

## MONITORING THE HEALTH OF FATTENING PIGS AT SLAUGHTER: INVESTIGATIONS ON A HERD CUT-OFF FOR HAPTOGLOBIN CONCENTRATION IN MEAT JUICE

Van den Berg A, Danuser J, Regula G

*Swiss Federal Veterinary Office, Schwarzenburgstrasse 161, Switzerland*

### Introduction

The presence of a large number of animals with an acute phase response within a slaughter group can indicate acute or chronic health problems within a herd. Testing haptoglobin concentration in meat juice may therefore be a useful screening test to assess animal health and welfare status of a herd at slaughter. Our aim was to investigate the association between clinical findings at the abattoir and haptoglobin concentrations in meat juice on a herd level. In addition, we explored the ability of a herd test based on different cut-off levels for haptoglobin concentrations to identify herds with clinical health problems.

### Materials and Methods

In a cross-sectional study at two larger abattoirs in Switzerland, 107 groups of slaughter pigs were examined. At the ante-mortem examination, the percentage of pigs with clinical signs (lameness, peritarsitis, tail biting, othaematomas and injuries or abscesses) per slaughter group was determined. From an average of 20 pigs per slaughter group, a post-mortem examination was done at which alterations of lungs, livers, hearts, and carcasses were recorded. Meat samples of the neck were taken from an average of 20 pigs per slaughter group, in total 2192 samples. Meat juice was obtained by freezing and thawing of the meat samples. Meat juice was single tested for haptoglobin concentration with RIDASCREEN® Haptoglobin from R-Biopharm.

The different health indicators (clinical signs and lesions) were screened for statistical association with haptoglobin concentration with the Mann-Whitney test. Variables with a p-value <0.05 were entered in multinomial logistic regression models. Herds were classified as positive or negative based on different cut-off values for haptoglobin.

### Results

Of all samples, the mean haptoglobin concentration was 0.15 mg/ml ( $s=0.25$ ), the median 0.06 mg/ml (25%tile=0.03, 75%tile=0.16). Pigs from groups in which tail biting, lameness, othaematomas, peritarsitis, abscesses, pneumonia, pleurisies, pericarditis or condemnations of livers, lungs or carcasses occurred, showed higher levels of haptoglobin than pigs from slaughter groups without any of these clinical signs ( $p<0.05$ ). A good agreement between presence of clinical signs and test for elevated haptoglobin concentration result was obtained when herds were classified as positive if at least 10% of the pigs had a haptoglobin concentration above 0.4 mg/ml meat juice. If a herd cut-off of 5% of pigs with a haptoglobin concentration above 0.6 mg/ml was chosen, similar results were obtained.

The multinomial logistic regression model for a cut-off of 0.4 mg/ml and a maximum of 10% of the pigs tested above the cut-off included the variables lameness (OR=2.8), tail biting (OR=2.7) and pneumonia (OR=2.1). The model with a cut-off of 0.6 mg/ml and a maximum of 5% animals above the cut-off identified the variables lameness (OR=3.1), tail biting (OR=2.5) and othaematomas (OR=6.2) as risk factors for positive herds. Both models correctly classified 66% of all slaughter groups according to the presence of clinical signs.

### Discussion

The associations which were observed between clinical signs observed at slaughter and haptoglobin concentration demonstrate a potential of measuring haptoglobin concentration in meat juice as a screening test to identify problem herds at slaughter. However, misclassification of herds is likely to occur for the following reasons. Many acute infections with an acute phase response do not result in clinical signs which can be observed at slaughter. On the other hand, clinical signs can remain visible after the acute phase response has terminated. As the current model classified 66% of the slaughter groups correctly, the test is not yet applicable in practice, and further investigations are needed