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Food packaging made from tomatoes

Researchers are using a lacquer made from processed tomatoes to coat cans of food as part of a drive to replace food packaging with healthier, natural alternatives.

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Tin cans are usually coated with a mixture of chemicals including Bisphenol-A (BPA), a molecule that in high doses can mimic the hormone oestrogen, which has caused concern among government medical research organisations such as the US National Institutes of Health for its effects on the development of babies' brains.

While only tiny amounts of the molecule can make their way into the human body, and health researchers agree its use at the levels found in food packaging poses no threat to human health, consumers are increasingly asking for BPA-free products.

'If you use a natural lacquer, these components are not present, so there is no risk of migration of this molecule,' said Dr Angela Montanari, the coordinator of the BIOCOPAC project, which is developing the lacquer.

BIOCOPAC started out by analysing tomato waste with a view to formulating biolacquers that could be applied to metal materials on normal production lines. The main component is the biopolymer cutin extracted from the cuticle of the fruit.

'The aim is to use natural lacquer without dangerous substances derived from oil, and also to increase the recyclability and decrease the waste of the tomato industry,' Dr Montanari said.

Several small- and medium-sized enterprises (SMEs) belong to the BIOCOPAC consortium and the project aims to meet their demands for greater economic and commercial competitiveness by finding a lower cost way to treat metal food cans.

The project, which ended in March 2014, believes it will take two years before the lacquers are being used in real cans. However, before that can happen, the project needs to conduct further research to work out how to mass-produce the new lacquer in a way that can ensure that each batch is consistent.

‘We need to scale-up our extraction procedure of cutin from tomato peel,’ Dr Montanari said. ‘From different lots of tomato we need to obtain the same product with the same characteristics.’

Plant matter

While the BIOCOPAC project is using tomatoes for their hard outer skins, the EU-funded SUCCIPACK project is using some of the molecules found in plant matter to make polybutylene succinate (PBS), a plastic-like material that it hopes could be turned into an effective food wrapping material.

‘Bio-sourced packaging is in fashion – the industry and consumers are calling for it,’ said Christophe Cotillon, the project coordinator of SUCCIPACK.

The SUCCIPACK team has had to overcome some challenges however, including making PBS more airtight and waterproof. The solution has been to combine different components in the packaging material, and use multiple layers and surface treatments to improve its qualities as a barrier.

And they believe it will yield significant environmental benefits, partly because it is more easily recycled. ‘The aim is not to use resources coming from oil products – it’s not green. Consumers also want this out of respect for the planet, and the qualities of the end-product are practically identical,’ said Cotillon.

The shelf life of a product could be prolonged too – SUCCIPACK estimates ricotta cheese could last for 25 days, up from 12 days currently – cutting down on waste.

The arrival of plant-based wrappers for food is not far off as PBS material could be commercialised within four years, the project said. ‘I think we will see the new packaging on supermarket shelves soon – we have already had some conclusive trials,’ said Cotillon.

More info

BIOCOPAC

SUCCIPACK