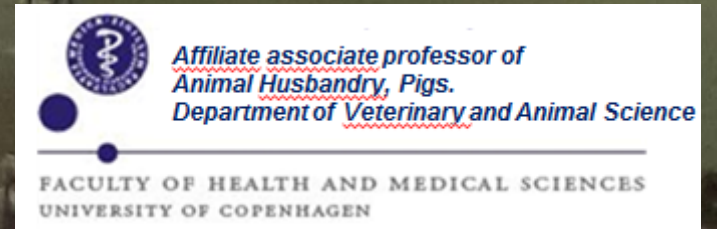


New paths for better results: Experiences with free farrowing and lactation systems

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Danish Pig Levy Fund **SEGES**
INNOVATION

Today's theme: *New paths for better results*

- Loose housing of lactating sows is a new path
- We need to develop the system, so we obtain better results.....or at least the same
- Potential
 - Improved ability to perform natural behaviours
 - Improved access to the udder
 - Improved acceptance of pig industry by society
- Challenges
 - Increased risk of crushing
 - Increased cost
 - Increased emissions
 - Limited readiness to pay a premium



Experiences – to be touched upon today

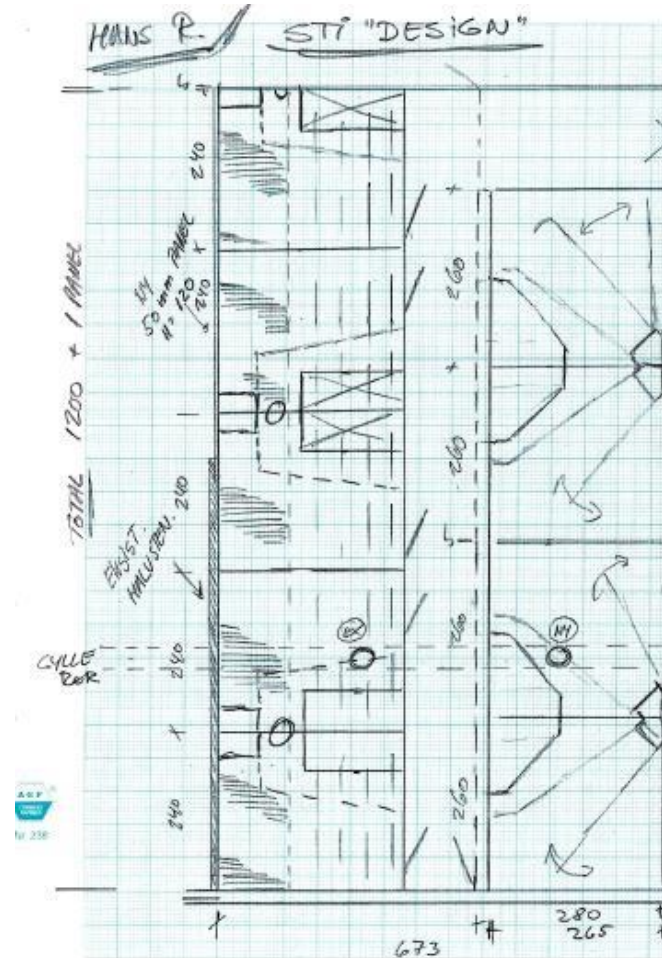
- Start up with limited number or full scale
- Free farrowing or option to confine temporary (= free lactation)
- Decision/investment and running/optimizing
- From animal welfare to sustainability
- Space
- Confinement
- Daily management
- Where do we go from here – which path do we take?



Limited number (e.g. five-ten pens) or full scale – pros and cons

2010-2015

- Limited numbers – pros
 - Get experience
 - Develop and optimize
 - Limited investment
- Limited numbers - cons
 - Ventilation etc
 - Management
 - Sows



2015-

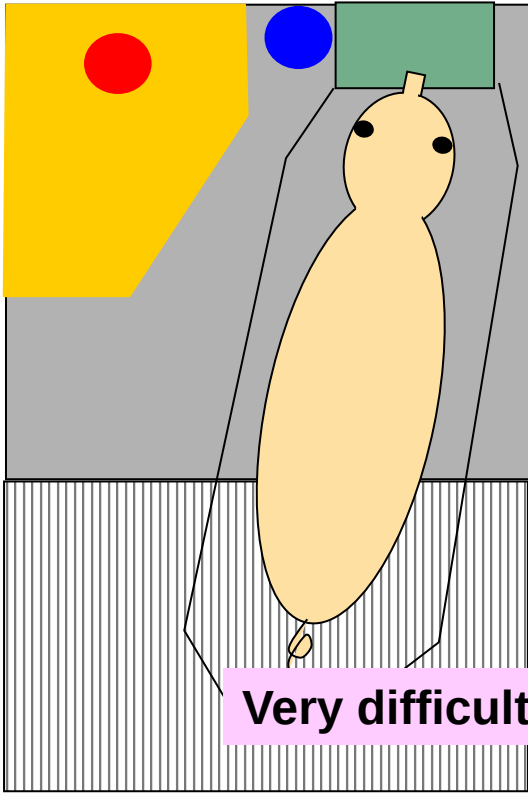
- Full scale – pros
 - Optimize management
 - Sows accustome
 - Stockpeople accustome
- Full scale - cons
 - 'Irreversible'
 - Large investment

Be aware of the pros and cons of the way you start up with loose housing

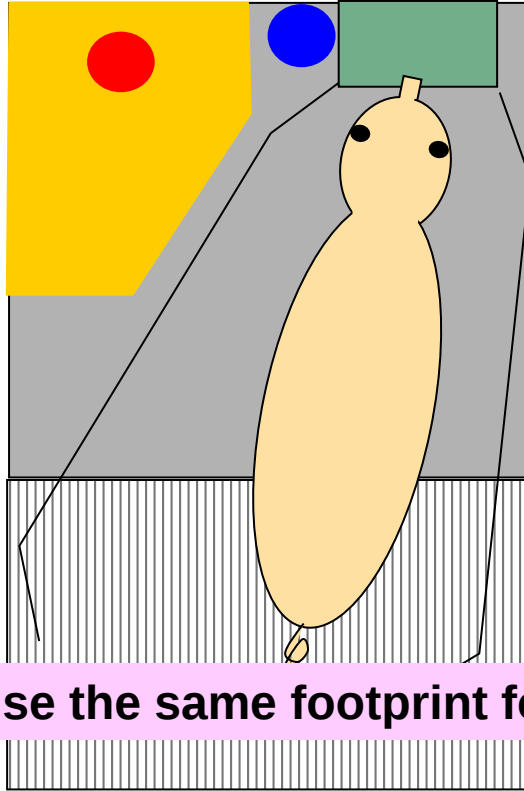
Can we prepare pens with crates?

The answer is 'no'

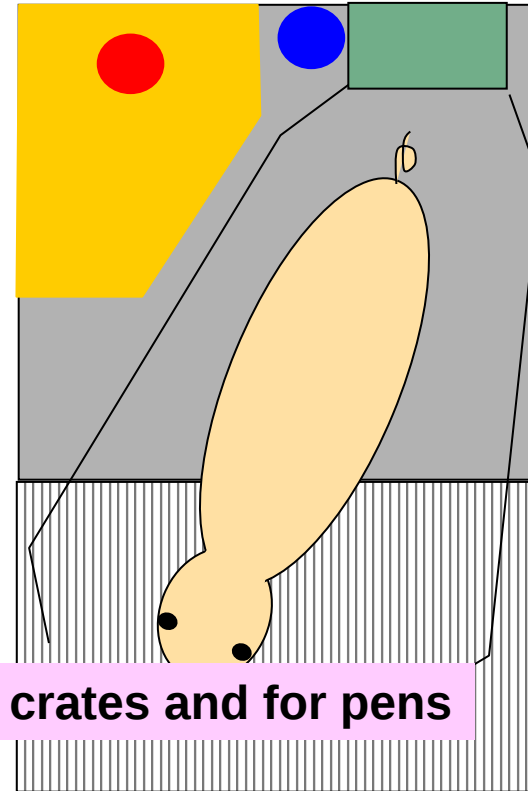
While the crate is **closed**, the sow eats and defaecates in the same position.



When the crates is **open**, the sow continues to eat at the trough.



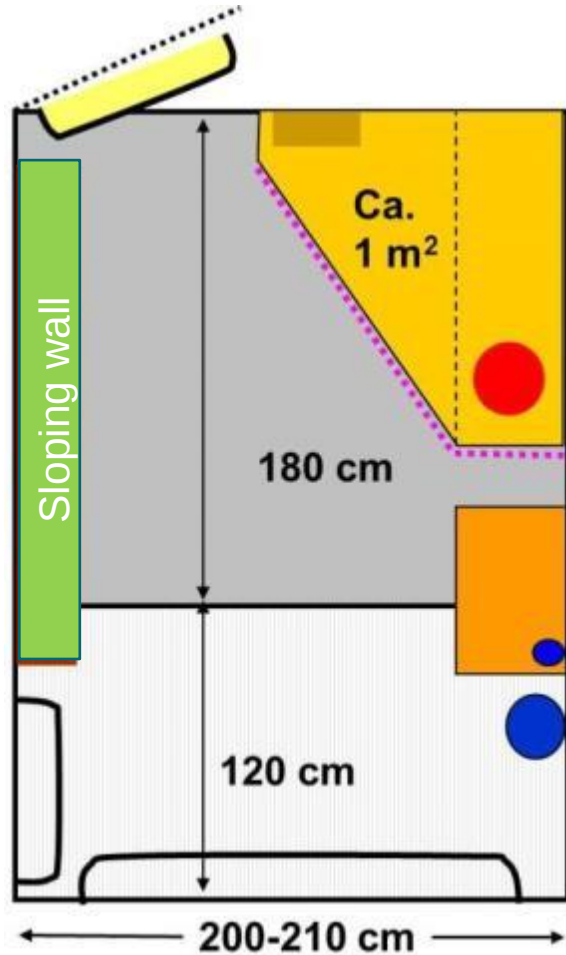
But turns away from the trough when defaecating.



Very difficult to use the same footprint for crates and for pens

Free farrowing or option to confine temporarily?

- Initially - Pen meeting needs of sow, piglet, caretakers



1. Creep area adjacent to the pathway

- Piglets are checked everyday
 - Safety
 - Fast
 - Limit risk of disease transfer

2. Sow-resting area next to creep

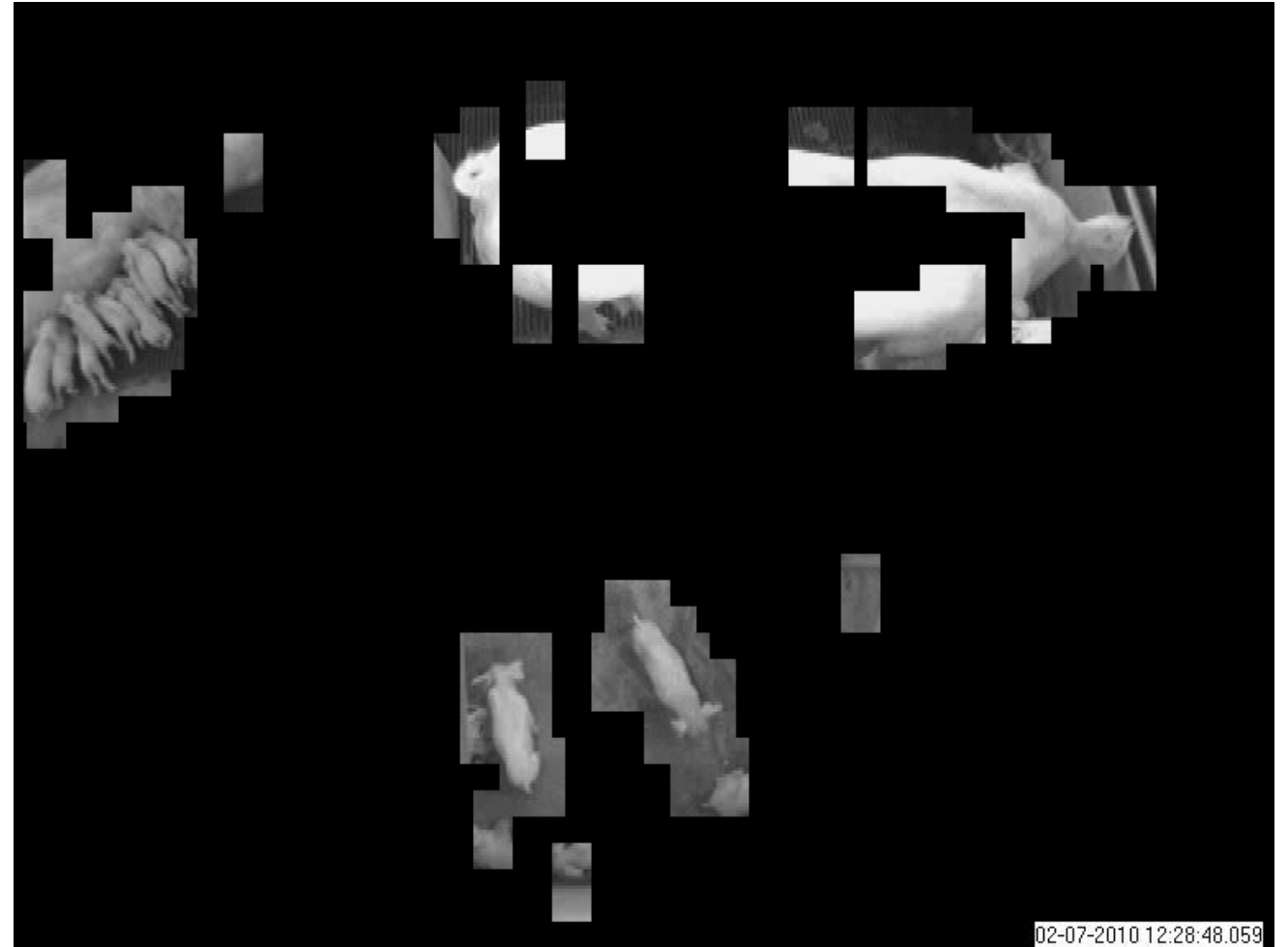
- The sows choose to lie next to creep
 - Partly solid floor – at least in Denmark
 - Reduce environmental impact
 - Partly solid floor is cheaper than aircleaners etc
 - Warmth – dry floors before farrowing – and piglet survival
 - Keep nestbuilding- and rooting material in pen – not in slurry

3. The sow walks away (turns away) from feeding area, when defaecating



Piglet survival

- Sow versus pig welfare



Three commercial herds

- Ok small scale
- Three herds – results

Piglet mortality, expressed as numbers, in crates and pens in Herds A, B and C.

White bars=mortality before litter equalisation, Black bars=mortality after litter equalisation. P-value for herd × housing interactions: mortality before equalisation: $P = 0.107$; mortality after equalisation: $P = 0.031$. Black bars with different superscripts differ ($P < 0.05$).

Animal (2014), 8:1, pp 113–120

Loose lactating sows

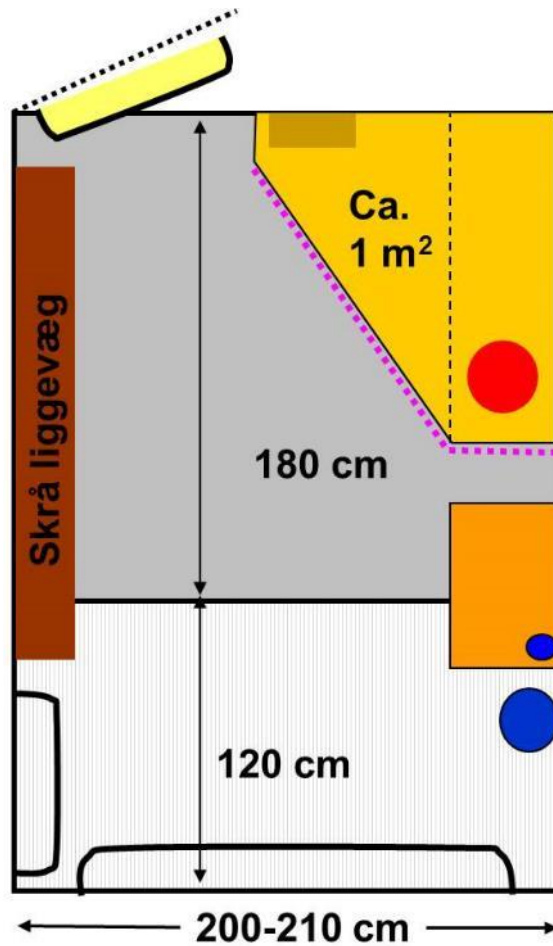
- 'Killer' sows
 - ~50% of the loose sows are 'Killers'
 - ~20% of the sows in crates
- Identification of 'Killer' sows
 - Need to find them in time to save the piglets
 - Research-fishing-expedition (5 to 10 years??)
 - How many will we find?
 - Likely intervention = crate (50% of the sows?)



Impact of confinement?

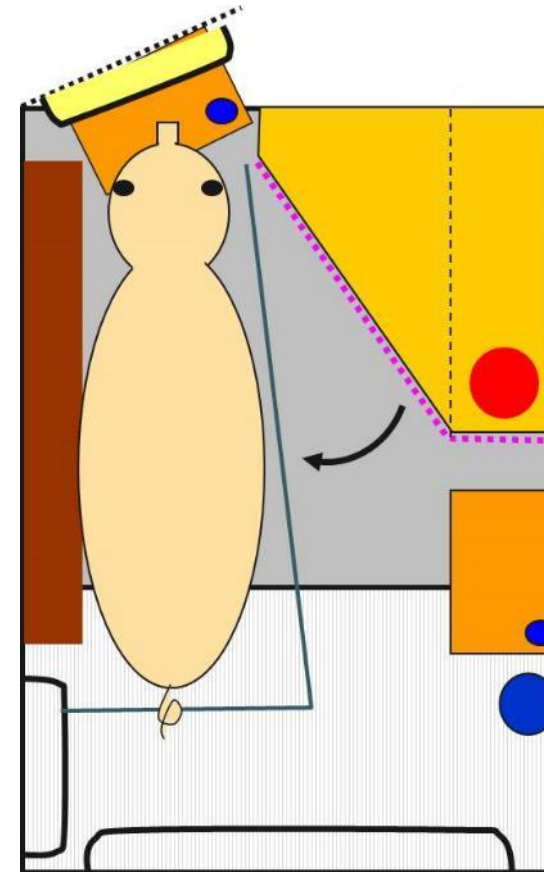
Two pen designs

FF = Free Farrowing



AU/DAWS/PRC +

SWAP = Sow Welfare And Piglet protection



UCPH/PRC

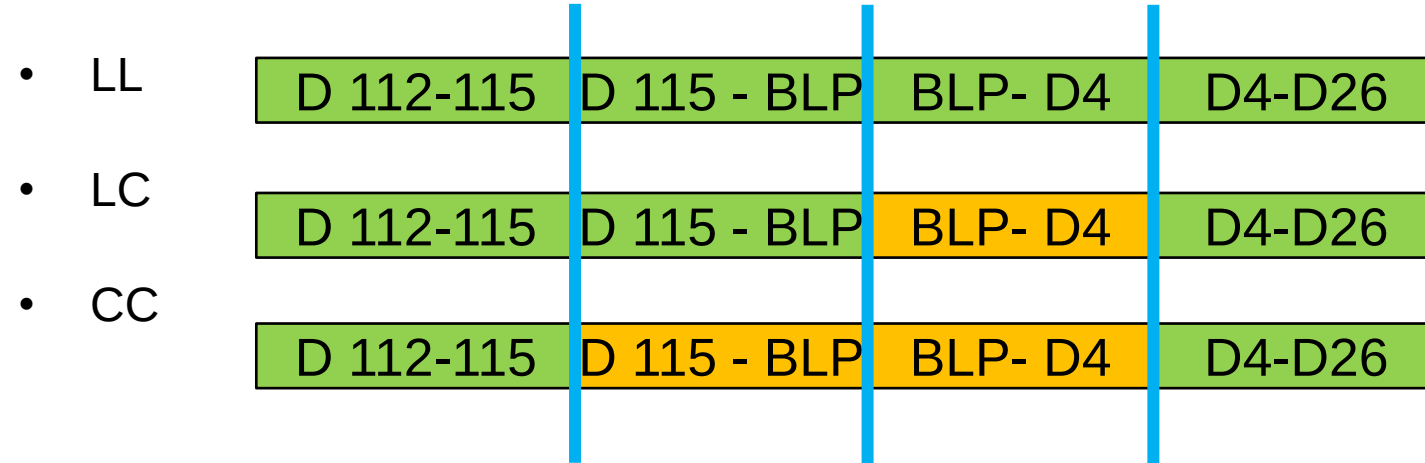


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SWAP

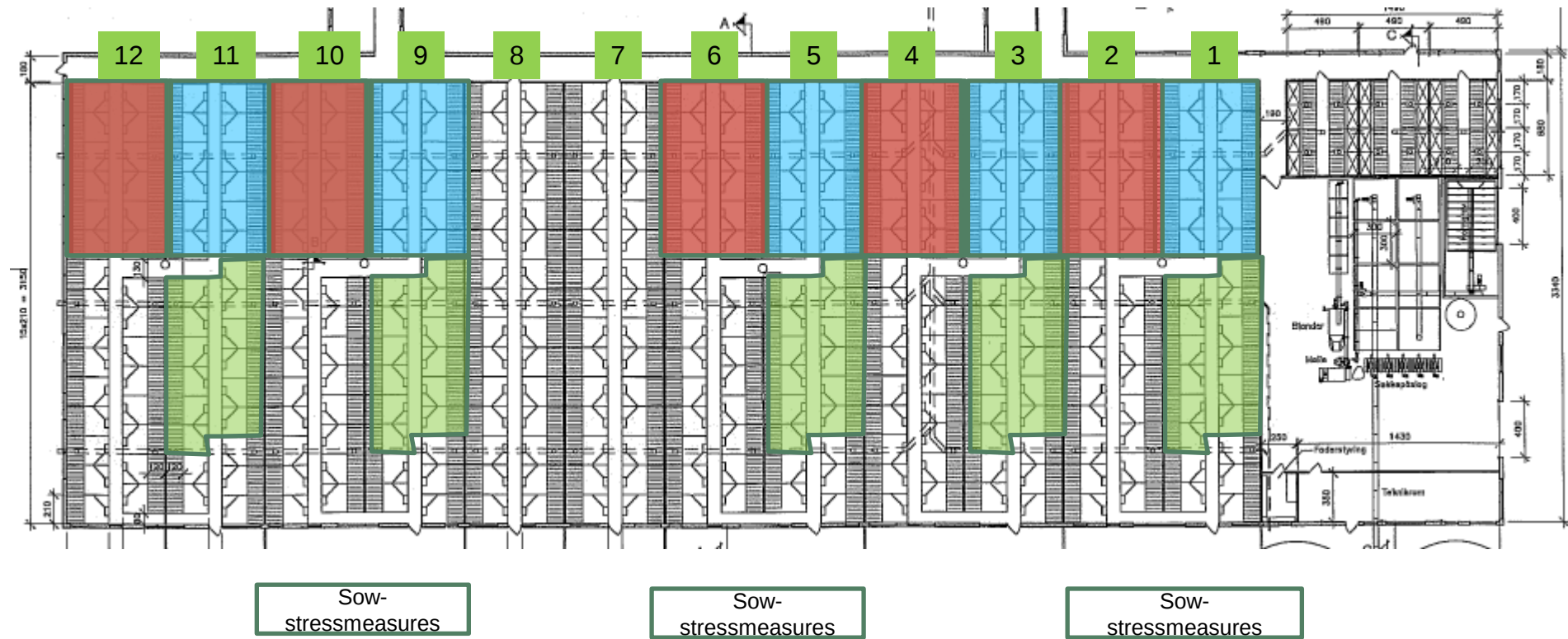
Herd trial

Three groups (nest building/day 0-4)



- 570 litters per group (PRC)
 - Production results and post mortem analysis
- 3*36 sows (+ double up) (Hales - PhD)
 - Cortisol (saliva)
 - Pulse/HRV
 - Behaviour

SWAP



Blue = CC ('SWAP') (5*12= 60 pens)

Red = LC (SWAP) (5*12 = 60 pens)

Green = LL (FF) (5*12=60 pens)

Two designs



Impact of swap on sow movement?



- Before farrowing – nest building period
 - No difference in duration of nest building period
 - No difference in duration of nest building per hour
- After farrowing
 - The sows were lying lateral majority of the time
 - >110 minuts out of 120 minuts observed (4 x daily)

No difference between loose and confined
- in pens designed for loose housed sows



Hales et al., 2014

Impact of swap on salivacortisol-level (stresshormon)?



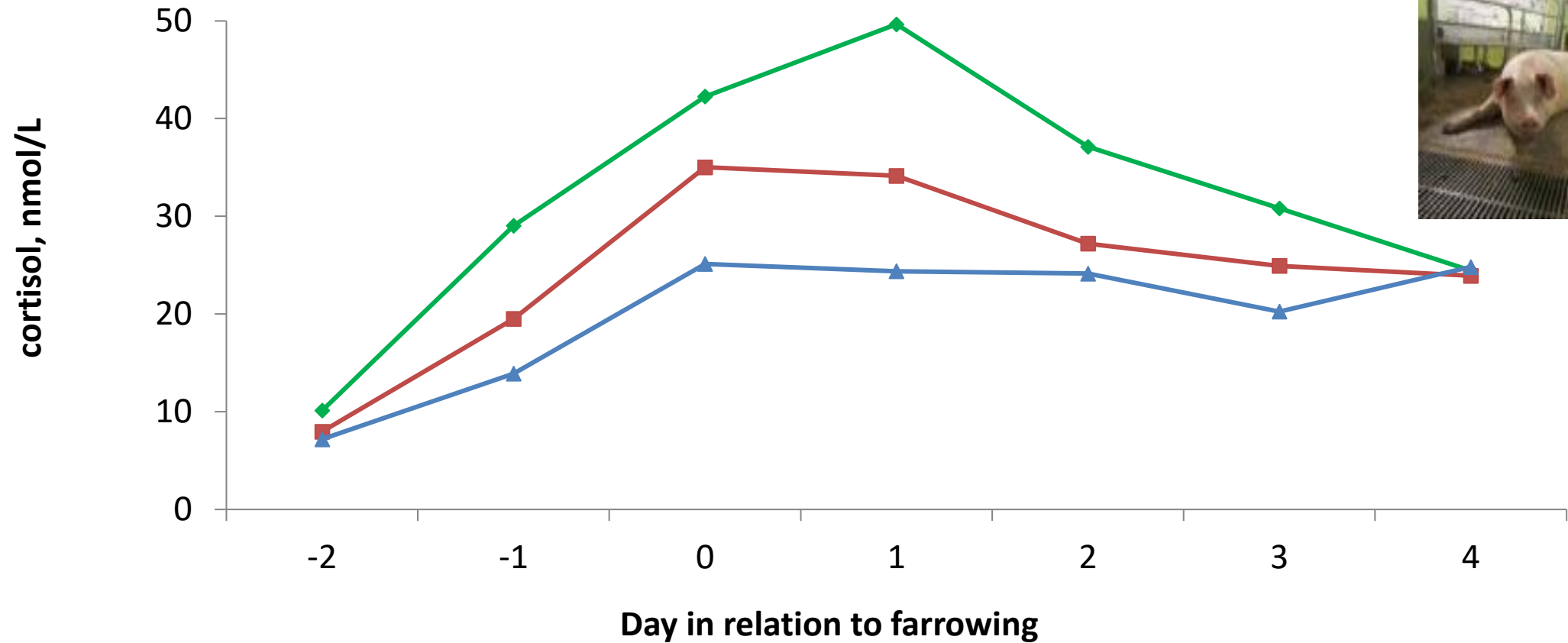
Hales et al., 2014

Cortisol

LC: Loose-Confined: Loose D114 gest until finished farrow then confined day 4 post farrowing

LL: Loose-Loose: Loose D114 gest until day 4 post farrowing

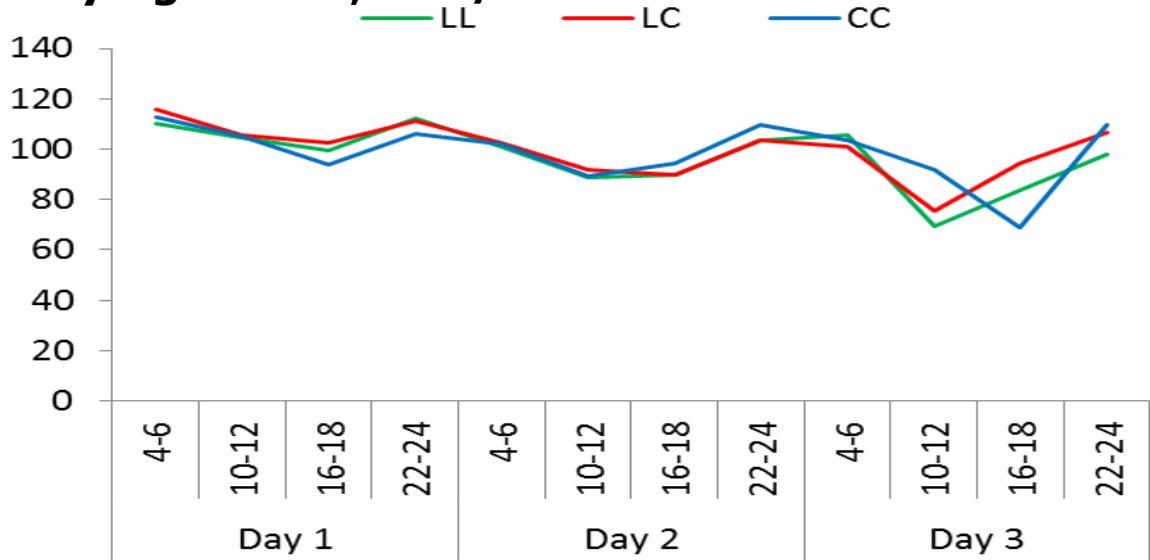
CC: Confined-confined: Confined D114 gest until day 4 post farrowing



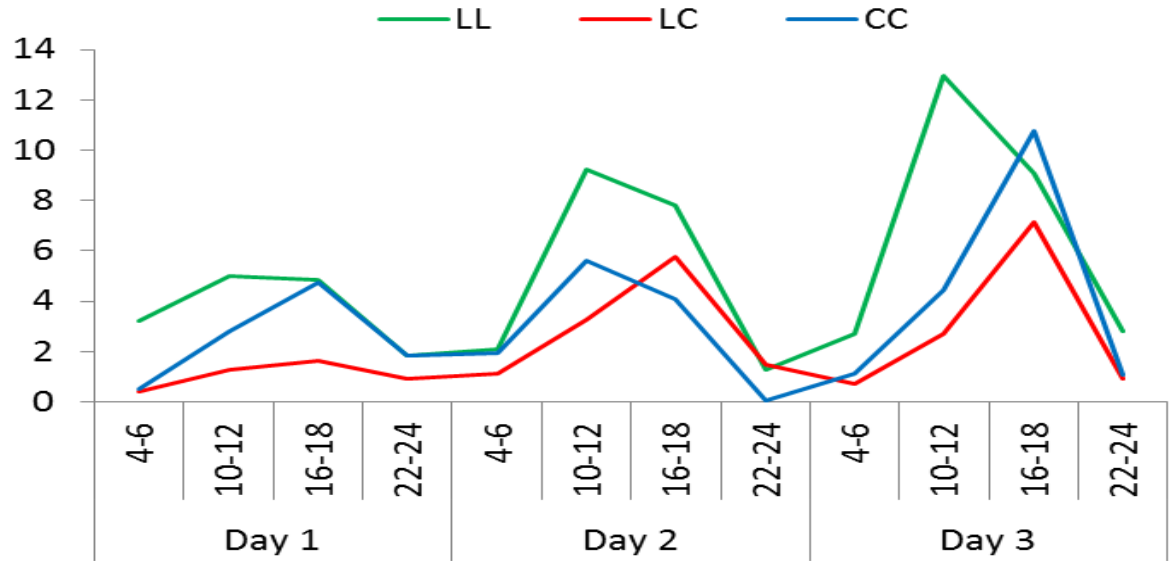
Sows postures



Lying lateral, min/interval

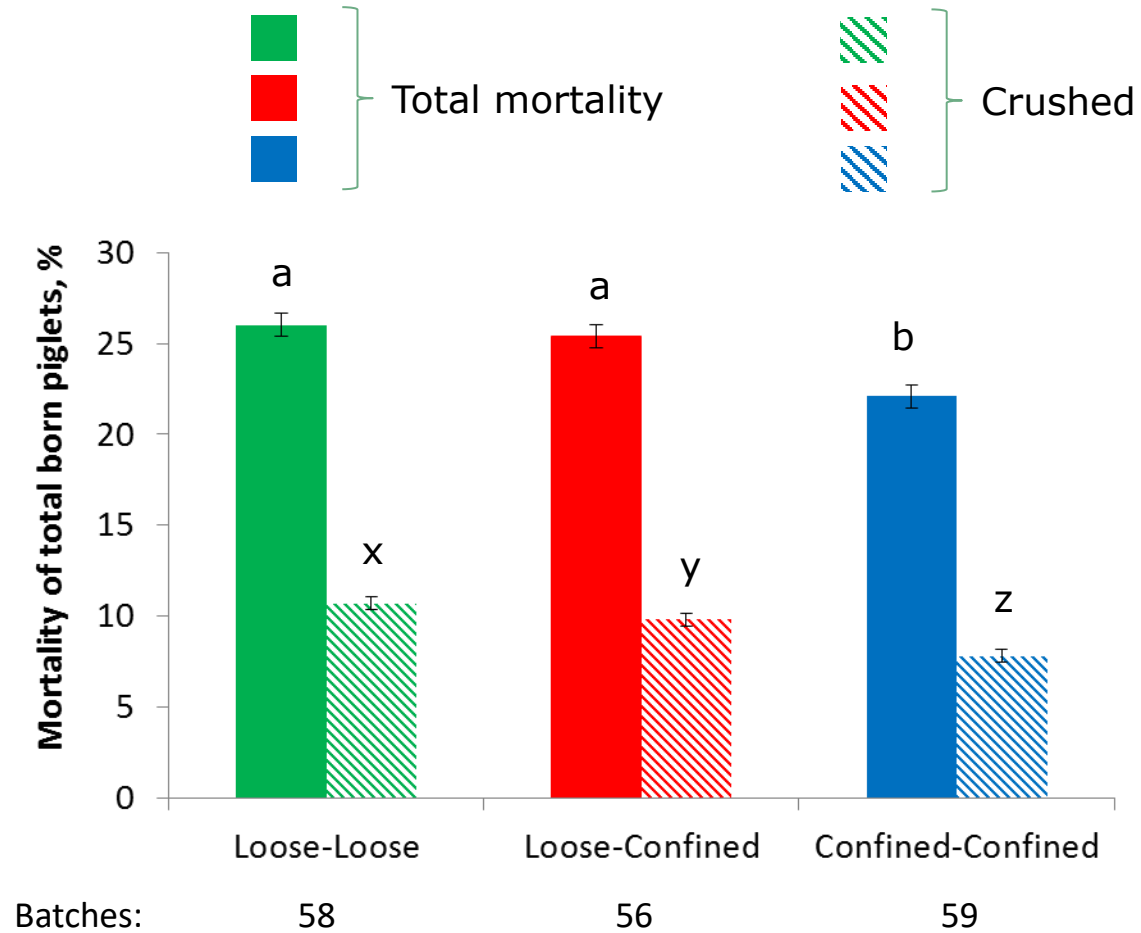


Standing, min/interval



Hales, 2015

Piglet mortality - impact of confinement



Hales, 2015

Farrowing unit – loose sows

- Two kinds of pen design

SWAP = Sow Welfare and Piglet protection



FF = Freedom farrowing



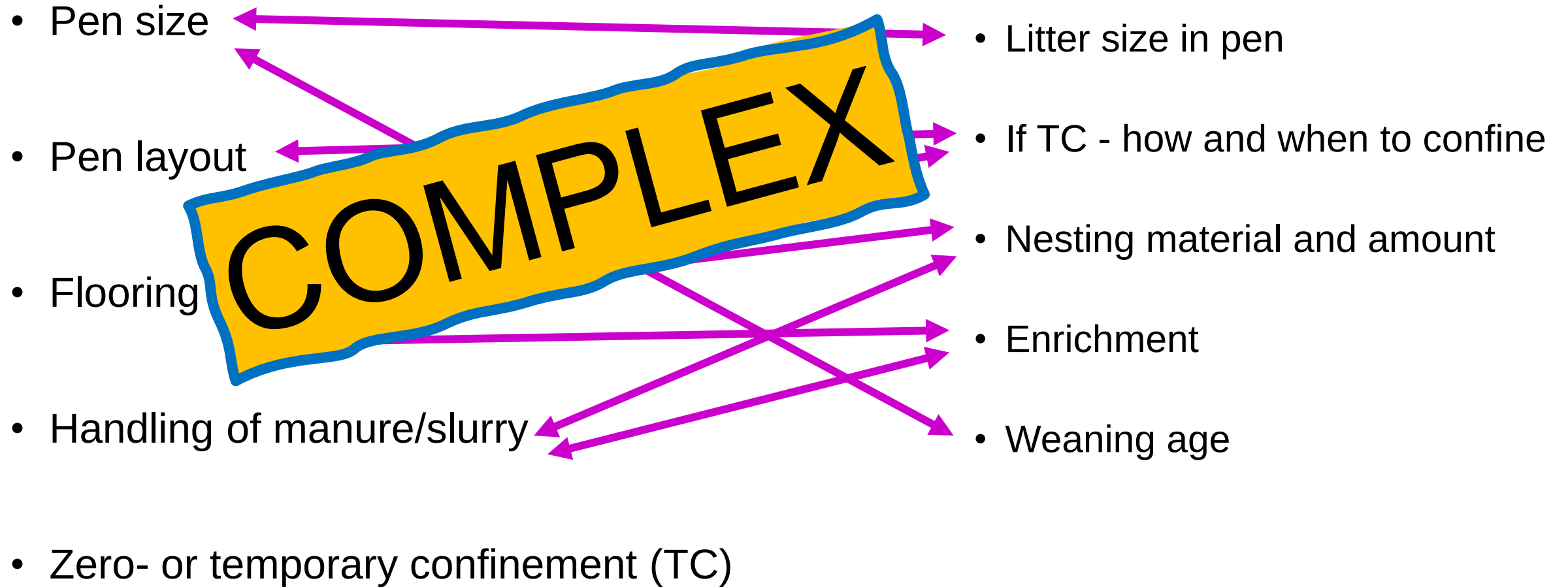
Decisions before building and running afterwards

- Key decisions
- Once you've build – conditions are given - live with it....and optimize within conditions
- Start with successful implementation of higher welfare initiatives
 - Understanding:
 - What do pigs do
 - When do they do it
 - Why do they do it
 - How do they do it
 - ...



Initial key decisions

Other key decisions



Initial key decisions

‘Irreversible’ decisions

- Pen size
- Pen layout
- Flooring
- Handling of manure/slurry
- *Zero- or temporary confinement (TC)*

Other key decisions

- Litter size in pen
- If TC - how and when to confine
- Nesting material and amount
- Enrichment
- Weaning age

‘Ideal’ pen size (1)

- Sows’ dimensions



- Planar width – turning space



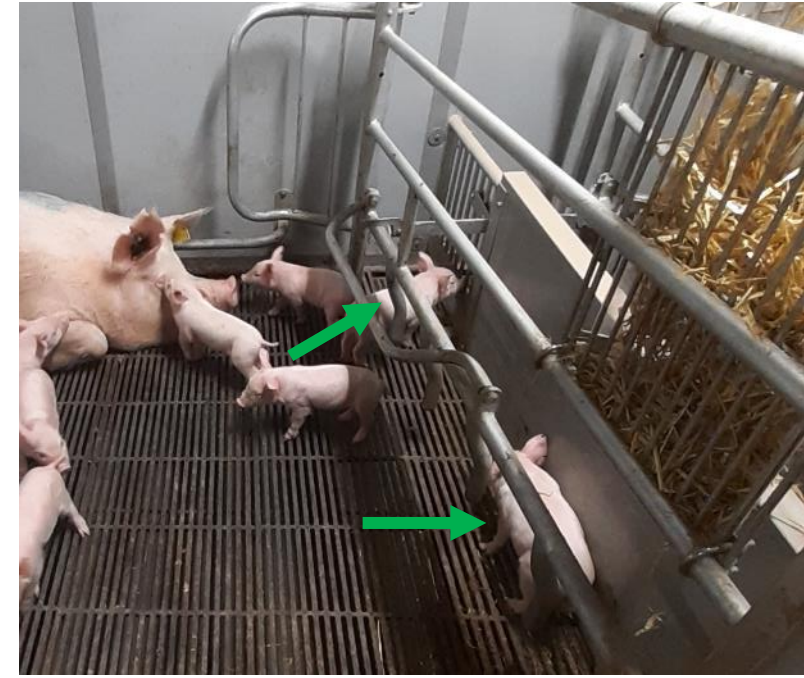
Planar width of 153 cm
Planar area of 3.17 m²

considered necessary to allow unobstructed turning for sows with the 95-percentile weight.

Needs further research

‘Ideal’ pen size (2)

- Dimensions*number
- Piglet dimensions
 - Birth,
 - One week
 - Four-five weeks
- Litter size in pen
- Functional areas
- Piglet safety zones



Pen layout (1)

- First decision
 - Creep area along passageway
 - Safety
 - Efficiency
 - Reduce risk of transferring diseases
 - Easy access



<https://www.freefarrowing.org/research/references/freedom-in-farrowing-and-lactation-2021-ffl21/>

Overcoming barriers, facilitating change



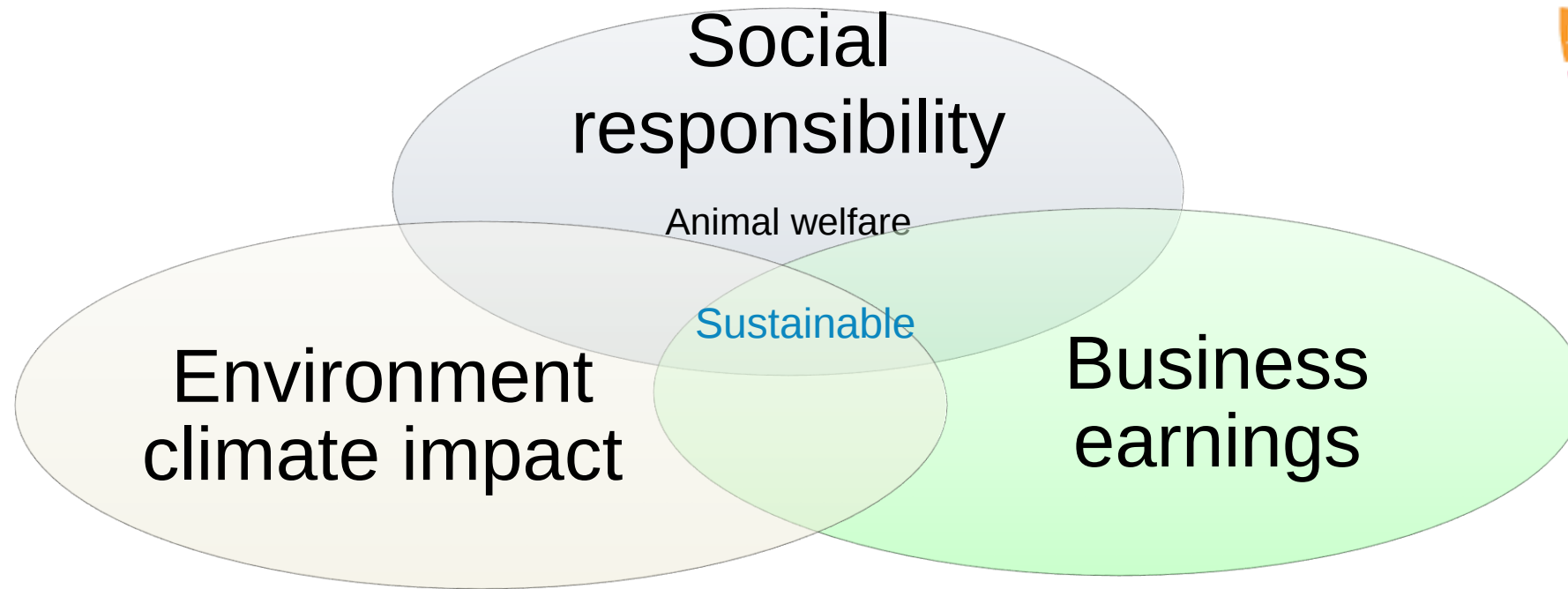
Virtual Workshop August 12th-13th 2021

As part of the [Free Farrowing series of workshops](#), a virtual event (organized by FLI, SEGES, SRUC and Vetmeduni Vienna) was held over two days.

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[FFL21 : Change experiences by a Danish farmer \(openagrar.de\)](https://openagrar.de)

A more sustainable Danish pork production



From animal welfare to sustainability

'We' want

- Space
- Cleanliness
- Low input labour
- Healthy piglets

'However:

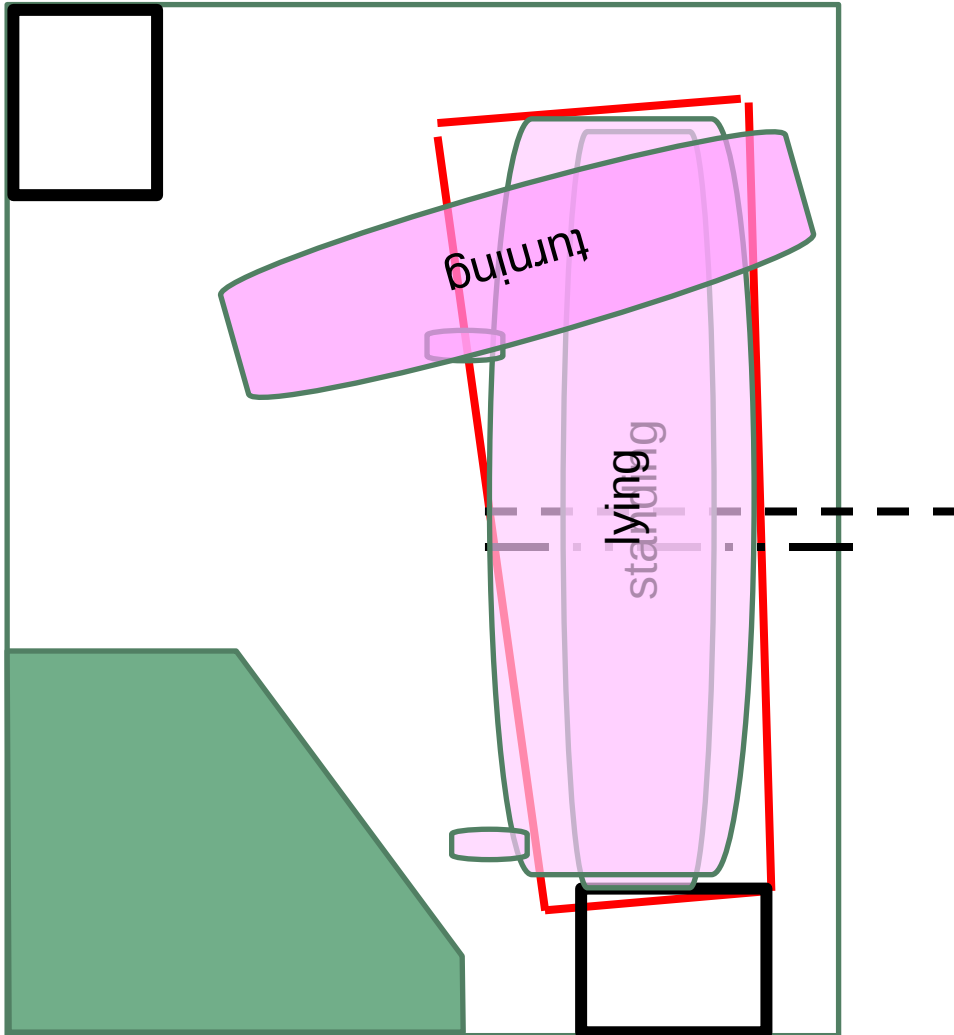
- Space
 - Larger surfaces - increase emissions
- Cleanliness
 - If slatted floor – increase emissions
- Low input labour
 - If slatted floor – increase emissions
- Healthy piglets
 - If slatted floor – increase emissions

Space – dilemma between space for welfare and risk of emissions

- Austria
 - 5.5 m²/sow
- Germany
 - 6.6 m²/sow
- It's not as simple
 - Is there a perfect size?
 - Key decisions
 - Solid or partly slatted floor?
- Examples
 - Square pens (equal sided)
 - Fully slatted floor
 - Rectangular pens
 - Dimensions – pen
 - Fixed width
 - Fixed length
 - Fixed ratio width/length
 - Dimensions flooring (solid / slatted)
 - Within each of the above designs
 - Fixed ratio solid/slatted floor
 - Fixed depth of slats of 100 cm
 - Fixed depth of solid of 200 cm

Rectangular – fixed width (220 cm)
 $273 \text{ cm} * 220 \text{ cm} = 6.0 \text{ m}^2$

29



R60FWFR

Fixed ratio 2:3

R60FWFS

Fixed slats 100 cm

R60FWVS

Fixed solid 200 cm

Confinement

- Temporary confinement – take the best of both loose and confined
 - Loose – natural behaviour, access to udder,
 - Confined – lower piglet mortality, safe work conditions
- Before farrowing - loose
 - No piglets at risk, active nest seeking and nestbuilding
 - Quiet/calm the last couple of hours
- During farrowing - confined
 - Ensure access to udder when confined
 - Recent review
 - ‘Lower’ mortality with TC than FF
 - ‘Higher’ mortality with TC than permanent C
- After a few days – loose again
 - Awareness when opening

Ref:

<https://doi.org/10.3389/fvets.2022.811810>

Daily management

- Calm calm calm
- Not just in farrowing unit
- Include 'calmness' in layout
 - Sections
 - Less pen per section
 - Creep alongside passageway
- Include 'calmness' in daily routines
 - Handling of sows and piglets



Newly farrowed sow



Handling of sick sows



MANAGEMENT IS VERY VERY IMPORTANT
when working with loose sows

Experiences – touched upon today

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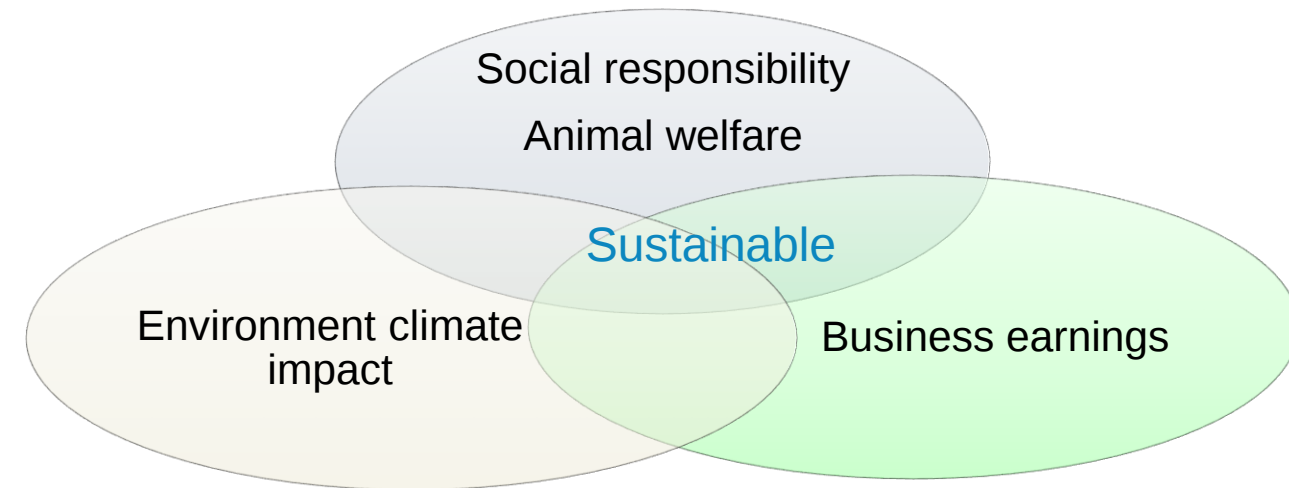


Where do we go from here – which path do we take?

- Loose housing – with an option to confine
- In respect of the three pillars of sustainability
- Science based
- Work together – across borders



Overcoming barriers, facilitating change



Future

- Reflections
 - German legislation
 - End the Cage Age Initiative
 - EU?
- Challenges
 - Sustainability
 - Competitiveness
- Opportunities
 - Increased milk production
 - Large litters
 - Licence to produce,

