

### **3A-107: Sensory specific liking and satiety induced by pig meat flavours. (Predictive models based on subjective ratings and brain activity measured by fMRI)**

**Principal Investigator:** Eugeni Roura

Centre for Nutrition and Food Sciences, Queensland Alliance for Agriculture and Food Innovation, The University of Queensland.

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## **Executive Summary**

A recent project funded by the Pork CRC and Australian Pork Limited has provided evidence that lean pork may provide cardiovascular (CV) and metabolic health benefits. The general objective of the current project was to continue the evaluation of potential health benefits of eating pork based on the high satiation rates commonly found in protein based foods.

In a preliminary study we observed that pork-related smell and taste cues may elicit early satiety and prolong fullness ratings between two meals. Studies on meal termination in humans have shown that one of the main reasons to stop eating during a meal was a decline in food pleasing rates. Recent advances in neuroscience have identified specific areas in the brain (often related to the orbitofrontal cortex - OFC) which seem to respond to the hedonic value of food aromas. Thus, satiety has been related to the OFC stimulation which indicates a decrease in hedonic value which has been referred to as sensory specific satiety (SSS). SSS is an important driver of meal termination. Our project has been a preliminary study of pork SSS using subjective sensory tests in human subjects together with objective brain activity measures by using functional magnetic resonance imaging (fMRI).

We designed a trial with 18 healthy adults aimed at study the effect of pork flavoured chewing gum and a pork rich breakfast on appetite for several food categories (meat, fruits, vegetable and cakes), general satiety and pork related SSS. Brain scanning using fMRI was used to study the responses of specific areas such as the OFC to food cues (visual and olfactory). In addition, subjective ratings on hunger, fullness, desire to eat, liking and wanting were assessed.

The principal findings of this preliminary fMRI study confirm our main hypothesis that pork elicited a strong satiety ratings based on sensory cues. Pork SSS was strong after breakfast when panellist were exposed to visual cues and the results were enhanced by the addition of olfactory cues in the second fMRI. In addition, our data proves that the subjective ratings are related to the brain activity particularly at the OFC region. The OFC responses are known to be related to the reward circuit. Our observations provide evidence that pork flavour can be considered as a potential tool for appetite-control. Given the increasing prevalence of obesity in Australia, evidencing pork healthy attributes evidence will reassure consumers that lean pork is a healthy choice, which should strengthen its market value and potential. In addition, our project has developed a novel method to measure the properties of pork related to hedonic attributes.

The novel fMRI application developed has the potential to evaluate the sensory pleasing of pork and compare it to other foods/meats. Future research could target the development and characterization of a branded sensory signature unique to Australian pork which enhances its succulence as well as its health related claims.