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The relationship between food deprivation and blood glucose at induction of anaesthesia in juvenile pigs

Restricting food for 4 – 48 hours is recommended before general anaesthesia in pigs (Bradbury and Clutton, 2016). However, prolonged deprivation is stressful and may have adverse physiological effects including hypoglycaemia.

In this retrospective observational study, 28 juvenile [age 8 (5 – 11) weeks] female Landrace-cross pigs [18.5 (10 – 34) kg] were anaesthetised for an unrelated, experimental study. Time from food withdrawal until anaesthesia induction was recorded. Blood glucose (BG) was measured (AlphaTRAK, Zoetis) at induction of anaesthesia (isoflurane in oxygen), 10 minutes after pre-anaesthetic medication with intramuscular morphine (0.3 mg kg⁻¹), medetomidine (7 µg kg⁻¹), midazolam (0.3 mg kg⁻¹) and alfaxalone (2 mg kg⁻¹).

Hypoglycaemia [BG < 4.7 mmol L⁻¹ (Constable, 2017)] at induction was recorded in 1/16 (6%) pigs with food withhold < 4 hours, 3/8 (38%) pigs with food withhold 4-8 hours, and 4/4 (100%) pigs with food withhold > 8 hours (Fisher's Exact Test, two-sided, test statistic 12.9, $p < 0.001$). Median food withhold was 3.4 (0 – 19) hours. There was a strong correlation between duration of food withhold and BG at induction (Pearson, $r = -0.73$, 95% CI -0.87 – -0.49, $p < 0.0001$). Other than hypoglycaemia, no adverse events (vomiting, regurgitation, oral debris at tracheal intubation) were observed.

Duration of food deprivation is strongly correlated with BG at induction in female, juvenile pigs anaesthetised as described. Withholding food > 4 hours may lead to an unacceptably high incidence of hypoglycaemia at induction. Food withhold < 4 hours does not appear to be associated with additional adverse effects.

References

- Bradbury AG, Clutton RE (2016) Review of Practices Reported for Preoperative Food and Water Restriction of Laboratory Pigs (*Sus scrota*). *Journal of the American Association for Laboratory Animal Science* 55, 35-40.
- Constable P, Hinchcliff K, Done S et al. (2017) *Veterinary Medicine: a textbook of the diseases of cattle, horses, sheep, pigs and goats*. (11 edn), Elsevier, Edinburgh.