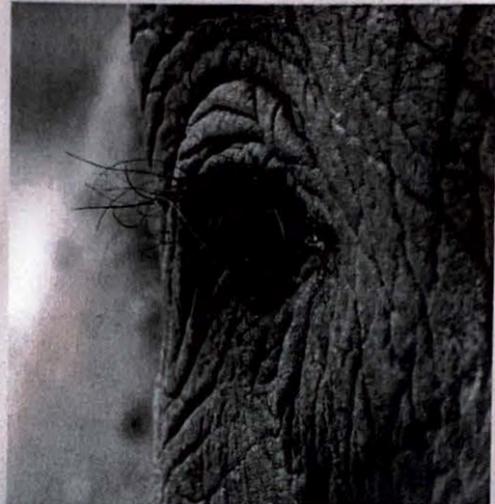




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## Improved pig welfare at slaughter – pigs' responses to air- or nitrogen foam.

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The most commonly used stunning method in commercial slaughter of pigs is carbon dioxide, which has been criticized for inducing pain and discomfort before stunning is completed. One potential alternative is nitrogen, reported to have less aversive effects. An innovative technique dispersing the nitrogen gas in soap foam bubbles resulted in 2.7 times quicker oxygen depletion than when only using free nitrogen gas. The objectives in this study were to assess the behavioural and physiological responses of pigs to air-filled and nitrogen-filled foam to discern if the pigs have negative aversions to the foam, and to map the stunning process when pigs are exposed to nitrogen-filled foam.

In the experiment pigs were exposed to either air-filled foam, nitrogen-filled foam or no foam (control). The experiment included 60 pigs (20 per treatment; 9 weeks old and  $27.8 \pm 3.4$  kg) and was conducted at SLU's pig research facilities. The results showed that using nitrogen-filled foam resulted in 2.7 times quicker oxygen reduction than when only using free nitrogen gas. The pigs did not show any strong aversive behaviours when exposed to the foam, regardless if it was air-filled or nitrogen-filled foam. However, they seemed to avoid putting their heads and snouts into the foam as the foam levels rose and the number of escape attempts through the top increased when the box was filled with foam. Physiological responses (e.g. increased heart and respiratory rate) was detected as the oxygen level decreased, which was expected. Mean time to loss of posture was 57.9 s., followed by vigorous convulsions which went over to more irregular, milder movements. Mean time to last observed convulsion was 131.2 s. Quality of stunning was checked five minutes after the start of the nitrogen foam production. The pigs were at that occasion recorded to be in deep unconsciousness or dead.