Housing of lactating sows

OneWelPig
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SEGES INNOVATION

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Why…..

- There is an increasing global population and demand for food
  - → There is a need and future for pig production
- Animal sourced food should be produced in a sustainable way
  - → Focus on environment, welfare and economics
    - → We need to understand interactions, connections, dependence, influence…, compromises
    - → Europe can do this
- Development of housing should be science based
  - → Robust systems requires knowledgebased decisions – and not feelings
  - → It takes time to develop systems
  - → Once installed – not easily changed
- I love pigs and farming

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The future is not ‘only’ welfare
- it is a more sustainable production

Acknowledge the Danish pig producers who - for many years - have invested in research and development in loose housing of lactating sows

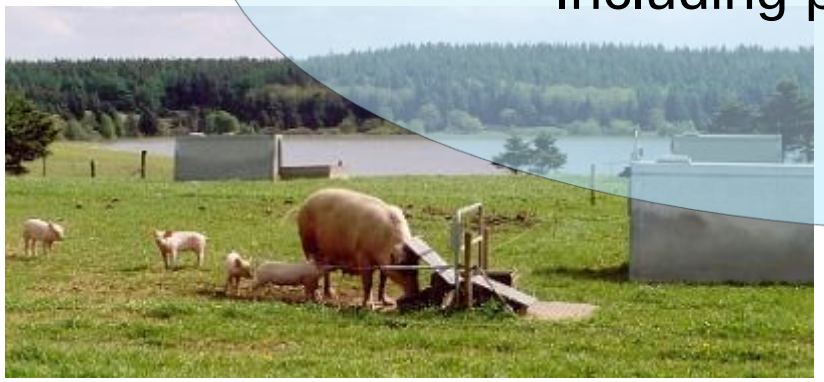
Environmental / climatic influence

Social responsibility

Including pig welfare

Economic potential

Long term investment and daily management



Think sows as high performing athletes

‘’Prepare them to give birth to and feed many piglets

- Conditions – our responsibility:
- *Housing*
- *Nutrition – before, during and after*
- *Physical conditions – and avoid injuries*

And not just conditions (shoes) – also tieing the shoe laces

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Expectations of hyperprolific sows

- We ‘want’ sows:
  i. Capable of nursing many, strong, viable piglets
  ii. To remain in the herd for >6 farrowings with high productive performance
  iii. To be resilient & require low inputs for labour & medication

- We expect sows to:
  i. Have uncomplicated farrowings
    - Despite with large litters it is a marathon of 4-8hrs
  ii. To produce large amounts of milk continously
    - 16 L/day on average
  iii. To release many fertile eggs & conceive promptly after weaning

Expectations and conditions

- High expectations regarding the sows' performance
  - Must provide conditions for them to be able to meet our expectations

Housing

+

Nutrition

+

Management and produc er / barnstaff needs

+

+

Species specific needs: Meet basic requirements for welfare

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Strategi and interest from society – process of implementation?

Status – number of pens for loose lactating sows:

- 2023:
  - app. 9,700 pens out of DK's app. 225,000 farrowing places (900,000 sows) are for loose sows
  - < than 10 pens installed….
- 2024
  - Installing 2846+ pens for loose lactating sows (subsidies – must be with pigs by new year)

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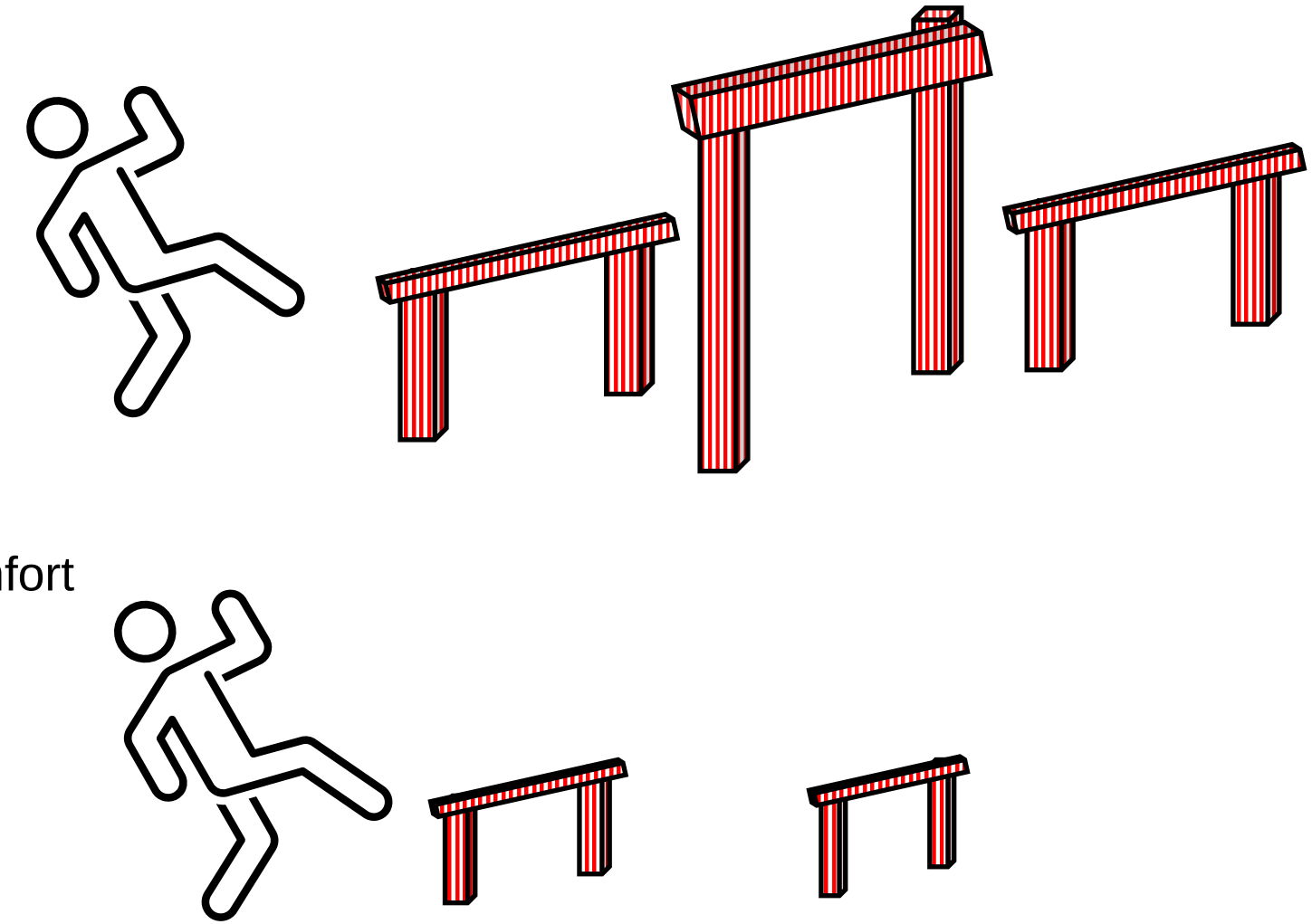
Reasons for ‘implementation’

- Barriers
  - Increased space
    - Green field or reduced herd size
  - Investment
  - Design
  - Functionality
  - Productivity
  - Stockpeople-experience and –comfort
  - ….
- *Solutions*



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The Pig Statutory Declaration

- Pen must be designed so the sow can turn unhindered.
- Pen must have a space allowance of at least 6.5 m^2 including the piglet creep area.
- At least 3 m^2 of the space allowance must be solid or drained flooring.
- The freedom of movement for sows and gilts can be restricted by confinement in the period immidiately preceeding farrowing and up to four days post farrowing at the most
- In the week prior to farrowing, the sows must have access to sufficient nestbuilding material
- Transition period likely to be between 15 years

Hearing in summer/autumn 2024

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End the cage age

The 'End the Cage Age' initiative was submitted to the Commission on 2 October 2020, having gathered 1,397,113 statements of support. See press release.

In its response to the ECI, the Commission commits to table, **by the end of 2023, a legislative proposal to phase out, and finally prohibit, the use of cage systems for all animals mentioned in the Initiative**.

In particular, the Commission's proposal will concern:

- Animals already covered by legislation: laying hens, sows and
- Other animals mentioned in the ECI:rabbits, pullets, layer bree ducks and geese. For these animals, the Commission has alr Food Safety Authority) to complement the existing scientific ev conditions needed for the prohibition of cages.

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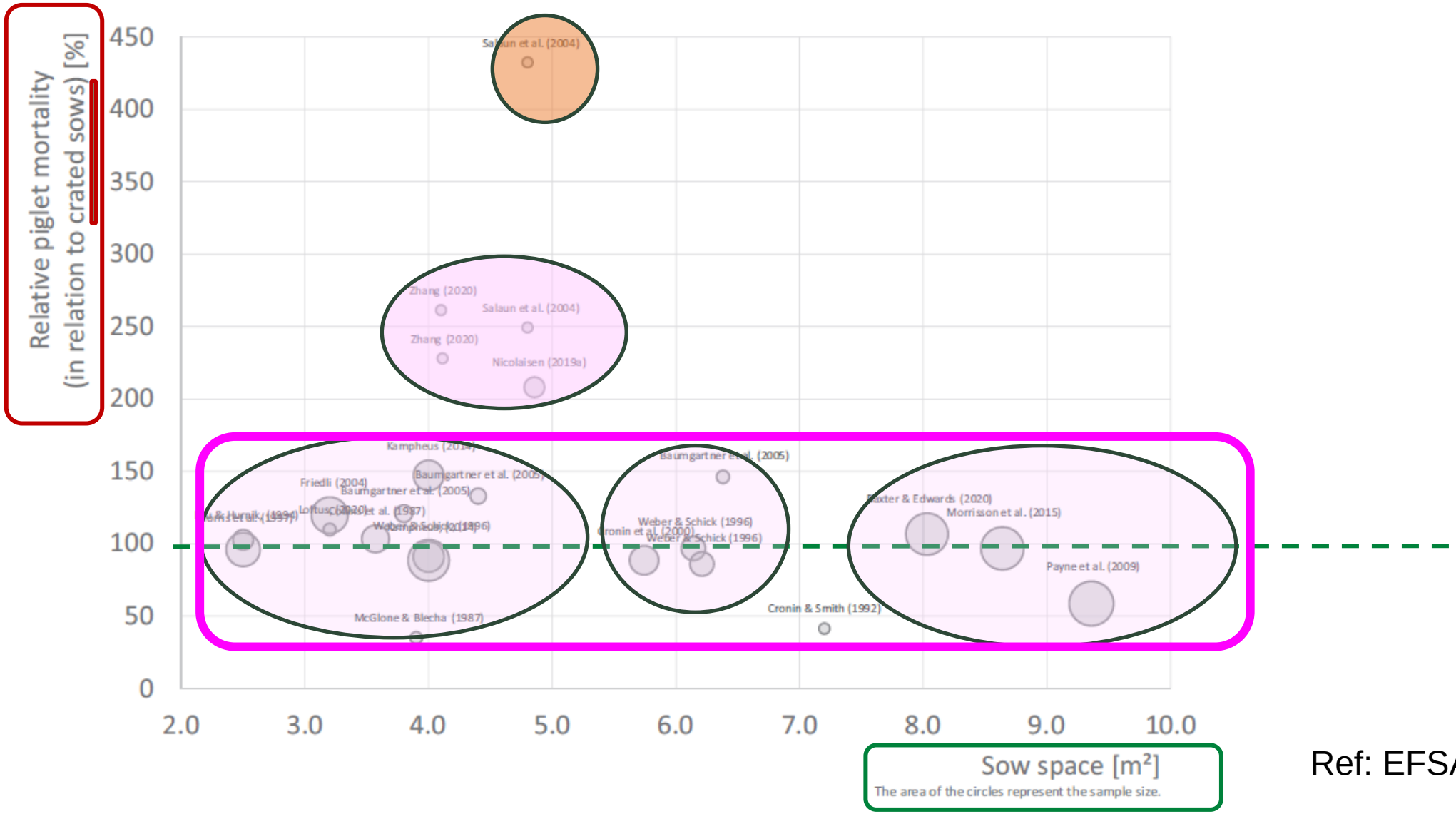
Space & piglet survivability



Ref: EFSA SO 2022

Space allowance

Space allowance and pen dimensions
Important – and irreversible decisions

- Pen - size
  - Recommendations from E
    - 7,8 m^2 ≈ piglet survivability loose farrowing at same level as permanent crating
    - 4,5-9,8 m^2 (+1,2 m^2 for piglets)
  - German requirement
    - 6,5 m^2
  - Turning space
    - At least 153 cm
    - SEGES analyzing new trial data

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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
  - Include in design and thoughts:
    - What do pigs do
    - When do they do it
    - Why do they do it
    - How do they do it
    - …

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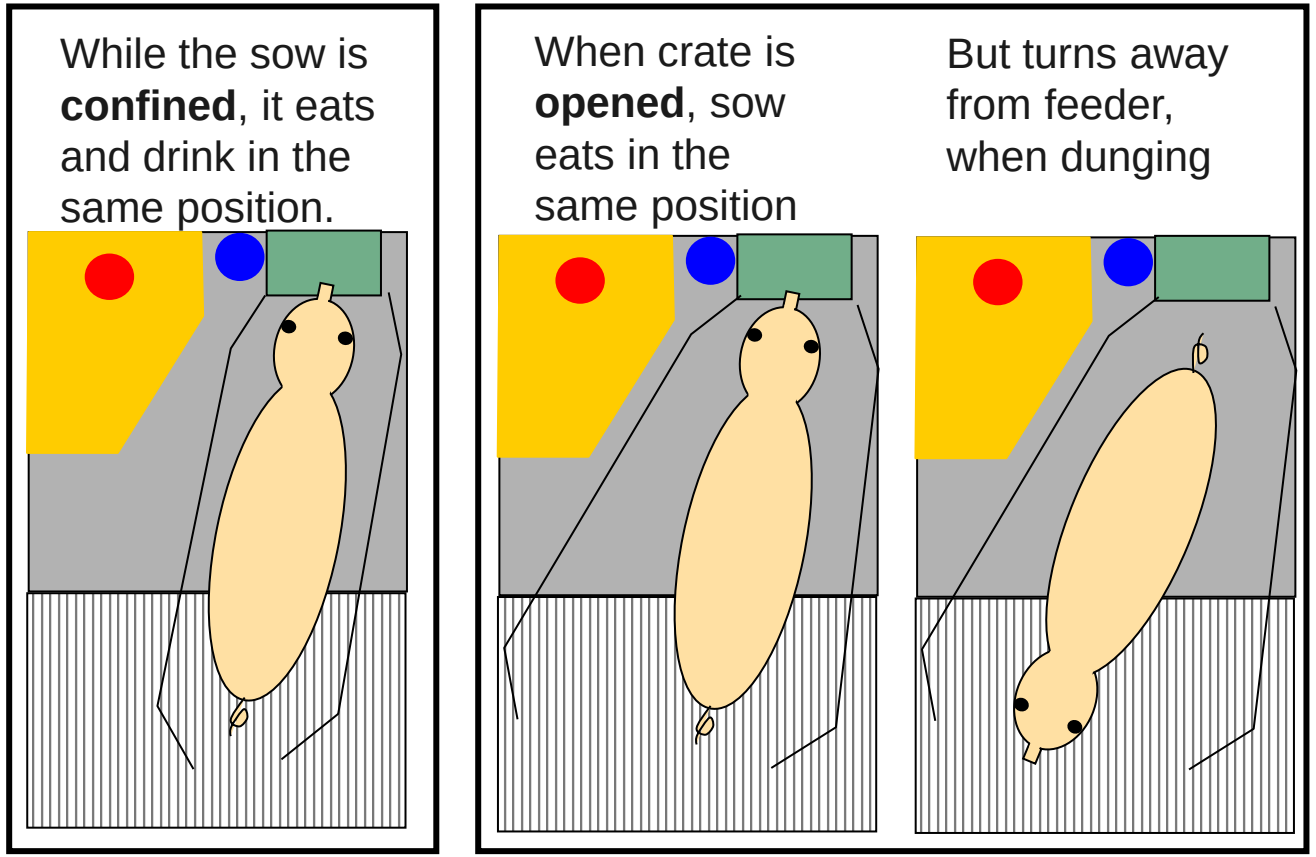
Development - 1

- Opening farrowing crates
  - They will not be opened – because of bad hygiene
    - Sows eat, drink, dung + uniate
      - But **NOT** in the same position
  - Sows need more space
  - Caretakers access to creep area



Very difficult ('impossible') to use same footprint and flooring for permant crate and for loose

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The sow is loose – most of the time

Farrowing crate
– sows are confined

Pens
– sows are loose

Brief use of the confinement –

BUT in a pen *designed* for

loose sows

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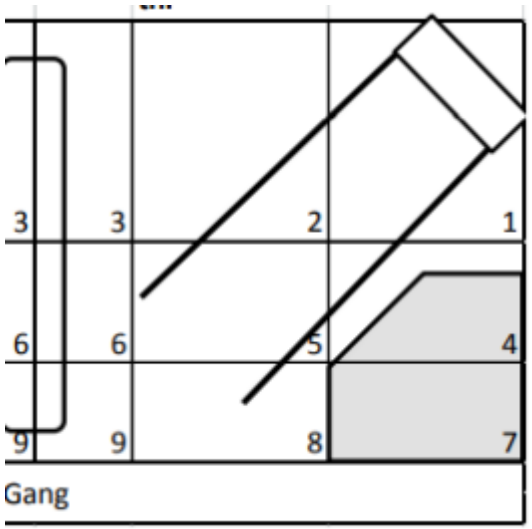
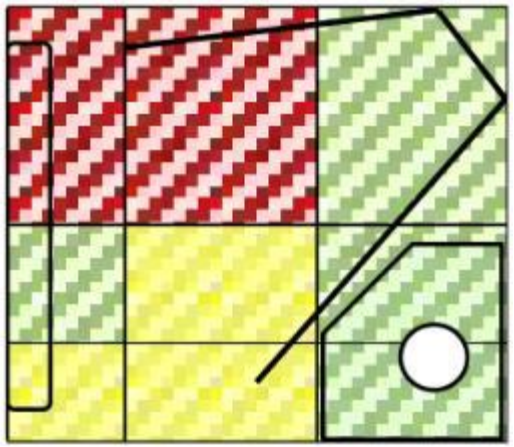
Development - 2

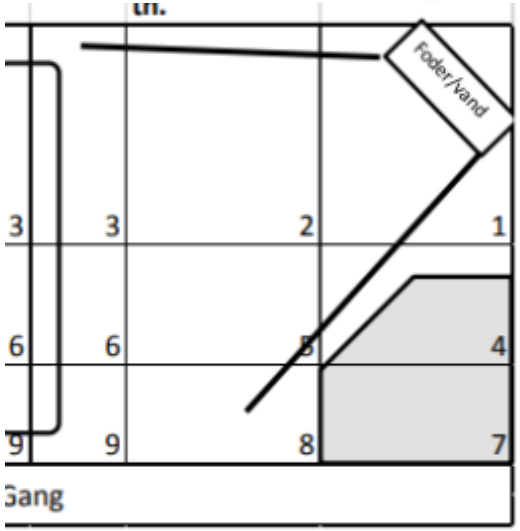
- Equalsided pens
  - 240*240
    - 2009-littersize
  - Sows dunging behaviour – fully slatted

Figur 6. So opbokset kortvarigt omkring faring.

Figur 7. Løsgående so.







Erfaring 1721

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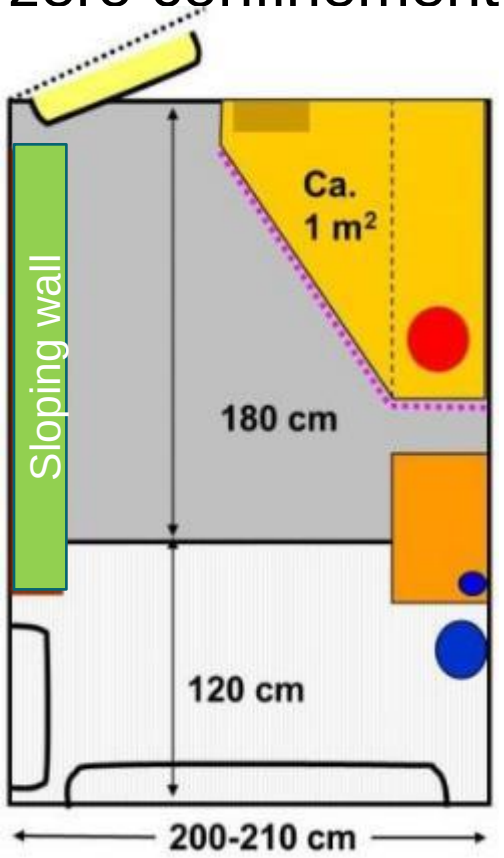
Development - 3

- Free Farrower – zero confinement



1. Creep area along passageway

- All piglets need checked upon EVERY day
  - Safe
  - Fast
  - Reduce risk of disease transfer

3. Sow walk (turn) away from feeder when dunging

2. Sow resting/nesting area next to creep

- Sows choose to lie close to piglets hule
  - Partly solid flooring (reduced slurry surface)
    - Reduce environmental impact
      - Partly solid floor is cheaper than aircleaner
    - Warm dry floors prior to / during farrowing increase piglet survivability
    - Maintain nestbuilding and rooting-/enrichment material in pen (and not in slurry pit)

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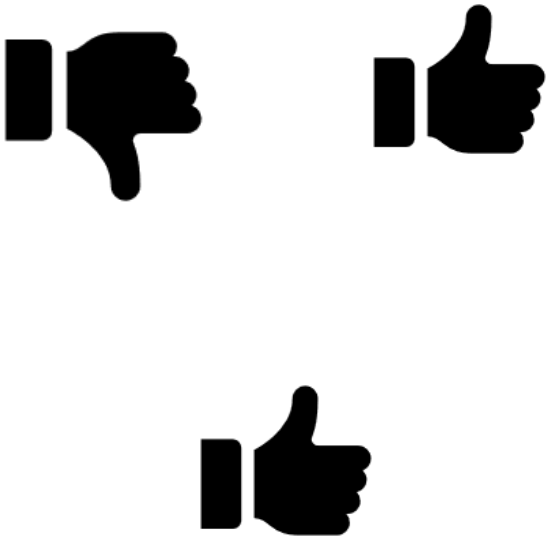
Spatial dimensions



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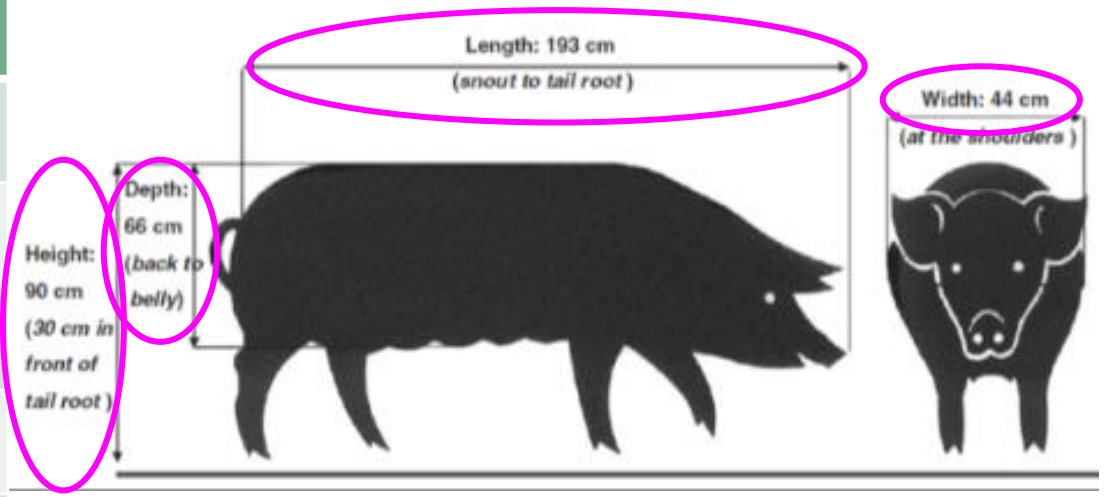
Sow dimensions

Danish crossbred sows in commercial herds in 2017

Year	2017	
Sows:	N = 103, ≥ parity 5	
Dimension	Ave. ± s.e.	95% percentile
Length, cm	192 (±0.6)	203
Height, cm	90 (±0.4)	96
Width, cm	43 (±0.5)	48
Depth, cm	65 (±0.6)	72



Moustsen et al., (2011)
Livestock Science 141, 272-275

Moustsen & Nielsen, Meddelelse 1113, www.svineproduktion.dk
Nielsen et al. (2018), Livestock Science 209, 73–76.

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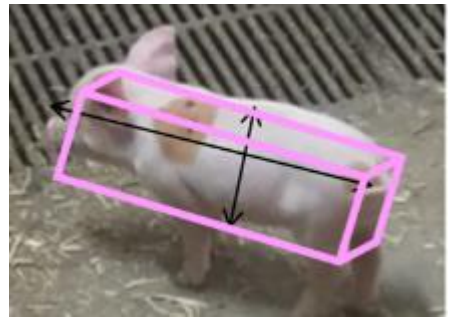
Piglet dimensions



	Age	
Dimensions (cm)	< 1 week (n = 42)	3 weeks (n = 65)
Length	31.3	44
Height	17.8	24.5
Width	7.3	11.5
Depth	8	12.5
Piglet weight (kg)	1.4	5
Space/piglet (m^2)	0.02	0.06

Data: SEGES pig production

Total area (m^2) required: space at maximum piglet age & number housed within the pen

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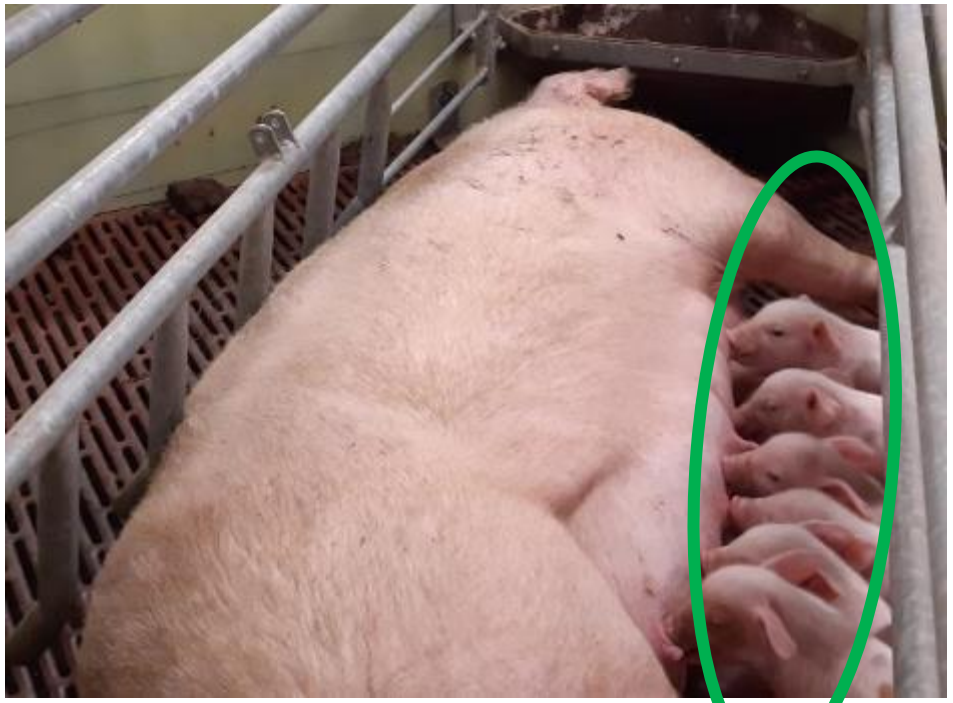
Dimensions – pen equipment

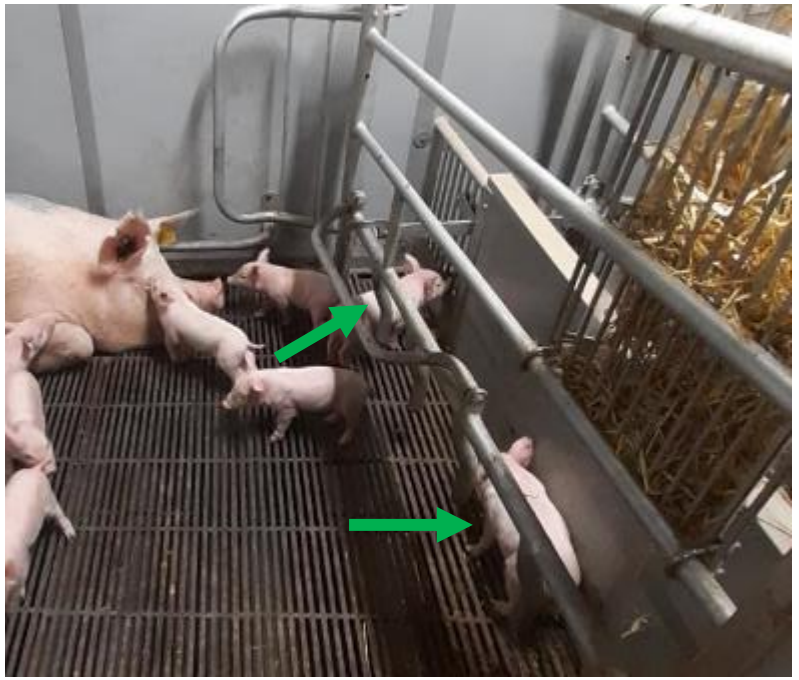
Sows:
Dunging
Lying
Thermoregulate
…

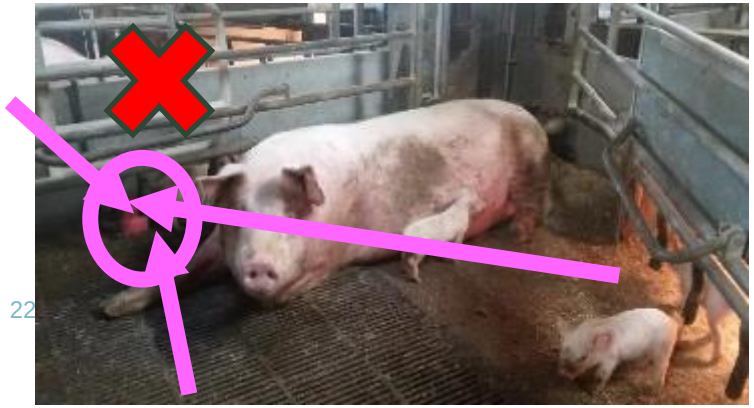
Piglets:
Shoulder width
Safety zones
…..

‘Ideal’ pen size - space for piglets

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

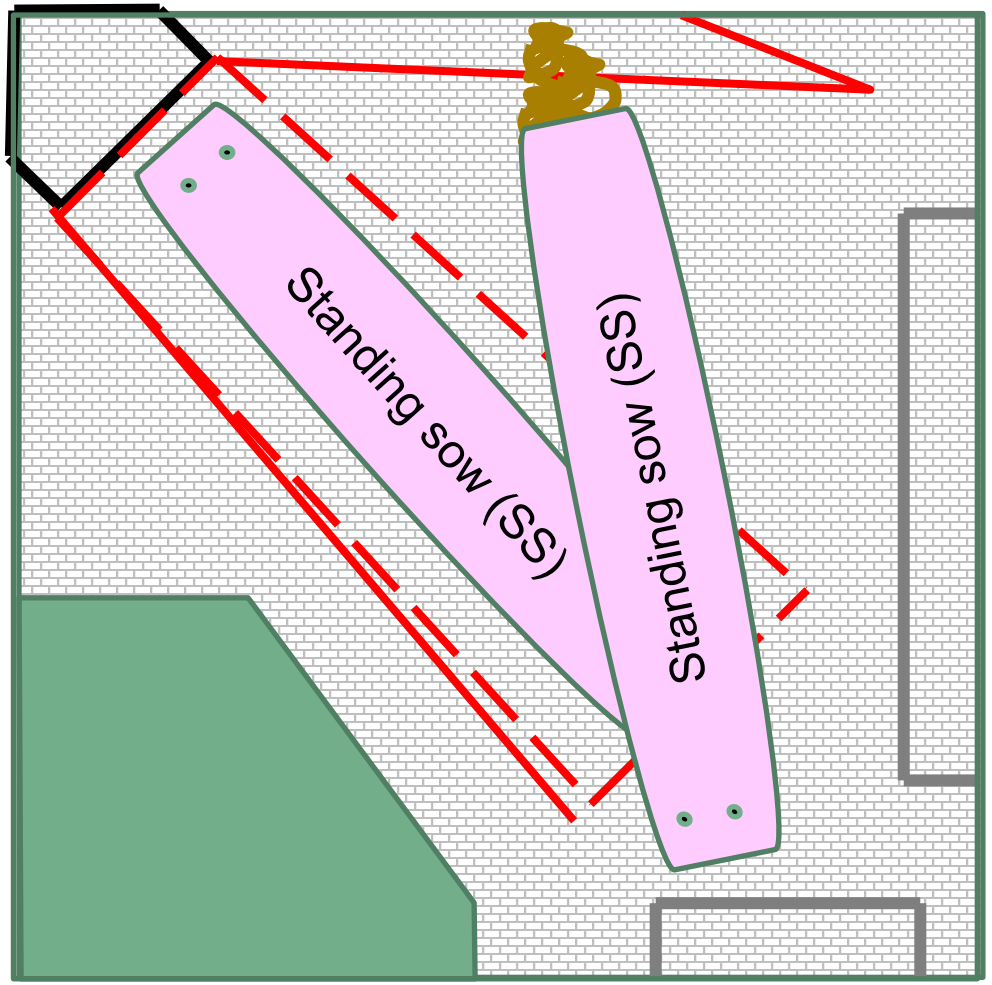




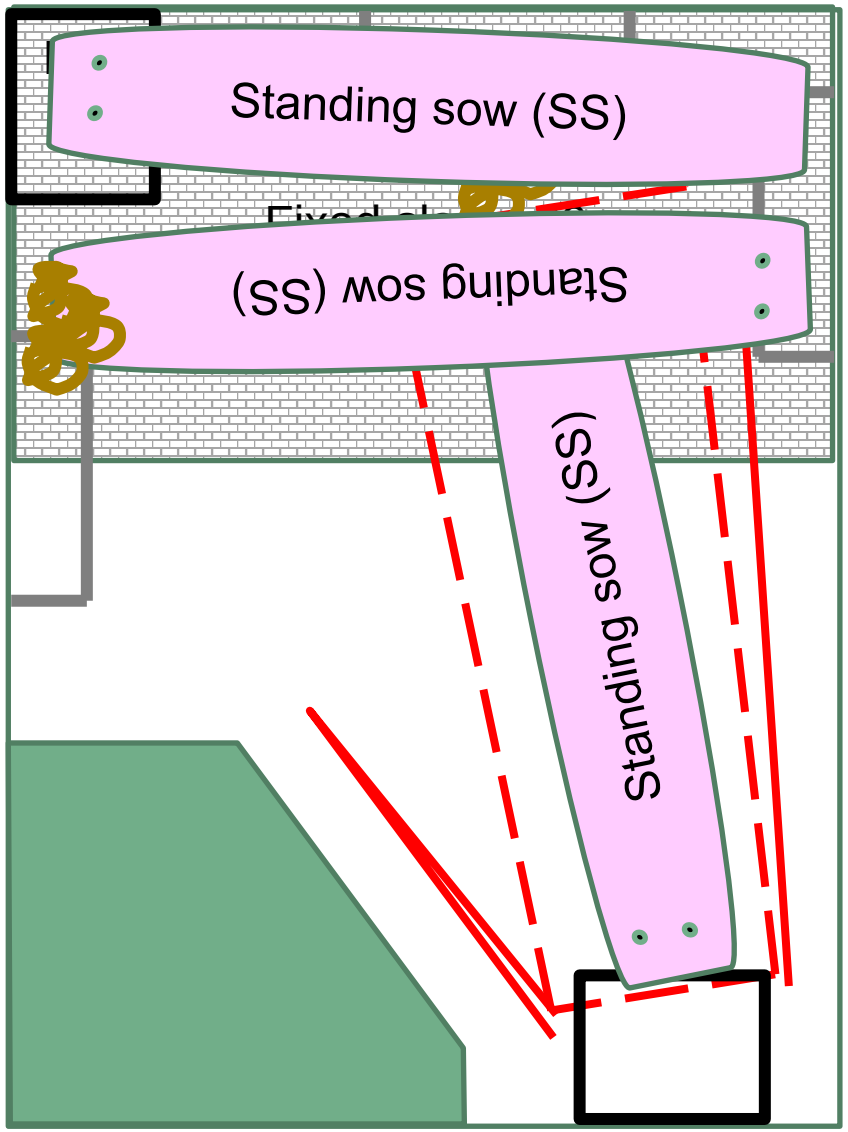


Pens of 6,5 m² can be different

Equalsided pen (*255*255*)



Rectangular pen (*220*300*)



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Area and pen dimensios – welfare and environment

Equalsided – fully slatted:

Solution **under** floor

Rectangular pen – option for partly solid floor:

Solution ***above*** floor

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Space – temporary confinement and loose

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‘Ideal’ pen size – space for the sow

- Sows’ dimensions
  - Minimum

- Planar width – turning space
  - Minimum
  - Ease of movement

Planar width of 153 cm
Planar area of 3.17 m^2

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

Needs further research

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Turning

- Later pregnant sows
  - Parity two or older (11 sows <= parity 4; 15 sows >= parity 5)
- Test pen
  - 120-140-160-180-200-220 cm
- Turning
  - Initial – one turn to ‘understand’ the principle
  - Thereafter - random order of pen dimensions
  - Three turns per pen dimension
- Registrations on site
- Videorecording (few/some turns missing)
- Automatized analysis (including neural network)

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How much space needed to turn……















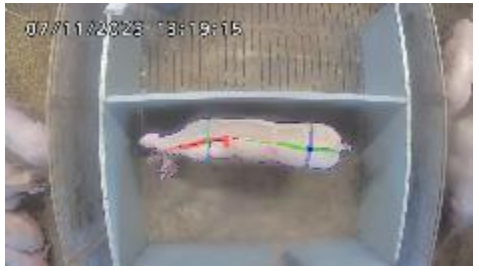


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Turning – preliminary analysis

- On site registrations
  - Sow: Parity, weight, length, depth, width
  - Complete/uncomplete turn
  - Start and stop of each turn
- Automated analysis
  - Curvature
  - Distance

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Legal framework as it relates to space

Welfare *legislation*

- For *legislation* to be ‘meaningful’
  - Controllable
  - Sanctionable
  - → Space
- Challenge
  - Does it make a difference – outcome based?

Pen layout – work conditions

- First decision regarding design
  - Creep area along passageway
    - Safety
    - Efficency
    - Reduce risk of transferring diseases
    - Easy access
    - Worker wellbeing
      - Human – animal relationship
      - Quality of and in care

Initial key 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

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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
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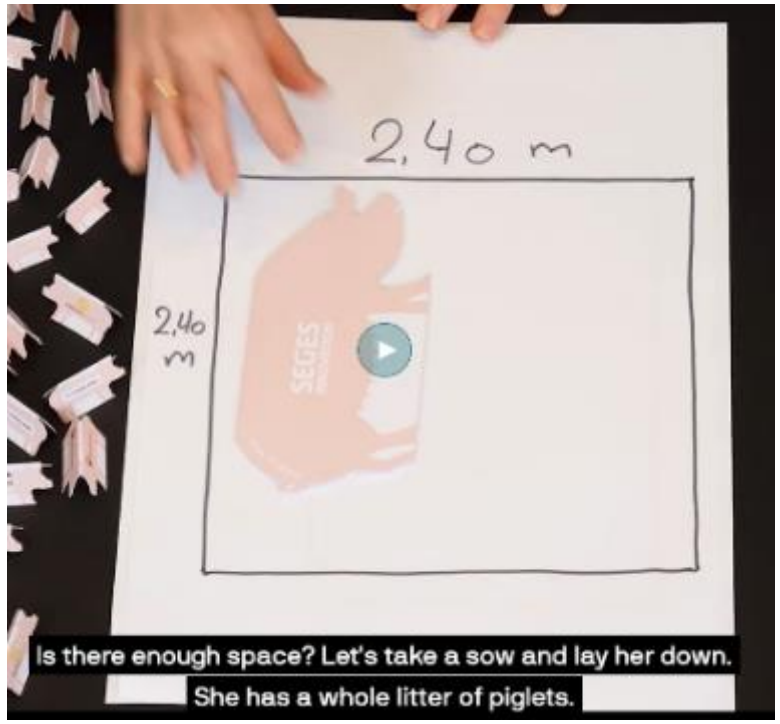
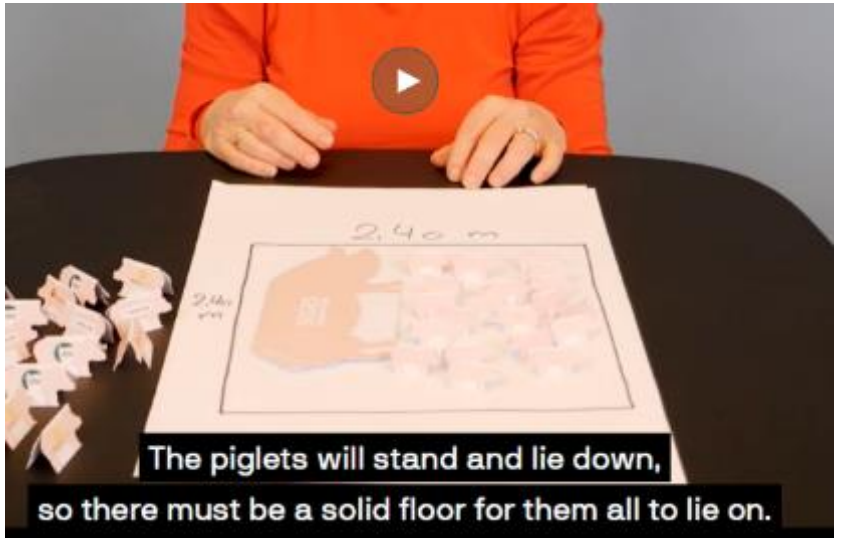
Decision support tool

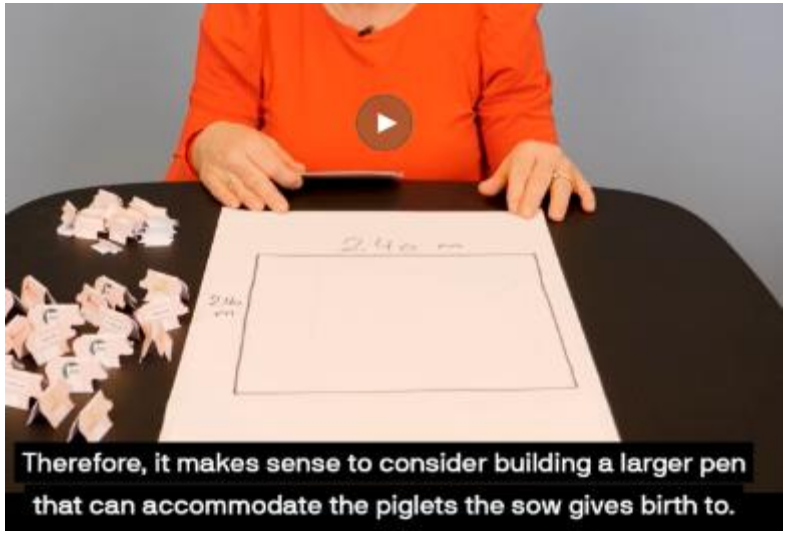
- Is the design criteria meeting the needs of the sow, piglets and caretakers?





- Papgrise og checkliste hjælper dig til bedre staldindretning - SEGES TV

Video – with English subtitles



Conclusions

- Step 1 - Animals
  - Understanding the animals needs/requirements – sufficient space….
    - Dimensions
    - Activity
- Step 2 - Animals
  - Future production
    - Loose
    - Larger litters
    - Sustainability
- Step 3 -
  - Farm staff
  - Legal framework
- Step 4 – Supporting the animals
  - Understanding the animals
    - in design and implementation for technologies
    - when providing the animals with choices
- Step 5 – and the most obvious – also needs a fresh look….
  - Feed, water, air…

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Take Home Message

- The farrowing environment sets the conditions for sow and piglet productivity and their welfare

- Set the conditions in the farrowing environment which leads to high welfare and productivity

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