Glucose and glycogen levels in piglets that differ in birth weight and vitality

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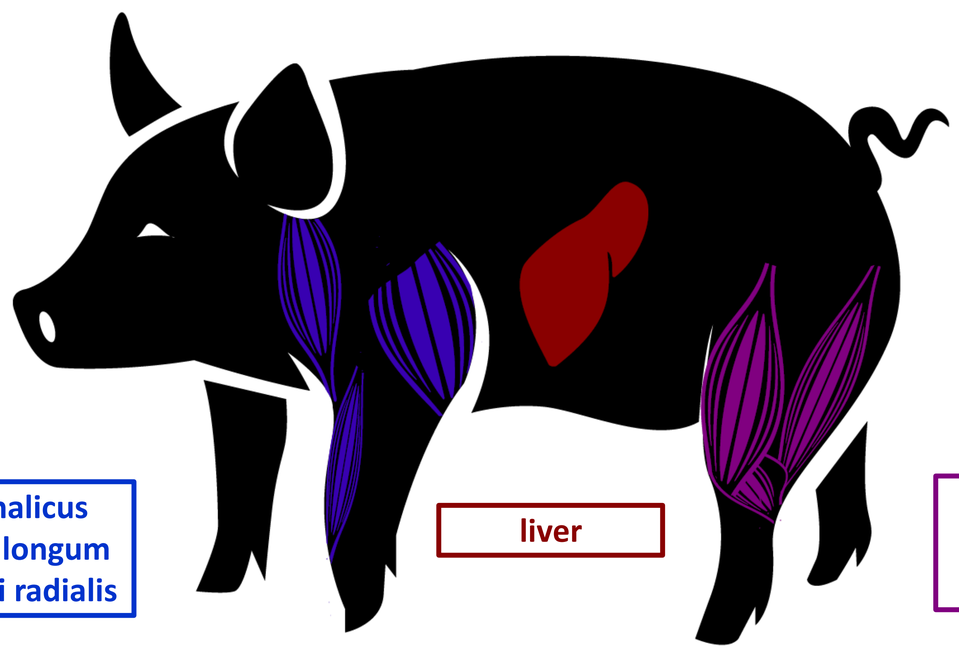
Introduction & Objectives

Intrauterine crowding greatly affects postnatal characteristics, such as piglet birth weight and vitality. In a previous study, we found that **piglets with a low birth weight/low vitality (L piglets) show a reduced motor performance**, compared to piglets with a normal birth weight/normal vitality (N piglets). A possible explanation is that L piglets **lack the energy** required to increase their motor performance to the level of that of N piglets. As such, the objective of this study was **to compare glucose and glycogen levels between L and N piglets during the first four days of life**.

Materials & Methods



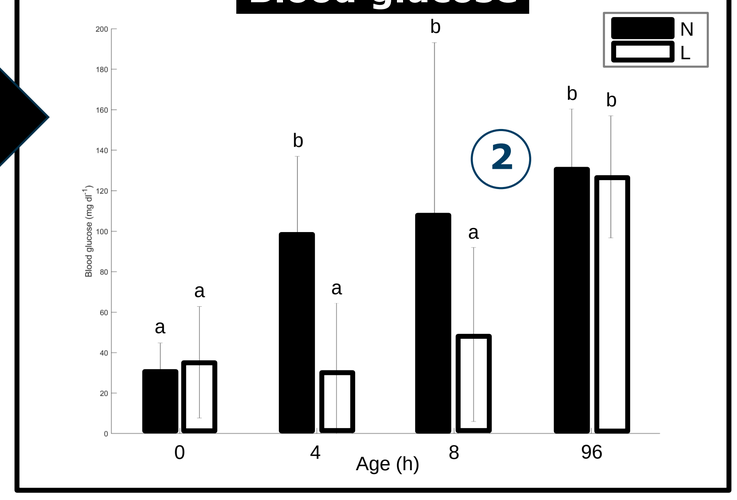
Glucometer

Glycogen determination
1. Add HCl at 100°C for 2 h to convert glycogen to glucose
2. Add Peroxidase-Glucose Oxidase (PGO) enzymes
3. Determine glucose concentration spectrophotometrically

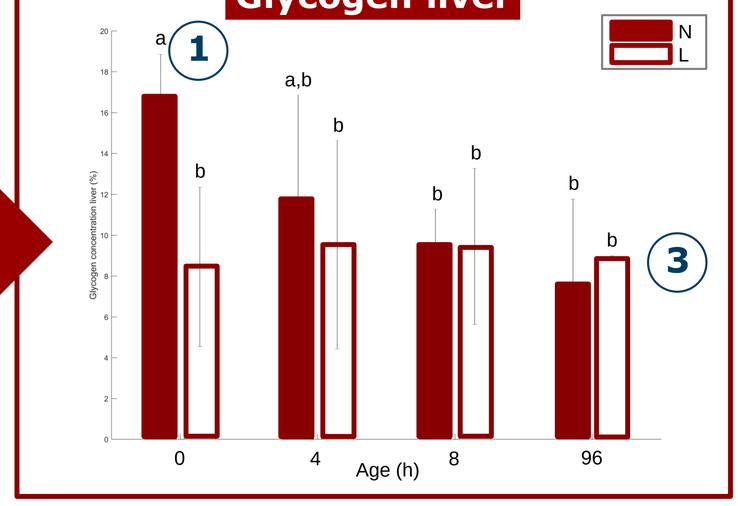
Protocol adapted from Theil et al. (2011)

Results

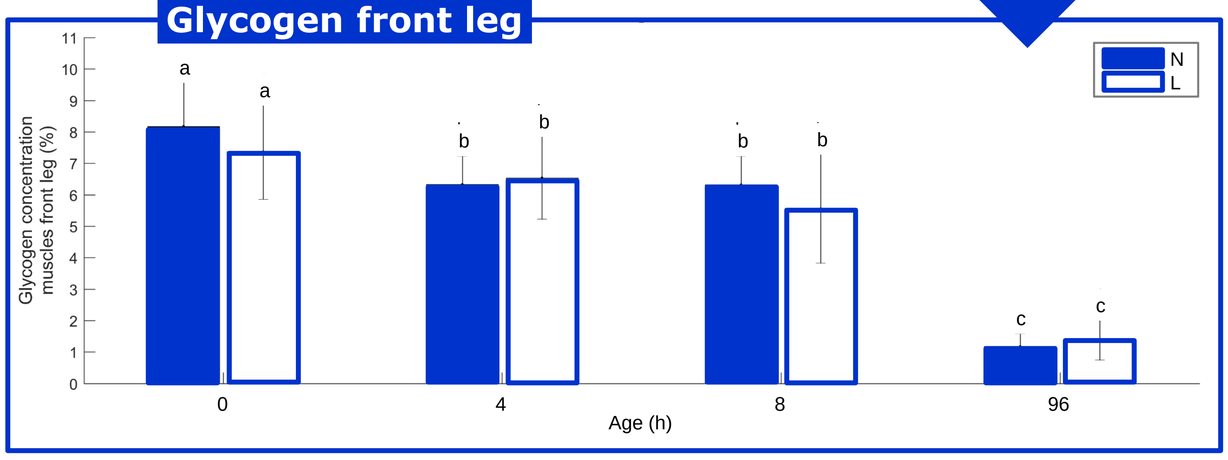
Blood glucose



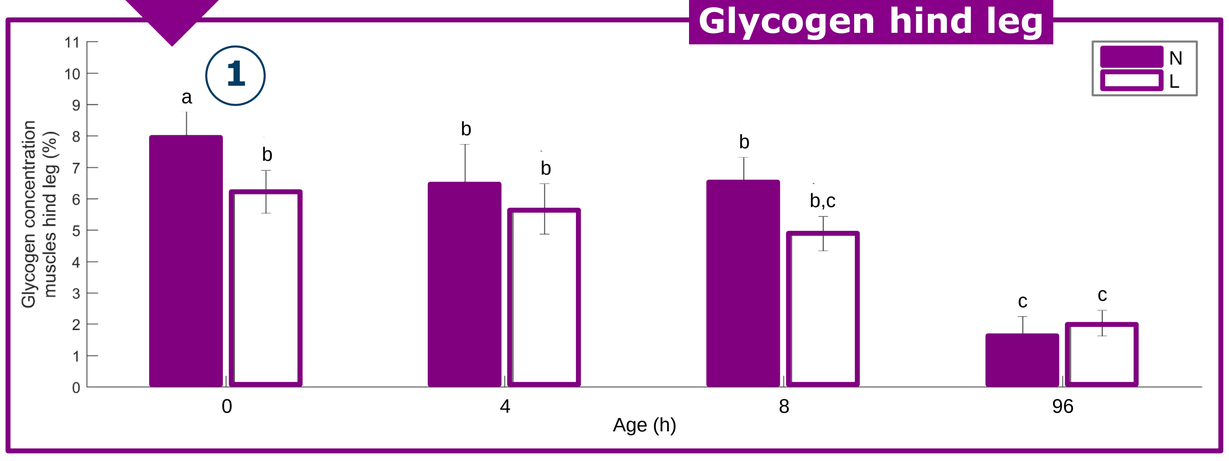
Glycogen liver



Glycogen front leg



Glycogen hind leg



n = 32. N = piglets with a normal birth weight/normal vitality; L = piglets with a low birth weight/low vitality. All values are mean ± SD. Significant differences (linear mixed models, $p \leq 0.05$) are indicated by different letters. Glycogen concentrations front and hind leg pooled for 3 muscles.

Conclusion

Based on our results**, lower glycogen concentrations at birth** (1), a **delayed increase in glucose** (2) and the **lower depletion of glycogen** (3) might negatively affect motor performance in L piglets. It is however hard to state with certainty whether the low mobilization of glycogen in L piglets is a consequence, rather than a cause of their lower motor performance.

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