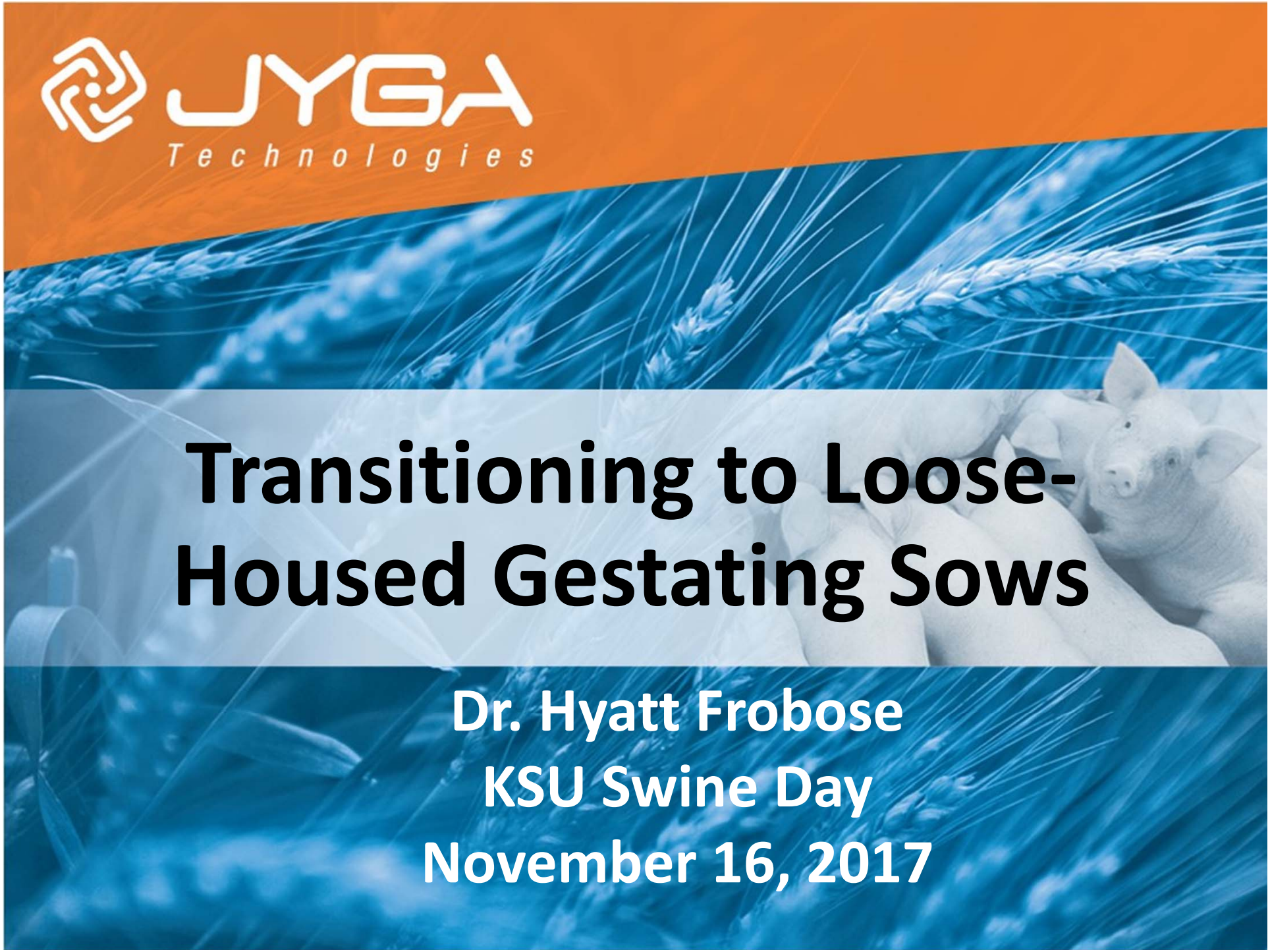

Transitioning to Loose-Housed Gestating Sows

Dr. Hyatt Frobose

KSU Swine Day

November 16, 2017


Ad Libitum?

Disclaimer

- Currently serve as nutritionist and US Business Director for JYGA Technologies (GESTAL feed systems).
- Much of the information presented herein is based on my own on-farm experience and GESTAL internal research, but is supported by peer-reviewed literature wherever possible.

"Properly implemented and managed, many group-housing strategies can yield similar productivity and welfare compared to gestation stalls"

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Commonly Referenced Pen Disadvantages

- Increased Mortality
- Removals (Lame/Aborts)
- Off-Feed Events
  - Competitive vs. Non-competitive

We assume all sows ate

We know she didn't eat

Get her out of there!

- BCS Variation
  - -Need to overfeed the group?

Are these consequences we just have to accept?

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Impact of Group Sow Housing

Will production levels change?

- Research shows similar production levels in stalls & groups
- Scientific reviews: Barnett el al (2001), McGlone et al (2004), Rhodes et al (2005)

"… there is no clear difference in productivity that can be attributed to stalls or group housing systems."

"farms using pens reported no differences in labour, productivity or animal welfare…" (Buhr, 2010)

SMS Management Alternative Housing Study 2012

	Crates (386 farms with 726, 437 females)			Pens (133 farms with 194,114 females)			ESF (8 farms with 11,183 females)		
	Top 25%	**All**	Bot 25%	Top 25%	**All**	Bot 25%	Top 25%	**All**	Bot 25%
P/WN/Mf/YR	28.43	**25.7**	23.31	27.00	**24.8**	22.64	30.36	**25.59**	22.00
Wean Service	6.05	**6.68**	7.36	5.89	**6.21**	6.66	5.66	**6.65**	6.25
Farrow Rate %	90.20	**87.0**	84.10	87.60	**86.0**	84.40	93.70	**84.50**	77.10
Fe Death %	6.20	**7.50**	8.40	7.20	**6.80**	6.40	3.60	**7.70**	8.90
Ave. Parity	2.52	**2.64**	2.65	2.81	**2.92**	2.95	2.67	**2.58**	2.81

Data provided by Swine Management Services from Article in NHF-May 2012

Maybe it's not as bad as we think……but likely more variation

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“Is retrofitting the most cost-effective?”

Options:

1) Herd expansion
2) Build new facility
3) Retrofit existing barn
   - Can you maintain herd inventory?
   - Depop/Repop or phase by phase retrofit

Planning for Group Housing

- Renovations are costly!
  - Consider the future of your business
  - An opportunity to ‘right size’ the sow herd?
- Opportunity to adjust work environment, utilize new technology
  - Attract and keep younger staff?
- Planning is critical in successful transitions

Economic analysis - Buhr, 2010

Calculated trade-off between barn renovation and new build, based on **building age** and **‘net present value’**

Conclusion: build new if the barn is 21 years old or older

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Feeding System Options

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Feeding System Options

Competitive: sows gain feed by fighting/aggression

Floor feeding

Shoulder Stanchions (drop fed or trickle fed)

Feeding System Options

- **Non-competitive:** Cannot gain feed by fighting
- Competition for entry to feeding space
- Individual feeding

Electronic sow feeders

Free-access stalls

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PIC Report – April 2016

Group Housing Comparison

	Stalls	Free Access	Floor Feeding	Stanchions	ESF	Out door	JYGA Gestal
Welfare	+	++++	+++	+++	+++	++++	+++
Body Condition Management	++++	+++	++	+++	++++	+	++++
Aggressions	x	x	xxx	xx	xx	x	x
Building / Retro fitting Costs	x	xxx	x	x	xxx	x	xx
Running Costs	x	xx	xx	xx	xx	xx	xx
Ease of management	++++	+++	+++	+++	++	+	++
Feed Usage	xx	xxx	xxx	xxx	x	xxx	x

+ poor, ++ acceptable, +++ good, ++++ very good
x lower, xx moderate, xxx higher

“When to mix sows into groups?”

- Mixing induces stress and can reduce embryo survival during early pregnancy (before d 21)[1]
- Physiological reference points[2]
  - D 11-12 – maternal recognition of pregnancy
  - D 14-18 – placental attachment aka “implantation”

- Accordingly, recommended times for grouping sows are pre-implantation (< 7 days after breeding) or post-implantation (post-preg check).
- Current research comparing mix time has been inconclusive, and results often confounded by other factors.

[1]Van der Lende & Schoenmaker, 1990. [2]Spoolder et al., 2009. [3]Knox et. al., 2014.

“When to mix sows into groups?”

Other Factors:

- In retrofit/expansion projects, can utilize more existing gestation stalls if mixing post-implantation
- In new construction, cost per gestation sow space (~19 sqft/sow) is typically lower for pens versus stalls
- If mixing pre-implantation, must consider how to detect open females and utilize pen space most efficiently

Boar pen used to heat check in pre-implantation mixing barn

"What is the optimal stocking density"

- Canadian Code of Practice mandates a minimum of 19 ft^2 for sows and 15 ft^2 for gilts.
- EU guidelines: Gilts-18 ft^2 Sows-24 ft^2

Table 2. European minimum floor space per sow, based on group size and animal age

Size of group	Gilts	Sows
Fewer than 6	1.81 m^2 (19.5 ft^2)	2.48 m^2 (26.7 ft^2)
6-39	1.64 m^2 (17.7 ft^2)	2.25 m^2 (24.2 ft^2)
40 or more	1.48 m^2 (15.9 ft^2)	2.03 m^2 (21.9 ft^2)

- More space/sow needed for smaller vs. larger groups[4]
- Personal observations align with a review by Bench et al. (2014) who concluded that additional space above 20.5ft^2 did not affect sow productivity.

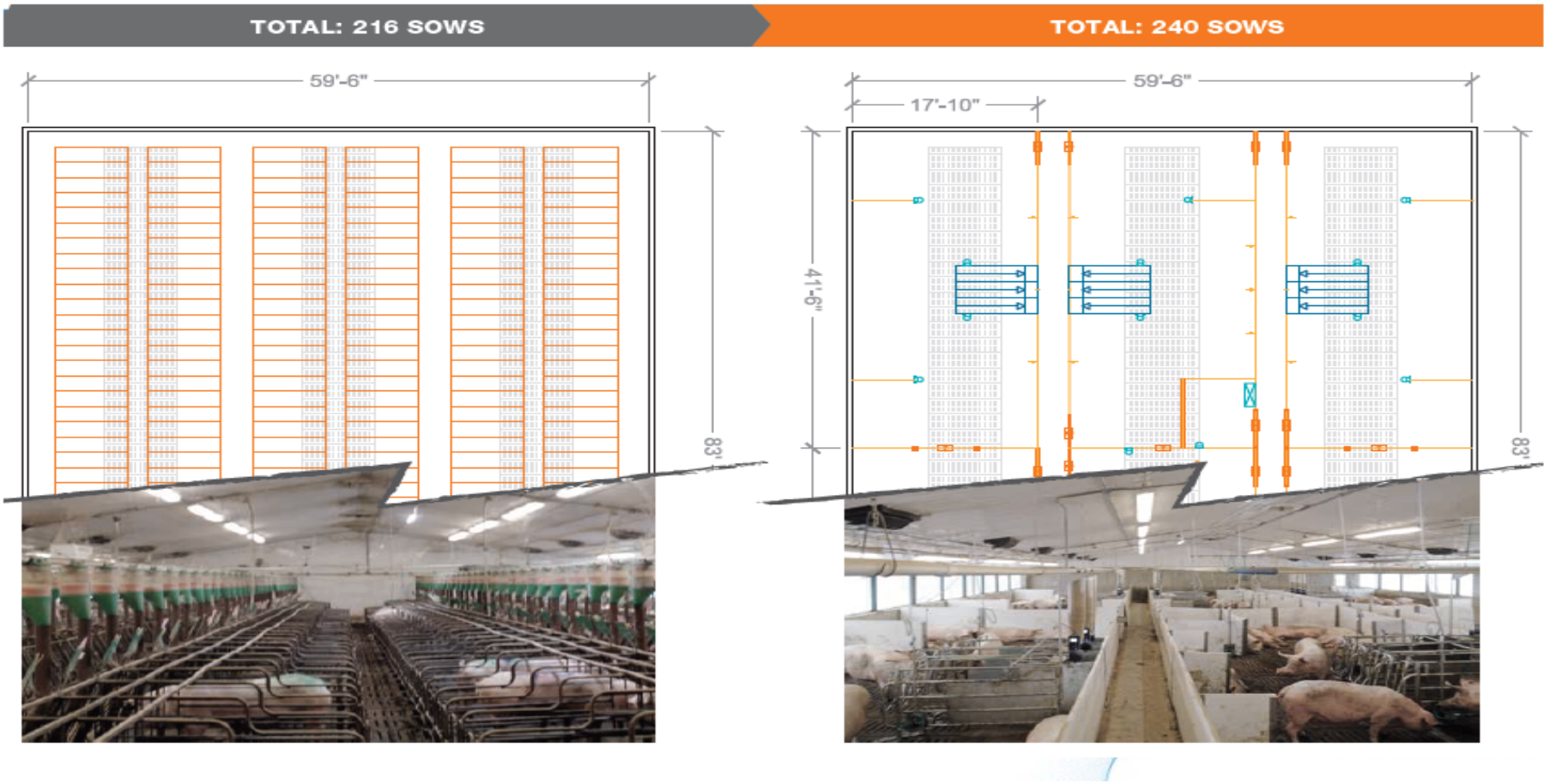
[4]Adapted from Turcotte et al., 2015.

“What is the optimal stocking density”

- To maximize number of sow spaces in retrofit facilities, eliminate as many alleyways as possible.

6 rows of 36 stalls = 216 stalls

Gestation Pen 760 sq. ft.
40 sows / 19 sq. ft.



"What is the optimal stocking density"

- In expansion and new construction, consider the cost of every additional square foot.
- The table below illustrates an example from a 2016 new 2,100 sow farm. Pens stocked at 20.4ft^2/hd, but with alleyways and G-stalls the total building = 22.5ft^2/hd.

Sows	Sqft/hd (total)	Total Sqft	Cost/Sqft	Total Cost	Cost/hd
2100	22.5	47,250	$43.36	$2,048,760	$975.60
2100	1.1	2,310	$18.98	$43,843	$20.88
Total	23.6	49,560		$2,092,603	$996.48

Each additional 1 sqft in pens requires about 10% additional space in alleys.

For a 2 ft pull-plug pit. For deep-pit add $4-6/sqft.

[5]Personal communication, US building contractor 2017.


15.0 ft²


17.75 ft²


18.8 ft2
Guardian


19.25 ft²


19.5 ft2


21.5 ft²


32.0 ft²

“Static vs. dynamic grouping strategy”

Static Advantages[4]:

- Allows all-in/all-out (manage like a “snake”)
- Easier to evaluate BCS of group
- Reduced aggression (only one mixing event)

Dynamic Advantages[4]:

- Better floor space utilization (allows for creation of large groups)
- Allows for optimal ratio of sows/feed station in traditional ESF

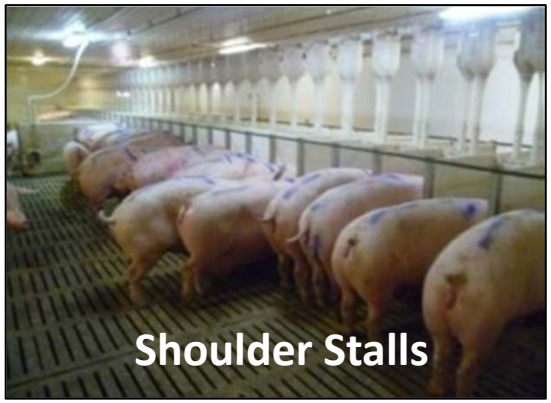
- Anil et al. (2008)[6] and Li and Gonyou (2013)[7] reported higher levels of aggression and injuries in dynamic groups, but no differences in sow productivity were detected.

[4]Turcotte et al., 2015.

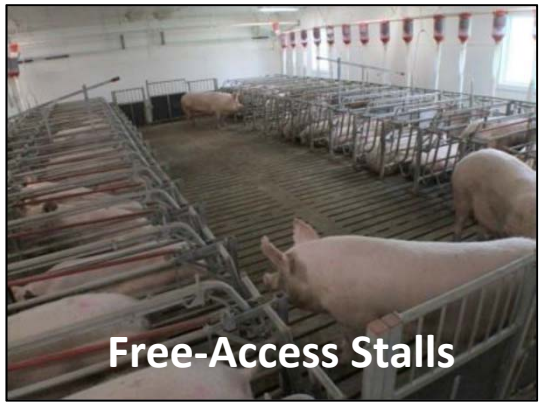
“How many sows per pen?”

Feed system dependent

Small Groups (<10 hd)



Small - Med groups (<20 hd)



Flexible (1 stall per sow)

Med-Large groups (40+ head)

Flexible (1 station per 15-20 sows)

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“How many sows per pen?”

- Don’t overlook the daily chores of the gestation stockperson in traditional and free-access ESF systems
- Regardless of feed system, **THERE WILL BE** sows who do not eat and need to be identified.
- Reasons for “non-eaters”:
  1. Lost RFID tag
  2. Lameness/sickness
  3. Animal is untrained/slow learner
  4. Fear of dominant sows

When determining optimal group size, think about finding sows in a large group pen.

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Where is she?

Pen Structure and Design

Rule number one for retrofits: CLEAR COMMUNICATION!

- Provide accurate photos/measurements to your builder/designer
- Every farm is different
- Ask for multiple opinions
- Different feed systems require different approaches
- Too often…rushed timing or miscommunication leads to poor results!

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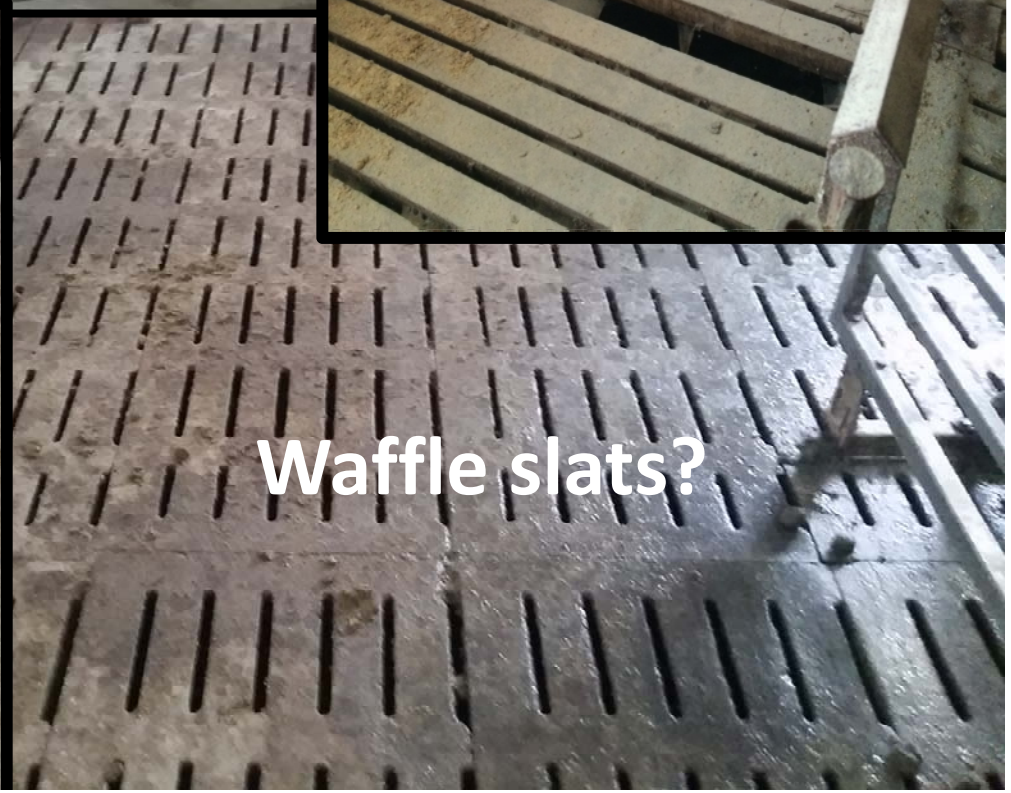
Flooring Type

- Solid, partially-slatted or fully slatted can work
  - Fully slatted = more forgiving
  - Solid floor texture
- For partially-slatted barns, location of slatted/solid areas is extremely important
  - Solid areas as resting areas
  - Slatted areas as traffic/dunging areas
- Pen slope (drainage)
- Slat gap (<20 mm)
- Slat direction


Solid Floor Texture

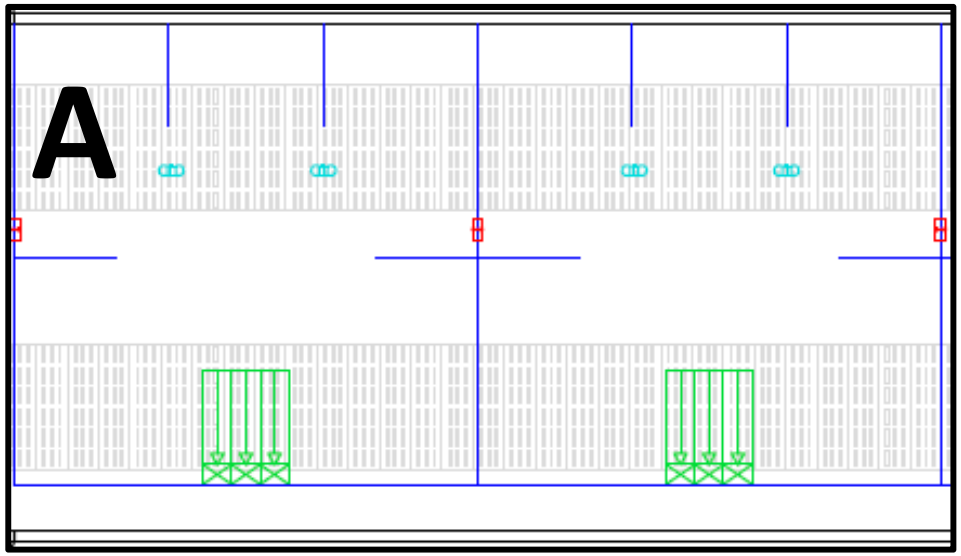

Spend the $$...just
replace the slats

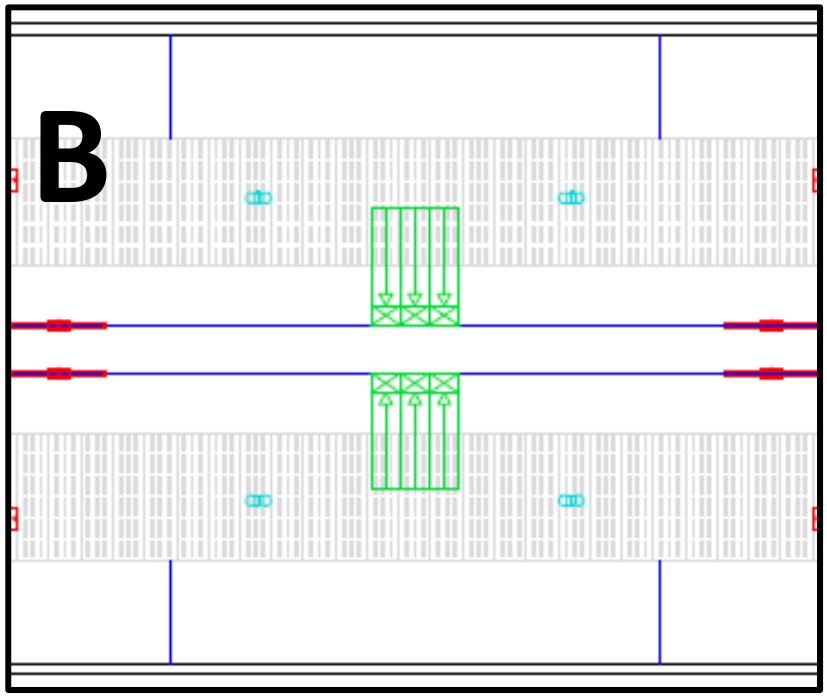

<20 mm
Gap


Waffle slats?


Slat Direction

Quiz - Flooring





Waterers

- Number, type and location are **ALL** important features of pen waterer design
- Recommended ratio is: 10 sows per cup/bowl waterer
  5 sows per nipple waterer
  *Min. 2 waterers per pen
- Floor vs. wall-mounted
- In partially-slatted barns, locate waterers over slats
- In fully-slatted pens, use waterers to help create activity/dunging areas vs. resting areas

Bowls bigger than finishing cup waterers!

Waterers on the floor are always dirty!

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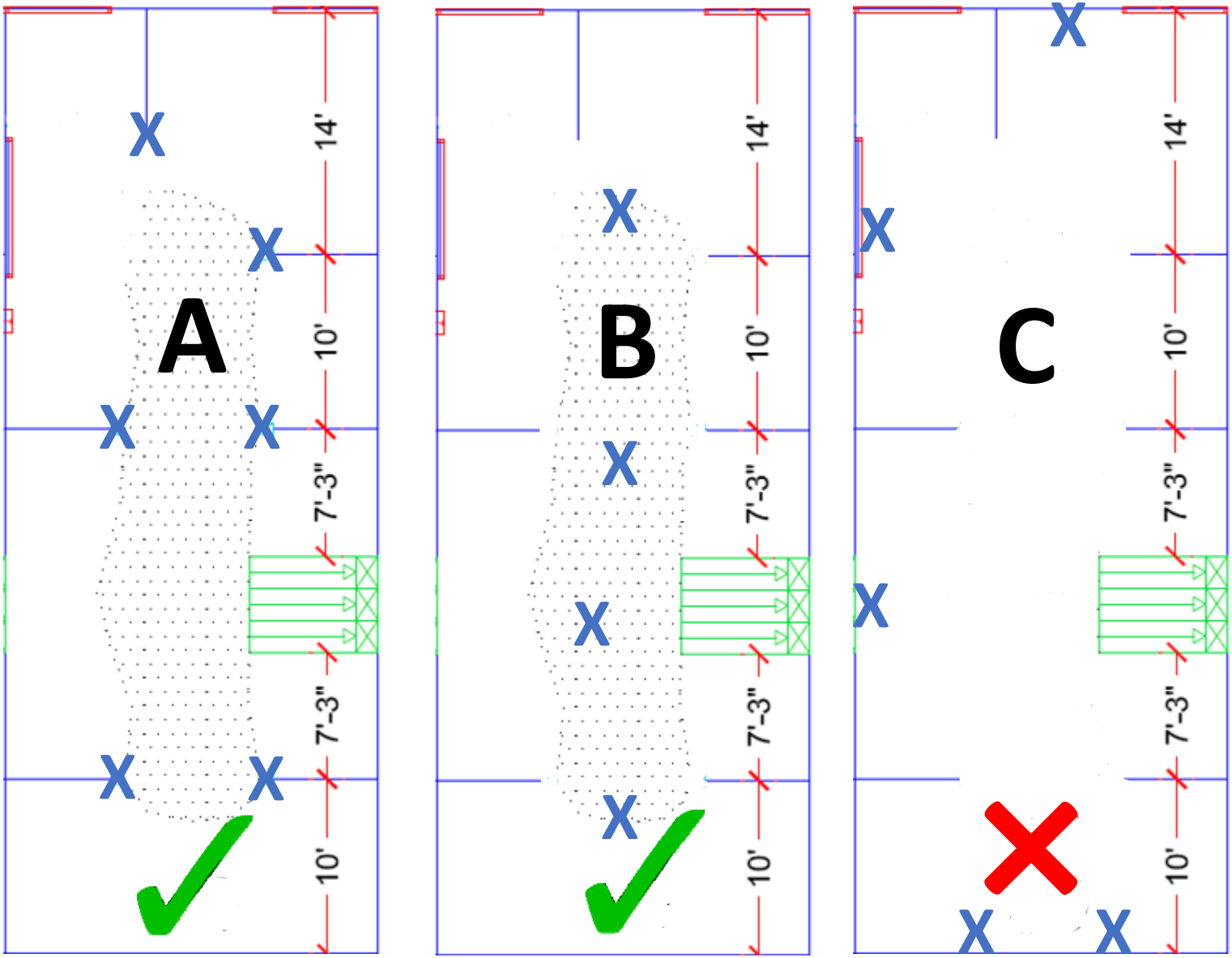
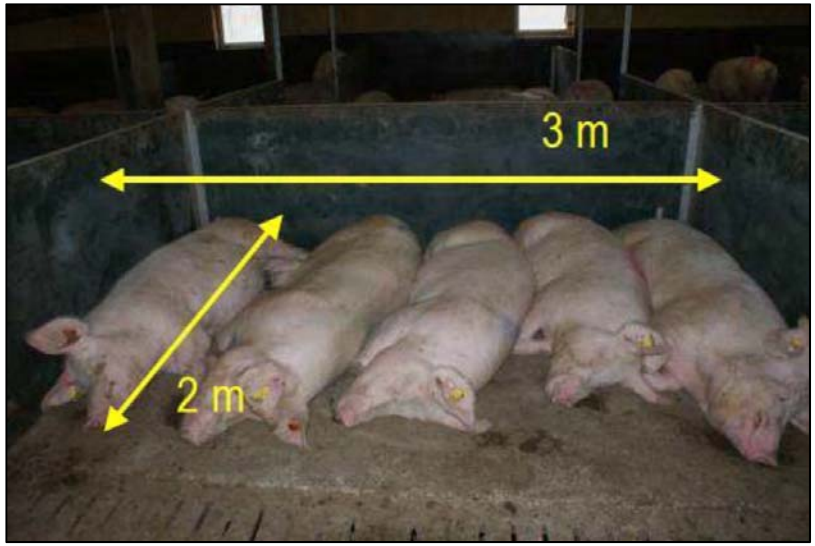
Seriously….

Quiz – Waterer Location



Nesting/Gating Material

- Nesting walls within group pens reduces aggressive interactions during group formation[8].
- Recommended nesting wall dimensions
- Vented vs. solid

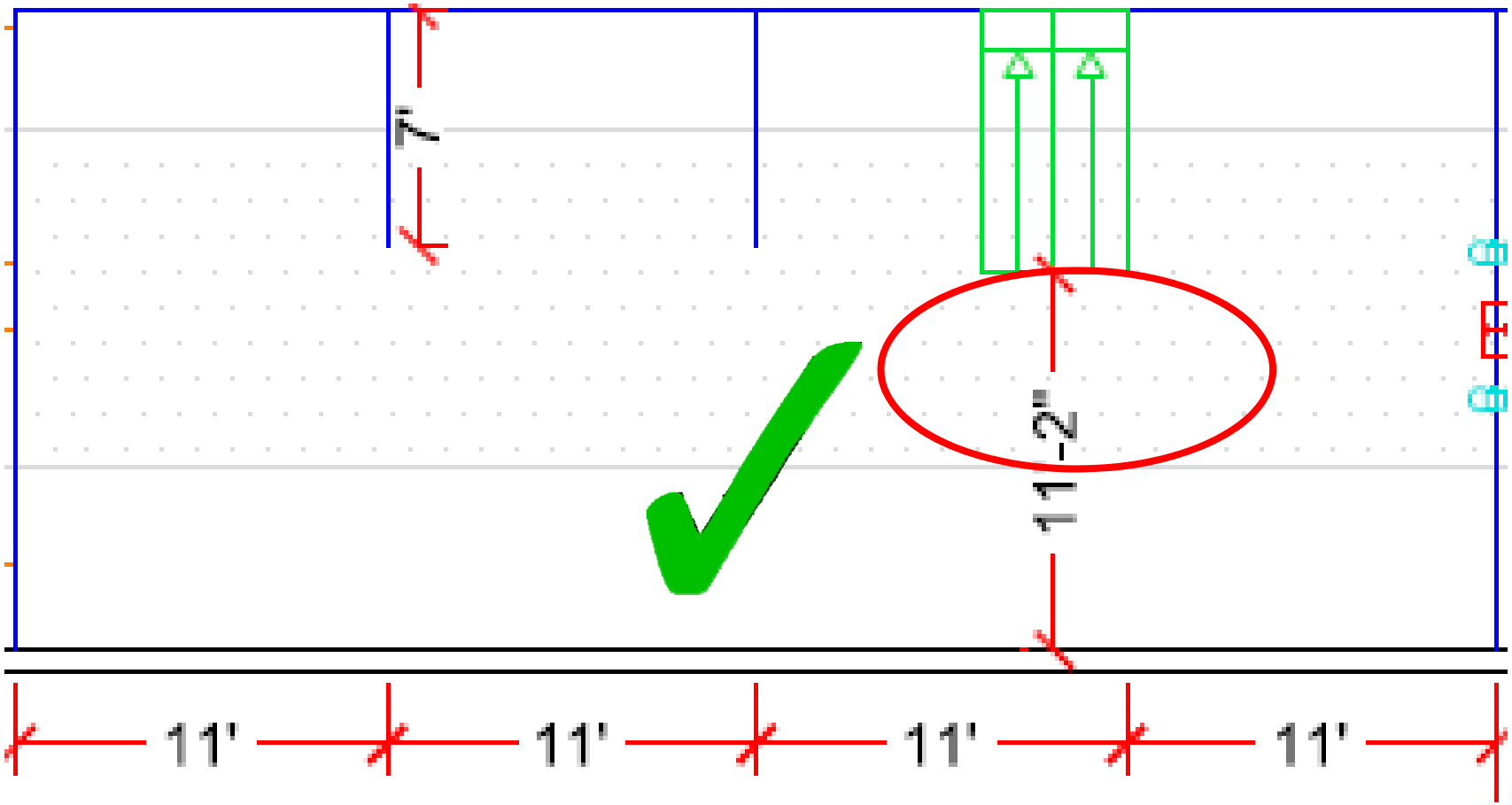


[8]Verdon et al., 2015.

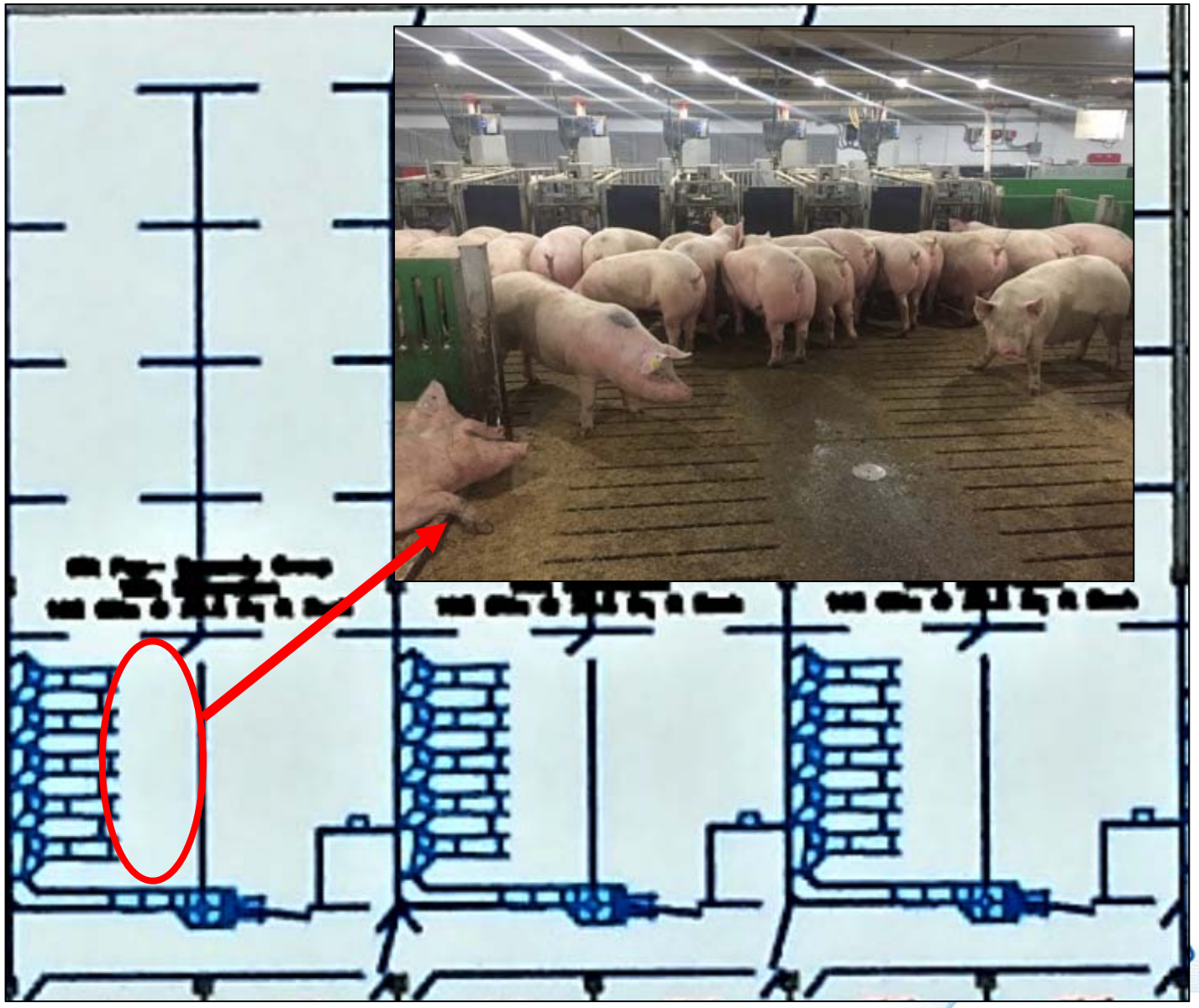

A


B

What's wrong with this layout?



What's wrong with this layout?



Man Gates

- It is important that workers walk pens every day, and opening gates gets really old……
- There are many effective designs

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Lighting

- Easy to overlook light locations in retrofit facilities
- Shadows and dark corridors cause animals to balk and slowing the learning process in ESF systems

- Place a light above each station whenever possible
- May need to use variable light intensity in different regions of the pen if feed access is 24 h/d

Hospital/TLC Pens

Guidance:

1) Easy access and visible to staff
2) Located close to gestation pens
3) Allocate ~10-15% spaces for floor feeding or stanchions
4) ~3-5% for non-competitive feed systems

Stockmanship

“No matter how acceptable a system may be in principle, without competent, diligent stockmanship, the welfare of animals cannot be adequately cared for”. – British Codes for the Welfare of Farm Livestock

The Transition - Staff

- For farm staff, the conversion to group housing is not a choice, but a mandate. Some workers will not have the right attitude to be successful managing loose sow housing.
- KEY: Identify the right person to manage group-gestation!

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The Transition – Old Sows

- In most retrofits, previously stall-housed sows will be converted to group housing.
- It's important to identify feet/leg issues and overgrown toes before placing the sow in the pen. Remove to hospital area and cull after next farrowing.
- Old sows display more aggression at initial mixing
- Utilize a "mixing pen" if possible
- The first cycle will be the hardest…everyone is adjusting. Make sure additional labor is available

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Bottom Line

1. Properly managed, various group housing systems can yield equivalent production to gestation stalls.
2. The transition needs to be carefully planned, and producers need to manage their expectations of staff and existing sows.
3. The cheapest initial investment may not be the cheapest long-term.
4. Conversion to group-housing offers an opportunity to improve stockmanship in your operation.
5. Opportunities exist to reduce feed cost, minimize aggression, and increase performance through the use of new technologies and production strategies.

QUESTIONS ?