

# Innovate UK

**Results of Competition:** Newton Fund - UK-India Research and Innovation Bridges  
**Competition Code:** 1511\_CRD2\_NEWTON\_INDBRID

**Total available funding for this competition was £5M from Innovate UK and RCUK**

**Note: These proposals have succeeded in the assessment stage of this competition. All are subject to grant offer and conditions being met.**

Participant organisation names	Project title	Proposed project costs	Proposed project grant
Dearman Engine Company Ltd University of Birmingham S. Cartwright & Sons (Coachbuilders) Ltd	Dearman Liquid Air TRU Systems for Cold Chain in India	£862,500	£590,114
<b>Project description - provided by applicants</b>			
<p>The International Institute of Refrigeration (IIR) estimates that 200 million tonnes of perishable produce could be preserved if developing economies had the same level of cold chain infrastructure as the developed world. India is currently estimated to lose up to 40% of such produce post-harvest due to inadequate cold chains. There is a need to urgently address this issue, particularly the lack of transport refrigeration units (TRUs) for the safe transport of food, but to do so in a way that is sustainable. The Indian National Centre for Cold-chain Development (NCCD) states that 53,000 additional TRUs are needed simply to catch up with current demand, excluding any future growth. If this shortfall and future demand is met with 'business as usual' diesel fuelled TRUs, the environmental and health impacts will be significant. This innovative industrial R&amp;D collaboration will optimise the proven zero-emission Dearman liquid air fuelled TRU system for the Indian market. The proposed project will enable the consortium to bring new affordable products to market in an accelerated timescale and meet the demands of the rapidly expanding Indian cold chain sector with a clean sustainable green technology.</p>			

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<b>Koolmill Systems Ltd</b> Sheffield Hallam University Marlow Foods Ltd KMF Precision Sheet Metal Ltd East End Foods PLC Process Technologies Ltd New Food Innovation Ltd	Enhanced Rice Milling and Maximised Valorisation of Rice Milling co product	£811,111	£609,560
<b>Project description - provided by applicants</b>			
Achieving optimal efficiency in the post harvest handling and processing of rice is a ubiquitous challenge for India's agri-food sector. Rice is the staple food of 65% of the population and India, is the world's second largest producer. It produces 103MT pa and exports 12MT of this. However, on average, head rice return in post production handling is a low 50% of the paddy weight, with 50% of waste by-products consisting of rice brokens, husk hulls and bran that are currently under utilised. The objectives of the project are twofold: firstly develop a higher efficiency and lower energy milling process that will significantly reduce rice brokens during milling and increase total rice output. Secondly, optimise the by-products available from the improved milling process to re-process rice bran into highly nutritious food ingredients and process rice husks into rice husk ash for re-use in the construction industry.			

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Nextek Ltd Brunel University London Solution 4 Plastic Ltd University of Greenwich Earth Champions Foundation Ltd	Bio-Based Packaging for Fresh Food (BIOFRESHPAK)	£915,394	£778,045
<b>Project description - provided by applicants</b>			
<p>This project, Bio-based Packaging for Fresh Food (BIOFRESHPAK) is focused on developing packaging materials that will be biodegradable and recyclable and will A) reduce wastage by improving the storage stability and shelf life of food during transit between the producer and the urban consumer, B) reduce the level of adulteration via sealable and tamper-evident features, C) reduce urban solid waste from packaging going to landfill, and D) improve health and well being of the population by improved retention of nutritional quality and reducing risk of spoilage in fruit and vegetables. To achieve these objectives, the project will develop innovative bio-based hybrid polymer packaging films with selective humidity and permeability control and improved storage-life performance with enhanced environmental characteristics. The packaging systems will be based on the incorporation and compatibilisation of presently under used agri-waste (tapioca starch from cassava processing waste) at low costs into conventional and other bio-based polymers. The treatment of the agri-waste (wet stored cassava starch and waste water) will contribute to minimising significant cassava waste.</p>			

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Ozo Innovations Ltd Edinburgh Napier University University of Nottingham	Electrolysed Water for Post-Harvest Washing (JadooJal)	£789,359	£624,218
<b>Project description - provided by applicants</b>			
<p>The JadooJal project addresses the key challenges of post-harvest washing to reduce microbial contamination of Indian commercial crops, thereby reducing post-harvest spoilage losses and improving food safety &amp; nutritional value. JadooJal will apply OZO's Electrolysed Water (EW) solutions made in-situ to control microbial load on key Indian crops, including grains, onions, mango, banana, guava, papaya and tomato. EW will be applied by washing, spraying and/or fogging both immediately post-harvest and during processing, storage and transport. OZO's EW solutions have powerful, broad spectrum antimicrobial efficacy and are made in-situ from simple food approved salts &amp; water. JadooJal will evaluate the potential of EW to significantly reduce the use of water, energy and chemicals vs existing Indian food production processes. JadooJal will test the efficacy of EW against key spoilage/pathogenic microbes on valuable Indian food crops using microbiological &amp; metagenomics analysis (to access non-culturable microbe populations), and will quantify the nutritional benefits arising from reduced spoilage. Any microbial resistance will be investigated and EW treatments optimised to overcome this.</p>			

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<b>NquiringMinds Ltd</b> Brunel University London	GrainCare	£899,852	£710,852
<b>Project description - provided by applicants</b>			
The GrainCare project applies modern low cost sensing technologies and advance analytics to the problem of post-harvest spoilage by looking at the drying and storage process India produces about 263.3 million tons of food grains per year. Annual post production losses are 15 million tons of food grains. The GrainCare project applies modern low cost sensing technologies and advance analytics to this problem in order to reduce post-harvest spoilage. It will consist of the following elements a) low-cost, low power robust sensors, that can sample grain during drying or during storage b)advanced calibration technologies, which can infer true moisture levels from ambient humidity and other readings, using machine learning technologies which can calibrate based on grain type and other parameters c) open APIs and interfaces to allow sensing and control systems to be applied to the widest range of drying equipment and drying process d) advance learning control systems that can optimise: crop yield, moisture levels for storage, energy use and labour time e)simple user interfaces that will ensure the technology can be used easily by the target market			

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PepsiCo International Ltd University of Nottingham	NewTriton	£721,142	£491,168
<b>Project description - provided by applicants</b>			
NewTriton- ReNEWable, sustainable nuTRITION. This project provides approaches in the re-use of commercial waste streams to create a market first, "late stage customisation" ingredient, reducing oil and salt in the diet, increasing productivity and reducing environmental impact through innovative process development. The project requires the development of an innovative process compatible with existing production and control systems to enable increased dietary fibre in the final product . This will not only deliver major waste reductions but will also dramatically reduce CO2 emissions from transport and enhance the shelflife of a product 'made to consume', thereby reducing waste in both the distribution system and in domestic use. The system will be engineered by combining innovative process engineering know how, informed by food science research and development, with a ready market and supply chain to exploit the innovation. Outputs from this research will benefit India's economy through increased efficiencies and reduced need for raw material importation, and socio-economic development through environmental and human sustainability benefits.			

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Coveris Flexibles (Gainsborough) UK Ltd University of Lincoln Grimsby Institute (GIFHE) ECH Engineering Ltd	Development & Optimisation of Fresh Produce Supply Chain and Storage Systems	£806,801	£621,049
<b>Project description - provided by applicants</b>			
As a major agri-food business operating in perishable fruits and vegetables the Sangha Refrigeration business currently faces high wastage levels and major operational challenges. This project involves Indian Partners Sangha Refrigeration and IARI (Indian Agricultural Research Institute) and UK partners the University of Lincoln (National Centre for Food Manufacturing), Coveris Flexibles UK Ltd, FRPERC (Food Refrigeration & Process Engineering Research Centre) and ECH Engineering Ltd, working together to develop and optimize the fresh produce supply chain and related storage processes. Project activities will include the review, research and development of small (target 1000 USD, 10 tonne unit for small farmers and communities) and large scale cold-storage facilities for fresh produce including potatoes, onions and other vegetables. We will also develop highly novel and state of the art large volume storage control systems and a new generation of packaging materials to control moisture and gas levels during produce storage, which are biodegradable and suitable for a tropical climate and other challenges of the Indian produce supply chain.			

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