



Nutrition for Family Living

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May, 2005 Topics

Marvelous Mushrooms

Reflections on the Cost of Eating Well and Recent Research on Eating Patterns

Announcement

Marvelous Mushrooms

By Zhifang Yang and Sherry Tanumihardjo

Background: A variety of delicious mushrooms has been enjoyed among ethnic groups throughout the world. Mushrooms are fungi but we use them like vegetables. Because of the low energy density of mushrooms, it was often thought that they did not offer much nutritional value except the addition of unique flavors to many dishes. However, new research shows that mushrooms can help fill various nutritional needs.



Nutritional Value: Mushrooms are low in protein, but the protein is of relatively high quality compared to other plants. Essential minerals include potassium, phosphorous, magnesium, zinc and copper. The most concentrated vitamins are the B-complex. New research findings have shown that the fiber content includes those associated with cholesterol-lowering (chitin) and healthy hearts (beta-glutan). Mushrooms are relatively low in carbohydrate. For example per serving, white, brown and Portabella mushrooms provide three grams of total carbohydrates, including one gram of dietary fiber. Also, one serving of mushrooms contains a mere 20 calories and less than one gram fat, which may contribute to their role in weight loss and maintenance. In addition, mushrooms' high water content (over 90 percent) can bring a feeling of fullness, and their low calorie density can help to promote weight maintenance.

Research: Studies conducted over the past 30 years, mostly in Asia, have examined the possibility that mushrooms or substances obtained from mushrooms may play roles in the treatment of certain types of cancer, improving immunity, reducing the risk of coronary heart disease, reducing blood pressure, and lowering blood glucose. The Mushroom Council has funded studies to determine the effect of substituting white button mushrooms for higher calorie and fatty foods in the short- and long-term, and to determine the role of mushrooms as part of a low-carbohydrate diet on weight loss, blood lipids and satiety. Mushrooms are being studied as a weight-loss aid because of their low energy density and nutrient content. One study calculated the calorie and fat savings if a 4-ounce grilled Portabella mushroom was substituted for a 4-ounce grilled beef patty for one year in a group of men. Based on the calculation, they would be expected to have an annual savings of 18,400 calories, or a potential weight loss of 5.3 pounds, and a yearly reduction of 2,725 grams of fat. This calculation of course, assumed that they did not compensate for these calories by eating other foods.

The bottom line: Mushrooms, like vegetables, can be part of a healthful diet and are considered to have important health promoting components. Not all varieties of mushrooms are the same, so be adventurous and include an edible mushroom type for dinner that you may have never tried before.



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Safety note: Not all wild mushrooms are edible. Some types are toxic. Experts recommend taking a course on identification before you pick mushrooms yourself.

References used:

Block Dietary Data Systems, Berkeley, CA. Mushrooms: More than just another fungus. Final report, 2003; <http://www.nutritionquest.com>.

Dikeman, C. L., Bauer, L. L., Flickinger, E. A., Fahey, G. C., Jr. Effects of stage of maturity and cooking on the chemical composition of select mushroom varieties. *Journal of Agriculture and Food Chemistry*, 2005; 53: 1130-1138.

U.S. Department of Agriculture, Agricultural Research Service. 2004. USDA National Nutrient Database for Standard Reference, Release 17. Nutrient Data Laboratory Home Page, <http://www.nal.usda.gov/fnic/foodcomp>.

Wasser, S.P. Medicinal mushrooms as a source of antitumor and immunomodulating polysaccharides. *Applied Microbial Biotechnology*, 2002; 60: 258-274.

This article is part of a 4-year project supported by the National Research Initiative of the USDA Cooperative State Research, Education and Extension Service, grant number 2003-35200-05377 to Tanumihardjo entitled "Promotion of high vegetable consumption as a weight-loss strategy and general well-being."





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Reflections on the Cost of Eating Well and Recent Research on Eating Patterns

By Amy Rettammel

An Issues Brief published in March by the University of California Agricultural Issues Center <http://aic.ucdavis.edu/pub/briefs/IB%2029.pdf> compared the cost of a standard market basket of foods (Thrifty Food Plan) to the cost of a healthier basket (Thrifty Food Plan with healthier substitutes). The average cost of the standard market basket for two weeks of food was \$194; the average cost for the healthier basket was \$230. The authors attributed the higher cost to whole grains, lean ground beef, and skinless poultry. Here are the substitutes made in this comparison:

Table 1. Thrifty Food Plan and healthy market basket comparison

Food Item	Thrifty Food Plan	Healthier
Breads	Enriched	100% whole wheat
Canned peaches	In heavy & in lite syrup	In lite syrup
Canned pears	In heavy syrup	In lite syrup
Cheese	Whole fat	Low-fat
Chicken	With skin	Skinless
Cold cereal	Corn flakes	Bran flakes
Cooking oil	Vegetable	Canola
Egg noodles	Whole egg	Yokeless
Evaporated milk	Whole	Low-fat
Flour	White	Whole wheat
Frozen French fries	Frozen French fries	Potatoes
Frozen fish	Filets, breaded	Filets, unbreaded
Ground meat	Lean	Lowest fat
Milk	Whole, 1%	Nonfat, 1%
Rice	White	Brown
Salad dressing	Regular	Low-fat
Spaghetti	Enriched	100% whole wheat
Spreads	Margarine	"Healthy" spread
Tuna fish	Light	Albacore

Looking at this table, an informed educator would see a number of things that could be addressed through education. For example, purchasing chicken with skin and then removing the skin at home makes a healthier food (lower in saturated fat) without added expense. The healthier basket included the lowest fat ground meat available at the stores visited, instead of ground meats simply labeled "lean." Substituting dry beans can be a more affordable way to reduce the frequency of buying ground meat overall. The healthier basket also included "healthy" spreads instead of regular margarine spread. Other ways to reduce saturated and trans fats in the diet would be to use less margarine spread overall, or to use vegetable oil in cooking instead of butter, margarine, or lard. These are all valuable food preparation techniques that we teach people every day.

Whole grains are a little more complicated. The authors of this issue brief explained that they were able to find whole grains in most of the stores they visited (25 stores in total). However, whole grain breads were offered under brand names only, not under more affordable generic brands. Follow-up interviews with managers of small independent grocery stores in lower income neighborhoods indicated that they stock 100% whole wheat breads at the beginning of the month because customers are only willing to purchase them at the beginning of the month. At the end of the month the higher priced 100% whole wheat bread sits on the shelf and goes stale. In addition, whole wheat flour, whole wheat pastas, and brown rice were not available in packages as large as their white counterparts, leaving the consumer without the price break of buying larger quantities. On the other hand, a study looking at how low-income households economize their food purchases found that low-income households did not tend to use the strategy of purchasing larger



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food packages to spend less on food - perhaps due to transportation constraints, budget constraints, or storage constraints. A summary of this report appeared in the November 2003 issue of Nutrition for Family Living

<http://www.uwex.edu/ces/wnep/specialist/nfl/mmpdfs/0311.pdf#page=4>.

Fresh fruits and vegetables were part of both market baskets. The Thrifty Food Plan that was used for comparing the baskets met the 5 servings per day recommendation, rather than the newer 9 servings per day. While fresh fruits and vegetables did not contribute to the difference in the prices of the two baskets (since there is no healthier comparison), understanding the barriers and motivations people have to meeting fruit and vegetable recommendations can inform nutrition education.

In October 2004, USDA's Economic Research Service published a series of bulletins, "Understanding Fruit and Vegetable Choices – Economic and Behavioral Influences"

<http://www.ers.usda.gov/Briefing/Consumption/>. Here are some highlights:

- Not only do low-income households spend less on fruits and vegetables than other households, they are also less likely than higher-income households to respond to an increase in income by spending more on fruits and vegetables.
- In any given week, approximately 19% of all low-income households bought no fruits and vegetables, compared with about 9% of higher income households.
- Eating away from home gets in the way of meeting fruit and vegetable recommendations. Food prepared away from home makes up about one-third of the average American's daily calorie intake, but it accounts for less than ½ a serving of fruit and 1 ¼ servings of vegetables.
- The following characteristics of the household head increase the variety of vegetables purchased by that household: is an older adult, has a college education, cooks more meals from scratch. The presence of children in a household decreases the variety of vegetables purchased there. Asian and Hispanic households purchase a greater variety of vegetables than non-Hispanic white and black households.
- Consumers may cite cost as a barrier to purchasing fruits and vegetables when other factors such as taste, preferences, and availability may be more important. For example, a person may hesitate spending \$.97 for a pound of peaches, not realizing that they will be getting 4 ½-cup pyramid servings in a pound, which translates to 21 cents per serving. A recent analysis showed that, when expressed in pyramid servings, eating 3 fruits and 4 vegetables per day can cost less than \$1.00. Authors published a page showing 7 ways to eat 3 fruits and 4 vegetables for a dollar or less per day: <http://www.ers.usda.gov/publications/aib790/aib790e.pdf> - scroll to p.3. Note these are 1999 prices; adjust up 10% for 2003 prices.
- People with more formal education tend to have better dietary knowledge, which can contribute to eating more fruits and vegetables. They also tend to eat out more often, which can contribute to eating less fruits and vegetables. If the trend toward increased eating out continues, these two characteristics could conceivably cancel each other out, resulting in no increase in fruit and vegetable consumption.



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A recent summary of the nutrition and health characteristics of low-income populations provides insight into why it is important to understand economic and behavioral barriers to eating well <http://www.ers.usda.gov/Publications/AIB796/>. According to analysis of the Healthy Eating Index (HEI), those with higher incomes have better quality diets – but all income groups have diets that need improvement. The HEI scores an overall diet based on 10 components – each of the 5 food groups, variety, fat, saturated fat, cholesterol, and sodium. Scores 80-100 imply a “good” diet; scores between 51 and 80 imply a diet that “needs improvement” and scores 50 and below imply a “poor” diet. Below is a graphic representation of the scores, according to 4 categories of people as outlined in the graph legend:

Figure 1
Healthy Eating Index scores for all Americans, and by Food Stamp Program participation

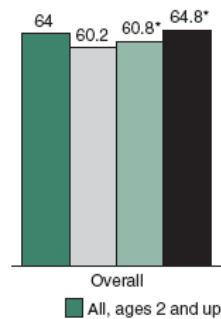
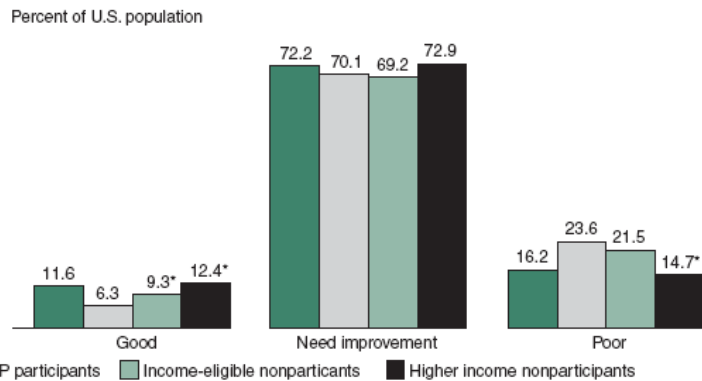


Figure 2
Diet quality based on Healthy Eating Index scores for all Americans and by Food Stamp Program participation status, age adjusted

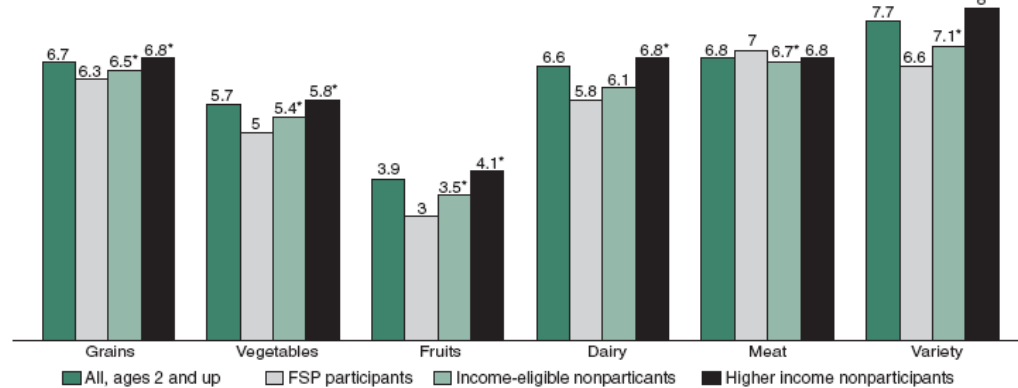


*Statistically significant difference from FSP participants at the 0.05 level or better.
Source: National Health and Nutrition Examination Survey, 1988-94.

Economic Research Service/USDA

When individual food groups were scored (on a scale of 1 to 10), all income groups showed the lowest scores for meeting fruit and vegetable recommendations (5-9 servings per day):

Figure 3
HEI scores on food components for all Americans and by Food Stamp Program participation status, age adjusted



*Statistically significant difference from FSP participants at the 0.05 level or better.
Source: National Health and Nutrition Examination Survey, 1988-94.

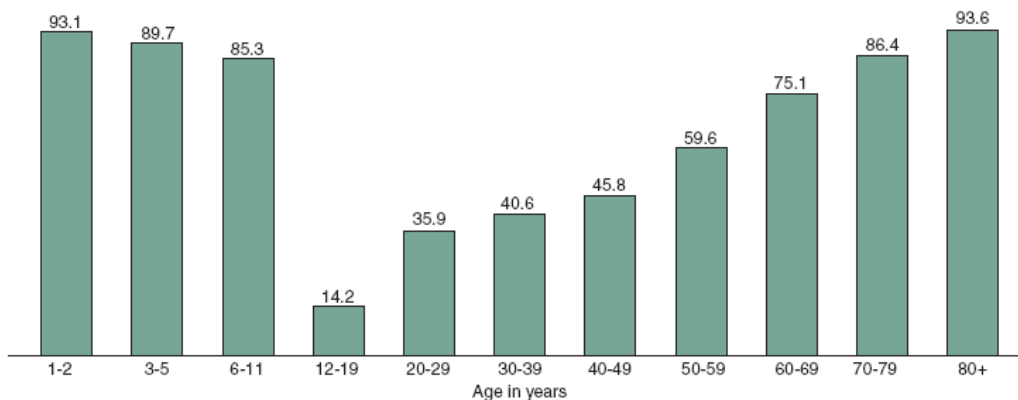
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Also of interest to nutrition educators is the analysis of National Health and Nutrition Examination Survey (NHANES-III) data looking at milk, soda, and breakfast consumption. Preschoolers, females, and older adults participating in the Food Stamp Program were less likely to report eating breakfast than their higher-income (>185% poverty) counterparts (88% vs. 93% for preschoolers, 50% vs. 57% for females, and 78% vs. 84% for older adults). Of particular note is the pattern of breakfast consumption by age, as represented in the graph below:

Figure 2
Americans consuming breakfast, by age
Percent

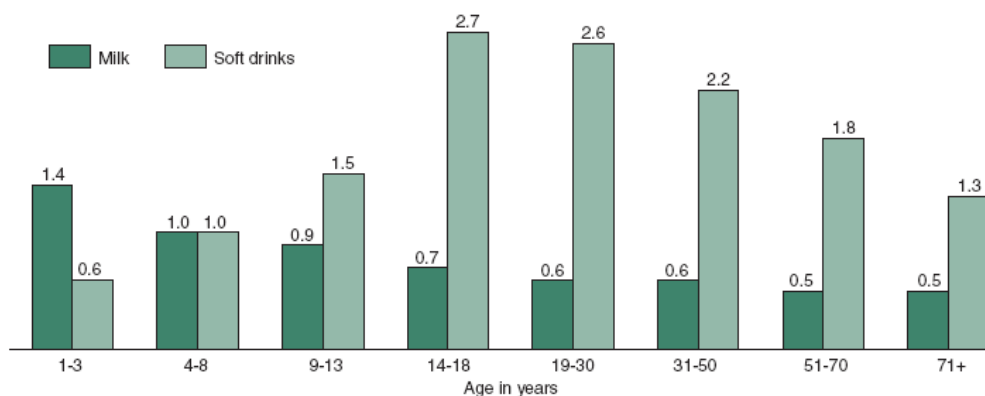


Source: National Health and Nutrition Examination Survey, 1988-94.

Economic Research Service/USDA

In general, NHANES-III data shows that people are drinking more soft drinks than milk. This was true for Americans over the age of 8, regardless of gender or income level. As with breakfast consumption, there appears to be a pattern associated with age, as depicted in the graph below showing daily consumption:

Figure 3
Average consumption of milk and soft drinks, by age
Number of 8-oz servings



Source: National Health and Nutrition Examination Survey, 1988-94.

Economic Research Service/USDA



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Implications for Extension Educators: There will always be room for improvement in the American diet, regardless of income level. The 2005 Dietary Guidelines for Americans puts renewed emphasis on whole grains and increased fruits and vegetables, both categories of foods with at least the perception of high cost among consumers. Barriers other than cost may be more important – like taste preference or routine. While national surveys give us valuable data to understand trends among populations, understanding the motivations and barriers of individual learners is the most effective way to begin addressing dietary improvement with them. Below is a list of some teaching materials that may be useful for this, particularly when dealing with cost as a barrier:

Stretching Your Food Dollars booklet

http://www.uwex.edu/ces/wnep/tch_res/res_detail.cfm?resource_id=32

Money for Food lessons 10 (using coupons and store specials) and 11 (other shopping tips)

<http://www.uwex.edu/ces/wnep/teach/mff/index.cfm>

"What Will Your \$5 Buy?" display

http://www.uwex.edu/ces/wnep/tch_res/res_detail.cfm?resource_id=240

"What a Souper Idea" display

http://www.uwex.edu/ces/wnep/tch_res/res_detail.cfm?resource_id=302

WNEP Nutrition Fact Sheets <http://www.uwex.edu/ces/wnep/teach/foodfact.cfm>

Cooking with Bread pamphlet

http://www.uwex.edu/ces/wnep/tch_res/res_detail.cfm?resource_id=242

Simply Soups pamphlet http://www.uwex.edu/ces/wnep/tch_res/res_detail.cfm?resource_id=243

Bean Magic pamphlet http://www.uwex.edu/ces/wnep/tch_res/res_detail.cfm?resource_id=305

Get Fresh! videos http://www.uwex.edu/ces/wnep/tch_res/res_detail.cfm?resource_id=209

"Creative Substitutions" video

http://www.uwex.edu/ces/wnep/tch_res/res_detail.cfm?resource_id=135

"Shopping Basics" video

http://www.uwex.edu/ces/wnep/tch_res/res_detail.cfm?resource_id=141

Nutrition Lesson Plans for Older Adults include a number of lessons about whole grains and fruits and vegetables. In the whole grains lessons, the one about whole wheat bread addresses barriers to eating, including cost, and gives a few tips.

http://www.fcs.uga.edu/noahnet/lp/wgrains/WholeGrains_Lesson2_Breads_Oct04.pdf



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Wisconsin WIC's new Breastfeeding Coordinator Kate Pederson, who served as the Coordinator of the Wisconsin Nutrition Education Network from 1997-2003, is now the state Breastfeeding Coordinator/Nutritionist for W.I.C. at the Wisconsin Division of Public Health. Kate's new email is pederka@dhfs.state.wi.us. We're looking forward to working with Kate in her new role!