Project Number & Title

1C-119: Brain-derived neurotrophic factor as an indicator of environmental enrichment effectiveness

Project Leader

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Project Participants

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Aims and Objectives

To investigate the changes in brain-derived neurotrophic factor (BDNF) depending on whether enrichment has been provided or not.
To investigate whether BDNF can be measured in saliva through ELISA, and its correlation with plasma and serum BDNF to determine the best sampling matrix.
To investigate the correlation between BDNF concentration changes and other behavioural measure (maze test).
To establish the variation in BDNF concentrations between various conditions (within individuals overtime, age effect).

Key Findings

Overall, serum BDNF concentration was higher in pigs provided with environmental enrichment, in the form of a foraging block, compared to pigs housed in a barren environment. The provision of enrichment early in life, before weaning, resulted in a more pronounced BDNF concentration increase than enrichment provided later in life, after weaning. BDNF concentration reduced as the pigs aged from 3 to 11 weeks of age. There was no correlation between BDNF and the performance of the pig in a maze test. BDNF could be reliably measured in serum, but we could not reliably measure BDNF in plasma and it was not detectable in saliva.

Application to Industry

Measuring BDNF in pig serum is a promising tool to assess the effect of providing pigs with environmental enrichment. However, further research is needed to determine whether various forms of enrichment are more or less effective, and to link changes/differences in BDNF to other indicators of improved pig welfare.