

Researchers develop world's first alcoholic beverage made from tofu whey

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Associate Professor Liu Shao Quan (right) and PhD student Mr Chua Jian Yong (left), both from the Food Science & Technology Programme under the NUS Faculty of Science, successfully turned tofu whey into a tasty alcoholic beverage which they named Sachi. Credit: National University of Singapore

A research team from the National University of Singapore (NUS) has successfully turned tofu whey, a liquid that is generated from the

production of tofu and is often discarded, into a tasty alcoholic beverage which they named Sachi. The innovative fermentation technique also enriches the drink with isoflavones, which are antioxidants that have many health benefits.

The creation of Sachi was initiated a year ago by Associate Professor LIU Shao-Quan and his PhD student Mr CHUA Jian-Yong, who have an interest in [sustainable food production](#). Both are from the Food Science and Technology Programme at the NUS Faculty of Science.

"The traditional way of manufacturing tofu produces a large amount of whey, which contains high levels of calcium and unique soya nutrients such as isoflavones and prebiotics. Hence, disposing tofu whey is wasteful. Very little research has been done to transform tofu whey into edible food and beverage products. I had previously worked on alcohol fermentation during my undergraduate studies in NUS, so I decided to take up the challenge of producing an [alcoholic beverage](#) using the whey. The drink turned out to be tasty, which is a pleasant surprise," said Mr Chua.

Turning waste into a tasty beverage

Tofu, also known as bean curd, is a popular food made from soybeans. One of the most common methods of producing tofu is by curdling freshly boiled soya milk, cooling it, and pressing it into a solid block. During the pressing process to remove excess water, tofu whey is generated. However, when tofu whey is discarded as an untreated waste, it creates environmental pollution as the protein and soluble sugars in the whey could contribute to oxygen depletion in the waterways. In contrast, upcycling tofu whey can be a means of generating economic returns for businesses.

"The health benefits associated with soy products, coupled with changing

preferences towards vegetarian diets, have fueled the growth of tofu production. As a result, the amount of tofu whey has also increased proportionally. Alcoholic fermentation can serve as an alternative method to convert tofu whey into food products that can be consumed directly. Our unique fermentation technique also serves as a zero-waste solution to the serious issue of tofu whey disposal," explained Assoc Prof Liu.

Under the guidance of Assoc Prof Liu, Mr Chua took about three months to come up with a unique recipe to make an alcoholic beverage from tofu whey. He first made fresh soya milk from soybeans, and then used the soya milk to make tofu. In the course of making tofu, he collected the whey. Sugar, acid and yeast were added to the tofu whey, and the concoction was fermented to produce the alcoholic beverage. Mr Chua also designed a novel fermentation technique which utilises the tofu whey fully without generating any waste. The whole process of making the alcoholic beverage takes about three weeks.

Biotransformation of tofu whey yields benefits

Altering the composition of tofu whey via biotransformation methods converts its strong beany odour into a fruity, sweet flavour, and extends the shelf life of tofu whey from less than one day to about four months. In addition, after fermentation, the bound isoflavones that were present in the [tofu](#) whey were transformed into free isoflavones that can be absorbed more easily by the human body. The result is a refreshing beverage that is a tad sweet, with fruity and floral notes, and has an alcohol content of about 7 to 8 per cent.

The team has filed a patent for the novel process of making Sachi, and they are looking to collaborate with industry partners to introduce the drink to consumers.

Provided by National University of Singapore

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