



# The

# Scientific Newsletter

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## F&V CONSUMPTION IN LOW INCOME POPULATION

### Editorial

Forty years ago, Paris witnessed 'Les Événements'. The startling and exciting outburst of radicalism involved students, in alliance with trade unionists, taking to the streets to demand an end to the old conservative system of inequality and corruption. The elderly President De Gaulle was so impressed by the intensity of the street violence that he went briefly into exile. The protesters wanted not only cultural liberation but also direct participation in government and business. The revolutionary demands were idealistic, but they failed to win the day. Shortly after May 1968 the Gaullists were re-elected. Today, the Paris Conference\* and this Newsletter address the theme of promoting fruit and vegetable consumption. This may be seen, forty years on, as yet another retreat from the ideals of social solidarity. Such a view would be too simplistic: indeed, simply wrong. Social inequalities in health are among the most important consequences of stratified societies. Large health inequalities persist in rich countries and, as noted by the 'Marxists, tendance Groucho' of 1968, they have both material and cultural roots. The focus on strategies to increase fruit and vegetable consumption among people on low incomes is a sign that industrial interests, reflected by IFAVA, can change in a progressive way. Distinctly less romantic than university occupations, but if put into place with creativity and determination, it is likely to do more for the health of the socially disadvantaged.

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# Do adolescents from socioeconomically disadvantaged backgrounds have unsupportive home food environments?

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Despite the health benefits of a nutritious diet, many adolescents have diets that are less than optimal<sup>1,2</sup>, particularly those from socioeconomically disadvantaged backgrounds. For example, adolescents of low socioeconomic position (SEP) tend to consume fewer fruits and vegetables and more high fat foods than their counterparts of higher SEP<sup>3,4</sup>. Why adolescents of low SEP have poorer diets is not known. However, lack of knowledge about the positive aspects of healthy eating (and negative impacts of unhealthy eating), lack of skills necessary to prepare nutritious food, different priorities, or inability to afford healthy foods, may be possible reasons. Another possible reason is that adolescents of low SEP have less supportive home food environments. In a recent article, we examined whether low SEP adolescents have less supportive family mealtime environments, fewer eating rules and poorer home availability of fruits and vegetables than adolescents of high SEP<sup>5</sup>.

## **Youth Eating Patterns (YEP) study**

To examine whether aspects of the home food environment vary across SEP, we invited year seven and nine students from secondary schools in metropolitan and non-metropolitan regions of Victoria, Australia, to complete an online food habits survey in 2004 and 2005. A total of 3,264 students (48% girls) from 37 schools completed the YEP survey during class time. We also invited their parents to complete a separate survey, which included questions about their own (and their partners) demographics, including highest level of education. We then used maternal education as our indicator of SEP.

## **Less supportive family mealtimes?**

Less supportive family mealtime environments may partly explain the poorer diets of low SEP adolescents. Our study found that adolescents of less educated mothers were more likely to report that they were always allowed to watch television during mealtimes. Television-viewing at mealtimes has previously been shown to be associated with poor eating choices and decreased family interactions<sup>6,7</sup>, and has previously been reported to occur more frequently in households of poorly educated mothers<sup>6</sup>. Our study also found that family mealtime environments of high SEP adolescents were more conducive to healthy eating, with adolescents of more highly educated mothers more likely to report that vegetables were always served at dinner, that the

evening meal was never an unpleasant time for the family and that the evening meal was always or usually a time when their family really talked and caught up with each other.

## **Fewer eating rules?**

In contrast to previous studies with children, which found less educated mothers to be less likely to implement eating rules in the home<sup>8,9</sup>, our study found that eating rules were not associated with maternal education in adolescents. The lack of any relationship between eating rules and maternal education in adolescents may reflect the diminishing control parents have over their children's food choices as they move from childhood to adolescence<sup>9</sup> or the opposing effects (both negative and positive) that parental use of eating rules may have on children's and adolescents' diets<sup>10,11</sup>.

## **More unhealthy foods in the cupboard at home?**

Lower availability of healthy foods and greater availability of unhealthy foods in homes of low SEP adolescents may also partly explain their poorer diets. Our study found that adolescents whose mothers were poorly educated were more likely to report that unhealthy foods (e.g. soft drink, potato chips, and confectionary) were always or usually available at home. In contrast, adolescents whose mothers were more highly educated were more likely to report that fruit was always or usually available at home. These findings are consistent with previous studies, which found a significant association between education level and food purchasing, with less educated respondents being less likely to purchase grocery items that were consistent with the dietary guidelines recommendations<sup>12</sup>.

## **Conclusions**

This study highlights how home food availability and aspects of the family mealtime environment of adolescents differ across SEP. Interventions aimed at improving adolescent nutrition should focus on encouraging parents, particularly those from socioeconomically disadvantaged backgrounds, to increase the home availability of healthy food (e.g. fruit and vegetables) and to provide family mealtime environments that are supportive of healthy eating (e.g. limited television-viewing during meals).

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# Is price a barrier to eating more fruits and vegetables for low-income families?

— Cecile Knai —

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Summary of Diana Cassady, Karen M. Jetter, Jennifer Culp. Is price a barrier to eating more fruits and vegetables for low-income families? J Am Diet Assoc. 2007 Nov;107(11):1909-15.

Efforts to increase the fruit and vegetable consumption of Americans include the Dietary Guidelines for Americans 2005<sup>1</sup>. This most recent edition of the Guidelines increased the recommended daily servings for fruits and vegetables from previous recommendations of five to nine servings a day, and also recommended specific amounts of certain types of vegetables, including legumes, dark-green vegetables and orange vegetables.

Despite these and other efforts to increase fruit and vegetable consumption to the whole population and to high-risk groups<sup>2,3,4</sup>, there are still disparities between high- and low-income consumers<sup>5,6</sup>. Higher income consumers are more likely to meet dietary recommendations.

Increasing attention has been focused on how the food environment supports the choice to eat more healthily<sup>7</sup>. Price, along with taste and convenience, is a leading influence on food choices<sup>8</sup>. Price may pose a significant challenge to the ability of low-income consumers to meet the 2005 Dietary Guidelines recommendations for fruits and vegetables. This is because :

- 1) a greater number of servings are recommended, increasing the total cost above the previous 5-A-Day targets and
- 2) dark green and orange vegetables and legumes encourage by the 2005 Dietary Guidelines tend to cost more than starchy vegetables<sup>9</sup>.

The purpose of this market basket study was to examine the price environment for fruits and vegetables by investigating three research questions:

- 1) Is the cost significantly more if they purchased a fruit and vegetable market basket that meets the newer 2005 Dietary Guidelines compared to the 1995 guidelines reflected in the Thrifty Food Plan?
- 2) Do fruit and vegetable prices vary by neighbourhood income level and store type? And
- 3) What is the effect of the new dietary guidelines for fruit and vegetables on the food budget of a low-income family?

## ***The 2005 Dietary Guidelines vs. the 1995 Thrifty Food Plan***

In terms of quantity, it was found that a family of four would purchase fewer fruit and vegetables compared to the shopping list for the Thrifty Food Plan. The largest increases from the Thrifty Food Plan to the 2005 Dietary Guidelines market basket were in dark-green vegetables (239%), orange vegetables (83%) and legumes (52%). The average price per serving was highest among the fruit, dark green vegetables and legume subgroups. In terms of average cost, the new guidelines

market basket cost 4% less than the Thrifty Food Plan market basket. There was a 63% decrease in the cost of starchy vegetables and a 20% decrease in the cost of fruits. This decrease in cost offset significant cost increases for dark green vegetables (111%), orange vegetables (83%) and legumes (55%). The total cost difference was not significant but the change in cost for each subgroup was significant ( $P < 0.001$ ) given the changes in amounts for each market basket.

## ***Price of fruit and vegetable by neighbourhood income level and store type***

The study found that the average price of fruit and vegetables was significantly less expensive in very-low- and low-income neighbourhoods, and in bulk supermarkets. However the results of the study suggest that several important cost barriers exist for low-income consumers who wish to meet dietary guidelines. For example, only a careful selection of the store will guarantee that low-income shoppers pay less because prices vary across stores in very-low-income areas. Even within the same chain prices varied noticeably. Also, the cost of the new guidelines' fruit and vegetable market basket will require substantial changes in the family food budget.

## ***Influence of the 2005 Dietary Guidelines fruit and vegetable basket on the family food budget***

It was found that a family of four shopping in a very low income neighbourhood would spend on average \$1688 annually to meet the 2005 Dietary Guidelines recommendations. A family of four using food stamps in California receives on average \$3888 each year<sup>10</sup>, so the new dietary guidelines would require 43% of the food stamp budget. Households in the lowest two income quintiles spend an average of \$2410 each year on food at home<sup>11</sup>, which means lower-income households would have to allocate 70% of their food at home budget to the new dietary guidelines fruit and vegetable market basket.

## ***Conclusions***

The results of this study suggest that the budgetary cost of increasing fruit and vegetable consumption to levels recommended in the new dietary guidelines may be more of a barrier to healthful eating than the price per serving of fruit and vegetables. Public policies should examine ways to make fruits and vegetables more affordable to low income families.

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# From Research to Policy: Economic Interventions Support Increases in Fruit and Vegetable Intake

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## *Interventions to Increase Fruit and Vegetable Intake*

Interventions using nutrition education to increase consumption of fruits and vegetables have reported some successes, although the magnitude of the behavior change has been modest<sup>1</sup>. Recent analyses seem to point to the potential for more “upstream” strategies, including policy, pricing, and environmental changes to affect food access and availability in addition to consumer information and motivation<sup>2</sup>.

Strategies to promote the choice of fruits and vegetables by lowering their cost relative to those of alternative foods has gained attention as the evidence continues to mount regarding their potential for positive health effects with increased intakes. These strategies have been little tested most likely due to the cost of implementation, although the available evidence shows that they are highly effective. Reducing the prices of fresh fruit and baby carrots in work sites and secondary schools has resulted in substantially increased sales of these items<sup>3,4</sup>. Two published reports on the provision of coupons for the purchase of fruits and vegetables at farmers markets, one with low-income older adults over a 5-year period<sup>5</sup> and the other for participants in the Special Supplemental Nutrition Program for Women, Infants and Children (WIC) in Connecticut (U.S.)<sup>6</sup>, showed high levels of coupon use.

## *Review of the WIC Food Packages – An Opportunity for Policy Change in the U.S.*

The WIC program is a governmentally funded, locally administered public health program in the US that provides supplemental foods of high nutritional quality, nutrition education, and referrals to health care for low-income and nutritionally at-risk women and children, during critical periods of growth and development. The WIC program was developed prior to the appreciation of the relationship of intake of fruits and vegetables to chronic disease risk. The supplemental foods selected at the time the program was initiated were to provide nutrients most limited in the diets of pregnant and breastfeeding women, infants, and children up to the age of 5 years—calcium, iron, vitamin A, and vitamin C and protein. The supplemental food packages have traditionally consisted of nutrient-dense foods such as: fluid milk, cheese, eggs, dry beans, peanut butter, fruit juice, and iron-fortified cereals and formula for infants. There has been

considerable discussion about adding fruits and vegetables to the WIC supplemental food package. A report issued by the Institute of Medicine (IOM) in 2005 recommended a number of changes to the packages including the addition of fruits and vegetables for all participants older than 6 months of age<sup>7</sup>. At the time of this study, the only fruits and vegetables provided were juice (for all participants older than 4 months) and fresh carrots for breastfeeding women.

## *Can Economic Incentives be Utilized to Improve Consumption of Fruits and Vegetables?*

The objective of the present study was to determine whether an additional economic subsidy to purchase fresh fruits and vegetables for postpartum WIC participants would result in increased consumption. The WIC program provides an ideal setting for investigating means to improve consumption of fruits and vegetables because it is targeted to a low-income population and is designed to improve dietary quality both by offering high-quality, nutrient-dense foods and through nutrition education. The program reaches about half of all infants born in the United States, along with their mothers and about 25% of preschool children<sup>8</sup>.

The current study measured two interventions to increase fruit and vegetable intake and compared these to a control site. The interventions were carried out at a major supermarket and a year-round farmers’ market. Study participants had recently delivered and were either breastfeeding or non-breastfeeding postpartum women, English or Spanish-speaking and at least 18 years of age. Following a 2-month monitoring period to document baseline fruit and vegetable intake, participants at the two intervention sites were issued \$10 worth of vouchers per week in \$1 units for the supermarket site and \$2 units for the farmers’ market site to buy produce of the participants’ choice. Control participants were provided with a set of coupons of lesser value (\$13 per month) redeemable for disposable diapers, in compensation for their time participating in interviews. The intervention was carried out for six months and participants were followed for an additional six months to track changes in fruit and vegetable intake.

Dietary intake was assessed four times during the 14-month study (at study entry, 2 months after study entry, end of 6-month intervention and 6

months following the end of the intervention) using a multiple pass 24-hour dietary recall. Participants’ descriptions of total food consumption were disaggregated into component food parts and fruits and vegetables converted to standard serving sizes by the same methods outlined by USDA for analysis of national food consumption data. Other variables collected included: demographics, other governmental program participation, food security, breastfeeding rates, and participants’ height and weight.

## *Incentives Supported Increased Fruit and Vegetable Intake*

Based on a mixed modeling approach, total consumption of fruits and vegetables increased over the course of the study. At baseline, participants at the farmers’ market site reported consuming on average 5.4 servings of fruits and vegetables, at the supermarket site 6.9 servings, and at the control site 5.0 servings. At the end of the intervention, participants reported consuming on average 7.8 servings at both the farmers’ market and supermarket sites and 4.8 servings at the control site. Six months after the intervention, the increase in fruit and vegetable intake was sustained. Farmers’ market and supermarket participants reported consuming 7.5 and 7.4 servings on average while the control site reported consuming a total of 4.9 servings. The increases in fruit and vegetable intake demonstrated with use of this subsidy translate to approximately 1 serving per 4,186 kJ (1,000 kcal) or 2 servings per 8,372 kJ (2,000 kcal) per day. Increases in fruit and vegetable intake were primarily realized by increases in consumption of vegetables.

## *Research Supports Policy Change*

The results of this study together with a similar, longer-term study (5 years) conducted in a rural county in Northern California, were used to support the recommendations suggested in the 2005 IOM report on making changes to the WIC food packages<sup>7</sup>. After an open comment period, the USDA’s Food and Nutrition Service published an interim final rule on December 6, 2007, revising the WIC food packages to include fruits, vegetables, and whole grains. These revisions align the WIC food packages with the 2005 Dietary Guidelines for Americans and infant feeding practice guidelines of the American Academy of Pediatrics, reflecting recommendations from the Institute of Medicine’s report, “WIC Food Packages: Time for a Change”<sup>7</sup>. State agencies in the U.S. are now engaged in the planning process and must implement the provisions no later than August 5, 2009<sup>8</sup>.

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