



Documentation of animal welfare of pigs on the day of slaughter

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Introduction

Animal welfare on the day of slaughter has become an important factor caused by demands from authorities and NGO's as well as the retail market. If claiming a high level of animal welfare, it is necessary to document that this has actually been fulfilled. A continuous monitoring of a few well-chosen indicators of animal welfare would therefore be of interest for the slaughterhouses, if they are cost effective and can be implemented without altering slaughter speed.

Aim

The aim of this study was to evaluate different indicators for animal welfare in two commercial settings to pin point measures that might be possible to implement as on-line measurements of animal welfare.

Materials and methods

Experiment 1 was at a medium size slaughterhouse without automatic handling of the pigs (n=240 pigs). Behaviour was observed from off-loading to stunning. Post mortem (pm) blood temperature, pH and temperature in the loin 5 and 45 min and 22 hour pm, drip loss and skin damage were measured.

Experiment 2 was at a larger slaughterhouse with automatic handling of the pigs from lairage to stunner (n=80 pigs). Behaviour was observed from the producer to stunning. PM, the following was measured: blood temperature, temperature in the loin 5 and 45 min pm, blood concentration of lactate, creatine kinase (CK), glucose and skin damage.

Data analysis

A PLSR analysis was performed using the post mortem measurements as X-matrice and the pre mortem behaviour as Y matrice.

A stress index was calculated combining the stressful incidents and subtracting the positive incidence

Results

In both experiments, the PLSR analysis showed that animal behaviour is situated in the same half of the plot, indicating that the negative behaviour patterns are more or less correlated (Figure 1 and 2). The behaviour is correlated with the early post mortem temperatures (T_{blood} , T_0 and T_{45}) and pH_{22} in both experiments, indicating that a high score on the behavioural patterns, indicating a negative animal welfare just before stunning, results in a high temperature early post mortem and a high ultimate pH.

In experiment 1, a significant effect of the stress index was seen on temperature immediately after sticking in the LD ($P=0.007$) and a tendency in the blood ($P=0.010$) and also of pH_{45} ($P=0.08$).

In experiment 2, a tendency was seen between the behaviour during lairage and T_{45} ($P=0.06$), but no regressions were seen between the behaviour just before the stunner and the pH and temperature. However, there was an effect of behaviour close to the stunner on the concentration of glucose ($P=0.02$) and a tendency to an effect on the concentration of lactate of both behaviour close to the stunner ($P=0.10$) and during lairage ($P=0.08$).

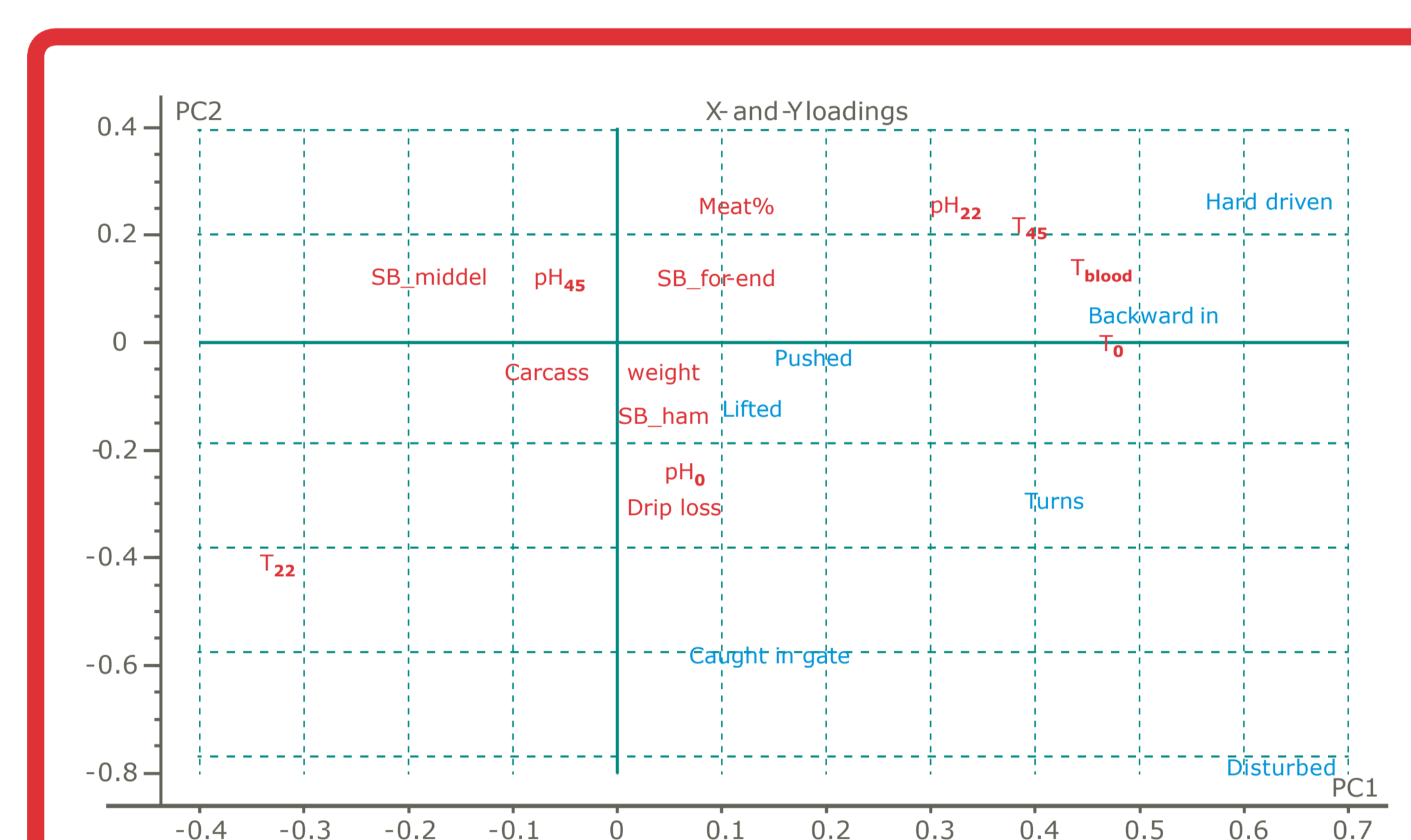


Figure 1. PLSR loading plot from experiment 1 of measures post mortem (X-matrice) and behaviour pre mortem (Y-matrice)

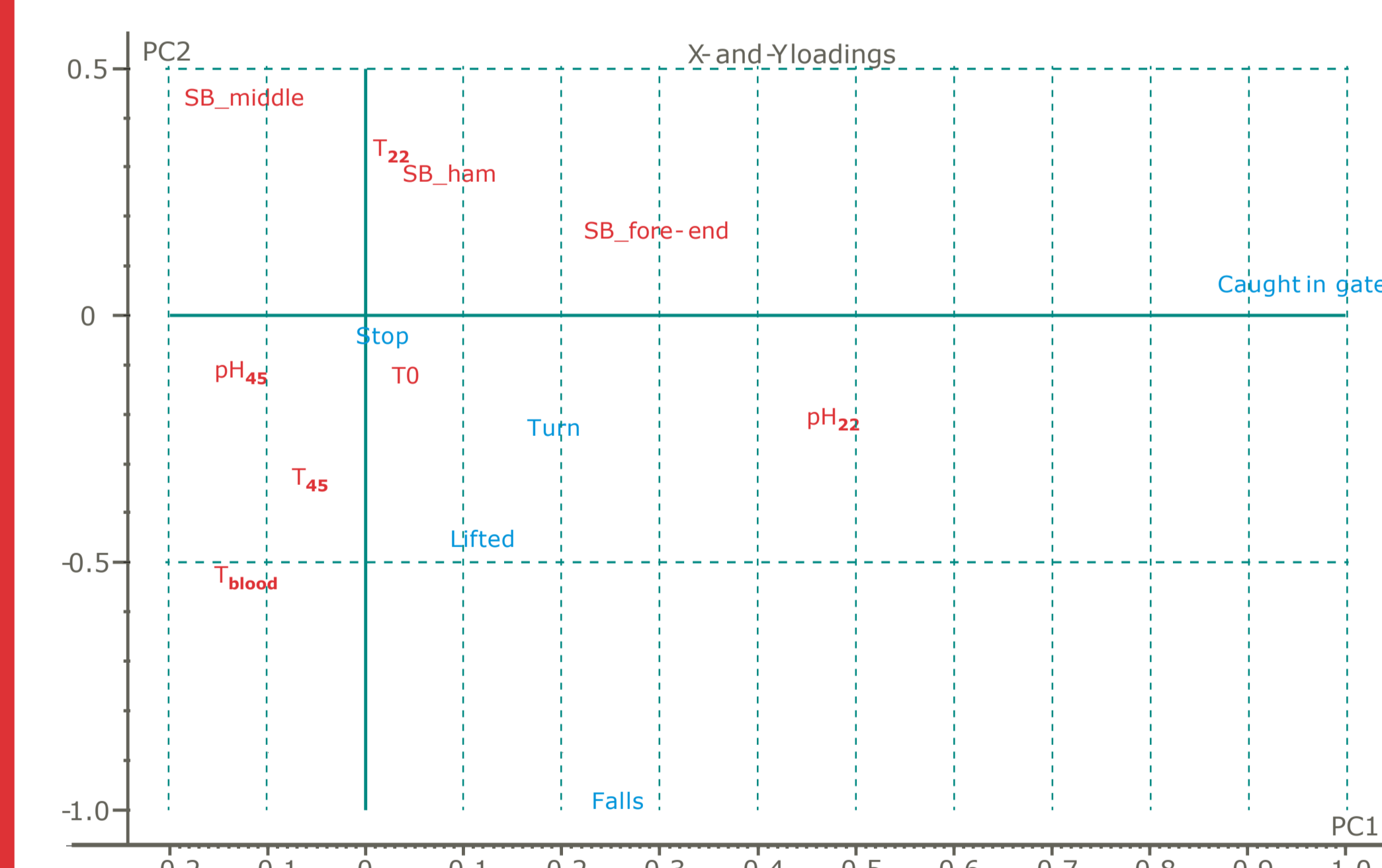


Figure 2. PLSR loading plot from experiment 2 of measures post mortem (X-matrice) and behaviour and handling pre mortem (Y-matrice)

Conclusion

The two experiments have indicated that temperature immediately after sticking and the concentration of lactate and glucose in the blood combined with skin damage might be relevant parameters for documenting animal welfare on the day of slaughtering. This has to be further investigated in future studies.

