Mutilation procedures: welfare implications and new strategies

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SRUC
Content

Directive 2008/120/EC

Painful operations in animals

• Castration
  - New strategies

• Tail Docking
  - New strategies
The relevant European context

minimum standards for the protection of pigs

Scope
Minimum standards apply to all categories of pigs kept for rearing and fattening:

• Piglets (from birth to weaning)
• Weaned piglets (from weaning to 10 weeks old)
• Fatteners (more than 10 weeks old), sows and gilts, boars.

Painful operations on animals

A veterinarian or “carer”, trained in aspects relating to animal welfare is authorised to carry out the following:

• Reduction of piglets’ corner teeth
• Docking of tails*
• Castration of males*
• Nose-ringing in outdoor husbandry systems.

* before 7th day of life (or after this age if carried out by a veterinarian and under anaesthesia and with additional prolonged analgesia)

Paragraph 8 of Chapter 1 of Annex I

Neither tail-docking nor reduction of corner teeth must be carried out routinely

- only where there is evidence that injuries to sows’ teats or to other pigs’ ears or tails have occurred.

Before carrying out these procedures,

- other measures shall be taken to prevent tail-biting and other vices, taking into account environment and stocking densities.

- Inadequate environmental conditions or management systems must be changed.

Implications for Animal Welfare

• Tail-docking, tooth clipping and tooth grinding are likely to cause immediate pain, and some prolonged pain to pigs.

• Physical castration is likely to immediate pain and some prolonged pain which is worse if there is tearing of the tissues.

• These practices are detrimental to the welfare of pigs, especially when carried out by incompetent and inexperienced persons.
Surgical castration

80% of male piglets (100 million) are castrated in the EU each year (PIGCAS 2008).

- Reduce aggression and sexual activity
- Prevent “boar taint”

An unpleasant taint (odour, taste and flavour) perceived in pork and pork products during cooking and eating.

Source: S. Edwards
Boar taint

**Androstenone**
- male sex pheromone
- Produced in Leydig cells in testes
- Accumulates in adipose tissue
- Secreted in urine and saliva

**Skatole**
- Dietary tryptophan breakdown product
- Produced by bacteria in large intestine
- Accumulates in adipose tissue
- Excreted in urine

*In the absence of normal functioning testes, boar taint is virtually eliminated*
Surgical castration

The most common type of castration procedure performed in the EU (79% of male pigs – EU27)

Procedure

1) Incision of the scrotum
2) Cut/tear of spermatic cord

Welfare implications: (EFSA 2004)

• Induces physiological and behavioural reactions indicative of pain.

Adapted from Prunier et al 2005
Surgical castration

Physiological indicators of pain

- Immediate activation of adrenal and sympathetic axis
- Increase in heart rate

Adapted from Prunier et al 2005
Surgical castration

Immediate pain-related behavioural indicators

- High frequency vocalisations
- Increased physical resistance to movement

Adapted from Marx et al 2003
After surgical castration

Post surgical pain can last for 5 days

Behavioural alterations

- Less activity and locomotion
- More trembling and spasms
- Huddling up
- Scratching and rubbing of the rump
- Avoidance of litter mates (e.g. isolation /desynchronised behaviours)

- Immunosuppressive effect of castration?

*Hay et al. 2003*
Alternatives to Surgical castration

• Surgical castration with anaesthesia/analgesia

• Production of entire males
  - slaughtering at a younger age

• Immunocastration

• Sperm sorting
Surgical castration (with anaesthesia/analgesia)

EU Aim – voluntary end of surgical castration of pigs in Europe by Jan 2018 (EFSA, 2004)

First step (from Jan 2012)
• Castration should be performed with prolonged analgesia and/or anaesthesia.

Local anaesthesia

• Injection of lidocaine into the testis and/or spermatic cord
• Reduces acute pain
• Less stressful (reduced cortisol/ACTH) post-castration
Surgical castration (with anaesthesia/analgesia)

2) General anaesthesia

**Injection:** ketamine/azaperone + meloxicam (Schmidt et al., 2012)
- Reduction in post-castration pain
- May impair short-term suckling behaviour

**Inhalation:** Isoflurane + meloxicam (Shultz et al., 2007)
- Reduces castration pain.
- Long periods of sedation increased risk of death by hypothermia and crushing

Currently no validated protocols in EU for:
- Use of long-lasting analgesics which could be applied to commercial herds
- GA for pigs undergoing castration in commercial farms.
### Production of entire males

- Castration is not normally carried out in Ireland and UK
- Slaughter at less than 100 kg (before sexual maturity)

<table>
<thead>
<tr>
<th>Advantages</th>
<th>Disadvantages</th>
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</thead>
<tbody>
<tr>
<td>Greater alimentary efficiency</td>
<td>Increased aggression/mounting</td>
</tr>
<tr>
<td>Leaner carcasses</td>
<td>More carcass damage</td>
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<tr>
<td>Increased PUFA content</td>
<td>Greater incidence of DFD meat</td>
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<td>Lower nitrogen excretion</td>
<td>Lower profitability</td>
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<tr>
<td>Lower production costs</td>
<td>Increase incidence of boar taint</td>
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</table>
Production of entire males

Management of boar taint (pre-slaughter)

- **Slaughter at lower weight**
  - Risk reduced but not completely removed

- **Housing**
  - Skatole from soiled floors absorbed through skin

- **Nutrition**
  - High energy feed increases risk

- **Genetics**
  - Both factors have medium to high heritability
  - Genetic markers
  - Delay sexual maturity
Production of entire males

Control of Boar taint (post-slaughter)

- Sensor array based detection systems—“electronic-noses”
  - Still in developmental stages

- Laboratory based assays for androstenone and skatole
  - ELISA/Colorimetry: inconsistent/time consuming/costly

Presently no method available for assessing boar taint on the slaughter line
Immunocastration Vaccine (e.g. Improvac)

Immunization of young male pigs against gonadotropin releasing factor (GnRF)

- Antibodies neutralize the GnRF
- Block the release of sex hormones
- Causes testicular atrophy
- Reduction in compounds associated with boar taint

Source: Ulla Schmidt

Source: A. Velarde
Spermatic selection

Sexing of spermatozoids

• Producing only females

• Flow cytometry
  - Detection and sorting of spermatozoids
  - Difference in size of DNA of X and Y chromosomes.
Tail docking

Prevent injury and production losses associated with the abnormal behaviour of tail biting

- Tail docking must not be carried out routinely
  - Only where evidence of injuries
  - Before resorting to TD, other measures shall be taken to prevent tail biting
  - Inadequate environmental conditions/management system must be changed

Over 95% of pigs are still being tail docked in the EU (EFSA, 2007)
Tail docking

Welfare implications

Acute responses indicative of pain

- Tail flicking (multi-directional)
- Tail jamming (clamping tail stump between hind limbs)
- High frequency vocalisations

Source: D. Sandercock
Tail docking

Welfare implications

Long-term pain?

• Prolonged pain from traumatic neuroma formation in tail stump?

EU FareWellDock project – Jan 2014

• Traumatic neuromas
• Functional nerve studies
• Nociceptive thresholds
• Peripheral/spinal neuronal changes – gene/protein expression

Source: D. Sandercock
Tail biting

Exploratory behaviour

• In natural conditions pigs spend up to 50% of time performing exploratory behaviours

In some indoor systems

• Pens with concrete or slatted floors restrict ability to perform foraging behaviour

• This can lead to redirected exploratory behaviour that leads to tail biting

• The aetiology of tail biting is complex and multi-factorial
Tail biting – risk factors

Redirected exploratory behaviour

Absence of straw or similar substrate

Redirected behaviour (initial phase)

- Slatted flooring
- Competition for feed
- High stocking density
- High temperature

- Dietary deficiency of essential amino acids
- Imitation
- Inadequate ventilation

SERIOUS TAIL BITING
Before carrying out tail docking

• Provide permanent access to a sufficient quantity of material to enable proper investigation and manipulation activities
  • straw, hay, wood, sawdust, mushroom compost, peat

• Review the composition of the feed

• Review environmental conditions

• Separate out animals with existing tail wounds
Thank you for your attention

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