Project Number & Title	
3A:116 Development of a generic pork eating quality model and interactive tool	
Project Leader	
Jessica Jolley	
Project Participants	
Richard Jarrett, Andreas Kiermeier, Heather Channon	
Aims and Objectives	

The aim of this project is to utilize all relevant Pork CRC data to develop an eating quality predictive model for Australian fresh pork, based on an overall quality score, as part of a non-prescriptive eating quality system.

Key Findings

- A total of 3,564 muscle samples from 626 pigs and 14,208 individual consumer responses were collated for analysis and included four different muscles, loin, silverside, chuck tender and bolar blade by three different cooking methods.

- From the multinomial regression of quality grade results against the recorded sensory attributes of aroma, tenderness, juiciness, flavour and overall liking, a model for the composite pork quality score (PQS) was developed.

  PQS = 0.82*Overall Liking + 0.14*Flavour + 0.07*Tenderness + 0.02*Juiciness – 0.05*Aroma

- The PQS was classified into four quality grade categories: unsatisfactory/below average, average, above average and excellent with the cut-off values of ≤35 (unsatisfactory/below average), 36-65 (average), 66-87 (above average) and ≥88 (excellent).

- 67.2% of the samples were correctly allocated when compared to the opinion score originally given by the consumer.

- The additive terms in the eating quality model were gender, ageing period, cut type x cooking method, endpoint temperature, moisture infusion, electrical stimulation, hanging method and ultimate pH. Significant interactions were found between endpoint temperature and gender, ageing period and cut type x cooking method.

- The key additive factors shown to have the largest influence on the PQS were moisture infusion (with larger effects of moisture infusion identified for loin roast and loin stir fry, compared with the other five evaluated cuts), hanging method and electrical stimulation (where the effect change was highest for roasts compared to the other cuts).

- The predicted values from the model for the range of samples tested in the various studies ranged from 46.2 to 78.2, indicating that all samples would have been graded as either average (category 3; 36-65) or above average (category 4; 66-87).

- From the predictive model, an interactive spreadsheet tool has been developed which predicts the PQSs for 70°C and 75°C, based on the input parameters of gender, ageing period, cut, cooking method, electrical stimulation, moisture infusion, ultimate pH and hanging method.

Application to Industry

This project has enabled the key outcomes arising from the complex multi-factorial studies conducted with Pork CRC support to be modelled and more simply communicated. An interactive spreadsheet tool has also been developed from which the effect of different pathway factors can be estimated.

This project has delivered a solid framework for an eating quality predictive model that needs to continue to be built on to ensure the model is and remains reliable for different cut types x cooking methods and when different combinations of factors are used. The recommendation for more samples will assist in strengthening the estimates of the model and investigating combinations of factors that may result in increasing the quality scores for pork cuts and further assist processors in producing high quality and consistent pork. Areas for potential future work include other pathway parameters such as retail ready packaging and alternative cooking methods or combinations of factors that were only in small studies (such as electrical stimulation and moisture infusion).