‘End the Cage Age’ - Pigs:

Review of technical issues associated with the replacement of farrowing crates for sows and proposals for harmonized legislation

Dr Emma Baxter, Dr Vivi Moustsen, Professor Laura Boyle

& Professor Sandra Edwards

June 2nd 2025
Pre- welfare platform meeting

SUPPORTED BY

Danish Pig Levy Fund

SRUC SEGES INNOVATION eagasc Agriculture and Food Development Authority Newcastle University

Paper aims

- Distill the latest knowledge from science and practice to aid decision making
- Reduce the risk of costly mistakes (economic and welfare)
- Propose **actionable recommendations** for progress

Why the policy paper is needed

- Since the 2021 EC response to End the Cage Age **momentum has stalled**
- Many want to progress – **need clear guidance on 'sticking points'**
- **Risk of fragmented legislation** – already evident
- **Threat to animal welfare**
  - Perpetuating crates
  - Building sub-optimal alternatives

Decisions?

What are the ‘sticking’ points?

- **CONFINEMENT**
  - Time/temporary crating
- **SPACE**
  - Pen size/shape (& sow turning space)
- **FLOORING** (& slurry management)
- **SUBSTRATES** (nest-building & after)

EFSA 2022 Recommendations

SCIENTIFIC OPINION

EFSA Journal

ADOPTED: 30 June 2022

doi: 10.2903/j.efsa.2022.7421

Welfare of pigs on farm

EFSA Panel on Animal Health and Welfare (AHAW), Søren Saxmose Nielsen, Julio Alvarez, Dominique Joseph Bicout, Paolo Calistri, Elisabetta Canali, Julian Ashley Drewe, Bruno Garin-Bastuji, Jose Luis Gonzales Rojas, Gortázar Schmidt, Mette Herskin, Virginie Michel, Miguel Ángel Miranda Chueca, Olaf Mosbach-Schulz, Barbara Padalino, Helen Clare Roberts, Karl Stahl, Antonio Velarde, Arvo Viltrop, Christoph Winckler, Sandra Edwards, Sonya Ivanova, Christine Leeb, Beat Wechsler, Chiara Fabris, Eliana Lima, Olaf Mosbach-Schulz, Yves Van der Stede, Marika Vitali and Hans Spoolder

Abstract

This scientific opinion focuses on the welfare of pigs on farm, and is based on literature and expert opinion. All pig categories were assessed: gilts and dry sows, farrowing and lactating sows, suckling piglets, weaners, rearing pigs and boars. The most relevant husbandry systems used in Europe are described. For each system, highly relevant welfare consequences were identified, as well as related

Industry Response

AKI

AN ASSESSMENT OF THE IMPACTS OF THE PHASING OUT OF CAGES IN EU LIVESTOCK FARMING: THE PIG AND LAYER SECTORS

FINAL REPORT

AKI EuroCARE FNEA

Actionable Recommendations

Latest Scientific Evidence

Practical Evidence

NPA NATIONAL PIG ASSOCIATION

WelFarmers

Actionable Recommendations – CONFINEMENT?

Pen type

- All new farrowing accommodation should be designed with the possibility to accommodate sows loose during farrowing and lactation

- **If necessary**, during a period of transition, **temporary crating** should only be permitted between **1 day prior to expected farrowing and 4 days after farrowing** to balance the needs of the sow, the piglets and the stockpeople

- Evidence?

CONFINEMENT?
Post farrowing?

EFSA Conclusions (2022)

- Piglet mortality is substantially higher if the sow is never confined
- A **temporary crating system** with an average space for the sow of **4.3–6.3m²** can achieve the **same piglet survival as a permanent crating system**.
- The minimum confinement time of a sow in a temporary crating system to achieve this is **7 days after farrowing** (90% certainty range between 3.4 and 16 days)

Latest Scientific Evidence

- Confirms zero-confinement, leads to increased piglet mortality (review Goumon et al. 2022)
- Is 7 days required?
  - No: **4 days post-farrowing** is an adequate confinement period (Moustsen et al., 2013; Heidinger et al. 2018)
  - If longer

→ Reduce activity, increase stress for sow

→ Reduce udder access, lower weaning weights piglets

CONFINEMENT – additional considerations
Influence of move in time

Latest Scientific Evidence

- Pre-farrowing **activity and nest-building** = behavioural need.
- Greatest activity pre-farrowing (~2.5days pre-farrow), sows travel 2.5-6.5km (Jensen, 1986)
- Nest-building ~1.5days pre-farrow
- Physiological changes prepare sow for farrowing

CONFINEMENT – additional considerations
Influence of move in time

Baxter *et al. Porcine Health Management* (2024) 10:16
https://doi.org/10.1186/s40813-024-00366-w

Porcine Health Management

RESEARCH Open Access

Factors contributing to high performance of sows in free farrowing systems

Emma M. Baxter[1*], Nicola Bowers[2,5], Rebecca King[3,5], Sarah Brocklehurst[4] and Sandra A. Edwards[5]

Abstract

Background Pressure to abolish farrowing crates is increasing, and producers are faced with decisions about which alternative system to adopt. For sow welfare, well designed free farrowing systems without close confinement are considered optimal but producers have concerns about increased piglet mortality, particularly crushing by the sow. Reporting accurate performance figures from commercial farms newly operating such systems could inform the transition process. This study investigated performance on three commercial farms operating four different zero-confinement systems, three of which were newly installed. A total of 3212 litters from 2920 sows were followed from farrowing to weaning over a three-year period with key performance indicators (KPIs) recorded. Mixed Models (LMMs, GLMMs) determined the influence of different factors (e.g. farrowing system, sow parity, management aspects) and litter characteristics on performance, including levels and causes of piglet mortality.

Results Piglet mortality was significantly influenced by farm/system. Live-born mortality ranged from 10.3 to 20.6% with stillbirths ranging from 2.5 to 5.9%. A larger litter size and higher parity resulted in higher levels of mortality regardless of system. In all systems, crushing was the main cause of piglet mortality (59%), but 31% of sows did not crush any piglets, whilst 26% crushed only one piglet and the remaining sows (43%) crushed two or more piglets. System significantly influenced crushing as a percentage of all deaths, with the system with the smallest spatial footprint (m^2) compared to the other systems, recording the highest levels of crushing. Time from the start of the study influenced mortality, with significant reductions in crushing mortality (by ~4%) over the course of the three-year study. There was a highly significant effect of length of time (days) between moving sows into the farrowing accommodation and sows farrowing on piglet mortality ($P < 0.001$). The less time between sows moving in and farrowing, the higher the levels of piglet mortality, with ~3% increase in total mortality every five days. System effects were highly significant after adjusting for parity, litter size, and days pre-farrowing.

Conclusion These results from commercial farms demonstrate that even sows that have not been specifically selected for free farrowing are able, in many cases, to perform well in these zero-confinement systems, but that a period of adaptation is to be expected for overall farm performance. There are performance differences between the farms/systems which can be attributed to individual farm/system characteristics (e.g. pen design and management, staff expertise, pig genotypes, etc.). Higher parity sows and those producing very large litters provide a greater challenge to piglet mortality in these free farrowing systems (just as they do in crate systems). Management

Latest Scientific Evidence

Sows need time to habituate/nest

- 'FREESOW' study (x3 commercial farms, x4 FF systems – followed +3000 farrowings).

- The time between moving in and farrowing influenced mortality – the closer moving in was to farrowing due date the higher the mortality (Baxter et al. 2024 – Porcine Health Management)
- Increased risk of postpartum dysgalactia syndrome (Papadopoulos et al. 2010).

All sows should move in at least 3 days before due date and be loose

CONFINEMENT? When to confine?

Latest Scientific Evidence

- If temporarily confining – when?
- Any confinement during nest-building is detrimental to the sow
- Confining during birth increases stress and confining after birth risks increased crushing mortality (Goumon et al. 2022)
- Compromise? **Only confine 1 day pre-farrowing**

Practical Evidence

- Loose has advantages
- Large litters are challenging esp. if sows loose around farrowing
- Confinement to start at the end of nestbuilding until day 4 (Austria/ProSAU – Heidinger et al. 2018)
- Confinement to start at day 115 of gestation until day 4 (Denmark – Hansen 2018; Hales et al. 2015)

Actionable Recommendations – SPACE?

Pen footprint (m^2)

- The **minimum** pen size should be **6.5m^2**
- A **minimum length of 250cm in at least one dimension**
- **An unobstructed turning width of at least 160 cm**

Piglet area?

- Within the 6.5m^2 pen, there is a **1.2m^2 minimum lying area** for the piglets which is inaccessible to the sow.

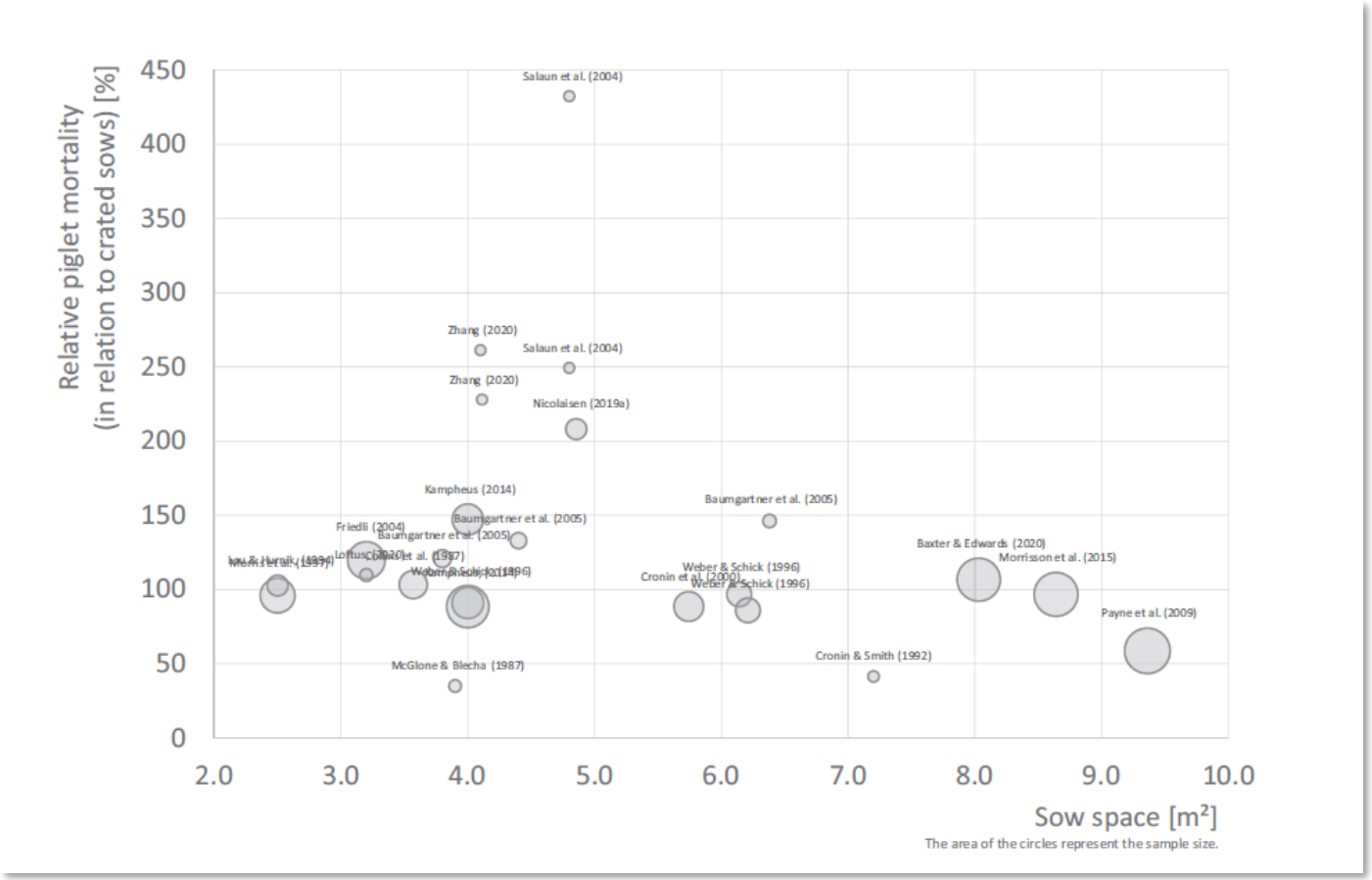
- Evidence?

Space allowance recommendations

EFSA 2022 Recommendations

Pen size

- **7.8 m²** (as piglet survivability when sows are **free farrowing** has same level as permanent crating)
- <u>Large uncertainty range</u> from studies (4.5-9.8m² with +1.2m² for piglet area)
  - Sow area = 6.6m²
  - Piglet area = 1.2m²



Space & piglet survivability - Ref: EFSA SO, 2022

SPACE?

Why can't we just....

... open up the crate?

- Sow welfare
  - Sows need more
    unimpeded in ar
  - Turning space al
    grouping/gather

Modern hyperprolific sows are ~50% heavier than 1980s (Moustsen et al. 2011, Nielsen et al. 2018)

SPACE?

Why can't we just....

... open up t

- Sow welfa
  - Sows rn around unimp
  - Turnin r and groupin down
- Piglet welfare
  - Too little space for sow to avoid piglets
    - Increase mortality *(Weber et al. 2009; King et al. 2019; Yun et al. 2019; EFSA, 2022; Goumon et al. 2022)*
- Hygiene
  - Sows try to defaecate away from where they eat *(Moustsen et al. 2023)*

Live-born litter size has **increased by ~50% over last 20 years** (*SEGES, 2020 – 11.7 to 17.5 per litter*)

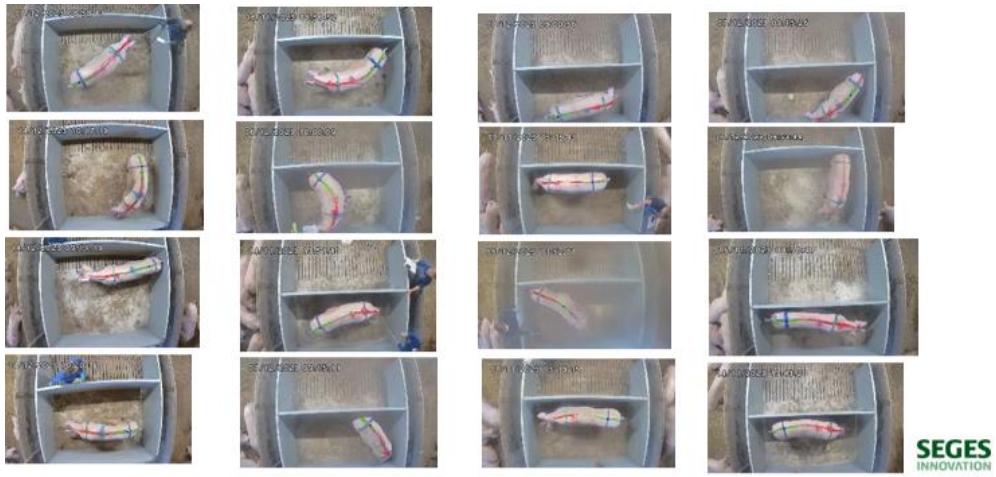
Why can’t we just….

… copy pen designs from Sweden, Switzerland or Norway (free farrowing since 1987, 1997, 2000)?

- They use zero-confinement – so ‘only’ need to design for loose sow so may not work for temporary confinement (e.g. hygiene issues)
- Some systems were designed 20+ years ago when litter size much lower and sows smaller.
- Increased litter-size leads to increased need for management in the first few days
    - Additional design needs required (e.g. worker protection)

Space allowance and pen dimensions are important – they are **often irreversible decisions**
Where to start?

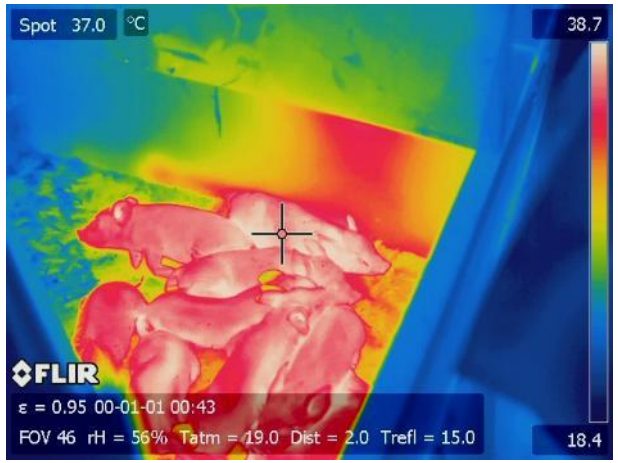
Quantity of space – Dynamic



Latest Scientific Evidence

- Lying, thermoregulating, suckling (*Nielsen et al. 2018*)
- Getting up and lying down, movement (sow length + 0.50m – *Moustsen & Duus, 2006*)
- TURNING?
  - **Do sows need their body length to turn unhindered?** (2m?)
- Latest evidence (Moustsen et al. 2025 under review)
- **Conclusions and recommendations?**
  - Sows can turn unhindered at less than their own body length
  - 1.2m too tight, 1.6m better, 1.8+m best

Quantity of space – Piglets



Latest Scientific Evidence

Pens need to accommodate:

- Larger litter at udder
  - Improved udder access when loose lactating → longer let-down of milk (Pedersen et al. 2011)
  - Increased weaning weights when loose lactating in some studies (Pedersen et al. 2011; Baxter & Edwards, 2021; Nowland et al. 2018)
- Large litter size in pen
- Functional areas
- Piglet safety zones and creep (enough for **all** young piglets to lie together in a heated area and for at least 14 piglets to weaning)
  - Creeps 0.9-1.3m^2 (Fels et al. 2016; EFSA, 2022; Wheeler et al. 2008)
- Piglets can share space with sow (and staff) when older

Actionable Recommendations – SUBSTRATE & FLOORING

Recommendations from latest evidence:

- All sows should be provided with a **nest-building substrate** from **48h prior to expected farrowing**
- Optimum nesting substrate is straw but important practical problems (e.g. availability, biosecurity, hygiene, handling, cost)
- COMPROMISE - **An absolute minimum a jute sack/sheet or** an **easily extractable substrate from a rack**, and **ideally particulate material at floor level**

- During other periods from entry to the farrowing pen until weaning, **enrichment should be continuously available for both sow and piglets** which is **destructible and organic**, e.g. particulate substrate or a jute sack/sheet.

Actionable Recommendations – SUBSTRATE & **FLOORING**

Recommendations from latest evidence:

- Pens **must include a portion of solid flooring:**
  - **A minimum to facilitate a comfortable and safe creep area for the piglets** and;
  - **To retain substrate** used for enrichment/nesting.

- Thereafter **decisions on the amount of solid floor should be based on pen size and shape, slurry management and the choice of substrate**.

- Where floors are slatted in the sow lying area, use of plastic-coated metal floors is encouraged.

- Evidence?

SUBSTRATE & FLOORING

EFSA Conclusions (2022)

- Highlighted the different functions that such material should serve.
- Greatest emphasis was given to its role as a nest-building substrate.
- Recommended that sows and piglets should be provided with enrichment material that allows them to perform exploratory behaviour in the period from farrowing to weaning.

- Did not make specific recommendations for flooring in the farrowing accommodation.
- Stated a preference in the general body of the Opinion for ‘solid floors instead of part-concrete, part round-weld-mesh flooring’ to address limb and foot injuries in farrowing accommodation.

SUBSTRATE & FLOORING

Latest Scientific Evidence

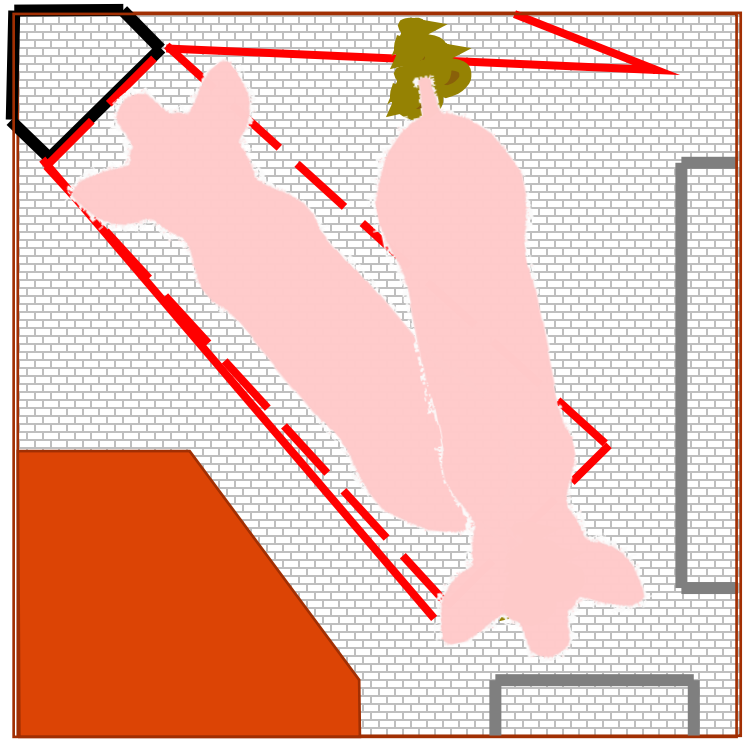
- Analysis of 26 studies involving natural fiber, man-made materials (e.g., hessian, jute, or burlap sacks) demonstrated their association with a tendency for lower stillbirth rates (Monteiro et al., 2023).

Practical Evidence

- Straw supplied in racks is very common in many herds with loose lactating sows and sows use the straw in racks
- Supplying straw in racks makes it possible to have fully slatted flooring
- Fully slatted flooring supports high level of hygiene, which is very important for piglet health, air quality, work conditions and maintaining attractable substrate – and the sows dunging behaviour when loose
- If straw is supplied at a floor level with unsatisfactory hygiene, the straw will not be attractive to the sows or piglets

Latest Scientific Evidence

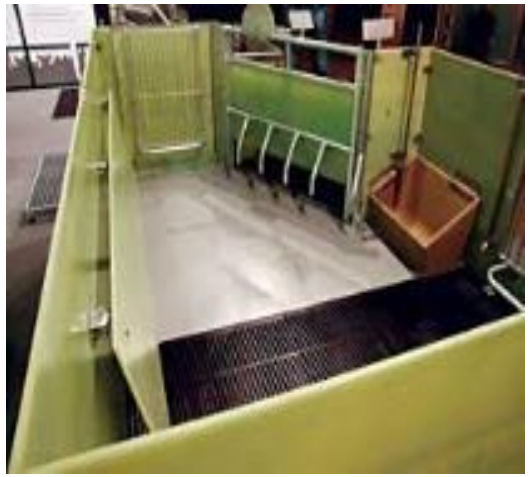
After eating sows will turn away from their feeders and dung/urinate. Not enough space/length = poor hygiene

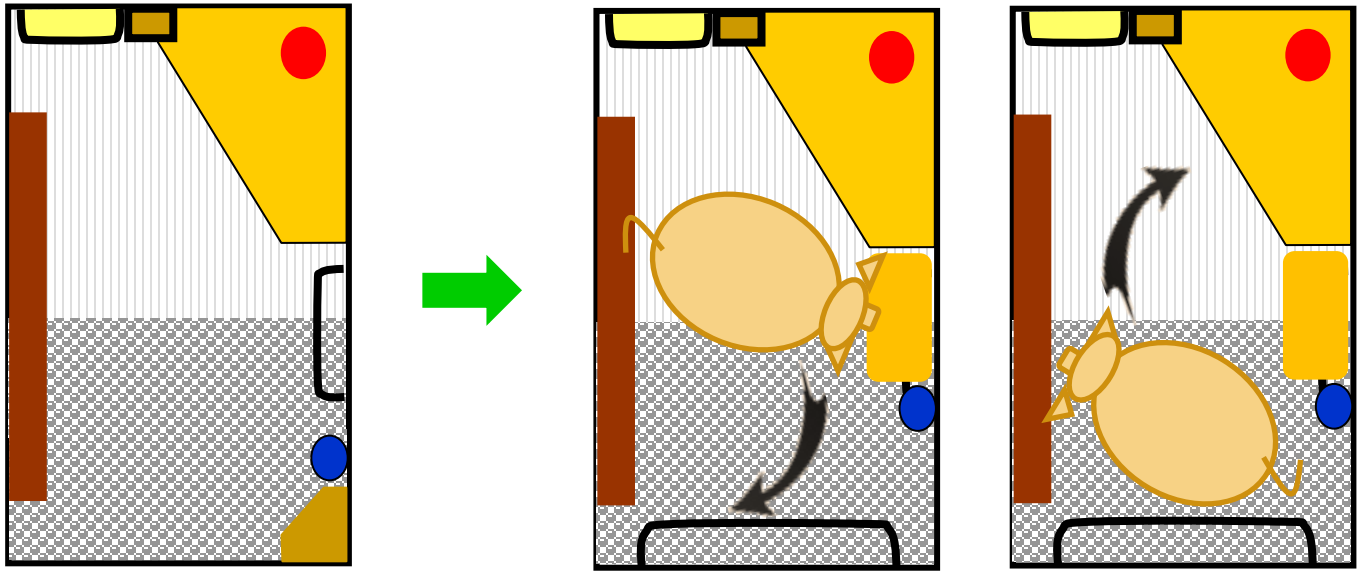


SEGES INNOVATION

Solutions?

- Fully slatted in square pens ⇨ BUT increases slurry surface – emissions risk





Moustsen et al. (SEGES Innovation). See also Andersen & Pedersen 2011

Rectangle pen 6,5 m^2

Considerations and take-home messages

- **Farrowing crates (and the footprint they currently occupy) are not sustainable**

- Deciding on a new farrowing system is multi-layered and complex
  - Zero- or Temporary- Confinement?

- Acknowledge key decisions and complexity (details matter)

- **Design for loose with option to confine not vice versa**
  - If confining – loose pre-farrowing, no more than 4 days post
  - Different management routines and mindset needed

- **SPACE and DETAILS (Quantity and Quality)**

Considerations and take-home messages

Common EU legislation is needed but since 2021 momentum has stalled

The transition period will be challenging

- Performance implications when sows (and staff) swap between systems *(e.g. King et al. 2019* – Animal)

- Sows and staff need time to learn the system (which will lead to improved performance and confidence to adopt free farrowing)