

THE ACUTE PHASE PROTEIN, HAPTOGLOBINE: A POTENTIAL PARAMETER IN WELFARE ASSESSMENT?

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Physiological parameters are important measures in animal welfare and health assessment. Cortisol, a frequently used parameter to assess (acute) stress in animals, has major disadvantages due to its rapid reactivity and decline and many influencing factors (i.e. diurnal rhythm, breed, sex and age). Acute phase proteins are potential alternative markers to assess stress in animals. A pilot study was conducted to investigate the response of plasma haptoglobin (HP) in pigs subjected to a stressor (repetitive food deprivation) and examine the relation between plasma HP and average daily growth (ADG).

Forty grower pigs (25.1 ± 4.4 kg, mean \pm SD) (sex and former pen mates balanced), were allocated to 4 conventional pens, 10 animals per pen (2 treatment, 2 control groups). The experiment lasted for 3 weeks: pre-stressor phase (day 1 to 7), stressor phase (day 8 to 14) and post-stressor phase (day 15 to 21). During the stressor phase, treatment groups were repeatedly subjected (day 8, 10, 12, 14) to an 8-hour food deprivation. Individual weights were collected twice per phase, blood was collected once per phase.

Mean levels of plasma HP of control and treatment groups showed large variation between individuals (control groups, stressor phase: 1.84 ± 3.11 mg/ml; treatment groups, stressor phase: 1.40 ± 1.16 mg/ml; control groups, post-stressor phase: 1.28 ± 0.70 mg/ml; treatment groups, post-stressor phase: 1.14 ± 0.84 mg/ml). No significant differences in HP levels were found between the control and treatment groups or between the different phases within the treatment groups. Significant negative correlations were found between ADG and HP (ADG and HP in pre-stressor phase: $r_s = -0.47$, $p=0.005$; ADG in stressor phase and HP in post-stressor phase: $r_s = -0.64$, $p=0.001$).

No differences in HP levels between treatment and control groups were shown. Possibly, food deprivation had no apparent stress eliciting effect. Large individual differences in HP levels could be detected. However, interesting correlations between the level of HP and ADG were found, corroborating the inverse relationship between the acute phase response and growth. Further research will be conducted using different (stronger) stressors and combining physiological data with behaviour.