EUWelNet
Coordinated European Animal Welfare Network

Task 3.3 Group housing of sows

Support material for training

Outline of the presentation

1. Natural behaviour of sows
2. Overview of the main group housing systems
3. Husbandry of group-housed sows
4. Difficulties in the interpretation of the legislation

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NATURAL BEHAVIOUR

Commercial breeds of pigs will behave similarly to wild boar if kept in a semi-natural outdoor area. They:

- spend **most of their active time rooting**, grazing and exploring, thus getting plenty of **exercise** and **stimulation**
- use dunging areas that are typically several metres away from a nest site
- **wallow** in wet mud to cool themselves by evaporation as they have almost no sweat glands

Modern breeds of pigs quickly adapt to living outdoors and behave like wild boar

SOCIAL BEHAVIOUR

In a natural environment pigs:

- **live sociably** in family groups of a few sows and their offspring
- build communal **nest sites** for sleeping but make an individual nest before farrowing
- develop a **dominance hierarchy** which is usually maintained by younger/smaller animals avoiding larger/older ones rather than by fighting

COMMUNICATION

Pigs communicate in several ways by using:

- their well-developed **sense of smell** to
  - find food
  - recognise others directly and via their urine or dung
- **pheromones** and other odours in
  - oestrus and mating behaviour
  - as alarm signals
- a range of **grunts**, alarm calls and other auditory signals, especially for group cohesion

COMMUNICATION

- Pigs don’t have very good eyesight but can still recognise others

- They have good **learning** and **memory abilities** so they can remember:
  - where stores of food are hidden
  - other pigs for at least 6 weeks

FEEDING AND FORAGING BEHAVIOUR

- Sows are usually fed just one meal per day
- They are **highly motivated to feed and forage**
- They must be given materials to **root and chew**
- Sows need a **high fibre diet**
- They need **protection whilst feeding +/or**
- They should be **fed at the same time**

As well as providing comfortable bedding, straw is excellent for rooting, chewing and foraging behaviour and can add fibre to the diet

Providing a complete, balanced diet does not satisfy the drive to root

- Dry sows need extra fibre and edible foraging material to help satisfy hunger and need to root/forage/chew
- These are some examples of suitable materials to provide

Compressed straw pellets

Bark or woodchip

Wood wool or shredded paper

Hay or silage

SOCIAL BEHAVIOUR & USE OF SPACE

- Small groups of 3-5 sows and their offspring is normal in free-living conditions
- They establish a stable dominance hierarchy
  - Sometimes by fighting
  - Dominant animals may use subtle warning behaviours
  - Subordinate animals often run away from or just avoid dominant sows

AVOIDING INJURY

Different floor heights increase the risk of claw damage and lameness.

Floors should be kept dry and non-slip especially when introducing new pigs to a group.

AVOIDING INJURY

- ✓ Adding **bedding** to solid floors may help keep sows warm in cold weather and reduce lameness, hoof abnormalities and skin lesions, which are signs of poor welfare.
- ✓ Bedding should be kept **clean** especially in warm weather to reduce disease risk.
- X A fully bedded floor can lead to soft, overgrown claws and foot problems.

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OVERVIEW

There are several options but each system needs to be well-managed to be successful.

Some general points that apply to most group systems are:

- Those caring for sows kept in large groups need to be skilful and confident, and thus may need extra training to cope with a new/more complex method of housing.
- It may be more difficult to observe, catch and treat individual sows.
- Pigs divide available space into feeding, dunging and lying areas.
- The dunging area should be regularly scraped.
- Separate showers or clean wallows by the drinkers may be needed to keep sows cool in warm or hot weather.
- Sows should not have to lie in the dunging area to keep cool or due to lack of space.

OVERVIEW

A major decision is whether or not to provide bedding such as straw, woodshavings etc.

General points to consider if providing bedding:

- Extra storage space is needed for bedding and enrichment materials.
- Changing from a slurry-based to a straw-based manure system requires different types of storage and machinery for muck handling.

OVERVIEW

Providing straw or similar bedding:

Advantages:

- ✓ Provides foraging opportunities
- ✓ More comfortable for sows:
  - ✓ Reduced leg injuries
  - ✓ Warmer in cold weather
- ✓ Potentially less environmental pollution

Challenges:

- ❖ Higher labour requirement
- ❖ Straw can block any slats or slurry systems
- ❖ Bedding may be expensive or not readily available
- ❖ With floor feeding: there may be more wastage and the bedding needs to be kept extra clean
- ❖ Hoofs can become overgrown and soft in fully-bedded systems

OVERVIEW

Non-bedded systems:

Advantages:

- ✓ Low risk of mycotoxins and dust
- ✓ The same muck-handling system can be used as before

Challenges:

- ❖ Floors can become slippery with higher risk of leg and foot injuries
- ❖ Reduced comfort for sows unless matting is used in lying areas
- ❖ Foraging material must be provided elsewhere
- ❖ Potentially expensive methods of controlling the environment and pollution may be needed

OVERVIEW

All group housing systems should provide:

- a lying area that allows all sows to lie down simultaneously
- non-bedded drinker and dunging areas
- foraging opportunities

Systems vary mainly in terms of
the method of feeding.
The most popular options are now outlined:

FREE-ACCESS LOCKABLE GATED STALLS

- There is one stall per sow where she can go at feed time or by her own choice at other times
- If they are locked in for feeding, sows must be released within 1 hour
- Modifying existing stall systems is possible, but extra communal areas are needed for foraging, drinking, dunging and maybe also for lying

FREE-ACCESS LOCKABLE GATED STALLS

Advantages:

- ✓ Individual rations can be given by using manual top-up
- ✓ Sows are fully protected whilst feeding
- ✓ Sows are easily moved, checked and treated
- ✓ Simple, reliable and easy to maintain

Challenges:

- ❖ For smaller group yarded layouts: once group size is determined it may not be easily changed
- ❖ Relatively labour-intensive
- ❖ Stalls take up a lot of space unless they are suitable for lying in
- ❖ If a sow drops out it is seldom possible to reallocate the pen space

PARTIAL STALLS

Yards with partial barriers and kennelled lying areas

Solid barriers give more protection than rails

The barriers give only some protection while feeding, therefore:

- Feed should be distributed rapidly
- Liquid feeding may reduce aggression, as there is less variation between sows in the rate of consumption than with dry feeding
- Trickle feeding may encourage faster eaters to wait for the next portion

PARTIAL STALLS

Advantages:

- ✓ Sows are fairly easy to check as they are all fed at once
- ✓ Simple to manage and basic auger feed delivery

Challenges:

- ❖ Dominant sows can guard several feed spaces
- ❖ More aggression can occur than in other feeding systems
- ❖ Uneven sow weights may result, as only flat rate feeding is possible
- ❖ Initial group selection relies on good stockmanship to match sows
- ❖ If a sow drops out it is seldom possible to reallocate the pen space

FLOOR FEEDING

- Overhead ‘dump’ feeders or spin feeders are used to distribute the feed in many places over the lying area
- Spin feeders scatter the feed more widely, so there is less aggression

FLOOR FEEDING

Advantages:

- ✓ Saves space
- ✓ Simple system with manual feeding also possible
- ✓ Observation is easy

Challenges:

- ❖ Sows are less easily caught and treated
- ❖ Not possible to give individual rations
- ❖ Extra feed needed for wastage and to account for individual variation
- ❖ Potential for disease from dirty floor/bedding

ELECTRONIC SOW FEEDERS (ESF)

- Popular option for larger and dynamic groups
- Sows are fed individual rations by a computer-controlled feeding station (ESF) that recognises ear tag transponders
- There should be at least 3 m of free space behind feed stations and at least 2 m between feeder entrances
- an exit race of at least 2 m should direct sows into the drinking/dunging area
- It is essential to have contingency plans in case of breakdown and a reliable supplier available 24/7

One-way gates and space around each feeder is needed to reduce aggressive interactions

ELECTRONIC SOW FEEDERS (ESF)

Advantages:

- ✓ Individual rations can be given easily
- ✓ Sows are protected whilst feeding
- ✓ The computer output helps spot sows which need attention
- ✓ Individuals can be treated relatively easily

Challenges:

- ❖ Requires extra skills and dedicated, vigilant stockmanship, particularly for managing large, dynamic groups

OUTDOOR SYSTEMS

- Suitable for:
  - Temperate climates
  - Light, free-draining soil
  - Rainfall below about 750 mm
- Feed is distributed widely on ground or in troughs giving 2 m+ per sow
- Extra feed is needed in cold weather and because sows exercise more

Sows are often kept in groups of 5-20 per paddock (15-20 animals/Ha) with huts providing shelter and containing deep straw bedding for warmth.

2 electrified wire strands 200 mm and 500 mm above the ground keep the sows in

OUTDOOR SYSTEMS

Advantages:

- ✓ Low cost housing and equipment
- ✓ Simple system with little equipment to break down
- ✓ Can be part of an arable rotation providing fertiliser and reducing disease and parasite build-up
- ✓ Marketing advantages (good public perception)

Challenges:

- ❖ Requires dedicated, skilled and fit stockpersons willing to work outside in all weathers
- ❖ Feed costs are higher
- ❖ Weather extremes may cause management and health problems (e.g. frozen water, sunburn)
- ❖ Methods to control worms and other parasites may be required

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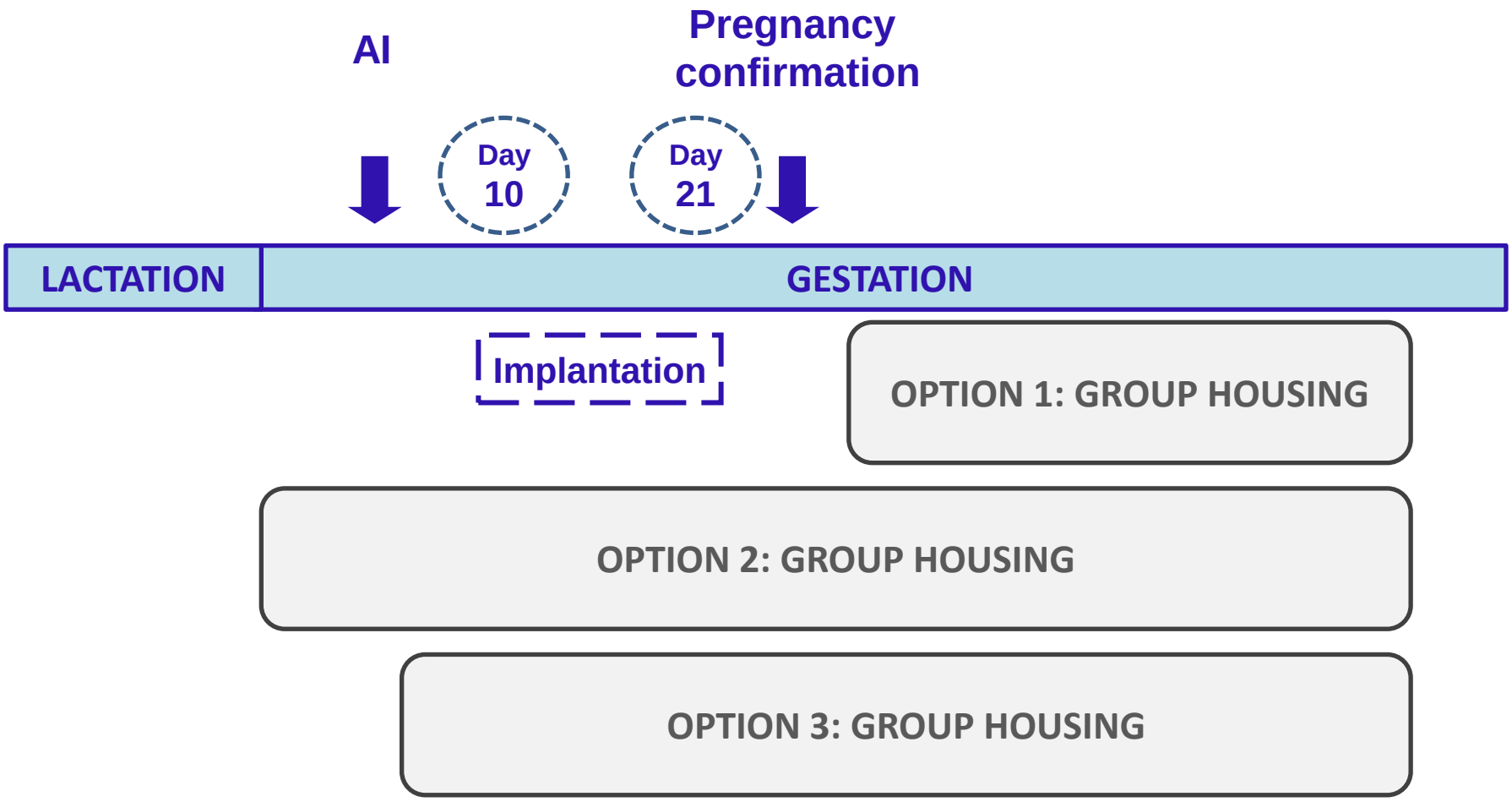
TIMING OF GROUP HOUSING



GROUP SIZE AND COMPOSITION

- Sows and pregnant gilts housed in separate pens
- Consider the system design of the farm
- Consider the facilities of the farm
- Decide the size of the groups

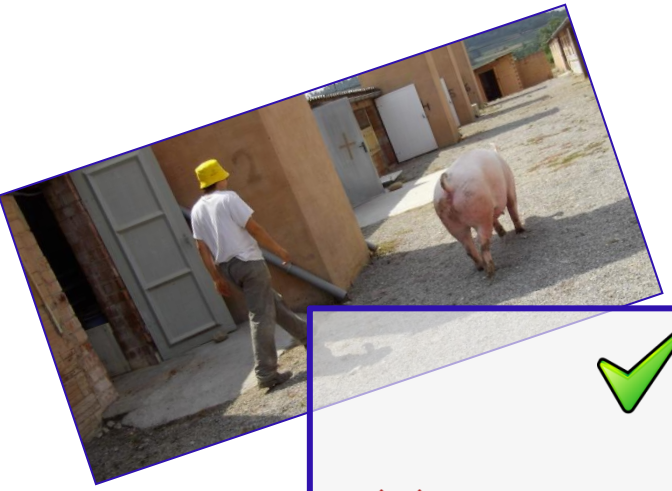
SMALL GROUPS
(5-10 Animals)

STATIC GROUPS

VERY LARGE GROUPS
(> 100 Animals)

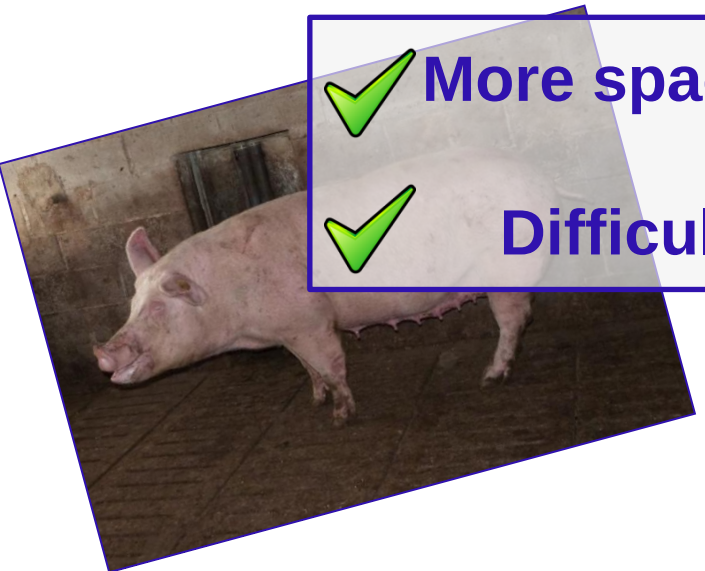
DYNAMIC GROUPS

VERY LARGE GROUPS
(> 100 Animals)



✓ Lower capital cost

✗ Management may be more difficult



✓ More space for the animals to escape

✓ Difficulties to detect newcomers

SOCIAL MIXING

COMPETITION FOR RESOURCES

AGGRESSION

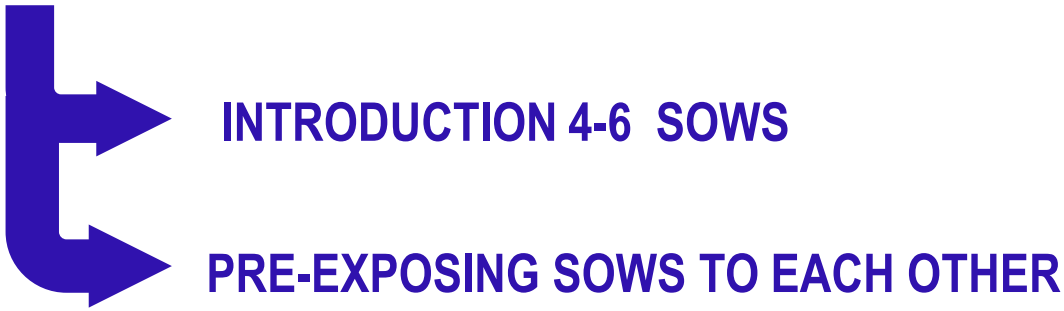
RISK OF LAMENESS – SKIN LESIONS – REDUCED FEED INTAKE

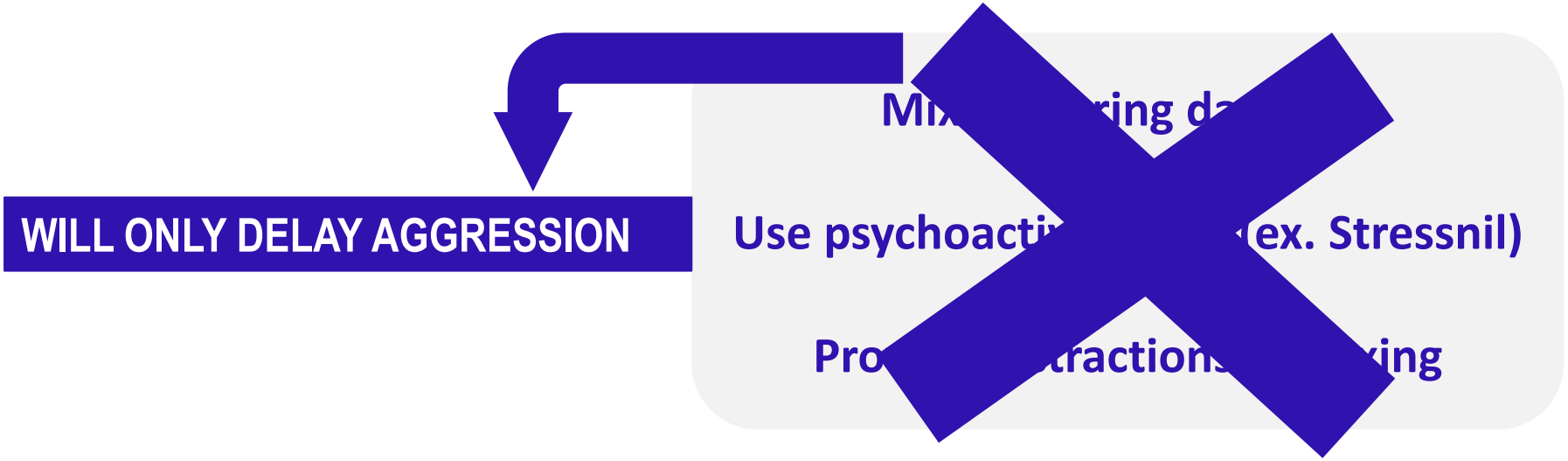
GENERAL TIPS TO AVOID AGGRESSION

1. ESTABLISH STABLE GROUPS
2. GIVE THE POSSIBILITY TO ESCAPE FROM AN AGGRESSION
3. USE NON-COMPETITIVE FEEDING SYSTEMS
4. GIVE ACCESS TO BEDDING/MANIPULABLE MATERIAL

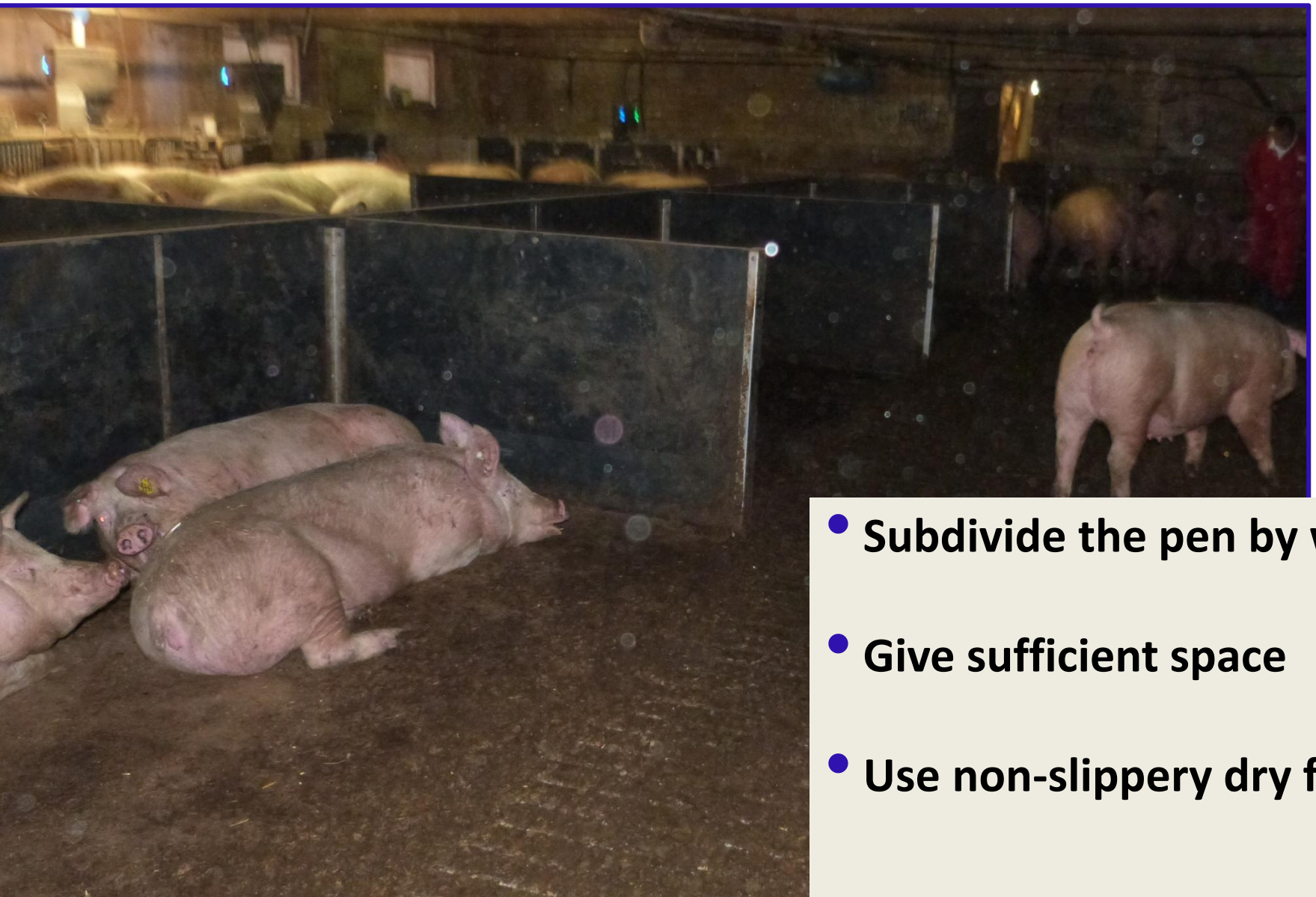
1 ESTABLISH STABLE GROUPS

LARGE DYNAMIC GROUPS





2 GIVE THE POSSIBILITY TO ESCAPE FROM AN AGGRESSION



- Subdivide the pen by walls
- Give sufficient space
- Use non-slippery dry floors

3 USE NON-COMPETITIVE FEEDING SYSTEMS

PARTIAL STALLS

Food should be distributed rapidly

Full partitions. 50 cm long

FREE ACCESS STALL

Individual sows can have extra feed

3 USE NON-COMPETITIVE FEEDING SYSTEMS

ESF

Training program of the sows

Leave space around feeding stations

Spread the feeding stations

4 meters between the feeder and the resting area

Establish feed cycle

When sows are hungry they are more likely to react aggressively

HIGH FIBER DIETS

Time spent eating

Satiety

USE ENOUGH DRINKERS

NUMBER:
10 sows/ drinker (optimum)
< 15 sows/drinker

FLOW:
> 2 L/min

A gestating sow needs 9-18 L of water /day

FRESH WATER

ACCESS

4 GIVE ACCESS TO BEDDING/MANIPULABLE MATERIAL

Decreases hunger

Increases motivation to explore

Provides better grip than barren floors

PRESENCE OF THE BOAR

OTHER IMPORTANT TIPS

GENETIC SELECTION

USE OF PIG APPEASING PHEROMONES

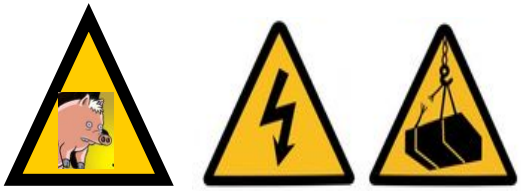
LEARNING AND MEMORY

Pigs can associate an experience with an outcome

Sows can learn a route easily

Sows remember other individuals

Sows remember good/bad handling



FEARFUL SOWS

→ **Occupational hazard**

→ **Difficult to handle**

→ **Poorer production performance**

MAXIMIZE POSITIVE CONTACTS

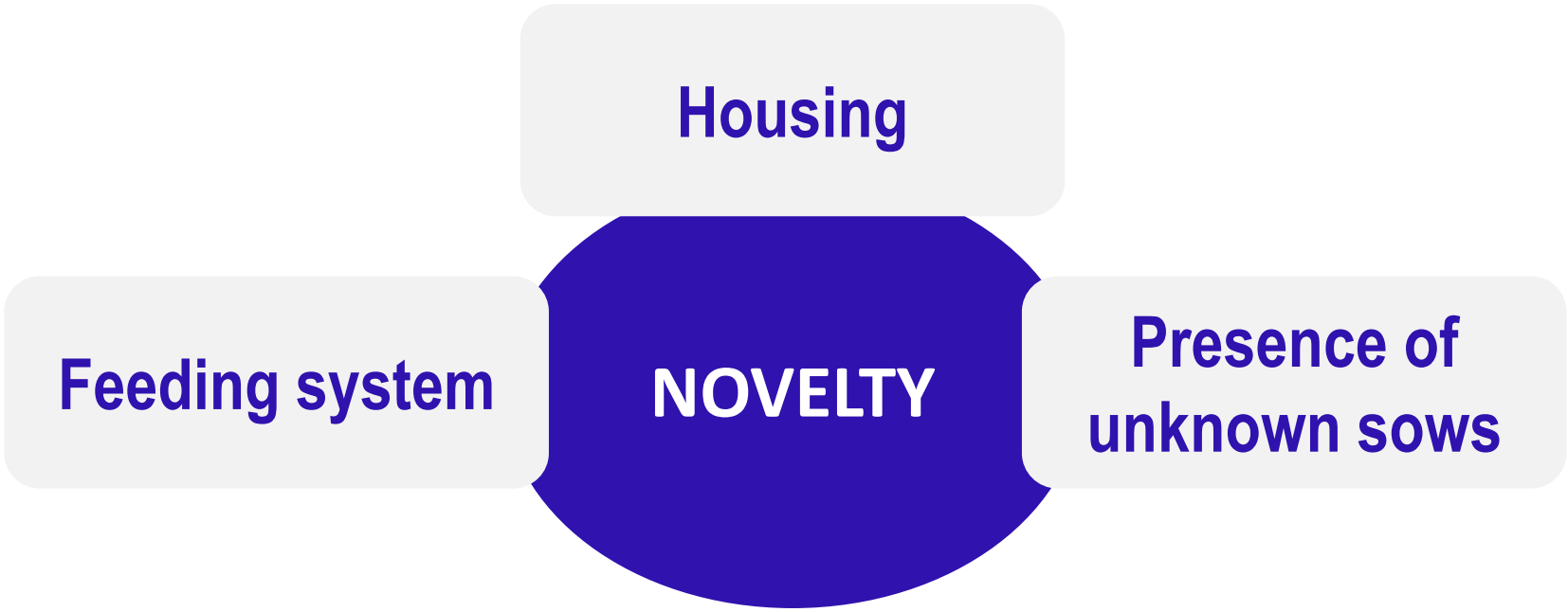
GIVE THE TIME TO THE SOWS TO MOVE BY THEMSELVES

MONITORING AND SUPERVISION OF SOWS

Daily detection of possible welfare problems

Screening information to detect any problematic sows

TRAINING GILTS TO USE THE FEEDING DESIGN



Gradual adaptation to the feeding system

- Training in small groups
- At least 2 weeks before AI
- Ration can be reduced the day before
- Ensure that each sow passes through the station each day

Gilts should not be forced to enter the feeding station

ONCE TRAINED:

- Gilts should be housed in a separate group until 2nd pregnancy
- When introducing animals in a dynamic group, introduce a GROUP of animals

CULLING REASONS

Reproductive failure

Lameness

Failure to adapt to group housing

- **After conversion older sows may show difficulties to adapt**
- **Desynchronisation in small static groups**

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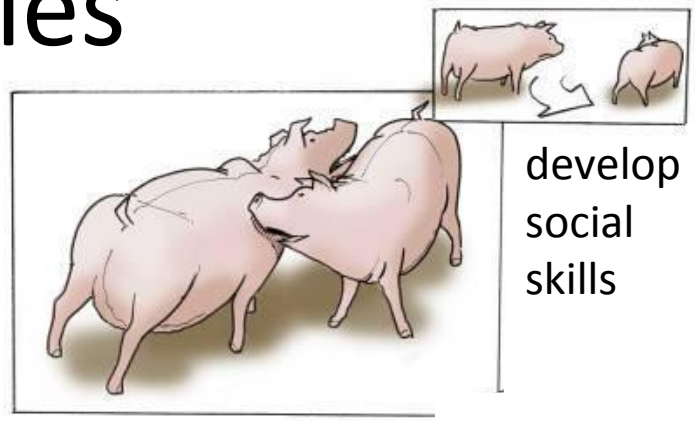
2013: EU Sows in Groups

- From 4 wks after service to 1 wk before farrowing
- Per sow 2.25 m^2 including 1.3 m^2 solid floor
- Groups <6 or >40 need 10% more or less space
- Manipulable material and/or bulky feed
- Measures to minimize aggression

Recommendations and future research goals:
(EFSA, 2007)

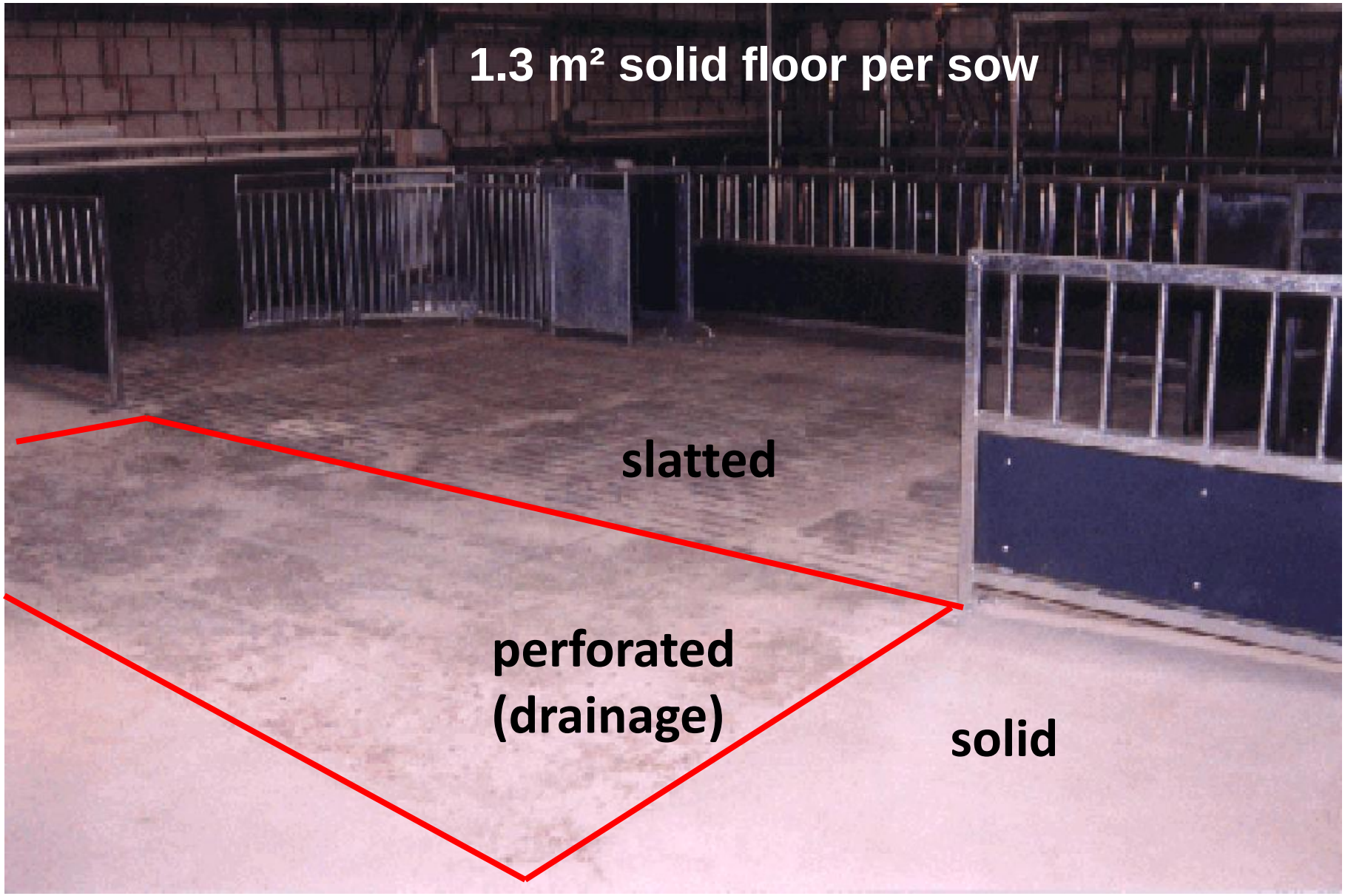
- Attention for flooring quality to prevent lameness
- Minimizing aggression by reduction of mixing
- Freedom systems from weaning to 4 wk pregnancy
- Fibrous diet and foraging material

Interpretation difficulties

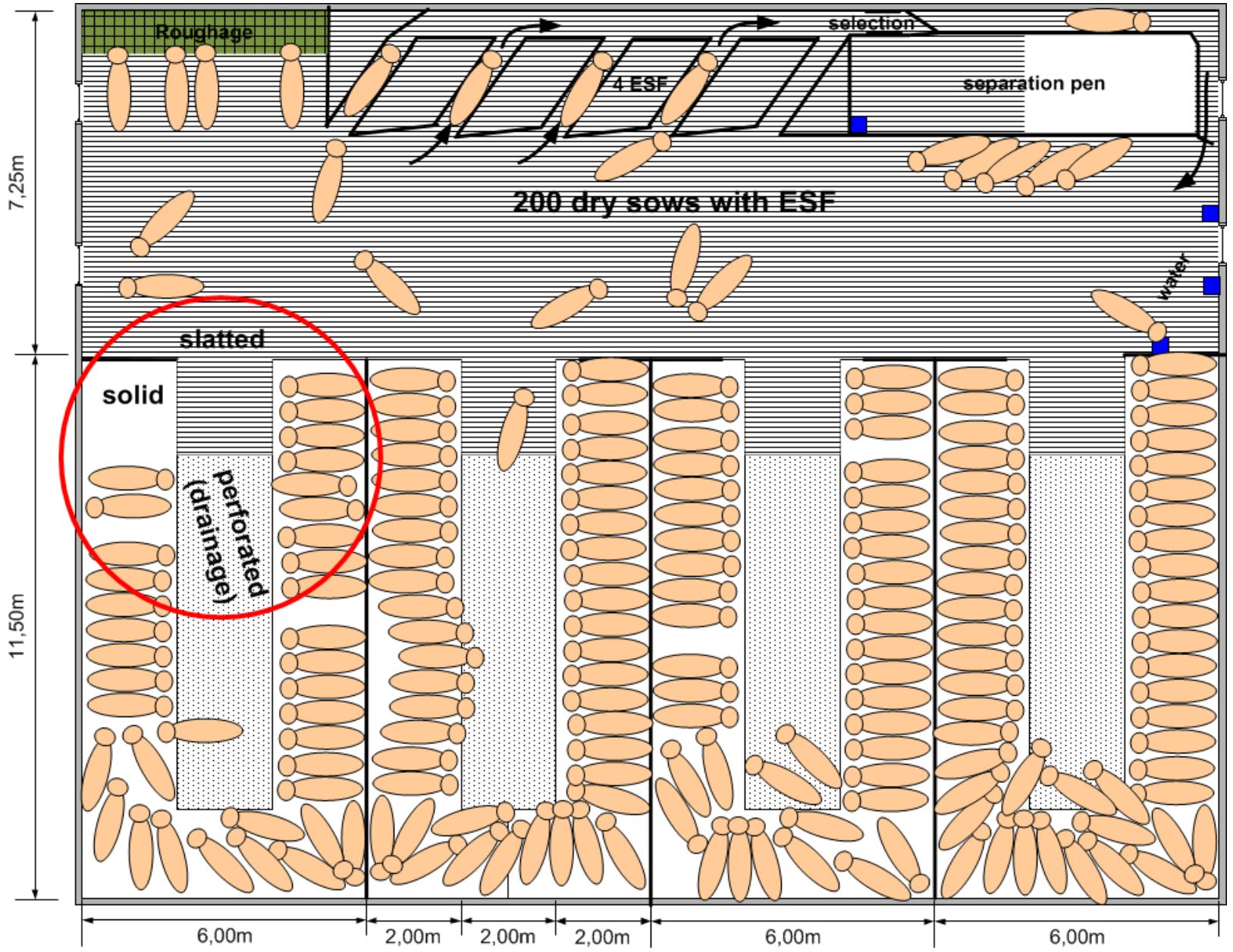


- Transition from gilt to sow
- Protection of restricted fed sows
- Keeping groups together with variation in insemination date
- Definition of fibrous feed and enrichment
- Definition of (continuous) solid floor
- Minimum space behind free access stalls?

Different floor types (% openings)



Example of different floor types (red circle) within a pen (200 sows ESF)



Prevention of abuse

- “Overcrowding” in some pens should be compensated with “undercrowding” in other pens to prevent mixing of individual sows
- If free access stalls are locked during longer periods this can be detected by dunging pattern and fresh skin lesions.
- At maximum 40% of the sows without piglets can be housed individually
- More than 25% of the farrowing pens housing sows without piglets is “suspicious”

Free Access Stalls with wide area between two rows, but dirty/wet spots show that stalls are mostly closed

Is 1.3 m² continuous solid floor per sow available?

Countries with additional demands to the regulations mentioned in Council Directive 2008/120/EC (requirements are only mentioned when more than two countries have additional demands)

Requirement	Countries with limited additions*	Countries with substantial additions*
Minimum unobstructed floor space (weaner and rearing pig)	AU	D, NL, S
Minimum unobstructed floor space (boar, gilt after service and sow)	AU, D	DK, NL, S
Continuous solid floor and maximum drainage openings		DK, D, NL, S
Group housing pregnant sows + gilts	DK	UK, S, NL
Manipulable material	AU, D, S	
Minimum amount of light		AU, B, D, S
Climate and laying area	BU, B, S	DK
Permanent access to fresh water	AU, D, S	
Mutilations		AU, DK, S

* AU = Austria, B = Belgium, BU = Bulgaria, DK = Denmark, D = Germany, NL = Netherlands, S = Sweden, UK = United Kingdom

(Mul et al., 2010)

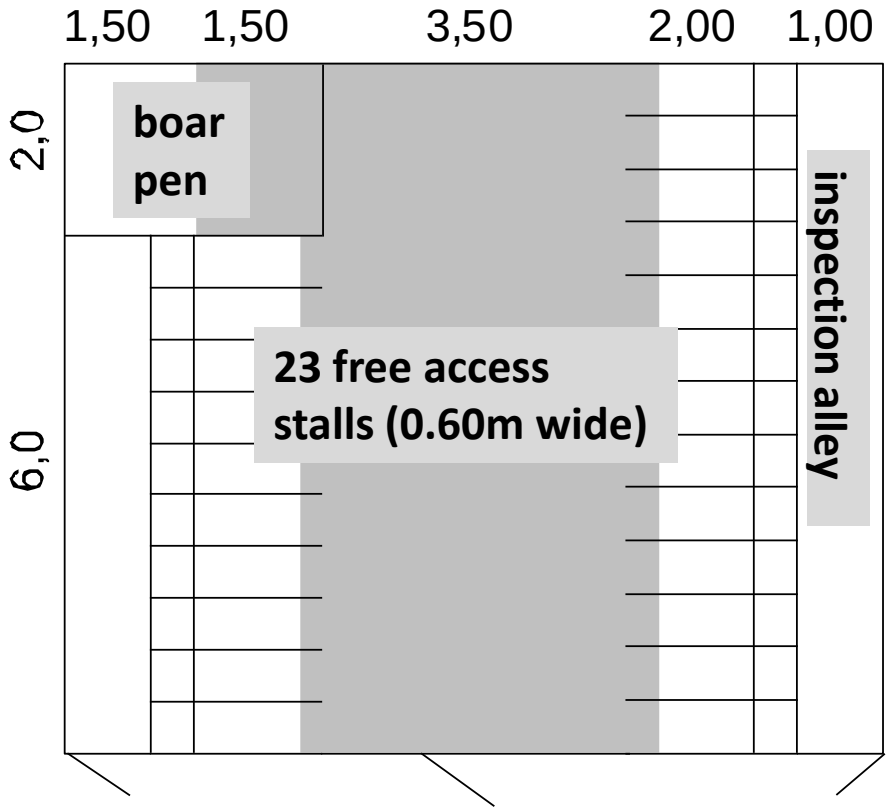
Table 2 National government funded pig welfare research, performed or in progress within the EU.

Research subject	Countries with completed research*	Number of countries completed research	Countries research is on-going*	Number countries research on-going
Group housing Sows	CZ, SF, IRE, NL, SP, UK	6	B, F, NL	3
Housing systems growing finishing pigs	BU, NL, UK	3	NL	1
Environmental enrichment	DK, SF, IRE, I, NL, UK	7	DK, F	2
Castration	F, IRE, I	3	B, F, NL, S, SP	5
Floor design	SF, IRE, I, NL, UK	5	F, D	2
Farrowing pens	AU, SF, IRE, UK	4	DK,D, UK	3
Water supply/management	BU, I	2		
High fibre diets	F, IRE	2		

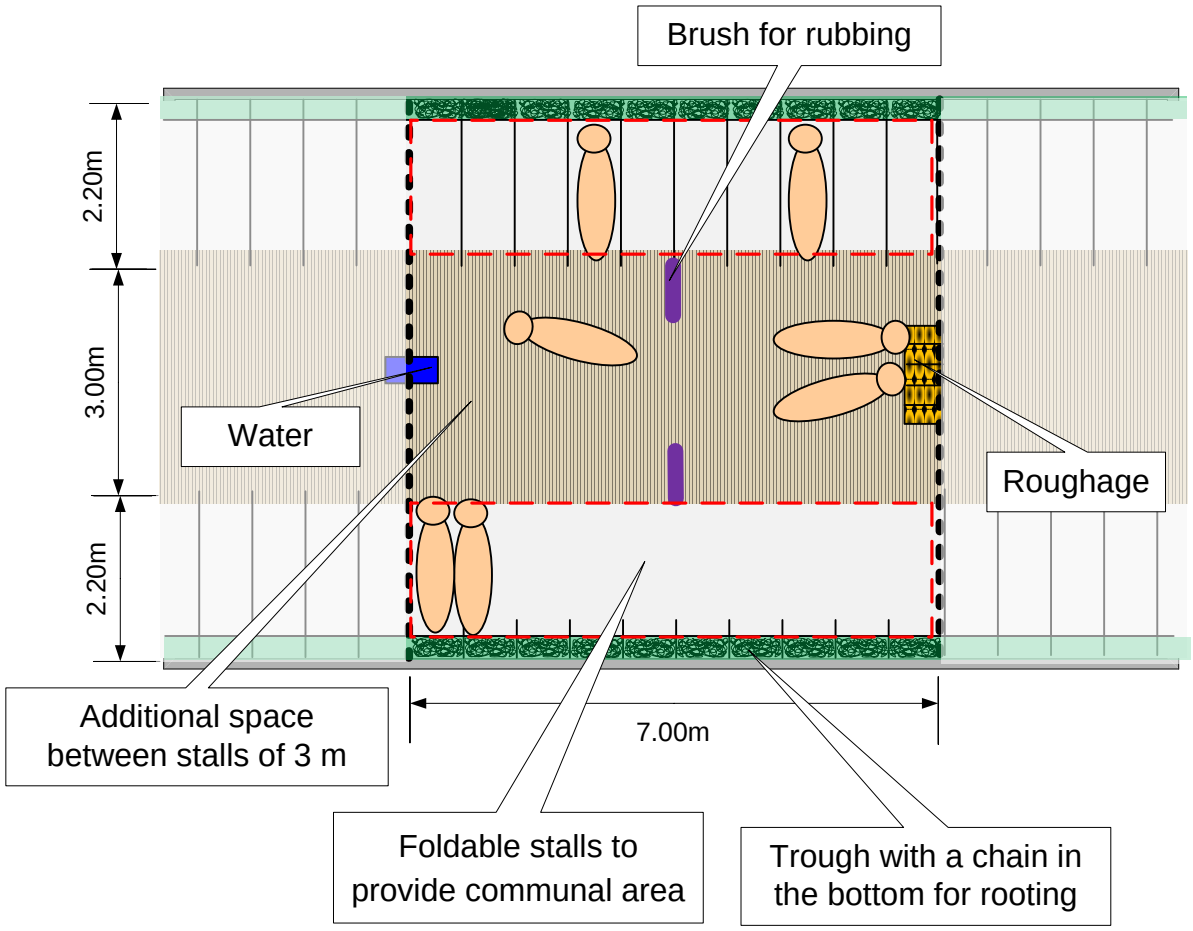
* AU = Austria, B = Belgium, DK = Denmark, CZ = Czech republic, SF = Finland, F = France, D = Germany, IRE = Ireland, I = Italy, LT = Lithuania, NL = The Netherlands, S = Sweden, SP = Spain, UK = United Kingdom

(Mul et al., 2010)

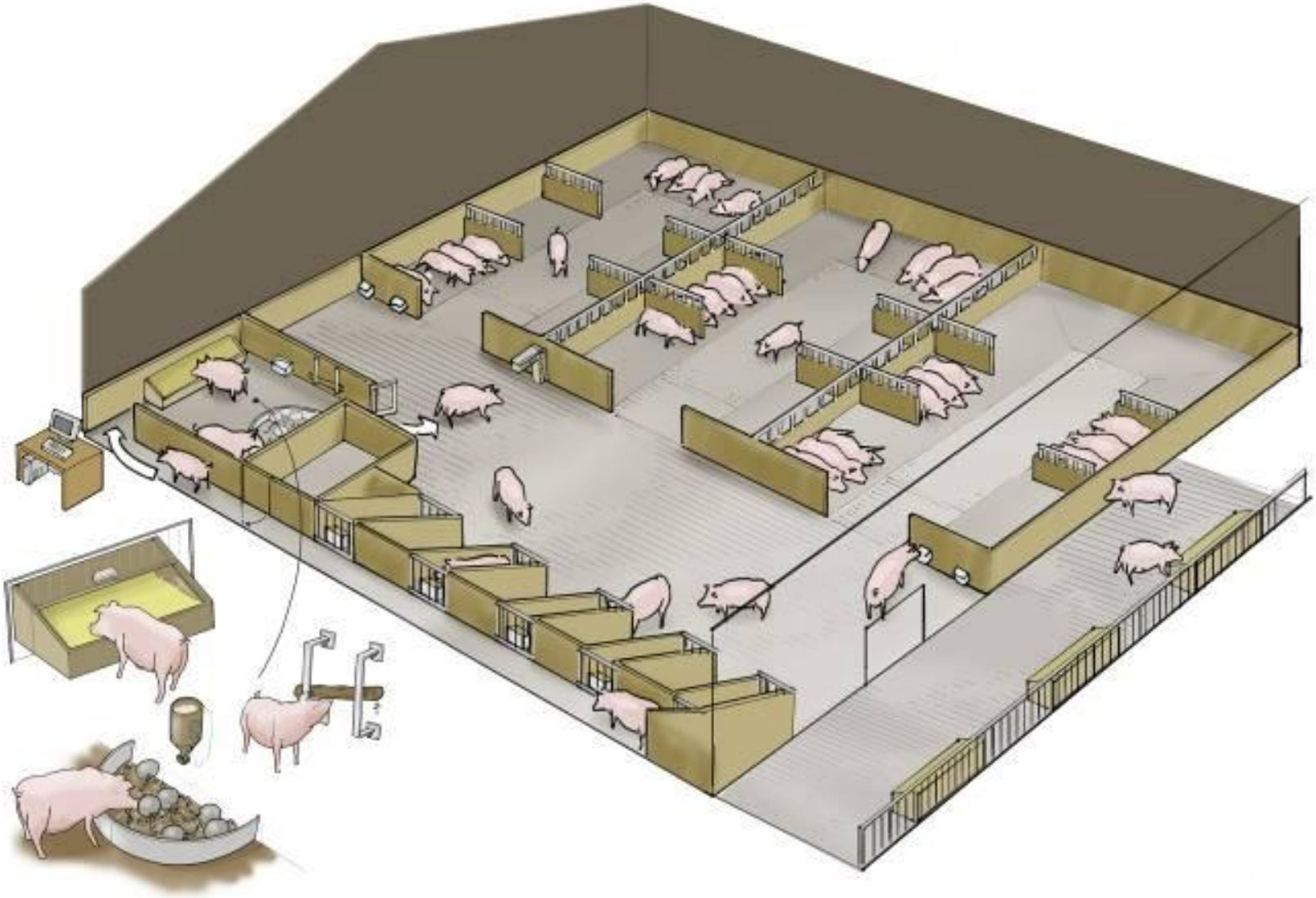
Typical example of Free Access Stalls, here in mating unit with boar pen
(additional space necessary for social interactions, but hardly any enrichment)



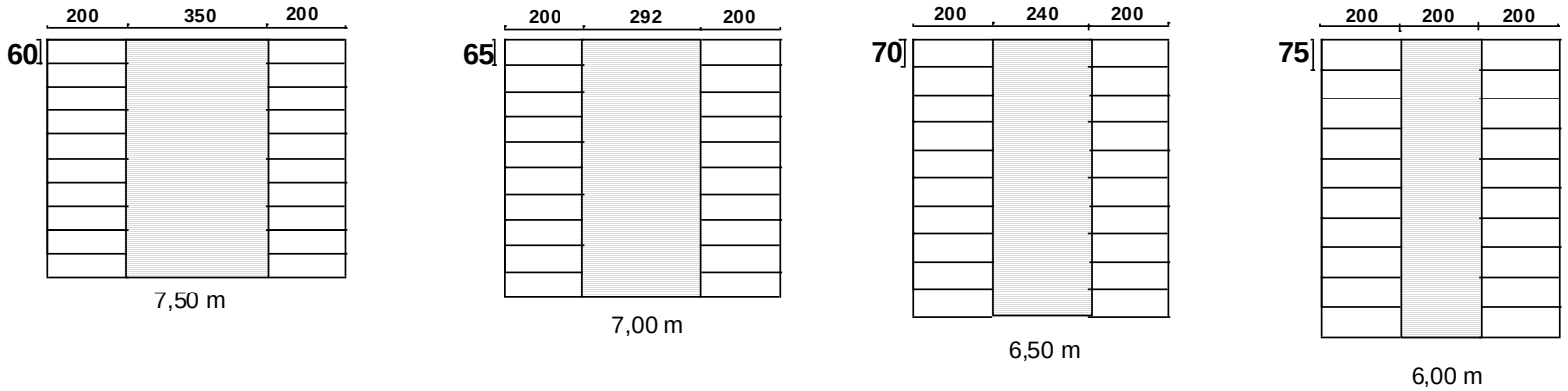
Improvements Free Access Stalls with group of 20 sows



Improvements Electronic Sow Feeding (200 sows)
(enrichment in left corner, roughage on right outside)



At a constant 2.25 m² per sow the width of the slatted area between 2 rows of stalls depends on the width of the stalls (wide with 60-65 cm stall width and narrow with 75 cm)



Solid floor (m²)	1,20	1,30	1,40	1,50
Slatted floor (m²)	1,05	0,95	0,85	0,75

Principles: 2.25 m² space per sow
100% solid floor inside stalls (sows always leave stall for excretion)


Successful group housing of sows is possible
when basics of housing and management are met