

Sticker science for fresher fruit

In a bid to eliminate unnecessary food waste, one enterprising Malaysian has come up with a solution to help fruits last longer, writes **Oon Yeoh**

ZHAFRI Zainudin loves fruits. Noticing how his fruit vendor friends had so many fruits go to waste from rotting, he decided to put his science research background to good use and come up with a way to help keep fruits last longer.

The result is StixFresh, an innovative sticker-based technology that helps extend the shelf-life of certain types of fruits. He is currently working on making it work with a wider range of fruits, and maybe, even vegetables.

DO YOU HAVE A FOOD SCIENCE BACKGROUND?

I graduated with a degree in software engineering but I couldn't get a job, so I decided to take up fishery, specifically developing and carrying out research and development on food that makes fishes grow faster and healthily. This didn't last long because of lack of funding, so in 2013, I moved on to researching rubber trees and focusing on R&D to increase rubber sap production through a soil activator that we developed.



Zhafri Zainudin

WHAT IS STIXFRESH?

Stixfresh is a technology that uses an all-natural process to significantly increase the shelf life of many fruits. Our Stixfresh sticker replaces the ubiquitous produce label and extends the shelf life of the fruit by up to two weeks. Yes, with this simple sticker, you can keep your avocados, mangoes and many other fruits around longer without spoilage.

WHAT'S THE SCIENCE BEHIND STIXFRESH?

When faced with potentially harmful environmental factors, plants produce secondary metabolites to protect themselves. Naturally-produced substances like alkaloids, steroids, fats, tannins and sugars help ward off pesky predators like insects, pathogens, or in some cases, other invasive plant species.

We created a patent-pending formulation from these substances and applied it to the non-sticky side of a sticker. In essence, StixFresh has repurposed these compounds to provide fruits with a similar protective shield. Independent studies have shown StixFresh may inhibit bacterial growth, thus slowing down over-ripening.

HOW DID YOU COME UP WITH THE IDEA OF USING A STICKER?

I'm a fruit lover. I really love to eat fruits. And I am surrounded by friends who have fruit stalls selling various types of tropical fruits. I noticed a lot of their fruits rotted every day, which resulted in wastage and lesser income. That triggered my desire to solve this problem.

I started to do a bit of research on the web on how to preserve fruits effectively. I noticed a lot of premium fruits would carry a sticker, usually for branding purposes or for allowing them to be tracked via barcode. I thought why not use stickers as a means to extend the life of the fruit. I was experimenting with mangoes and didn't expect anything positive but even my first version of StixFresh was able to extend the shelf life of mangoes. It wasn't stable so I needed to do some refinement, but that was the start of the StixFresh journey.

DID YOU COLLABORATE WITH SOME LABS OR UNIVERSITIES?

We went to the Malaysian Agricultural



Mangoes will last up to 14 days with Stixfresh once the fruits reach the retailers.



Stixfresh stickers extend the shelf life of fruits by up to two weeks.

Research and Development Institute (Mardi) to verify our findings and carried out a vitamin C and sugar content test on fruits using StixFresh. At Universiti Putra Malaysia, the product's efficacy was tested on the "chok anan" mango species. The collective studies showed that fruits with StixFresh stickers have higher moisture level retention, higher percentage of vitamin C retention, reduced acidity, increased sweetness and better retention of its cell structure, resulting in increased firmness.

HOW LONG DOES IT EXTEND THE FRUIT'S SHELF LIFE BY?

Stixfresh works best on certain fruits such as mangoes, papayas, avocados, dragon fruit, guava, pears, oranges and apples. Mangoes will last up to 14 days if we stick it once the fruits reach the retailers.

DOES IT WORK ON ALL FRUITS? WHAT ABOUT VEGETABLES?

You can't offer one solution to all kinds of fruits. At the moment it works well on fruits with a thin layer of skin. Of course we are working on solutions for other types of fruits. Our next product pipeline would be to produce something that would work with small fruits such as berries and grapes.

Our current formulation does not work on vegetables. We would need to look at a different approach and technique to solve that problem but we do want to tackle the vegetables as well.

AT WHICH POINT SHOULD IT BE REMOVED?

The stickers should not be removed until the consumer wants to consume the fruit. If the stickers are being removed anywhere along the supply chain, it will not produce the desired effect.

ARE THERE ANY HARMFUL INGREDIENTS ON THE STICKER?

Our mission is to always use all-natural, chemical-free, totally safe ingredients to keep your fruit fresh longer. The ingredients used in StixFresh meet GRAS (Generally Recognized as Safe) requirements in accordance with the US Food and Drug Administration. In fact, even if you accidentally bit and ate a piece of the sticker, you'll be fine.

WHAT WERE YOUR EARLIER SUCCESSES?

We started selling the product in early 2016 and received support from the Negeri Sembilan Department of Agriculture. At that time, most customers were SMEs under the department.

StixFresh was commercially launched in Malaysia March last year and we've sold 1.2 million stickers in 2018. Aeon, one of Malaysia's leading grocery retailers, uses StixFresh on some of their fruits, specifically at the Aeon outlets in Sunway Pyramid, Mid Valley, 1 Utama and Bukit Tinggi.

IS THERE ANYTHING LIKE THIS IN THE MARKET, EITHER DOMESTICALLY OR INTERNATIONALLY?

Our sticker technology is the first of its kind in the packaging industry. Actually, we are not creating a new step. We are just adding our technology to an existing process as many fruits do carry stickers. Stixfresh doesn't add a new step in the process, it simply replaces an existing sticker with a better product.

There are two other competitors that have technologies to extend the shelf life of fruits but they do not use the same method. Their approaches do not involve stickers. Fresh Pod involves the use of pellets and its fresh-uses filters. The sticker approach is unique to StixFresh.