Analysis of Campbell's® and Progresso® Soups

Project Team Members

Delisa Alejandre
Audelina Blanco
Sequoia Henry
Jeff Kirchen
Rongli Liang
Catherine Morin
Guadalupe Suarez

Projected Submitted To

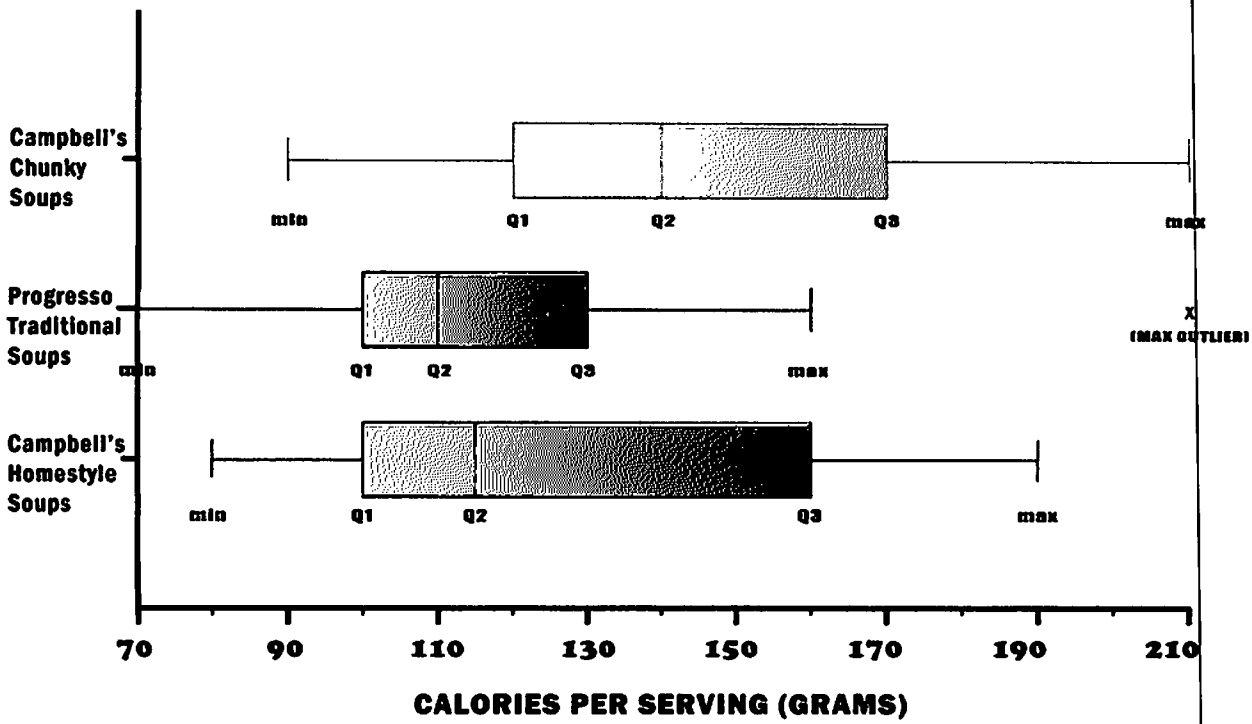
Melanie Xie
Santa Monica College
Statistics, Section: 2678

April 24th, 2015

The purpose of this project is to gather data in order to determine whether there is a significant, healthful difference when consuming *Campbell's® Chunky* soups versus their healthier option, *Campbell's® Homestyle* soups. The study will also explore another brand option, the healthier *Progresso® Traditional* soups of the *Progresso®* soup line, where a comparison to *Campbell's® Homestyle* soups will be formulated as well. During the research process, values such as sodium per serving, total fat per serving and calories per serving will be recorded, analyzed, charted and graphed. Based on the data collected for this sample, the findings should conclude as to whether there is a superior soup choice in regards to health, within the three brands surveyed. A possible interpretation could be that *Campbell's® Homestyle* or *Progresso® Traditional* soups will fare more nutritional results, since they both claim to be healthier options. Yet, as to which is more beneficial for both budget and health, the data presented in this paper will hope to shed clarification on the matter.

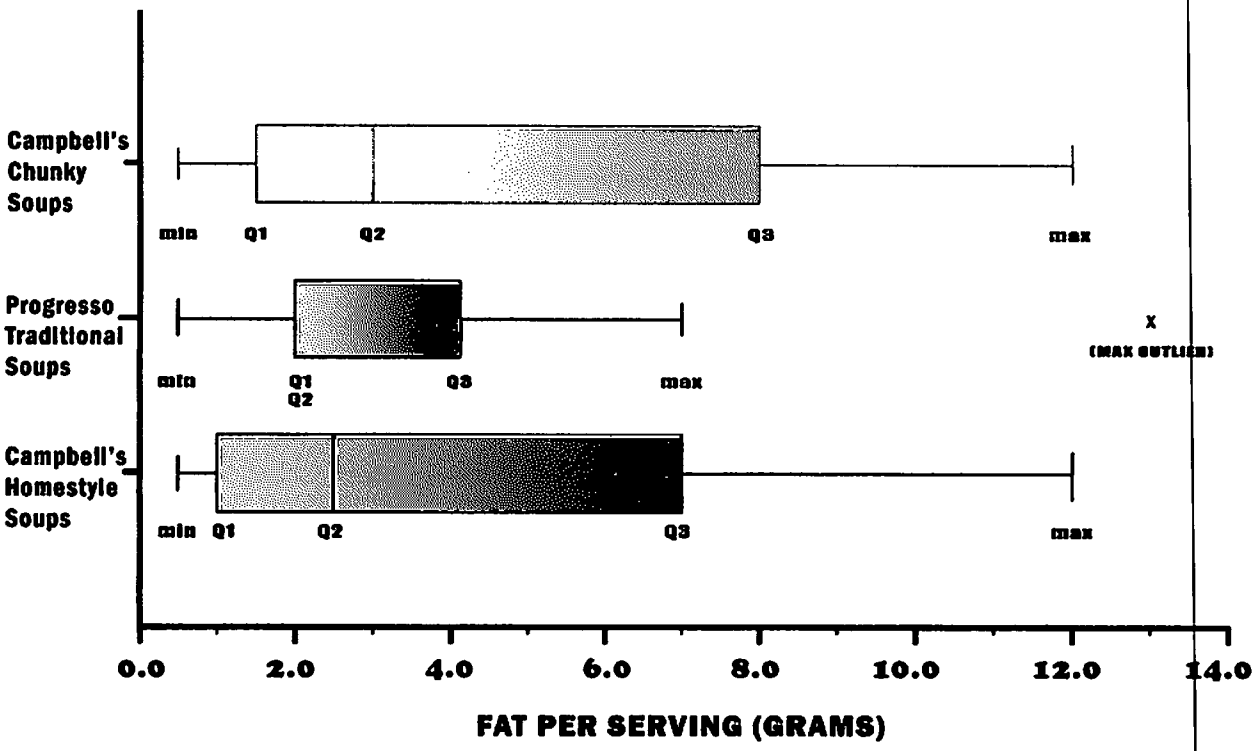
The group discussion for this project began in the frozen food aisle. The decision, at first, was to collect data on frozen vegetables versus canned vegetables. With this data, determination of which brand is more beneficial for both health and cost would have been made. However, it was revealed that there were an insufficient number of items available, at least 20 items, which was the requirement for this project. An adjustment to the type of sample was made, which resulted in canned soups from the *Campbell's®* and *Progresso®* product line. The data was collected using both the cluster and stratified method. By means of the cluster method, brands of soups selected at *Ralphs* ® grocery store, were divided into clusters, then two clusters that represent a brand were randomly selected among the various clusters using a random number generator. This is how *Campbell's®* and *Progresso®* soups became the samples that would further be studied. Within those brands, three different lines were chosen: *Campbell's® Chunky* soups, *Campbell's® Homestyle* soups, and *Progresso® Traditional* soups. However, stratification was used, fundamentally, to match each canned soup with a representative soup from the comparative product lines. The approach was to collect the data and compare which overall product line was healthier and cost less. The plan was implemented by having a student, Jeff, collect the data by gathering the following data sets: cost, sodium per serving size, fat per serving size, and calories per serving. The following charts and graphs will illustrate the findings of the data.

Calories Per Serving Comparison



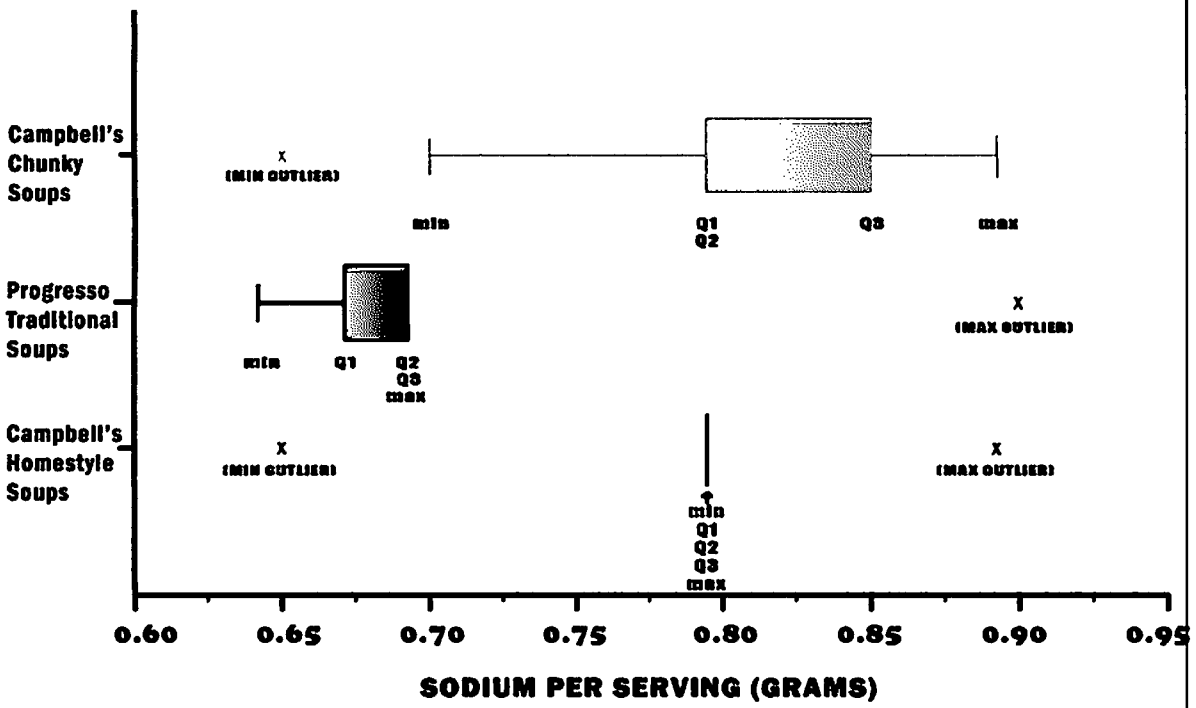
CAMPBELL'S CHUNKY SOUPS	PROGRESSO TRADITIONAL SOUPS	CAMPBELL'S HOMESTYLE SOUPS
MinX = 90.00	MinX = 70.00	MinX = 80.00
Q1 = 120.00	Q1 = 100.00	Q1 = 100.00
Q2 = 140.00	Q2 = 110.00	Q2 = 115.00
Q3 = 170.00	Q3 = 130.00	Q3 = 160.00
MaxX = 210.00	MaxX = 160.00	MaxX = 190.00
IQR = 50.00	IQR = 30.00	IQR = 60.00
Lower Fence = 45.00	Lower Fence = 55.00	Lower Fence = 10.00
Upper Fence = 245.00	Upper Fence = 175.00	Upper Fence = 250.00
Min Outlier = None	Min Outlier = None	Min Outlier = None
Max Outlier = None	Max Outlier = 210.00	Max Outlier = None

Fat Per Serving Comparison



CAMPBELL'S CHUNKY SOUPS	PROGRESSO TRADITIONAL SOUPS	CAMPBELL'S HOMESTYLE SOUPS
MinX = 0.50	MinX = 0.50	MinX = 0.50
Q1 = 1.50	Q1 = 2.00	Q1 = 1.00
Q2 = 3.00	Q2 = 2.00	Q2 = 2.50
Q3 = 8.00	Q3 = 4.13	Q3 = 7.50
MaxX = 12.00	MaxX = 7.00	MaxX = 12.00
IQR = 30.00	IQR = 2.13	IQR = 6.50
Lower Fence = -8.25	Lower Fence = -1.195	Lower Fence = -8.75
Upper Fence = 17.75	Upper Fence = 7.325	Upper Fence = 17.25
Min Outlier = None	Min Outlier = None	Min Outlier = None
Max Outlier = None	Max Outlier = 13.00	Max Outlier = None

Sodium Per Serving Comparison



CAMPBELL'S CHUNKY SOUPS	PROGRESSO TRADITIONAL SOUPS	CAMPBELL'S HOMESTYLE SOUPS
MinX = 0.70	MinX = 0.64	MinX = 0.79
Q1 = 0.79	Q1 = 0.67	Q1 = 0.79
Q2 = 0.79	Q2 = 0.69	Q2 = 0.79
Q3 = 0.85	Q3 = 0.69	Q3 = 0.79
MaxX = 0.89	MaxX = 0.69	MaxX = 0.79
IQR = 0.06	IQR = 0.02	IQR = 0.00
Lower Fence = 0.70	Lower Fence = 0.64	Lower Fence = 0.79
Upper Fence = 0.94	Upper Fence = 0.72	Upper Fence = 0.79
Min Outlier = 0.65	Min Outlier = None	Min Outlier = 0.65
Max Outlier = None	Max Outlier = 0.90	Max Outlier = 0.89

After analyzing and interpreting, in extensive detail, the data gathered from *Campbell's® Chunky* soups, *Campbell's® Homestyle* soups, and *Progresso® Traditional* soups, it was concluded that *Progresso® Traditional* soups is considerably healthier than the comparative brands studied. By healthier, the data proposes that there is, on average, less fat, less sodium and fewer calories per serving. Although *Campbell's® Homestyle* soups boasts that it uses natural ingredients, it did not fare better than *Progresso® Traditional* soups based on the variables collected. According to the data, *Progresso® Traditional* soups averages 117.14 calories per serving which is much lower than that of the other 2 brands. *Campbell's® Chunky* soups averages the highest amount of calories, with the average being 141.95 calories per serving and *Campbell's® Homestyle* soups, which is acclaimed to be healthier, has an average of 126.50 calories per serving. *Progresso® Traditional* soups also has significantly less amount of fat with an average of 3.52 grams per serving. The *Campbell's® Chunky* soups has 4.21 grams per serving and *Campbell's® Homestyle* soups consists of 4.18 grams per serving, a very similar amount. When we compare the average amount of sodium, *Progresso® Traditional soups* has the lowest amount at 0.70 grams per serving. *Campbell's® Homestyle* soups, coming in second at 0.77 grams per serving and *Campbell's® Chunky* soups has 0.81 grams per serving. These values may not seem tremendously discrete to one another, but when watching caloric/fat/sodium intake, these slight differences add up. While analyzing the box plots of the data set, it became visually distinct that *Campbell's® Chunky* soups was the least healthy option with the values on the upper end of the number line for each variable. *Progresso® Traditional* soups was on the lower end of the spectrum, particularly for sodium and *Campbell's® Homestyle* soups was somewhere in the middle. All three brands have similar standard deviations within the three variables. Sodium has a standard deviation of less than 0.1, therefore data points are closest to the mean. Fat's data points are approximately 4 standard deviations and calories have a standard deviation of approximately 30, spreading the data points over a wider range. An interesting analysis when looking at the data and the box plots, were *Campbell's® Homestyle* soups' sodium values. The min, max, Q1, Q2, Q3, upper fence and lower fence were all 0.79 grams per serving, with outliers at 0.65 grams and 0.89 grams per serving. This suggests that the 5 number summary were approximately the 50^{th} percentile rank and near the mean. When removing, outliers from the data set, it can alter the mean quite a bit. For example, exclusion of the outliers 12.00 g/serving and 13.00 g/serving from the total fat variable from *Progresso®*

Traditional soups changed the mean from 3.52 to 2.62 grams per serving. The new average would then be nearly half the amount of grams of fat per serving than the counterparts. Therefore, when examining the amounts of calories, sodium, and fat averaged with regards to budget, we can safely make the assumption, based on the data, that *Progresso® Traditional* soups would be the best choice when it comes to health.

Catherine Morin's task was to write the introduction, which establishes what the project entails and what is intended to be learned from the study. She also created the graphical elements for the tables and box plots, as well as edited the project's entirety. Delisa Alejandre was in charge of paragraph 2, which is a summary of how the data was collected. She described issues encountered when collecting the data and indicated the overall plan for the project. Jeff Kirchen volunteered to collect all the data for paragraph 3. He gathered data for *Campbell's® Chunky* soups, *Campbell's® Homestyle* soups, and *Progresso® Traditional* soups from *Ralphs®* grocery store and charted it in three separate tables. Jeff also set up formulas in excel that would find the mean, median, mode, standard deviation, etc. which are embedded in the table. Rongli Liang was given the role to draw out the box-plots in paragraph 4. She did 9 box-plots (3 sets of 3 variables) from the data set that was collected by Jeff and included the 5 number summary, upper and lower fences and any outliers. Sequoia Henry and Guadalupe Suarez were in charge of explaining what was concluded from the data. They interpreted what the data revealed and what was understood from it. For example, what the mean and standard deviation conveyed. Basically they are in charge of a concluding paragraph that summarizes the study. Audelina Blanco wrote paragraph six, which establishes what each team member contributed to the project, describing in detail their contributions.