



Gen X Moms' Attitudes and Beliefs Related to Fruit & Vegetable Consumption

2006-2009



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Executive Summary

Since 1991, the Centers for Disease Control (CDC) and Produce for Better Health Foundation (PBH) have been dedicated to producing a healthier America through increased fruit and vegetable consumption. As this report shows, this nutrition education initiative has resulted in positive change: most consumers seem to know the importance of eating more fruits and vegetables. Our research findings also indicate, however, that more work needs to be done in order to translate this awareness into positive dietary change.

Today, more than 50% of consumers report knowing that at least 5 servings (2½ cups) of fruits and vegetables is the recommended daily intake (1, 2). Yet their behavior is not consistent with meeting these daily recommendations. Research shows that just one in five Americans is actually eating five or more servings a day. Based on this statistic, most consumers would have to double the amount of fruits and vegetables they currently eat, in order to meet the *Dietary Guidelines for Americans, 2005* which recommend up to 13 daily servings (6½ cups) of fruits and vegetables.

To address this important national health need, after extensive consumer research, CDC, PBH, and other national partners launched a new call to action, Fruits & Veggies—More Matters®, in March 2007. A branded social marketing program, the Fruits & Veggies—More Matters campaign replaced the 5 A Day



Key findings over time indicate that mothers continue to strongly believe in the benefits of fruits and vegetables and continue to be concerned that their families are not consuming enough of them. However, the recession is having a significant negative impact on the attitude and behavior of lower-income mothers regarding fruits and vegetables.

program as the rallying cry to deliver the benefits of fruits and vegetables to consumers in a way that is designed to change and sustain their behavior over the long term. Fruits & Veggies—More Matters was developed with moms as the primary target audience. It was further tested with both male and female adults (Caucasian, Hispanic, and African Americans) and was found equally appealing among all groups.

As gatekeepers to their family's meals, moms have a critical role to play in any effort to increase fruit and vegetable consumption. This research report focuses on the attitudes and beliefs of moms when it comes to adding more fruits and vegetables to family meals and the obstacles they often face in making this change.

PBH focuses many of its activities on a subset of moms, Generation X (Gen X) moms, born between 1965 and 1979. Gen X moms were chosen, in part, because they are especially involved in their families' health and are concerned with disease prevention and holistic health. They actively seek information, especially regarding family health and well-being. Additionally, they tend to be very influential with their spouse or significant other as well as their parents (3).

As part of a comprehensive research plan for Fruits & Veggies—More Matters that includes both process and evaluation components, PBH conducted a baseline survey to identify the psychosocial factors associated with fruit and vegetable consumption by Gen X moms as they relate to moms' own consumption and behavior with their families.

An initial online survey was conducted in October 2006 with 500 Gen X moms, for the purpose of preparing for the public relations launch of Fruits & Veggies—More Matters and baseline survey. The baseline survey was developed and fielded online in February 2007 that included 1000 Gen X moms with children ages 2 through 12. Annual follow-up surveys were conducted in January of 2008 and 2009. This baseline survey and subsequent annual surveys serve as a tool for development of messaging and program activities and for evaluation of progress toward increasing fruit and vegetable consumption.

Baseline results indicated that moms value the importance of fruits and vegetables in the diet, believe that as a mom it is important to include them in family meals, and say that they intend to do so, although few think it will be easy. The most common barriers were different likes and dislikes of family members and difficulty including fruits and vegetables when at restaurants. Respondents also said it was more difficult to include fruits and vegetables at meals where they are not traditionally served, when away from home, and in the context of their everyday responsibilities.

Key findings over time indicate that mothers continue to strongly believe in the benefits of fruits and vegetables and continue to be concerned that their families are not consuming enough of them. However, the recession is having a significant negative impact on the attitude and behavior of lower-income mothers regarding fruits and vegetables. As a result, the overall market trend is a self-reported decrease in the consumption of fruits and vegetables and the importance of a healthy diet. Higher-income mothers, however, actually increased their self-reported fruit and vegetable consumption levels. Another key finding found that while the Internet remains the top preferred source of information regarding fruits and vegetables, more mothers are now likely to turn to an individual (dietitian, health care provider, or family member) for this information.

Providing Gen X moms with practical information to increase their family's consumption of fruits and vegetables, especially while on a budget, will help them follow through with their intentions. PBH's consumer website, www.fruitsandveggiesmorematters.org, developed specifically with moms in mind, continues to be a growing, reliable source of information for this audience. Insight gleaned from the annual surveys outlined in this report assist PBH in our effort to reach moms; we also hope that it helps you in your effort to increase fruit and vegetable consumption.



Key Trends

Collectively, attitudes, perceived behavioral control, and subjective norms have been shown to predict intention (4), which in turn, has been shown to predict change in health behaviors (5), including consumption of fruits and vegetables (6,7). It has also been found that intention has positive correlations with pre-contemplation and contemplation stages of change (8).

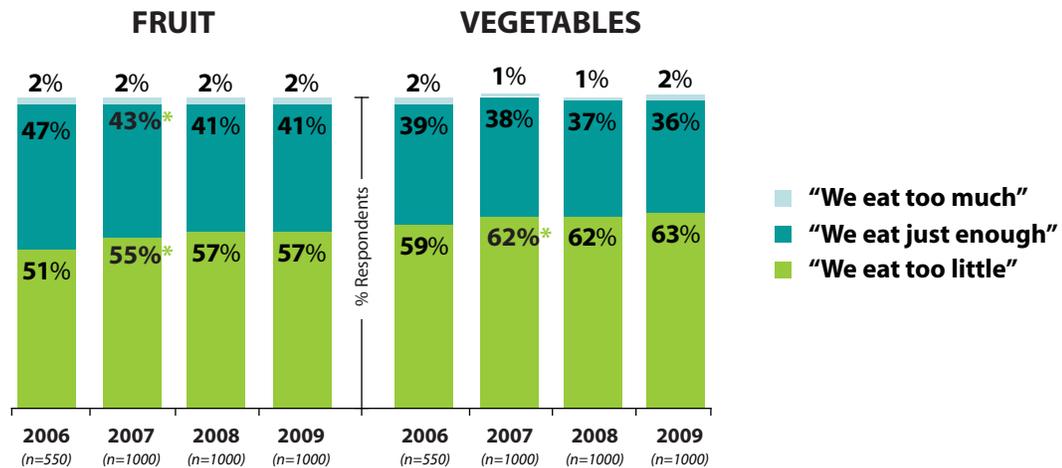
Appendix A shows how baseline and follow-up survey participants responded to questions that asked about psychosocial factors related to fruit and vegetable consumption. Details about each of these psychosocial factors are outlined in this section.

Attitudes

Most moms continue to believe that their families eat too few fruits and vegetables, with more agreeing that they consume fewer vegetables than fruits (Chart 1). Over time, moms report that they believe their families are also eating less fruit. It is possible that as moms understand the importance of eating fruits and vegetables, they come to recognize that they aren't eating enough.

Chart 1: Moms' Perception about Family's Fruit & Vegetable Consumption 2006-2009

Which of these statements best represents your family's eating habits for each of the following?
(Include fresh, canned, frozen, dried, and 100% juice)



* Represents statistically significant difference from previous year.

Moms' personal attitudes towards eating fruits and vegetables (Chart 2) did not change significantly over time when they were asked about fruits and vegetables together, but when asked about them separately in 2009 (Chart 3), we find that vegetables are less popular among moms than fruit. This finding is consistent with ethnographic research that was conducted during the development of Fruits & Veggies—More Matters in 2005. A slight preference for fruits was reported because they were sweet and ready to eat, while vegetables needed to be prepared.

Chart 2: Moms' Personal Attitudes about Fruits & Vegetables 2007-2009

Please rate your level of agreement or disagreement with the following statements:

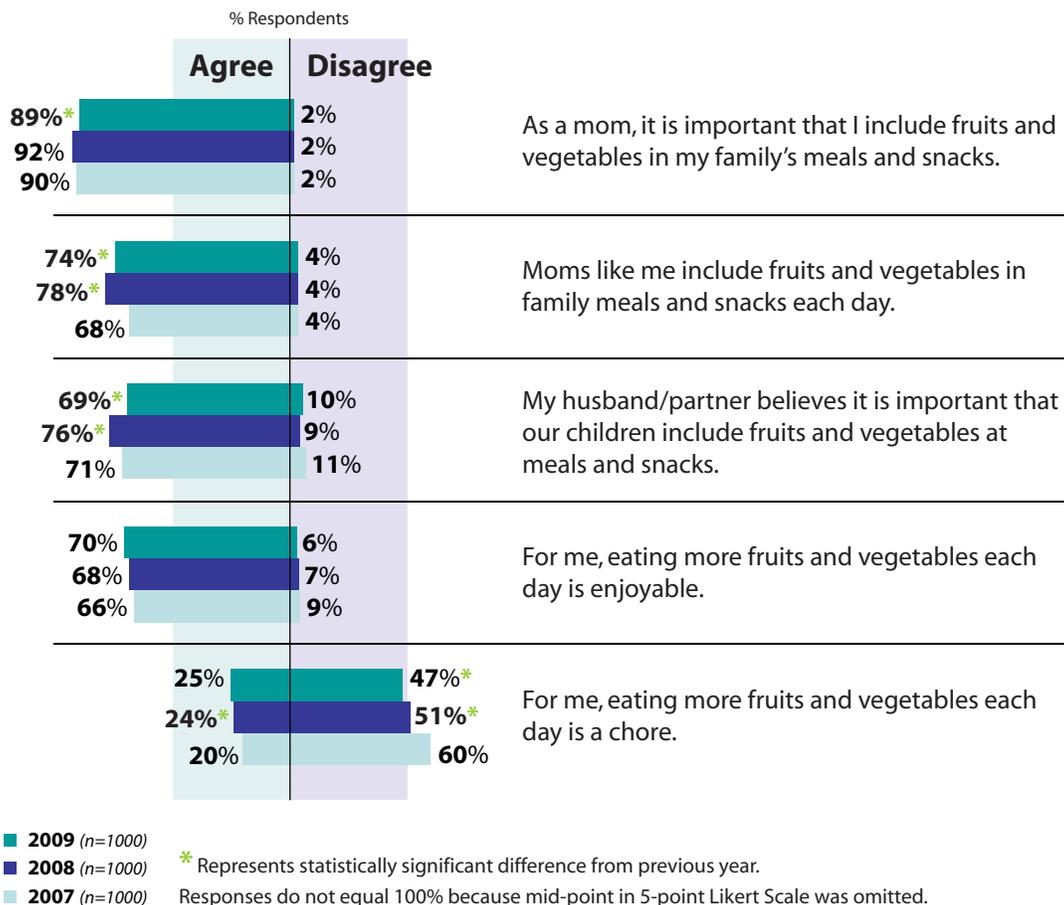
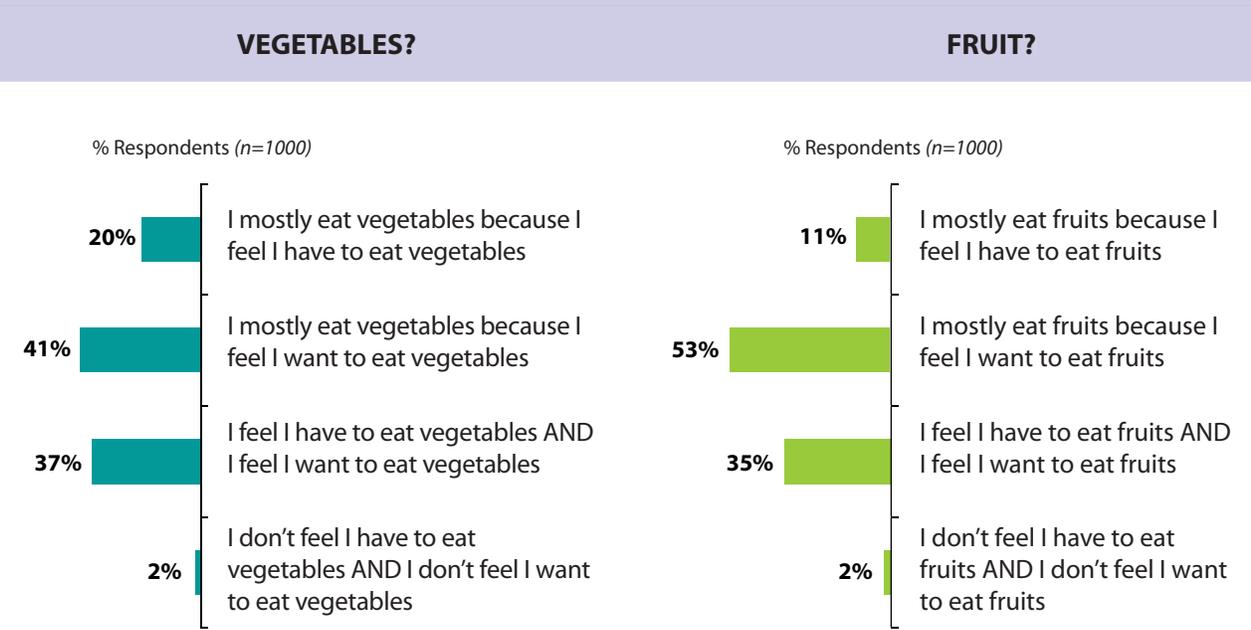


Chart 3: Moms' Attitude Differences about Fruits & Vegetables 2009

Which of the following best describes your attitude toward eating:

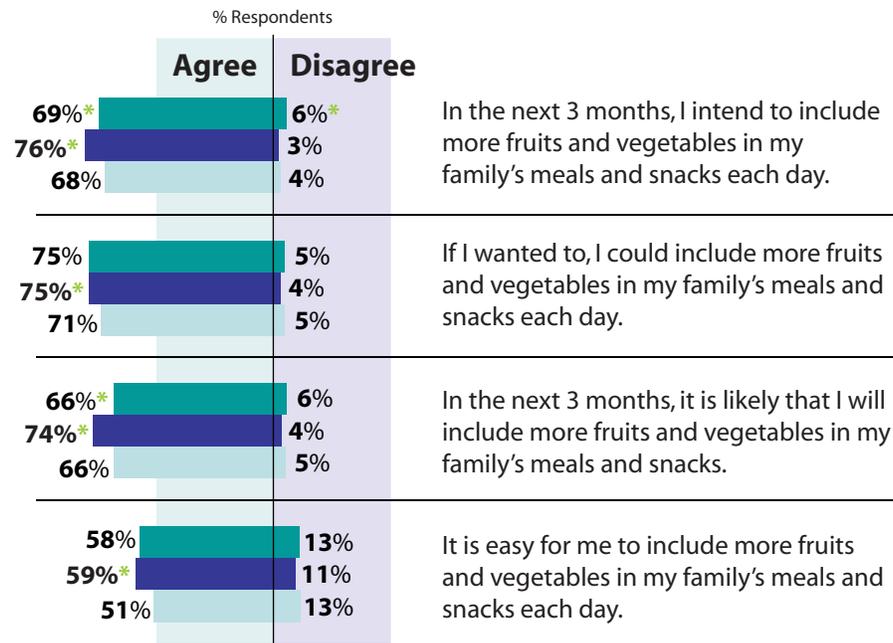


Intention

Between the 2007 baseline and 2008 follow-up survey, moms were showing higher purchase intention (Chart 4) which has been shown to predict change in health behavior (5). However, by 2009, moms reported that getting their family to eat more fruits and vegetables was not among their most pressing concerns (Chart 5). Thus, the lower purchase intent reported in 2009 (Chart 4) was probably directly related to the worsening economic climate and related pressures that were occurring at the time.

Chart 4: Moms' Intentions about Fruit & Vegetable Purchases 2007-2009

Please indicate your level of agreement or disagreement with these statements:

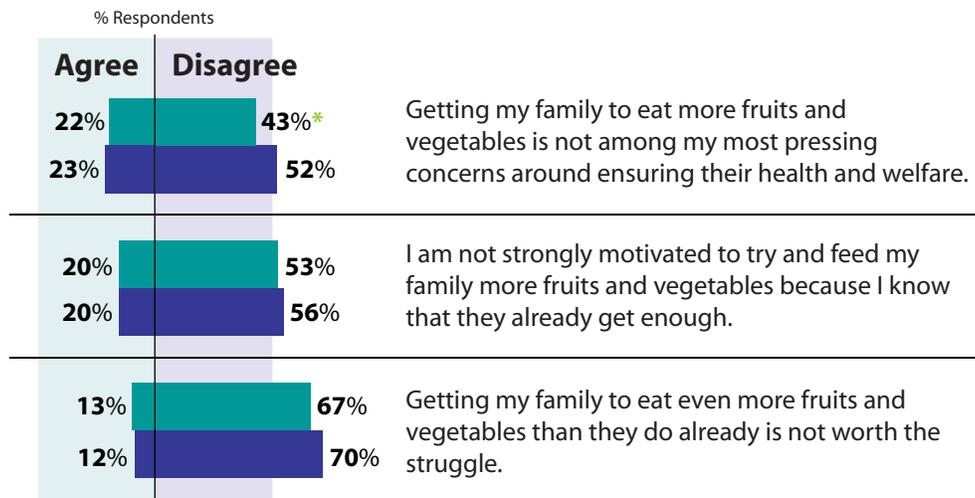


■ 2009 (n=1000)
 ■ 2008 (n=1000)
 ■ 2007 (n=1000)

* Represents statistically significant difference from previous year.
 Responses do not equal 100% because mid-point in 5-point Likert Scale was omitted.

Chart 5: Moms' Level of Motivation about Introducing More Fruits & Vegetables 2008-2009

Please review each of the following statements and tell us your level of agreement or disagreement with each:



■ 2009 (n=1000) ■ 2008 (n=1000) * Represents statistically significant difference from previous year.
 Responses do not equal 100% because mid-point in 5-point Likert Scale was omitted.

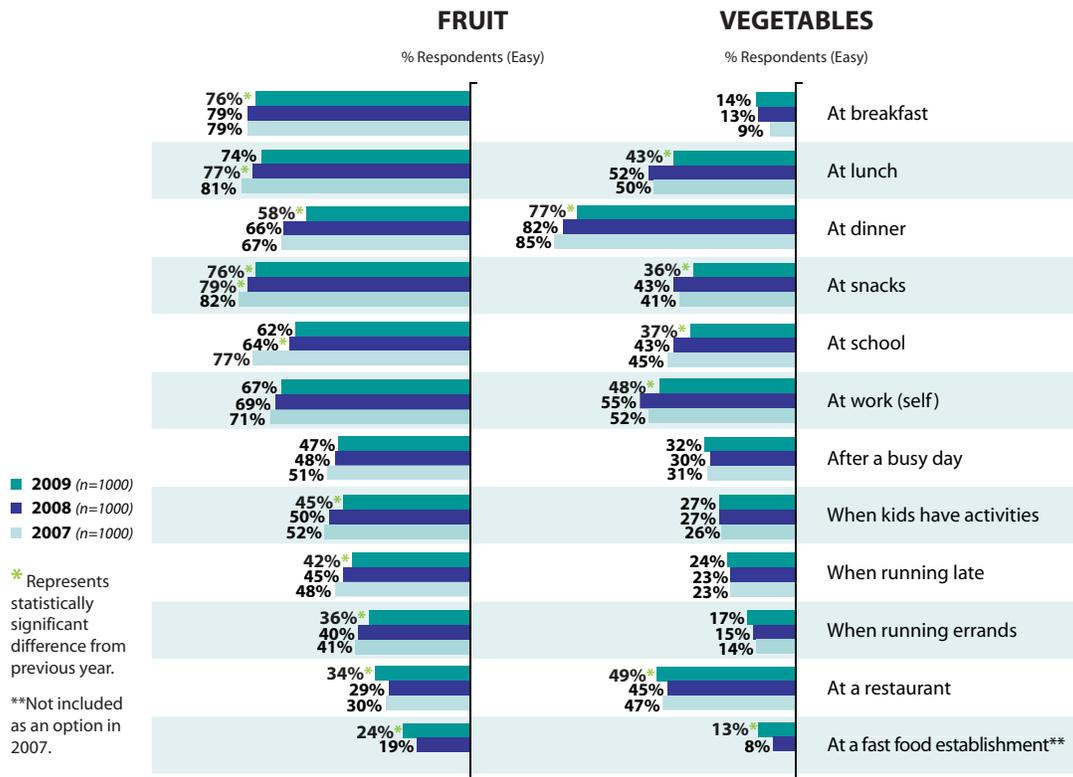


Self-Efficacy

In the 2007 baseline study, higher levels of self-efficacy were reported for including fruits and vegetables at meals where they are traditionally served (e.g. vegetables at dinner, fruits at breakfast). Levels of self-efficacy were lower and showed more variability for meals where they are not traditionally served (e.g. vegetables at breakfast), when eating in situations away from home, or during common, everyday situations that moms face, such as running errands, taking children to activities, etc. By 2009, however, moms were finding it increasingly harder to get their family to eat fruits and vegetables during all eating occasions (Chart 6). This is likely a result of the difficult economic period where lower-income mothers began shifting priority away from healthy eating. Providing moms with ‘how to’ information and innovative suggestions for including fruits and vegetables at eating occasions, while managing multiple responsibilities within a challenging economic environment, will be important to help them move to ‘action.’

Chart 6: Moms’ Ability to Add More Fruits & Vegetables 2007-2009

How easy is it for you to get your family to eat fruit and vegetables at the following times:



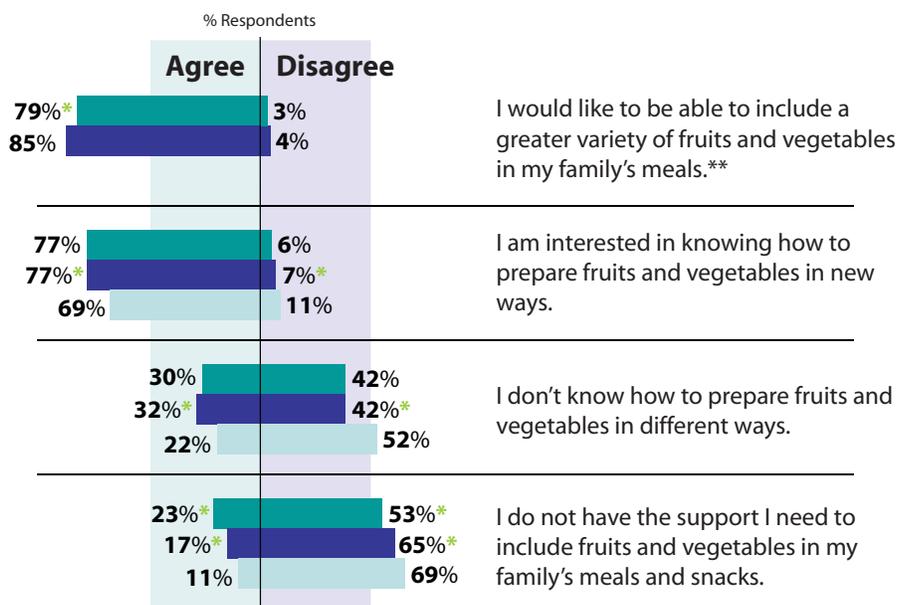
Beliefs & Social Support

Generally, moms indicate they would like to be able to include a variety of fruits and vegetables in their family's meals, and they are interested in knowing how to prepare fruits and vegetables in new ways (Chart 7). In 2008 vs. 2007, more moms felt they didn't know how to prepare fruits and vegetables in different ways. This, coupled with a greater interest in knowing how to prepare them in new ways, is likely an indication that moms wanted to move more toward action and realized that they needed to know more about fruits and vegetables in order to do so. By 2009, however, moms were feeling that they had significantly less support from their spouses and others with whom they identified and placed less importance on including fruits and vegetables in their family's meals and snacks (Chart 2). This, too, is likely a result of the difficult economic period. In fact, when respondents were split by income in 2009, those in the higher-income families (>\$150,000) were significantly more likely to say that "moms like me" include fruits and vegetables in family meals and snacks each day compared to families earning < \$25,000 annually.



Chart 7: Moms' Beliefs and Social Support About Adding More Fruits & Vegetables 2007-2009

Please rate your level of agreement or disagreement with the following statements:



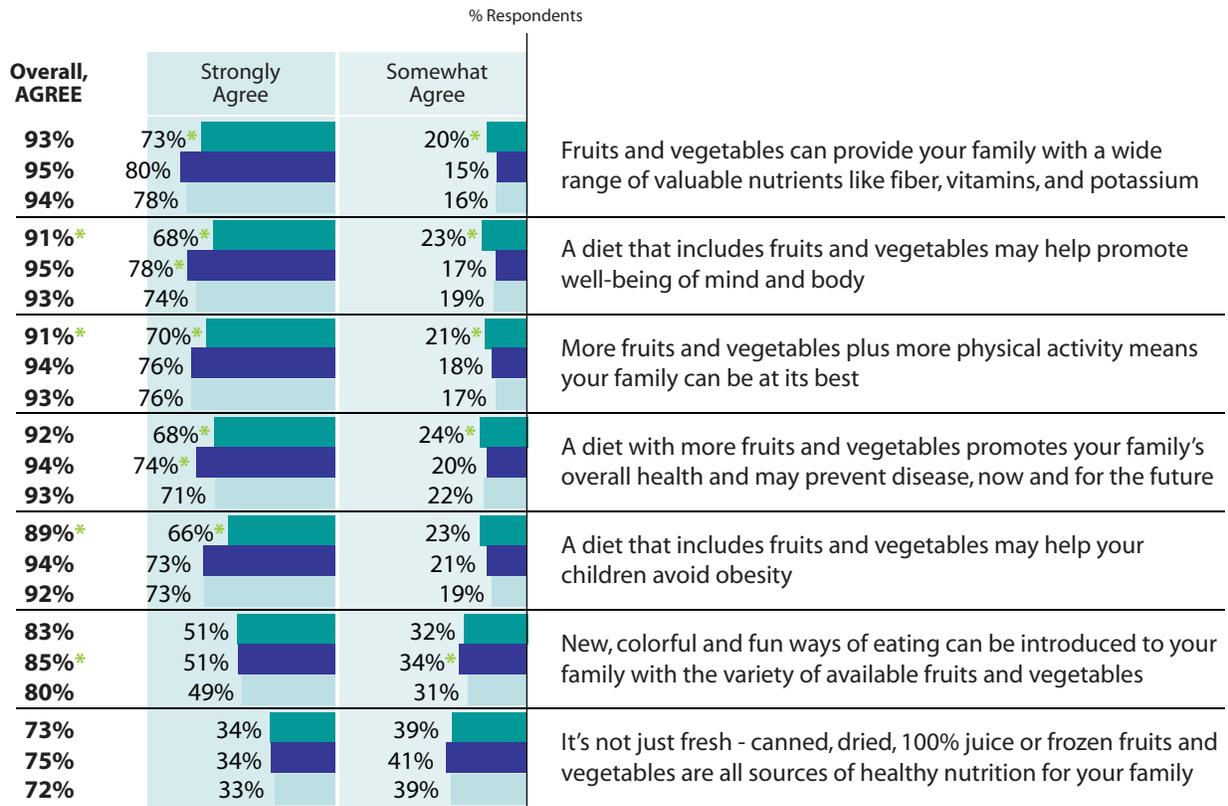
■ 2009 (n=1000) * Represents statistically significant difference from previous year.
■ 2008 (n=1000) **Not included as an option in 2007.
■ 2007 (n=1000) Responses do not equal 100% because mid-point in 5-point Likert Scale was omitted.

Perceived Benefits

The perception of fruits and vegetables and various health and nutrition issues can be seen in Chart 8. There was high level of agreement about the benefits of consuming fruits and vegetables, with a slight decline in 2009, suggesting moms were less inclined to believe in some of the benefits of eating fruit and vegetables. This might be mom's own way of justifying why it is not as important to include fruits and vegetables in her family's meals and snacks when there are more pressing economic concerns.

Chart 8: Moms' Perceived Health and Nutrition Benefits of Fruits & Vegetables 2007-2009

Please rate your level of agreement or disagreement with the following statements:



■ 2009 (n=1000)
 ■ 2008 (n=1000)
 ■ 2007 (n=1000)

* Represents statistically significant difference from previous year.



New in 2009 were questions pertaining to the disease-prevention benefits that fruits and vegetables may offer (Chart 9) and which components of fruits and vegetables provide health benefits (Chart 10). The role that fruits and vegetables play in preventing overweight, obesity, and weight gain ranked higher than their prevention of any other disease state. Vitamins, antioxidants, fiber, and minerals were the components that moms thought provided the greatest health benefits.

The high level of agreement about the benefits of consuming fruits and vegetables is consistent with observations from other studies showing that fruits and vegetables are recognized as part of a healthy eating pattern (9, 10). Thus, this awareness is an inherent advantage that can be leveraged in messages and programs, without the challenge of having to also convince moms about the associated benefits of fruits and vegetables. In terms of consumption, knowledge of health benefits and recommendations are an important mediating variable in children's and mothers' intake of fruits and vegetables (11). Further, positive attitudes and beliefs about the relationship between the consumption of fruits and vegetables and disease prevention have correctly predicted the intake of fruits and vegetables by children (11), mothers (12) and adults in general (13).

Chart 9: Moms' Perceived Disease-Prevention Benefits of Fruits & Vegetables 2009

Which of the following do you believe consuming fruits and vegetables may be beneficial for preventing?
(Please select all that apply.)

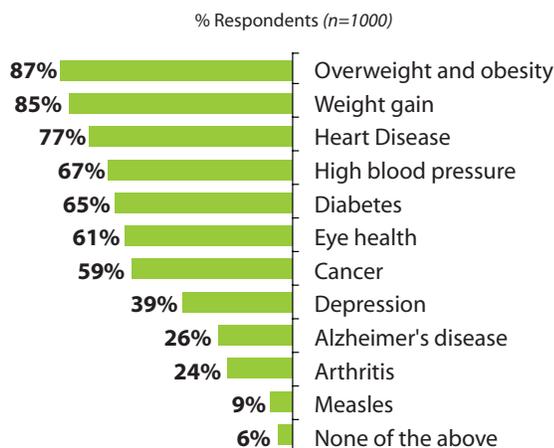
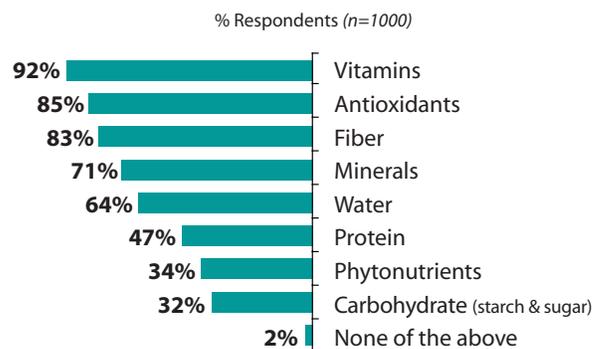


Chart 10: Moms' Perception of Healthy Components Associated with Fruits & Vegetables 2009

Which of the following components of fruits and vegetables do you believe may provide health benefits?
(Please select all that apply.)



All Forms

In 2007, fewer survey participants perceived benefits associated with consuming forms other than fresh produce, particularly canned fruits and vegetables. In 2009, frozen and dried fruits and vegetables were perceived to be less healthy, while fruit-based snacks and fruit flavoring were identified as less unhealthy (Chart 11). Again, this may represent a way for moms to justify purchasing less expensive fruit-flavored beverages in difficult economic times.

New questions were included in the 2009 survey to learn more about what drives consumer purchases and use of different forms of fruits and vegetables. Not surprisingly, convenience and shelf-life are key purchase drivers of non-fresh fruits and vegetables (Chart 12). Frozen and canned fruits were used as a snack, in desserts, smoothies, beverages, and fruit salads and consumed as is (Chart 13).

Chart 11: Moms' Perceived Healthfulness of Different Forms of Fruits & Vegetables 2006-2009

In general, how healthy do you consider the following foods to be?

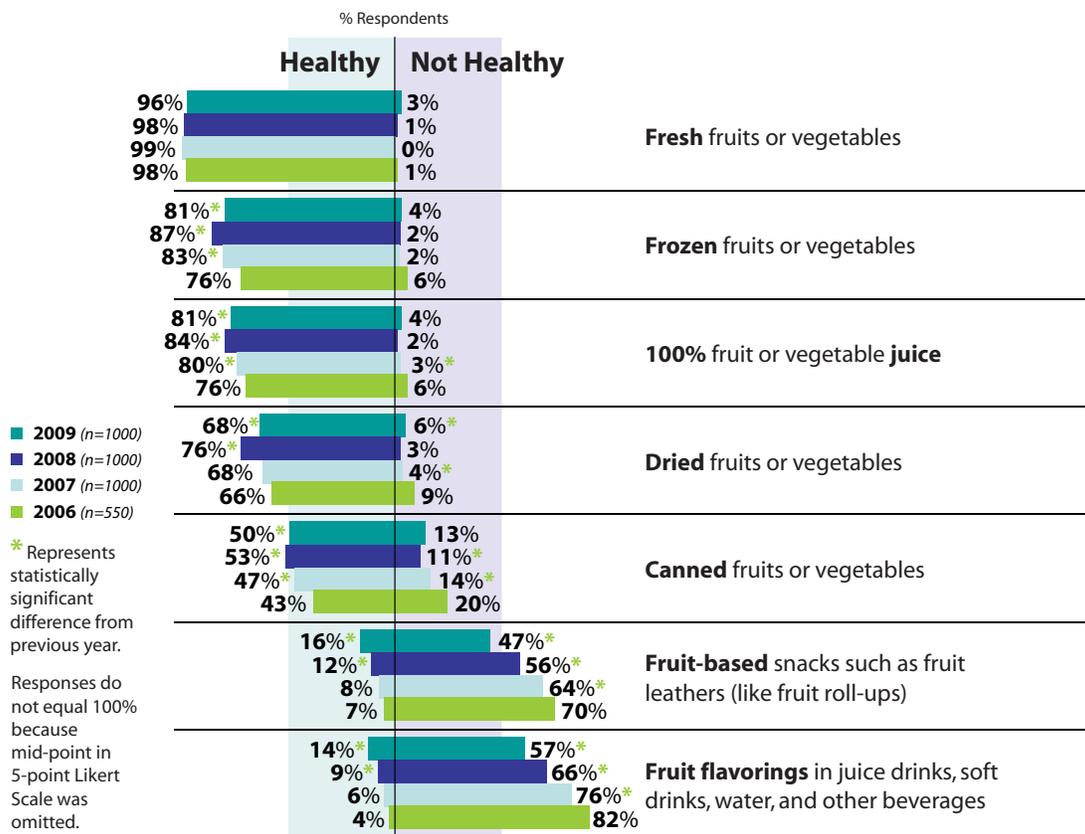


Chart 12: Factors Driving Moms' Purchase of Frozen and Canned Fruits & Vegetables 2009

Why do you purchase frozen and canned fruits and vegetables? (Please select all that apply.)

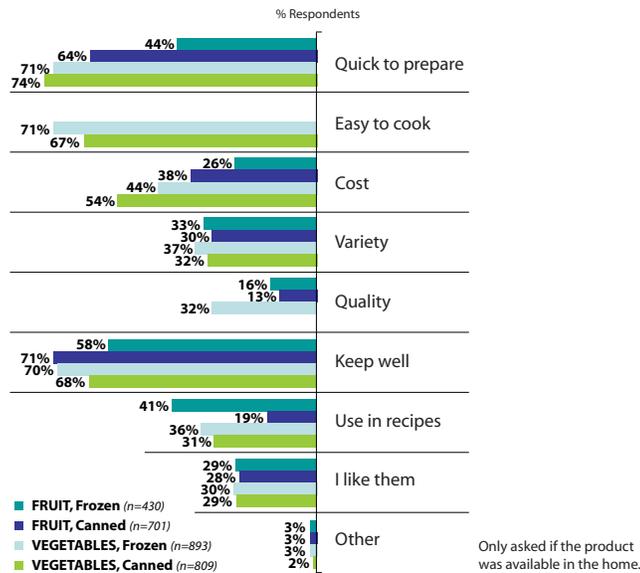


Chart 13: Moms' Reported Uses of Different Forms of Fruits & Vegetables 2009

How do you use frozen and canned fruits and vegetables? (Please check all that apply.)

	% Respondents			% Respondents	
	FRUITS Frozen	FRUITS Canned	FRUITS Dried	VEGETABLES Frozen	VEGETABLES Canned
Snacks	39%	64%	79%		
Dessert	54%	46%			
Smoothies/Beverages	69%	16%			
Fruit Salads	29%	37%			
As is	33%	67%			
Baking			38%		
Trail mix			39%		
On cereal			31%		
In salads			30%	15%	16%
Side dish				89%	89%
Casseroles				52%	51%
Soups/stews				54%	49%
Stir-fry				49%	20%
Add to sauces				18%	13%
Other	4%	4%	1%	2%	1%
Don't use	1%	0%	5%	0%	0%

(n=390) (n=687) (n=399) (n=854) (n=814)

Empty boxes indicate the category was not presented to the respondent.



Dried fruits were consumed as snacks, in baked goods, in trail mix, on cereal, and in salads. Frozen and canned vegetables were used in salads, as a side dish, in casseroles, soups, stews, stir-fries, and added to sauces (Chart 13). When asked why frozen, canned, or dried fruits/vegetables were not available, it was primarily due to dislike (Chart 14). Fresh fruit is the most likely form of fruit or vegetable to be purchased more than once a week (Chart 15), and there is very little wastage for all forms of fruits and vegetables (Chart 16).

Promoting the healthfulness, wide variety, and convenience of different forms of fruits and vegetables and demonstrating creative ways to include different forms in meals and snacks will help mothers carry out their intentions to include more fruits and vegetables in their families' diets.



Chart 14: Factors Associated with Non-Availability of Fruits & Vegetables in the Home 2009

What reasons best describe why frozen, canned, or dried fruits are not usually available in your home? (Please select all that apply.)

	% Respondents			% Respondents	
	Frozen	Canned	Dried	Frozen	Canned
Don't use	32%	22%	15%	32%	19%
Too expensive	24%	18%	29%	15%	3%
Don't know how to use	14%	1%	2%	2%	2%
Don't like	30%	31%	28%	29%	56%
Not available	1%	2%	1%	2%	2%
Family doesn't like	16%	22%	38%	19%	36%
Other	6%	22%	9%	17%	21%

(n=570) (n=299) (n=551) (n=106) (n=191)

Only asked if the product was not available in the home.

Chart 15: Moms' Reported Frequency of Fruit & Vegetable Purchases 2009

How many times per week do you go to the store to purchase the following?

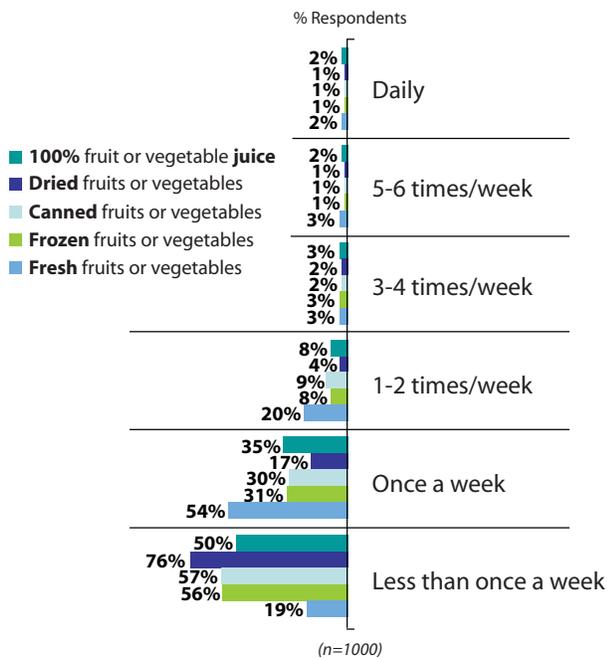
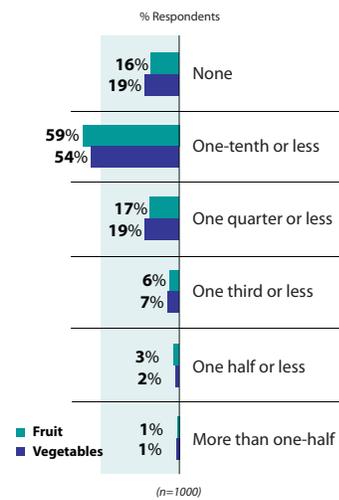


Chart 16: Moms' Reported Fruit & Vegetable Wastage 2009

How much of the FRUIT or VEGETABLES that you buy do you throw out? (Including fresh, frozen, canned, dried, and 100% juices)



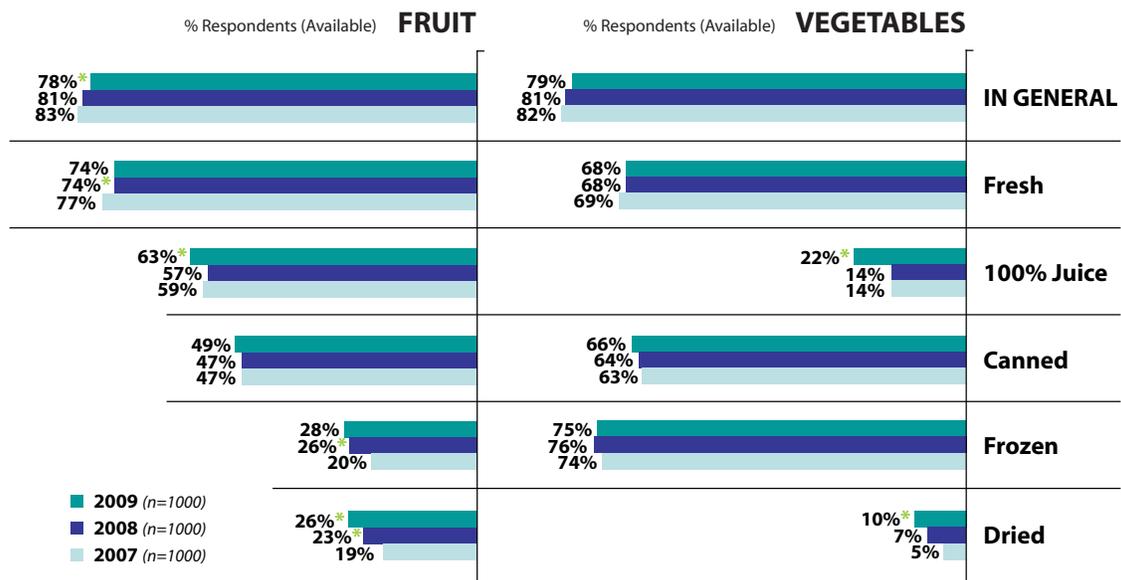
Availability in the Home

The majority of respondents in 2007 indicated that fruits and vegetables were always or almost always available in the home. Over time, less popular types of fruits and vegetables, such as vegetable juice and dried fruits and vegetables, were also more likely to be found at home (Chart 17).

Availability of fruits and vegetables in the home has been associated with higher consumption (14), particularly in children (15, 16). It has been suggested that availability may be a determinant of consumption by making fruits and vegetables easily accessible, stimulating consumption through visual cues, and increasing preference through consistent exposure (14). Encouraging a home environment that facilitates choosing fruits and vegetables is a practical way to promote consumption. Furthermore, habit has been shown to be a predictor of consumption (6, 17), so making fruits and vegetables available at all eating occasions will cultivate eating patterns that include them.

Chart 17: Availability of Fruits & Vegetables in the Home 2009

Please rate the availability of fruit and vegetables in your home.



* Represents statistically significant difference from previous year.

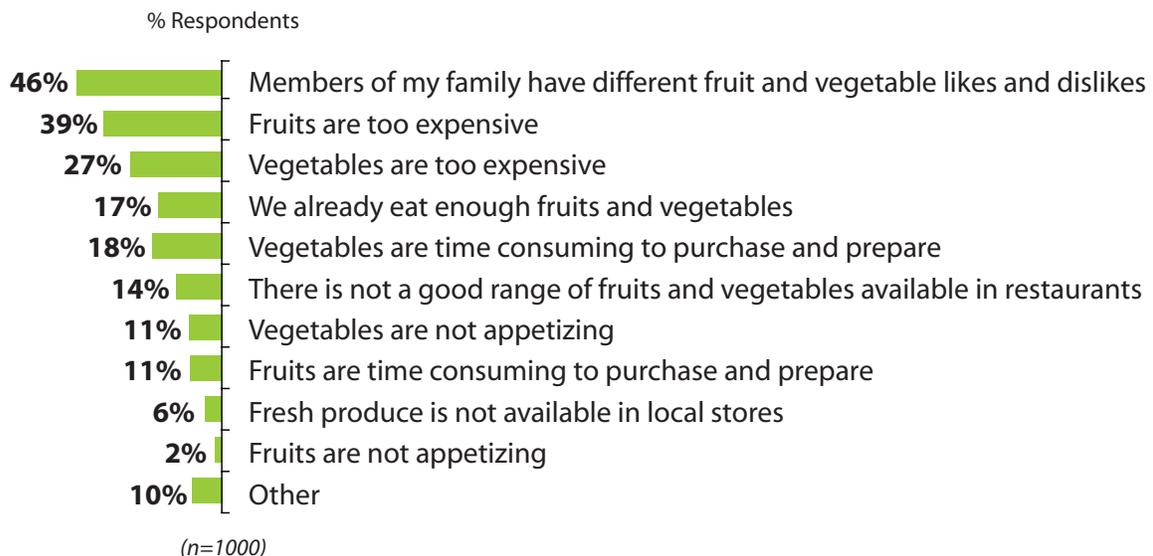


Barriers

From 2007-2009, the survey questions about barriers to eating more fruits and vegetables were varied slightly from year to year, in an effort to better understand obstacles, so each year is found in a different chart (Charts 18, 19, and 20). From 2007-2009, however, the primary barrier to including more fruits and vegetables in family meals was the different likes and dislikes of family members. In a qualitative sub-study investigating barriers to increasing the intake of fruits and vegetables in an intervention study, women participants both anticipated and reported that their children and male partner hindered their efforts (18). Mothers will prepare only those fruits and vegetables that their family likes, which may limit the variety served, if children are picky eaters or their husband or significant other does not like fruits or vegetables. Furthermore, the conflict with family members over eating or even just trying a fruit or vegetable may seem overwhelming. Providing support, encouraging perseverance, and offering practical suggestions, especially from the experience of others, can assist moms in their efforts. Additionally, moms may benefit from knowing they are not alone and that the most important thing is to keep trying.

Chart 18: Barriers to Increased Fruit & Vegetable Consumption 2009

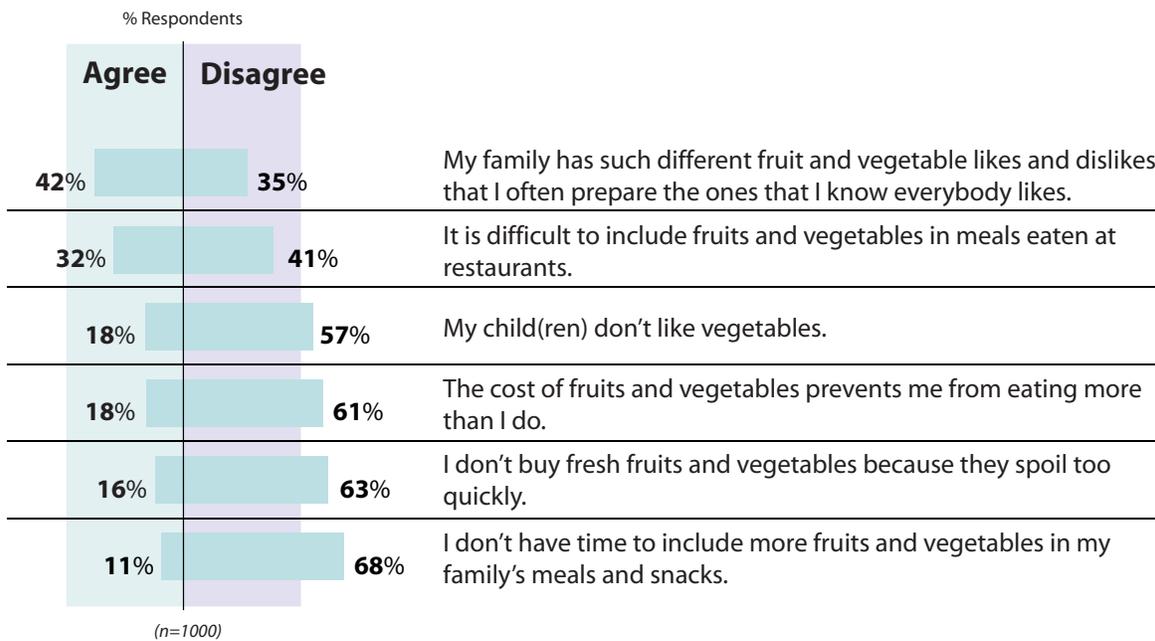
What makes it difficult for you to include more fruits and vegetables in your family's meals and snacks? (Please select all that apply.)



Until 2009, cost was not seen as a key obstacle to including more fruits and vegetables in the diet. In 2009, however, it ranked second behind family member likes and dislikes. In other studies, cost was a barrier, especially for low-income populations (19, 20). A recent analysis found that increasing fruit and vegetable consumption to levels recommended in the 2005 Dietary Guidelines would require substantial changes in the family food budget of a low-income household (21). American families across the board spend 15-18% of their food budget on fruits and vegetables. Thus, for a low-income family to increase expenditures for fruits and vegetables, considerable changes in other household expenditures would be needed and might not be feasible. Further, a recent analysis by the Economic Research Service (ERS) indicated that a household's income needs to be slightly greater than 130 percent of the poverty line before additional money will be allocated to purchasing fruits and vegetables (22).

Chart 19: Barriers to Increased Family Consumption of Fruits & Vegetables 2007

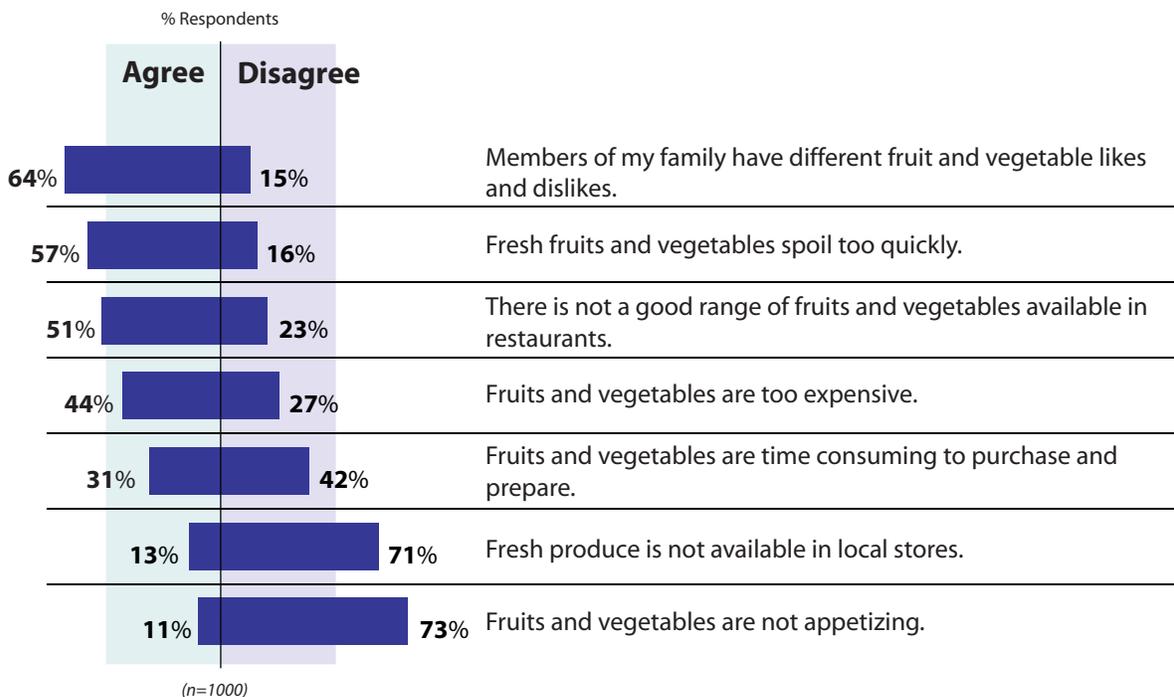
Please rate your level of agreement or disagreement with the following statements:



Responses do not equal 100% because mid-point in 5-point Likert Scale was omitted.

Chart 20: Barriers to Increased Family Consumption of Fruits & Vegetables 2008

The following are reasons that some people have said make it difficult to include fruits and vegetables in meals and snacks. Please indicate your level of agreement in relation to how difficult each is for you personally to include fruits and vegetables in meals and snacks.



Responses do not equal 100% because mid-point in 5-point Likert Scale was omitted.



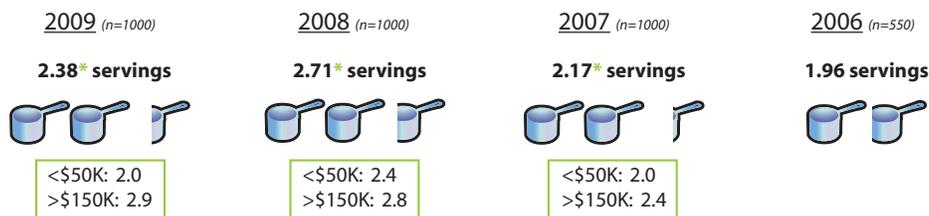
Self-Reported Intake

Self-reported intake of fruits and vegetables in these surveys was used to classify individuals for the purpose of analyzing and understanding associations with demographic and psychosocial variables. The accuracy of this self-reported intake is limited by the use of two questions. Short screeners using one or several questions to estimate intake of fruits and vegetables have been shown to both overestimate (23, 24) and underestimate intake (24) and are not recommended for tracking changes in consumption (23). However, several studies suggest that short screeners are acceptable for categorizing individuals by intakes. Two studies showed associations between categories of daily servings of fruit and vegetable intake based on self-reporting, using two questions and biomarkers including several serum carotenoids (25), plasma beta-carotene and alpha tocopherol (26), red cell folate (25), plasma ascorbic acid (26), and 24-hour urinary potassium excretion (26).

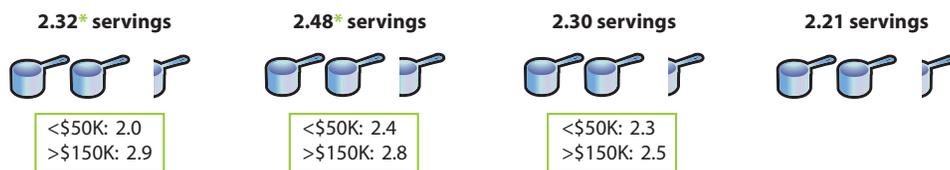
Recognizing all of these limitations in self-reported intake (Chart 21) indicates that the self-reported daily consumption of fruits and vegetables declined as lower-income households (<\$50K) cut back on purchases; conversely, higher-income households (>\$150K) reported an increase in their consumption.

Chart 21: Self-Reported Daily Consumption of Fruits & Vegetables, by Family Income 2006-2009

On average, how many pieces of fresh FRUIT and servings of juice, frozen, canned, and dried FRUIT of any sort do you eat on a typical day? (A serving is about the size of a tennis ball.)



On average, how many servings of fresh, frozen, canned, and dried VEGETABLES or VEGETABLE juice of any sort, including salad, and excluding fries and potato chips, do you eat on a typical day? (A serving is about the size of a tennis ball.)



* Represents statistically significant difference from previous year.
 □ Denotes statistically significant difference between type of respondent in current year.

Sources of Information

In 2007, the Internet was selected by 72% of respondents as either their first (44%), second (14%), or third (14%) choice for obtaining information about fruit and vegetables. By 2009, the Internet remained the preferred source of information for 74% of respondents, but specialists (dietitians/nutritionists, health care providers) and family were becoming more influential; magazines and supermarkets, on the other hand, were becoming less influential (Chart 22). It is possible that during difficult economic times, moms purchase fewer magazines and shop less frequently in traditional supermarkets.

The active use of the Internet to obtain information about fruits and vegetables by mothers is why PBH developed a website, www.fruitsandveggiesmorematters.org, specifically for this audience. In fact, benchmark metrics for the first half of 2009 show that the number of visits to the Fruits & Veggies—More Matters website was significantly higher (960%) than that of other comparably sized websites. Similarly, the number of page views for www.fruitsandveggiesmorematters.org was 1,528% higher than those for other nutrition-based websites of similar size, according to Google Analytics. Continued promotion and expanded use of this site is an inexpensive way to reach mothers with information that they need.



Chart 22: Preferred Sources of Information about Fruits & Vegetables 2007-2009

If you wanted any information about how to get your family to eat more fruits and vegetables, where would you go to obtain it? (Please rank your top 3 choices. For example: 1 = First choice, 2 = Second choice, 3 = Third choice)

	RANK ORDER (%)									TOTAL SCORE			TOTAL MINDSHARE SCORE		
	1 st Choice			2 nd Choice			3 rd Choice			2009	2008	2007	2009	2008	2007
	2009	2008	2007	2009	2008	2007	2009	2008	2007	2009	2008	2007	2009	2008	2007
Internet	44	49	44	18	16	14	12	11	14	74	76	72	286	303	277
Nutritionist/Dietitian	13	10	9	14	7	8	12	10	8	39	25	24	119	83	75
Health Care Provider	10	6	10	13	9	11	16	10	10	39	25	31	105	66	95
Family	8	5	8	10	10	9	13	8	11	31	24	28	83	66	78
Magazines	7	10	10	10	21	20	12	16	16	29	46	47	77	127	128
Books	5	5	5	13	14	12	11	13	14	29	32	31	75	80	76
Supermarket	6	7	5	5	8	8	7	11	7	18	26	20	52	71	54
Friend	3	5	5	8	9	10	7	10	9	18	24	24	46	60	64
Television	2	2	2	4	3	4	5	6	6	11	10	11	27	23	26
Newspaper	1	0	1	2	2	2	2	3	2	5	5	4	13	9	9
School	1	1	1	1	2	2	2	2	2	4	4	5	10	11	13
Drug Store	0	0	0	0	0	0	1	0	1	1	0	1	1	0	3

Mindshare Score: Additive score where each first mention garners five points, each second mention garners three points and each third mention garners a single point.

(n = 1000)

Applications

Gen X moms appreciate the importance of more fruits and vegetables in the diet and recognize the relationship of fruit and vegetable consumption to health and well-being, for themselves and their families. Attitudes towards including more fruits and vegetables are very positive, and the majority of moms say they want to, intend to, and expect to include more in their family's meals and snacks. During difficult economic periods, however, intentions are likely to be negatively impacted as lower-income mothers shift priority away from healthy eating.

In general, moms are primed for action-oriented messages that will help them follow through with preparing and serving more fruits and vegetables to their families. Barriers to including more fruits and vegetables, such as different preferences within the family, serving them while on a budget, or finding them in restaurants, reflect moms' need for practical information, suggestions, and tips that she can easily implement. Continuing to provide action-oriented messages to mothers, through www.fruitsandveggiesmorematters.org, health care providers, nutritionists/dietitians, supermarkets, and other media outlets will be important to assist mothers in their effort to provide healthy, happy homes for their families.

... moms are primed for action-oriented messages that will help them to follow through with preparing and serving more fruits and vegetables to their families.



Appendix A

Psychosocial Factors Related to Fruit & Vegetable Consumption

Question	Strongly Agree	Agree	Agree Somewhat	Disagree	Strongly Disagree
Intention					
In the next 3 months, I intend to include more fruits and vegetables in my family's meals each day.	2009: 31.8 2008: 37.2 2007: 27.8	2009: 36.8 2008: 38.7 2007: 40.3	2009: 25.7 2008: 20.8 2007: 27.6	2009: 4.3 2008: 2.7 2007: 3.4	2009: 1.5 2008: 0.6 2007: 0.9
Perceived Behavioral Control					
If I wanted to, I could include more fruits and vegetables in my family's meals each day.	2009: 33.9 2008: 34.6 2007: 30.5	2009: 40.6 2008: 40.5 2007: 40.7	2009: 20.9 2008: 20.8 2007: 24.0	2009: 3.7 2008: 2.7 2007: 4.1	2009: 0.8 2008: 1.4 2007: 0.7
In the next 3 months, it is likely that I will include more fruits and vegetables in my family's meals.	2009: 31.2 2008: 34.8 2007: 26.8	2009: 34.3 2008: 39.2 2007: 39.4	2009: 28.4 2008: 21.9 2007: 28.7	2009: 4.5 2008: 3.3 2007: 4.3	2009: 1.7 2008: 0.8 2007: 0.8
It is easy for me to include more fruits and vegetables in my family's meals each day.	2009: 27.6 2008: 23.1 2007: 21.1	2009: 30.4 2008: 35.9 2007: 30.3	2009: 29.5 2008: 30.0 2007: 35.9	2009: 11.1 2008: 9.6 2007: 10.2	2009: 1.4 2008: 1.4 2007: 2.5
Subjective Norm					
Moms like me include fruits and vegetables in family meals each day.	2009: 40.0 2008: 41.3 2007: 31.3	2009: 34.2 2008: 36.2 2007: 36.4	2009: 21.7 2008: 18.3 2007: 28.0	2009: 2.9 2008: 3.1 2007: 3.5	2009: 1.3 2008: 1.1 2007: 0.8
Self-Efficacy					
I don't know how to prepare fruits and vegetables in different ways. ^a	2009: 9.4 2008: 10.3 2007: 5.8	2009: 20.4 2008: 21.4 2007: 16.5	2009: 28.6 2008: 25.9 2007: 25.5	2009: 20.9 2008: 20.2 2007: 25.6	2009: 20.8 2008: 22.2 2007: 26.6
Social Support					
I do not have the support I need to include fruits and vegetables in my family's meals. ^a	2009: 7.4 2008: 6.4 2007: 3.4	2009: 15.9 2008: 10.7 2007: 7.4	2009: 24.3 2008: 17.5 2007: 20.4	2009: 22.8 2008: 24.6 2007: 28.7	2009: 29.6 2008: 40.8 2007: 40.1
Beliefs					
As a mom, it is important that I include fruits and vegetables in my family's meals.	2009: 59.1 2008: 68.7 2007: 68.1	2009: 30.0 2008: 23.4 2007: 22.1	2009: 9.2 2008: 6.1 2007: 7.7	2009: 1.2 2008: 0.9 2007: 0.5	2009: 0.5 2008: 0.9 2007: 1.6
My husband/partner believes it is important that our children include fruits and vegetables at meals.	2009: 42.1 2008: 47.5 2007: 45.7	2009: 26.7 2008: 28.7 2007: 25.1	2009: 20.7 2008: 15.2 2007: 18.5	2009: 8.6 2008: 6.3 2007: 7.1	2009: 1.9 2008: 2.2 2007: 3.6
Attitudes					
For me, eating more fruits and vegetables each day is enjoyable.	2009: 36.1 2008: 35.4 2007: 34.5	2009: 34.3 2008: 32.8 2007: 31.0	2009: 24.3 2008: 25.3 2007: 25.7	2009: 4.8 2008: 4.4 2007: 6.7	2009: 0.5 2008: 2.1 2007: 2.1
For me, eating more fruits and vegetables each day is a chore. ^a	2009: 7.2 2008: 7.2 2007: 5.2	2009: 17.5 2008: 16.5 2007: 14.5	2009: 28.2 2008: 25.1 2007: 20.0	2009: 23.8 2008: 24.1 2007: 26.1	2009: 23.2 2008: 27.1 2007: 34.2
Total (using^a Reversed Scores)	2009: 375.4 2008: 412.7 2007: 386.7	2009: 334.8 2008: 344.3 2007: 345.7	2009: 261.5 2008: 226.9 2007: 262.0	2009: 94.9 2008: 81.6 2007: 78.2	2009: 33.6 2008: 34.4 2007: 27.4

Appendix B

Methodology

To prepare for the public relations launch efforts of Fruits & Veggies—More Matters, a survey of 550 Gen X moms was developed by PBH and Ogilvy Public Relations Worldwide, the public relations agency for Fruits & Veggies—More Matters. The survey was conducted in October 2006. Using 2006 survey responses, a preliminary baseline survey questionnaire was developed and pilot-tested with 73 Gen X moms with one or more children under the age of 18 living in the home who were recruited either in grocery stores (n=5) or on the former 5 A Day website (n=67). Items were analyzed using principal components factor analysis to identify one or two salient items to be included on the questionnaire for each construct. Items loading highest on a factor were selected for inclusion.

Most questions were answered using a five-point Likert scale, with several questions that required open-ended responses. The Theory of Planned Behavior was used as a framework to ascertain psychosocial factors (social norms, perceived behavioral control, attitudes, and intentions) related to consumption of fruits and vegetables (27). Other constructs from Social Learning Theory that have been associated with fruit and vegetable intake in the scientific literature such as self-efficacy (28) and social support (29) were also included. Finally, other questions assessed perceptions about fruits and vegetables and awareness of recommendations for intake.



OnResearch, Inc (Ontario, Canada), fielded all surveys online. The 2006 preliminary survey was conducted October 3-6, 2006. The baseline survey was fielded online February 2-9, 2007, prior to the March 19, 2007, launch of Fruits & Veggies—More Matters. The two follow-up surveys were fielded online during January 18-22, 2008, and January 16-22, 2009. For all surveys, the sample was drawn from membership lists of survey panels for online companies who partner with OnResearch, Inc. Potential respondents who met inclusion criteria were invited via email to participate in the survey. The specifications included females whose date of birth was between 1965 and 1979, with at least one child under the age of 18. The email invitation did not specify that the survey was about fruits and vegetables, and the order of the questions was carefully considered to minimize bias in responses. In each study, a total of nearly 20,000 were asked to participate. Access to the survey was terminated once the planned sample of 1000 was reached (550 in the 2006 survey). Survey participants received rewards from the panel company for participating in surveys sent to them. Results of each survey were tabulated by OnResearch, Inc.

Chart 23: Objectives and Respondent Criteria
2006-2009

METHODOLOGY				
Wave	Round 4 (2009)	Round 3 (2008)	Round 2 (2007)	Round 1 (2006)
Survey Type	Online survey conducted via an online panel			
Fielding Period	January 16 – 22, 2009	January 18 – 22, 2008	February 2 – 9, 2007	October 3 – 5, 2006
Sample Size	n = 1000	n = 1000	n = 1000	n = 550
Confidence Level	3.1% (19/20 times)	3.1% (19/20 times)	3.1% (19/20 times)	4.2% (19/20 times)
RESPONDENT CRITERIA				
Geography	Residents of the United States			
Gender	Women only	Women only	Women only	Women only
Age	"Generation X" - born between 1965 and 1979	"Generation X" - born between 1965 and 1979	"Generation X" - born between 1965 and 1981	"Generation X" - born between 1965 and 1981
Additional Criteria	Must have children under the age of 18 living at home	Must have children under the age of 18 living at home	Must have children under the age of 18 living at home	Must have children under the age of 18 living at home

Appendix C

Demographics

Chart 24: Gen X Respondent Profile
2006-2009

	2009	2008	2007
MARITAL STATUS	%	%	%
Married/Living with someone	92	87	87
Single	3	5	5
Separated/Divorced	5	8	8
Widowed	<1	<1	<1

	2009	2008	2007
SPOUSE'S EDUCATION	%	%	%
Did not finish high school	2	2	1
High school graduate	16	10	11
Some college	25	24	23
College graduate	31	35	37
Some graduate work	4	6	4
Completed graduate work	19	20	20
Trade/vocational school	3	4	4

	2009	2008	2007
WORK OUTSIDE THE HOME	%	%	%
No	38	29	31
Yes, Part-time	22	21	21
Yes, Full-time	41	50	48

	2009	2008	2007	2006
GENDER	%	%	%	%
Female	100	100	100	100

	2009	2008	2007	2006
AGE	%	%	%	%
24 - 29	<1	3	12	16
30 - 34	31	27	35	35
35 - 41	55	71	54	49

	2009	2008	2007	2006
HHI	%	%	%	%
Less than \$25K	4	4	3	2
\$25K - \$50K	12	12	14	20
\$50K - \$75K	22	22	22	26
\$75K - \$100K	25	25	26	22
\$100K - \$150K	24	25	22	21
\$150K or more	14	13	12	9

	2009	2008	2007	2006
OWN EDUCATION	%	%	%	%
Did not finish high school	1	<1	1	<1
High school graduate	16	6	7	5
Some college	25	23	20	25
College graduate	36	41	43	41
Some graduate work	5	6	7	8
Completed graduate work	15	22	20	17
Trade/vocational school	3	3	3	3

	2009	2008	2007	2006
ETHNICITY	%	%	%	%
White/Caucasian	84	84	83	81
Black/African American	4	4	5	7
Hispanic/Latino	5	4	4	6
Asian/Pacific Islander	6	6	6	5
Other	1	2	2	2

Appendix C, continued

Demographics

Chart 25: Geographic Profile of Gen X Mom Respondents 2006-2009

"Atlantic"

	2009	2008	2007	2006
NORTHEAST	%	%	%	%
Connecticut	<1	2	1	1
Maine	<1	<1	<1	1
Massachusetts	4	2	3	2
New Hampshire	1	<1	<1	<1
Rhode Island	<1	<1	<1	<1
Vermont	<1	<1	<1	--

	2009	2008	2007	2006
MIDDLE ATLANTIC	%	%	%	%
Delaware	1	<1	<1	1
Maryland	2	2	1	2
New Jersey	3	3	3	3
New York	6	5	5	5
Pennsylvania	6	5	5	4
Washington	2	1	2	3

% Respondents

"Midwest"

	2009	2008	2007	2006
MIDWEST	%	%	%	%
Illinois	7	5	4	6
Indiana	3	2	2	2
Iowa	1	2	1	2
Kansas	1	1	1	<1
Michigan	4	7	8	5
Minnesota	2	5	6	5
Missouri	2	2	3	1
Nebraska	1	1	1	1
North Dakota	<1	<1	1	1
Ohio	5	4	4	4
South Dakota	<1	<1	0	<1
Wisconsin	4	4	3	4

"South"

	2009	2008	2007	2006
SOUTH	%	%	%	%
Alabama	<1	1	1	1
Arkansas	1	1	1	1
Florida	3	5	4	5
Georgia	1	3	3	4
Kentucky	1	2	1	1
Louisiana	1	1	1	1
Mississippi	<1	<1	1	<1
North Carolina	3	3	3	2
South Carolina	1	1	2	1
Tennessee	2	2	2	2
Virginia	3	2	3	2
West Virginia	1	0	0	0

"West"

	2009	2008	2007	2006
SOUTHWEST	%	%	%	%
Arizona	2	2	1	2
New Mexico	<1	<1	<1	<1
Oklahoma	1	1	1	1
Texas	8	10	10	11

	2009	2008	2007	2006
WEST	%	%	%	%
Alaska	0	<1	<1	<1
California	10	9	8	7
Colorado	3	2	2	1
Hawaii	<1	1	1	<1
Idaho	<1	1	1	1
Montana	<1	<1	<1	<1
Nevada	<1	1	<1	1
Oregon	2	1	1	1
Utah	1	1	<1	1
Wyoming	<1	0	0	0

References

1. Stables GJ, Subar AF, Patterson BH, Dodd K, Heimendinger J, Van Duyn MA, Nebeling L. Changes in vegetables and fruit consumption and awareness among US adults: Results of the 1991 and 1997 5 A Day for Better Health Program surveys. *J Am Diet Assoc* 2002; 102:809-817
2. NCI 5 A Day Attitude and Behavioral Tracking, National Omnibus Survey Results: November 2004. Unpublished data, reported by Porter Novelli for the National Cancer Institute
3. GFK/Roper Report, "Health and Well Being," April 2007, #14
4. Sjoberg S, Kim K, Reicks M. Applying the theory of planned behavior to fruit and vegetable consumption by older adults. *J Nutr Elder* 2004;23(4):35-46.
5. Rhodes RE, Blanchard CM, Matheson DH. A multicomponent model of the theory of planned behavior. *Br J Health Psychol* 2006 Feb;11(pt1):119-37.
6. Brug J, de Vet E, de Nooijer J, Verplanken B. Predicting fruit consumption: cognitions, intention, and habits. *J Nutr Educ Behav* 2006 Mar-Apr;38(2):73-81.
7. Bogers RP, Brug J, van Assema P, Dagnelie PC. Explaining fruit and vegetable consumption: the theory of planned behavior and misconception of personal intake levels. *Appetite* 2004 Apr;42(2):157-66.
8. de Vet E, de Nooijer J, de Vries, NK, Brug J. Comparing stage of change and behavioral intention to understand fruit intake. *Health Educ Res* 2007 Aug;22(4):599-608.
9. Yeh MC, Ickes SB, Lowenstein LM, Shuval K, Ammerman AS, Farris R, Katz DL. Understanding barriers and facilitators of fruit and vegetable consumption among a diverse multi-ethnic population in the USA. *Health Promot Int* 2009 23(1):42-51.
10. Paquette MC. Perceptions of healthy eating: state of knowledge and research gaps. *Can J Public Health* 2005 Jul-Aug; 96 Suppl 3:S15-9, S16-21.
11. Gibson EL, Wardle J, Watts CJ. Fruit and vegetable consumption, nutritional knowledge and beliefs in mothers and children. *Appetite* 1998 Oct;31(2):205-8.
12. Boutelle KN, Birkeland RW, Hanna PJ, Story M, Neumark-Sztainer D. Associations between maternal concern for healthful eating and maternal eating

- behaviors, home food availability, and adolescent eating behaviors. *J Nutr Educ Behav* 2007 Sep-Oct; 39(5):248-56.
13. Satia JA, Kristal AR, Patterson RE, Neuhouser ML, Trudeau E. Psychosocial factors and dietary habits associated with vegetable consumption. *Nutrition* 2002 18:247-254.
 14. Jago R, Baranowski T, Baranowski JC. Fruit and vegetable availability: a micro-environmental mediating variable? *Public Health Nutr* 2007 Jul; 10(7):681-9.
 15. Galloway MS, Jago R, Baranowski T, Baranowski JC, Diamond PM. Psychosocial and demographic predictors of fruit, juice, and vegetable consumption among 11-14-year-old Boy Scouts. *Public Health Nutr* 2007 Dec;10(12):1508-14.
 16. Young EM, Fors SW, Hayes DM. Associations between perceived parent behaviors and middle-school student fruit and vegetable consumption. *J Nutr Educ Behav* 2004 Jan-Feb;37(1):2-8.
 17. Kvaavik E, Lien N, Tell GS, Knut-Inge K. Psychosocial predictors of eating habits among adults in their mid-30s: The Oslo Youth Study follow-up 1991-1999. *Int J Beh Nutr Phys Act* 2005, 2:9.
 18. John JH, Ziebland S. Reported barriers to eating more fruit and vegetables before and after participation in a randomized controlled trial: a qualitative study. *Health Educ Res* 2004 19(2): 165-174.
 19. Havas S, Treiman K, Langenberg P, Ballesteros M, Anliker J, Damron D, Feldman R. Factors associated with fruit and vegetable consumption among women participating in WIC. *J Am Diet Assoc*. 1998;98:1141-1148.
 20. Eikenberry N, Smith C. Healthful eating: Perceptions, motivations, barriers, and promoters in low-income Minnesota communities. *J Am Diet Assoc*. 2004; 104:1158-1161.
 21. Cassady D, Jetter KM, Culp J. Is price a barrier to eating more fruits and vegetables for low-income families? *J Am Diet Assoc* 2007; 107:1909-1915.
 22. Stewart H, Blisard N. Are lower-income households willing and able to budget for fruits and vegetables? Economic Research Report Number 54, USDA, January, 2008U
 23. Peterson K, Hebert JR, Hurley TG, Resnicow K, Thompson FE, Greene GW, Shaikh AR, Yaroch AL, Williams GC, Salkeld J, Toobert DJ, Domas A, Elliot DL, Hardin J, Nebeling L. Accuracy and precision of two short screeners to

- assess change in fruit and vegetable consumption among diverse populations participating in health promotion intervention trials. *J Nutr* 2008 Jan;138(1):218S-225S.
24. Greene GW, Resnicow K, Thompson FE, Peterson KE, Hurley TG, Hebert JR, Toobert DJ, Williams GC, Elliot DL, Goldman Sher T, Domas A, Midthune D, Stacewicz-Sapuntzakis M, Yaroch AL, Nebeling L. Correspondence of the NCI fruit and vegetable screener to repeat 24-hr. recalls and serum carotenoids in behavioral intervention trials. *J Nutr* 2008 Jan;138(1):200S-204S.
 25. Coyne T, Ibiebele TI, NcNaughton S, Rutishauser IH, O'Dea K, Hodge AM, McClintock C, Findlay MG, Lee A. Evaluation of brief dietary questions to estimate vegetable and fruit consumption using serum carotenoids and red-cell folate. *Public Health Nutr* 2005 May;8(3):298-308.
 26. Cappuccio FP, Rink E, Perkins-Porras L, McKay C, Hilton S, Steptoe A. Estimation of fruit and vegetable intake using a two-item dietary questionnaire: a potential tool for primary health care workers. *Nutr Metab Cardiovasc Dis.* 2003 Feb;13(1):12-9.
 27. Francis JJ, Eccles MP, Johnston M, Walker A, Grimshaw J, Foy R, Kaner EFS, Smith L, Bonetti D. Constructing questionnaires based on the theory of planned behavior: a manual for health services researchers. May, 2004 <http://www-unix.oit.umass.edu/~aizen/tpb.html>, Accessed 7/6/06.
 28. Van Duyn MA, Kristal AR, Dodd K, Campbell MK, Subar AF, Stables G, Nebeling L, Glanz K. Association of awareness, intrapersonal and interpersonal factors, and stage of dietary change with fruit and vegetable consumption: a national survey. *Am J Health Promot* 2001 Nov-Dec; 16(2):69-78.
 29. Fuemmeler BF, Masse LC, Yaroch AL, Resnicow K, Campbell MK, Carr C, Wang T, Williams A. Psychosocial mediation of fruit and vegetable consumption in the body and soul effectiveness trial. *Health Psychol* 2006 Jul; 25(4):474-83.

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