Analysis for Innovators (A4I): Supporting industry

The Coconut Collaborative

Developing rapid and robust screening approaches to support food quality control.

Department for Business, Energy & Industrial Strategy

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The Coconut COLLABORATIVE®

Background

The Coconut Collaborative Ltd (CCL) manufactures Coconut Yogurt for the UK and a wide international market. Based on its innovative products and strong market presence it has become the market leading coconut brand in the UK.

Quality checks are required to ensure CCL maintains the high quality of product expected by its growing consumer base. The unwanted use of a barrel of coconut cream tainted by rancidity in the manufacture of coconut cream renders it unsuitable for sale and consumption. This leads to complete batches of coconut yogurt being rejected. Checks for rancidity are currently performed manually, with batches of coconut cream being tasted ahead of their use in production. With the growth of the business, this is becoming increasingly impractical but there are currently no automated methods available to test for rancidity.

Through the Analysis for Innovators (A4I) partnership, CCL had access to innovative and advanced measurement and analytical technologies at both the National Measurement Laboratory (NML) and the Science and Technology Facilities Council (STFC) to develop assess the feasibility of developing a rapid and robust screening approach to detect rancidity in coconut cream.

"The A4I project collaboration has been incredibly valuable to the Coconut Collaborative Ltd. It has enabled us to work in a time efficient way with world class institutions and scientists to develop and prove a principle for solving a very unique but real rancidity measurement problem. We are impressed with the encouraging results."

James Averdieck, Managing Director.

Impact

Supply specialists, engineers and scientists from CCL, the NML and STFC assessed the feasibility of using multispectral imaging (MSI) and Raman spectroscopy to detect traces of rancid coconut cream ahead of its use in the production of coconut yogurt.

Multispectral imaging (MSI) methods showed the sensitivity and repeatability to screen for and detect rancid coconut cream, performing a non-destructive test in no more than 20 seconds. MSI has also been shown to have the potential to be used as a quantitative screening approach to determine the level of rancidity in a sample of coconut cream.

These encouraging results have demonstrated proof of principle for using MSI as the basis for an enhanced level of quality control and screening in CCL's manufacturing plants. This screening approach will help avoid annual costs in excess of £500k through reduced production and material charges. With further optimisation, MSI could also be used as a predictive tool upstream in the sample production process prior to the onset of full rancidity, making further efficiency and cost savings for the industry in general.

In addition, the method has been "future proofed" so that it can also be extended to understand variations in coconut cream consistency between batches, suppliers and even geographic origin, as well as screening for the presence of other undesirable materials which could affect the quality of coconut cream.

This project has allowed CCL to continue to support the growth of its business whilst benefiting from the expertise brought by the collaboration with the NML and STFC.

Analysis for Innovators (A4I)

The A4I programme is run by the UK National Measurement System laboratories, the Science and Technology Facilities Council and Innovate UK. It provides companies with access to state-of-the-art measurement and analytical technologies to solve existing analysis and measurement problems that are a barrier to competitiveness or productivity.

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