

DUTCH RESEARCH ON STUNNING OF SLAUGHTER ANIMALS

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INTRODUCTION

In the Netherlands it was felt that the stunning procedures in the mid seventies were out of date. Especially in the rapid developing pig slaughteries. Not only the need for more efficiency in the slaughter process, but also the evidence that stunning was not synonymous with unconsciousness started research in this field.

RESEARCH

The daily practice of pig stunning could be divided in:

- mechanical stunning by way of captive bolt methods
- electrical stunning mostly by tongues
- stunning by way of carbondioxide.

The already mentioned need for more efficiency in larger slaughter-houses favoured the electrical stunning because of the quick effect. This means that the number of animals per hour which have to be stunned are hardly limiting. Further advantages are that electricity is *not costly* and *everywhere available*.

Captive bolt stunning is also effective, but requires more labour input.

Carbondioxide stunning is not very quick and therefore limits the number of animals per hour.

Electrical stunning

Pigs. Our investigations have been mainly focussed on electrical stunning. Effective stunning was defined as the induction of a generalised epileptic insult within one second through electrical current application. The EEG was registered. Variables of investigations were:

- the placing of the tongues on the head of the animal
- the pressure applied on the tongues
- the time of current flow
- the current level
- the period of unconsciousness.

Results. The most practical positioning of the tongues was found to be the so-called ear/ear location, which means that both tongues were put just below the earbase. In that position a current level (50 Hz) which guarantees an immediate stunning in at least 90 % of the pigs is 1.07 A. The 95 % confidence interval for this current level lies between 0.95 and 1.20 A. The minimal span of unconsciousness after an effective stunning was 32 seconds (average of 66 seconds).

Furthermore, it was found that after proper sticking electro-celebral inactivity as the consequence of blood loss sets in within 20 seconds. As a result of these investigations it is common practice now that pigs are stunned in a set up of a restrainer in which the animals are mechanically brought to the stunners who use tongue equipment or a modified Electro Sting with 300 till 500 V, respectively.

Based on this last set up equipment has been developed in which the animals are stunned automatically. The electrodes (700 V) at the end of the restrainer are so positioned that no animal can escape the contact, which means that immediate stunning follows.

Calves. The same methods of investigation have been used on calves partly because the rather costly mechanical captive bolt stunning asks for alternative methods.

Although an epileptic insult could be induced the period of unconsciousness happened to be 21 seconds minimal (41 seconds on the average) which is rather short for exsanguination. The so-called 90 % point was reached at 0.87 A with the eye to ear position of the tongues at 100 V.

The solution for electrical stunning of veal might be to evoke additionally to an epileptic insult a heart fibrillation by placing one of the stunning electrodes half-way on the neck. This would mean a kind of electro-cution.

Sheep. As with veal the same methods used on sheep gave some different results from those of pigs. With the eye to ear position of the tongues the 90 % point was found at 0.32 A with 100 V. The EEG showed a prolonged state of narcosis. However, they still react on pain stimuli.

Handling of sheep is easier than handling of calves (200 kg), but the electrical resistance is higher because of the wool. The shortest epileptic insult lasts only 21 seconds. Induction of heart fibrillation seems to be the solution as it was suggested with calves.

Carbondioxide

It was found that before the state of unconsciousness (registered by EEG recording) is reached carbondioxide (70 vol.%) gets the animals in a state of extreme excitation. Although this lasts only a short span of time in our opinion it cannot be tolerated from the animal point of view.

CONCLUSIONS

From recent investigations a better insight in the effect of stunning on pigs, calves and sheep have been gained. More efficient and effective stunning, especially in pigs, were the result of this. With respect to stunning of calves and sheep a comparable improvement is underway.

REFERENCES

- HOENDERKEN, R. Elektrische bedwelling van slachtvarkens. Diss. Utrecht, 1978.
LAMBOUY, E. and W. SPANJAARD. Electrical stunning of veal calves. Submitted to Meat Science, 1980.