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vegenotes

| CREATING VALUE FROM EDIBLE VEGETABLE WASTE - VG15076 |
| BOOSTING VEGETABLE CONSUMPTION THROUGH DIET (VEGEZE) - VG16071 |

VG15076 – CREATING VALUE FROM EDIBLE VEGETABLE WASTE

FACILITATORS

Project VG15076 was completed by CSIRO.

INTRODUCTION

With the global population expected to exceed nine billion by 2050, food producers face the challenging task of increasing production to meet the needs of a growing population. Meanwhile, approximately 30 per cent of produce grown by farmers is either lost or wasted post-harvest, contributing to food insecurity and eroding profits for growers.

Researchers from the CSIRO have been investigating ways to process this edible waste (also known as biomass) into novel food products to deliver additional value for vegetable growers.

ABOUT THE PROJECT

According to CSIRO Senior Research Scientist Dr Danyang Ying, vegetable loss and wastage is an increasing concern for growers as consumers demand consistency in the cosmetic appearance of fresh produce. This means that growers are increasingly left with quantities of vegetables that are edible, but don't meet the required retailer standards.

Working closely with broccoli and carrot growers in Victoria, Dr Ying and the CSIRO team have been exploring processing techniques to convert this highly perishable vegetable waste into a value-added food product that is attractive to customers and has the potential to generate a new income stream for growers.

MAJOR FINDINGS

The main focus of the project was to identify ways in which vegetable waste could be safely collected and processed into stable food ingredients. In the first instance, the researchers sought to understand the post-harvest chemistry of broccoli and carrots in order to lock in the nutritional value of the vegetable products. In turn, they experimented with processing techniques to convert a highly perishable product into an ingredient with a long shelf-life.

"By removing the water content of the vegetable, we were able to create nutrient-dense vegetable powders that have a long shelf-life, take up little space and which can be added to other products or used as an ingredient in cooking," Dr Ying said.

The research also explored the opportunities around developing nutritious extruded vegetable snacks, with positive results.

"We created a variety of vegetable snacks using extrusion technology and took them to the Queen Victoria Market in Melbourne for consumer testing. The feedback was very positive, especially among children, which surprised many parents," he said.

Work is currently being undertaken to reduce the cost of processing, and the research team is looking to partner with parties across the supply chain to develop a commercially viable product.

"We've had a lot of interest in the work done to date, and we believe that it would be possible to have a product in the market within the next 12 months."

The team has also proposed the idea of having regional processing hubs so that farmers can bring their edible biomass to a centralised location, where it can undergo minimal processing into a stable powdered product before being transported elsewhere for further processing.

"Providing a processing hub for regional growers could provide a number of benefits. Not only can it generate a second income for growers, but it also has the potential to address the environmental impact of biomass by providing a way to mitigate the production of greenhouse gases created by produce left out in the field."

CONCLUSION

Dr Ying believes that the research presents a great opportunity to increase overall vegetable consumption among the Australian population.

"Currently only a small proportion of the Australian population eats the recommended serves of fruit and vegetables as set out by the dietary guidelines. This is a way to boost their intake by offering novel alternatives to fresh produce."

According to Dr Ying, the potential for converting edible biomass into value-added products is enormous, and the research has only touched the surface.

"There are many opportunities to be explored, including the production of extracts, concentrates and fermented products, not to mention opportunities around biofuel," he said.

"There is the potential to create an entirely new industry, which makes it an exciting area to be working in."

ACKNOWLEDGEMENTS

This project is a strategic levy investment under the Hort Innovation Vegetable Fund.

VG15076 was funded by Hort Innovation using the vegetable research and development levy and contributions from the Australian Government.

VG16071 – BOOSTING VEGETABLE CONSUMPTION THROUGH DIET (VEGEZE)

FACILITATORS

Project VG16071 was completed by SP Health in collaboration with CSIRO.

INTRODUCTION

Data from the latest Australian Health Survey suggests that less than five per cent of adults consume enough vegetables to meet the Australian Dietary Guidelines. Meanwhile, analysis of the CSIRO Healthy Diet Score survey – a survey of over 198,000 Australian adults – revealed that people who always have three different types of vegetables with their evening meal have higher overall vegetable consumption.

Inspired by this data, researchers developed a smartphone app that targets this specific behaviour to ultimately increase consumers' vegetable consumption.

ABOUT THE PROJECT

To undertake the project, digital health experts SP Health collaborated with researchers from the CSIRO to develop a mobile app to encourage users to increase their vegetable intake at dinner.

"The inspiration for the project came from the CSIRO Healthy Diet Score survey, which found that people who regularly consumed three different types of vegetables with their evening meal were more likely to meet the recommended dietary guidelines," SP Health Director of Product Development Anna Crook explained.

The project team set out to develop an intervention study that specifically targeted this behaviour and encouraged participants to 'Do 3 at Dinner' as part of a 21-day challenge. This led to the development of the VegEze smartphone app, an easy-to-use mobile app that allows users to log and track their daily vegetable intake, as well as providing them with feedback and daily reminders for logging the vegetables they consumed. The app also included educational features, including meal ideas and facts on the health benefits of vegetables.

The VegEze research study was launched in the Apple App Store in November 2017. The app was downloaded over 12,000 times, and 5,000 Australians completed the baseline survey at the start of the challenge.

Between November 2017 and May 2018, 1,313 people completed the 21-day survey. Logged data was analysed at the end of the 21-day challenge, and then again at 90 days.

MAJOR FINDINGS

Data analysis found that the study sample comprised mostly women (84.3 per cent) with a mean age of 48.2 years. Before the start of the challenge, the average reported vegetable intake among participants was 2.9 serves per day, with 84 per cent of women and 93 per cent of men not meeting the daily recommendations laid out by the Australian Dietary Guidelines.

Following the 21-day challenge, researchers found that the app's encouragement to eat three types of vegetables at dinner was an effective strategy for increasing vegetable consumption. The study found that, on average, participants had increased their vegetable intake by 0.5 serves per day, and that their vegetable variety had also increased by 0.4 types per day.

The greatest gains were experienced by the lowest vegetable consumers, who increased their intake by 1.2 serves per day, and vegetable variety by 0.7 types per day. Positive results were also experienced by people who actively used the app, with greater increases in consumption and variety for those that used the app on most days of the 21-day challenge than those who demonstrated low use of the app.

Women were also big winners, with the research indicating that women were more able to maintain these gains in the longer term. After 90 days, the data showed that women not only increased their intake by 0.7 serves a day, but that 27 per cent were consuming enough vegetables to meet the Australian Dietary Guidelines.

CONCLUSION

According to Ms Crook, the research showed that by targeting specific behaviours, VegEze was an effective method for increasing vegetable consumption. She also highlighted the speed of impact compared to other interventions, such as Go for 2&5, and hopes to develop the app further.

"Through investment in this research, the vegetable industry has shown great leadership in improving the health of Australians. The app has attracted interest from a variety of potential partners – from health funds to supermarkets – and we're hoping to be able to help even more Australians take an active role in their health."

ACKNOWLEDGEMENTS

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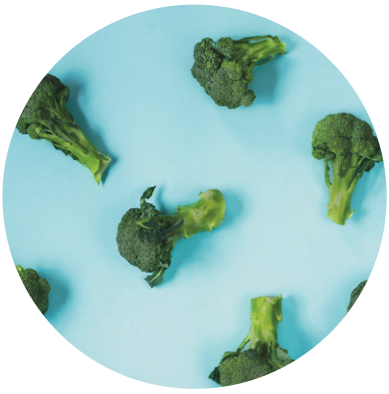

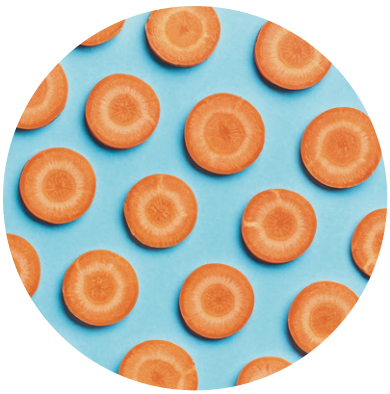

THE BOTTOM LINE: CREATING VALUE FROM EDIBLE VEGETABLE WASTE (VG15076)

Edible vegetable waste (also known as biomass) is an increasing problem for vegetable growers, and CSIRO researchers have been exploring ways to convert this biomass into nutritious value-added products. Focusing on broccoli and carrots, they have developed techniques to create nutrient-dense vegetable powders and extruded vegetable snacks with extended shelf lives.

To date, feedback from consumers has been positive, and researchers believe these novel value-added products have the potential to increase overall vegetable consumption by providing tasty, nutritious alternatives to fresh produce.

Researchers are currently working on ways to reduce the cost of processing, and supply chain partners are being sought to bring these products to market. Opportunities for the development of further products are significant, and if successfully commercialised, the research has the potential to generate additional income streams for growers.

FURTHER INFORMATION

For more information, please contact Dr Danyang Ying at danyang.ying@csiro.au.

More information about this project can be found at csiro.au/en/Research/AF/Areas/Food/Making-new-sustainable-foods/Converting-food-waste-into-nutritious-ingredients.

THE BOTTOM LINE: BOOSTING VEGETABLE CONSUMPTION THROUGH DIET (VEGEZE)(VG16071)

With less than five per cent of adults eating the recommended amount of vegetables as outlined by the Australian Dietary Guidelines, researchers have developed a smartphone app to target and encourage consumers to eat three different varieties of vegetables with their evening meal.

The impact of VegEze on vegetable consumption was measured through an intervention study, where app users participated in a 21-day challenge to 'Do 3 at dinner'. Participants logged and tracked their daily vegetable consumption through the app.

At the end of the challenge, the study found that, on average, people who used the app had increased their vegetable consumption by 0.5 serves a day, and their vegetable variety had also increased by 0.4 types per day.

Those who used the app regularly showed a greater increase in vegetable consumption and variety, while women were more able to make longer-term gains in vegetable consumption.

Overall, the researchers found that VegEze was an effective strategy for increasing vegetable consumption.

FURTHER INFORMATION

For more information, please contact Anna Crook at anna@sphealth.com.

The final report for this project is available on InfoVeg. Readers can search 'VG16071' on the InfoVeg database: ausveg.com.au/infoveg/infoveg-database.

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Please contact Michelle De'Lisle at AUSVEG via email at michelle.delisle@ausveg.com.au or call 03 9882 0277 to submit topics for potential inclusion in future editions of *Vegenotes*.

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