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New food packaging material could slow fungal growth

BY SAMANTHA BOH

RESEARCHERS have developed a new food packaging material that could double the shelf life of perishable food, like bread.

When packaged in the new material, fungal growth in bread sets in only at 10 days, experiments show.

In comparison, such growth sets in after three days when a common food packaging made of polyethylene, a synthetic resin, is used.

The environmentally-friendly material, developed over three years by a National University of Singapore (NUS) team, is formed by combining a grapefruit seed extract and chitosan – a biodegradable polymer derived from crustacean shells.

Both chitosan and the grapefruit seed extract work together to slow down fungal and bacterial growth.

The material also blocks ultraviolet light, slowing down the degradation of food products from oxidation and deterioration caused by the chemical action of light. It is biodegradable and made entirely of natural compounds.

The material is created through a one-day process, in which chitosan and the extract of grapefruit seed are mixed, filtered, cast in Petri dishes and then placed in an oven to dry. The final product is a thin transparent film.



INCREASING SHELF LIFE: Prof Thian and Ms Tan hold sheets of grapefruit seed extract-impregnated chitosan. Experiments have shown that fungal growth sets in only at 10 days when bread is packaged in the environmentally-friendly material. ST PHOTO: ALPHONSUS CHERN

Said PhD mechanical engineering student Tan Yi Min, 27, who co-led the research: "Extending the shelf life of food products also means reducing food waste and, as a result, reducing the rate of global food loss."

Associate Professor Thian Eng San, 41, from the NUS department of mechanical engineering, said grapefruit seed was chosen as it has anti-odour properties, which could be useful in packaging strong-smelling food like durian.

Prof Thian, the other co-leader of the research, noted that the raw materials needed to produce the film are, however, 30 per cent costlier than those of polyethylene.

But he is confident that the cost could be comparable if it is produced on a large scale in the future.

Prof Thian and Ms Tan will conduct further studies on the material with other food products, such as red meat and seafood, to assess how far it can slow down microbial and fungal growth.

They also aim to find out how long it will take for the material to completely biodegrade. The material is expected to hit the market in three to five years.

Professor William Chen, director of the Food Science and Technology Programme at Nanyang Technological University, said the invention of a new food packaging material that can prolong the shelf life of food is welcomed.

However, further studies are needed to ensure the safety of the new material, he added.

samboh@sph.com.sg

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