



Food costs, diet quality and energy balance in the United States[☆]

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HIGHLIGHTS

- Healthy diets are affordable but that message needs to be promoted.
- Additional guidance is needed on how to switch to healthier diets.
- Most Americans consume diets that need improvement.
- The relationship between income and diet quality is weak.
- How the food price is measured affects whether healthy food considered expensive.
- How Americans allocate their food budget is not in line with healthy diets.
- At any food spending level households can purchase healthy or unhealthy diets.

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ABSTRACT

The high obesity rates and poor diet quality in the United States, particularly among low income populations, are often attributed to low income, low food access, and high food prices of healthy foods. This paper discusses these associations and questions some of the metrics used to measure food prices. The paper argues that 1. On average, Americans consume diets that need improvement and there is only a very limited relationship between income and diet quality; 2. The way the food price is measured makes a difference in the perception of how expensive healthy and less healthy food is; 3. The way Americans allocate their food budgets between healthy and less healthy foods is not in line with healthy diets; and 4. At any food spending level there are households that purchase healthy (and unhealthy) diets, including budgets at or below the maximum allotment for the Supplemental Nutrition Assistance Program (SNAP) which provides a means for low-income households to purchase food. Our key finding is that healthy foods and diets are affordable, but policy makers, nutrition educators, researchers and the media need to focus on promoting this message, and providing additional guidance on making the changes for Americans to switch to a healthy and affordable diet.

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1. Introduction

The United States offers a wide array of both healthy and less healthy food choices. Unfortunately most Americans choose diets that are not healthy and, not surprisingly, are overweight or obese. Some economists argue that the cost of over-consumption has gone down as shown by lower real (inflation-adjusted) food prices and medical advances to treat obesity complications, while the cost of being active has increased as evidenced by more sedentary high-paying jobs [1].

However, a common explanation for the unhealthy food choices is a general perception that the healthy options are more expensive, and that some cannot afford to purchase healthy foods. This answer is unfortunately too simplistic and could lead to policies that will not impact the obesity crisis in the United States.

In this paper we argue that: 1. Most Americans tend to consume diets that need improvement and the relationship between income and diet quality is very limited; 2. The metric used to measure food prices makes a difference in whether healthy foods appear more expensive than less-healthy foods. 3. The way Americans allocate their food budgets between healthy and less-healthy foods is not consistent with healthy diets; and 4. At any food spending level there are households that purchase healthy (and unhealthy) diets. The key finding is that healthy foods are affordable, but there is a considerable need for education and other mechanisms to make the healthy choice a more desirable option.

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The paper reviews the literature on the relationship between income, food budget allocations, food prices and how these relate to obesity and diet quality in the United States. We supplement the literature with our own estimates using publicly-available data. We define healthy diets as diets that conform to the *Dietary Guidelines for Americans 2010* [2]—that is, diets high in fruits, vegetables, whole grains, lean proteins, low-fat dairy products (or other calcium sources), and low in saturated fat, added sugars and sodium. Similarly, we define healthy foods as being low in saturated fat, added sugars, and/or sodium, and containing at least a minimum amount of one of the five major food groups.

1.1. Data used to supplement the literature

Although most of the findings discussed in this article are drawn from the literature, we use the following four datasets to create charts which enhance our discussion.

1.1.1. NHANES (National Health and Nutrition Examination Survey)

NHANES, conducted by the National Center for Health Statistics of the Centers for Disease Control and Prevention (CDC), collects demographic, socioeconomic, dietary, and health-related information through a combination of interviews and physical exams. As part of the physical exam, an in-person interviewer collects a 24-hour dietary recall; a second day of dietary recall is collected by telephone within ten days of the first. The dietary recalls are reported in a multi-pass interview, whereby the interviewer reviews an initial list of foods generated by the participant and reminds him or her of commonly forgotten foods such as candy on a co-worker's desk, and foods and beverages consumed as secondary activities including sitting at a desk, driving, or watching TV. More information on the NHANES can be found elsewhere [3].

1.1.2. Consumer Expenditure Survey (CE)

The Bureau of Labor Statistics' Consumer Expenditure Survey collects detailed expenditure data covering all aspects of household purchases in the United States, including larger purchases such as property, automobiles, and other durable items as well as frequently-purchased smaller items such as food. Food expenditures are collected for both food purchased to prepare at home as well as foods purchased in restaurants or other away-from-home sources. Information on food and other frequently purchased items are collected in a two-week diary survey, while larger purchases are collected in a single interview. There are approximately 7000 households per quarter in this nationally representative sample. The data are used in a variety of economic studies and by policy makers. Additional details are available elsewhere [4].

1.1.3. Food Expenditure Series

The Economic Research Service (ERS) of the US Department of Agriculture produces the Food Expenditure Series. The annual series shows the total sales of all food by retailers, food-away-from home venues, as well as the value of food donated by the Federal government. Consumer expenditures are also broken down by household income. Total sales cover food purchased by consumers as well as government, businesses and non-profit organizations. While the full series begins in 1929, some data are available as far back as 1869 [5].

1.1.4. CNPP Food Prices Database

The CNPP Food Prices Database provides the cost of foods reported consumed by participants in NHANES. The prices assume that all food is purchased from stores, though many foods are assumed to be purchased as prepared or frozen foods, or make use of convenience items.

For foods that NHANES participants report obtaining from a restaurant or other food-away-from home establishments, prices are estimated as if the ingredients or pre-prepared food was purchased at stores. Convenience items were assumed for any food that generally takes more than 30 min to prepare. It is created for the estimation of the USDA Food Plans [6,7]. The prices are in edible grams—that is the price of food after peels, skins, seeds, shells, and bones have been removed, and the food is cooked. Because of the labor intensive nature of preparing these data, the database is only updated periodically. The most recent update is 2004 [8,9].

2. How income relates to obesity, food expenditure and diet quality

National data on prevalence of obesity and overweight in the US show that about one-third of adults 20–74 years of age were overweight, and another third were obese in 2009–2010¹ [10–12]. Whereas the prevalence of overweight has remained fairly stable since 1960–62, obesity rates more than doubled among adults ages 20–74 years, so that by 2005–06 obesity was more prevalent than overweight (Fig. 1). Similarly, the prevalence of extreme obesity (BMI equal to or greater than 40) increased more than seven-fold in the same period. However, there was very limited change in the prevalence of obesity among adults or children between 2003–04 and 2011–12 [78].

Among children ages 2–19, nearly one-third were overweight or obese in 2009–10, with significant differences observed by gender and by race/ethnicity [13]. Between 1980 and 2009–10 obesity more than doubled among 6–11 year-olds and tripled among adolescents (12–19 years) with most of the increases occurring in the 1980s and 1990s [13,14]. Increasing rates of obesity among children are particularly troublesome, since obese children are more likely to grow into obese adults [15–17].

2.1. Relationship of income to obesity

Because the prevalence of obesity is higher among the low-income [12,14], a common perception is that obesity is a low-income problem. However, a number of facts make it clear that this is not true. For one, the obesity rate is significantly higher than the poverty rate, which fell during the 1960's and has fluctuated between ten and fifteen percent since then [18], while obesity rates have increased in the same time period.

Second, the relationship between obesity and income differs by gender and race and ethnicity [11,12,19]. Whereas obesity prevalence among women and children tends to increase as income decreases, there is little difference in obesity prevalence across income levels among men. Among women, the inverse relationship between income and obesity is observed among non-Hispanic white women but not among other groups; in contrast, among men, a positive relationship between income and obesity is observed among non-Hispanic black and Mexican-American men.

Furthermore, most obese individuals are not low-income: among obese adults in 2005–08, 20% had incomes below 130% of the poverty level, 39% had incomes between 130 and 350% of the poverty level, and 41% had incomes at or above 350% of the poverty level [11]. Among obese children, 38% lived in households with income below 130% of the poverty level [12]. Also, income disparities seem to be weakening with time, as the largest increase in obesity over the last few decades has occurred among individuals with household incomes at or above 200% of the poverty line [20].

Given the sheer size of the prevalence of obesity, and the more rapid rise in obesity among higher income groups, Ljungvall and Zimmerman [19] concluded that obesity is not limited to lower socioeconomic groups. Thus it is not clear what role income plays in obesity. One economic study found that low-income women experience an increased BMI when there was an exogenous change in income-earning potential such as an expansion of the Earned Income Tax Credit [21]. Careful

¹ Overweight is defined as BMI equal to or greater than 25 but less than 30; obesity is defined as BMI equal to or greater than 30, and extreme obesity is defined as BMI equal to or greater than 40.

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