



Better Training for Safer Food *Initiative*

Training course on "Animal Welfare in pig production"

Mutilation procedures: welfare implications and new strategies

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Herning, Denmark, 12-15 May, 2014

Content

Directive 2008/120/EC

Painful operations in animals

- **Castration**
 - New strategies
- **Tail Docking**
 - New strategies

B T S F

The relevant European context

Council Directive 2008/120/EC

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.

Council Directive 2008/120/EC

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)**

Council Directive 2008/120/EC

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.

Council Directive 2008/120/EC

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

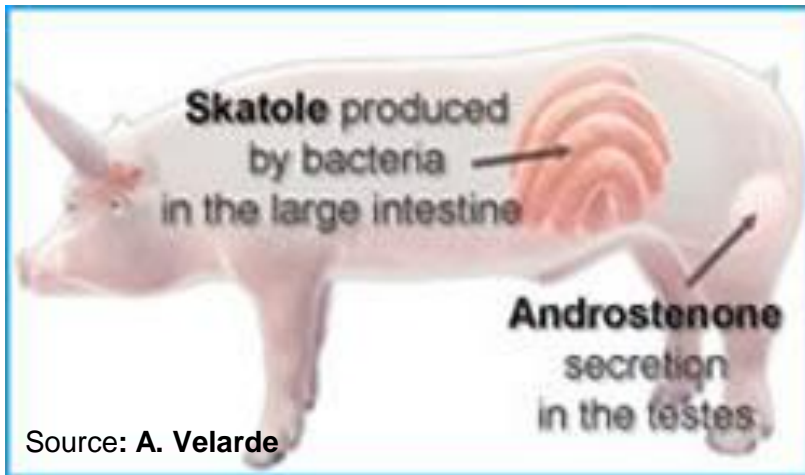


80% of male piglets (100 million) are castrated in the EU each year (PIGCAS 2008).

- 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.

Boar taint



Androstenone

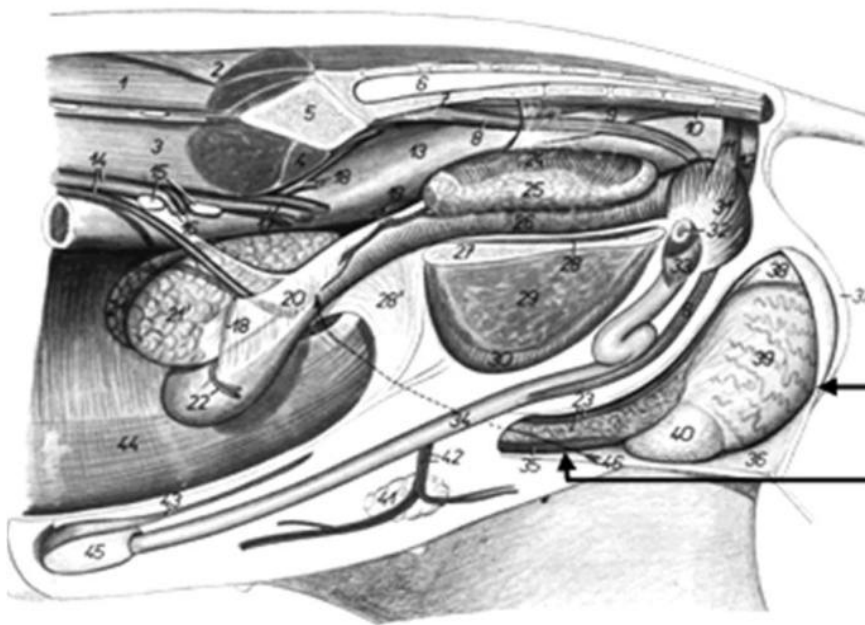
- male sex pheromone
- Produced in Leydig cells in testes
- Accumulates in adipose tissue
- Secreted in urine and saliva

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



Adapted from Prunier et al 2005

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

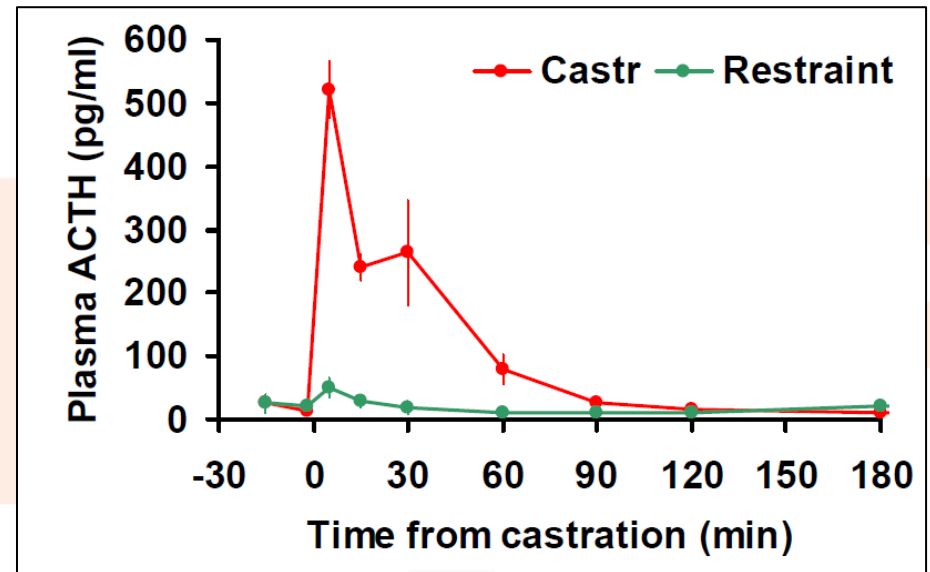
Welfare implications: (EFSA 2004)

- Induces physiological and behavioural reactions indicative of pain.

Surgical castration

Physiological indicators of pain

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

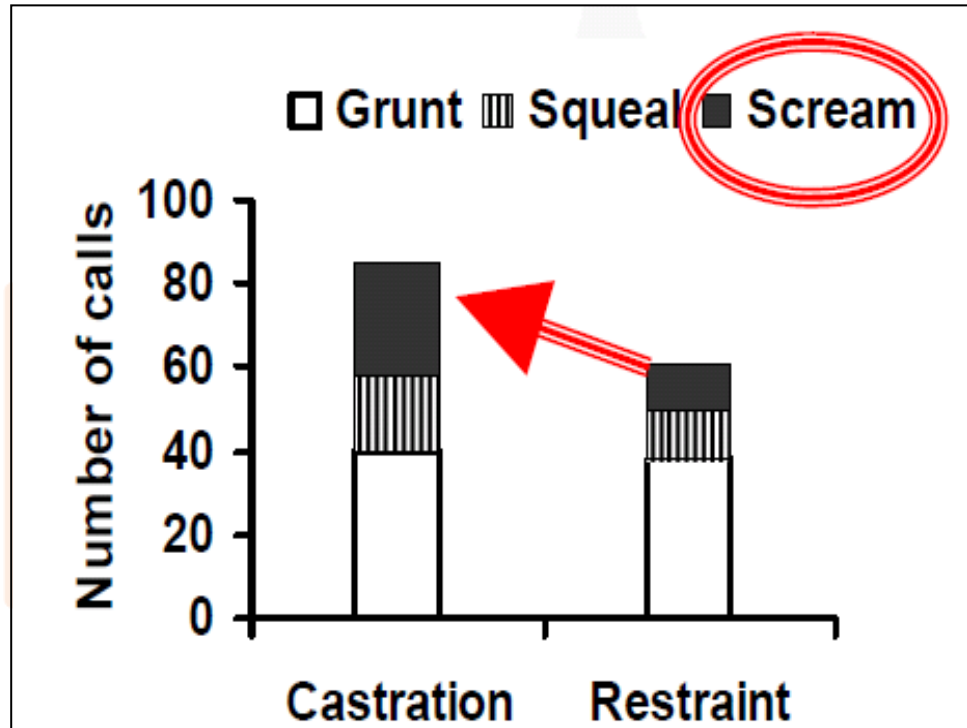


Adapted from Prunier et al 2005

Surgical castration

Immediate pain-related behavioural indicators

- High frequency vocalisations
- Increased physical resistance to movement



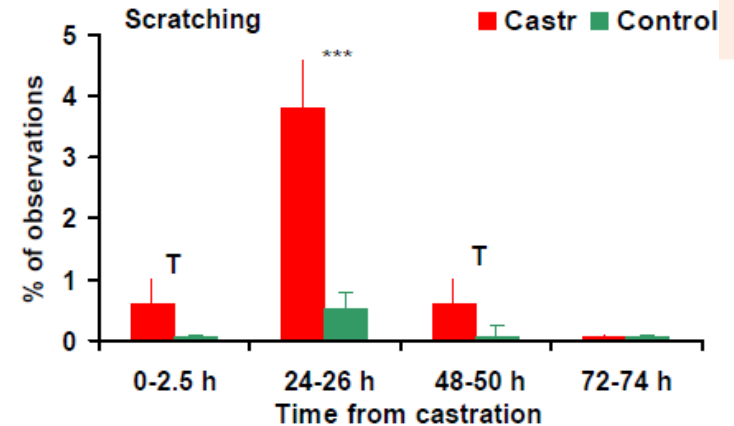
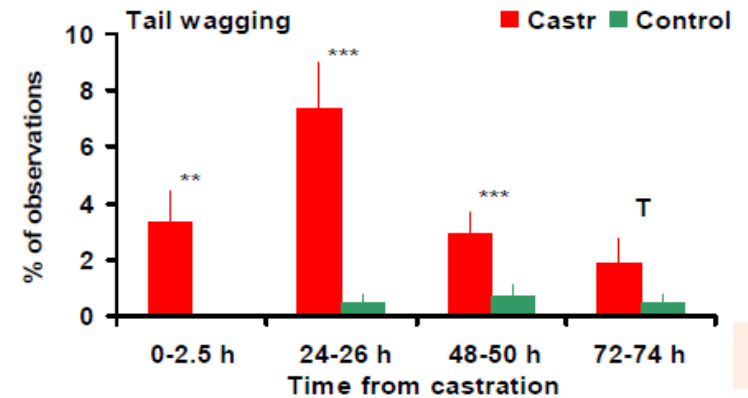
Adapted from Marx et al 2003

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**

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Surgical castration (with anaesthesia/analgesia)

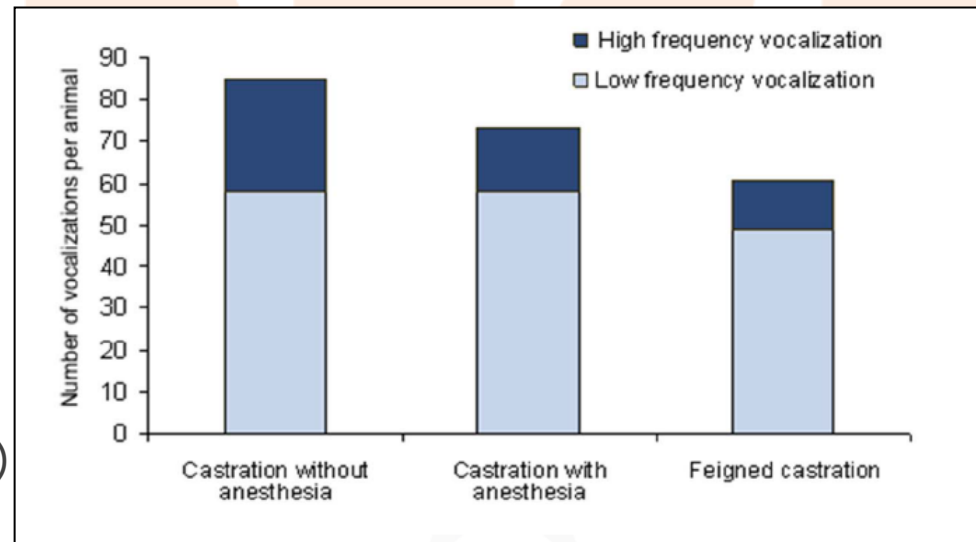
EU Aim – voluntary end of surgical castration of pigs in Europe by Jan 2018 (EFSA, 2004)

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)**

Advantages	Disadvantages
Greater alimentary efficiency	Increased aggression/mounting
Leaner carcasses	More carcass damage
Increased PUFA content	Greater incidence of DFD meat
Lower nitrogen excretion	Lower profitability
Lower production costs	Increase incidence of boar taint

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)

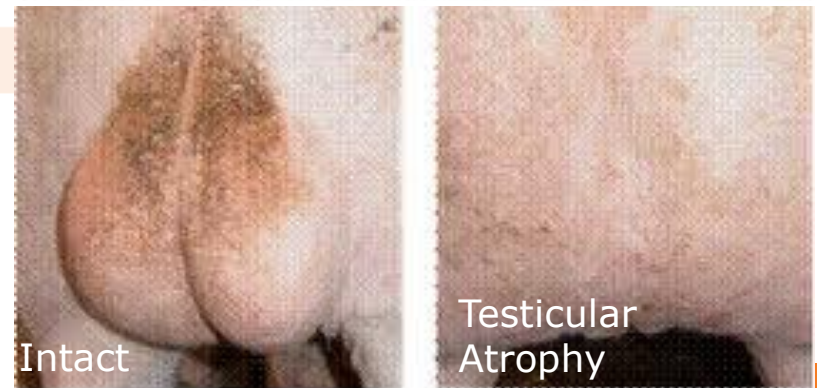
- **Sensor array based detection systems– “electronic-noses”**
 - Still in developmental stages
- **Laboratory based assays for androstenone and skatole**
 - ELISA/Colorimetry: inconsistent/time consuming/costly

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



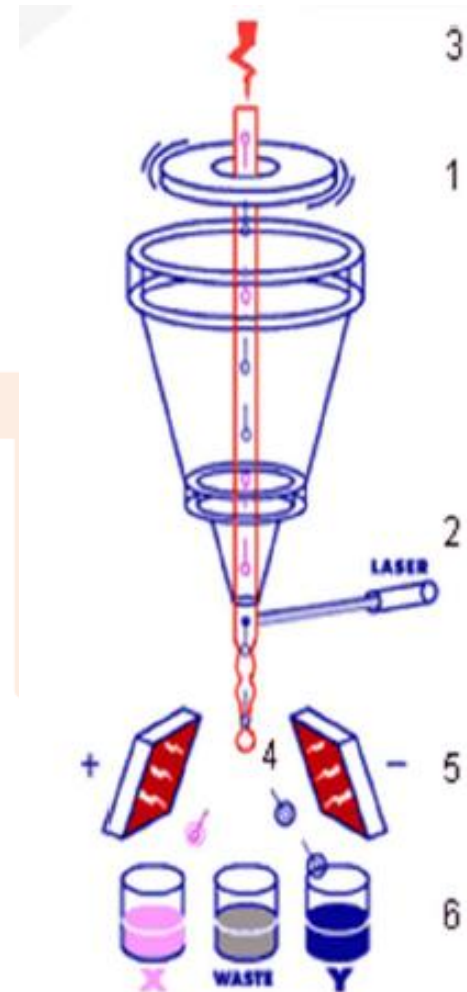
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Spermatic selection

Sexing of spermatozoids

- **Producing only females**
- **Flow cytometry**
 - Detection and sorting of spermatozoids
 - Difference in size of DNA of X and Y chromosomes.

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Tail docking



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

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

Tail docking

Welfare implications

Acute responses indicative of pain

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

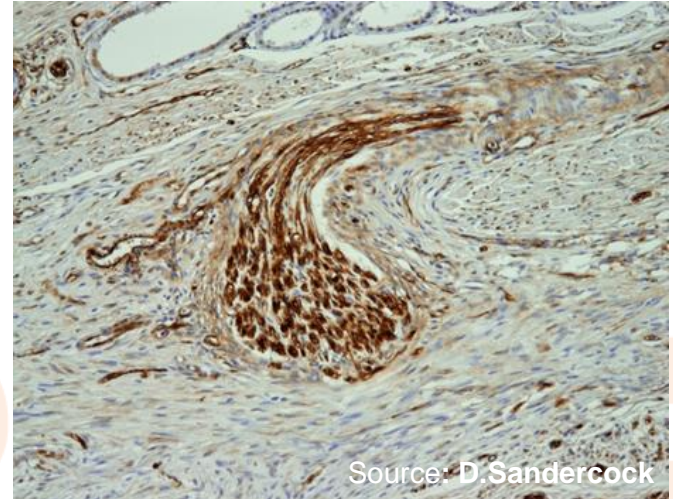


Tail docking

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



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**



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Thank you for your attention

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