



# Nutrition for Family Living

Susan Nitzke, Nutrition Specialist; susan.nitzke@ces.uwex.edu  
Sherry Tanumihardjo, Nutrition Specialist; sherry.tan@ces.uwex.edu  
Amy Rettammel, Outreach Specialist; arettamm@facstaff.wisc.edu  
Gayle Coleman, Nutrition Specialist; gayle.coleman@ces.uwex.edu

---

## September, 2007 Topics

Effectiveness of School-based Nutrition Education  
Rumors vs. Reliable Information

---

## Effectiveness of School-based Nutrition Education

By Gayle Coleman

An article published in the *Journal of Nutrition Education and Behavior* (JNEB)<sup>1</sup> indicated that school-based nutrition interventions produced a moderate increase in fruit and vegetable intake among children. The article noted challenges with evaluating the impact of nutrition education on children and with accurately measuring and comparing children's dietary behaviors.

Authors of the JNEB article looked at both the individual and combined results of 7 studies. The purpose of their project was to evaluate whether school-based nutrition interventions have an effect on child vegetable and fruit consumption, and 2) whether the effect of the interventions is modified by dose, duration, and/or type of intervention. Their original search of studies published between January 1990 and December 2002 yielded 896 unduplicated records. After screening for school-specific evaluation of fruit and vegetable interventions, and studies that focused specifically on children between the ages of 5 and 18 years, the number of studies was reduced to 13. The first authors of 7 of these 13 studies agreed to share their case-level data for inclusion in this project.

The 7 studies included in the analysis were the Integrated Nutrition Project<sup>2</sup>, Colorado 5 A Day<sup>3</sup>, California's 5 A Day Power Play!<sup>4</sup>, Gimme 5<sup>5</sup>, Child and Adolescent Trial for Cardiovascular Health (CATCH)<sup>6</sup>, Minnesota's 5 A Day Power Plus<sup>7</sup>, and Alabama High 5<sup>8</sup>. Combining the 7 data sets produced 8156 children matched from pretest to posttest. Seventy-five percent of these children were elementary school-aged (7 to 12 years) and 66% were white. Approximately 59% received a treatment condition and 41% received a control. The average classroom intervention was 2 years in duration but ranged in length from 2 months to 3 years. All of the studies were theory-based with 5 studies using Social Cognitive Theory. Each study implemented at least 2 strategies to deliver the intervention with 1 strategy being a classroom component. Six of the studies included a family component, 4 included a food-service component, 2 included a community component, and 1 included a media campaign.

Outcomes were measured in a variety of ways and 4 of the studies used multiple methods to estimate fruit and vegetable intake. Five of the studies used 24-hour dietary recalls, 3 used plate waste, 2 used observation, and 2 used a survey or questionnaire. There were 2 main outcomes in this combined data analysis used to define intervention effectiveness, net fruit/vegetable *difference* and net fruit/vegetable *relative change*. Differences between the intervention and control groups were tested for significance using 2-sample t tests. In the pooled data, the intervention groups consumed 0.45 more fruit/vegetable servings per day than the control groups ( $P < .001$ ). With the exception of the CATCH study, which was designed to reduce fat intake not increase fruit/vegetable intake, participants in the control groups consumed fewer fruits and



## Nutrition for Family Living September, 2007

vegetables at posttest than they did at pretest (0.03 to 0.35 fewer servings.) Four studies showed increases in fruit/vegetable intake for the treatment groups (0.24 to 0.69 more servings.) After pooling the data for the 7 studies, the net relative change was 18%, with a decrease of 6% in the control groups and an increase of 12% in the treatment groups. When looking at differences in increasing fruit and vegetable relative change using subgroup analyses, there were no statistically significant differences for race or gender. Interventions that targeted younger students (grades 2 to 4) and that were shorter in dose (2 months to 2 years) were more effective in increasing percent intake of fruits and vegetables. However, the authors caution that the dose was based on only one component of the intervention, the classroom component, and therefore the effects of other components such as food service or the family component could have affected the results.

The authors concluded that combined data for these 7 studies showed moderate increases in fruit and vegetable consumption among children who participated in these published nutrition education intervention programs. Similarities among these 7 studies (inclusion of treatment and control groups, measurement of fruit and vegetable intake at pre- and posttests, targeting school-aged children, having a classroom education component) made it possible to conduct this pooled analysis and provide the statistical power to conduct subgroup analyses. They suggest that net relative change in fruit and vegetable intake might be a more accurate measure of change across dietary intervention-based studies because measuring dietary behavior is difficult and subject to measurement error. The authors also acknowledged that the studies relied on different measures of food intake which could have biased their results due to differences in precision and accuracy among these measures.

*Implications for Extension Educators:* This study supports the role of school-based nutrition education in increasing children's fruit and vegetable intake. It highlights the need for good evaluation measures and tools to capture the impact of this education. Studies such as this one present credible evidence that counters recent media stories that belittle nutrition education<sup>9</sup>.

<sup>1</sup>Howerton MW, Bell S, Dodd KW, Berrigan D, Stolzenberg-Solomon R, Nebeling L. School-based Nutrition Programs Produced a Moderate Increase in Fruit and Vegetable Consumption: Meta and Polling Analyses from 7 Studies. *Journal of Nutrition Education and Behavior*. 2007;39:186-196.

<sup>2</sup>Auld GW, Romaniello C, Heimendinger J, Hambidge C, Hambidge M. Outcomes from a school-based nutrition education program using resource teachers and cross-disciplinary models. *J Nutr Educ*. 1998;30:2682-80.

<sup>3</sup>Auld GA, Romaniello C, Heimendinger J, Hambidge C, Hambidge M. Outcomes from a school-based nutrition education program alternating special resource teachers and classroom teachers. *J Sch Health*. 1999;69:403-408.

<sup>4</sup>Foerster SB, Gregson J, Beall DL, et al. The California Children's 5 a Day Power Play! Campaign: evaluation of a large-scale social marketing initiative. *Fam Commun Health*. 1998;21:46-64.

<sup>5</sup>Nicklas TA, Johnson cc, Meyers L, Farris RP, Cunningham A. Outcomes of a high school program to increase fruit and vegetable consumption: Gimme 5-A fresh nutrition concept for students. *J Sch Health*. 1998;68: 248-253.

<sup>6</sup>Perry C, Lytel LA, Feldman H, et al. Effects of the child and adolescent trial for cardiovascular health (CATCH) on fruit and vegetable intake. *J Nutr Educ*. 1998;30:354-360.



## Nutrition for Family Living September, 2007

---

<sup>7</sup>Perry CL, Bishop DB, Taylor G, et al. Changing fruit and vegetable consumption among children: the 5-a-Day Power Plus program in St. Paul, Minnesota. *Am J Public Health.* 1998;88:603-609

<sup>8</sup>Reynolds KD, Franklin FA, Binkley D, et al. Increasing the fruit and vegetable consumption of fourth-graders: results from the high 5 project. *Prev Med.* 2000;30:309-319.

<sup>9</sup>Mendoza M. Review Finds Nutrition Education Failing. AP News Release July 4, 2007, available online: <http://www.wtopnews.com/?nid=106&sid=1181058>



## Nutrition for Family Living September, 2007

---

### Rumors vs. Reliable Information

---

By Susan Nitzke and Barbara Ingham

These days, most savvy consumers have learned to ignore scary rumors that are spread by email, the Internet, infomercials, etc. Still, it can be difficult to distinguish reliable warnings from false rumors (for example, aspartame/nutrasweet causing brain cancer or multiple sclerosis, flesh-eating germs in bananas, and toxic ingredients in canola oil).

*Implications for Extension Educators.* One challenge of learner centered education is that “urban legends” and other types of misinformation may be shared by well-meaning learners during small-group activities. When this occurs, Extension educators are advised to tactfully counteract such statements by explaining that particular information is controversial, outdated, or widely disputed by experts in the field and quickly guide the learners’ attention back to the main points of the lesson or program.

Recommended references and resources for fact checking:

<http://urbanlegends.about.com/cs/nethoaxes/ht/emailhoax.htm> This website has annoying advertisements, but contains helpful information on how to spot email hoaxes.

<http://www.quackwatch.org/> and its companion site <http://www.nutriwatch.org/> Quackwatch, Inc., is a nonprofit corporation headed by Stephen Barrett, M.D. to combat health-related frauds, myths, fads, and fallacies. The Quackwatch website has many articles about evaluating nutrition products and a searchable database, but some information at this site is outdated, including frequent references to older editions of the Dietary Guidelines for Americans and the Food Guide Pyramid. Nutriwatch is operated by Stephen Barrett, MD and Manfred Kroger, PhD to evaluate health claims for nutrition products. They also issue warnings about inappropriate product claims, report illegal claims for products to regulatory agencies, offer advice on how to seek legal redress against dietary supplement companies, and provide links to relevant resource documents. One of the latest Nutriwatch entries is “Silly statement about powdered milk” by Dr. Manfred Kroger, <http://www.nutriwatch.org/04Foods/skim.html>.

[http://www.fda.gov/fdac/features/2006/606\\_fraud.html](http://www.fda.gov/fdac/features/2006/606_fraud.html) This article on “Cracking down on health fraud” was published in *FDA Consumer* magazine in Nov/Dec 2006. It includes a list of ways to identify health frauds near the end of the article.

<http://www.ftc.gov/bcp/edu/pubs/consumer/health/hea07.shtm> This article on “miracle health claims” by the Federal Trade Commission in 2006 also contains tips on spotting fraud.

<http://www.healthfinder.gov/> This is a Federal Web site for consumers, developed by the U.S. Department of Health and Human Services together with other Federal agencies. The healthfinder.gov site links to carefully selected information and Web sites from over 1,500 health-related organizations.

<http://www.ific.org/> The International Food Information Council and its IFIC Foundation communicate science-based information on food safety and nutrition to health and nutrition professionals, educators, journalists, government officials and others providing information to consumers. IFIC is supported primarily by the broad-based food, beverage and agricultural industries.