

United States
Department of
Agriculture



Economic
Research
Service

Economic
Information
Bulletin
Number 83
September 2011

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Christian Gregory
Travis Smith
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A Report from the Economic Research Service

www.ers.usda.gov

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Abstract

Over the last 20 years, awareness of diet-related health concerns has become widespread in the United States as obesity, along with its associated human and financial costs, has increased. To estimate how this awareness affects Americans' perceptions of their own diet quality over this period and the factors associated with self-assessed diet health, we examine data from both the 1989-91 Continuing Survey of Food Intakes of Individuals and the 2005-08 Flexible Consumer Behavior Survey module of the National Health and Nutrition Examination Survey. We find, first, that Americans have become much less likely to rate their diets as "Excellent" or "Very Good" in terms of healthfulness, even though the healthfulness of the American diet has undergone little change over this period. Second, current self-ratings of diet are inversely related to the frequency of fast-food and food-away-from-home consumption and positively related to the frequency of sharing meals with family. In addition, self-ratings of diet are positively associated with household availability of dark green vegetables and low-fat milk and negatively associated with availability of sweetened soft drinks.

Keywords: Diet perceptions, nutrition information, consumer perceptions, diet rating, CSFII, NHANES, FCBS

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Summary

What Is the Issue?

An obstacle to policies aimed at improving diets through education is that consumers tend to overrate the quality of their diets and to think that dietary guidelines are directed at others, not themselves. In this study, we look at the change in Americans' subjective perceptions of their diet quality between 1989-91 and 2005-08. These changes provide a snapshot of consumers' increased dietary realism and, perhaps, receptiveness to dietary guidance, and they also suggest the possibility that a changed information environment has affected consumers' perception. In addition, we use data from the ERS-supported Flexible Consumer Behavior Survey (administered with the National Health and Nutrition Examination Survey (NHANES)) to highlight how perceptions of diet quality vary with food expenditures, household food availability, and eating behavior.

What Did the Study Find?

Although the actual healthfulness of diets has not changed much in the last 15 years, there has been a large and significant decrease in the percentage of Americans who rate their diets as Excellent or Very Good.

- The share of people who said that their diets were excellent or very good declined by 9.1 percentage points, from 41 percent to 31.9 percent, between 1989-91 and 2005-08.
- Declines in the share of excellent or very good self-ratings of diet were especially large among Hispanics and people who were underweight, overweight, or obese, younger than 65, or had some college education (but not a college degree).
- People who perceived themselves as overweight became less likely to rate their diet as excellent or very good between 1989-91 and 2005-08.
- Those who had diets high in fat were much less likely to rate their diets as very good or excellent in 2005-08 than in 1989-91.

These results suggest a reduced optimistic bias in Americans' views of their diets—and perhaps greater receptiveness to information about the relationships between diet and health.

We also find a strong relationship between diet assessment and some dietary choices and habits. Comparing subjective ratings of diet quality across different groups, we find:

- Self-ratings of diet healthfulness tend to be low among people who report a higher share of their food budget spent away from home and of calories eaten away from home.
- Those with better diet self-ratings are more likely to share meals with the family, both at home and away from home.

- Those who report high diet quality are more likely to keep skim milk and dark green vegetables on hand in the household, and they are less likely to stock sugar-sweetened beverages.

How Was the Study Conducted?

The data for our comparisons of diet quality perception come from the 1989-91 Continuing Survey of Food Intakes of Individuals (CSFII) and the 2005-2006 and 2007-2008 waves of the National Health and Nutrition Examination Survey (NHANES). The CSFII is also our source for data on household food expenditures in 1989-91. The 2007-08 NHANES data on diet quality perceptions, food-away-from-home frequency, household food expenditures, the kinds of food kept at home, travel time to the grocery store, and social context of eating come from the Flexible Consumer Behavior Survey (FCBS) module sponsored by the Economic Research Service. The 2005-06 NHANES included a subset of FCBS questions, including diet quality perception and food-away-from-home frequency. For these questions, we report results from the combined 2005-08 NHANES data.

Introduction

Over the past 20 years, changes in food markets and food production technology, as well as the dramatic increase in obesity prevalence, have brought America's eating habits into sharp public focus. Americans, we now know, eat diets that are too high in calories, fats (especially saturated fats), sodium, and added sugar. Our diets are also too low in fiber, whole grains, fresh vegetables, and important nutrients. The effects of our dietary habits are partly borne out by the health costs attributable to obesity which, by one calculation, were \$85 billion in 2006 (Finkelstein et al., 2009). These effects are also felt in the reduced productivity and quality of life that come with health conditions associated with obesity.

Although health researchers now know a great deal about the quality of American diets, consumers' perceptions of their diets are often inaccurate. Research has shown that consumers tend to perceive that their diets are better than they are relative to widely accepted dietary guidance. For example, Glanz et al. (1997) showed that consumers had difficulty estimating the amount of fat in their diets: more than a fourth of American consumers in Glanz's study underestimated their fat intake, and an even larger fraction of Dutch participants did so. Variyam, Shim, and Blaylock (2001) found that 40 percent of U.S. household meal planners surveyed in 1989-90 judged their diet to be of higher quality (in terms of healthfulness) than could be justified using a standard rubric, the USDA's healthy eating index (HEI). In the 1989-91 Continuing Survey of Food Intakes of Individuals (CSFII), respondents who got more than half of their daily calories from fat were nearly twice as likely to rate the healthfulness of their diets as Excellent compared with those with lower fat intakes.¹

This "optimistic bias" about diet is both an obstacle and an impetus for policy geared toward encouraging behavioral change through better information.² On the one hand, such optimism might impede efforts to change behavior because it suggests that consumers see guidelines for diet improvement as directed toward others, not themselves. On the other hand, the optimism illustrates the need to understand how nutrition information is conveyed and received and, possibly, the need for more information about diet.

This study is concerned with changes in diet perception because they offer us a window into changes in this optimistic attitude toward diet. Changes can offer a snapshot of consumers' increased dietary realism and, perhaps, receptiveness to dietary guidance, and they also suggest the possibility that a changed information environment has affected consumers' perception. To assess these possibilities, we examine how Americans' evaluations of diet quality have changed over the period 1989-91 to 2005-08. We compare self-assessed diet quality reported in the 1989-91 CSFII with a similar measure collected in the 2005-06 and 2007-08 waves of the National Health and Nutrition Examination Survey (NHANES). We examine the way that changes in diet assessment vary across groups characterized by demographics, weight self-perception, and dietary intake. We also investigate how diet self-assessment varies with per capita food expenditures. We show that there is a strong relationship between diet assessment and some dietary choices and habits. In particular, consumption of food away from

¹Authors' calculation from data described in this report.

²There is a large extant literature about "optimistic bias" with respect to food safety and health issues. In general, "optimistic bias" refers to the underestimation of defined risk, relative to peer groups directly or indirectly defined. For example, respondents in a survey might be asked about their perception of the risk of diabetes or heart attack relative to others of similar age. While self-assessments of diet health obviously imply defined risks and a reference point, the question in CSFII and NHANES about diet health does not specify either of these. We use the term "optimistic bias" here advisedly. See Miles and Scaife (2003) for a review of relevant literature.

home (FAFH) and sharing meals in a family context seem strongly related to diet assessment. Moreover, reports in more recent data about the kinds of food stored at home are strongly related to diet assessment and suggest some familiarity with dietary guidance. Overall, we find that Americans have grown much more realistic (less optimistic) in their self-assessments of diet healthfulness in the 19 years covered by our data.

Data

The data we use come from two surveys: the 1989-91 CSFII and the 2005-06 and 2007-08 waves of the NHANES. The samples from both of these data sets are drawn using complex, stratified designs, and both are weighted to be representative of the U.S. population.³ NHANES is currently the primary U.S. data set that continuously tracks information about diet, nutrition, and health outcomes for the civilian non-institutionalized population. NHANES oversamples low-income persons, adolescents 12-19 years of age, persons over 60 years of age, African Americans, and Mexican Americans. Although some of the content of the health modules does vary, basic information about diet intake, demographics, and income is constant over the 2005-06 and 2007-08 waves of the data.

The 1989-91 CSFII was administered as two tandem surveys. One was the CSFII proper, which included a 3-day food and nutrient intake component for a total of over 11,000 respondents; the other was the Diet and Health Knowledge Survey (DHKS), which collected information on diet knowledge, attitudes, and perceptions from the approximately 6,000 meal planners/preparers identified in the CSFII. The dietary intake component of the CSFII was folded into the NHANES in 2002, so the food intake data from the two surveys are in all important respects comparable. The 2007-08 NHANES included a supplementary module sponsored by USDA's Economic Research Service, the Flexible Consumer Behavior Survey (FCBS). The FCBS collected data similar to that in the CSFII-DHKS, such as information on self-assessed diet quality and household food expenditures. The FCBS also included new questions on food-away-from-home frequency, family dining habits, household food stocking habits, and time used for shopping and cooking. While the full-blown FCBS was administered with the 2007-08 NHANES, a subset of questions from it, including questions on diet quality perception, were included in the 2005-06 NHANES.

We use data from the CSFII 1989-1991 and NHANES 2005-2008 to make comparisons of self-assessed diet quality, energy and nutrient intake, and income; in addition, we have information in all these years on whether intakes are from food at home (FAH) or food away from home (FAFH). As a result, analysis of the share of calories from FAFH makes use of all years in the data. Our comparisons of self-assessed diet quality by per capita food expenditure use the CSFII data and NHANES 2007-08, since expenditure data are only available in those years. Finally, data about frequency of eating FAFH or fast food away from home, availability of foods in the home, travel time to the grocery store, and the frequency of eating in a household setting come from the FCBS in the 2007-08 NHANES.

For this study, we limit the sample to respondents who are at least 20 years old and have completed a full complement of dietary intake diaries for each

³All our estimates take into account the complex sample design.

survey.⁴ In the 1989-91 CSFII, we impose the additional constraint that the sample person be the respondent to the diet intake survey.

Changes in Self-Assessed Diet Quality

In each of the surveys we use, respondents were asked to appraise the overall healthfulness of their diets.⁵ The choices offered were “Excellent,” “Very Good,” “Good,” “Fair,” and “Poor.” For the population as a whole and for women and men, the percentage of persons who said that their diet was Excellent or Very Good declined between the two surveys; for the entire population, the percentage of people who rate their diets as Excellent or Very Good fell by 4.6 and 4.5 percentage points, respectively. For men, the declines were 8.5 and 2.0 percentage points, and for women, 3.3 and 5.1 percentage points, respectively (table 1).⁶

The decline in the likelihood of reporting an Excellent or Very Good diet was shared over most demographic groups. Large decreases were seen for respondents of Hispanic origin, those with household incomes between 130 and 300 percent of poverty, and those who had some college education (but not a college degree).⁷ Interestingly, people who were underweight, overweight, or obese became less likely to rate their diets as Excellent or Very Good compared with those of normal weight (fig. 1).⁸ In addition, there was no strong change in the likelihood of rating one’s diet as Excellent or Very Good for low-income people, who are generally less likely to rate their diets as Excellent or Very Good: 34 percent of people below 130 percent of the poverty line rated their diet as Excellent or Very Good in 1991, as opposed to 44 percent of those above 300 percent of the poverty line.

These broad and significant changes in diet perception could happen for two reasons. First, diets might indeed have worsened between these two surveys, with the self-evaluations reflecting this fact. Second, it could be that diets have not changed, but that people exhibit marginally less optimistic bias in

⁴For the CSFII, there were 3 days of intake survey; for NHANES, 2 days. In the CSFII, we retain only those persons who responded themselves to the intake surveys, which contain the assessment of diet.

⁵In NHANES, respondents are asked “In general, how healthy is your overall diet?” In CSFII, the prompt for the respondent is, “In general, would you say the healthfulness of your diet is Excellent, Very Good, Good, Fair or Poor?”

⁶The summary measures calculated here rely on sampling weights and variance units constructed by NHANES (see CDC (2005) for more on the construction of weights and variance units). We estimate means and proportions by the formula

$$\bar{x} = \frac{\sum_{i=1}^n w_i x_i}{\sum_{i=1}^n w_i},$$

where w and x are sample weights and values of the random variable of interest. We calculate the variance of the means using Taylor series linearization. For a sampling design like NHANES, we estimate the variance of a random variable, x , by

$$\bar{v}(x) = \sum_{h=1}^L \frac{n_h}{n_h - 1} \sum_{i=1}^{n_h} (x_{hi} - \bar{x}_h)^2 + \sum_{h=1}^L \sum_{i=1}^{n_h} \frac{m_{hi}}{m_{hi} - 1} \sum_{j=1}^{m_{hi}} (x_{hij} - \bar{x}_{hi})^2,$$

where h indexes the number of strata, i indexes primary sampling units within a strata, and j indexes household clusters sampled within PSUs; x_{hi} and x_{hij} are the PSU-level and cluster-level totals and \bar{x}_h and \bar{x}_{hi} are the strata and PSU-level means of the random variable x . The total variance of x is the sum of the within-strata and the within-PSU variance of x .

⁷Decreases are calculated as $P(\text{Excellent/Very Good}|\text{CSFII}) - P(\text{Excellent/Very Good}|\text{NHANES})$. Significance is determined using a conventional t-test for the difference between proportions.

⁸We use conventional definitions of body mass index: BMI < 18.5 = underweight; 18.5 < BMI < 25 = normal weight; 25 < BMI < 30 = overweight; BMI > 30 = obese. Unless otherwise noted, all changes are statistically significant at $p < .05$.

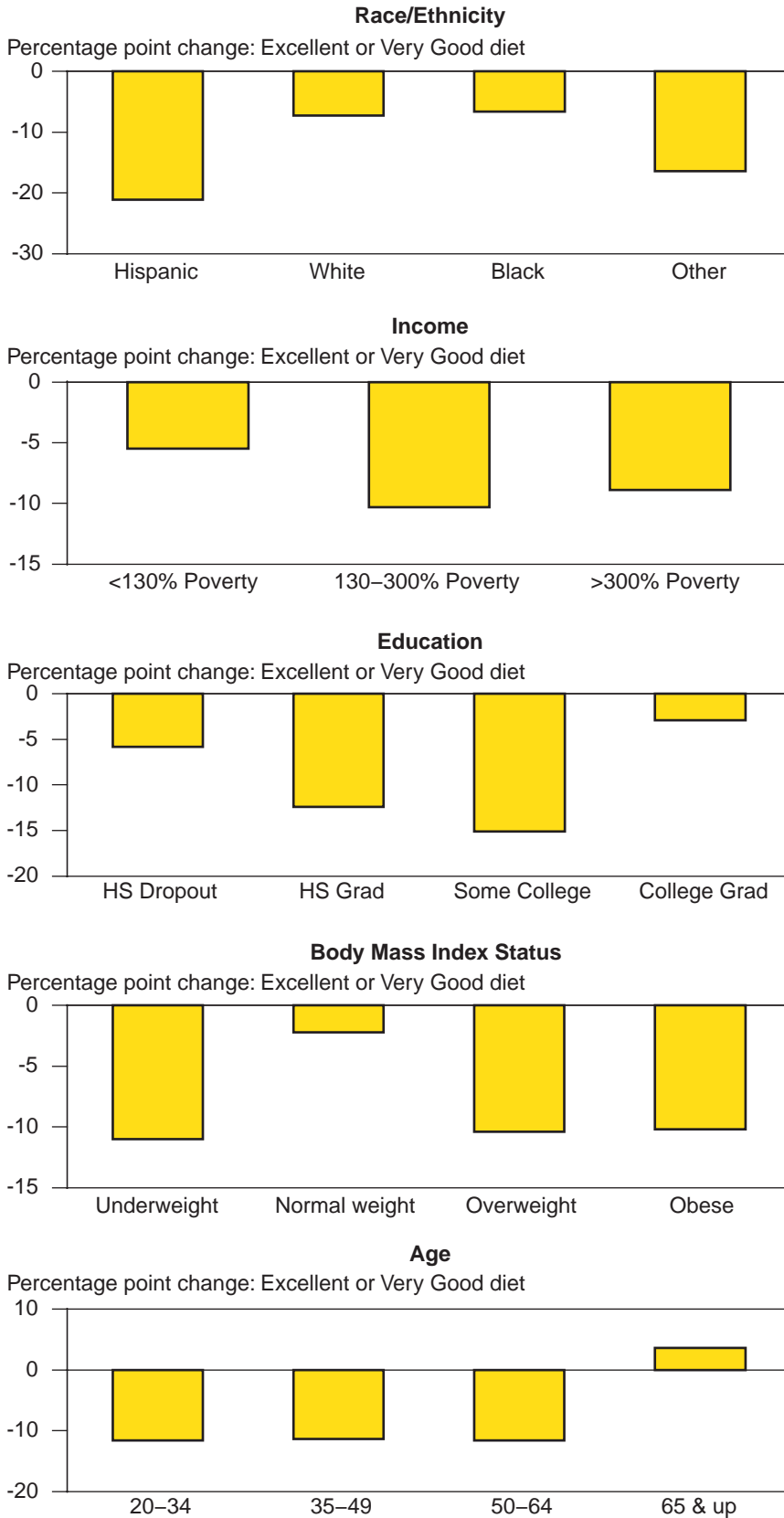
Table 1
Self-assessed diet quality, 1989-91 and 2005-08

Population	N					
		Excellent	Very Good	Good	Fair	Poor
All 1989-91	5,655	13.2	27.8	39.3	15.5	4.2
All 2005-08	12,669	8.6	23.3	40.7	21.2	5.8
% Change		-4.6	-4.5	1.3	6.2	1.6
Men 1989-91	1,117	16.7	25.3	32.5	17.8	7.7
Men 2005-08	6,188	8.2	23.3	40.4	22.2	5.9
% Change		-8.5	-2.0	7.9	4.4	-1.8
Women 1989-91	4,538	12.3	28.4	41.2	14.9	3.3
Women 2005-08	6,481	9.0	23.23	40.9	21.3	5.6
% Change		-3.3	-5.1	-0.3	6.3	2.3

Cells show percentages of sample that report given levels of diet healthfulness. All calculations account for sample design. Source: Authors’ calculations based on CSFII 1989-91 and NHANES 2005-08 data.

Figure 1

Change between 1989-91 and 2005-08



All differences are significant at least at $p < .10$.

Source: Authors' calculation based on CSFII 1989-91 and NHANES 2005-08.

their evaluations of their diets; this could also imply that they are becoming more receptive to dietary guidance.

Previous research has shown that the quality of American diets did not change much over the period in question, at least as measured by the Healthy Eating Index (HEI). The HEI is a benchmark constructed by the USDA to measure diet quality alongside the recommendations in the *Dietary Guidelines for Americans* and the *Food Guide Pyramid* (replaced by *MyPlate*). An HEI score above 80 is considered “Good,” while scores between 51 and 80 indicate a diet that “needs improvement,” and scores below 51 suggest a diet that is “Poor.” The HEI has had two iterations: before the 2005 Guidelines, it was constructed on the basis of 10 components, and since then it has been constructed on the basis of 12 components that better accommodate changes to the 2005 *Guidelines*. While it would be best to compare HEI scores for 1989-91 and 2005-08, the latter scores are not yet available. Other comparisons, however, yield fairly convincing evidence that diet healthfulness didn’t change much between these surveys. Studies using the CSFII waves from 1989-1990 and 1994-96 and the 10-component score found that the average HEIs for these years were virtually indistinguishable from each other. Both years had average scores between 63 and 64 out of a possible total index score of 100 (Bowman et al., 1998; Center for Nutrition Policy and Promotion, 1995). Subsequent studies using the 2005-basis (12-component) score and data from the 1994-1996 CSFII and 2003-04 NHANES similarly found HEI scores basically unchanged at around 58 (Guenther et al., 2007; CNPP, 2008; see also Variyam and Smith, 2010).⁹ The fact that—with different component scales—the 1994-96 HEIs were identical to both 1989-90 and 2001-02 HEIs suggests that the general healthfulness of the American diet has not changed very much over the last 15 or 20 years.

There is an important *caveat* to this characterization of the American diet, however. All of the component scores for the HEI—and thus the overall score—are calculated on a per 1,000-calories-of-intake basis. (The recommended amounts are normalized for age groups, so that children and seniors are not assumed to need the same intakes.) With this method, the healthfulness of an actual level of intake (3,500 calories as opposed to 2,500, for example) does not contribute one way or the other to the HEI. From one point of view, that is sensible, since we do not know much about what “over-eating” may be for any given person.¹⁰ On the other hand, we do know that eating more than one expends in energy will lead to weight gain, no matter how “healthy” the calories are. The increased prevalence of overweight and obesity in the United States—along with related conditions, such as diabetes and heart disease—suggests that caloric intake is out of balance with energy expenditure, quite generally speaking. This is not accounted for in the HEI.

Notwithstanding this omission from the HEI formula, however, there is little evidence that caloric intake affects how consumers evaluate their diets. Table 2 shows levels of caloric intake conditional on self-assessed diet in the CSFII and NHANES. Although caloric intake is higher on the whole in the NHANES data, the differences in the changes in intake from one survey to another are only marginally significant for those who rated their diets as Very Good, Good, or Fair relative to those who rated their diets as Excellent. In other words, despite the fact that those with Poor diets showed a bigger

⁹In addition, the same proportion of Americans had HEI scores high enough to indicate a good diet—about 12 percent—in 1989-91, 1994-96, and 2001-2002. That proportion was about 10 percent in 1999-2000. See Bowman (1998), CNPP (1995), and CNPP (2002); scores for 2001-2002 from authors’ calculations using data found at <http://www.cnpp.usda.gov/Healthy-EatingIndex-Archive.htm>.

¹⁰HEI scores do take age into account in establishing appropriate consumption amounts.

Table 2

Total caloric intake by self-assessed diet quality

Survey	Total caloric intake				
	Excellent	Very Good	Good	Fair	Poor
CSFII	1,721	1,659	1,710	1,756	1,744
NHANES	2,106	2,231	2,252	2,320	2,381
Change	385	573*	542*	564*	638

*Changes relative to Excellent category significant at $p < .10$. Other differences are insignificant. Source: Authors' calculation based on CSFII 1989-91 and NHANES 2005-08.

increase in calorie intake over the period, there is no statistical evidence that this increase is different from the other diet-rating categories. So the omission of calorie levels from the HEI, while perhaps important for the evaluation of the health of a diet, does not seem to affect our interpretation of the change in self-assessment of diets. For the things that are measured by HEI, there is little or no change; for caloric intake, which is not measured by HEI but for which there is change, there doesn't seem to be much association with changes in self-rated diet.

Given this data, it could be that Americans have become more aware of what constitutes a healthy diet and more receptive to dietary guidance. Indeed, other research shows that Americans have become more aware of Government information sources for healthier diets. According to Variyam and Smith (2010), 51 percent of Americans had heard of the *Dietary Guidelines* in 2005-06, as opposed to just 30 percent in 1994; similarly, 79 percent had heard of the Food Guide Pyramid in 2005-06, while only 33 percent were familiar with it in 1994.

There are other signals in the data that Americans are becoming aware of the shortcomings of their dietary habits. For example, people who had high-fat diets, who thought they were overweight,¹¹ and who got at least a third of their daily energy from food away from home (FAFH) all showed better recognition of diet healthfulness in later years compared with the earlier survey years (fig. 2).¹² Among those who had a high-fat diet, the decline in the percentage who rated their diet as Excellent or Very Good was 14.5 points. Among those who thought of themselves as overweight, there was a 12-percentage-point decline. For those who got at least a third of their energy from food away from home, the decrease was 7 percentage points.

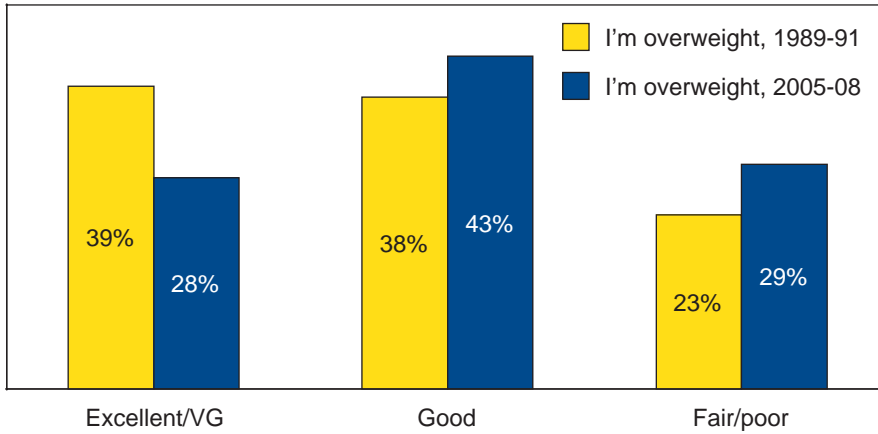
¹¹ Respondents were asked if they thought they were "overweight, underweight, or about right."

¹² For the purposes of this calculation, we defined a high-fat diet as one in which at least half of all energy intake was from fat.

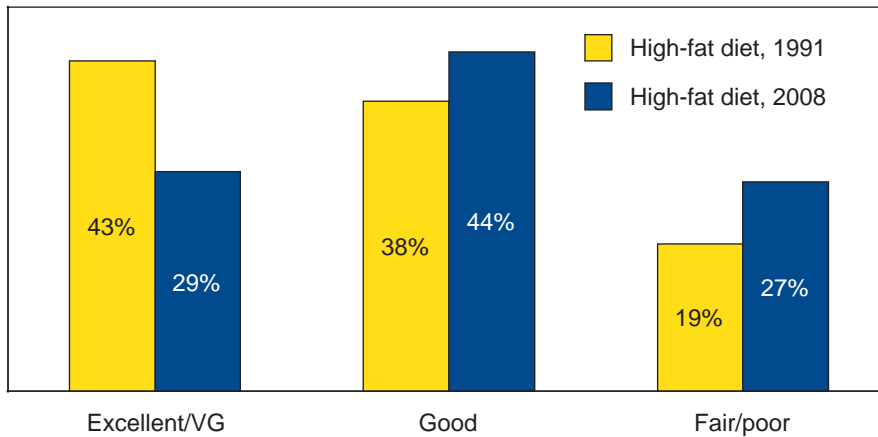
Figure 2

Changes in self-assessed diet quality by self-perceived weight, calories from FAFH, and calories from dietary fat

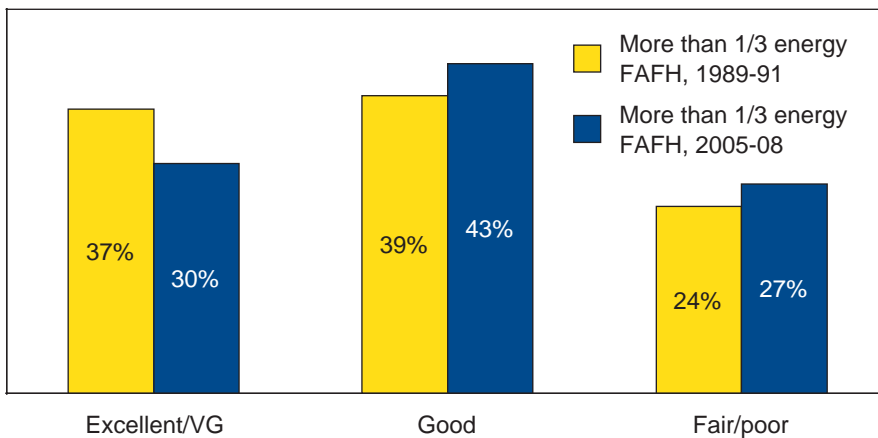
Changes in self-assessed diet quality by self-perceived weight status



Changes in self-assessed diet quality among those with a high-fat diet



Changes in self-assessed diet quality by food away from home



FAFH = Food Away From Home. Differences between years are significant at $p < .01$.

Source: Authors' calculations based on Continuing Survey of Food Intakes of Individuals 1998-91 and National Health and Nutrition Examination Survey 2005-08 data.

Diet Perception, Food Away From Home, and Food Expenditures

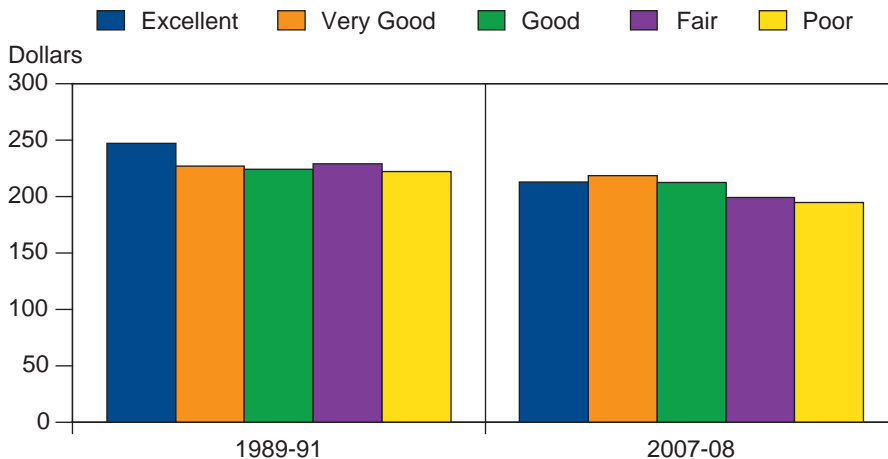
Conventional wisdom suggests that better diets cost more, and it is not a stretch to think that the converse proposition—that spending more might secure a better diet—is also widely assumed by consumers. But could the changes in overall diet assessment shown above reflect this belief? For this to be true, we would have to observe a growing expenditure-based disparity in self-assessment of diet; that is, we would have to see the expenditure threshold for “Excellent” or “Very Good” diets increase substantially in NHANES relative to CSFII.

To examine the role of food expenditures on diet assessment, we used data in the 1989-91 CSFII and the last 2 years of NHANES data available, 2007-2008.¹³ Data about expenditures in these years are on a household basis; we calculate expenditure on a per capita basis by dividing total expenditure by the size of the household. We also use the survey distinction between food purchased at a grocery or specialty foods store and food purchased and eaten away from home to find FAFH expenditure.

Interestingly, there is little difference in food expenditure between those who rate their diets as Excellent and those who rate them as Poor in either wave of our data. In 1989-91, for example, the difference in per capita monthly food expenditures between these two groups is only \$24. While this difference is statistically significant, the former group also spent significantly more than all others, including those who said their diet was Very Good or Good. At the same time, those with Very Good or Good diets spent essentially the same amount on food as those with Fair or Poor diets. Thus, in 1989-91, the primary difference was between those with Excellent diets and everyone else. In 2007-08, the difference in expenditure between diets rated Excellent and Poor was only \$18. This difference is not statistically significant (fig. 3). All

¹³As explained above, data on household food expenditures are not available in the 2005-06 wave of NHANES.

Figure 3
Per-capita food expenditures, by self-assessed diet quality, 1989-91 and 2005-08



Expenditures deflated to 2008 dollars using the CPI. Differences between those who rate their diet "Excellent" and all others are significant in 1989-91 at $p < .05$; other differences are not significant.

Source: Authors' calculations using Continuing Survey of Food Intakes of Individuals 1989 and National Health and Nutrition Examination Survey 2007-08 data.

of this indicates that the decrease over time in the likelihood of rating one's diet as Excellent or Very Good is likely not related to an increased difference in food expenditures between those who have relatively high (Excellent, Very Good) ratings of their diets and those who do not.

However, there is a clear relationship between household financial resources and diet perception.¹⁴ As we might expect, people who rate their diets as Excellent tend to come from households with greater financial resources than those who rate their diet as Poor. This difference is more pronounced for 1989-91 than for 2005-08. In the earlier years, income decreases more or less incrementally with diet rating: those who rate their diets as Very Good in general have less income than those who rate their diets as Excellent, while those rating their diets as Good have less income than those rating diet Very Good, and so on. In the later years, the primary difference in household income is between those who rate their diets as Good or better and those who rate them as Fair or Poor. This may suggest that, in more recent years, income does less to explain diet rating, except in the very tails of diet distribution (fig. 4).

Another aspect of diet behavior that could be related to changes in perception is the increased reliance on food away from home over the last 20 years. Foods that are produced in restaurants, convenience stores, and specialty stores are generally thought to be less healthy than foods prepared at home and so are a cause of concern to nutritionists and health policymakers. As Todd, Mancino, and Lin (2010) have shown, consumption of an extra meal away from home each week significantly increases calories and lowers servings of fruit, vegetables, and whole grains per 1,000 calories consumed. (See also Lin, Guthrie, and Frazao, 1999.) As we know, however, Americans have made FAFH an ever larger part of their diets. According to our data, between

¹⁴Data on income are available in all NHANES years.

Figure 4
Household income by self-assessed diet quality



Differences between non-adjacent categories are all significant at $p < .05$. Household income deflated to 2008 dollars using the Consumer Price Index.

Source: Authors' calculations using Continuing Survey of Food Intakes of Individuals 1998 and National Health and Nutrition Examination Survey 2005-08 data.

Table 3

Increased reliance on food away from home, by sample year

	Percent of calories FAFH	Percent of expenditures FAFH
CSFII	24.0	21.5
NHANES 05-08	34.6	26.2*
Change	10.6	4.7

FAFH = Food Away From Home.

Between-year changes are significant at $p < .01$.

*Data on percent expenditures FAFH available only in NHANES 2007-08.

Source: Authors' calculations based on Continuing Survey of Food Intakes of Individuals 1989-91 and National Health and Nutrition Examination Survey 2005-08 data.

1989-91 and 2007-08, the fraction of daily calories from FAFH increased from about a quarter to more than a third. The fraction of total household food expenditures on FAFH increased from 21 to 26 percent (table 3).¹⁵

An interesting aspect of the dependence on FAFH is its strong correlation with diet perception. Even more striking is the distinction that consumers draw between food away from home and fast food away from home. As noted, FAFH is generally of lower quality than food prepared at home. Consumers recognize this: in the most recent data, people who rate their diet as Excellent eat food prepared away from home, on average, a little over three times per week, while those who rated their diets as Poor ate food away from home nearly six times per week. Fast food, which is believed to be of lower quality than FAFH in general, is even more strongly associated with perceived diet quality in our data.¹⁶ While those who rate their diet as Excellent eat fast food less than once a week, those who give their diet a Poor rating eat fast food about three times as often (fig. 5).¹⁷ This suggests that consumers understand both the relative quality of FAFH compared with food prepared at home and the deleterious effects of fast food on diet quality.

In addition to eating FAFH more frequently, people who rate their diets as Poor come from households that spend a larger fraction of their food budgets on FAFH than people who say they have healthier diets.¹⁸ For example, in 2007-08, people with Poor diets spent 29 percent of their food budgets on FAFH, while those rating their diets as Excellent spent 22 percent. People rating their diets as Poor also get a higher share of their total energy intake from FAFH. In the same year, people with Poor and Excellent diets got 39 and 26 percent of their calories from FAFH. The ratio of the share of calories from FAFH to the share of expenditures on FAFH is generally higher for those with Poor-rated diets. That is, people with Poor-rated diets get more calorie bang for the FAFH buck than those with better rated diets (fig. 6).

One reason that nutritionists and health policymakers are interested in FAFH intake is that it can be a source of “cheap calories” without much nutritional value. But is the relative cost of calories associated with diet assessment? That is, do people associate calorie cost with healthfulness of diet, regardless of food source?¹⁹

The short answer to this question is, “Not really.” In both waves of the survey, there is an association between calories per dollar and diet assessment, although not a strong one. For example, in 1989-91, respondents who

¹⁵The levels reported here differ from those developed by Clauson and Leibtag (2008); they report that FAFH consumption was 37.6, 37.2, and 37.3 percent of total expenditure in 1989, 1990, and 1991, and that it was 41.5 percent in 2007 and 2008. The difference in the levels of their estimates and ours are no doubt due to important differences in our data sources and what is counted: Clauson and Leibtag (2008) use data from Department of Commerce Census of Retail Trade—i.e., establishment data, instead of the household data we use here. In addition, their expenditure measure includes food eaten at schools and colleges as well as any food provided to domestic military personnel. It is interesting to note that, despite the differences in the fraction of expenditure on FAFH between those results and ours, the increase between the two periods in FAFH expenditure is very similar at between 4 and 5 percentage points.

¹⁶It is not clear that fast food is significantly worse than food prepared at restaurants, although it is frequently portrayed this way in the media and trade press; “fast food” has become shorthand for all food away from home in many contexts. On the relative healthfulness of fast food and other FAFH, see Guthrie, Lin, and Frazao (2002), table 1. Also see Binkley (2008).

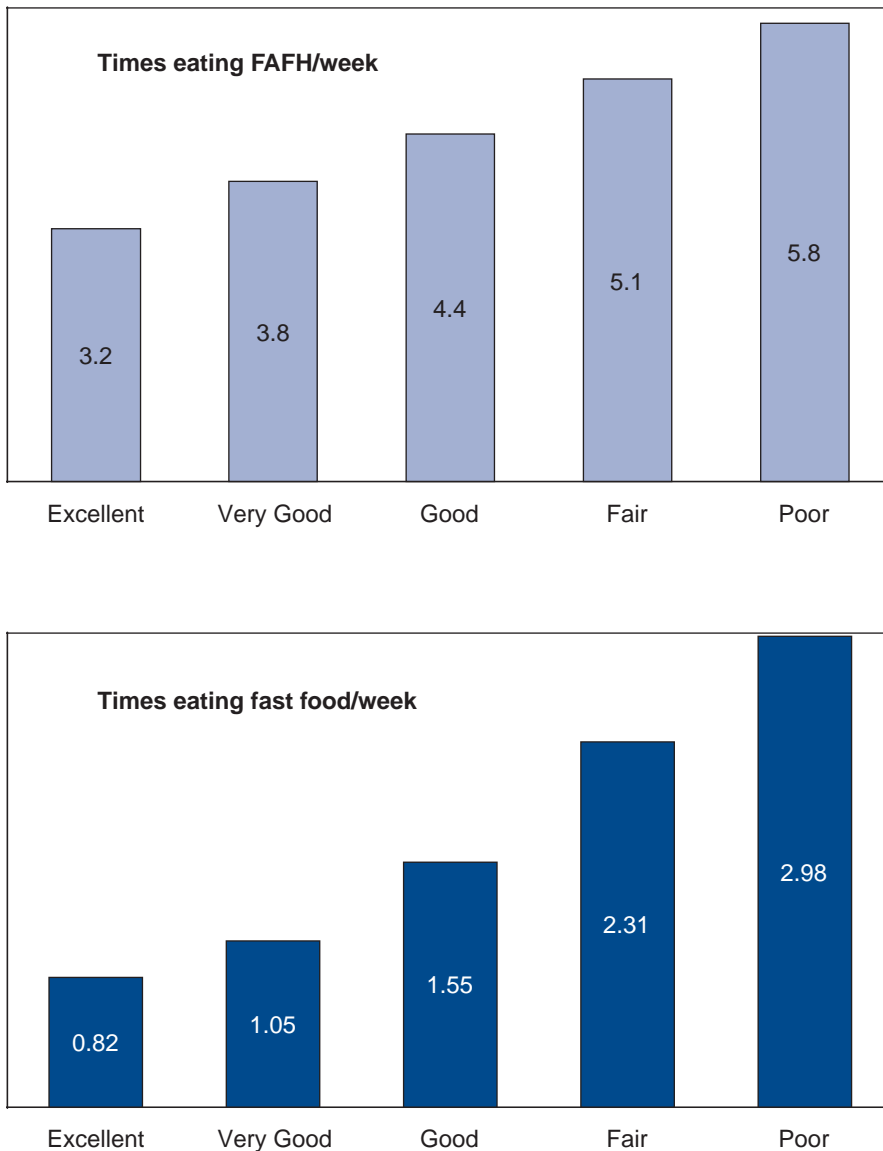
¹⁷Both differences between groups are significant at $p < .01$. All other differences for nonadjacent diet categories are also significant at $p < .01$.

¹⁸The figures show this on a per capita basis.

¹⁹Food expenditures are collected on a monthly household basis; we divide by size of household to get per capita monthly expenditure. Food intake is collected on a per person daily basis; in order to calculate calories/dollar spent, we divide per capita monthly expenditure by 30 and then take the ratio of daily intake by this normalized expenditure measure. Results are insensitive to excluding persons who claim that they ate less or more than usual on the day in question.

Figure 5

Weekly FAFH and fast food frequency by self-assessed diet quality



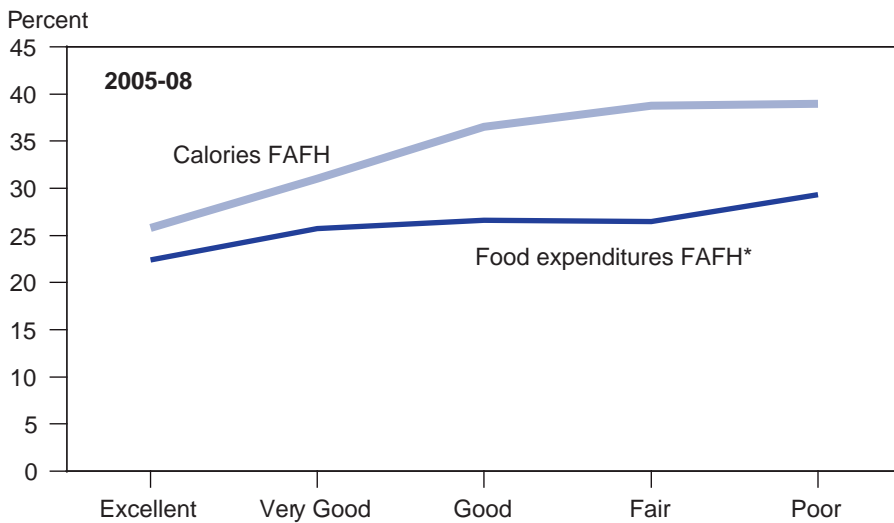
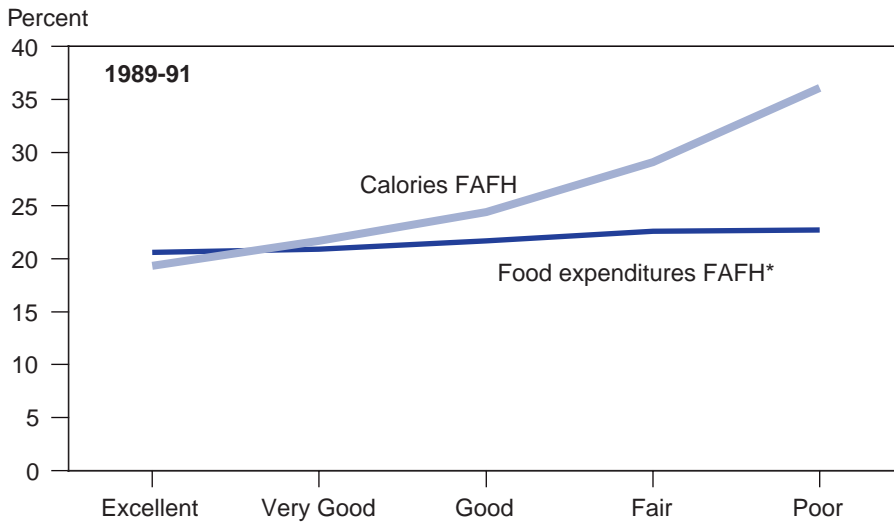
FAFH = All food consumed away from home.

Source: Authors' calculations using National Health and Nutrition Examination Survey 2007-08 data.

got the most calories per dollar were those who rated their diets as Good; the most evident difference in energy per dollar is between those who rate their diets as Excellent and everyone else. In 2007-08, those who rated their diets as Fair or Poor got more calories/dollar than those with Excellent or Very Good diets, but these differences are not statistically significant (table 4).

Figure 6

Percent of expenditures and calories FAFH



*Data on percent of expenditures on FAFH available only in National Health and Nutrition Examination Survey 2007-08.

FAFH = All food consumed away from home.

Source: Authors' calculations based on Continuing Survey of Food Intakes of Individuals 1989-91 and National Health and Nutrition Examination Survey 2005-08 data.

Table 4

Calories per dollar, by self-assessed diet quality

	Self-assessed diet quality				
	Excellent	Very Good	Good	Fair	Poor
Calories/dollar 1989-91	247.5	283.0	296.0	280.6	282.4
Calories/dollar 2007-08	437.4	418.6	447.6	482.9	513.6

Differences between Excellent and all other categories are significant at least at $p < .10$ in 1989-91. Differences between categories are statistically insignificant in 2007-08.

Source: Authors' calculations using Continuing Survey of Food Intakes of Individuals 1989-91 and National Health and Nutrition Examination Survey 2007-08 data.

Food Preparation and Availability

Although the above evidence suggests that diet assessment is strongly negatively correlated with the frequency of FAFH consumption altogether, new data from the Flexible Consumer Survey module in NHANES qualifies that association. The data show that people who rate their diets as Excellent eat with their families more often than those who rate their diets as Poor. This is true both in general (i.e., including occasions with FAFH) and when we consider only occasions when meals are prepared and eaten at home. People who rate their diets as Excellent are also more likely to have someone in the household prepare dinner at home; this happens in households of people with Excellent diets between five and six times per week, but only four times per week for those rating their diets as Poor (table 5). This confirms earlier research that suggests that diet quality is strongly associated with eating meals with members of one’s family (Gillman et al., 2000) and with the mealtime environment in general (Boutelle et al., 2003; Nuemark-Sztainer et al., 2004).

The type of food that is stocked in the household is also closely associated with diet perception. People who said they always have low-fat or fat-free milk in their homes were significantly more likely to rate their diets as Excellent than those who never did. Similarly, those who reported always having dark green vegetables in the house were three times more likely to rate their diets as Excellent or Very Good than those who said they never kept them in the house. People who said they never had sugared soft drinks in the household were more likely to have Excellent or Very Good diets than those who always did (fig. 7).

A particularly interesting result drawn from these data is that diet assessment seems unrelated to travel time to the grocery store. Although we might think that those who rate their diets as less healthy would also be constrained in their food choices by their distance to supermarkets, the data suggest this is not the case. The travel time to the grocery store for all respondents in this survey is about 15 minutes, regardless of reported diet quality (fig. 8). This average time is the same as a national average reported by USDA (USDA, 2009), but considerably less than this same study showed for low-income persons. This suggests that income alone—at least as it is reflected in travel time to the market—is not driving people’s evaluation of their diets.

Table 5

Frequency of eating together, by diet quality

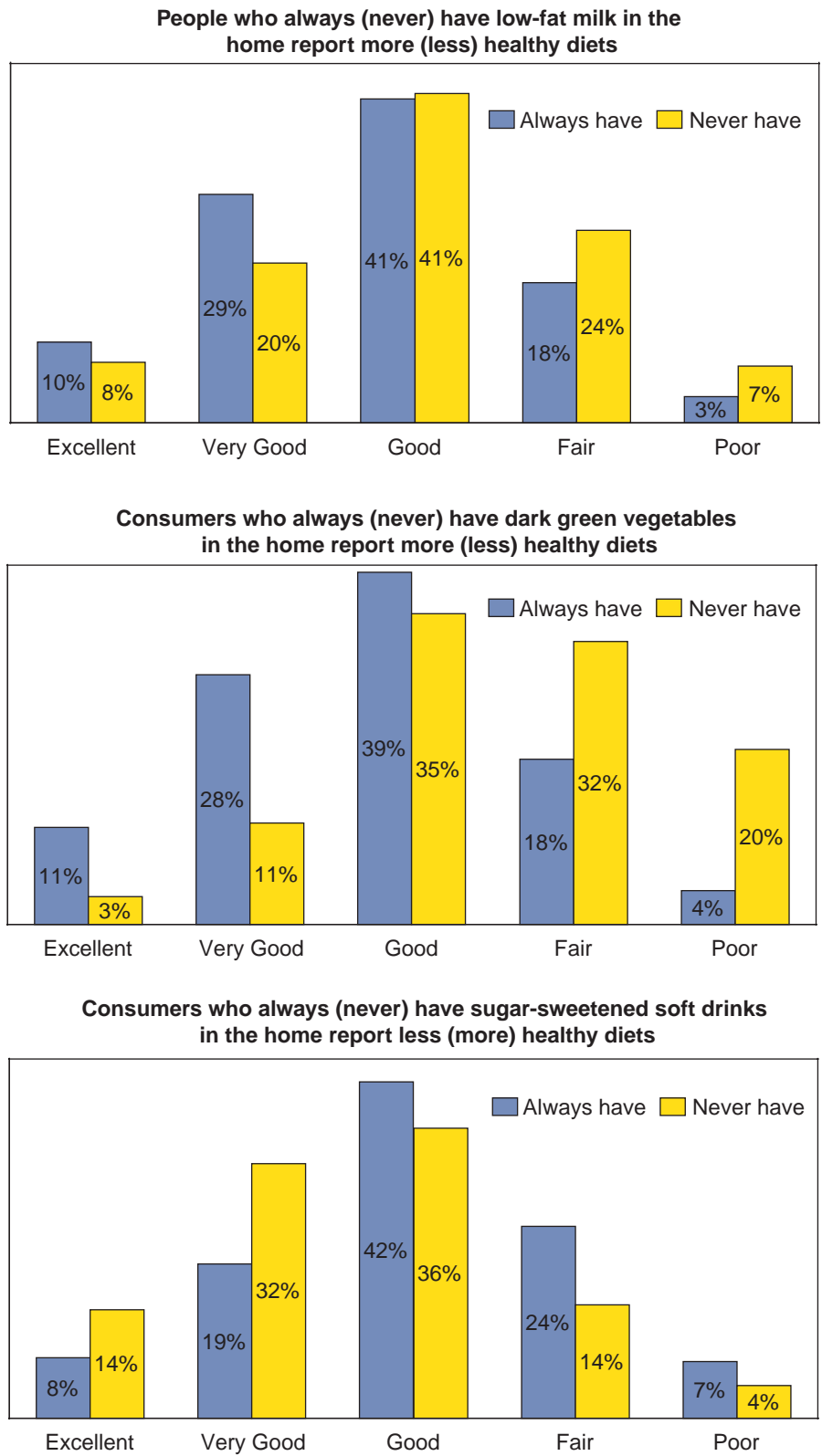
	Excellent	Very Good	Good	Fair	Poor
Times cook & eat together at home per week	7.2	6.9	6.0	5.4	5.5
Times eat together per week	7.6	7.0	6.0	5.2	4.6
Times someone cooked dinner per week	5.5	5.3	5.0	4.7	4.1

Differences between those rating their diets as Excellent and Poor are significant at $p < .05$.

Source: Authors’ calculations using National Health and Nutrition Examination Survey 2007-08 data.

Figure 7

Self-assessed diet quality, food items stocked in household



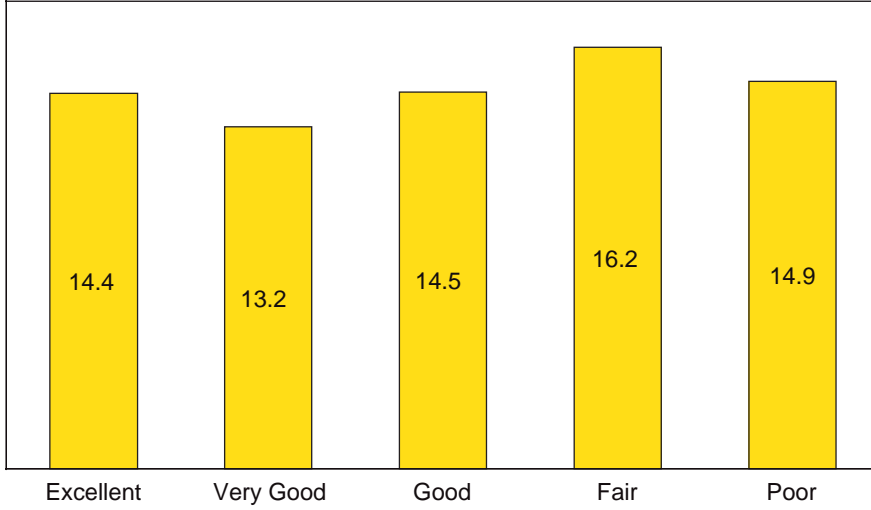
All differences except those for those reporting Good diet health are significant at $p < .01$.

Source: Authors' calculations using National Health and Nutrition Examination Survey 2007-08 data.

Figure 8

Travel time to grocery store, by self-assessed diet quality

Travel time to grocery store, minutes



Source: Authors' calculations using National Health and Nutrition Examination Survey 2007-08 data.

Discussion

Although the actual healthfulness of diets has not changed much in the last 15 years, there has been a large and significant decrease in the percentage of Americans who rate their diets as Excellent or Very Good. These results may be good news for health policymakers, particularly those concerned with nutrition education. At the very least, these results suggest a reduced optimistic bias in Americans' views of diet—and perhaps greater receptiveness to information about the relationships between diet and health. At best, the results suggest that Federal nutrition education efforts such as the Nutrition and Labeling Act, Supplemental Nutrition Assistance Program Education (SNAP-Ed), the Dietary Guidelines and MyPyramid.gov (now MyPlate.gov) have really made a difference in the way that Americans view diet quality. Our results from the recent Flexible Consumer Behavior Survey offer suggestive—though certainly not conclusive—evidence consistent with the latter view: households that always keep dark green vegetables and low-fat milk on hand are more likely to rate their diets as Very Good or Excellent than those that never do, and those that always keep sugared soft drinks on hand are less likely to report Excellent or Very Good diet ratings than those that never do.

The results we present are descriptive. They do not positively identify what is causing this change in diet perception. However, they do suggest avenues for further research. Most importantly, it would be helpful to know whether and to what degree nutrition information informs diet evaluations (such as reduced optimistic bias), and especially diet choices. This is particularly important for Federal nutrition education programs such as SNAP-Ed and Women, Infants, and Children (WIC) Nutrition Education, which are targeted towards those who, in general, have fewer resources to call upon in creating a healthy diet. The general question about what lies behind the change in diet perception is important in considering private sector actors, as well: the Affordable Care Act established regulations that require restaurants to publish nutrition information at the point of sale. Given our results with respect to FAFH, it will be important to know whether and how consumers use such information.

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