

## « NEW IDEAS TO INCREASE F&V CONSUMPTION »

### Editorial

The health benefits of a high Fruit and Vegetable (F&V) intake are beyond doubt. However, actual consumption of this food group is insufficient in large parts of the population, resulting in calls for interventions to increase it.

In this edition of the IFAVA Newsletter, three attempts to do so are presented, focusing on different factors influencing the choice of F&V for a meal.

The way foods are prepared is an important determinant of consumers' attitudes towards them. Lack of knowledge and experience as to how to cook vegetables can therefore present a barrier to their consumption as reflected in a recent study from Brisbane, Australia. Winkler and Turrell suggest that the know-how of vegetable preparation appears to be particularly low in groups that have repeatedly shown a low consumption.

As preparation also strongly influences taste and consistency, it is an important factor for consumer acceptance. In their study, Rennie and Wise show a preference for steamed vegetables over cooked ones, suggesting that cooking techniques should be considered in interventions to promote vegetable intake.

However, in everyday life, many people have to rely on community nutrition and catering for their food at least on working days, placing canteens in the focus of intervention approaches. Children are a particular target group for such attempts as their F&V consumption is generally too low. A recent investigation reported by Swanson and Branscum showed that intake in young children can be increased by offering sliced fruit, particularly the varieties difficult to handle.

These three findings show the need to consider all factors influencing food choice when promoting F&V consumption.

**I. Elmadfa**

University of Vienna, Austria

President of the International Union of Nutritional Sciences (IUNS)

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# Promoting Consumption of Fruit: The Effects of Slicing Apples and Oranges in an Elementary School Cafeteria

— Mark Swanson, Adam Branscum —

University of Kentucky College of Public Health United States

Despite the documented health benefits of Fruit and Vegetable (F&V) consumption<sup>1</sup>, extensive data documents the under-consumption of these foods by Americans<sup>2-3</sup>. Serving millions of United States schoolchildren daily, school cafeterias offer important opportunities to improve produce consumption. School cafeterias need to explore ways of improving not only what is offered, but what is consumed by students. One possible option is to make already available healthy foods more accessible to students. This study compared the consumption of apples and oranges served in an elementary school cafeteria on a day they were served sliced versus a day they were served whole.

## To measure student selection and consumption of fruit,

we used digital still photography to record every lunch served and eaten as part of the National School Lunch Program. Digital photography is highly reliable and precise means of measuring cafeteria consumption<sup>4-5</sup>. This approach can quickly collect large amounts of data from students without disrupting cafeteria operations. A unique identifier number is attached to each disposable lunch tray and a picture taken of each tray as the student exits the serving line and again before tray disposal. While trays were not associated with particular students, they were marked in a way to determine the

grade level (K through 4) of the student.

Following a procedure described elsewhere<sup>4</sup>, two analysts compared each pair of pictures and visually estimated the amount of each item selected and consumed. The two analysts' estimates were averaged to create a single value for the quantity of each item consumed. The study then estimated the proportion of students eating at least half an apple or orange on each of the two study days using Clopper-Pearson exact 95% binomial confidence intervals. Differences between sliced and whole fruit consumption were considered meaningful if 95% confidence intervals did not overlap. The relationship of age to fruit consumption was tested using logistic regression.

## Whole apple and sliced orange

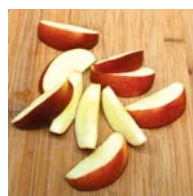
A lower percentage of students (6.8%) ate at least half an apple when sliced, compared to whole (6.8% vs. 8.9%), but the difference is not statistically meaningful, since the 95% confidence intervals overlap. In contrast, slicing oranges led to a significantly higher percentage of students selecting and eating at least half an orange (10.3% vs. 2.3%), a difference that is statistically meaningful. Additionally, the effect of slicing oranges was significantly greater among younger students than among older students. For example, almost 18% of Kindergarten students ate half an

orange or more when sliced, compared to just over 2% for whole oranges. The difference in orange consumption rates for fourth graders, however, was not significant.

## Slicing : an idea to increase F&V consumption

Because this was a purely observational study, we can only speculate on why slicing oranges would increase consumption, while slicing apples does not. It is telling that the impact of slicing on consumption was particularly important for younger students. Oranges, which can be difficult to peel in the short time given to students for lunch, were more accessible when sliced and significantly more students selected and consumed oranges when they were offered in sliced form. Whole apples, we speculate, are easier to eat than unsliced oranges.

This study demonstrates that relatively simple, low cost changes in the way food is presented to students can have significant effects on the selection and consumption of healthy food choices. Carefully considering the convenience and accessibility of food items could help cafeteria personnel increase healthy eating by students. However, our findings demonstrate that it cannot be assumed that an action to make one food item more accessible - such as slicing - will have the same effect on another food item.



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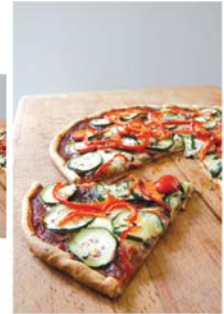
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# Confidence to cook: considerations in promoting fruit and vegetable consumption

— Elisabeth Winkler —

Cancer Prevention Research Centre - University of Queensland - Australia



*Cook F&V... homemade pizza...*

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In order to inform efforts to promote Fruit and Vegetable (F&V) consumption, and to do so equitably, a better understanding is needed of the determinants of their consumption, and particularly the determinants within socioeconomically disadvantaged groups, whose fruit and vegetable intake is particularly low.

## Cooking skills and inadequate F&V intake

Cooking skills have been a focus of several small-scale nutrition interventions, typically in combination with other strategies, and one of the aims of the Australian National Nutrition Strategy is to “educate and skill our population to choose a healthy diet”. This strategy has been based on a rationale that a decline in cooking skills is one reason for the inadequate consumption of F&V. However, despite contemporary social trends that affect how food is prepared and consumed and concerns about deskilling, population nutrition monitoring typically focuses on food intake. Such monitoring does not typically focus on the skills that might affect food choice, with the most recent population-based study of this kind occurring in the early 1990s in the United Kingdom. Thus, there is very little evidence as to how skilled, or confident, the population of Australia, or other developed nations, actually are to cook foods that constitute healthy diet. There is also very little evidence on whether these skills truly are declining, which could be of concern in population health nutrition. Furthermore, evidence that cooking skills are linked with choosing to consume a healthier diet is limited to a few isolated studies, often focused on highly specific groups of the population, such as adolescents, or young adults.

## Lack of confidence to cook vegetables...

A recently published cross-sectional study of the main food preparers of 426 households in Brisbane, Australia, found that lack of confidence to cook vegetables - and to do so using a variety of techniques - were both associated with less household purchasing of vegetables. Of the two measures, the one with strongest association with household vegetable purchase was the one that reflected how confident participants were (from ‘not at all confident’ to ‘very confident’) to prepare 21 different vegetables. Possibly, the degree to which people are confident to prepare

specific foods has more relevance to their behavior than their general confidence in kitchen.

Confidence to cook vegetables (measured such that 21 is the lowest possible score and 126 the highest) was high on average (median 117) but varied across the full range of possible scores. This indicated that on the whole, most people who cook for their household are quite confident to cook vegetables, but importantly, that there are ‘household chefs’ with very little confidence to cook vegetables. In the study, lacking confidence to cook was most common among household chefs who were male, of low education, unwilling to disclose their income, not living with other adults, and not living with minors. Interestingly, these groups overlap to some degree with some of the population groups the scientific literature often show as having comparatively low F&V intake: men, low socio-economic status, and those living alone.

## ... a reason for inadequate consumption

While the study is by no means definitive, findings from this study and the literature in general are consistent with the notion that a lack of confidence to cook might form part of the reason for inadequate vegetable consumption, particularly among low socio-economic groups. The findings also lend some credence to the possibility that increasing vegetable intake might require improving confidence to cook them, particularly among some of the groups who most could benefit from intervention.

## Promoting skills and confidence to cook F&V

Major nutrition promotion efforts, such as Go for 2&5® in Australia, or the United States National Fruit and Vegetable Program, aim to promote F&V intake by targeting awareness. While such campaigns are sorely needed, and even make available tasty recipes high in vegetables, knowledge alone is not enough. It may well turn out that such efforts prove more effective in increasing F&V intake of those who already possess the relevant skills or confidence to cook vegetables, than those who do not. Efforts targeting skills and confidence to cook vegetables and other nutritious foods may also be needed in order for such campaigns to succeed, and to succeed equitably.

# Preferences for Steaming of Vegetables

— Carla Rennie —

The Robert Gordon University, Aberdeen, UK

The World Health Organisation (WHO) suggests eating at least five portions of Fruit and Vegetables (F&V) a day to reduce the risk of developing chronic diseases such as coronary heart disease and some cancers. Boiling continues to dominate amongst cooking methods for vegetables but steaming is preferable with fewer losses of water-soluble vitamins and other soluble beneficial components. A campaign to target steaming should demonstrate improvements in taste by providing samples to the public. Since some vegetables may show greater taste benefits than others, this study aimed to determine whether people prefer steamed vegetables and which might be the most appropriate to demonstrate this preference.

## Material and Methods

Three types of fresh vegetables were cooked using three methods; boiling, steaming and microwave steaming. Similar sizes of each vegetable were cooked in 180g batches. Optimal boiling times for each vegetable found during a pilot study were 10, 5 and 7 minutes for carrot, cabbage and broccoli; times recommended for steaming were 7, 10 and 7 minutes respectively. Microwave steaming was carried out using Zip 'n' Steam bags at a high setting for 2 minutes. Each batch was held at 74°C for up to 30 minutes before presentation to subjects. Samples of 25g cooked vegetables were placed in coded polystyrene pots and presented to assessors in a Latin square to eliminate order bias. They rated each sample for appearance, texture, flavour and overall acceptability using a nine-point (1-9) hedonic scale, and recorded how they usually cooked vegetables.

## Preferences for steaming Vegetable

There were 35 females and 15 males, 80% of whom were aged 18-35 years. Steaming and microwave steaming were significantly higher rated than boiling for broccoli with regard to all features. In terms of acceptability the average scores were 6.2 and 7.1 for the two steaming methods and 5.1 for boiling ( $P < 0.001$ ). Carrots were similarly considered better for flavour and overall acceptability. Cabbage was generally rated lower for all features and there were no differences amongst the cooking methods (for acceptability, scores were 4.9, 5.1 and 5.2, respectively). The question about the usual cooking method for vegetables was employed to group the subjects. The most common method was boiling, with 21 subjects using this method.

Mean scores for acceptability of steaming and microwave steaming were significantly higher for assessors who usually boil vegetables (5.5, 6.2 and 6.5, respectively) ( $P = 0.013$ ). This was also found for those who usually stir-fry vegetables, but did not reach statistical significance for the few subjects who already steam vegetables.

Only 10% of the subjects who usually boil vegetables appeared to prefer the boiled vegetables.

## Changing for steaming ?

The findings obtained show that microwave steamed and steamed vegetables, with the exception of cabbage, were generally preferred over those that were boiled. It was also found that the majority of participants who boiled their vegetables at home did not prefer this cooking method when given a choice including steaming.

Microwave steaming was marginally preferred over steaming, but the cost of the bags adds an inhibitory factor to the adoption of this more convenient method for many people.

If subjects can be persuaded to steam by giving samples of steamed broccoli, they might also steam other vegetables and consequently obtain the appropriate nutritional benefits.

There are however, many barriers to change that need to be taken into account in the promotion of steaming as a regular method for cooking vegetables, because sensory attributes may not be enough to convince many people to make a change.

A recent trend has been demonstrated in market research on sales and ownership of small kitchen appliances with sales of

domestic electric steamers increasing from 480,000 units in 2001 to 700,000 units in 2006, an increase of 46.8%. However, ownership does not necessarily reflect usage. The same report shows that only 41% of those owning a steamer used it at least once a week. This indicates that there are barriers to the use of this equipment, even for those who have purchased and tried it.

This study suggests that most people who currently boil vegetables would prefer steaming, especially if they taste broccoli, although the small numbers of subjects who already steam vegetables limit the conclusions that can be drawn about their preferences. More research is needed to understand the barriers to the adoption of steaming as a way of cooking vegetables



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Rennie, C. & Wise, A. (2010) Preferences for steaming of vegetables. *J. Hum. Nutr. Diet.* 23, 108-110.