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Dear Mr Burton,

GCRI Trust report for the Horizon Digital Nutrition Sandpit Meeting.

Many thanks again for your help in securing funding to help with my visit to Malaysia for the travel regarding the Horizon Digital Nutrition sandpit workshop and Crops For the Future Research

I was asked to attend the Horizon Digital Nutrition Workshop on the 21st-22nd of February in order to share my expertise in plant biochemistry and metabolomics both in the plant and in the consumer, and coupling that with a broader nutrition background. This is of particular importance as consumers in the UK are becoming increasingly aware and interested in their own nutritional health and these techniques are important to assess the nutritional quality of the foods that they eat. Notably it is of particular importance when considering new or novel foods which are being brought onto the market. Digital nutrition offers a platform for novel technologies capitalising on the digital revolution which has already changed so many aspects of daily life. Digital Nutrition seeks to add new technologies to help tackle the very pressing issues of nutrition across the world, ranging from hunger in developing countries to malnutrition caused by poor diet and overeating in the more developed Western countries. It also offered opportunities for the scientists on the nutrition and crop science end to communicate with computer scientists in a way which facilitates sharing of expertise to develop databases and succinctly analyse data in an efficient way which may previously have been missed, opening up new approaches to fields such as crop control and consumer behaviour. This development will clearly lead to new approaches in our lab group, which works with a number of UK growers on a range of crops, primarily Brassica crops but also lettuce, beetroot, strawberries and others.

The workshop specifically aimed to develop links between Malaysian research groups such as the University of Nottingham Malaysian campus, and CFFR and UK based research such as Horizon research and The University of Reading. There was a focus on bringing together the issues of underutilised crops, micro and macronutrient deficiencies, and food chain issues, while being paired up with experts in the digital spheres of research, to develop new projects and quality publishable data. We were given talks on aspects of underutilised crops, and the focus of the research facilities present, had an opportunity to meet each of the other attendees and discuss further with those who offered complementary skillsets before pulling together in groups to form a viable idea for the sandpit.

The programme was set up as to introduce us to each other, the topics which we were advised to focus on, and what we could each offer. Day 1 saw brainstorming exercises designed to bring out new approaches to the area of nutrition, which day 2 focussed on finetuning the projects before giving a presentation of our project.

Our group worked toward a phone application which could ‘read’ receipts and compare this information against existing nutrition databases to calculate an evolving nutrient profile highlighting areas where the consumer could improve their diet to maintain an ideal nutrient profile. With the current drive for people be eat more healthily, and the current failure of the general populace to reach it’s ‘5 a day’ goal ([currently only 16% reach this daily target in the UK](http://www.ncbi.nlm.nih.gov/pubmed/22189508)) this can highlight the need to eat more fruit and vegetables, and open up reasons as to why the goal is currently not being reached (i.e. convenience, affordability, or taste) which may be exploited by the UK food crop market. This could in turn collect a series of data allowing us to gauge eating habits in specific areas, comparing eating habits in the UK and Malaysia, or in low and high income areas of the UK. With accurate and up to date information on eating habits in the UK, and comparison to a current South East Asian diet we can determine factors involved in obesity and nutrient malnutrition in the UK. In addition we hoped to add in consumer correlation data allowing an Amazon style ‘people who bought this also bought...’ function in order to allow consumers to see better nutritional choices which they may appreciate, and which may give them a suitable complement of macro and micronutrients. This would also have upselling potential for the supermarkets, allowing for a future funding stream to keep developing the app and make future work viable. The group is still in touch and is looking into ways to continue with this idea at present.

The workshop offered equivalent of £20 000 split between the UK and Malaysian research partners, however this was taken by another group hoping to conduct surveys in both participating countries to assess why members of the public were not currently using underutilised crops, which will have broader impact toward understanding consumer behaviour, and in turn will drive what is produced for the market. Novel crops are directed to enrich developing countries, but this will give insight into what new crops would be complementary for the UK market, and what UK crops they may compete with.

While in Kuala Lumpur I also had a chance to visit the Crops For the Future Research who conduct research on underutilised crops. Crops For the Future is a non-profit company part funded by UKaid, Nottingham University, and the Malaysian Government. I visited some of their labs and spoke to several of their researchers which gave me a good understanding of the impact of their work. I had a meeting with Sayed Ali-Azam, the CEO of the research centre about their current and future work and what I may have to offer to the facility. This was a great opportunity to discuss work collaborations between CFFR and UoR. One such collaboration was with Dr Asgar who is working on edible films; typically agar based gels impregnated with naturally sources antimicrobials, which can be applied to fresh fruit, especially soft fruits as they have high value and propensity to spoil quickly. Such films are intended to impart negligible sensory characteristics to the fruit, but would slow respiration and provide physical and chemical protection from spoilage microorganisms; and are aimed at maintaining high levels of nutritive secondary metabolites through post harvest storage. This would not only avoid waste but add value to high value soft fruit crops grown in the UK. We hope to collaborate on this work, bringing this technology to the UK market, thus adding quality and value, and reducing waste in the food chain for a range of typical UK fruit crops. Reading University has the ideal facilities to develop this, particularly with regards to consumer acceptance, one of the largest hurdles, via our sensory analysis suite.

Overall I think this has been of great utility to myself and to my current lab group, and has great potential through the groups both in Reading University and Nottingham University to further modern crop research and I hope to continue strengthening the links made over the course of the week spent in Kuala Lumpur. My time was broadly split between the Horizon workshop with an emphasis on developing newer techniques and practices regarding UK and Malaysian health through understanding and guiding purchasing practices; and my time with CFFR and the University of Nottingham Malaysian campus focussing more on development of new crops and added value to existing crops, again of benefit to both the UK and to the developing world. Naturally, many UK growers have interests across the globe where different crops can be grown, and international collaboration is essential to maintain an exceptional level of scientific research at home. I am very grateful to GCRI for helping me to gain the necessary funding to get to these workshops, as it helped to pay for a significant amount of the travel costs incurred, and without which this work could not have been done.