

A1 SQL Analysis Assessment

What are “healthy” and “cost”?

From this assignment - "Do healthier foods cost less?", the definitional questions "What is healthy?" and "What are costs?" arise which are discussed below. The definition of "healthy" in terms of diet has been periodically revisited over the last 100 years, starting with a starvation-only diet in the 1800s, followed by the "vinegar diet" (Potiker 2016). Even today, some approaches are opposed, from low- to high-carb or low-fat to ketogenic diets. Studies have shown that an unhealthy diet causes chronic diseases such as obesity, cardiovascular disease, and cancer (Morris et al. 2014).

Therefore, many organizations, such as the World Health Organization, Alliance for a Healthier Generation, and the U.S. Department of Health and Human Services, deal with healthy nutrition and produce publications on the subject. For the definition of healthy food, I will use the publication "Dietary Guidelines for Americans" of the US Department of Health and Human Services saying healthy is a varied diet that covers all the necessary nutrients without additional stimulants.

Therefore I used their guidelines to categorize the following categories vegetables, fruits, grains, dairy-free, and milk as healthy and the types of alcoholic beverages, high sodium, high fat, and high sugar as to be avoided (CDC 2022), (Perdue and Azar II 2022).

The second question that will be examined deals with the price of the products. A healthy diet consists of many different products, including "proteins, fats, carbohydrates, vitamins, minerals and water", which should be presented comparably, regardless of serving and package size (Weininger 2021). Therefore I follow Deptford's approach and normalize all foods to the price per 100 grams. (Deptford et al. 2017).

Do healthier foods cost less?

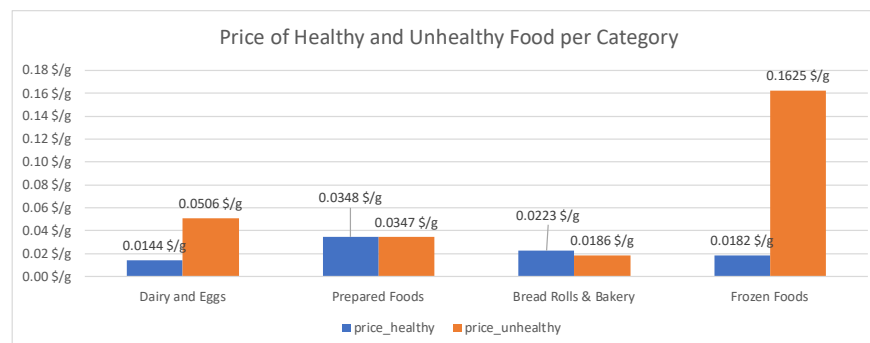
To further discuss the issue of the price of healthy and unhealthy food, I separate the analyses into liquids and food. Analyzing the mean price of all products per gram, I perform the t-test with unequal variances with the null hypothesis, which states that there is no significant difference between the two means.

Both analyses show by the orange marked value (> 0.05) to reject the null hypothesis because there is a significant difference.

Food: t-Test: Two-Sample Assuming Unequal Variances			Liquids: t-Test: Two-Sample Assuming Unequal Variances		
	Variable 1	Variable 2		Variable 1	Variable 2
Mean	0.0492	0.0610	Mean	0.0343	0.0211
Variance	0.0234	0.0295	Variance	0.0023	0.0006
Observations	139.0000	71.0000	Observations	23.0000	26.0000
Hypothesized Mean Difference	0.0000		Hypothesized Mean Difference	0.0000	
df	128.0000		df	31.0000	
t Stat	-0.4884		t Stat	1.1939	
P(T<=t) one-tail	0.3130		P(T<=t) one-tail	0.1208	
t Critical one-tail	1.6568		t Critical one-tail	1.6955	
P(T<=t) two-tail	0.6261		P(T<=t) two-tail	0.2416	
t Critical two-tail	1.9787		t Critical two-tail	2.0395	

In absolute terms, this analysis shows that healthy foods are about 35% cheaper than unhealthy ones in terms of price per gram. However, the picture is different for beverages, where healthy beverages are about 10% more expensive than unhealthy ones.

In the following chart, I will analyze the prices of healthy and unhealthy products according to their categories. All liquids are excluded since there is no category for both healthy and unhealthy liquids.



This shows that the prices of "Prepared Foods" (0.035 \$/g) and "Bread Rolls & Bakery" (0.02 \$/g) have nearly identical for healthy and unhealthy products, but significantly different for "Frozen Foods" with a difference of 0.1443 \$/g and partly different for "Dairy and Eggs" with only 0.0362 \$/g.

To answer the question of whether healthy food is cheaper than unhealthy food, it has been shown that healthy beverages are much more expensive than unhealthy ones like beer and wine. To conclude, we saw that healthy food is significantly cheaper on average than unhealthy food.

My top three actionable insights - Do healthier foods cost less? What should Whole Foods do to take advantage of this?

My actionable Insights aims to create a benefit for Whole Foods. In addition, I argue fully profit-oriented but also to solve the problem of unhealthy nutrition as a global issue.

1. Shrink packing size

An important KPI for share-managed companies is sales. This actionable insight pursues the goal of increasing sales and, thus, also the related profit. One possibility, known from times of inflation, is "shrinkflation". Whole Foods must reduce the packaging size of the products at an identical price. Literature shows that up to 25% reductions are not noticeable to the buyer (Wood 2022). Two famous examples have historically occurred in the beverage industry where Coca-Cola reduced the package size from 2l to 1.75l or Doritos reduced from 9.75oz per package to 9.25oz, removing about 5 chips (Wood 2022). The following table shows the relationship between the average price per dollar and the average package size in grams. For example, Frozen Foods has a Ratio of '0.0002052937', indicating a relatively good packing size in comparison the Beer with only '0.0000019343', meaning it has a low price with a big packing size. Thereby it can be seen that products with a small packaging size achieve a higher price. For this reason, the packaging size of the products should be reduced starting from the bottom.

Category	AveragePrice	AverageSize	Ratio	
Produce	0.12 \$/g	140.73 g	0.0008224555	
supplements	0.15 \$/g	312.3 g	0.0004778619	
Snacks, Chips, Salsas & Dips	0.04 \$/g	193.64 g	0.0002153015	
Frozen Foods	0.08 \$/g	394.17 g	0.0002052937	
Desserts	0.05 \$/g	327.58 g	0.0001470841	
Meat	0.04 \$/g	352.69 g	0.000107214	
Prepared Foods	0.03 \$/g	374.54 g	0.0000929482	
Bread Rolls & Bakery	0.02 \$/g	344.31 g	0.0000637679	
Beverages	0.04 \$/g	765.27 g	0.0000465678	
Wine	0.03 \$/g	698.9 g	0.0000422094	
Dairy and Eggs	0.02 \$/g	639.13 g	0.0000280619	
Beer	0.01 \$/g	2687.53 g	0.0000019343	

2. Marketing Strategy

A major problem in the USA, but also in the entire world, is unhealthy nutrition. The World Health Organization speaks of a global obesity crisis (WHO 2021). To address this problem, I take the approach of advertising healthy eating. Statistics have shown that advertising and promotion of healthy eating are very successful (Cameron et al. 2016). After alcoholic beverages, supplements have the highest profit margin in supermarkets (Flynn 2022). As the table below shows, supplements have a relatively high price compared to other product categories, which is why the absolute increase in profit is so much higher. Therefore, I propose to start a marketing campaign that puts healthy nutrition in a vital context with the regular intake of supplements. This will increase sales and profits, but also improve the nutrition of the population.

Category	AveragePrice
supplements	0.15 \$/g
Produce	0.12 \$/g
Frozen Foods	0.08 \$/g
Desserts	0.05 \$/g
Meat	0.04 \$/g
Beverages	0.04 \$/g
Snacks, Chips, Salsas & Dips	0.04 \$/g
Prepared Foods	0.03 \$/g
Wine	0.03 \$/g
Dairy and Eggs	0.02 \$/g
Bread Rolls & Bakery	0.02 \$/g
Beer	0.01 \$/g

3. Whole Foods Shopping App

A widely underestimated component is the customer binding and the brand image. A good image and a reputation associated with sustainability will bind young consumers in the long term (Thimothy 2016). To create this image, I suggest that Whole Foods further develop its supermarket application on the smartphone by adding automatic grocery planning. The customer should enter their shopping budget, and the app should create a shopping plan that is healthy and cost-effective. In addition, the customer should be able to enter some preferences such as vegan, vegetarian, gluten-free, intolerances, and preferences. For Whole Foods, this will result in enormous advantages through predictive analytics in the supply chain, as the individual purchasing behavior of customers can be predicted based on historical purchasing behavior (Aditi 2020). In addition, the app can influence shopping behavior by selecting products that are about to expire to increase the revenue overall.

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- Wood, Bryan. 2022. "Shrinkflation: Ethical Dilemma, Deception, or Good Business?"