

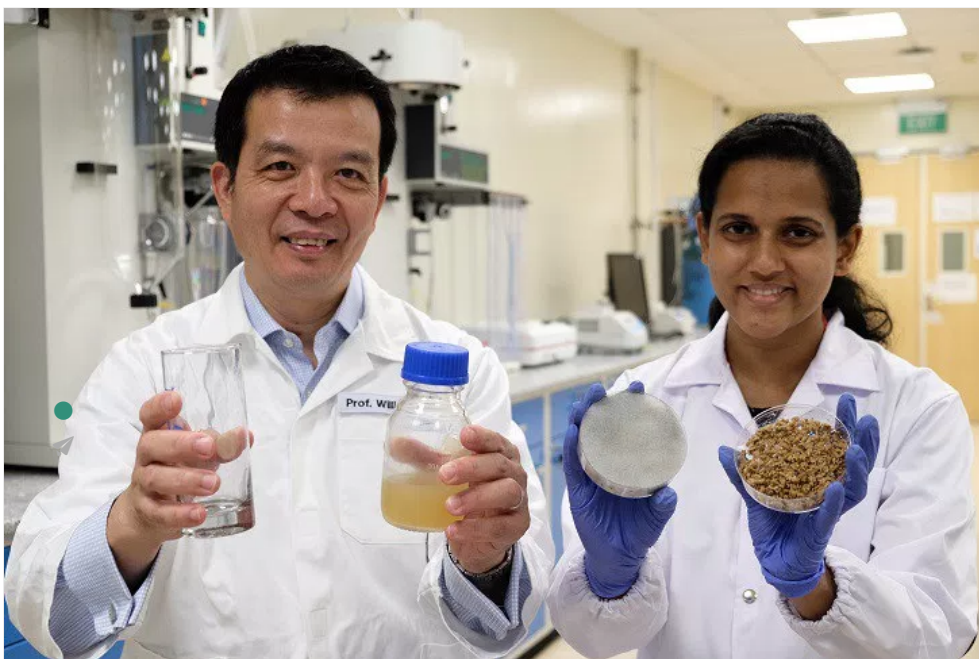
# Beer wastes are being recycled to make more environmentally friendly beer

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After a brewery makes its beer it ends up with a whole lot of leftover grains. They don't have much value and are usually composted or used to feed animals. However, there is a way that this waste can be useful! **Scientists from Nanyang Technological University in Singapore have converted these "useless" grains into a valuable liquid** that can grow beer yeast. Beer making can be a self-renewing cycle, instead of creating so much waste.

Yeast is necessary for the fermentation that turns the sugars from grains into alcohol. Breweries need loads of yeast to make all their beer and the yeast needs a lot of food. When grains, like barley or hops, are fermented by yeast, the sugars, proteins, and nutrients are used up. The spent grains just contain just tough plant fibers. These grains make up 85% of waste.



*The researchers with their upcycled beer products. Image credits: Nanyang Technological University, Singapore.*

This new process spins straw into gold. The almost worthless grains can be transformed into a liquid nutrient that sells for US\$30 a liter. Actually producing it from the grain scraps is very cheap. Some microorganisms break the tough plant fibers down into little nutritious nuggets. The researchers used food-grade microbes to do this. The nuggets can be mashed into a liquid that is good food for yeast.

"We have developed a way to use food-grade microorganisms to convert the spent grains into basic nutrients that can be easily consumed by yeast. About 85 per cent of the waste in brewing beer can now be turned into a valuable resource, helping breweries to reduce waste and production cost while becoming more self-sustainable," said Prof Chen, Director of NTU's Food Science and Technology Programme, who is leading the research.


Breweries are very interested in using this technique on a commercial scale. In particular, Asia Pacific Breweries sees its potential and donated their grains to the project.

Food production that is a self-sustaining cycle is good all-around. Sustainable agriculture helps global food security. If the waste is reused then the resources used to grow the yeast can be used to produce other food. In the whole world, over 193 billion liters of beer are produced. For every five liters of beer produced, one kilogram of spent waste grain is produced. So that is a lot of resources that can be used another way to feed people.

Mitchell Leow, Head of Corporate Affairs at APB Singapore, said: "This research is a testament to how science and innovation enables companies to find novel ways to be more sustainable in their operations. Sustainability is a business priority, especially for a large-scale commercial brewery like APB Singapore. We take great efforts to reduce our waste footprint, through such circular processes that ensure materials like spent grain, glass bottles, and even waste water are repurposed and not simply discarded."

Journal reference: Sachindra T. Cooray et al, Evaluation of brewers' spent grain as a novel media for yeast growth, *AMB Express* (2017). DOI: 10.1186/s13568-017-0414-1

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