# Health and Environmental Benefits of Vegan Diet

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1. What vegan foods provide necessary vitamins a person needs?
2. What vegan foods provide necessary minerals a person needs?
3. What vegan foods provide the necessary fats, proteins, carbohydrates, fiber a person needs?
4. What specific vegan foods or meals can a person eat to get necessary vitamins and minerals?
5. How do the foods in those meals compare to the foods in an omnivorous diet?
6. To what extent does a vegan diet reduce greenhouse gas emissions, compared to an omnivorous diet and a vegetarian diet?

## Data Sources

- UK [study](#) of greenhouse gas emissions by diet type and individual food
- French [study](#)* of emissions and diet composition by food type (only used to get emissions of cheese)
- Nutrition Coordinating Center Food & Nutrient Database (NCCDB) ([link](#))
- UK gov't Eatwell model ([pdf](#))

## Code References

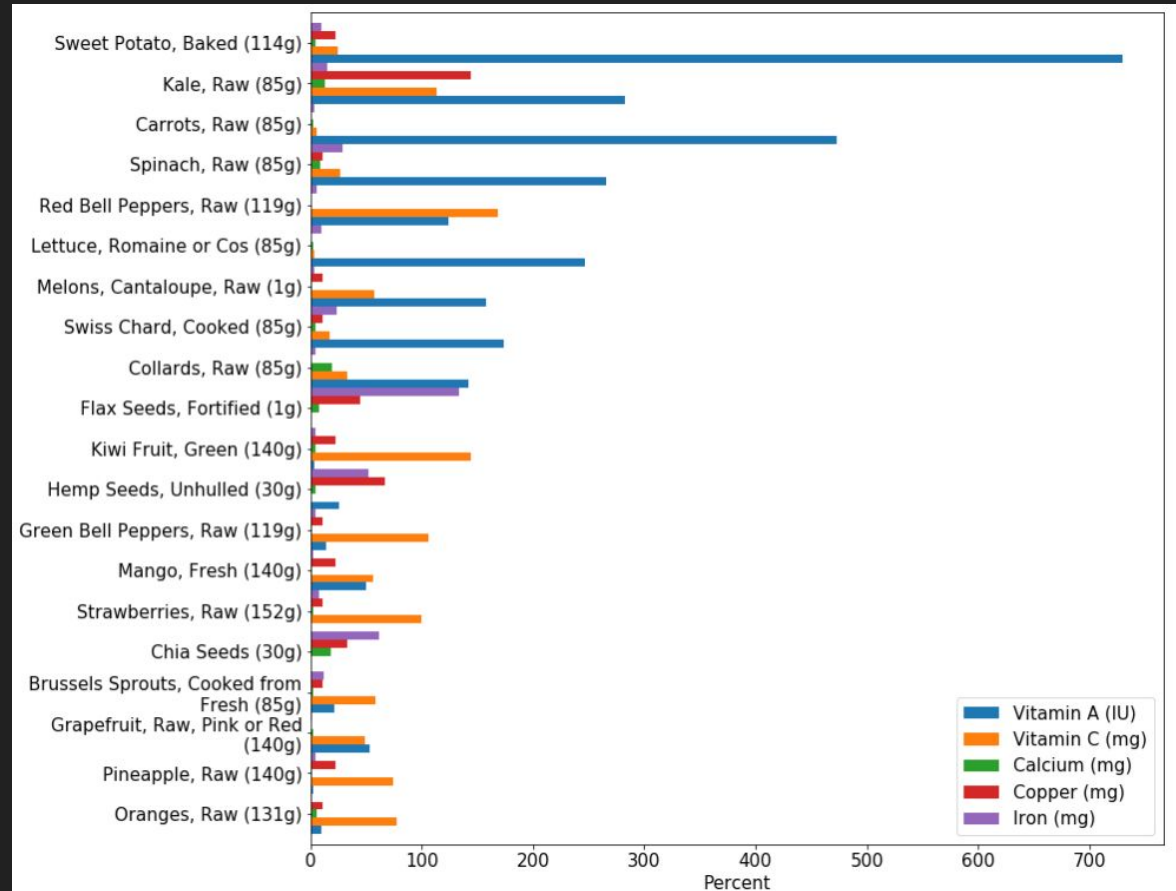- Organic food CSE184 project [code](#)

## Visualization References

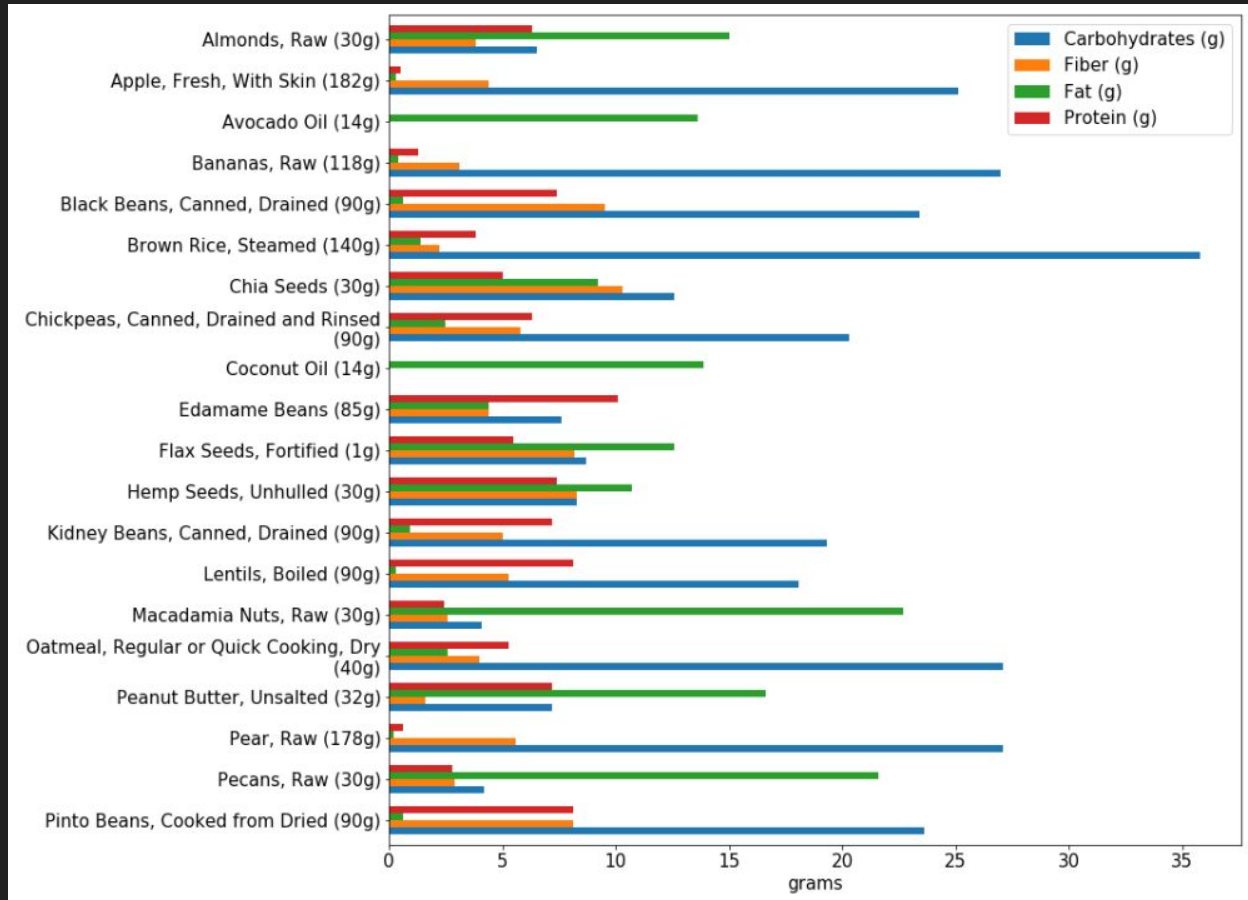- Organic food CSE184 project [ppt](#)

## Datasets

- Diet by food group ([raw](#)) ([processed](#))
- Emissions by diet type ([raw](#)) ([processed](#))
- Emissions of individual foods ([raw1](#), [raw2](#)*) ([processed](#))
- Vegan foods ([processed](#))
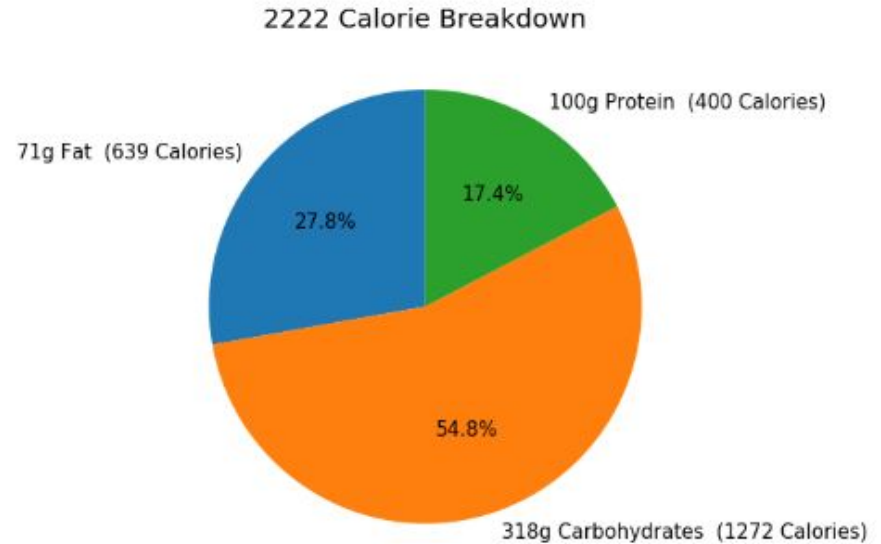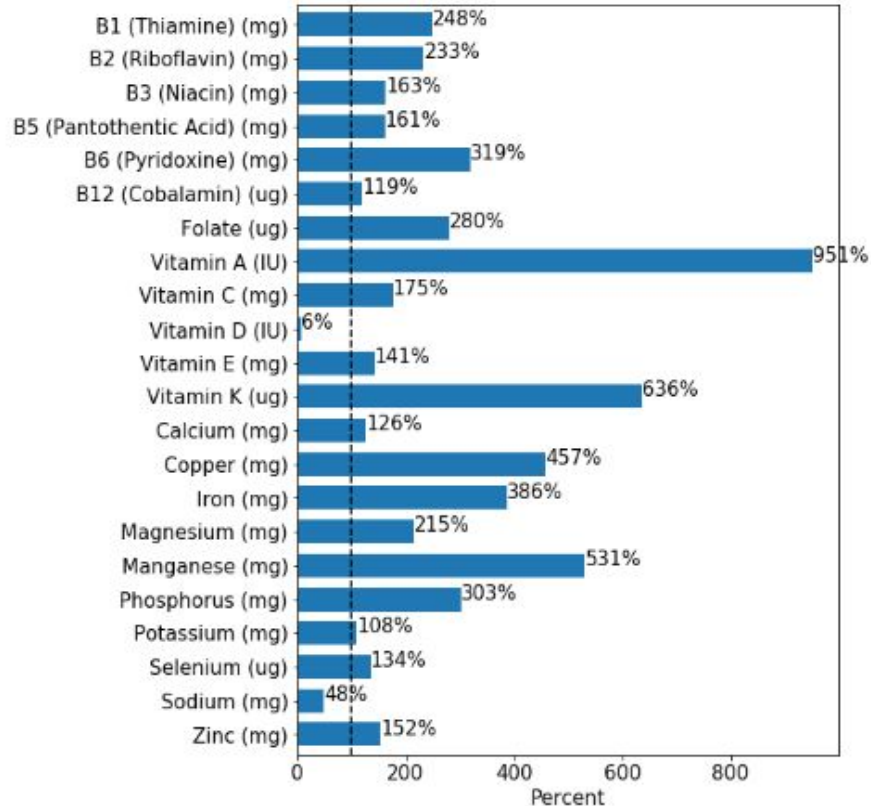
* must use eduroam or campus VPN to access

# What vegan foods provide necessary vitamins and minerals a person needs?

# What vegan foods provide necessary fats, proteins, carbohydrates, fiber a person needs?
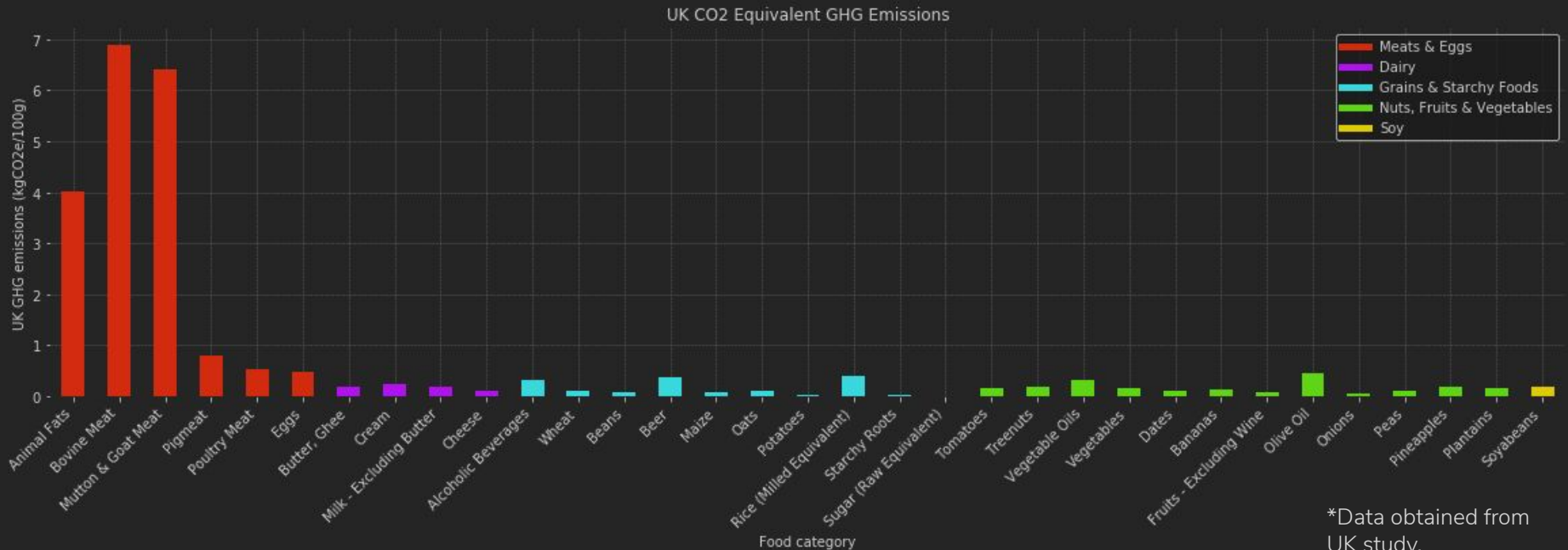
# Average of 3 Healthy Vegan Meal Plans



Bar chart (Percent):
- B1 (Thiamine) (mg): 248%
- B2 (Riboflavin) (mg): 233%
- B3 (Niacin) (mg): 163%
- B5 (Pantothentic Acid) (mg): 161%
- B6 (Pyridoxine) (mg): 319%
- B12 (Cobalamin) (ug): 119%
- Folate (ug): 280%
- Vitamin A (IU): 951%
- Vitamin C (mg): 175%
- Vitamin D (IU): 6%
- Vitamin E (mg): 141%
- Vitamin K (ug): 636%
- Calcium (mg): 126%
- Copper (mg): 457%
- Iron (mg): 386%
- Magnesium (mg): 215%
- Manganese (mg): 531%
- Phosphorus (mg): 303%
- Potassium (mg): 108%
- Selenium (ug): 134%
- Sodium (mg): 48%
- Zinc (mg): 152%

2222 Calorie Breakdown
- 100g Protein (400 Calories): 17.4%
- 71g Fat (639 Calories): 27.8%
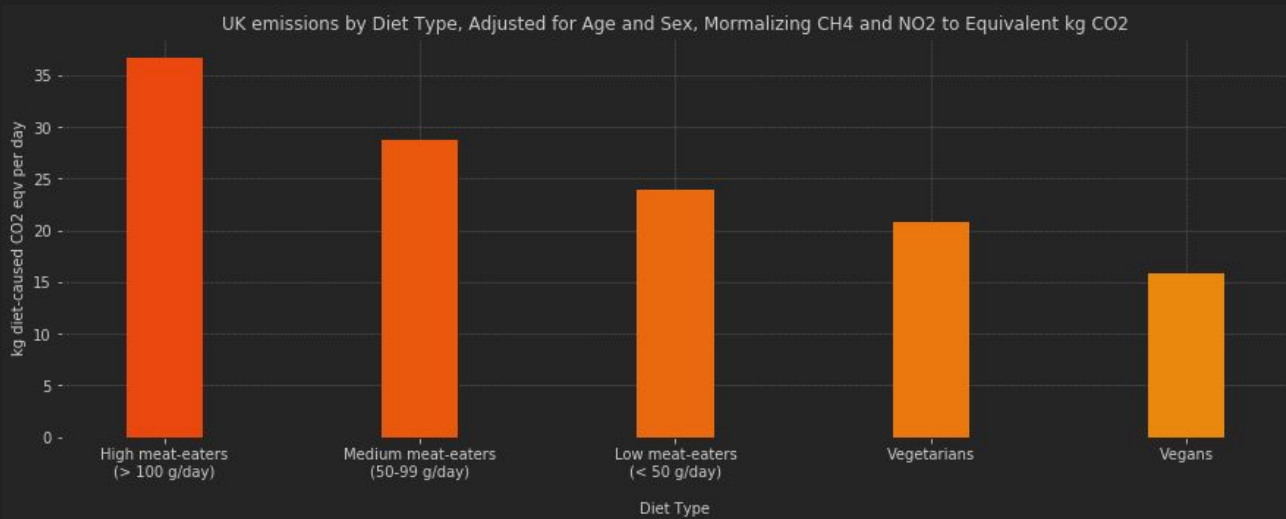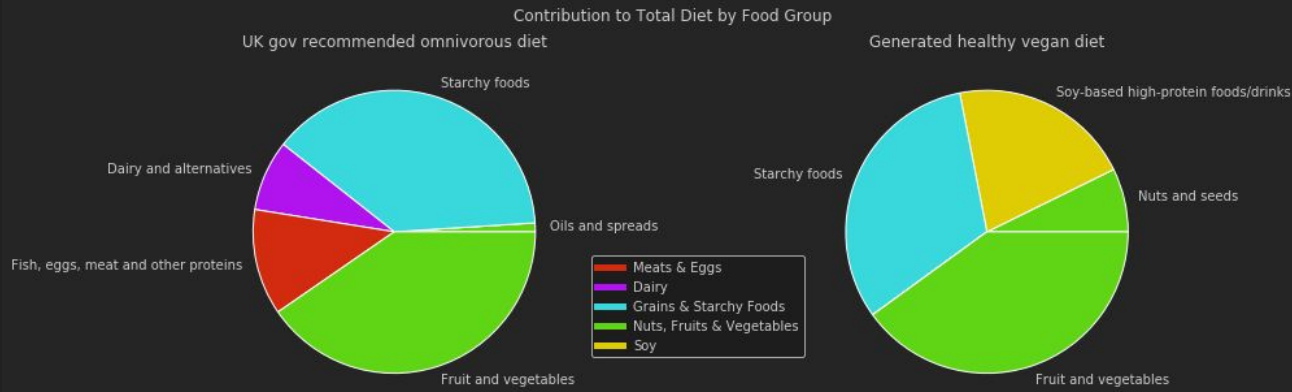- 318g Carbohydrates (1272 Calories): 54.8%

# Results

Vegan diet has more protein, eqv fruits & vegetables, and less starch.

Growing and processing food for vegan diet emits ~½ as much $CO_2$ per day as meat diet.

*Omnivorous diet obtained from UK gov Eatwell model. Vegan diet generated by authors. Emissions by diet type obtained from UK study.



Contribution to Total Diet by Food Group

UK gov recommended omnivorous diet

Generated healthy vegan diet

Legend:
- Meats & Eggs
- Dairy
- Grains & Starchy Foods
- Nuts, Fruits & Vegetables
- Soy



UK emissions by Diet Type, Adjusted for Age and Sex, Mormalizing CH4 and NO2 to Equivalent kg CO2

# Libraries Used

- Scraping: BeautifulSoup, Requests, Selenium
- Wrangling: Numpy, Pandas
- Visualization: Matplotlib

# Scraping/Wrangling/Visualization Tasks Accomplished

- eli_pandolfo_1.ipynb
    - Scraped tables from research papers on the web & created hierarchical indexes
    - Merged, reshaped, dropped and combined rows and columns
    - Created multicolored bar plots and side-by-side pie charts with corresponding colors
- cesar_amaya_1.ipynb
    - Scraped cronometer.com to get nutrition of food
    - Find tops foods in minerals, vitamins, fats, protein, carbohydrate, and fiber.
    - Plot meal plans showing nutrition for each day.