QTM 151
Final Project

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How does consumer behavior affect diet quality and nutritional adequacy?

Is spending **less/more money on eating out or delivered foods** associated with having **low/high diet quality and nutritional deficiency**?

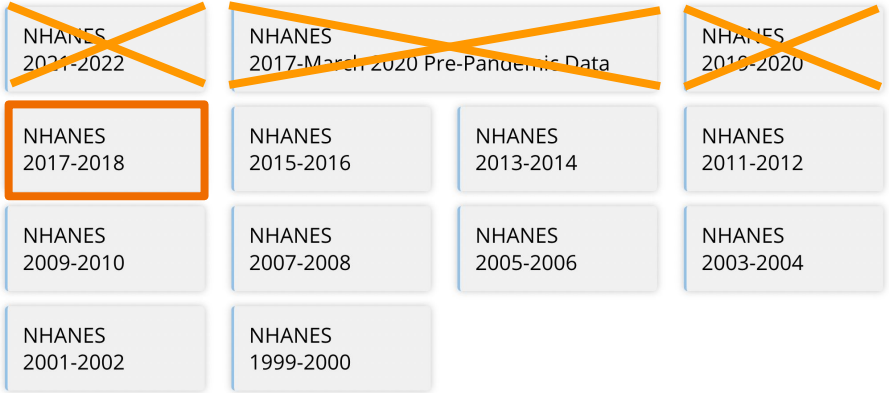
Consumer Behavior and Dietary Intake

National Health and Nutrition Examination Survey (NHANES) 2017-2018

- Questionnaire Data
  - Food expenditures at the **family level**
  - **CBD121** (money spent on eating out)
  - **CBD131** (money spent on carryout/delivered foods)
- Dietary Data
  - Daily total dietary intake information
  - Six Essential Nutrients
    - **Fat:** DR1TTFAT (total fat)
    - **Vitamin C:** DR1TVC (vitamin c)
    - **Minerals:** DR1TIRON (iron)
    - **Water:** DR1_320Z (total plain water drank yesterday)
    - **Protein:** DR1TPROT (protein)
    - **Carbohydrates:** DR1TCARB (carbohydrate)

Why 2017-2018?

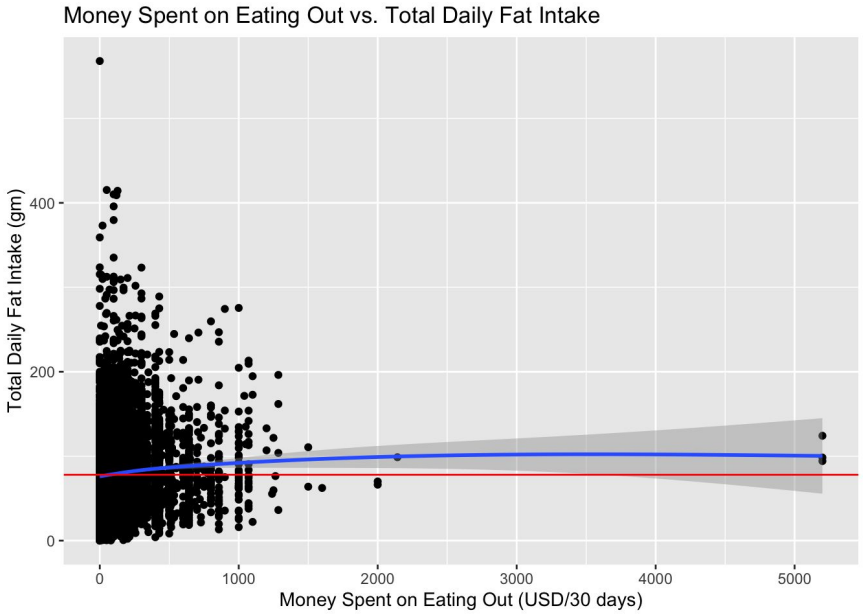
- Most up-to-date data available on the official website
- Data from 2019 to 2022 were found to be incomplete and NOT nationally representative due to the pandemic
- Wanted to draw a conclusion relevant to today's context

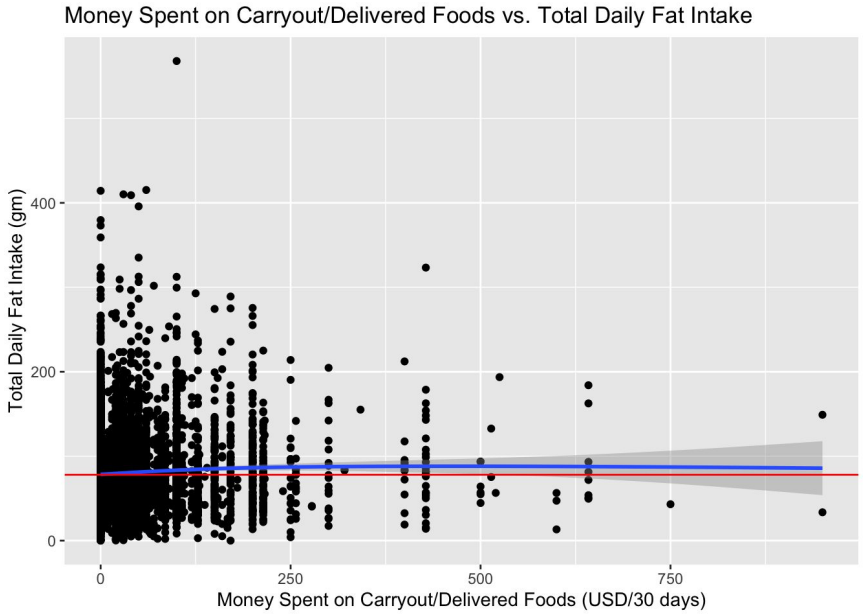


Why Six Essential Nutrients?

- Our body needs these six basic nutrients to function properly and maintain overall health
- Must be obtained from foods, i.e. our body cannot produce them on its own
- Best measure to evaluate diet quality and nutritional adequacy

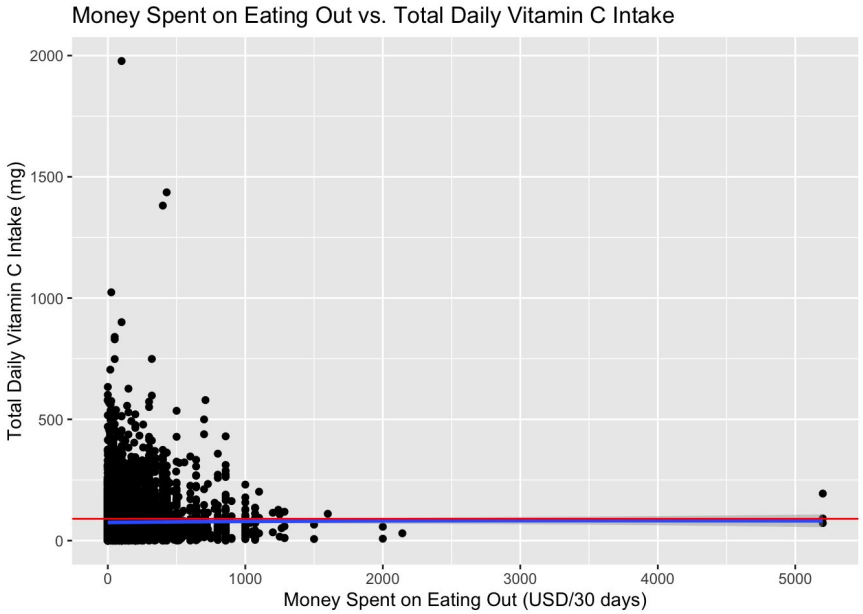
Consumer Behavior and Fat

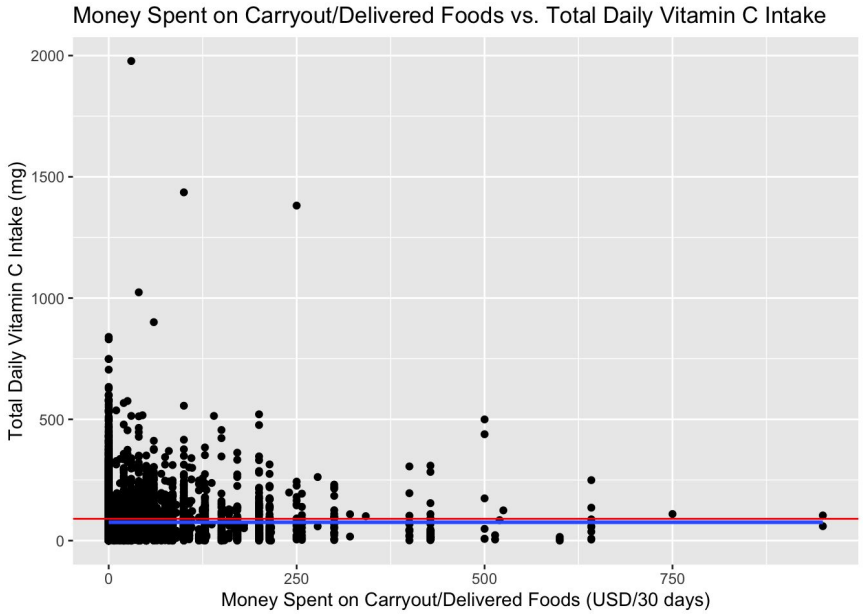




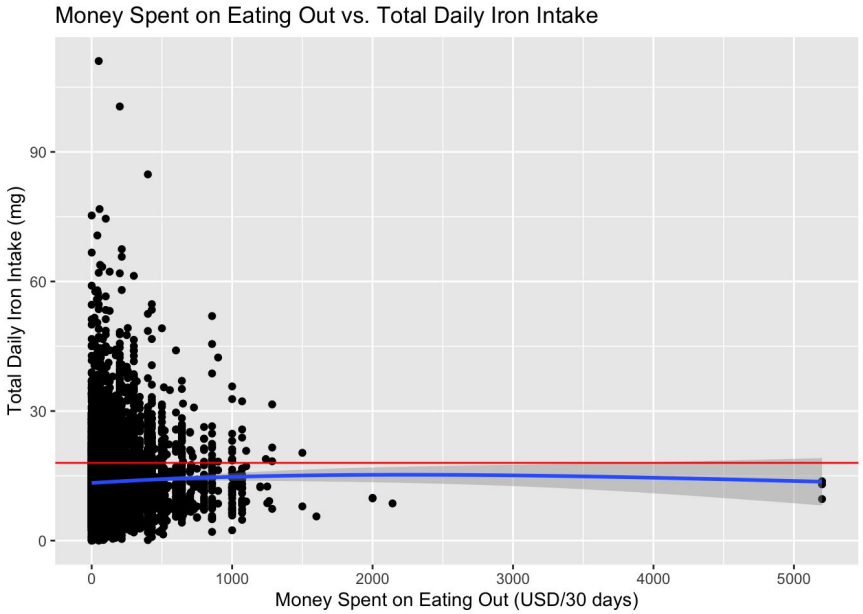
Nearly horizontal line indicating no clear correlation.

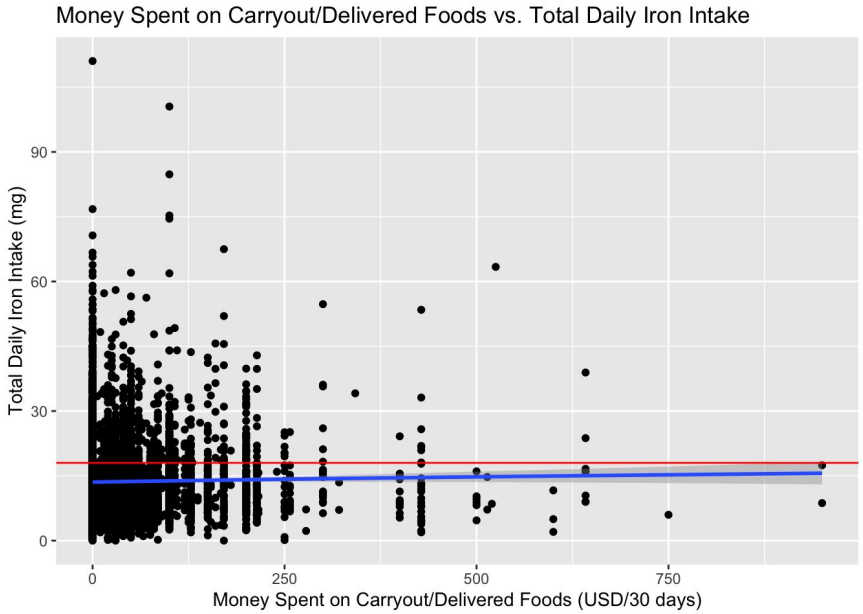
Consumer Behavior and Vitamin C



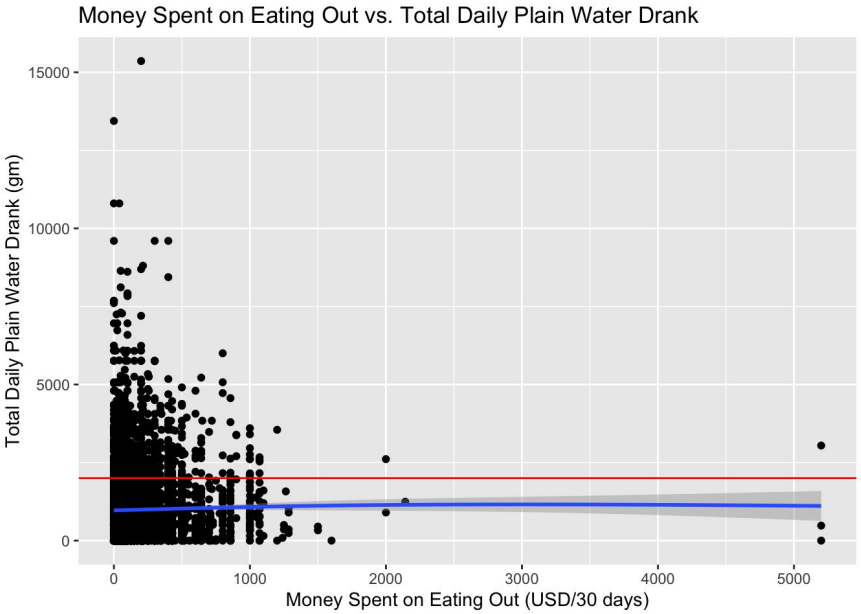


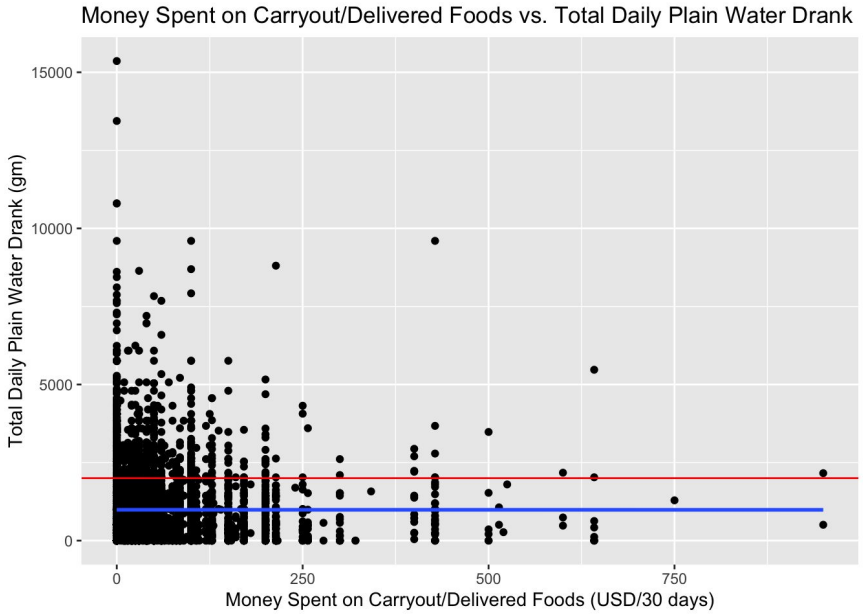
Consumer Behavior and Minerals (Iron)



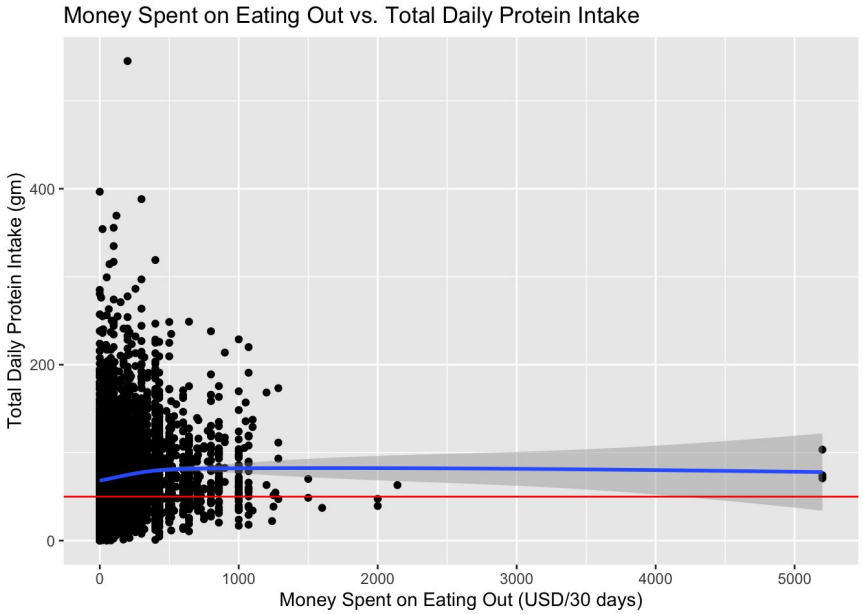


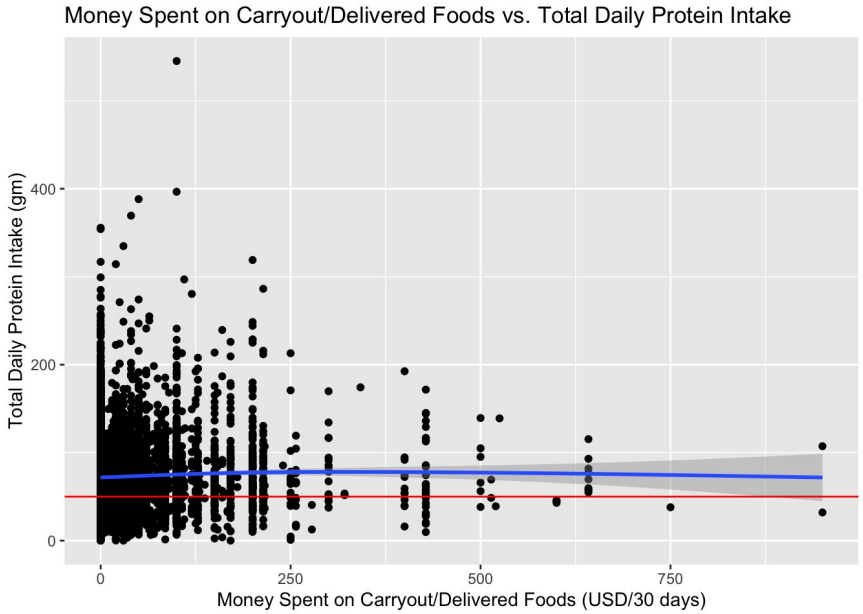
Consumer Behavior and Water



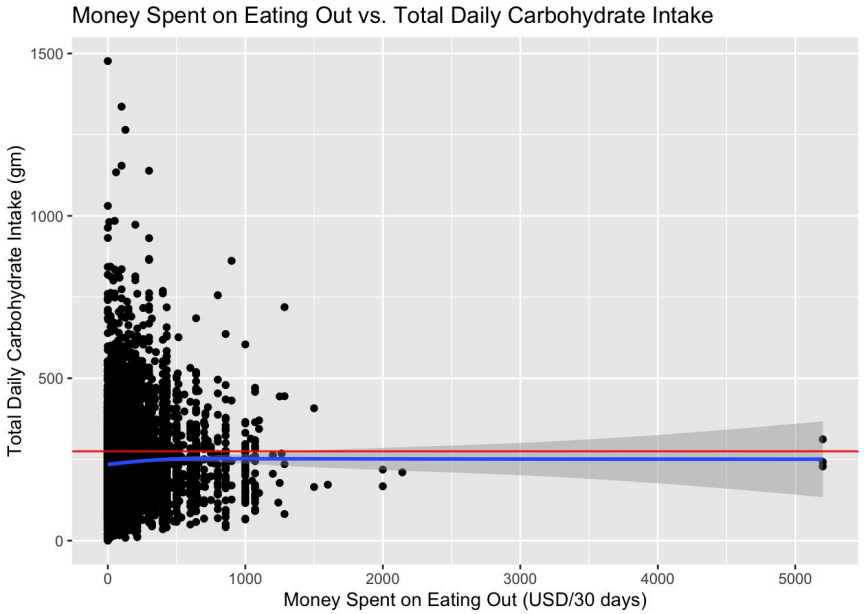


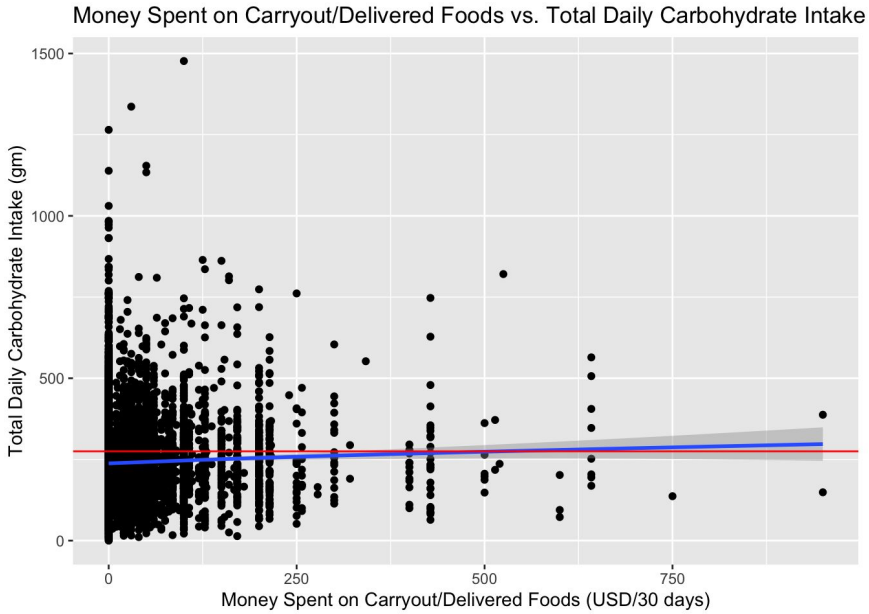
Consumer Behavior and Protein





Consumer Behavior and Carbohydrates





Discussion

- Fitted lines plotted by the geom_smooth function in ggplot do NOT suggest anything significant about the relationship between consumer behavior and dietary intake.
    - The lines are nearly horizontal, meaning **no correlation**.
- Most of the data points are clustered at the bottom left corner of the graphs (= spent no OR less money).
- Data points found to the right of the graphs (= spent more money) are associated with small values for y, or dietary intake.
    - Those who spent money (approximately more than 250 USD) on eating out and delivered foods consumed less essential nutrients.

Conclusion

- What we observed: the more money spent on eating out and delivered foods, the less essential nutrients consumed.
- HOWEVER, most respondents who spent money (approximately more than 250 USD) on eating out and delivered foods **meet OR slightly deviate from** the recommended daily amounts for the six essential nutrients.
- Therefore, we cannot **rashly** conclude:
    - That spending more money on eating out and delivered foods is associated with having low diet quality and nutritional deficiency (→ what people generally assume to be true)
    - AND that consumer behavior affects diet quality and nutritional adequacy.

Reference

For DVs (Daily Values), the recommended amounts of nutrients to consume or not to exceed each day developed by Food and Drug Administration (FDA):
https://www.fda.gov/food/new-nutrition-facts-label/daily-value-new-nutrition-and-supplement-facts-labels

For the amount of water intake recommended by health experts:
https://www.healthline.com/nutrition/how-much-water-should-you-drink-per-day

For data frames used for the final project (NHANES):
https://wwwn.cdc.gov/nchs/nhanes/continuousnhanes/default.aspx?BeginYear=2017