



Project Number & Title - 2A-112: *On farm immunoassay test kit for inflammatory diseases to test the immune status of a herd*

Project Leader: Dr Jae Cheol Kim and Dr Diana Turpin

Project Participants: Professor John Pluske

Aims and Objectives

The aim of this project was to develop an oral fluid diagnostic kit using lateral flow technology that would quickly show (i.e. within 1-2 hours from collection of samples to diagnosis) the immune status of a large herd. Based on this, decisions could then be made regarding the need for nutritional and/or veterinary intervention with the option for more testing (e.g. pathogen screening).

The first step in this project was to validate the proposed concept before initiating the development of a prototype.

Two major hypotheses were tested to validate selected reactive proteins as biomarkers for herd immunity. The selected reactive proteins examined in this project included the three main acute phase proteins for pigs: haptoglobin, C-reactive protein and PigMAP as well as soluble cluster of differentiation 14 and neopterin.

The two major hypotheses were:

1. Oral fluid levels of reactive proteins are strongly correlated to plasma levels of the reactive proteins.
2. The proposed single-point measurement in an oral fluid sample collected by hanging a cotton rope in a pen represents the mean levels of reactive proteins determined by individual sampling of the reactive proteins.

If the above two hypotheses could be supported, the project would progress to developing a prototype for the oral fluid diagnostic kit (stop/go milestone).

Key Findings

The preliminary outcomes of the first stage of this project supported the first hypothesis that the concentration of C-reactive protein and haptoglobin in the oral fluid of individuals correlates to the concentration in the plasma. However, with regard to the second hypothesis, results demonstrated that only haptoglobin concentration in the oral fluid sample collected by a one-point group sampling technique (hanging cotton in the pen) was positively correlated with the mean haptoglobin concentration determined by oral fluid sampling from individual pigs in the group. In saying this, while most of the commercial farms used for sampling were experiencing underlying health issues, all farms were already receiving veterinary intervention (in-feed medication or a vaccination program) at the time of sampling. High haptoglobin values were detected for two out of the seven farms tested and this was most likely due to management issues. Therefore, a relationship between saliva haptoglobin and health status still needs to be established and further to this, more data is required for the group saliva and mean individual saliva correlations in pens that are immunocompromised.

Application to Industry

The finding that haptoglobin could potentially be a suitable marker for the development of an immunoassay kit used to detect inflammatory disease from oral fluid is a valuable outcome, however further validation of these findings is required involving more sampling on commercial farms experiencing herd health problems before veterinary intervention.