Business Interaction Voucher Funded Projects 2014

High Value Chemicals from Beetroot Waste for Fast Moving Consumer Goods
Award Holder: Avtar Matharu, University of York
Industrial Partner Company: Unilever R&D

Project Outcome Summary
Beetroot is regarded as the new super-food with increasing volumes of processed beetroot entering supermarkets either in pre-cut or shredded form for salads, pickles and sandwiches. We are consuming more beetroot. In the UK, over 55,000 metric tonnes of beetroot is processed for grocery alone annually.

This project between the Green Chemistry Centre of Excellence, Biorenewables Development Centre, Unilever and Greencore has shown that the waste generated from washing, peeling, cutting and shredding, ie, processing, represents an interesting resource potentially rich in high value functional molecules such as antioxidants, pigments and flavourings.

The Recovery of Food Waste from Municipal Solid Waste During Pulping
Award Holder: Sonia Heaven, University of Southampton
Industrial Partner Company: Fiberight Limited

Project Outcome Summary
This collaboration between Fiberight Ltd and the University of Southampton is aimed at maximising the recovery of food waste from UK municipal solid waste (MSW) as a feedstock for use in energy production, nutrient recovery and creation of value-added bio-based products. The business of Fiberight Ltd is the production of second generation sugars and other value-added commodities from MSW. Fiberight Ltd is developing a transferable sugar-lignin platform which the company wishes to implement in the UK to drive forward industrial biotechnology from waste. The current project focuses on recovering food waste from MSW without the need for source segregation, by using differing pulping and washing technologies. This solubilised food waste stream can then be used as an input to anaerobic digestion and in other related biotechnologies to increase its value from rubbish to resource.
Investigating the Potential of Rapeseed Meal for Producing High Value Food Ingredients and Additives
Award Holder: Carol Wagstaff, University of Reading
Industrial Partner Company: Stainswick Farm

Project Outcome Summary
Oilseed rape is cold pressed to give high-quality, high value oil. The rapeseed meal that remains is a potential source of co-products of economic value. Cold pressing incompletely extracts the oil fraction from the seed and more aggressive processing of the meal would produce significant additional oils that would have a use in feed and food applications. Post processing of the meal when it is freshly pressed gives a more desirable oil composition that is higher in unsaturated compounds.

The rapeseed meal contains active compounds such as myrosinase and glucosinolates that have potential applications as food ingredients which would give added beneficial health properties to the foods they were added to. The carbohydrate fraction contains cellulosic and hemicellulosic compounds that could be further metabolised to produce prebiotic compounds that are likely to have significant economic value. The samples contained almost no carotenoid compounds. Small traces were detected in the meal samples and none in the seeds.

The rapeseed meal was found to be a rich source of anthocyanins, polyphenol compounds which have potential health benefits and which are also have commercial use as natural food colourants. Extraction methods need further optimisation to purify the anthocyanins from the meal.

The project therefore established that rapeseed meal has potential value as a source of oils, carbohydrates, glucosinolates and anthocyanins. All of these compounds have uses in the food industry as ingredients or health beneficial additives.

Sonication Enhanced Recovery of Anthocyanins from Blackcurrant Waste (SERAB)
Award Holder: Ana Winter, Aberystwyth University
Industrial Partners: A&R House (BCL) Ltd, Celbius Ltd

Project Outcome Summary
This project was aimed at developing a process for the extraction of anthocyanins from blackcurrant pomace, a waste product of the soft drinks industry. Experiments showed that effective water extraction of anthocyanins could be achieved with the application of sonobioprocessing technology which involves the use of ultrasound to enhance extraction. Preliminary studies also indicate that cross-filtration could be used for isolating and concentrating anthocyanins. Alternatively, solid phase extraction was demonstrated to be highly effective.