

### **3B-103: A metabolomic analysis of the acute response to meals that contain pork or chicken**

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#### **Aims and Objectives**

The aims of this study were to investigate the acute responses to consumption of meals containing either pork or chicken, and to identify relationships between amino acids and markers of glycaemic and lipaemic control. A secondary aim was to explore amino acid predictors of plasma zinc concentrations.

Ten healthy adults (men and women) participated in a post-prandial study on 2 separate occasions. In a randomised cross-over design, participants consumed a meal that contained either pork or chicken as the main source of protein. The concentrations of 21 amino acids, glucose, insulin, triglycerides, non-esterified fatty acids and zinc were determined at timed intervals over 5h post-prandially.

#### **Key Findings**

The response of amino acids was influenced by the test meal. The mean concentration of plasma histidine was significantly higher after consuming the pork meal, with consistently higher changes from baseline observed after 60 min. In contrast, higher percent increases were noted at limited time points for valine and leucine+isoleucine in those who consumed chicken compared to pork.

The differences in meal composition did not influence glucose, insulin, triglyceride, non-esterified fatty acids or zinc concentrations. However in linear regression various plasma amino acids (shown in brackets) predicted the changes in plasma glucose (alanine, lysine and histidine), triglycerides (ornithine, tyrosine), non-esterified fatty acids (valine), and zinc concentrations (arginine).

#### **Application to Industry**

Our study demonstrates that a single meal of pork or chicken produces a differential profile of amino acids in the post-prandial state. The sustained increase in histidine following the consumption of a pork meal may have beneficial metabolic effects such as decreasing appetite. There is evidence from the literature that histidine contributes to an improved metabolic profile such as decreased oxidative stress and inflammation, and may be responsible partly for the health benefits of high protein diets that contain pork, e.g. weight loss.

Our results will provide opportunities for innovative product development, e.g. selection of specific muscle compartments or other parts of the animal carcass that have high histidine concentrations.

Further research is needed to confirm our novel findings and if confirmed, this information may lead to new evidence-based claims regarding pork and health outcomes.