Non-destructive methods to assess the quality of food

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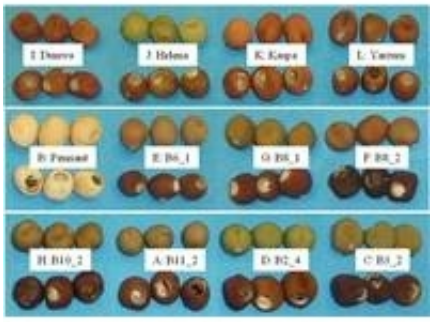

Scientists from The University of Western Australia are developing rapid and non-destructive ways to assess the quality of food that will deliver significant benefits to industry.

The research approach is similar to how infra-red thermometers are used to detect fever in humans or animals by converting information about the colour of the skin into a prediction of the internal body temperature.

Associate Professor Christian Nansen, from the UWA Institute of Agriculture and School of Animal Biology is looking at how the same technology can be used to class food products.

"With this technology, food items moving down a conveyor belt can easily be 'tagged' by an infra-red scanner, and fast computers can quickly analyse the imaging data and determine whether or not a given food item needs to be rejected, or whether it needs to be diverted to the cargo bin for lower-grade food items.

"It is similar to the baggage handling system at an airport: the infra-red scan taken along the conveyor belt represents the 'tag' which ensures that each item of luggage - or fruit - gets to the right cargo bin and airplane," he explained.

Using imaging technology to develop quality control systems for unprocessed and processed food items is a rapidly growing and expanding research area which includes detecting and quantifying defects in grains, fruits and vegetables, pesticide residues, and meat quality.

The challenge is that as many food items such as, fruits and vegetables vary markedly in size, surface texture and colours classification based on surface colour is often associated with low classification accuracy.

In his latest research published in the Journal of Food Engineering Associate Professor Nansen, who primarily conducts research on image-based detection of stress in crops and insects, has collaborated with Associate Professor Guijun Yan, Dr Nader Aryamanesh and Masters student Xuechen Zhang at UWA to explore whether this technology could also be used to detect weevil infestation inside field pea.

"The research question was whether field peas infested with beetles reflected light differently compared to field peas without internal beetle infestations," Associate Professor Nansen said.

The team behind this project used 12 varieties of field peas with and

without pea weevil infestation with pea varieties encompassing a wide range of background colours.

The researchers compared different classification methods and found that one developed by Associate Professor Nansen's group out-performed more conventional classification methods, paving the way for accurate large-scale, commercially viable classification of food items that can be performed under significant time constraints.

More information: Christian Nansen, Xuechen Zhang, Nader Aryamanesh, Guijun Yan, "Use of variogram analysis to classify field peas with and without internal defects caused by weevil infestation," *Journal of Food Engineering*, Volume 123, February 2014, Pages 17-22, ISSN 0260-8774, dx.doi.org/10.1016/j.jfoodeng.2013.09.001.

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