Funky food from fruit by-products

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Credit: Yuwen Teo

Researchers have found that reusing the by-products of fruit and cereal processing could help promote the sustainability of the food industry, as long as its overall environmental fingerprint is clearly evaluated.

Food processing of cereal and fruits creates a rather voluminous amount of by-products. The London, UK-based Institution of Mechanical Engineers recently estimated that anywhere between 35% and 50%—or 1.2 to 2 billion tons—of all food produced is wasted worldwide; a fraction of which is due to by-products in food processing. To remedy this situation, some scientists saw an opportunity to develop eco-efficient, innovative and sustainable processes to create new, food or feed products from such left-overs. These include healthy, 'ready-to-eat'

fruit pastes, juices and crunchy citrus-flavoured, vanillin enriched snacks.

This approach is the focus of an EU-funded research consortium dubbed the NAMASTE project, working in collaboration with Indian partners. "We [have], so far, developed and assessed procedures [to obtain] some bioactive molecules and ingredients and … for [evaluating] quality … in the formulation of new food products," says Fabio Fava, the project's EU scientific coordinator. He is also a professor of industrial and environmental biotechnology at the University of Bologna, Italy. The project focuses in particular on wheat bran and citrus by-products, in Europe. In India, it targets rice bran, mango and pomegranate by-products.

The project has already yielded some concrete results. The Indian coordinating institution, the North East Institute of Science and Technology in Jorhat, Assam province, for example, has formulated 15 types of carp and ornamental fish feed. Other partners in India have also developed jams, biscuits and a health drink whereas snack rolls are also on the menu in the near future. In parallel, European colleagues have produced highest purity vanillin from agro-industrial by-products of bran processing containing ferulic acid. Others investigate how wheat bran could be turned into extruded and breakfast snacks. Using the by-products of citrus-based processing, EU scientists are also investigating the possibility of creating fruit-based beverages.

For some experts, the question remains whether, from an environmental perspective, this is the best way to give value to food processing by-products. "This question can be answered according to the cascading principle, where the best option is that which harnesses maximum value from the by-products," says Frances Fortuin, senior project manager at the Dutch consultancy Food Valley NL, located in Wageningen.

There is no definite conclusion as to whether exploiting cereal and fruit by-products makes more environmental sense than using them as renewable energy or soil fertilisers. Fava defends the claim to sustainability, though. "The conversion of our by-products into ingredients and then into food products can allow to produce higher value compounds [compared] to energy or fertiliser," he says, "and to return part of the material coming from .. food-processing … [back] to the same pipeline."

What is more there is a question mark over whether the project can realistically contribute to the sustainable development of food processing . Some experts, such as Andrew Westby, the director of the Natural Resources Institute at the University of Greenwich, UK, considers this project to be a positive development, bearing in mind that these by-products would otherwise be discarded. However "resources such as water and agricultural inputs have been expended in growing the fruits and cereals, and this should not be negated when assessing the sustainability of program," he tells youris.com.

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