Technical parameters of head-only electrical stunning of pigs – verifying under commercial conditions

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Introduction

The EFSA Journal (2004), 45, 1-29, Welfare aspects of the main systems of stunning and killing the main commercial species of animals:

4.2.3. High research priorities

The technical reference data for head-only electrical stunning of pigs such as 1.3 A are either rather old or worked out under experimental laboratory conditions. There is a need to verify these data under commercial conditions.
Questions

• What current is needed for effective stunning in practice?
• Is it any correlation between impedance of head and effectiveness of stunning?
• Is it any correlation between live weight and impedance of head?
Material and method

• Measures at 4 slaughterhouses
  – at least on two different days in each
• 145 pigs
  – Fatteners
  – 30 – 150 kg (85% is between 90 and 130 kilos)
Device
Recorded data

- individual live weight (kg) before stunning
- current (A) during stunning (measured with the device placed in the circuit)
- voltage (V) during stunning (measured with the device placed in the circuit)
- current duration (seconds)
- effectiveness of stunning (5 criteria, 4 of them must be recognised for effective stunning)
Effectiveness of stunning
immediate collapse
Effectiveness of stunning

immediate onset of tonic seizure lasting several seconds followed by clonic seizure
Effectiveness of stunning

immediate apnoea
Effectiveness of stunning
upward rotation of eyes
Effectiveness of stunning
abscence of response to nose prick
Results

• Effectiveness: **88,3% (128 cases out of 145)**

• Effectiveness under 1,3 A: **84,7%**

• Effectiveness at least at 1,3 A: **91,8%**

• Effectiveness with low voltage (<220 V): **89,6%**

• Effectiveness with high voltage (≥220 V): **87,2%**
Results

• Effectiveness if current duration was less than 8 seconds: 73.9%
• Effectiveness if current duration was at least 8 seconds: 89.3%
Results

• Impedance of head under 100 kilos:
  – 30 pigs, on average 120 Ω

• Impedance of head of pigs to scale at least 100 kilos:
  – 115 pigs, on average 170 Ω
Conclusions

• No significant correlation is between current or voltage and effectiveness
• Correlation between live weight and impedance of head is proved
• Longer current duration can lead to more effective stunning even if voltage is variable
Conclusions

- Establishing **one single electrical parameter** (e.g. 1.3 A) as indicator of good stunning **is not acceptable** from animal welfare point of view
- Checking **animal based indicators** are most valid to assess effectiveness of stunning than preset parameters in legislation
Thank you for your kind attention...

...and have a pleasant trip home!