Wet/Dry Feeders

Technology, Management & Cost Control

CRYSTAL SPRING

HOG EQUIPMENT

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Leading the hog industry in quality, innovation & simplicity .

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Wet/Dry Feed Concepts

OBJECTIVE

Facilitate smooth transition from sow's milk to solid feed with rapid growth, excellent feed efficiency and minimal impact on animal health

Cranwell and Moughan, (1989)

PROBLEM

In the process of weaning, ... changes occur in the intestine of the pig that make it more susceptible to digestive discomfort, diarrhea and lack of appetite

Han et al., (2006)

METHOD

Increasing food and water intake is important for determining growth and good health

Han et al., (2006)

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What we know…

- Pigs drink when they eat; *McCracken et al., (1995); Thacker, (1999)*
- Enhancing water delivery…increases feed intake and growth; *Barber et al., (1989)*
- Feeding behavior is learned; *Patridge and Gill, (1993)*
- Slurry feed increases feed intake and growth. *Han et al., (2006)*

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What do we want?

- Good pig health
- Pigs that grow fast with Good Daily Gain (ADG)
  - Pigs that consume their daily ration of feed
- Have excellent feed efficiency – Feed conversion (F:C)
- Maximize Genetic potential
- Reduce water and feed waste
- Maximize investment in nutrition and medicines
- Optimize manure management

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- Feed cost represent up to 60 -80% of the total cost of pork production
- In a barn with 1200 animals use about 42 ton of feed per feeder per year
- The type of feeder has a significant impact on controlling feed costs and improving overall production results

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Factors in the selection of the feeder

- Quality / Durability = Return on investment
- Maximize genetic potential (ADG/F:C)
- Maximize feed use (less waste)– maximum nutritional potential
- Minimize water loss

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Feeder Management

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Wet/Dry Feeder Management

Correct management is key for the best performance

- WATER FLOW
- PEN SIZE
- FEED FLOW
- CORRECT FEEDER SELECTION

Managing Water

- Water is the most important Nutrient

Having the correct flow = Good Performance

- +++ water = negative impact on F:C
- --- water = negative impact on ADG

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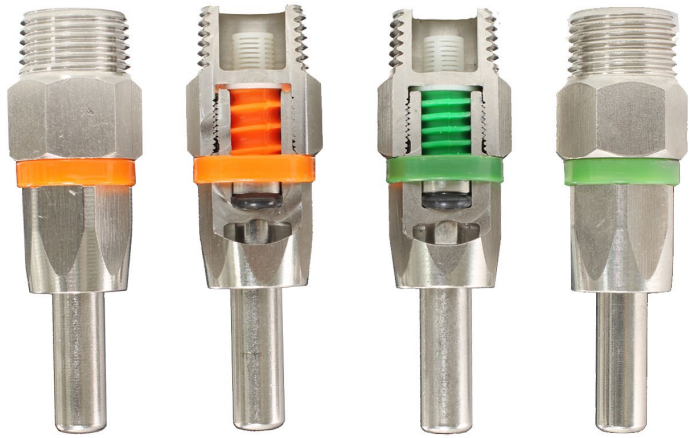
Water flow control

- Patented design for use in dry/wet feeders
- Adapts to different water pressures in the barn
- Different silicone inserts for the control of the adequate water flow in each phase of production



Adaptive-Flow™ Feeder Nipples

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Water Flow Rate Recommendations

	Week in Barn	Pig Age (Days)	Pig Weight (lbs)	Pig Weight (kg)	Feeder Nipple Valves	Water Flow (cup/min)	Water Flow (ml/min)
Nursery Phase	1	21-27	12	5	Off Day 1-2 On Day 3	**2.0-2.5**	**473-592**
	2	27-34	19	9	On	2.0-2.5	473-592
	3	35-41	26	12	On	2.0-2.5	473-592
	4	42-48	33	15	On	2.0-2.5	473-592
	5	49-55	45	18	On	**2.5-3.0**	**592-710**
	6	56-62	55	25	On	2.5-3.0	592-710
Finishing Phase	7-12	63-155	60-155	27-70	On	**3.0-3.5**	**710-828**
	13-19	71-155	160-230	73-104	On	3.0-3.5	710-828
	20-24	156-183	235-280	107-127	On	**3.5-4.0**	**818-1000**

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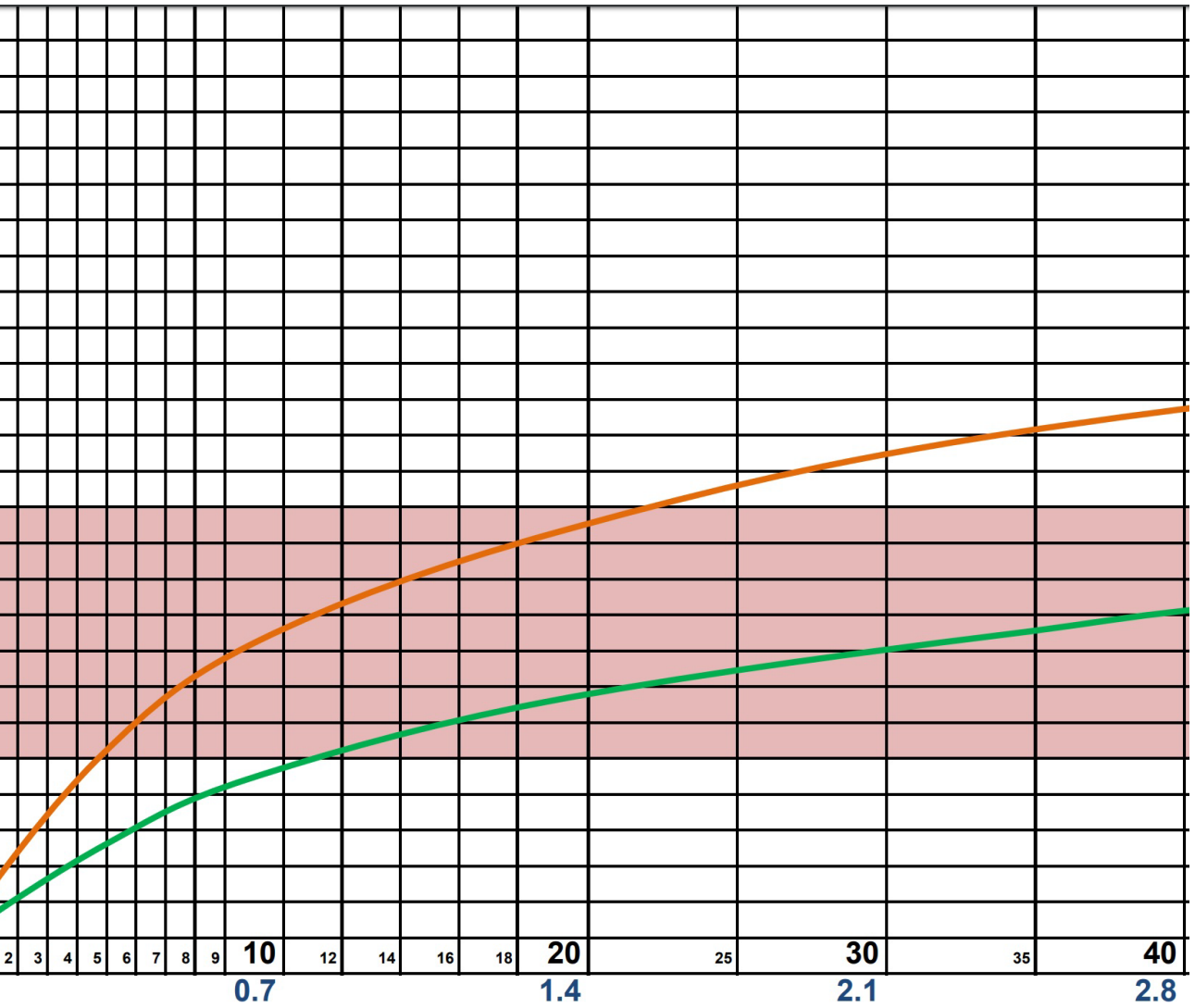
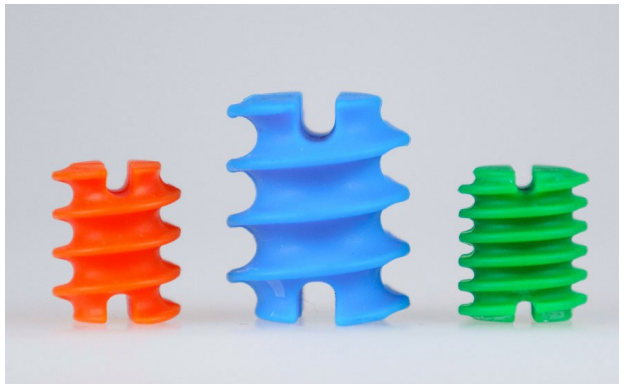
Water Flow Table - Adaptive Drinkers -Flow ™ Crystal Spring®

cups/min	mL/min
10.1	2400
9.7	2300
9.3	2200
8.9	2100
8.5	2000
8.0	1900
7.6	1800
7.2	1700
6.8	1600
6.3	1500
5.9	1400
5.5	1300
5.1	1200
4.6	1100
4.2	1000
3.8	900
3.4	800
3.0	700
2.5	600
2.1	500
1.7	400
1.3	300
0.8	200
0.4	100
0.0	0
	PSI
	bar





Orange – Standard Flow
Blue – High Flow
Green – Low Flow

HIGH FLOW ADAPTIVE VALVES
LOW FLOW ADAPTIVE VALVES

Water Flow Rates

- The drinker nipples in Crystal Spring feeders require a low pressure to attain the desired flow rates, therefore a pressure regulator may be needed to reduce pressure and adjust flow

- Two recommended regulators:

Ziggity 970

10-25 psi (0.7-1.7 bar) – barn regulator

Maxiflo 6002 (for nursery)

¾ - 8psi (0.05-0.55 bar)

or

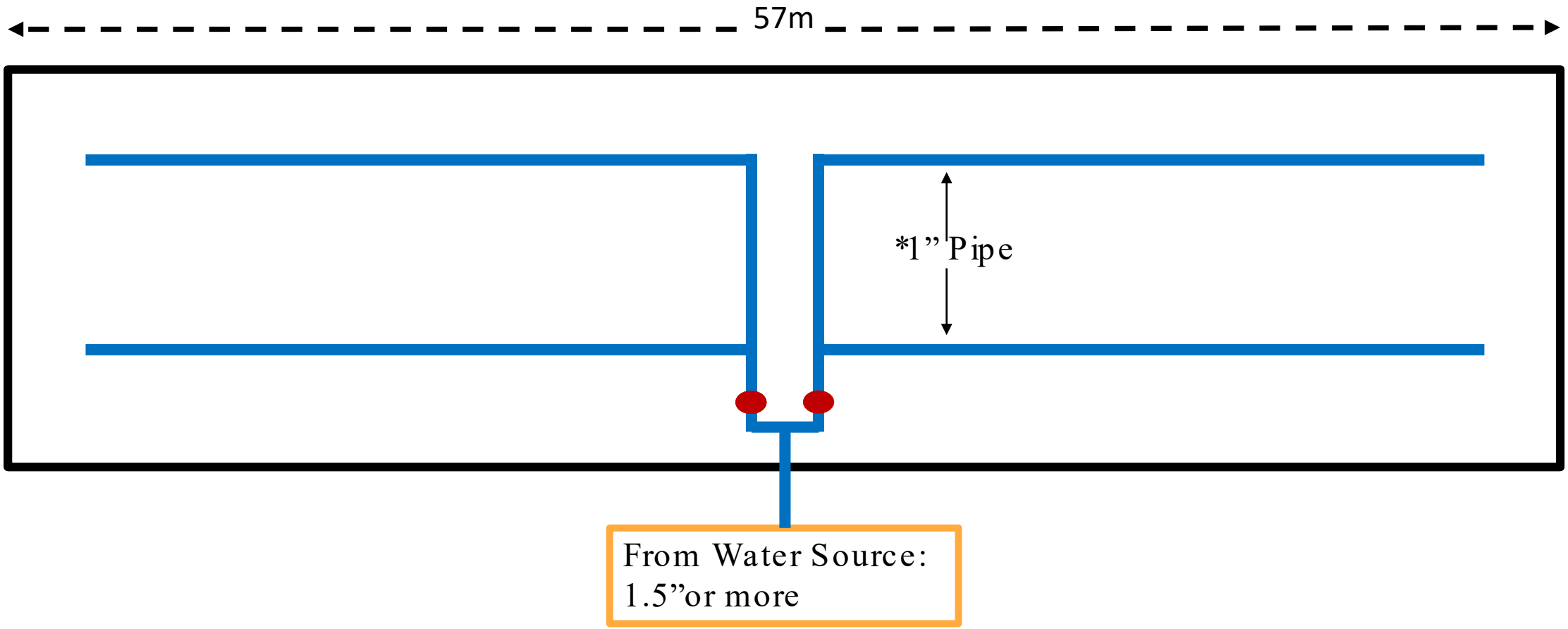
Maxiflo 6003 (W/F & Finishing, Sow)

1.5 – 13psi (0.1-0.9 bar)

*One Regulator for 600-700 pigs

Barn Length – Water Supply Recommendation

- Mid-barn entry point:



Supplemental Water

- Wet/Dry feeder required to be main source of water to pigs
- Recommend one supplemental nipple or cup with shut off valve for 30-50 pigs
- For this... feeder nipples have to work well - adequate flow for each growth phase

Cup

Gate-attached Pipe

"Swinger" Chain-suspended

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Feed flow control

Patented EZ-Adjustment™

- Fine increment allows adjustment for different types of feed (mash, pellet)

Managing Feed

Factors that impact feed flow

Feed formulation:

- Amount of "energy" in flour: milk, corn, fat, etc.
- Granularity of Mash
- Pellet size
- Pellet quality

Environment Factors

- Ventilation/Humidity
- Water dripping in feeder hopper

Drinker Nipple Flow Rate

- Too much water, gumming at shelf
- Too Little – dry feed

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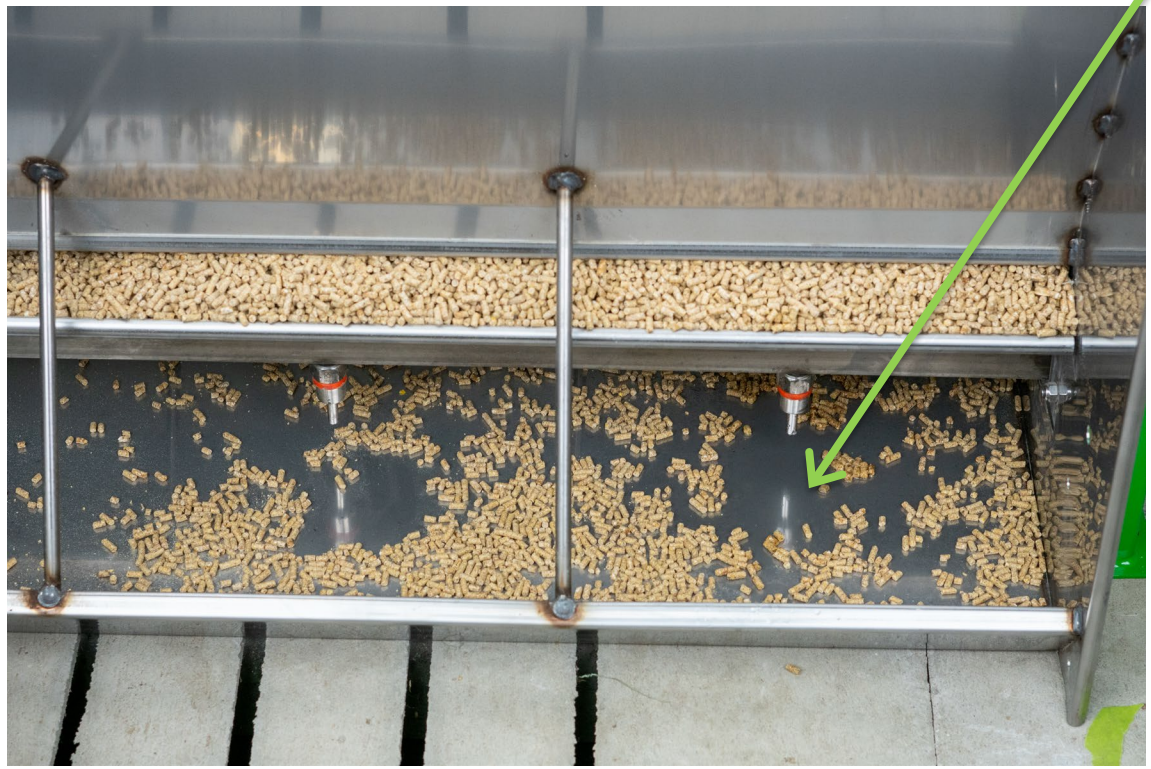
Feeder Management



Correct Feed Flow: 50-60% coverage at the bottom of the feeder

For correction:

- Always measure water flow first, and adjust if necessary
- Only then adjust the opening of the feed tray – one notch at a time/observe effect in 3-4 hrs.
- Other situations may be density (pig-to-feeder space ratio) and inadequate ventilation

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Feeder Spacing

Feed intake is 20% faster in dry/wet feeders
compared to dry feeders

Feeder Spacing

Crystal Spring's general spacing recommendation is:

- 2.54cm / 1” Linear per pig

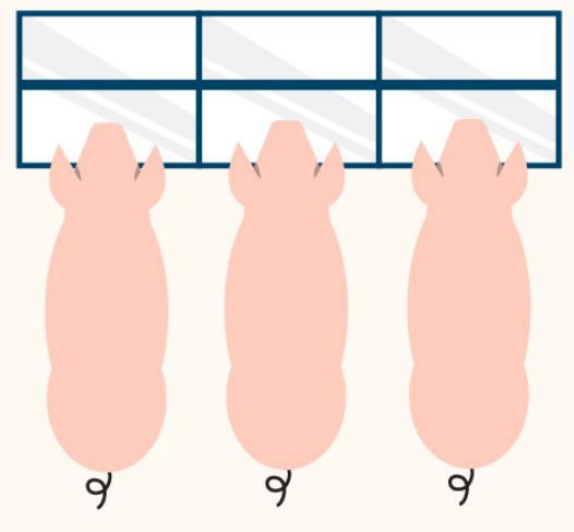
- Nursery: 2.54cm/ 1” linear per pig
- Wean/Finish & Finishing: 14 pigs/space
  - 12 – 16 pigs per feeder space (.8”-1.15”):
    - Less than 12 pigs/space or 1 pig/1.15” = negative impact on F:C
    - More than 16 pigs/space or 1 pig/.8” = negative impact on ADG

Feeder Spacing

Additional Factors to be considered:

- Ventilation
- Floor Space Density
- Floor Type (slat, solid, deep bed)
- Genetics
- Nutrition

Feeder Spacing -Nursery

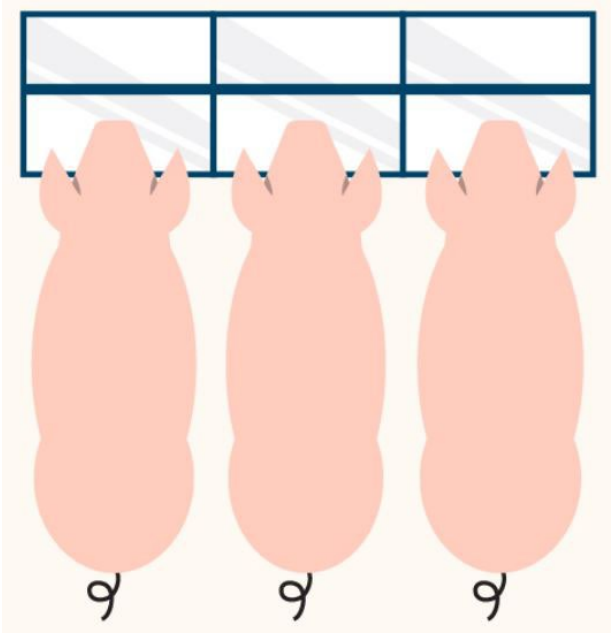


Up to
65lb/30kg

Feeder Space Width

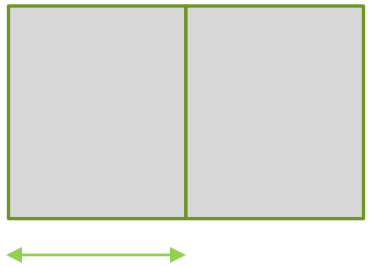
7” – 17.8cm

Heavier piglets require wider feeder space



Up to
100lb/45kg

Feeder Space Width

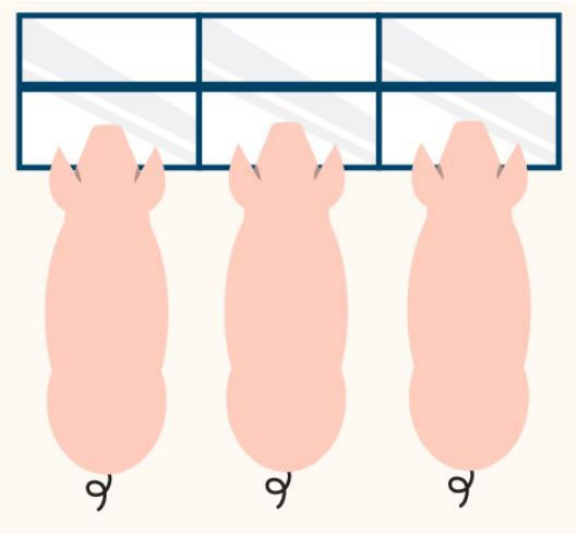


10” – 25.4cm

Shoulder width creates restriction to access feeder space

Feeder Spacing -Finishing

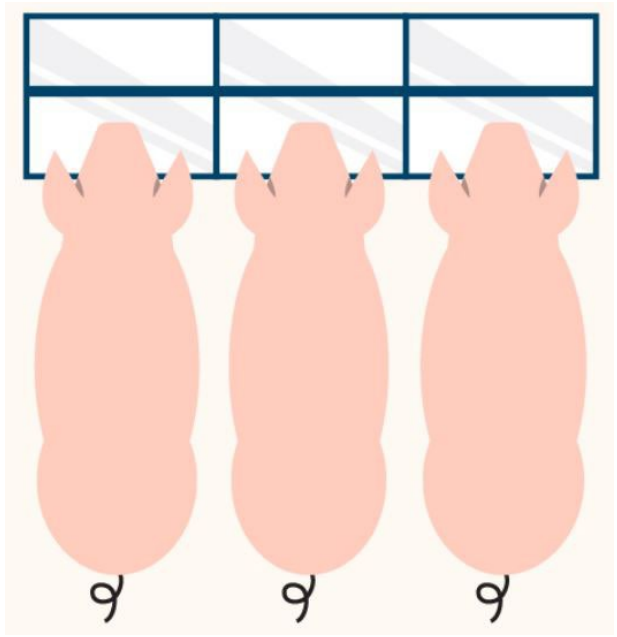
Heavier pigs require wider feeder space



Up to 250lb/115kg

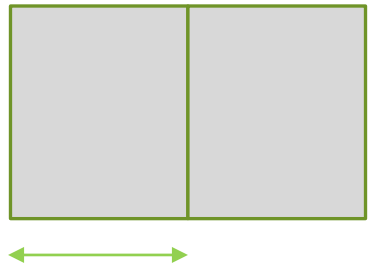
Feeder Space Width

12” – 30,5cm



Up to 330lb/150kg

Feeder Space Width



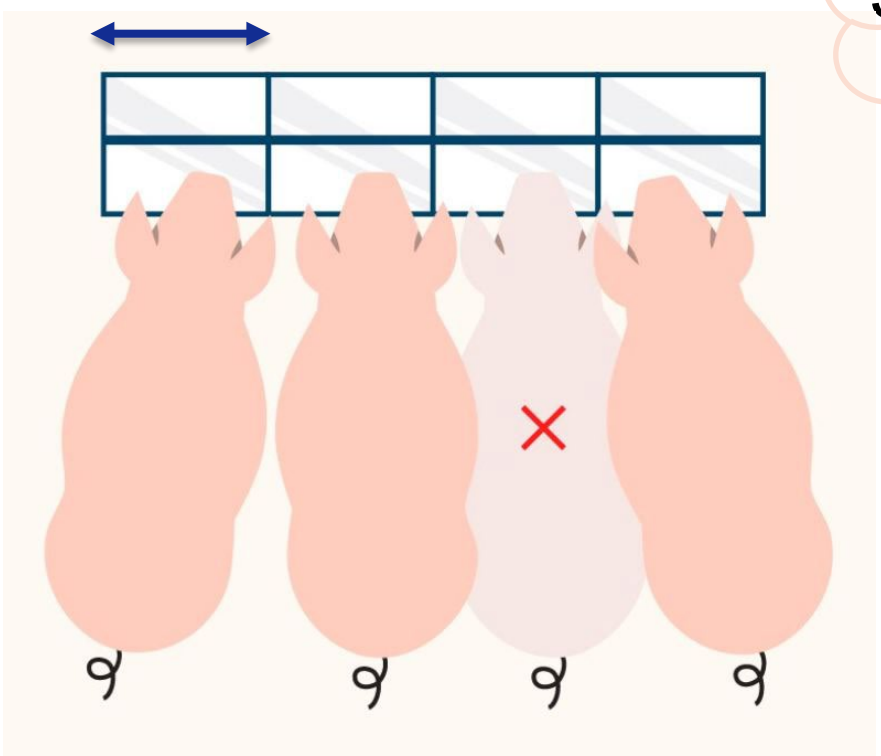
14”/15” – 35,5/38cm

Shoulder width creates restriction to access the drinker nipples

Feeder Spacing

Heavier Pigs Require Wider Feeder Space

Spacing of 16-18” – 40,6/45,7cm



330lb/150kg +

- **Large hindquarters = restrict space**
- **Angle restriction to reach drinker nipples**

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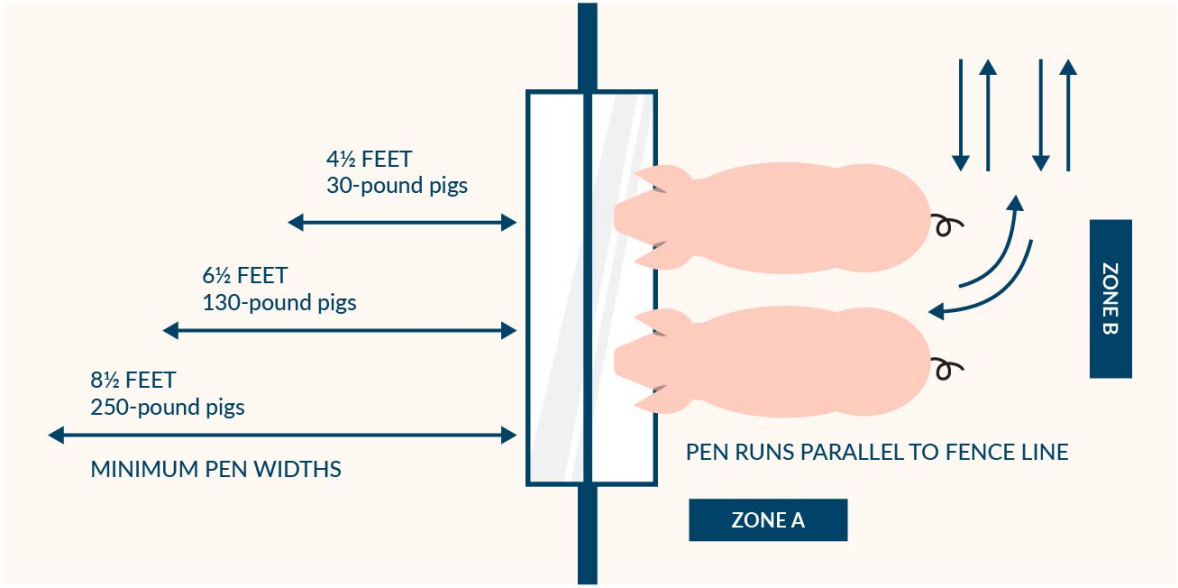
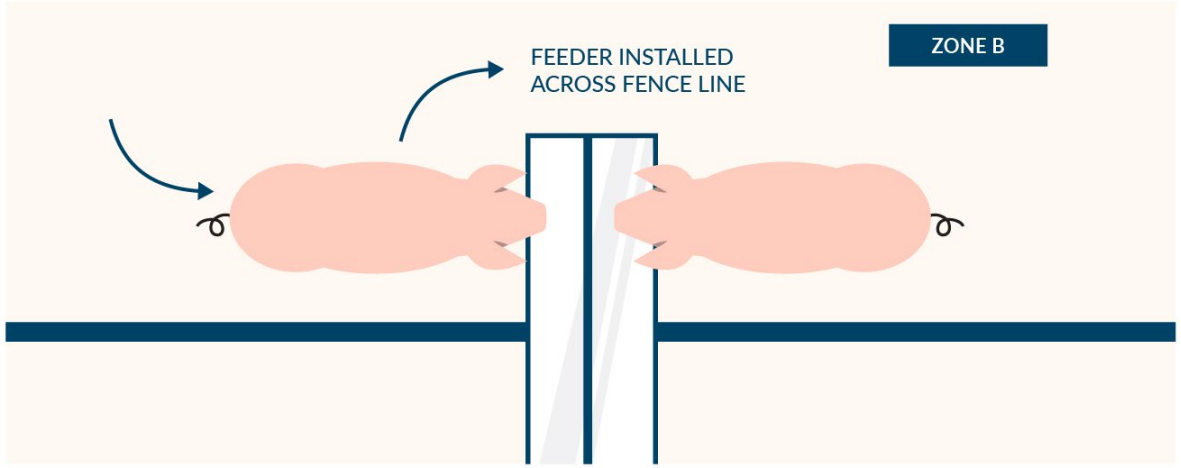
Pen Design:
Providing Quality Pig Space



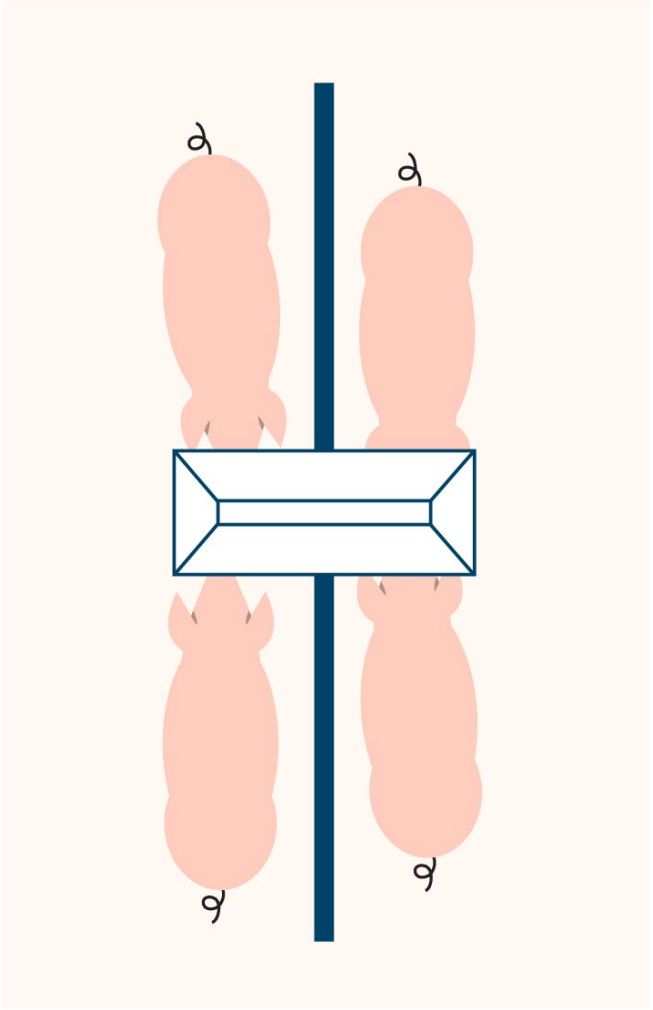


Feeding behavior in small pens

Eliminate eye contact and intimidation hierarchy

Competition for space from a single direction

- Allows more time in the hopper
- Improve feed intake
- Improves batch weight uniformity



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Feeder Management

Pan Coverage

IDEAL

Too much feed

Too much water

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Feeder Management

Feeder Space

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Feeder Management

Feeder Management

Pig Training

- First days in the barn
- First two weeks after weaning
  - Hydration
  - Stimulate – “gruel feed” in pan
- Supplementary waterers
- Ventilation / Heating

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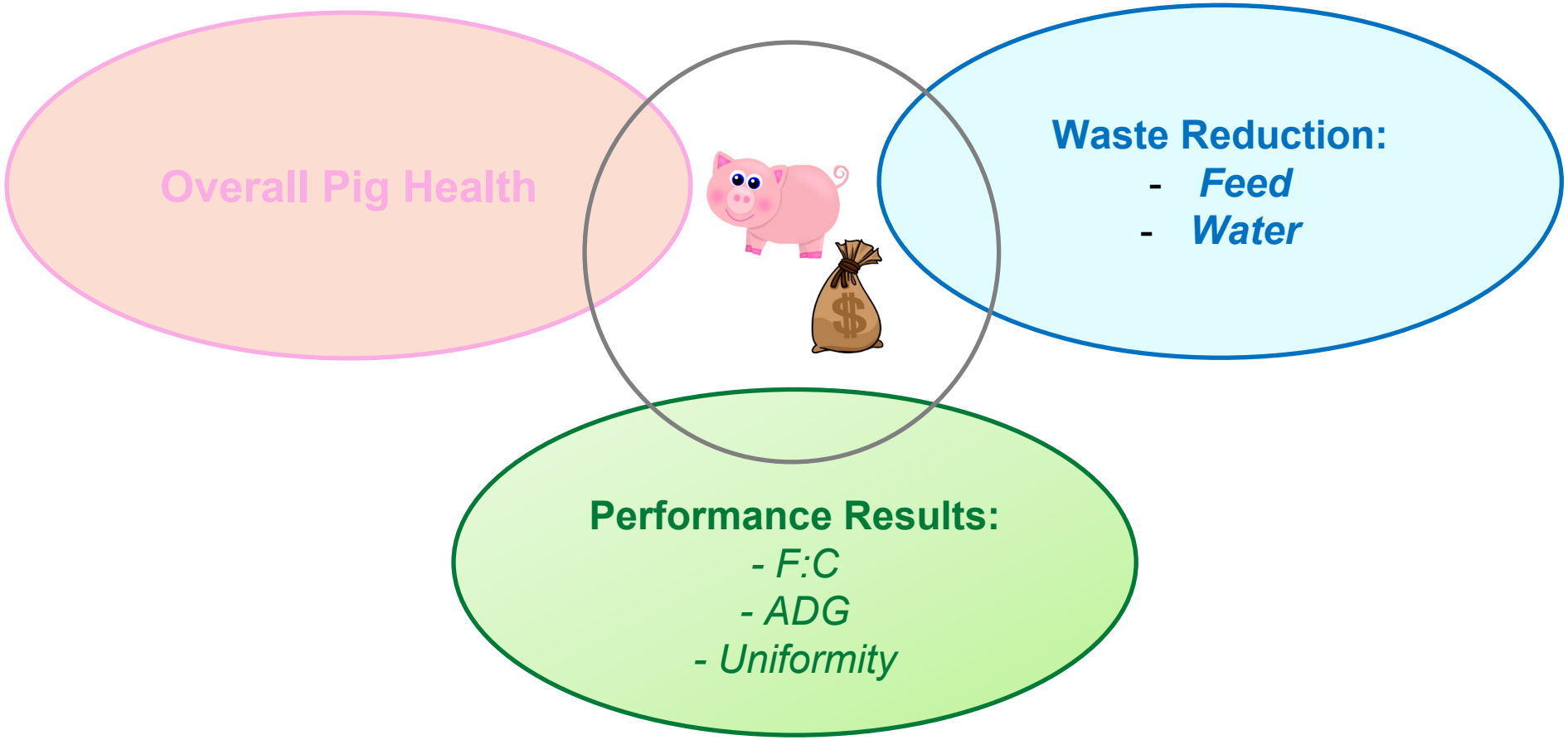
Advantage of Wet/Dry Feeding



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THANK YOU!

Questions?