Animal welfare towards sustainability in pork meat production

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Sustainable meat production

A form of production ‘ecologically sound, economically viable, socially just, and humane’ (Appleby, 2004).
What is animal welfare?

- Possibility to express normal behaviour
- Emotions: absence of negative emotional states, such as chronic fear and pain, and presence of positive emotional states
- Adequate biological functioning

Introduction
Intensive production systems

Increase:
- Production volume and meat consumption
- Efficiency in the use of the available resources
- Productivity and food security

Reduction:
- Environmental footprint of livestock production.

Risk to impair animal welfare:
- Negative emotions
- Inability to perform normal behaviours
- Difficulties to cope with the environment
1. Introduction

2. **Animal welfare on farm**

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Neonatal mortality

Implications:
- animal welfare problem
- economic losses

Average:
- 10-15%

Moment:
- 80% during the first 3 days post-farrowing
- 50% during the first day post-farrowing

(Biological limitation?)

Some farms: 7-8%

Responsible some sows

(Marchant et al., 2001)
Crushing

Causes

Change of posture (pain)
Maternal behaviour
Farrowing duration
Lactation

SOW

STRESS

Neonatal mortality

Low weight
Hypothermia
Close to the mother
Slow mobility

PIGLET

WEAKNESS

SOW

STRESS
Under natural conditions...

1-3 days before farrowing:

1rst phase: INTERNAL FACTORS (prostaglandin F2α)

- Isolation from the group
- Look for a place to nest

2nd phase: EXTERNAL FACTORS (enrichment material temperature)

- Dig with the snout a circular hollow
- Build the nest (with grass, straw ...)

Neonatal mortality
Stress around farrowing

Presence of other animals
Impossibility to build the nest
Novelty, breed, pain ...

Prolonged farrowing duration
Neonatal hypoxia
Tiredness of the mother

Maternal behaviour
Rejection
Aggressions
Crushing events

Lactation
Delay in the secretion of colostrum
Inhibition of milk ejection

STRESS plasmatic cortisol

Endogenous opioids

Inhibition of Oxytocin release

(Lawrence et al., 1994)

Neonatal mortality
Loose-house systems

- With nesting material
- Benefits on farrowing duration, maternal behaviour and lactation
- Fewer still born and less risk of infection

Mortality average:

- in DK: Increased mortality (2-8%)
- in S, UK, CH: No differences in large herds investigations
Litter size

- Increased duration of farrowing
- Lack of teats for all piglets.
- Reduction of the colostrum per piglet
- Increase of the competition between littermates
- Reduction of the birth weight
- Lack of space
In barren pens with concrete or slatted floor, pigs could not perform foraging behaviour.

Tail-biting

Low level of sensory input

Prohibition of tail-docking routinely

[...] pigs must have permanent access to a sufficient quantity of material to enable proper investigation and manipulation activities, [...] 

Little evidence of the type and quality of the enrichment material

• Chains, chewing sticks, balls..?
• Adverse effects on other aspects (contamination, heat stress...)

Inconsistently implemented in many Member States
Training tool to standardise understanding of the legislative requirements, as well as problems and solutions related to tail biting.

Initiatives for implementation

https://euwelnetpigtraining.org/

Tool-boxes for on farm use to assess:
- The functionality of the supplied manipulable material.
- The presence and strength of risk factors for tail biting.
  - Genetics
  - Nutrition
  - Climate
  - Health
  - Social competition
  - Lack of functional enrichment
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Stockmanship

Quality of stockmanship

Personality:
- How a person interacts with the environment
- Stable over time

Attitude:
- Is learnt
- Modified through experience and education

Behaviour

Fear

Animal Welfare and productivity

Hemsworth & Coleman, 1998
Pre-slaughter handling

Interaction between humans and animals during transport, lairage and moving to the point of stunning

- Fear (to human)
- Slipping and falling
- Pain
- Lesions
- Thermal stress
- Hunger and thirst

Welfare
Meat Quality
Good human-animal relationship

Training the personnel working with animals is probably the most cost-effective strategy to improve animal welfare and meat quality.

Training on:

- **Senses ability**
  - wide-angle vision
  - limited forward binocular vision
  - poor depth perception

- **Behavioural patterns**
  - social animals
  - prey species
  - flight zone / point of balance
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**Regulation 1099/2009**

**Article 5:** requires operators to carry out regular checks to ensure that animals do not present any signs of consciousness or sensibility.

**Article 16:** requires slaughterhouse operators to put in place and implement monitoring procedures.

- Toolbox of welfare indicators
- Outcomes of consciousness, unconsciousness and death
- Standard operating procedures (objectives, responsibilities, control measures, monitoring procedures, corrective actions and records)
Monitoring procedures at slaughterhouses

Toolbox of welfare indicators

- Head-only electrical stunning
- CO₂ stunning

Stunning → Shackling → Sticking → Bleeding → Death

UNCONSCIOUSNESS

key stage 1

key stage 2

key stage 3
Before shackling

**OUTCOMES OF UNCONSCIOUSNESS**
- relaxed body
- apnoea
- absence of corneal or palpebral reflex
- absence of vocalisations
- absence of response

**TOOLS**
- muscle tone
- breathing
- corneal or palpebral reflex
- vocalisations
- response to nose prick or ear pinch

**OUTCOMES OF CONSCIOUSNESS**
- righting reflex attempts to raise the head
- presence of breathing
- presence of corneal or palpebral reflex
- presence of vocalisations
- presence of response

**Key Stage 2 (during sticking):** check for outcomes of consciousness

**Risk of consciousness: apply intervention**
During sticking

Key Stage 2 (during sticking): check for outcomes of consciousness

OUTCOMES OF UNCONSCIOUSNESS
- relaxed body
- apnoea
- absence of vocalisations
- absence of corneal or palpebral reflex
- absence of response

TOOLBOX 5
- muscle tone
- breathing
- vocalisations
- corneal or palpebral reflex
- response to nose prick or ear pinch

OUTCOMES OF CONSCIOUSNESS
- righting reflex, attempts to raise the head
- presence of breathing
- presence of vocalisations
- presence of corneal or palpebral reflex
- presence of response

Risk of consciousness: apply intervention

Key Stage 3 (during bleeding): check for outcomes of consciousness
Key Stage 3 (during bleeding): check for outcomes of consciousness

OUTCOMES OF UNCONSCIOUSNESS
- relaxed body
- apnoea
- absence of corneal or palpebral reflex
- absence of vocalisations

OUTCOMES OF CONSCIOUSNESS
- righting reflex; attempts to raise the head
- presence of breathing
- presence of corneal or palpebral reflex
- presence of vocalisations

TOOLBOX 6
- muscle tone
- breathing
- corneal or palpebral reflex
- vocalisations

No risk of consciousness

Risk of consciousness: apply intervention
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Conclusions

• Animal welfare is an important pillar of sustainability in meat production.

• Intensive pig production increases efficiency in the use of available resources, productivity and food security.

• .... But might impair animal welfare.

• Training of stockpeople is one of the most cost-effective strategies to improve animal welfare.
Future Research

• The benefits of loose house systems, taking into account both the piglet survival and the sow health and welfare.

• Short and long term consequences of large litter size.

• The minimum requirement for manipulable material to express exploratory behaviour to eliminate the need of tail docking.

• Strategies to reduce pre-slaughter stress.

• Implementation of standard monitoring procedures to detect signs of consciousness after stunning, before sticking and during bleeding until death occurs.
Thanks for your attention!

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