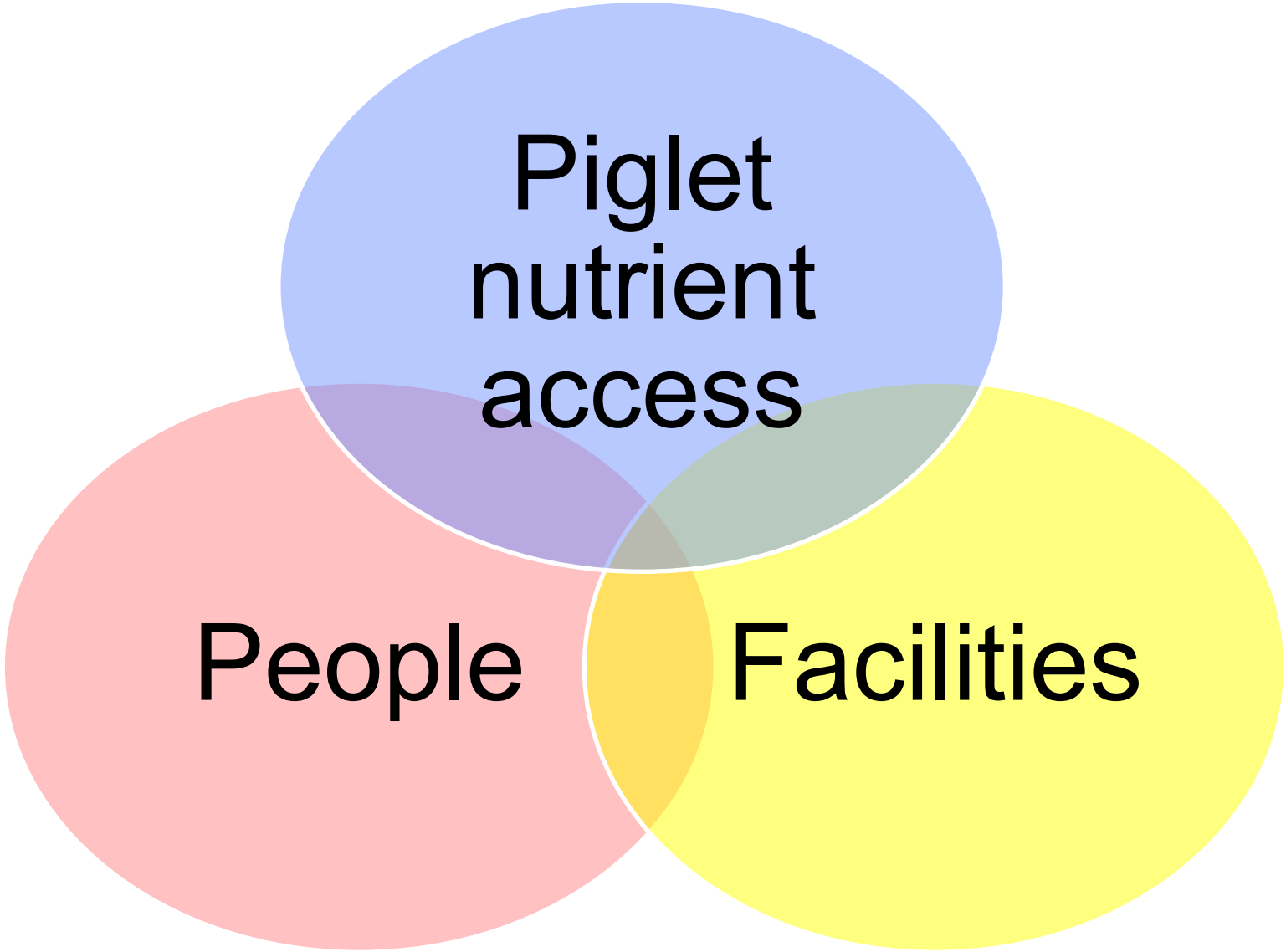
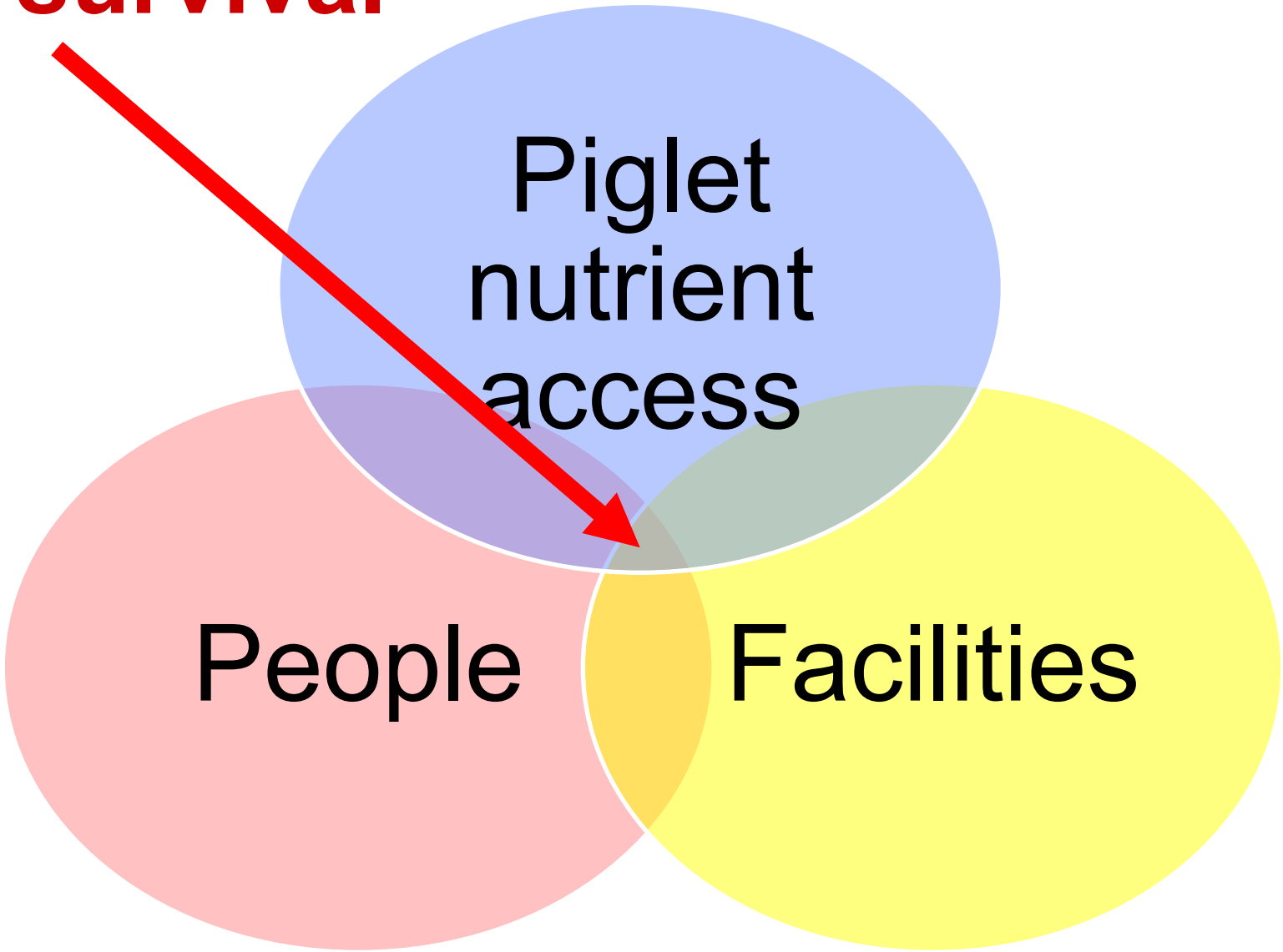
The problem


Farrowing Barn Performance
Q1&Q2 2020-2024
MetaFarms
PRODUCTION INDEX
17.00
16.00
15.00
14.00
13.00
12.00
11.00
10.00
14.8
15.0
15.2
15.5
15.7
13.3
13.4
13.5
13.8
14.1
11.05
11.08
11.19
11.36
11.78
2020
2021
2022
2023
2024
25% loss
Total Born
Born Alive
Pigs Weaned/Sow Farrow

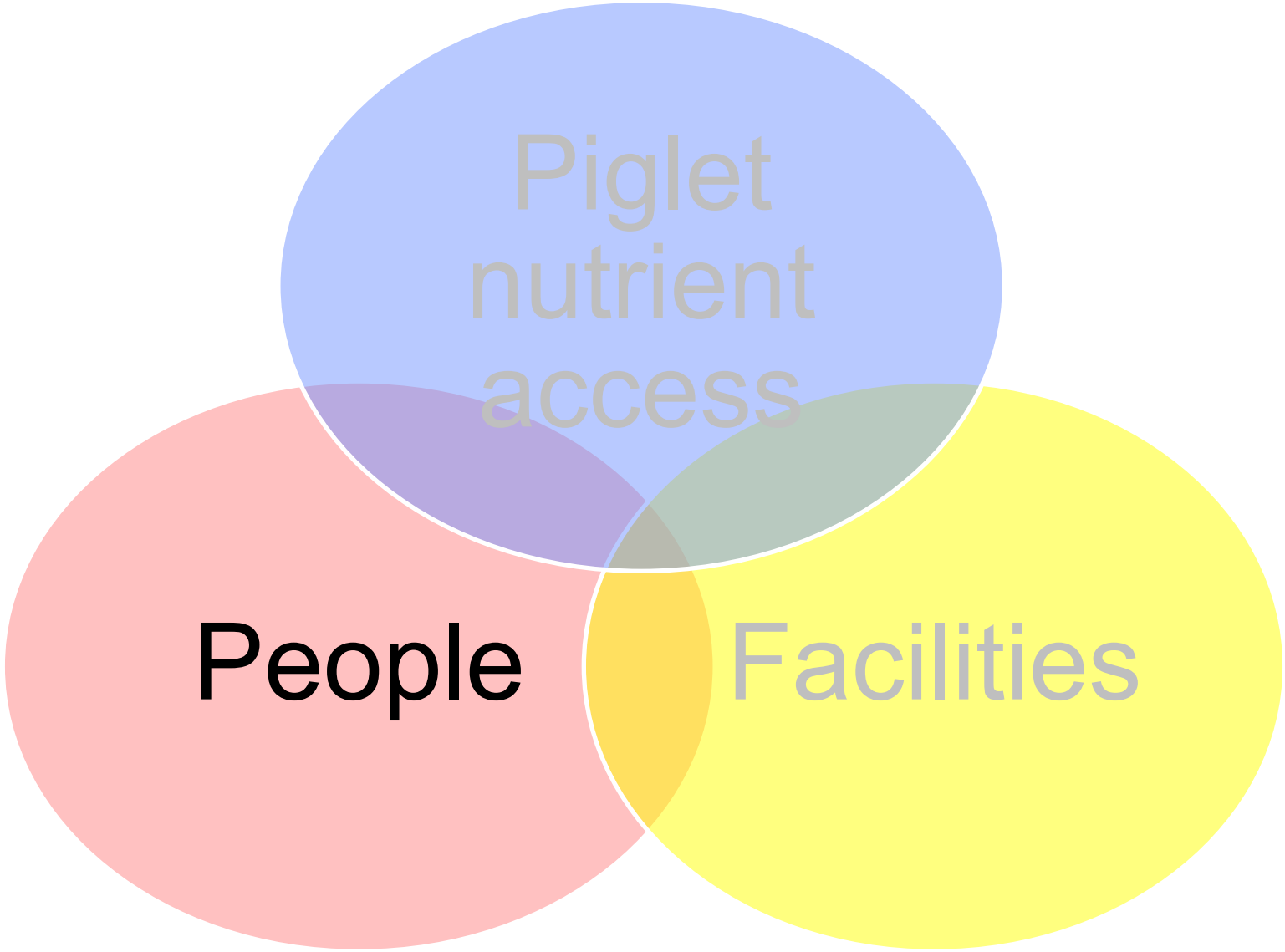
Maximizing piglet survival



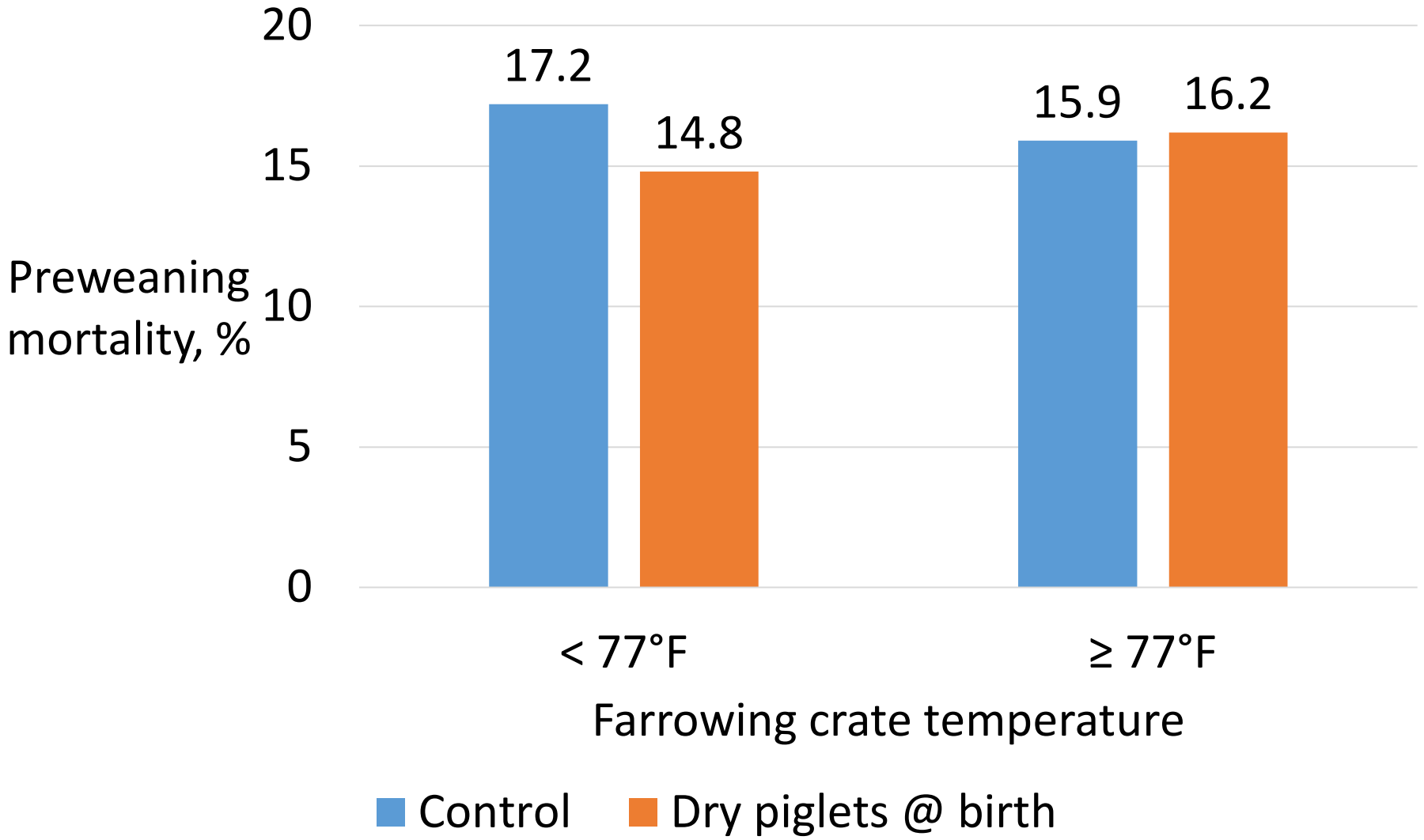
Maximizing piglet survival



Maximizing piglet survival



Drying piglets - not needed ≥ 77°F

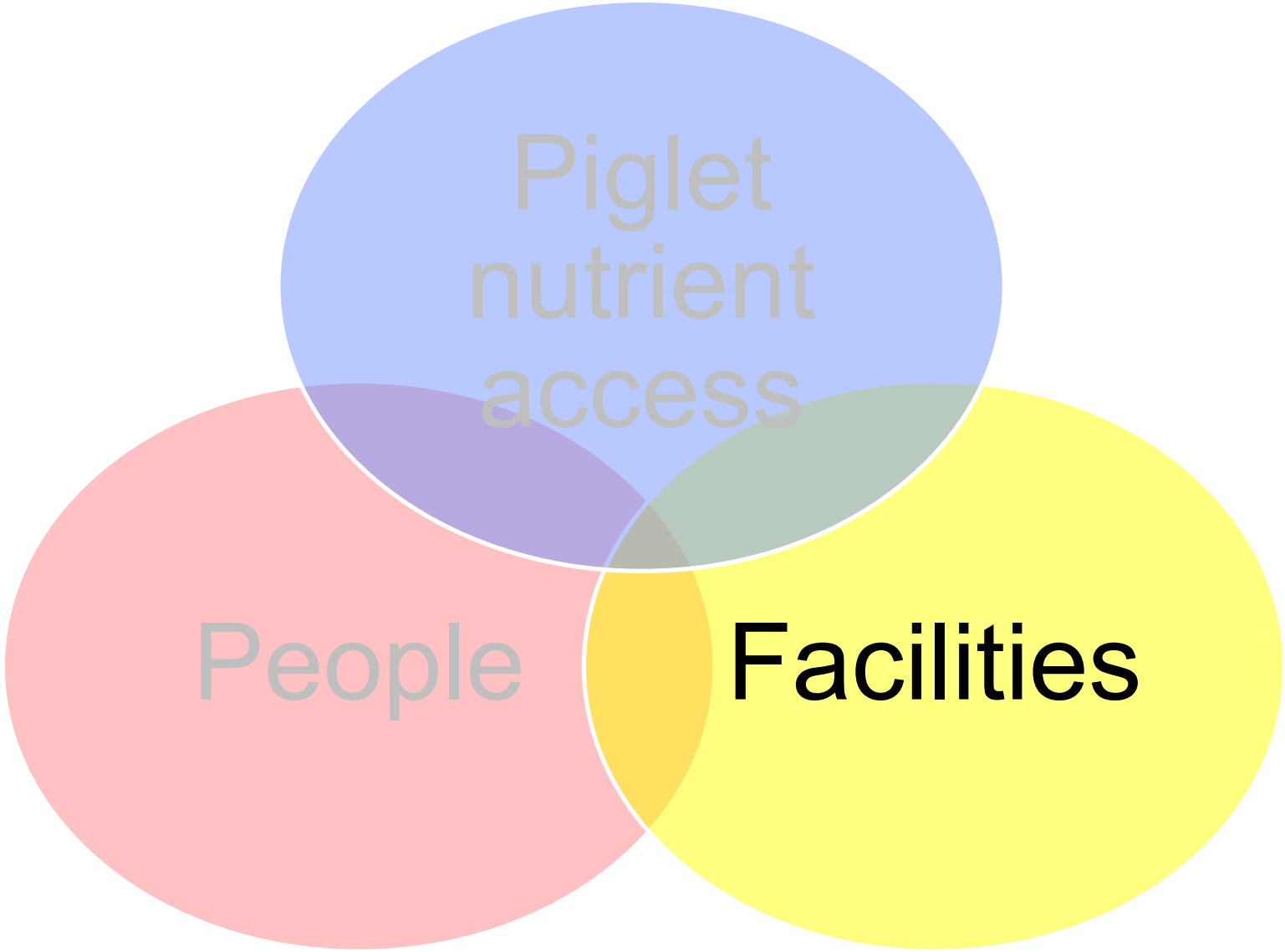


Vande Pol et al. (2021)

The importance of people → piglet survival

- Farrowing room set up
- Heating/cooling & ventilation
- Farrowing assistance
- Assisting weak piglets
- Cross-fostering strategies
- Monitoring sow health
- Etc.

Maximizing piglet survival



Does farrowing crate size impact piglet survival?

Research for piglet survival requires hundreds of replicates per treatment to achieve adequate statistical power.

July 2, 2020

6 Min Read

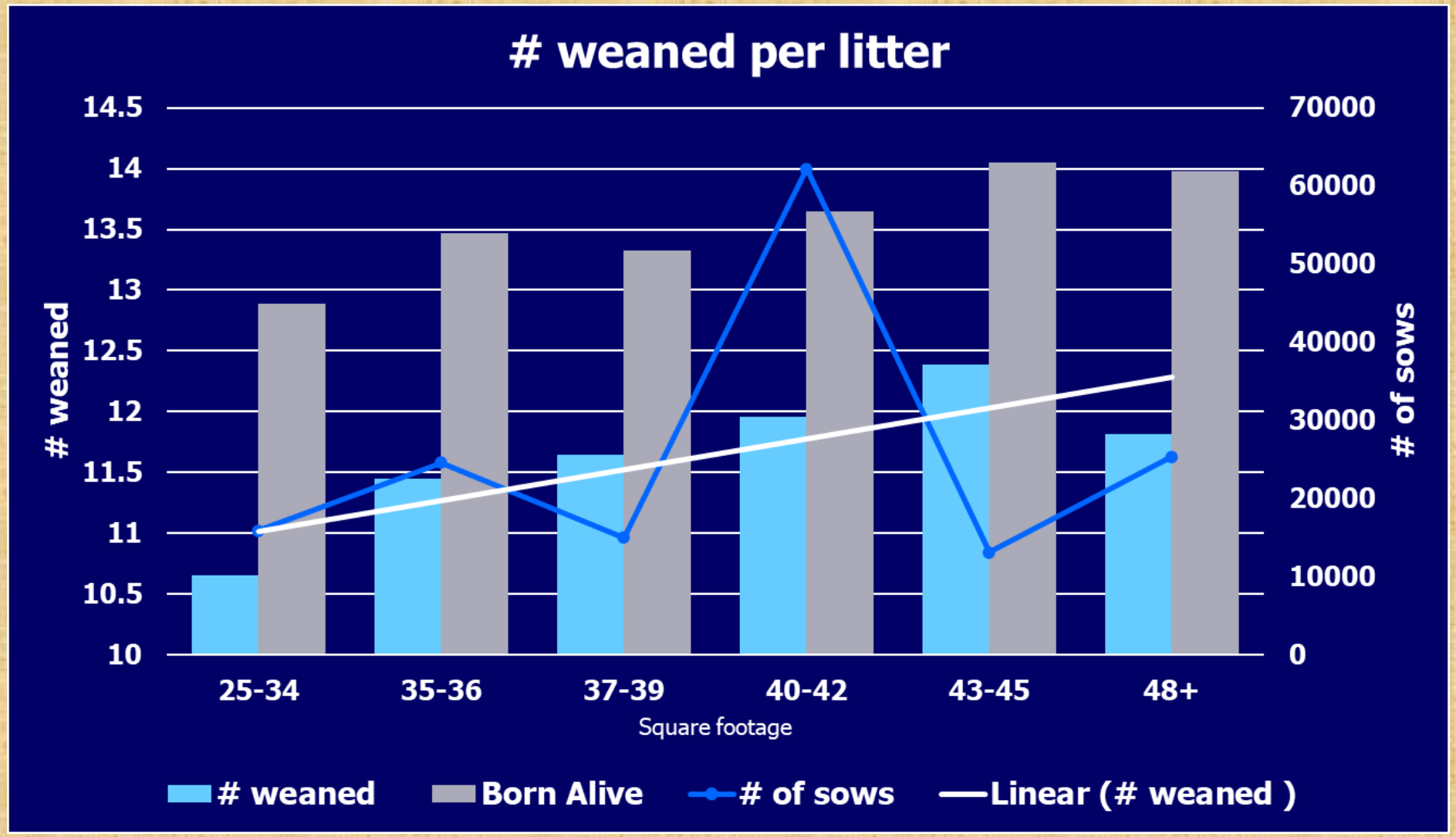
Recent Headlines

Farrowing Crate Size:

Number weaned per sow

Parity	*No. litters*	*Standard*	*Large*	*Advantage*
1	*3,760*	*10.26*	*10.73*	*0.47*
2	*3,065*	*10.41*	*10.99*	*0.58*
3	*2,551*	*10.18*	*10.83*	*0.65*
4	*2,268*	*9.91*	*10.18*	*0.27*
5	*1,801*	*9.68*	*9.65*	*-0.03*
6	*1,502*	*9.21*	*9.42*	*0.21*
7+	*1,663*	*8.97*	*8.86*	*-0.11*
All	***16,610***	***9.95***	***10.28***	***0.33***

SMS Survey 4-1-19 Farrowing Crate Area-52 farms



30 & Up Consulting LLC
Ron Ketchem
Email: ron.ketchem30@outlook.com

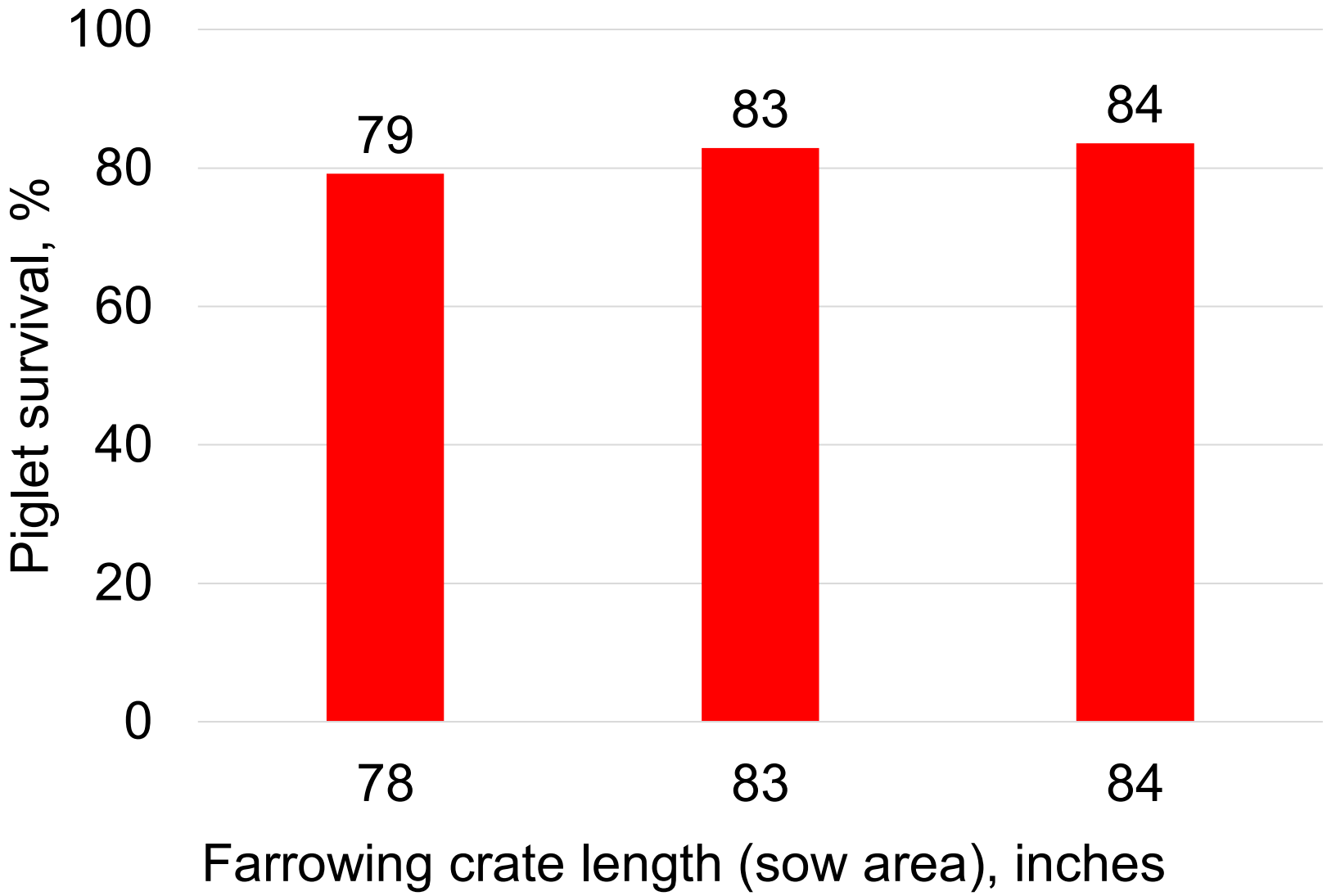
Farrowing crate width

- 60 vs. 66 inches - no difference in piglet survival

  (Vande Pol, 2017)

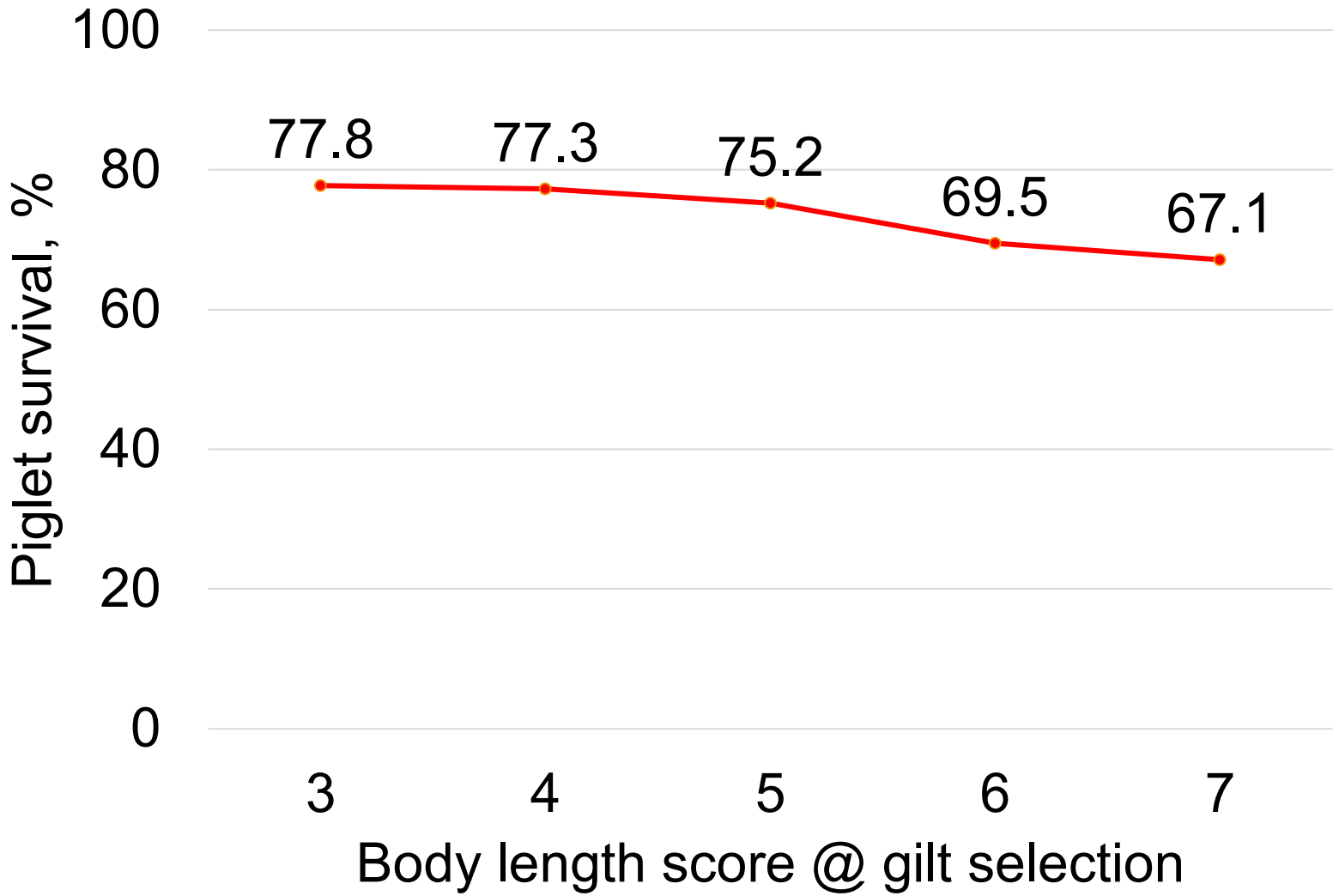
- 17 vs. 20 inches (sow) - did not appear to impact piglet survival

  (Ketchum & Rix, 2013)



Knauer, unpublished

Long bodied gilts = poor piglet survival?

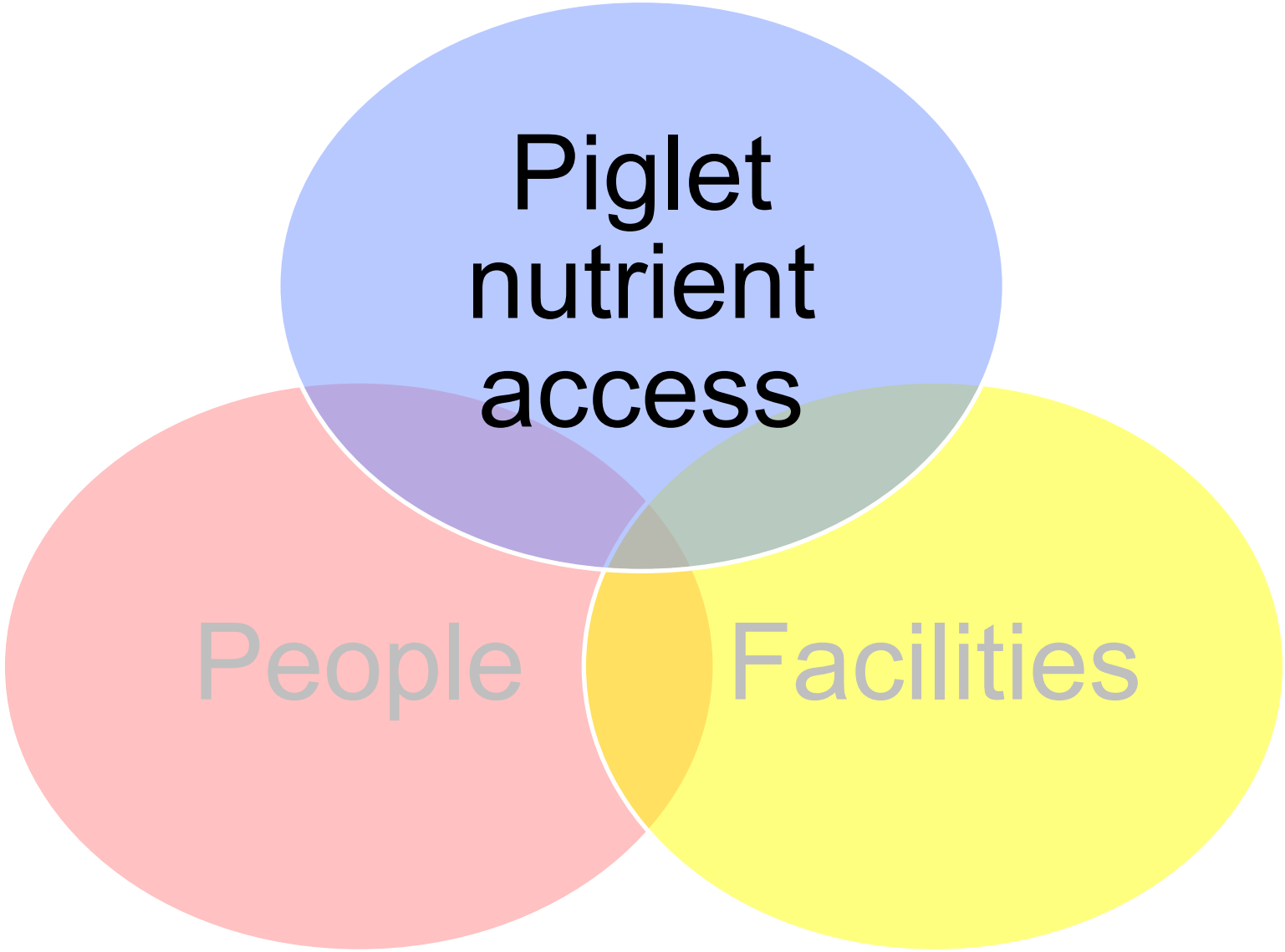


Adapted from Stalder (2009)

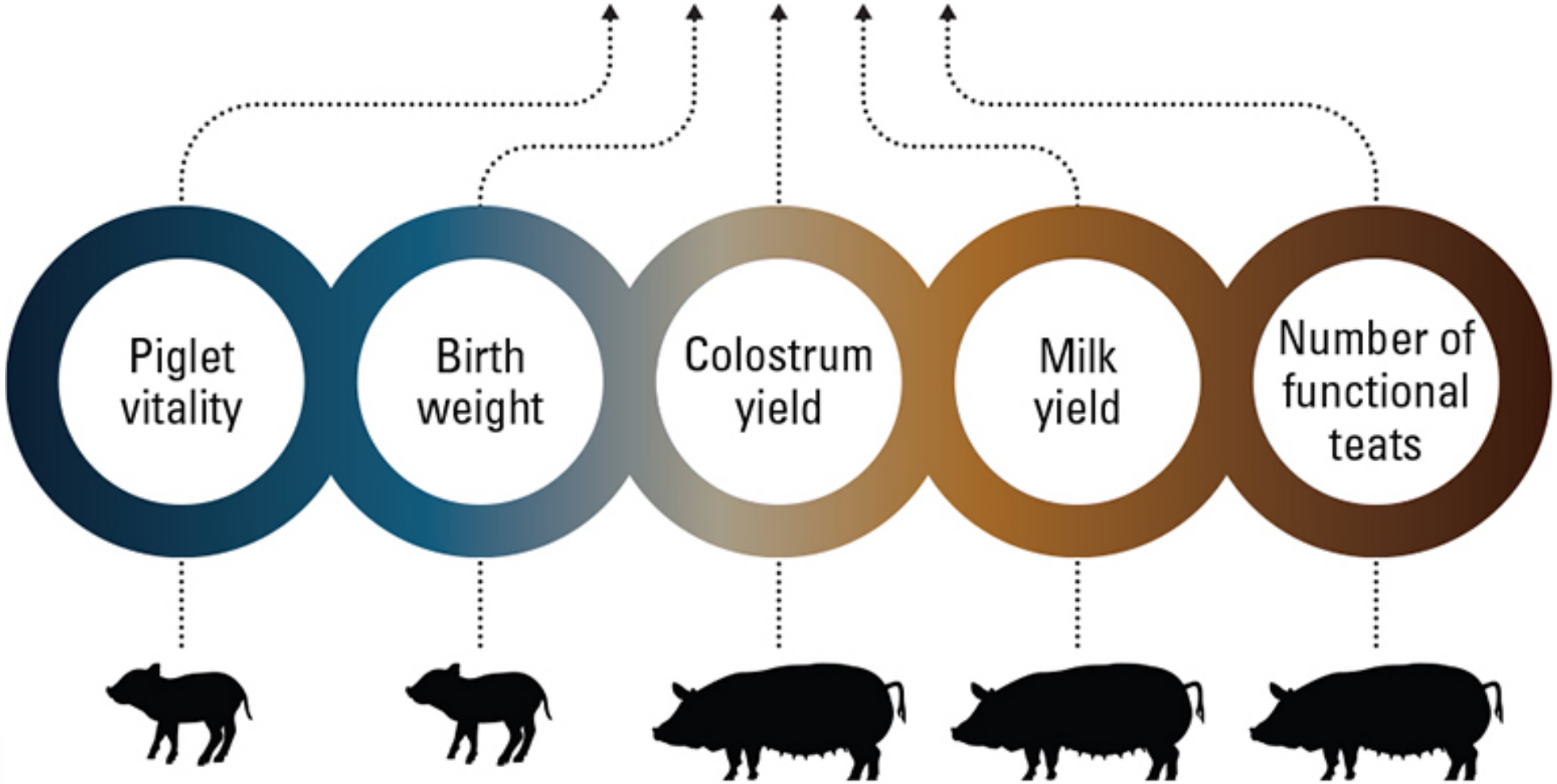
Crate fit

- Vargovic et al. (2022) reported “crate fit” associated with stillborns & piglet survival

Maximizing piglet survival



NUTRIENT ACCESS (PIGLET)



Genetics of piglet throughput (Knauer 2020), image courtesy of NHF

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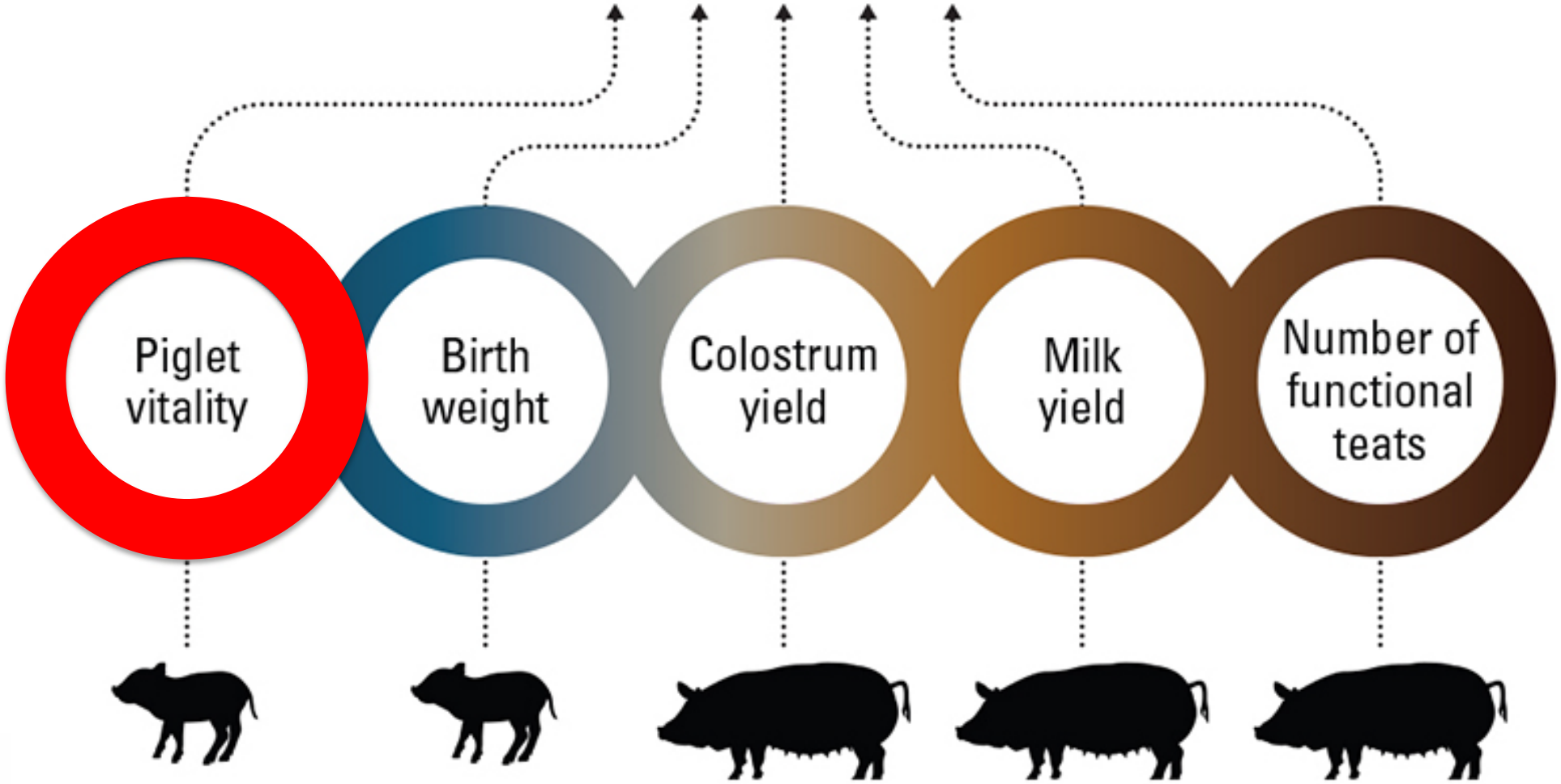
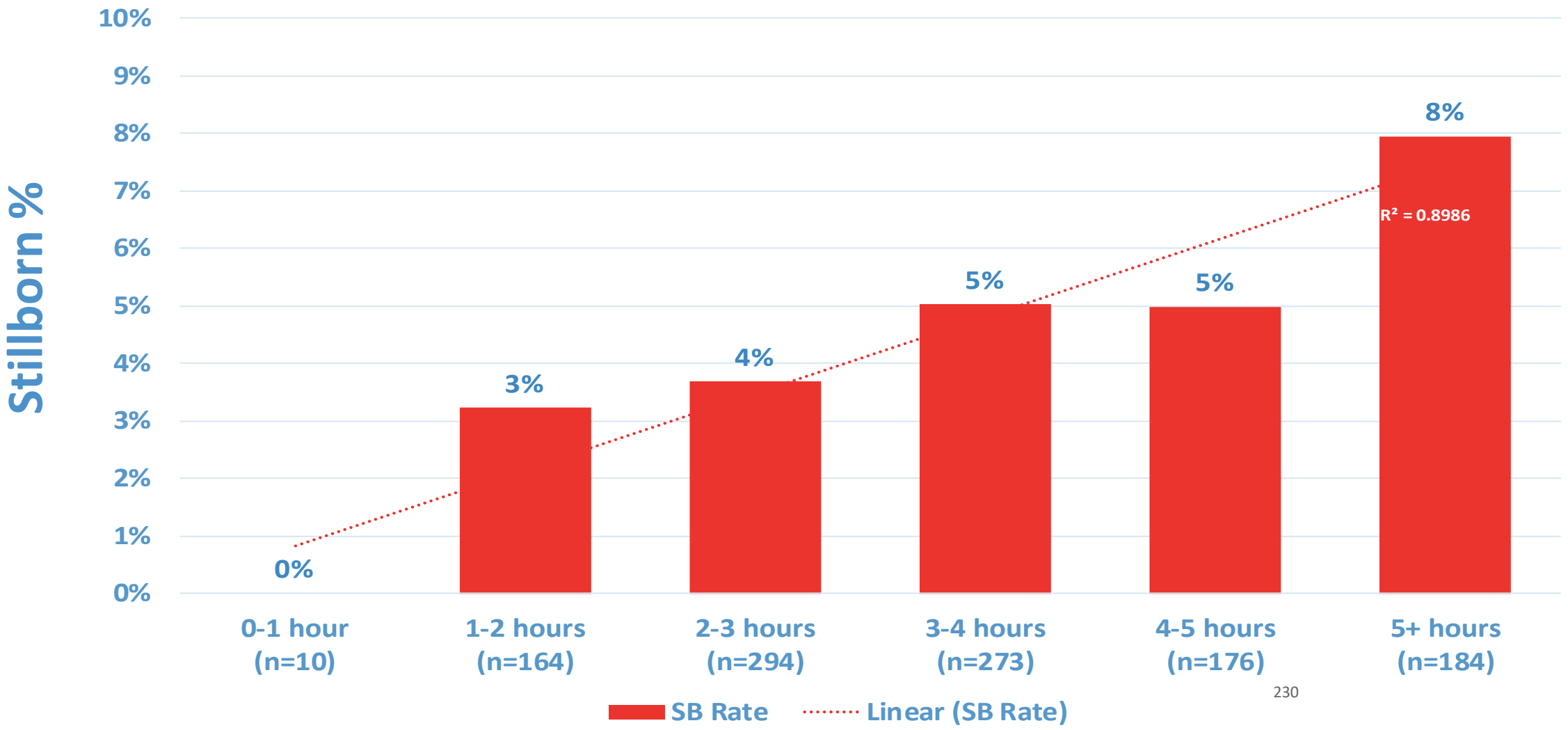


Genetics of piglet throughput (Knauer 2020), image courtesy of NHF

Shorter farrowing duration ↓ stillborn%

Never Stop Improving



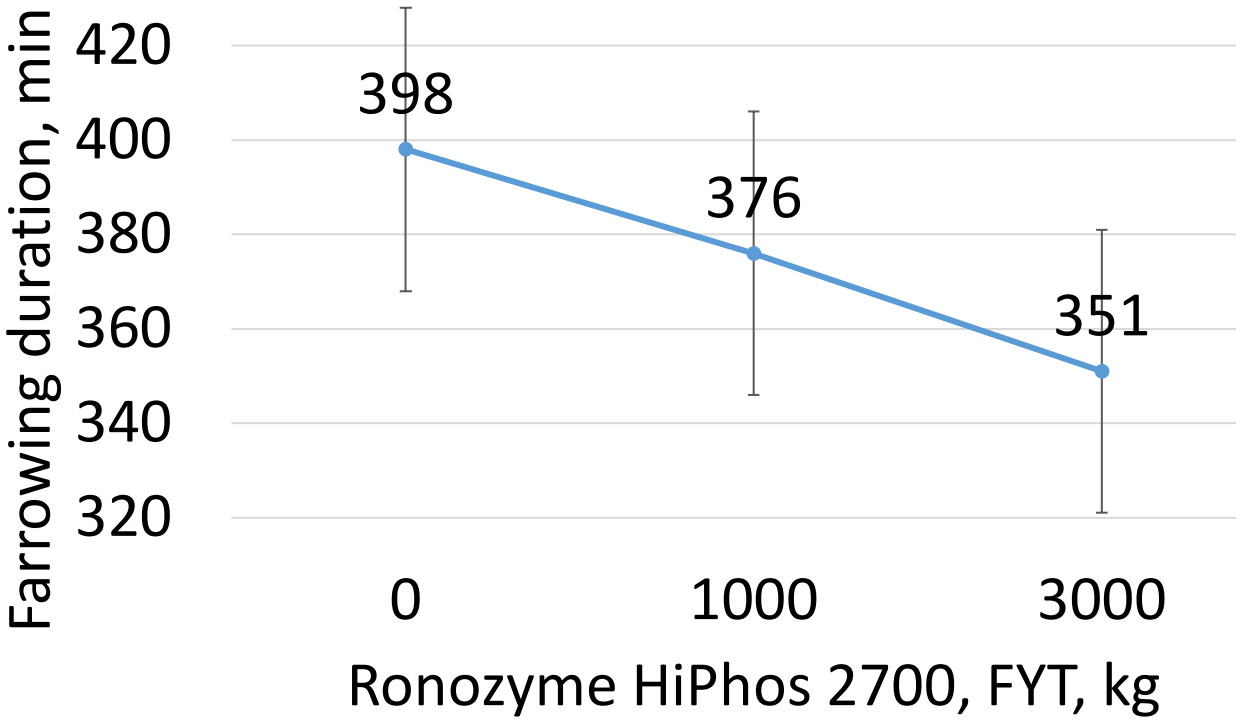
PIC®

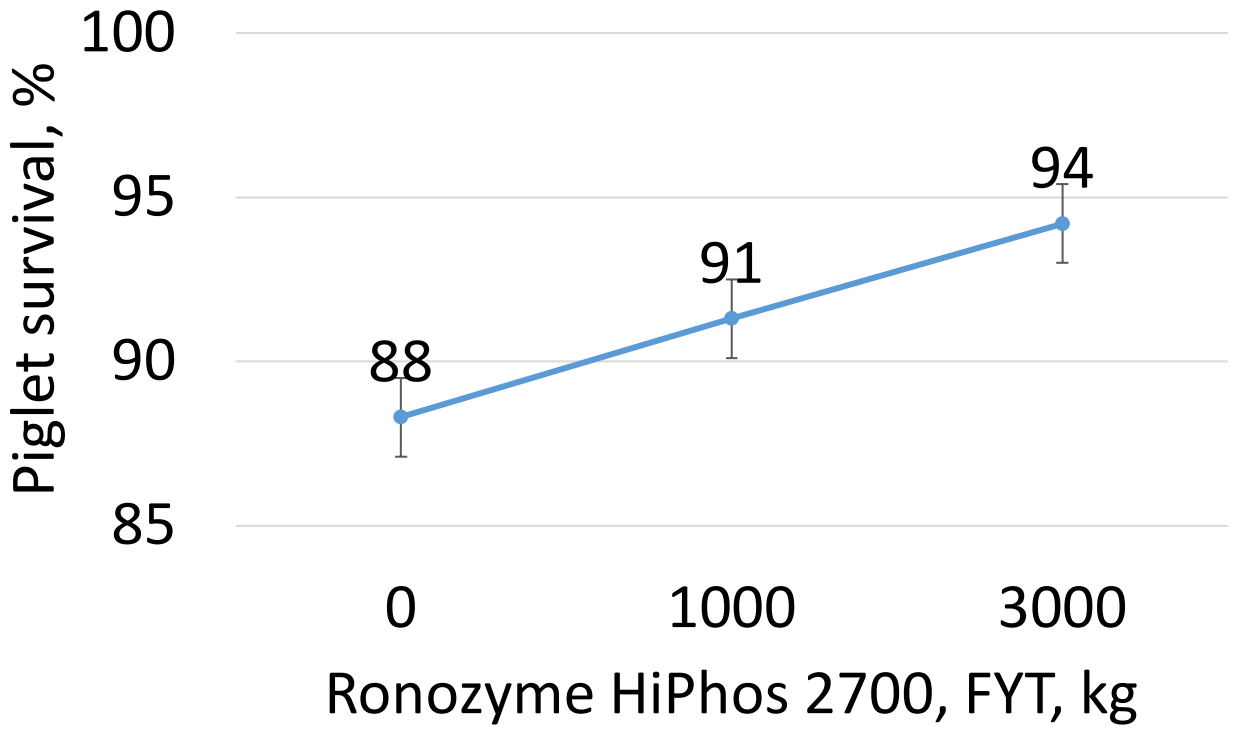
Dr. Pedro Mosqueira

Can we develop prefarrow feeding strategies to minimize workers needed during farrowing?

farrowing duration = ↓ genetic influence

↑ phytase in late gestation eases farrowing





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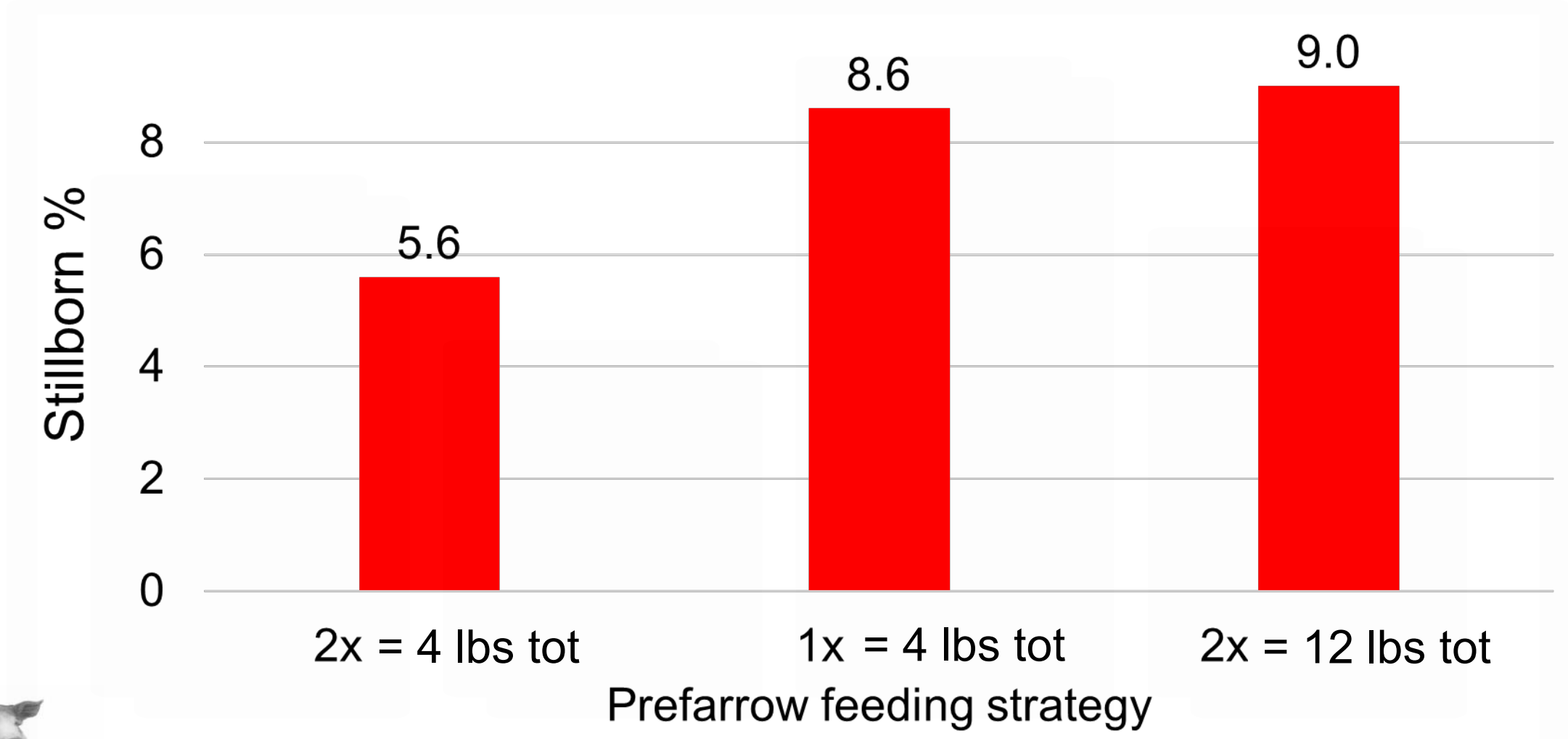
Batson et al. (2021)

Feeding multiple meals (per day) prefarrow

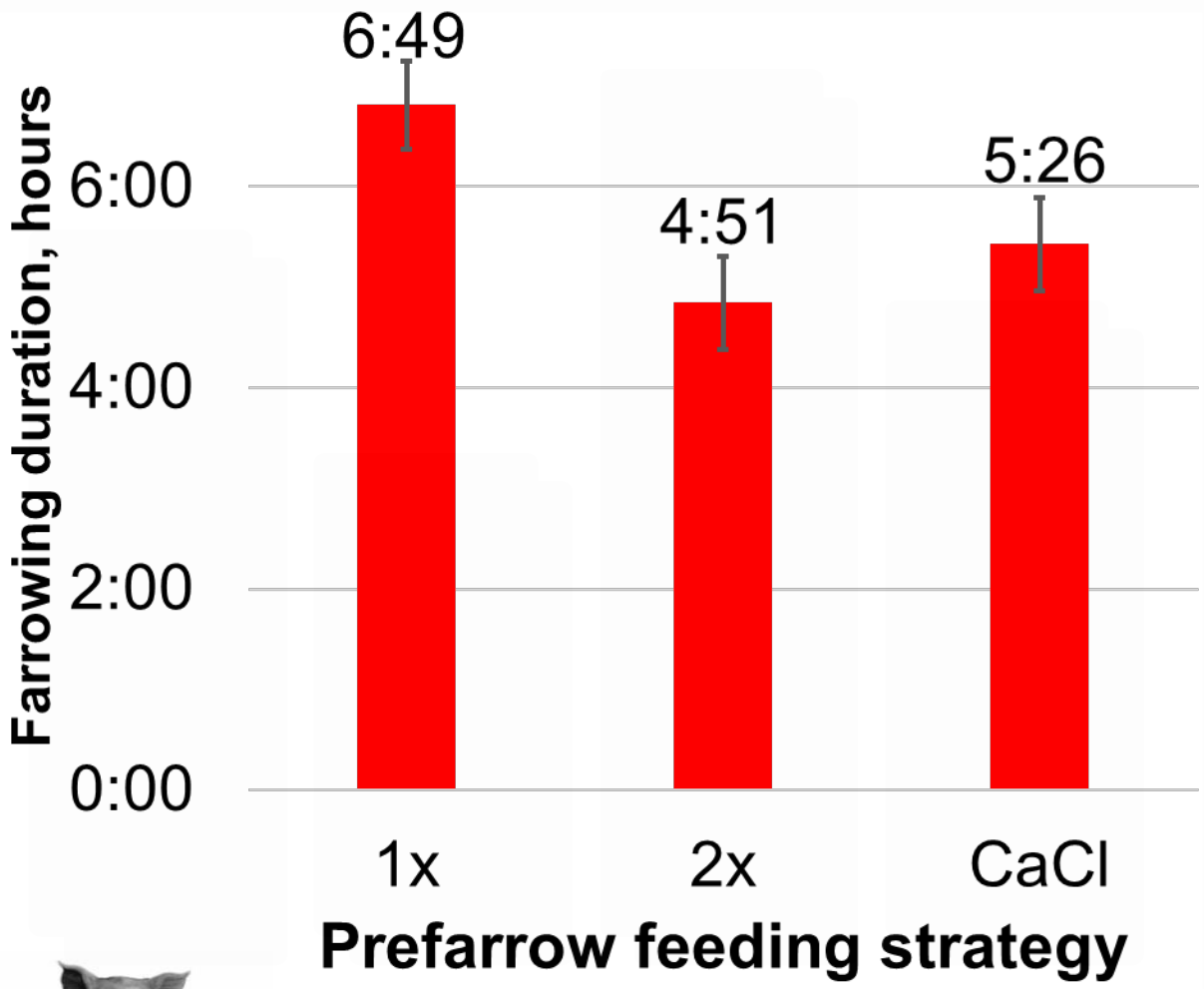


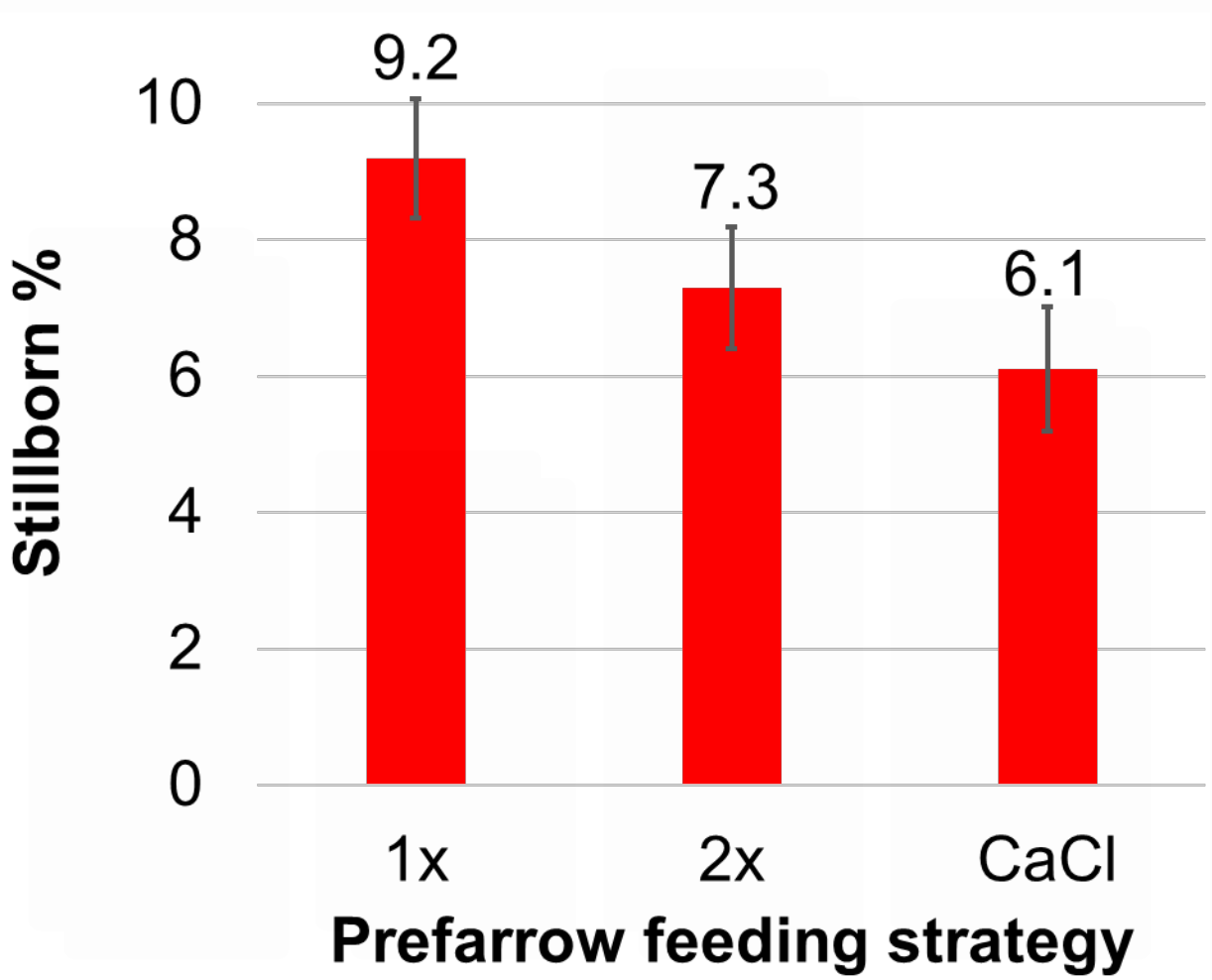
Miller & Kellner (2020)

Materials & methods

- Summer 2021 – commercial sow farm in eastern NC
- PIC multiparous sows (n=215)
- 3 diets prefarrow (fed 1 to 6 days)
  - 5 lbs once per day (1x)
  - 2.5 lbs twice per day, 6am & 6pm (2x)
  - 5 lbs once per day & top dress 50g TransRite Sow Ultra (CaCl)
- Students record data continuously heavy farrowing days

Results - farrow duration & stillborn %





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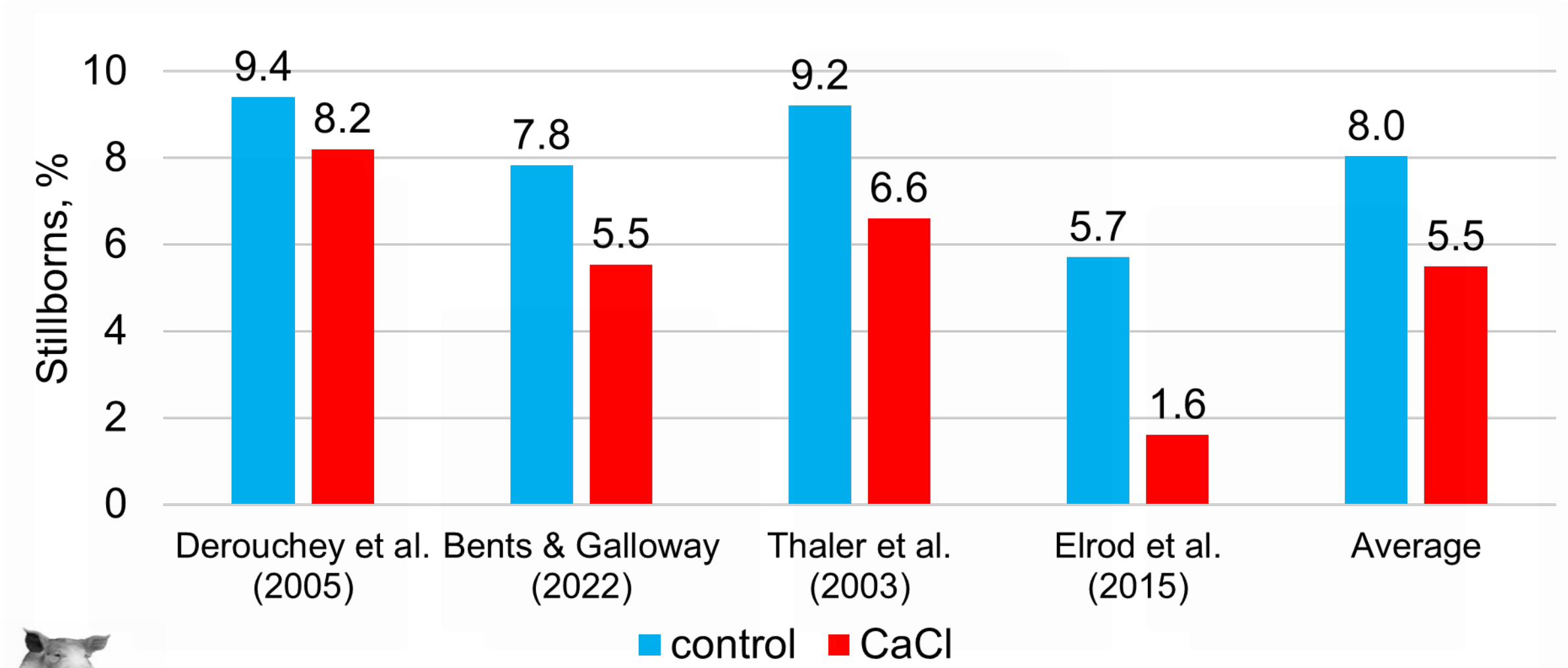
Peppmeier et al. (2022)

CaCl prefarrow - ↓ stillborns



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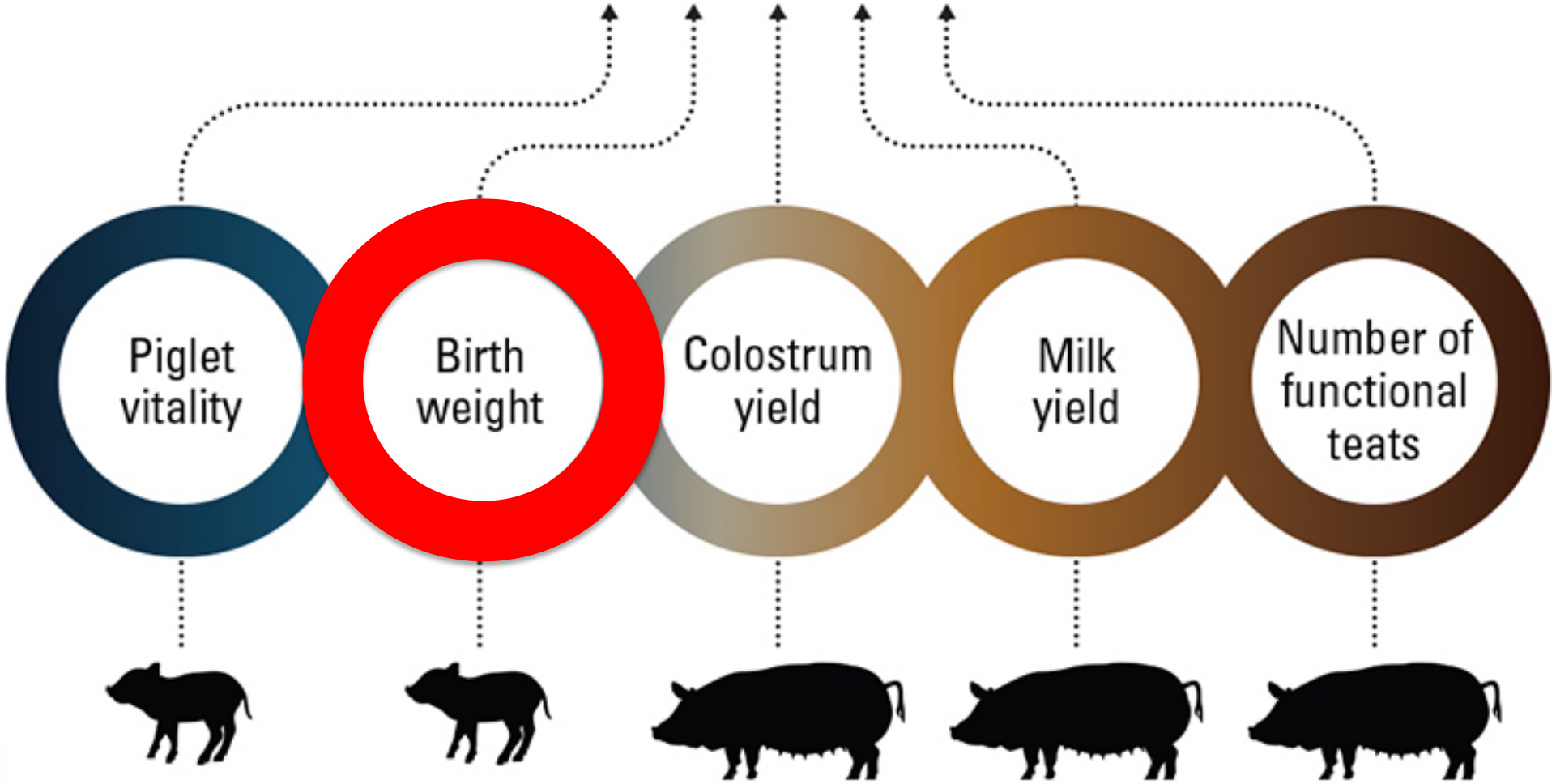
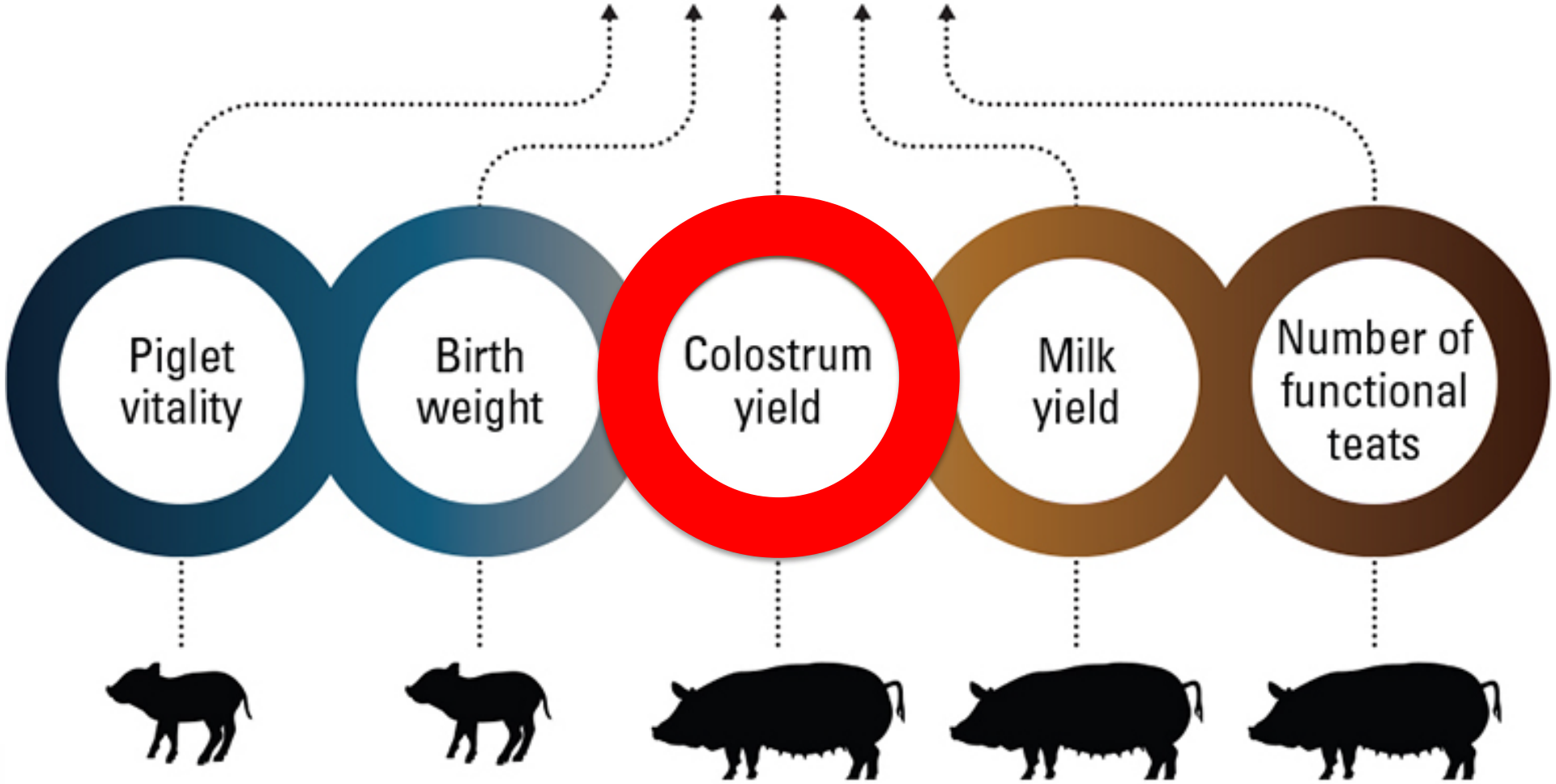


Genetics of piglet throughput (Knauer 2020), image courtesy of NHF

Piglet birth weight

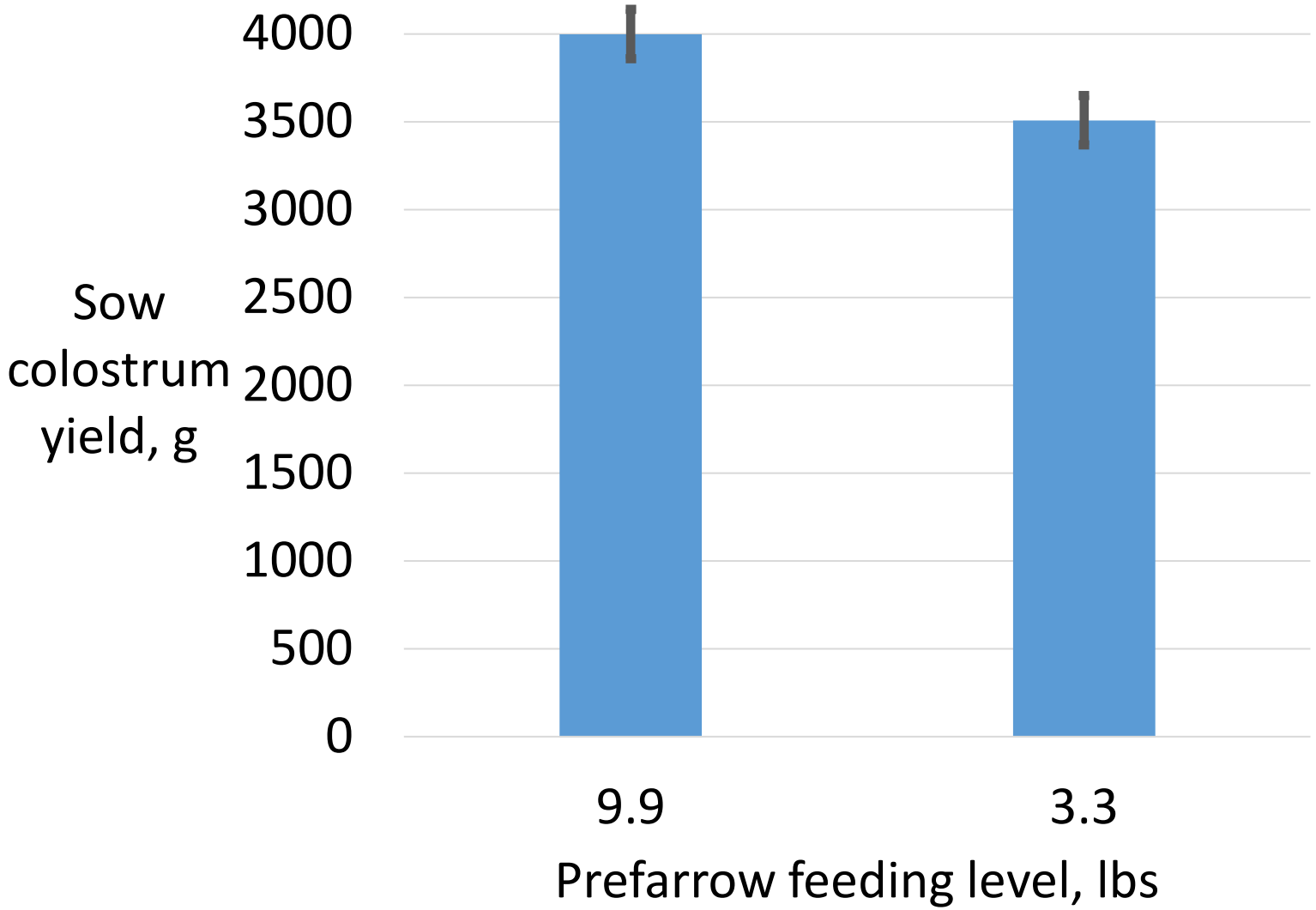
- No consistent feeding strategies to ↑ piglet birth weight
  - Few, small studies suggest vitamin C may ↑ birth weight in first parity females
    - Knauer et al. (2023)
    - Aznar et al. (2024)

NUTRIENT ACCESS (PIGLET)



Genetics of piglet throughput (Knauer 2020), image courtesy of NHF

Feeding ↓ NRC prefarrow may ↓ colostrum



Decaluwé et al. (2014)

Does the modern sow produce enough colostrum?

Increases in litter size will not be of benefit unless there are sufficient nutrients to support additional piglets.

September 7, 2023

5 Min Read

Recent Headlines

Litter size & teat number impact colostrum

Trait	Total number born			Functional teat number		
	Estimate	SE	P-value	Estimate	SE	P-value
Piglet colostrum intake, g	-27.0	1.9	<0.01	10.0	5.3	0.06
Sow colostrum yield, g	170.4	28.5	<0.01	323.7	77.9	<0.01
Piglet colostrum intake coefficient of variation, %	2.0	0.23	<0.01	-1.4	0.6	0.03
Piglet survival, %	-2.2	0.3	<0.01	2.4	0.9	<0.01
Litter size at weaning	0.53	0.05	<0.01	0.30	0.13	0.02
Piglet weaning weight, kg	-0.15	0.02	<0.01	-0.02	0.06	0.19
Litter weaning weight, kg	2.12	0.4	<0.01	1.8	0.9	0.06
Weaning weight coefficient of variation, kg	0.7	0.2	<0.01	0.4	0.4	0.39

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Knauer and Wiegert (2023)

↑ litter size ↓ colostrum per piglet

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Knauer and Wiegert (2023)

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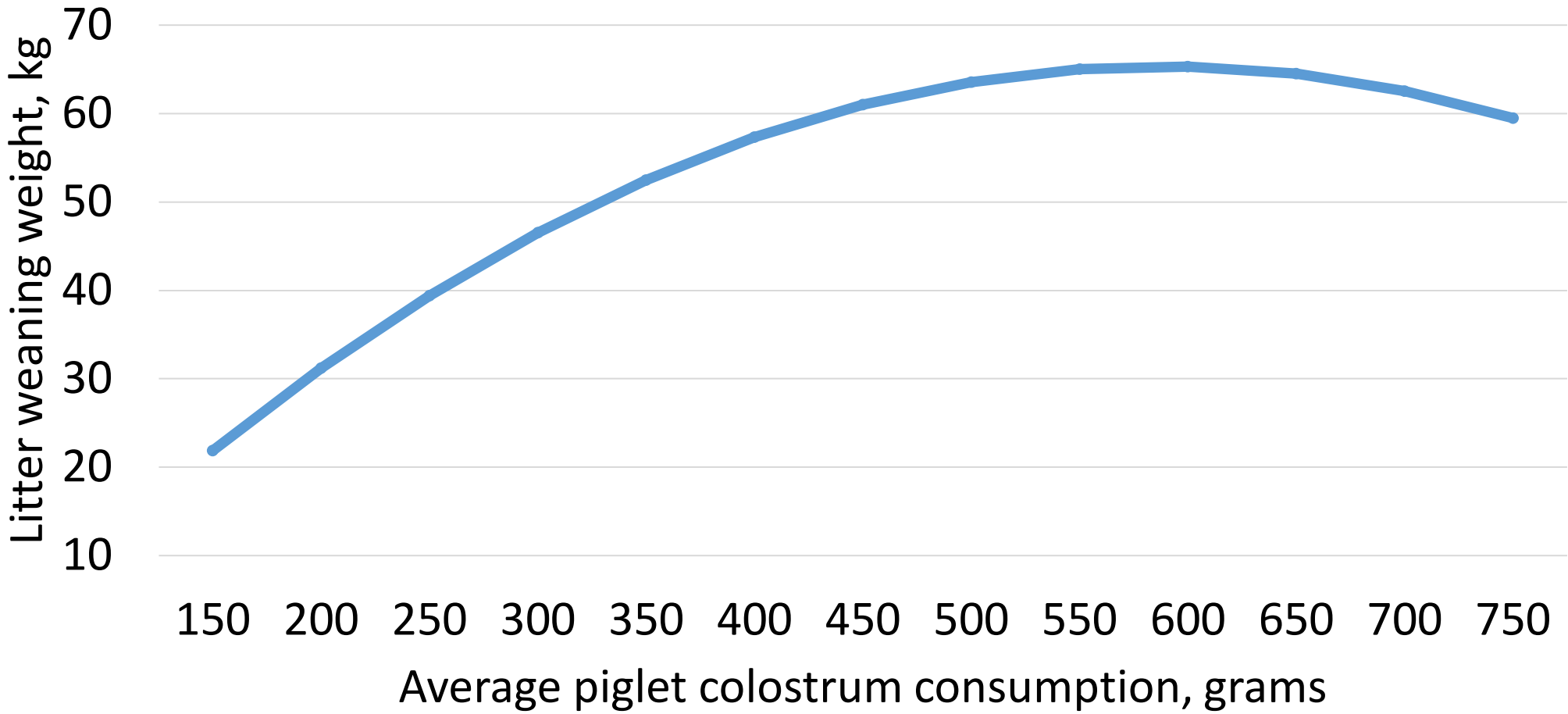
Knauer and Wiegert (2023)

Modern sow - colostrum shortage?



Knauer and Wiegert (2023)

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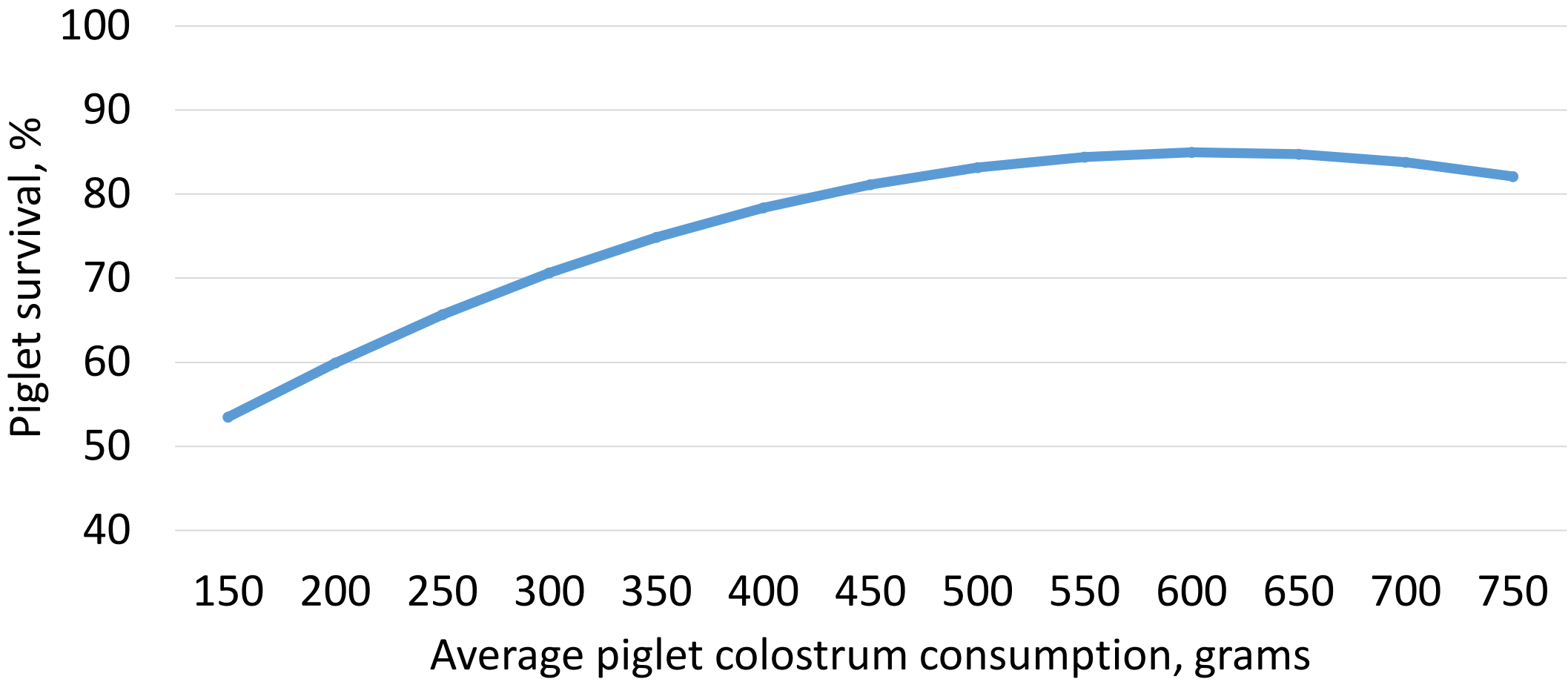
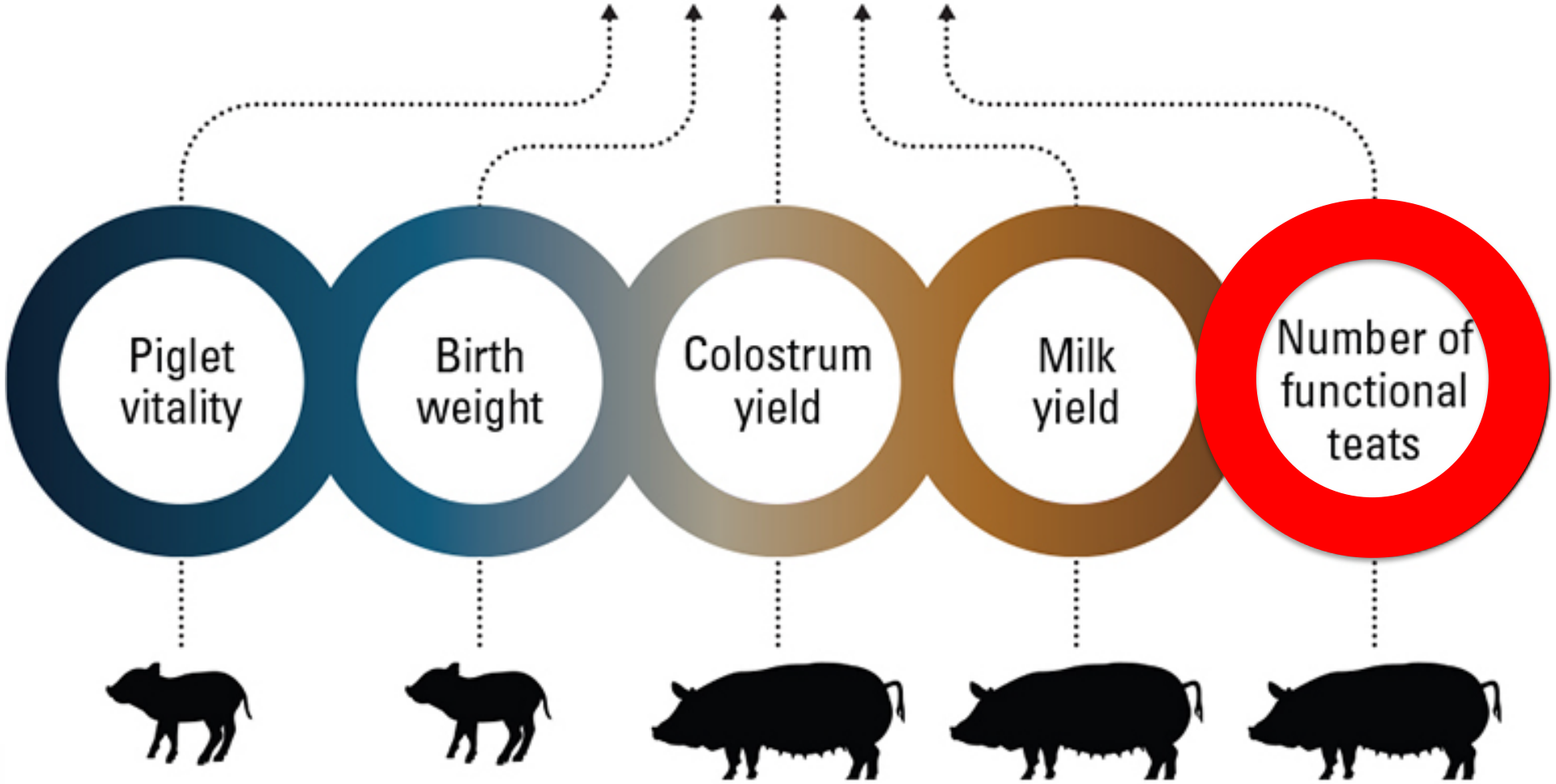


Knauer and Wiegert (2023)

NUTRIENT ACCESS (PIGLET)



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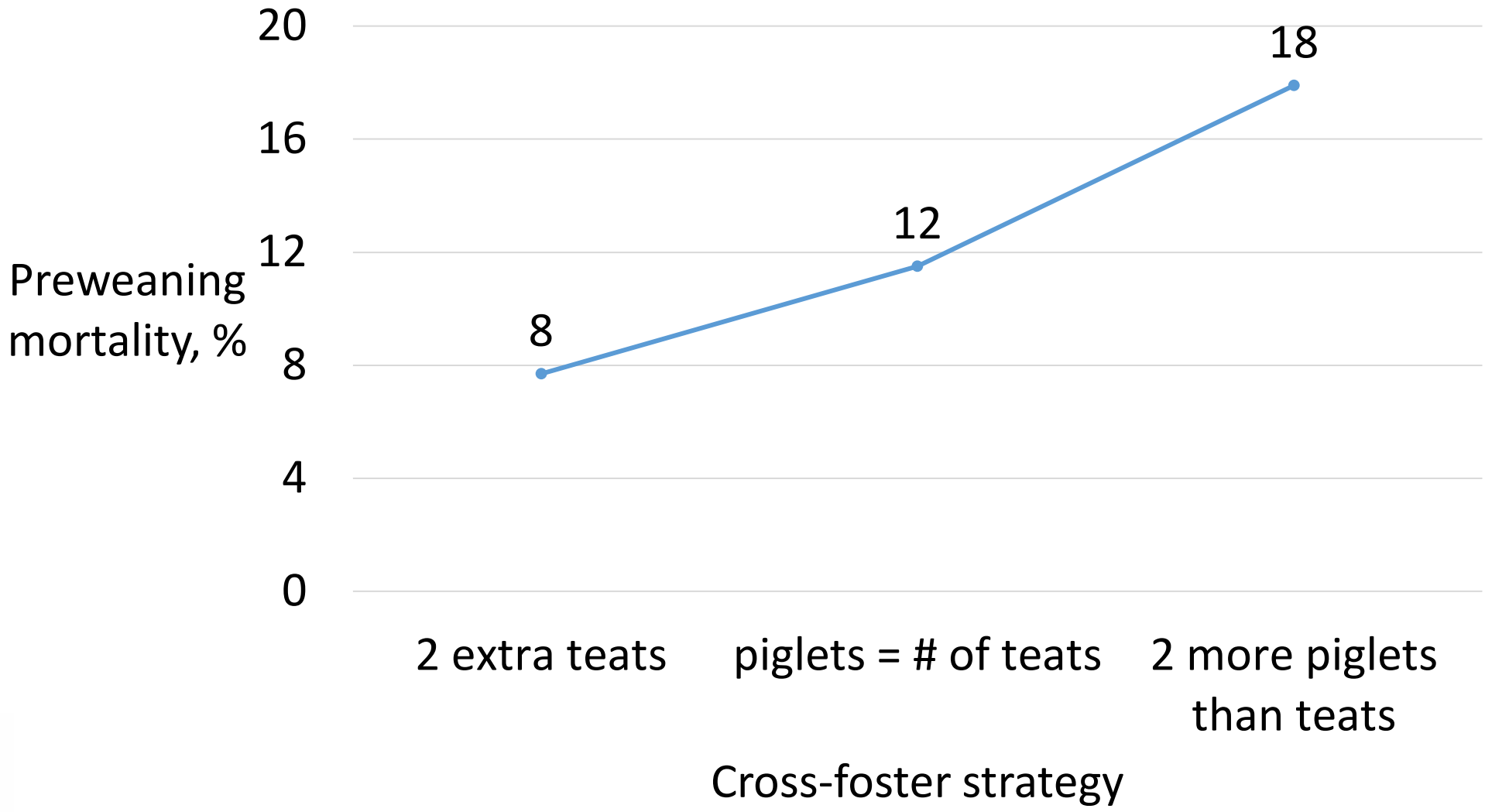
Number of functional teats ↑ piglet survival

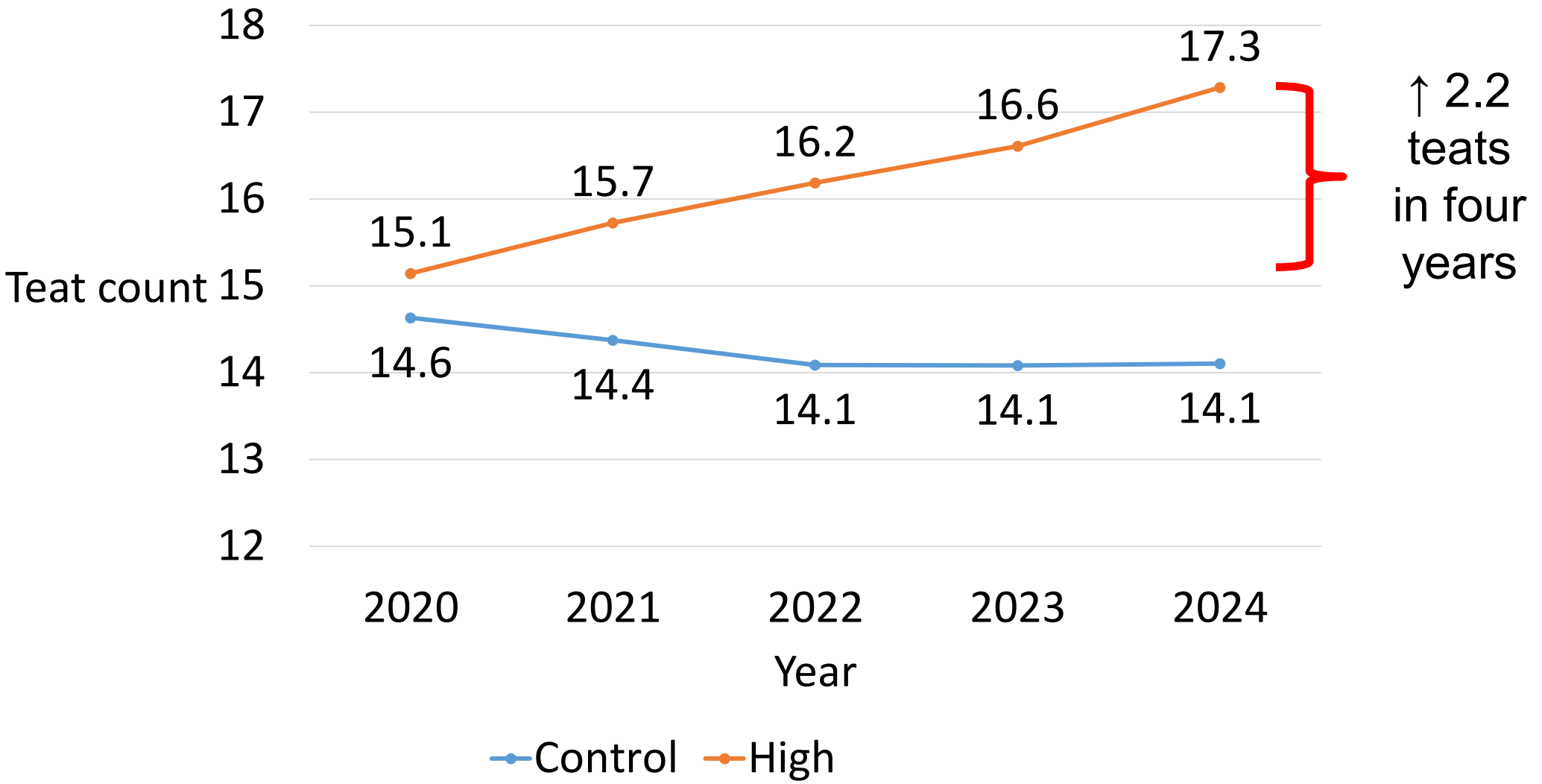
- Enfield & Rempel (1961)
- Skjervold (1963)
- Wiegert & Knauer (2018)
- Speckman et al. (2021)
- Earnhardt-San et al. (2023)
- Obermier et al. (2023)
- Etc.

An extra teat = ~2.5% ↑ in piglet survival



Vande Pol et al. (2021)

Genetic selection for teat count



. Knauer, unpublished

Identifying functional teats

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Nonfunctional teats – size matters

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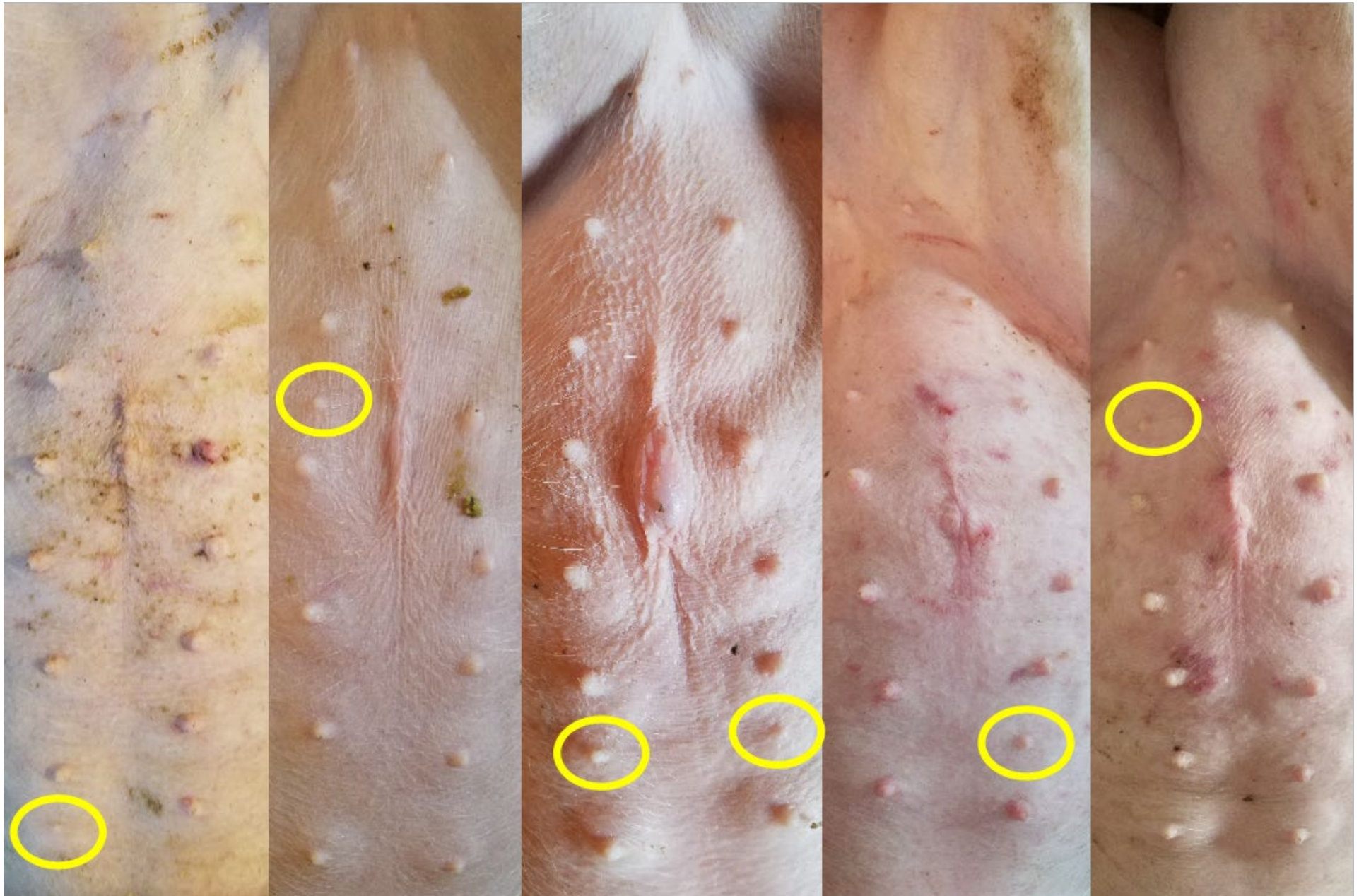
Nonfunctional teats – size matters

Identifying nonfunctional teats – @ weaning



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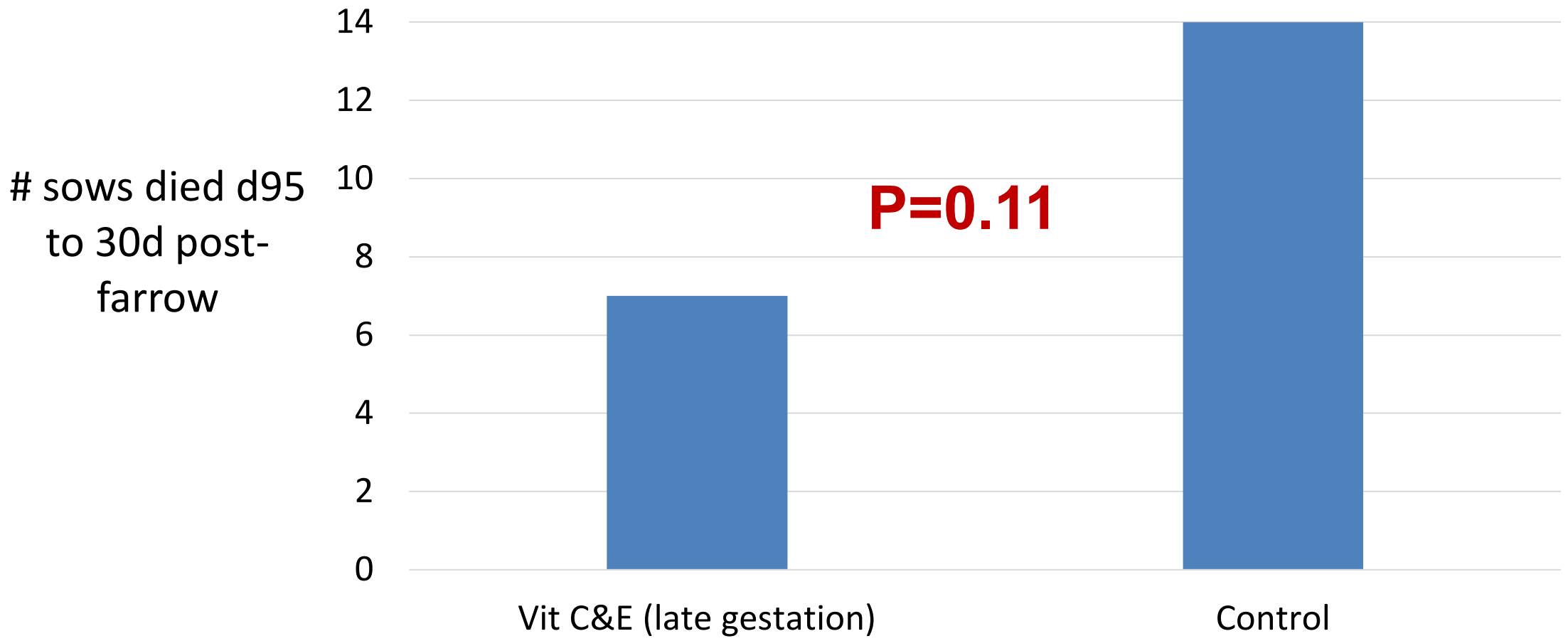
Top dress vitamins C & E - sow mortality



Knauer (2023)

Today's takeaways

- Consider farrowing crate length when remodeling
  - 8 feet minimum?
- Prefarrow feeding to ↓ labor @ farrowing
  - Phytase
  - CaCl
  - Multiple meals
  - Fiber
  - Etc.

Today's takeaways

- Does the modern sow produce enough colostrum?
- Functional teat number
  - ~2.5% ↑ piglet survival per extra teat
  - ↑ colostrum yield & distribution
    - ↑ teats ↓ the need for split suckling
  - If your target is 15.5 number born alive
    - Perhaps need 17 or 18 functional teats

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Thank you for your time

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