# ANDROID PHOTO DIET LOG

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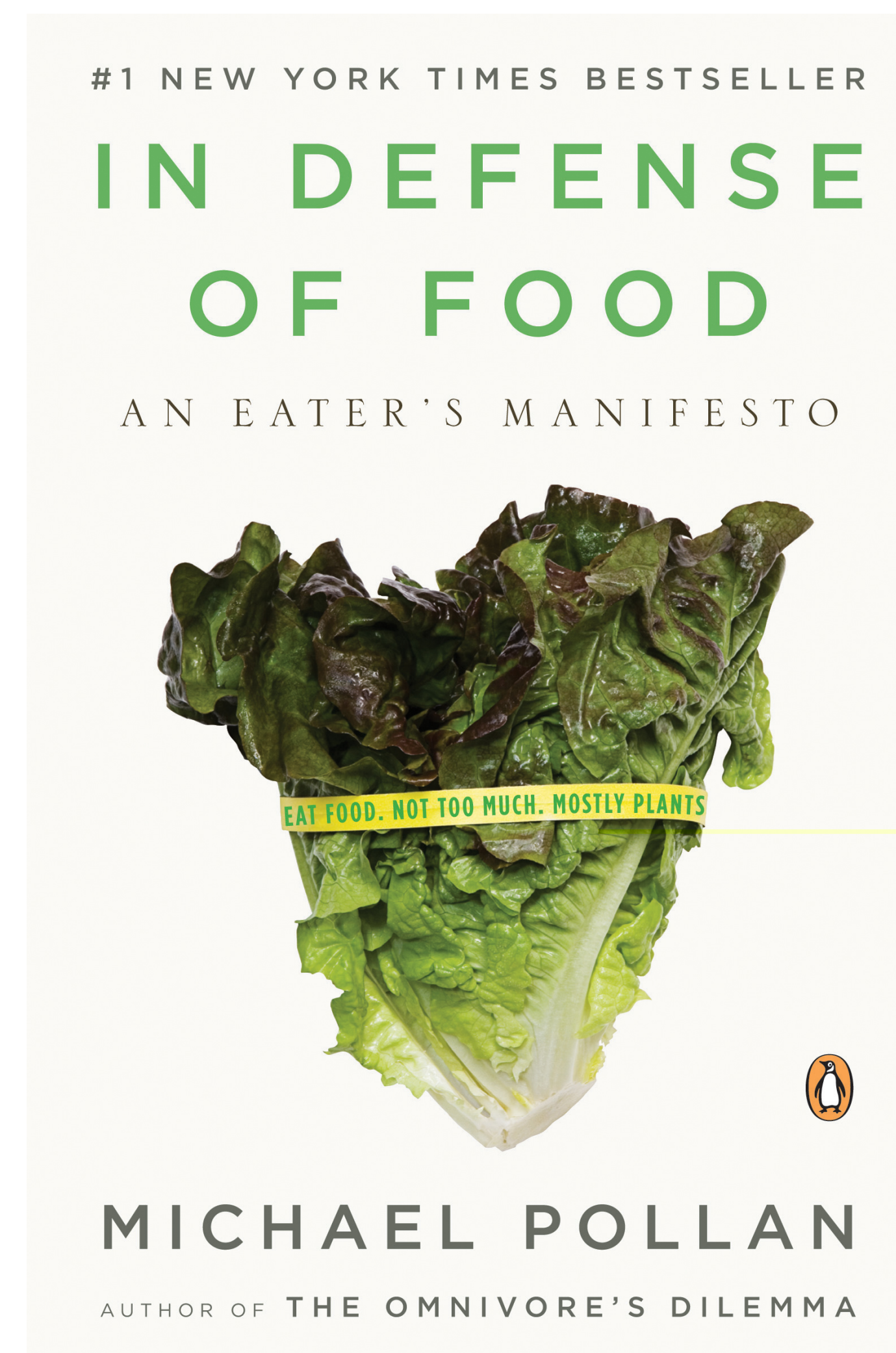**Client**: Walter F. Block          **Advisor**: Mitchell E. Tyler

## Abstract

This project uses a different approach to diet logging that is not about counting calories but instead focuses on portion size and food groups. The diet log works by having the user take a picture of their meal and draw shapes around the different food groups present. These shapes are used to calculate the area represented by each food group within the meal. The diet log is implemented as a smartphone application using Google's Android mobile operating system.

## Problem Statement

Obesity is the fastest growing expense in the Unites States healthcare system. Often individuals are advised to keep a log of their diet to better appreciate what and how much they are eating or as part of a nutritional study. However, self-administered logs are notoriously inaccurate and hard to maintain even over a short interval. Written logs are especially cumbersome for younger individuals.

## Background Information

- Approximately 60 million Americans are obese
- Obesity increases the risk of diabetes, hypertension, and cancer
- Diet industry is $40 billion per year in America
- Diet logging ranges from simple pen and paper to electronic calorie counters
- The NIH is offering a grant (since 2005) to whoever can come up with a solution to the low compliance of conventional diet logs, to be used for research

**#1 NEW YORK TIMES BESTSELLER**

**IN DEFENSE OF FOOD**

AN EATER'S MANIFESTO

**MICHAEL POLLAN**

AUTHOR OF *THE OMNIVORE'S DILEMMA*

*Initial motivation for project came from Michael Pollan's idea of a simpler approach to improving one's diet.*

## Design Specifications

- Diet logging mechanism should be easily accessible and portable
- Tailored towards college-aged young adults – implemented via a smartphone application or web-based software
- Focus is not on calorie counting but instead on qualitative trends and relative amounts of different food categories
- Diet log must have sufficient storage capabilities to accommodate periodic and long-term reviews
- Diet logging process should be fast and with an easy to use interface to encourage user compliance
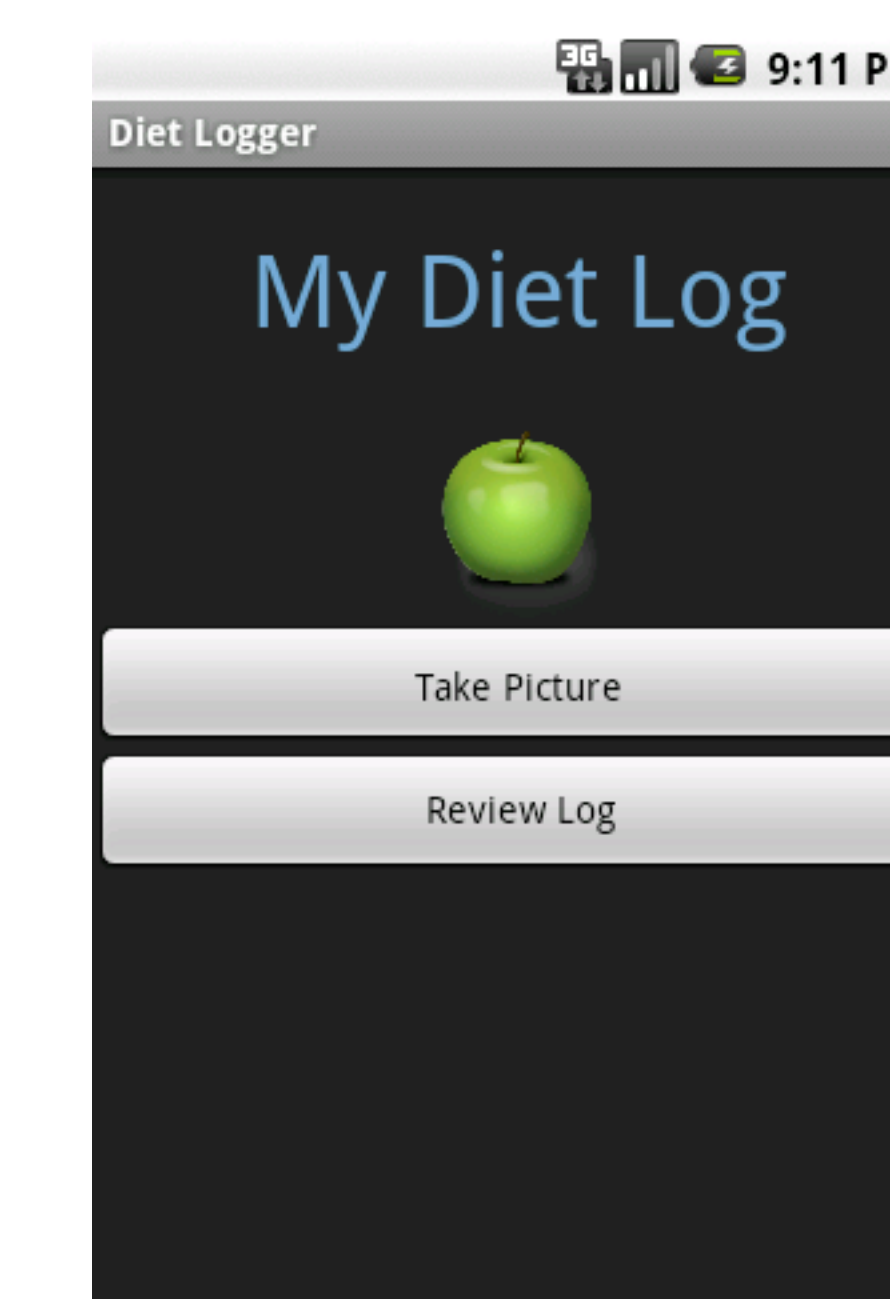- Log primarily intended for use as a research tool

## Final Design

| Take Picture | Main Menu | Review Log | Draw |
|---|---|---|---|



Take Picture: Opens camera, saves picture to SD Card
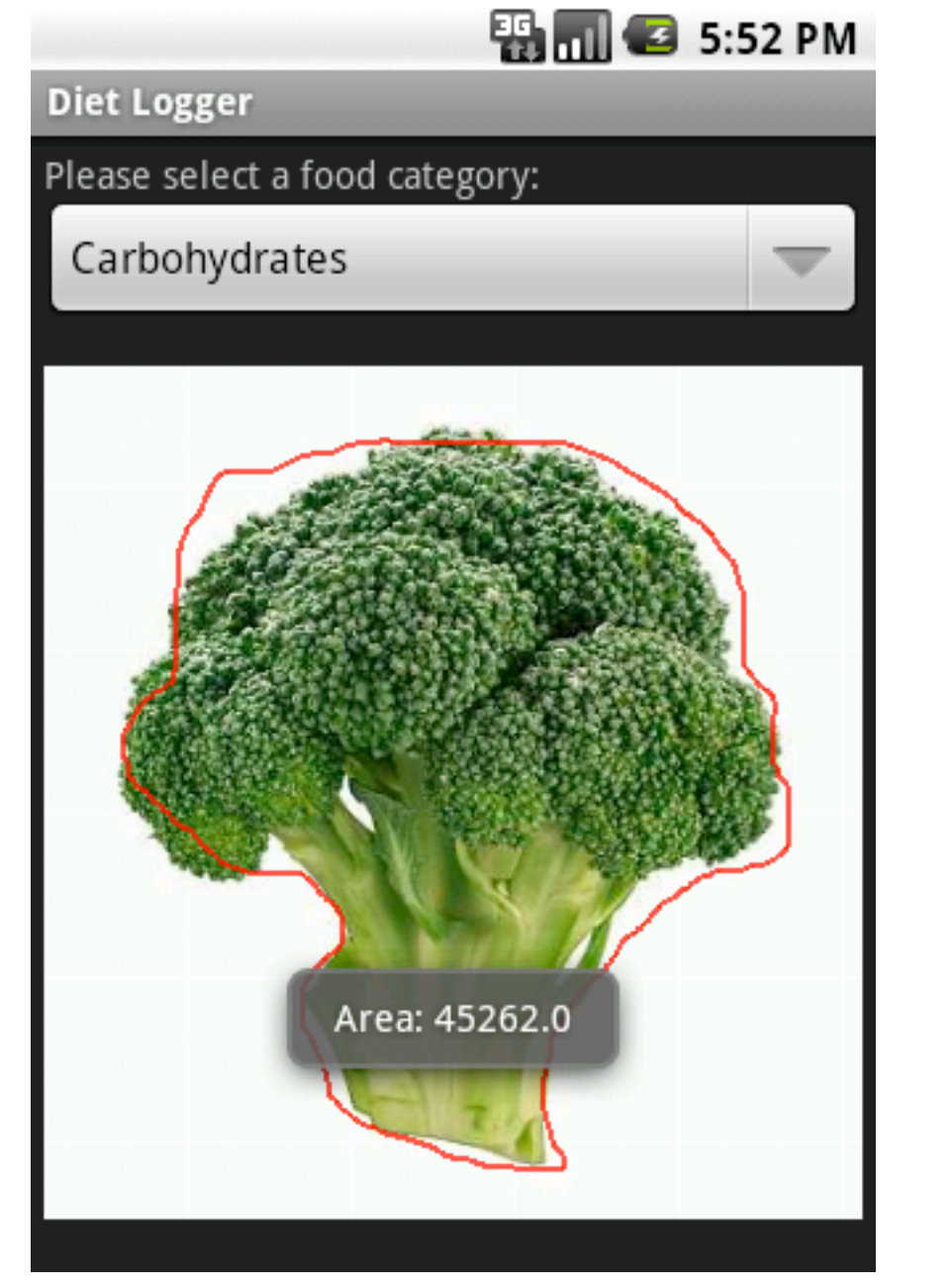
Main Menu: Program entry point

Review Log: Slideshow/ gallery of food log

Draw: Calculates areas of drawn shapes for each category

**Area calculations**:

Area of a planar non-self-intersecting polygon with vertices $(x_1, y_1), ..., (x_n, y_n)$ is:

$$A = \tfrac{1}{2}(x_1 y_2 - x_2 y_1 + x_2 y_3 - x_3 y_2 + \ldots + x_{n-1} y_n - x_n y_{n-1} + x_n y_1 - x_1 y_n)$$

Beyer, W. H. (Ed.). CRC Standard Mathematical Tables, 28th ed. Boca Raton, FL: CRC Press, pp. 123-124, 1987.

## Future Work

- Database linking pictures to area values
- Approximate volumes through meal size compensation
- Allow for user–customized categories
- Weekly summary with slide show and quantitative summary
- Find a researcher to employ photo diet log method



Legend:
- Fruits
- Dairy
- Vegetables
- Protein
- Carbohydrates
- Fats

35%, 11%, 29%, 10%, 8%, 7%
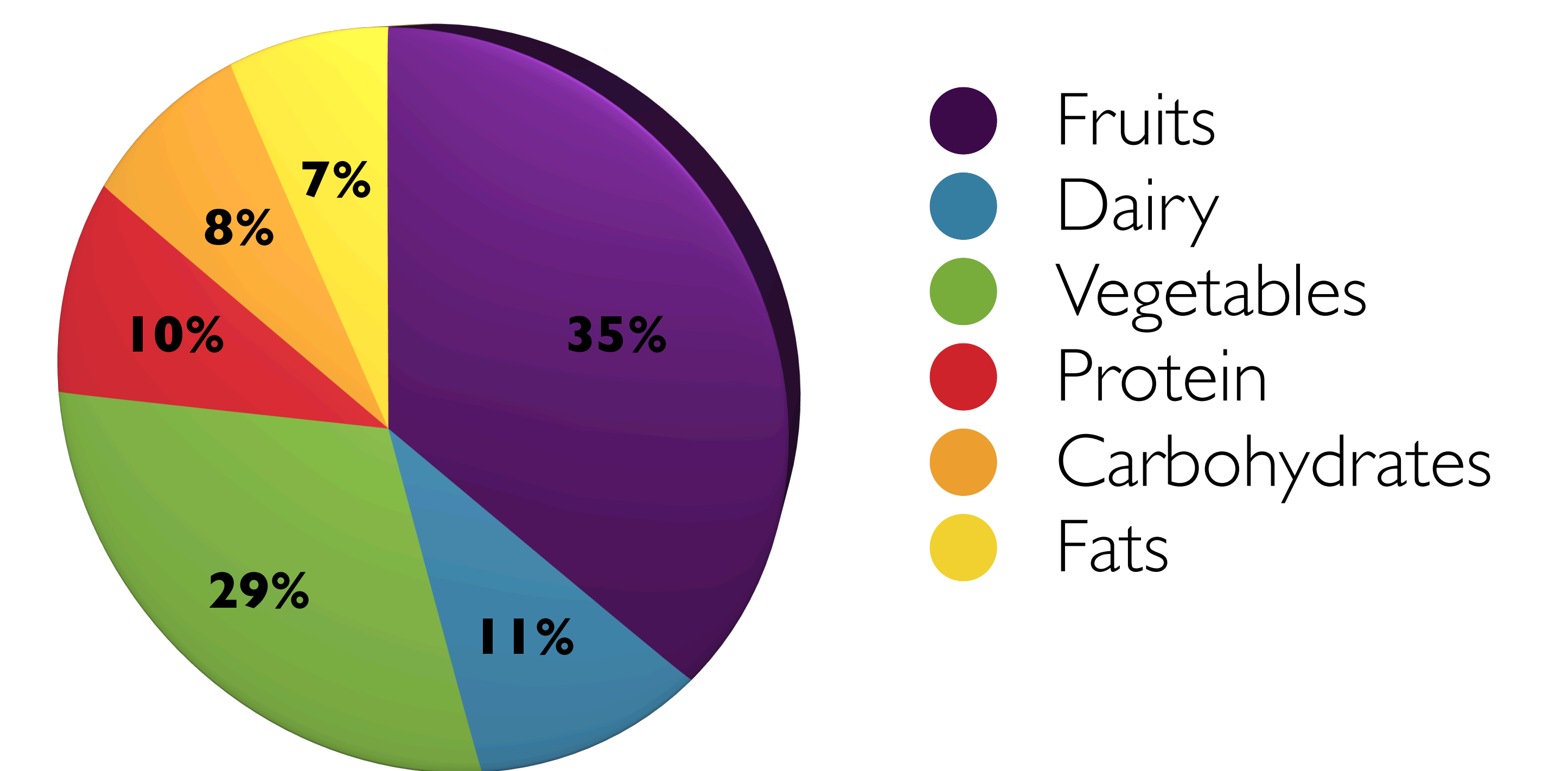
Future plans include implementing a weekly summary, possibly in the form of a pie chart like above

## Acknowledgements

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