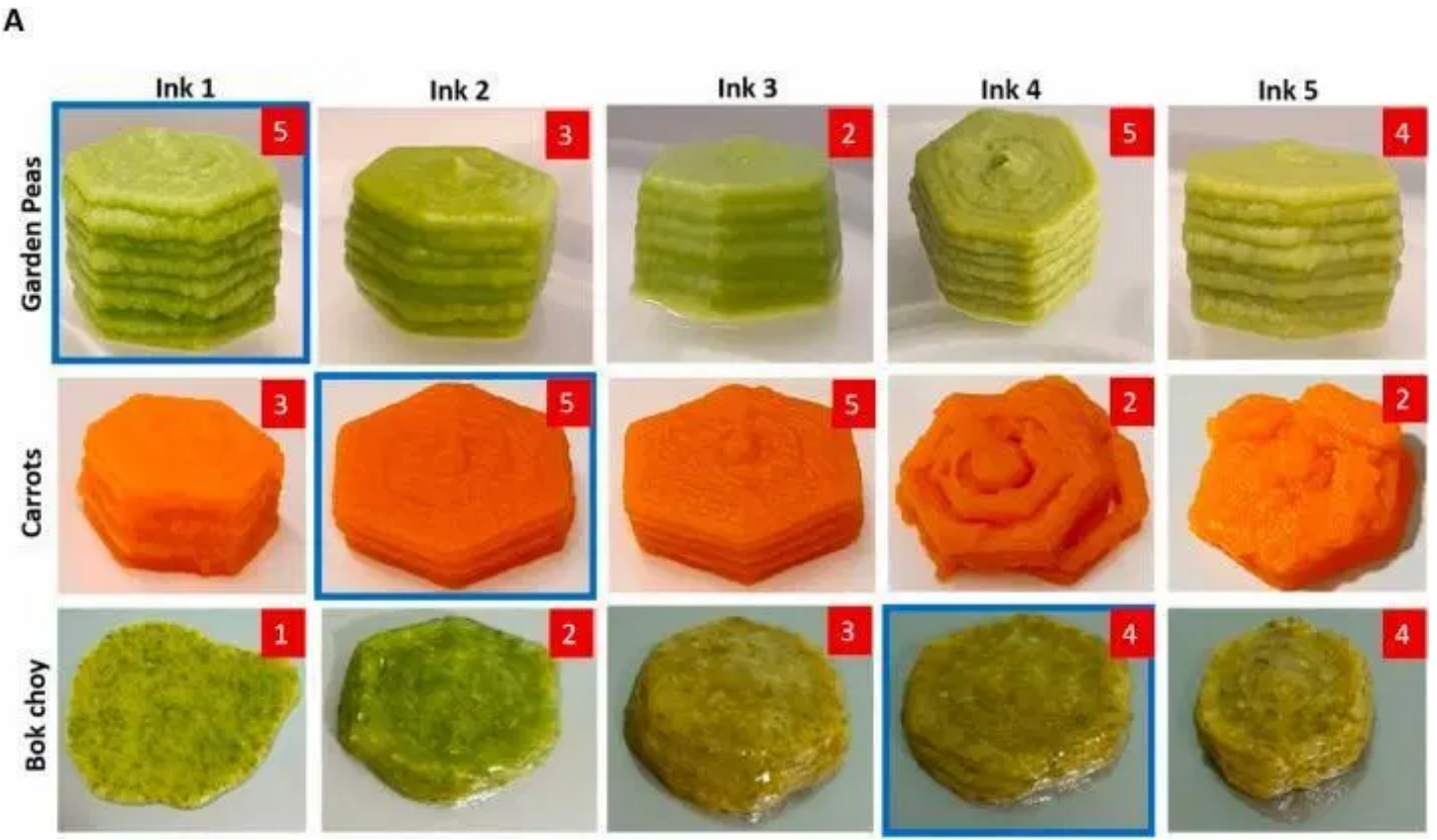

DISHING UP 3D PRINTED FOOD, ONE TASTY PRINTOUT AT A TIME

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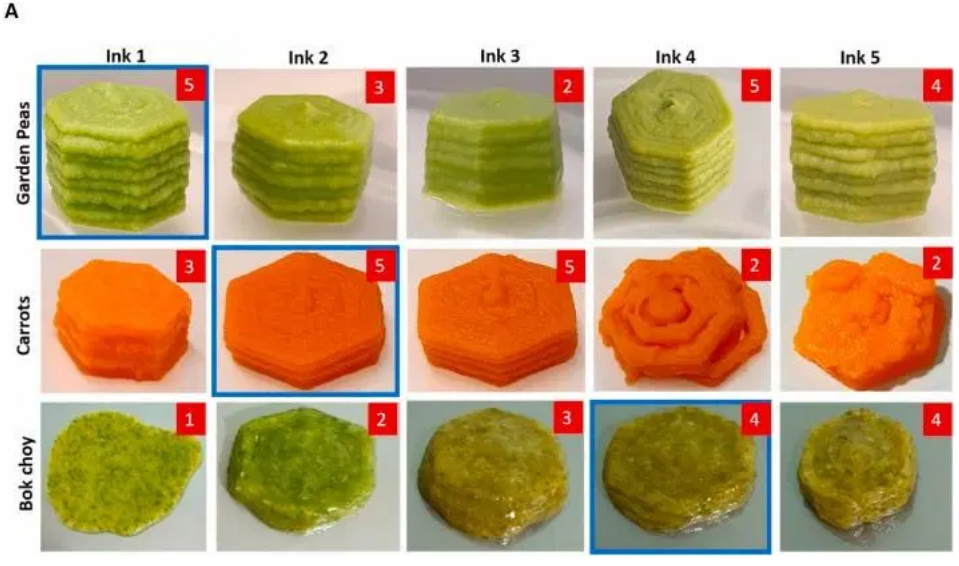
Singapore researchers develop new method for ‘printing’ fresh vegetables, leading to tastier, more nutritious food for patients with swallowing difficulties



Credit: SUTD / NTU / KTPH

Researchers from Nanyang Technological University, Singapore (NTU Singapore), Singapore University of Technology and Design (SUTD) and Khoo Teck Puat Hospital (KTPH) have developed a new way to create “food inks” from fresh and frozen vegetables, that preserves their nutrition and flavour better than existing methods.

Food inks are usually made from pureed foods in liquid or semi-solid form, then 3D-printed by extrusion from a nozzle, and assembled layer by layer.

To overcome this challenge, the research team explored various combinations of fresh and frozen vegetables to make the food inks stable.

Not only were they able to better preserve the nutrition of the printed food, they also made it more palatable. This new method of making food inks should lead to increased meal consumption by patients, contributing positively to their physical health and mental state of mind.

Additionally, the team discovered that vegetables could be broadly classified into three categories with each requiring a different hydrocolloid treatment in order to become printable. For instance, garden pea, carrot and bok choy were chosen as representatives in each category, requiring no HCs, one type of HC and two types of HCs, respectively (refer to images).

Prof Yi Zhang, the principal investigator from the NTU team said, “Our technology helps to provide dysphagic patients with adequate nutrient-rich and safe diets. Their feeding is more dignified, enabling them to socialise and consume meals that look, feel and taste like regular food. Our method of 3D printing fresh vegetables can be used easily in hospitals, nursing homes, day care centres for the ageing population with dysphagia and other swallowing disorders. Our research is also another step forward in digital gastronomy, where we can cater to specific requirements prescribed by dieticians, such as nutrition customisation and visual appeal.”

Prof Chua Chee Kai, corresponding author and the Head of Pillar, Engineering Product Development at SUTD, added: “The next frontier of additive manufacturing is 3D food printing. As the 3D food printing landscape is increasingly evolving, we are excited to continue pushing the boundaries of this industry to find innovative solutions for global issues such as food security and sustainability.”

Gladys Wong, co-principal investigator and Senior Principal Dietitian from KTPH said: “3D Food Printing is more than a novelty. I believe it will be a viable approach in the near future in providing sustenance and nourishment to our increasing ageing population. Our frail, elderly patients as well as those with swallowing difficulties will be able to enjoy a visually presentable and pleasurable dining experience even with a restrictive diet of smooth pureed dishes.”