

First course of veggies may appeal to hungry preschoolers

May 5 2010

Increasing the amount of vegetables in the first course of preschool lunch could be a smart way to get children to eat more vegetables, according to Penn State nutrition researchers.

"We have shown that you can use portion size strategically to encourage children and adults to eat more of the foods that are high in [nutrients](#) but low in calories," said Barbara J. Rolls, Helen A. Guthrie Chair of Nutritional Sciences.

Rolls and her Penn State colleagues study how varying the portions of fruit and vegetable side dishes can be used to raise vegetable consumption in children and adults.

Researchers served lunch to 51 children at a daycare center on four occasions and measured their vegetable intake. Children were provided with no carrots or 30 grams (about 1 ounce), 60 grams (about 2 ounces), or 90 grams (about 3 ounces) of carrots as the first course of their lunch.

The children had 10 minutes to eat the carrots, after which researchers served them pasta, [broccoli](#), unsweetened applesauce, and low-fat milk.

They found that when preschool children received no first course of carrots, they consumed about 23 grams (nearly 1 ounce) of broccoli from the main course.

When the children received 30 grams (about 1 ounce) of carrots at the

start of the meal, their broccoli intake rose by nearly 50 percent compared to having no carrots as a first course. But when the first course was increased to 60 grams (about 2 ounces) of carrots, average broccoli consumption nearly tripled to about 63 grams -- or a third of the recommended vegetable intake for [preschool children](#).

The extra carrots eaten at the start of lunch did not reduce the amount of broccoli eaten in the main course, but added to the total amount of vegetables consumed. The team's findings appear in the current issue of the [American Journal of Clinical Nutrition](#).

"We gave the children [carrots](#) first without other competing foods," explained Rolls. "When they are hungry at the start of the meal, it presents us with an opportunity to get them to eat more vegetables."

According to Maureen Spill, graduate student in nutrition and study co-author, the findings challenge the conventional belief that children won't eat vegetables. It also provides parents a simple strategy to get their children eating a more healthy and nutritious diet, she added.

"The great thing about this study is the very clear and easy message for parents and care-givers that while you are preparing dinner, put some vegetables out for your children to snack on while they're hungry," said Spill. "Parents also need to set an example by eating vegetables while children are young and impressionable."

Other researchers in the two studies include Leann L. Birch, Distinguished Professor of human development; Liane S. Roe, research nutritionist, and Jennifer S. Meengs, lab manager, all at Penn State

The National Institutes of Health and the Robert Wood Johnson Foundation supported this work.

Provided by Pennsylvania State University

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