



# VIDEO SURVEILLANCE OF CO<sub>2</sub>-STUNNING OF FINISHING PIGS IN GROUPS

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## BACKGROUND

Some abattoirs occasionally experience problems with increased frequencies of muscle hemorrhages. Muscle hemorrhages can arise before or after the arrival to the abattoir. In an ongoing project, the aim is to optimize handling of finishing pigs from unloading to killing at the abattoir, reducing loss caused by injuries and improving animal welfare. In order to investigate the causal factors of muscle hemorrhages, it is essential that technical and animal-based welfare parameters can be monitored continuously during handling, stunning and killing.

## OBJECTIVE

To develop a simple concept that will make it possible to monitor and document mechanical handling and behaviour of pigs during and before CO<sub>2</sub>-stunning.

## MATERIAL AND METHODS

Three video cameras covered the front side of the push-hoist gates and the sliding wall in the driveway area (Fig. 1).

Two digital cameras were installed, one in each end of one of the six or seven boxes in a Back Loader stunning equipment (Fig. 2).

Technical parameters and video from two CO<sub>2</sub>-cameras showing live on a screen via a SCADA system (Fig. 3).

## RESULTS AND DISCUSSION

The setup was tested in three different slaughter lines, and enabled extended detailed integration and recording of technical and animal-based parameters under production conditions in a single user interface. A protocol for the registration of technical and measurable animal-based variables was developed.

### HANDLING IN DRIVEWAY:

- Pressure (magnitude and duration) was recorded and displayed for push-hoist gates, sliding division gates and sliding wall (Fig. 3).
- From corresponding video: Falling, lifting, pushing, and slipping was registered

### CO<sub>2</sub>-STUNNING:

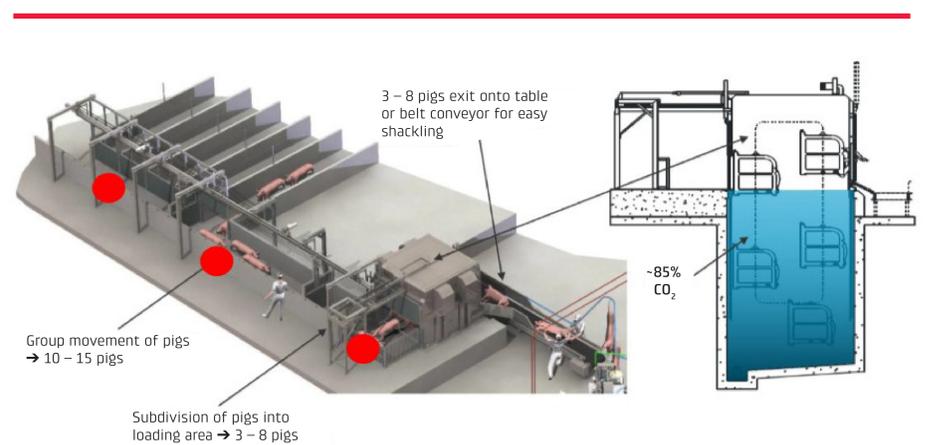
- CO<sub>2</sub>-concentration at floor level, at the first box stop and at the lowest box position
- From corresponding video:
  - Induction (movements before loss of consciousness)
  - Excitation (movements after loss of consciousness)
  - Latest box position where visible movements can be observed

## CONCLUSION

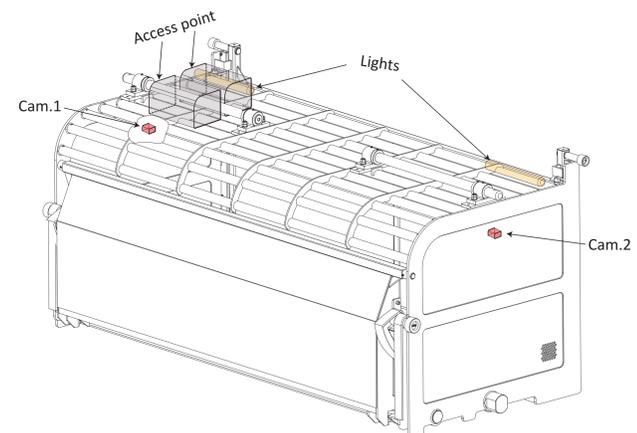
This setup is suitable for the continuous surveillance and for description and documentation of animal responses to relevant technical parameters during driving and CO<sub>2</sub>-stunning of finishing pigs in groups.

Furthermore, this setup can contribute to the investigation of whether, and in which way, incidents in the driveway (or handling from lairage to the driveway) influences the pigs during the following CO<sub>2</sub>-stunning process.

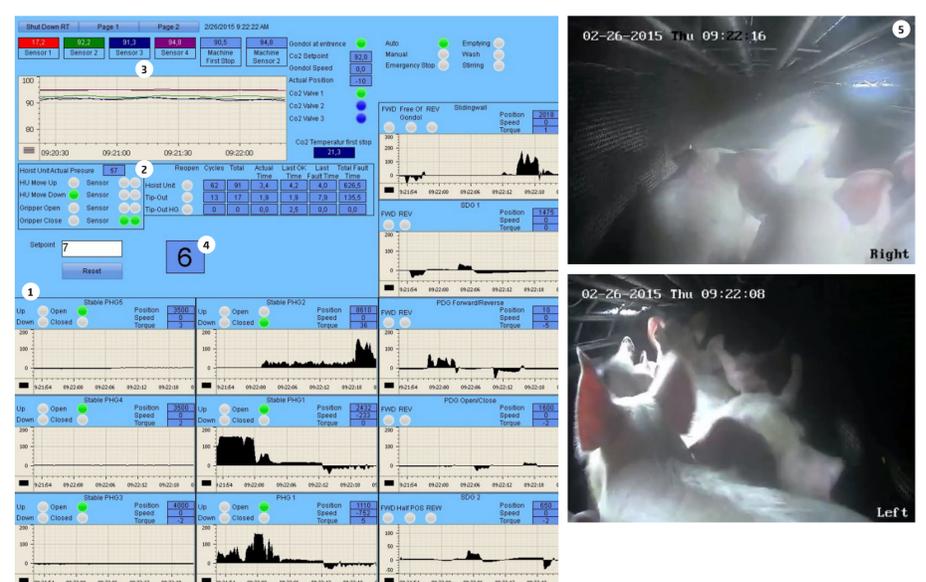
The surveillance tool can potentially become a valuable asset for the rapid detection of unintended incidents that should be addressed, in order to prevent injuries during handling before slaughter.



**Figure 1:** Process of driving and stunning finishing pigs in groups. Digital video cameras (red dots) were placed along the driveway, in order to survey handling and behavior in the driveway.



**Figure 2:** Lighting and placement of cameras for video surveillance of the stunning progress. Only one of the total of six or seven boxes in each CO<sub>2</sub> stunner was equipped with camera setting.



**Figure 3:** Screen dump from continuous monitoring of driveway parameters and the stunning process.

- 1: Gate pressure (kg) of stable push hoist gates (PHG1-5), Push hoist gate 1 (PHG1), the two sliding division gates (SDG 1 and 2), the push division gate (PDG open/close and forward/reverse), and the sliding wall that drive the pigs into the stunner.
- 2: Electronic surveillance of the box entrance gate performance.
- 3: CO<sub>2</sub> sensors at the lowest position: Machine sensor 2 and Sensor 4, at position 6 (first position after entrance): Machine first stop, sensor 2 and 3, and at the floor level: Sensor 1.
- 4: Box position: 7= entrance, 6= first stop, 1=tip out.
- 5: Camera surveillance of the stunning process, here at position 6 (first stop).



## CONTACT

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