What We Should Eat, and Why We Don't

by

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A Thesis Presented in Partial Fulfillment
of the Requirements for the Degree
Masters of Science Biology and Society

Approved April 2014 by the
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ARIZONA STATE UNIVERSITY

April 2014

ABSTRACT

Deciding what to eat can be difficult. There are multiple different diets which are popular today, and all of them say different things about which foods optimize health, and which foods are destructive. The situation become more complicated when the suggestions are all purportedly based on relevant science, and all have had demonstrated positive impacts on overall wellbeing. Even when we do have good information, financial factors, geography, and time constraints can prevent us from acting on it. In an attempt to portray the difficulties involved in eating well, I start by analyzing what each of six diets – The Paleo Diet, The Perfect Health Diet, the vegetarian diet, the vegan diet, the Mediterranean Diet, and the Traditional Asian Diet - says about what we should be eating. I then explore what the science says about what we should be eating, and whether this science lines up with the diets, by discussing an extensive review of books and literature on nutrition. Lastly, in order to gain an understanding of factors which discourage us from eating well, I tracked my consumption habits for a week using My Fitness Tracker, and noted any reasons that I chose to eat or not eat certain foods. I supplemented this with a discussion of the shortcomings of the Healthy, Hunger-Free Kids Act, and the types of factors that prevent people from acting on information. In conclusion, diets should be praised for attempting to align American eating habits with the best scientific information, but the vast amount of information and the difficulty involved in eating well may ultimately prevent people from doing so.

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Introduction

I am concerned with my health. More specifically, I am conscious of the fact that certain lifestyle choices, particularly concerning what I eat, will be detrimental in the long term. Others may guide me into the final stages of longevity. Having spent two years of my undergraduate career researching the history of government nutrition programs in America, I am aware of the large volumes of information available on the subject. I am equally aware that this information is divided amongst countless sources, and that it can be difficult to determine which of them we should trust with our livelihood. Much of the advice we have heard from government is in fact wrong. If nutrition research can be likened to a piece of yarn, it is now one tangled mess, and we have just recently found an end of it. Eating well can be hard.

My goal this time around is to explore and understand a few aspects of the current nutrition battle; the differences between what various sources tell us we should be eating, what science says about what we should be eating, and how various factors influence my own success in making use of the best scientific advice on nutrition. In a few words, my research addresses an important question – "what should we be eating, and why don't we?"

We do not have to look far to find confusion in the area of nutrition research. The USDA, which began releasing dietary recommendations in the early 1900's, has changed the tune of its recommendations numerous times to match that of the recent research.

Some of the earliest and most widespread government food recommendations first began at the beginning of the 20th century, in a very different social and economic environment than exists today. In addition to establishing factories as a major economic

force and source of work, the Industrial Revolution created a stratified social structure, resulting in tremendous wealth for a small group while creating poverty for others. Heavy immigration from Eastern Europe deepened this disparity by bringing unprecedented numbers to work the factories in northern cities. By the early 1900's, poverty was high in America's developed cities, and the parallel issue of hunger was on the rise.

It was these conditions that spurred the first government recommendations regarding food. Troubled by the growing issue of childhood hunger, human rights activists and aid organizations pushed for intervention, and argued that school lunches were an effective way of doing so. Slowly, the government responded; first state governments, then the federal government, and by 1946 a total of 6.7 million children participated received a school lunch. These preliminary government programs were created to address childhood hunger, and the content of the meals showed it; calorie-rich foods like milk, bread, butter were the mainstay of the first school lunches.

Over the next several decades, however, the federal government changed the tune of lunch recommendations numerous times. In 1946, fueled by concern over reports of malnourished soldiers, Lyndon B. Johnson signed the National School Lunch Act, which financially stabilized school lunch programs and began to highlight the need for nutrients in the diets of Americans. In 1966, the Child Nutrition Act reached further by establishing Nutrition Education and Training Centers to educate the populace about nutrition. It also created food distribution programs such as the National Breakfast Program, the Woman Infants and Children (WIC) Program, and the Special Milk Program. Slowly, recommendations shifted from calories to nutrients. This was

especially true from the 1990's on, when the rising obesity epidemic urged even more intense research and change in school lunches.

Though only a small part of the dietary recommendations in the U.S., the changes demonstrated through school lunch policy over the last century are a reflection of the food guides published during the same period. The first printed recommendations, as we think of them today – food diagrams with neatly labeled boxes and descriptions – were released in 1916 and 1930 by the USDA. Called "Food for Young Children" and "How to Select Food," these guides focused on five food groups – milk and meat, cereals, vegetables and fruits, fats and fat foods, and sugars and sugary foods – and emphasized food choices which were compatible with a limited budget. This is similar to the school lunch recommendations, which began with calorie-rich foods. In 1943, recommendations changed slightly with the Basic Seven diagram, which began placing more emphasis on nutrition and balance. It differentiated between types of vegetables and between meat and dairy as opposed to lumping them all together. The downside to the Basic Seven was that all of the differentiation, as well as the lack of specified serving sizes, made it complicated.

Between the 1940's and the 1990's, then, new diagrams were published in an effort to be less complicated and more in line with changing thought on nutrition but each with its own potential downsides; the Basic Four introduced serving sizes and serving recommendations but left out advice on fats and sugars; the Hassle-Free Food Guide was essentially the Basic Four with an added group to clear up confusion regarding fats and sugars; the Food Wheel added the concept of moderation and provided serving requirements for three different calorie levels, but was once again complicated. The last

diagram released in the 1900's, and most well-known, was the Food Pyramid, which will be discussed in more detail later.

In short, the federal government, which began releasing dietary recommendations in the early 1900's, has changed the tune of its recommendations numerous times to match that of the recent research; throughout the depression, calorie-rich foods were recommended as a means of staving off hunger (Levine). It is the opposite in 2014 - calories are the enemy and starvation (drastic calorie reduction) is one widely accepted plan for weight loss (Bailor 2014).

Even in the last five years, even, recommendations have changed significantly. Where fats and cholesterol were once rarely thought of, they are now blamed for the high prevalence of chronic diseases in the western world, and have been for several decades (Minger 2013; Jaminet 2013; Taubes 2010). The original USDA Food Pyramid has since been deconstructed in favor of simpler diagrams with different allocations of recommended foods. Still, a number of researchers and nutrition authors disagree with government recommendations on what we should be eating, and a glance at nutritional advice shows that few of the experts agree with each other. Some say to avoid animal products entirely, some say to eat large quantities of eggs, high-fat meat and dairy, and others say that meat should only be eaten occasionally and, when eaten, should be limited to fish and poultry.

The question of what to eat is an important one, evidenced by the current state of health in America. As of 2010, one third of premature deaths in the U.S. were due to poor nutrition and lack of exercise, and seven of every ten annual deaths due to chronic diseases (CDC 2008). In the same year, 16% of American children were considered

obese (Ogden 2012), while the prevalence rate for adults was 34.4% (Shields 2011). According to a study done in 1999, one quarter of children ages 5 to 10 years have high cholesterol or high blood pressure (Freedman). Of the six leading causes of death in the United States, four of them are linked to dietary habits. (Hu 2001; Kung 2008). More statistics could be cited, the conclusion being that many of America's leading diseases are at least partially linked to the food we eat. At the very least, we can agree that something should be done differently.

I realized immediately that answering the question is far more difficult. Simply setting parameters took some time. For example, what does should, mean? I could not merely come up with a list of "good" and "bad" foods, primarily because labels are arbitrary. Likewise, the foods we "should" eat may change depending on the context. If the aim is to reduce consumption of pesticides and hormones, then it may be organic produce and grass-fed meats that "should" be eaten. If the goal is to maintain a family of six on a small budget, one "should" avoid organic in favor of foods which are more cost-effective. Likewise, each religion comes with its own dietary "shoulds" – Christians should avoid shellfish and meat from non-hoofed animals, and Jews should avoid pork.

Given the nation's concern with chronic diseases, I focused my question in terms of what we "should" be eating to foster good overall health. As a result, I was not concerned with ethical, moral or religious reasons for choosing or excluding certain foods, as these would make the issue far too complicated for brief, meaningful conversation. However, as our ability to act on what we should be eating is influenced by various physical constraints, I do discuss financial and geographical limitations that impact my own eating habits, because they likely impact those of others as well.

Thus, the term "should" has two definitions here. The first is in reference to what the available science says are the healthiest foods to be eating. Then, after discussing physical constraints on what we are actually able to eat, we will be left with a set of foods that are both scientifically supported and actually feasible; this set of foods falls under the second meaning of our word "should."

The term "information" can also be misleading, in that it can be anything from an anecdote from a friend to a statement backed up by hundreds of peer-reviewed journals. In this way, it could be correct or entirely fictional and from reliable or unreliable sources. It could also be kept secret, in that there may be information regarding nutrition of which the general public is entirely unaware. Here, the information I am talking about is in two forms; that put forth by popular diets and that put forth by scientific evidence. Thus, it is information which is public, and the assumption is that it is at least published with good intent, or with the intent of being reliable. I will discuss what the information is, specifically, in later sections.

Lastly, in discussing the inherent "confusion" in deciding what to eat, I mean specifically that the number of different opinions on what we should be eating, without any method of ranking them or deciding definitively which are the "best," makes it difficult for the average person to decide what foods should be included or excluded from their diet. Thus, confusion in this paper is defined rather simply – a difficulty choosing amongst the available information on nutrition.

It is under these parameters that I began my exploration. I started by reviewing and familiarizing myself with the prevalent diet plans and diet philosophies. In *Death by Food Pyramid*, Denise Minger divides the current diets into three groups; Paleolithic

style diets, the Mediterranean Diet, and whole-food, plant based diets. I used this framework as a foundation. Once I had completed my review of the prevalent diets, I randomly chose two from each of Minger's three groups, with one minor adjustment; as the Mediterranean diet is the only diet in the second group, I added the traditional Asian diet both because it is widely considered healthy and because it mirrors the foreign influence that is present in the Mediterranean diet.

Proceeding as described, I arrived at the following six diets; The Perfect Health Diet and the Primal Blueprint as examples of Paleolithic-style diets, the Mediterranean Diet and Traditional Asian Diet as examples of foreign influence diets, and the Vegan and Raw Food diets as examples of whole-food, plant-based diets. After choosing these diets, I compared and contrasted them both within and across groups, with the goal of discovering whether these diets are saying the same things and, if not, wherein lie the differences.

The second step of my search was to analyze the diets in terms of what science says we should be eating. To do so I conducted a review of relevant scientific research. For several months I had been researching diets and nutritional science and attempting to make sense of it all. Towards the end of this process, Minger published *Death by Food Pyramid,* which does a much more comprehensive analysis than I was able to accomplish in a few months, and ends with a breakdown of what the science says we should be eating. At that point, I began using Minger's book as the basis for further research and review. *Death by Food Pyramid* is premised on the idea that a majority of what we have been told about nutrition stems from bad science and is thus misleading. Drawing on this review, I revisited the sources cited in her book. In addition, I read and reviewed a

number of books relevant to each of the diets I chose in the first part of my study, with special attention to the type and quality of the science behind each of the books. I added this research to what I had conducted independently.

Lastly, using myself as a correlate to the average young person, I recorded my dietary habits for a week using an online dietary tracker called MyFitnessPal. I researched a number of different trackers before deciding on MyFitnessPal[1], and did so because it had the most extensive and inclusive list of foods, including menu options at restaurants near me. During the week, I was careful to avoid changing my eating habits, and was consistent with my normal thought processes and habits regarding food.

There was one notable exception. As using a food tracker requires individual entries for every act of consumption, I avoided snacking. Essentially, small sporadic servings of M&M's, almonds or anything else that would an entry outside of a meal were avoided like a slab of raw beef liver. With my eating data collected, I set about analyzing my habits in terms of my own personal parameters – financial, schedule-related, etc. From here, I rely on prior research to apply my understanding of my personal lifestyle choices to the American population as a whole.

First, let me be clear about my intentions. For one, I am not attempting to disprove the diet authors, or any of the health-proponents I discuss here; their work is founded on years of research, and it would be folly to claim even a fraction of their

[1] Dietary trackers are tools to assist in eating well, with MyFitnessPal being one. Upon signing up, you are asked to complete a brief profile including your current weight, age, and exercise habits, and to list your goals for weight loss/gain and exercise amounts. Each day, you enter the foods you ate into the tracker. The majority of dietary trackers have an extensive list of foods, recipes and restaurant menu options. Each entry is added by the sites users, and includes detailed dietary information (protein, calorie, fat content, etc.). As you add additional entries, the tracker totals the number of proteins, calories, fats, carbohydrates, etc. that you have had for the day and alerts you when you go over or under your recommended daily requirements.

knowledge. But there are some pretty massive disagreements about what we should eat, and so I intend to explore and discuss the complexity of available information and provide ideas on how we may choose from the information in play.

What Do Popular Diets Say?

Part of the difficulty in eating well is simply figuring out what it means to eat well; it seems that everybody in the nutrition realm has their own idea on what to eat, resulting in more information than we can possibly know what to do with. For years, the Food Pyramid was the standard for public consumption. Now, bookshelves are lined with information on how to eat exclusively vegetables, predominately meat, and everything in between. U.S. News published a list of what they deem the "27 best diets" based on ratings in seven different categories (U.S. News and World Report), which includes all of the diets in this paper, plus a few.

Considering they all claim to be one of the healthiest combinations of food you can eat, the differences between them is shocking; some recommend that fats make-up the majority of calories, while others avoid fat and place the emphasis on carbohydrates, and still others choose protein as the superior macronutrient. Some eliminate all animal products, some keep animal products and exclude grains, and others eliminate only meat. It is helpful to have a method of organizing the various diets in order to better understand where they say the same things, and where they differ drastically.

According to Denise Minger, the existing philosophies on what we should be eating can be divided into three groups: Paleolithic-style diets, the Mediterranean Diet, and whole-food, plant-based diets. As a whole, Paleolithic diets encourage us to eat

similar to our ancestors, and thus forbid consumption of foods that did not exist prior to the agricultural revolution. In other words, processed foods, vegetable oils and other synthetic fats, and grains are out, and meat, fruits, vegetables and legumes can be eaten until satiety. The Mediterranean diet is different in that it encourages heavy consumption of grains and olive oil, and favors fish, poultry and nuts over red meats (Mayo; Minger 2013). Whole-food, plant-based diets are the most stringent in their exclusions, allowing nothing but fruits, vegetables, and nuts in the most strict diets, and adding dairy and protein supplements in the more flexible versions.

Important to note is the proponents of each and every diet believe theirs to be the superior regimen. It is also true that each of the diets demonstrate significant improvement in chronic disease rates when compared with more "westernized" diets. This is interesting, considering the differences between the groups. Even searching within the groups produces interesting results.

To simplify the comparisons, I narrowed my analysis to two diets from each of the three groups defined in *Death by Food Pyramid*, with one exception: as the Mediterranean diet is the only diet in its group, I added the traditional Asian diet for purposes of having another diet of foreign influence, and because of recent American interest in the legendary health of Asian populations. Also, while Minger simply lists a number of popular advocates for her whole-food, plant-based groups, I have chosen the raw and vegan diets as representatives of that group because of their popularity today. Thus, the six diets are the Paleolithic and Perfect Health diets from the Paleolithic group; the Mediterranean and Asian diets from the second group; and the Raw and Vegan diets from the whole-food, plant-based group.

As mentioned, each of these six diets has had demonstrated benefit in reducing the impact of chronic diseases. Much of the focus on Mediterranean and Asian diets, for example, is the lower incidence of nearly every chronic disease in these areas of the world (Brill 2009; Dokos 2011; Mayo; Sofi 2013). It is no surprise that these regions are two of the seven Blue Zones[2] of the world (Buettner 2008). The inhabitants of another Blue Zone, Loma Linda, California, are noted for living long and healthy lives on a strictly vegan diet. Naturally, there are confounding factors. Many of the areas which adhere to these diets also value exercise and socialization (Buettner 2008), which also promote good health. For this reason, it is difficult to give food all the credit for longevity, but we can be confident that it plays an important role; none of the healthiest regions of the world eat processed food, for example.

Surprisingly, the Paleolithic-style, Mediterranean and Asian, and whole food, plant-based diets have little in common outside of their apparent health benefits. In *Death by Food Pyramid*, Denise Minger created a diagram demonstrating areas of overlap between the three groups. I have included it in Appendix 2 for reference. As the outline demonstrates, all three include tubers, low-glycemic fruit, and vegetables; that provides a starting point, but still leaves significant room for variation.

To illustrate, I researched the food pyramids corresponding with each of the six diets I studied, and turned them into pie charts based on an estimate of the percentages. Percentages were estimated as closely as possible, and the main purpose was to demonstrate the discrepancies between the various diets. The first set of pie charts shows

[2] According to Dan Buettner, author of *The Blue Zones: Lessons for Living Longer From Those Who Have Lived the Longest*, five areas of the world have inhabitants with "measurably longer lives" and "the highest chance of becoming centenarians: Ikaria, Greece; Nikoya, Costa Rica; Sarinida, Italy; Okinawa, Japan; and the Seventh Day Adventists of Loma Linda California.

a direct translation from the food pyramid, including all types and quantities of food listed in the pyramid for that diet. The second set of pie charts represents each of the six diets in terms of percentages for grains, plants, animal products, and fats, and demonstrates just how different these diets are. Even diets that are grouped together by Minger have notable differences.

The Paleo Diet and Perfect Health diet both adhere to the logic of Paleolithic-style diets. Essentially the thinking is as follows; humans are evolutionarily adapted to thrive on certain foods; humans have subsisted on nothing but plants and animal products, excluding dairy, for thousands of years; foods such as grains and dairy did not become available until the beginning of the Agricultural Revolution ten thousand years ago; ten thousand years is a relatively short amount of time in terms of evolution, and certainly too short of a time period for humans to adapt to new forms of food; humans are therefore evolved to thrive on plants and animal products. As a result, Paleolithic-style diets exclude any foods which were unavailable prior to the Agricultural Revolution. On this logic, both the Paleo and Perfect Health Diets get the majority of calories from fruits, vegetables, and animals, with some coming from healthy oils, nuts, and legumes. Both, for the most part, exclude grains and dairy.

While both diets are the same in principle, however, there are a number of important differences. Where the Paleolithic Diet excludes all grains and legumes, the Perfect Health Diet makes room for rice and rice products; green beans and peas, although legumes, are in, too. Similarly, the Perfect Health Diet distinguishes between "safe" and "unsafe" starches, recommending that a little over 20% of calories per day be taken from starches such as Taro, rice, tapioca, and potatoes. The Paleo Diet restricts

starches based on their higher glycemic index. Lastly, and most importantly, the two diets have conflicting prioritization of macronutrients; the majority of calories on the Paleo Diet are consumed in the form of protein, and fat is predominant in the Perfect Health Diet.

The term "Asian Diet" as used in this context was coined in 1995 by Oldways, a non-profit that works to provide Americans with nutrition advice based on the dietary practices of other cultures. This goal is premised on studies showing decreased rate of chronic illness among eastern nations. Working with the Harvard School of Public Health and the Cornell-China-Oxford Project on Nutrition, Health and Environment, Oldways created a food pyramid to demonstrate proportions of food eaten in Asian cultures. Over the last two decades, the term took off, and we now see dozens of cookbooks, newspaper articles and blogs showing people how to "eat Asian" to improve their health.

An obvious problem with labeling any diet as Asian or Mediterranean is that both are very broad terms. With roughly 50 geographically Asian countries, it is highly unlikely that all of them eat the same. In fact, there are often large regional differences in cuisine, just as there are in America. The same is true in the Mediterranean region. However, many of the regional dietary differences among Asian and Mediterranean nations are in the way things are cooked, rather than the foods that are cooked. In this sense, they should be seen as a philosophy on nutrition, with the pyramids representative of the large commonalities amongst these regions.

According to Oldways, the Asian Diet is based on whole grain breads, millet, noodles, corn and rice, with rice being consumed at the majority of meals. Vegetables, fruits, legumes, seeds and nuts are consumed daily. Fish and shellfish, considered the

healthiest meat, may be eaten every day, with eggs and poultry eaten weekly, and red meat monthly. Proportions are also important in the Asian Diet. While rice is a staple, it is eaten as a supplement to meals rather than as the main course. When meat is eaten, it is in a ration of roughly 1:3 to vegetables, much of which are leafy greens.

Admittedly, differences between the Mediterranean and Asian diets are expected. They represent regions with very different cultures and food sources. Still, they provide an interesting example of how two apparently dissimilar diets can both be touted as good examples of healthy living. Like the Asian diet, the Mediterranean diet is a philosophy on eating rather than a recreation of all of the diets in the Mediterranean region of the world, and was developed by Oldways, the Harvard School of Public Health, and the European Office of the World Health Organization. Despite regional difference, the Mediterranean and Asian diets are surprisingly similar. The Mediterranean Diet features fruits, vegetables, and whole grains, with a preference for fish over meat and poultry. Red meat is consumed only a few times per month. Unlike the Asian diet, that of the Mediterranean regions includes daily intake of dairy products, heavy consumption of olive oil, and moderate alcohol intake. In summary, both diets are rich in vegetables and fish, and differ in other ways.

Defining the boundaries of whole-food, plant-based diets is difficult, as Minger's description includes the names of popular proponents rather than individual diets. This makes sense, given that all of the diets in this category are essentially the same, with a few minor tweaks. Two of the more popular variations, the vegetarian and vegan diets, illustrate these minor differences. These two ways of eating are virtually identical in that both are built on a foundation of fruits, vegetables, and whole grains, and neither allows

consumption of meat, with some exceptions. Vegetarians typically allow dairy and eggs as a means of getting the B vitamins which are harder to find in fruits and vegetables. Vegans typically solve this problem through B vitamin supplements or by way of dairy substitutes and imitation meat products. There are numerous interpretations of "vegetarian" and "vegan" exist, but these are the most common guidelines, and others are less widely practiced.

By now, it should be pretty clear just how confusing it can be to eat correctly. If your vegetarian friends swear by vegetables, online articles tell you to go Paleo, and the government-sanctioned Food Pyramid remains steadfast in its low fat, high carbohydrates advice, it is difficult to blame you for not making a decision; there is simply too much information. Fortunately, looking at the nutrition science, which at least some of the diets are based on, clarifies what we should, or should not, be eating.

What Does The Science Say?

Background

Bad science is everywhere. Many American beliefs on dietary health are untrue. The idea that eating fat and cholesterol causes heart disease is one of them. The bit about calories being the cause of obesity is another. What about the parts where margarine is superior to butter, pizza counts as a vegetable and grains form the basis of a healthy diet? - those too.

If you go to the website for MyPlate, which has replaced My Food Pyramid, you will find the MyPlate guidelines elucidated more clearly. Under a tab labeled "Healthy Eating Tips," readers are encouraged to eat whole grains for half of their overall grain consumption, vary the vegetables they eat, avoid fat-laden meat, and "focus on fruit."

The stated goal of MyPlate is to provide the average person with a model of healthy eating, and to encourage better health among the general population. To achieve this, the My Plate was structured, supposedly, on the most current and accurate research on what we should be eating. At the top of MyPlate's list of healthy eating suggestions is a couple sentences about helping you get started "toward a healthy diet."

Here is where the confusion begins. If you visit the Harvard School of Public Health's site on healthy eating, you will find strikingly different information. While lauding My Plate for improvements on the Food Pyramid, Harvard researchers points out a number of flaws with the MyPlate setup. For one, they say, it makes no effort to discourage consumption of processed foods, sugary drinks and sodas, candy, or other foods generally described as junk. While it does reduce recommended servings of grains and dairy in comparison to the Food Pyramid, there are none of what may be considered healthy restrictions; whole grains instead of refined grains, fish, nuts and poultry over red meat and eggs, and unsaturated fats over saturated. They attempt to remedy the shortcomings of MyPlate with their own version, the Healthy Eating Plate, which replaces "grains" and "protein" with "healthy grains" and "healthy proteins," adds an image to represent healthy oils, and includes written descriptions of what should be included and excluded from each group. In terms of eating healthy, it seems to be a step above the original My Plate. The Harvard School of Public Health did the same thing with a rendition of the Food Pyramid, called the Healthy Eating Pyramid.

When two trusted sources give conflicting information on an important societal topic, perhaps the most natural reaction is confusion. If we had absolutely no preconceptions on healthy eating, we would be at a loss as to whether we should listen to

the USDA or the Harvard Public School of Health, and may be unaware as to how to determine which we should listen to. Both claim a foundation on the best available science, and both claim to be in the best interest of America's health. Without a great deal of work it is difficult to determine what we should be eating, and this is true when just two conflicting views are present; in the current realm of nutrition, there are numerous. Many of these views are primarily from advocates of specific diets and, fortunately, the majority of them are based on the science. However, this is likely the same reason they all say different things; even within the scientific evidence, there is room for confusion.

We will begin by addressing the many myths about what we should be eating. You may be surprised to learn that government recommendations on fat, cholesterol, and grains are in fact controversial. Then, we will delve into what the science actually says, and whether it is as simple as we would hope, with an initial focus on fat and the on grains. As a note, there is an abundance of science related to nutrition, much of which comes at it from different angles; gastronomy, ethical and social considerations, and even evolution. The science we are concerned with are the studies exploring the types of foods which are more or less likely to result in chronic disease.

Fat

For decades, the message has been that cholesterol and saturated fat drastically increase the risk of heart disease. As early as 1914, a Russian scientist by the name of Anichkov found that feeding rabbits pure cholesterol was enough to create atherosclerosis similar to that which leads to heart disease in humans. His studies produced the "lipid hypothesis," which states that heart disease results from high levels of

cholesterol. Other studies throughout the late 1990's showed similar findings (Minger 2013).

This was only the first link in the chain of evidence linking diet to heart disease. The second was postulated by an American scientist named Ancel Keys. After analyzing food intake data and mortality statistics from the late 1940's he created a graph of six countries, plotting national fat intake against heart disease rates for each country – the graph showed a strong positive correlation; the more fat a country's inhabitants consumed, the higher its rates of heart disease (Minger 2013),. Adding this to the idea of cholesterol causing heart disease produced the diet-health hypothesis. Essentially, this states that saturated fat elevates levels of total cholesterol, which in turn causes heart disease.

Unfortunately, the science behind the diet-health hypothesis is actually rather weak. Notably, Anichkov was never positive that his studies translated to humans, and cautioned against "jumping to conclusions" about whether cholesterol was dangerous in humans (Minger 2013). Not to mention, for a human to get the same amount of cholesterol as was fed to rabbits, we would have to consume nearly one hundred eggs per day. Similarly, in his six-country analysis, Keys neglected to include 16 other countries, which together weakened the correlation between saturated fat and heart disease. Thus, while Anichkov, Keys, and a handful of other researchers have studies defaming saturated fat and cholesterol, the accusations simply do not hold up, especially in light of more recent research.

In actuality, very few studies have demonstrated a link between saturated fat and heart disease. In 1970, an eleven year report was published on the Oslo-Diet Heart Study.

Participants who were recommended a diet low in saturated fats and cholesterol and high in polyunsaturated fats demonstrated lower incidence of myocardial infarction than those on their normal diet. A few other studies show a positive correlation between diets high in cholesterol and fat and incidence of coronary heart disease (Miettinen 1972). A handful of other studies show a similar correlation.

The majority of evidence, on the contrary, is for saturated fat being at the very least inconsequential, and likely beneficial. An analysis of 21 studies showed no significant evidence for a link between saturated fat and cardiovascular disease (Siri-Tarino 2010). Others have demonstrated possible benefits of saturated fat, with an inverse relationship between saturated fat and stroke in Asian populations (Yamagishi 2010). A 2013 review of saturated fats had similar findings (O'Keefe).

Admittedly, this is an oversimplification of the data. While it is true that saturated fats do not deserve their bad reputation, it is more the case that different types of saturated fats have different effects (Hu). For example, the number of carbons in a fatty acid chain determines whether the result will be an increase or decrease in total cholesterol (Hu 2001). Cholesterol-raising fatty acids are typically longer chains, while short to middle chain fatty acids are beneficial (Hu 2001; Jaminet 2012). There are even differences among the cholesterol-raising fatty acids, with some having more potent effects than others (Hu 2001; Xue 2009). In this way, saturated fats are complicated. On the whole, however, they can be counted on the good side.

The study of fats in general is messy. Mono-unsaturated fats, for example, are considered both healthy and essential for the body (Assuncao 2009; Hu 2001). In fact, they are assumed to be one of the factors behind the longevity of many Mediterranean

countries, which receive a hefty percentage of their daily calories in the form of olive oil. Americans, on the other hand, get most of their monounsaturated fats from meat and dairy. These confounding factors makes research difficult (Hu 2001),

Polyunsaturated fats, the other half of the category called unsaturated fats, are another example of fat confusion. They come in two varieties – Omega 3 and Omega 6 polyunsaturated fats, which are found in fish, meat products, and some vegetables (Lavie 1979). Omega 3 fatty acids are well-established as essential for overall well-being (Lavie 1979; Minger 2013), and some have hypothesized important roles of Omega 6's (Hu 2001). You have probably guessed, by now, that there is more to the story.

We already know that the science cannot always be trusted; good science can be, but not all science is good. Minger mentions that studies showing health benefits of Omega 6's are few, and the ones that do exist are flawed in various ways. In reality, both Omega 3's and Omega 6's, because of their structure, are more likely to undergo a process called oxidation, which turns them into toxic compounds linked with weight gain, cancer, and metabolic syndrome, among other things (Champ 2012, Crescenzo 2012, Holman 1954; Hulbert 2005). This is confusing, given the recent encouragement to eat more Omega 3 and Omega 6 fats.

In reality, the only fats we know for certain are harmful, without exception, are the same ones we have been encouraged to eat for decades – trans fats. These are found in vegetable oils, fast-food, margarine, commercially baked products, and processed animal products like lunch meat (Hu 2001). Thus, it is no surprise that they are associated with a number of chronic health problems (Hu 2001).

The rule with the other fats is that they are all essential to a healthy diet. The twist is that it is likely the ratio of saturated fats, monounsaturated fats, Omega 3's and Omega 6's that is important, not the consumption of fat itself (Bailey 2003; Champ 2012; Holman 1954; Rogge 2009). Most of the negative effects of Omega 6's are believed to result from gross overconsumption of Omega 6's. Most sources recommend a relatively equal intake of the two Omega's (Cordain 2011). In most processed foods and vegetable oils, Omega 6's drastically exceed both the recommended daily intake of Omega 6's and the quantity of Omega 3's (Jaminet 2013).

Saturated fat is not the criminal it has been made out to be. In truth, the focus on saturated fats as being agents of disease is strange, given the number of studies which now deem them essential to health. Likewise, it is unusual that foods rich in trans fat have survived to cause so many health problems. As we will see however, so has another prominent food source.

Grains

It appears that the most widespread advice on carbohydrates is controversial as well. Recall that the Food Pyramid suggests that grains form the foundation of a healthy diet, with meat, vegetables, dairy and oils recommended in smaller quantities. Surprisingly, the majority of studies agree that cereal grains increase risk of various diseases and health problems (Dohan 1984; Hoggan 1997; Hadjivassiliou 2006; Kalaydjian 2006; Kraft 2009; Ross-Smith 1980; Singh 1976), contain elements which limit nutrient absorption, and are themselves deficient in nutrients.

Aside from direct health effects, grains are simply a worse choice, nutritionally speaking, than nearly every other food (Fuhrman 2003). They are deficient in vitamins A,

C, and beta-carotene, as well as iron, zinc, magnesium, copper, and fatty acids. There is also evidence of elements in grains which inhibit nonheme iron absorption, the most prominent being phytate (Cordain 2011).

Grains have a long evolutionary history, with the driving factor being predation. In addition to possessing the structures necessary to grow, the development of mechanisms against herbivores that would eat them is essential (Cordain 1999). Likewise, many herbivores developed larger guts and more specified digestive specimens to counter the defenses of plants. Being that humans only recently began eating grains (roughly 10,000 years ago), we are not as capable of safely eating grains, and more affected by their defenses (Bernardo 2007; Cordain 1999).

In the literature, these defenses are referred to as anti-nutrients, and cause a host of unpleasant effects. Alkylresorcinols are shown to be involved in renal degeneration, red-cell blood hemolysis, and DNA strand scission (Cordain 1999). Alpha-amylase inhibitors are found in large amounts in bread, breakfast cereals, pasta, and other wheat products, and are responsible for allergenic reactions to certain flours. These anti-nutrients are not limited to refined foods, so whole-grain products, despite having a greater concentration of nutrients, are likewise toxic (Cordain 1999). Though anti-nutrients may actually hold benefits when consumed in small amounts, this is as of yet unproven by the evidence (Cordain 1999),.

What Should We Be Eating?

Nutrition is very complex, and the science can be finicky. When we study a specific molecule, vitamin, mineral, or nutrient, it is in isolation; the nutrient is isolated from the food, which is isolated from the diet, which is isolated from the lifestyle, which

is isolated from the culture it belongs to. The studies are necessarily specific, and thus unable to take into account combined effects of foods and nutrients. Nonetheless, science does have important, definitive things to say about what we put into our bodies. This section will provide a simplified version of the science in order to highlight the complexity found therein and attempt to come up with a general set of rules for eating well.

There are few, if any, studies which show fruits and vegetables in a negative light, and I will not dwell on them here. Essentially, fruits and vegetables are the most agreeably healthy foods we have. None of the six diets exclude them. Joel Fuhrman, a popular advocate of plant-based diets, created a list of the most nutrient-dense foods; leafy green vegetables were at the top, followed by solid, green vegetables, followed by colored vegetables, and finishing with grains at the very bottom, after meat (Fuhrman 2003). Increasing the consumption of fruits and vegetables has been shown to decrease the risk of cancer, in addition to a number of other chronic diseases (Riboli 2003).

However, as another note on the complexity and confusion in nutrition research, even this super-group of plants is not free from contention. Some say that, just as cereal grains have adapted toxins to ward off predators, vegetables carry toxins in much higher quantities than animal products. Thus, they should not form the basis of our diets, but rather should be a side to healthy fats and protein (Jaminet 2013). This is not, by any means, the majority opinion, but does work towards a point; experts do not always agree, even on the healthiest food groups.

Like fat and grains, meat is a divisive force in dietary conversation. Like fat, it has been blamed for risk of chronic diseases. And, like fat, it turns out meat may not be the killer many people would believe.

The science suggests that, while meat is not necessarily harmful, there are certain considerations to be made before eating it. For example, the meat we eat now is not the same as what our ancestors would have eaten. Where our ancestor's meat came from wild game, ours is raised on large plantations, and is often much higher in fat. Where our ancestors valued blood, bones and organ meats, we prefer prime cuts of muscle meat, which is much less nutrient dense. Lastly, modern cooking methods, such as frying and grilling, have a way of altering the composition of meat so that it is particularly carcinogenic (Minger 2013).

Denise Minger recommends using gentler, safer cooking methods for meat and also including animal organs, bone broth and cartilage in your weekly foods. Much like organ meats are more nutritious than muscle meats, some animals are better sources of meat than others (2013). As a general rule, fish is the healthiest, with lamb, goat, red meat, poultry, and pork being less beneficial (Jaminet, 2003).

The complexity is obvious. Looking at the science provides a lot of the information we need to make wise decisions. Simply eliminating processed foods and sugars helps focus; all that is left are vegetables, meat, dairy, oils, and nuts and legumes. If we dig a bit deeper, we will find information on the best meats to eat, the potential negativities of dairy consumption, the least harmful oils, and whether starches, nuts and legumes are worth the potential risks.

At this point, however, we are no longer able to make blanket statements like we did with processed foods being harmful and vegetables being superior. The statements we do make become more complicated. There is nothing wrong with meat, but: avoid grain-fed, stick to lean cuts, and fish and organ meats are preferable. Lamb and goat should be eaten over red meat, which should be eaten infrequently. Vegetables are great; eat leafy greens the most, the solid green vegetables, then solid colored vegetables. Starches may or may not be healthy for you, it depends on how you interpret the data (the Paleo and Perfect Health Diet say very different things here, for instance).

Science tells us a great deal, but is limited in that nutrients are complex and interrelated, and science can only accurately study them in isolation. Now, one of the few things we know for sure is that nutrition is incredibly nuanced, and there seems to be no single answer to the question of what to eat. Of course, this is natural.

Individuality is essential to a discussion of what to eat. Each of the diets can be reached by some combination of eliminating foods that are believed to be maladaptive with our bodies. In other words, each of the six diets is designed to "best" meet the requirements of the human body. Coincidentally, this core of foods happens to be those that humans have been eating for centuries. But human bodies are subject to immense variation, mediated in some ways by our culture contexts.

If we can draw on evolution to say that humans are evolved to eat certain foods, we can certainly specify further; within this group of foods that all humans are evolved to eat, individual cultures are best adapted to eat certain foods over other foods. Within the group of "meats," some civilizations had little access to fish and instead hunted land

animals such as elk or caribou. Others were coastal and ate tremendous amounts of seafood.

This is more than speculation. In the 1950's, Weston Price analyzed the diets of un-westernized tribes across the globe. He found that cultures eating their traditional diets showed nearly no sign of heart disease or cancer, and had nearly perfect oral health. This was regardless of the composition of the diet; Asian cultures ate a lot of fish, Eskimos ate mostly whales and land animals, and inhabitants of the Swiss Alps ate raw dairy by the one-inch slice. Yes, the diets were drastically different. The point is that each of these cultures were eating the foods they had eaten for centuries and doing phenomenally well in terms of health. If they had switched and tried to live on the diet of another culture, they may have thrived, but it is equally likely that their health would become suboptimal (Minger 2013).

Because individuals descend from specific cultures, we too are a best-fit for certain types of food. As an example, the enzyme Amylase is found in saliva and plays a crucial role in digestion of starches. If starches are not digested, they turn into glucose and cause blood sugar levels to rise, so Amylase is good. The tricky part is that individual differences in levels of amylase can vary hugely, with some individuals having 6 times as much as others. Starches are not necessarily bad, but some people are genetically better-adapted to starch consumption, and will do better on a diet high in those foods. Dairy is another great example. Lactase is an enzyme that breaks down the sugar in milk products, but not everybody has it. Those who possess Lactase are able to enjoy the benefits of dairy products while those born without it must look to other sources of the nutrients it offers (Minger 2013).

In the end, perhaps the simplest way to eat healthy relies on two principles. The first mimics Michael Pollan's recommendation to "eat food." In other words, avoid "foods" which were processed or made with additives, preservatives, hormones, food colorings, or other unnatural ingredients. As a means of simplification, he suggests buying only foods which can be found on the outer edge of the store; fruits, vegetables, dairy, and meats (Pollan 2008).

The second principle is variety. Diets mentioned in this paper have a lot of differences; the Paleo diet suggests getting the majority of calories from protein, and the Perfect Health Diet says to get them from fats. Vegans exclude all animal products, and include eggs and dairy. What all of the diets do agree on, however, is variation. Each says to eat different types of fruits and vegetables, and the diets that include meat recommend eating everything from fish to organ meats.

The science, too, indicates that variation is a key in eating well. Being that our bodies require a host of vitamins and nutrients, and no one food item contains them all, we must consume a spectrum of different foods to operate maximally. Remember that fats can be harmful if consumed in excess or in the wrong rations – eating too much of the same nutrient can be harmful, no matter how beneficial the nutrient is. In 2013, a lady spent a couple of months in the hospital after overdosing. The drug – bok choy (Black 2010).

As with everything thus far, even these two principles have caveats. Not all of the food found on the outer edge of the store is healthy. Yogurt that comes in tubes (Go-Gurt) and cream cheese are by no means the elixir for longevity. Fish that have been refrozen multiple times and put on the shelf at the end of their shelf life should be

avoided. True, fruits and vegetables are pretty safe. However, even among the "outer-rim" foods that are healthy, studies show that some are better than others. If it is meat, the healthiest is grass-fed, organic meat. Fruits and vegetables are the freshest and most nutrient dense from local organic sources, and dairy from grass-fed cattle. In essence, get as close to the natural state of your food as you can.

The question of what to eat is complicated, but we have been able to narrow it down to a set of healthy guidelines. The next step is to look at the other half of the problem, which is why people do not always eat the things they know are best for them.

Healthy for a Week

Having spent the past two years reviewing lunch policy, analyzing changes to national food programs, and pouring over nutrition research, I have a good understanding of the foods which will support my health, and which will demolish it. In order to understand factors which may affect how I implement the knowledge I have, I tracked what I eat for a week using an online dietary tracker called My Fitness Pal. This had two purposes. On one level, analyzing my food consumption for a week allowed me to determine whether my own eating possessed any elements which could be considered unhealthy. At the same time, I tracked my thought processes and rational behind everything I ate.

As a twenty-three year old male, on an average food budget, I may be representative of the average young person who cares about their health and wants to eat in a way that will contribute to disease-free longevity. Thus, tracking my diet, and the factors that influence it, provides a better understanding of the factors which are generally

at play in an individual's struggle to eat well, though I understand that an n of 1 is not experimentally robust.

The results of my week-long experiment are listed in Appendix 2. You will notice two things immediately. The first is that many of my listings are from restaurants; this is atypical, but happened to fall during my week of recording and will thus be included in my discussion. The second is the absence of spontaneous snacking. As using a food tracker requires individual entries for every act of consumption, I avoided most. Essentially, small sporadic servings of anything that would require an entry outside of a meal were avoided. I did have snacks, but they were typically more robust, like a helping of twenty to thirty almonds, rather than a handful of candy every time I passed by a bowl. Other than this, however, I was careful to keep my eating habits the same, whether I was at home or eating out, and kept careful track of them throughout the week.

Let us start with the meals I ate at home; the majority of my meals were fairly healthy. Breakfasts consisted of three eggs, three or four ounces of sausage or ham, a cup of coffee and either a salad, protein shake, or other form of fruit or vegetables. If I had a salad for breakfast, it was accompanied by two tablespoons of olive oil. If not, the olive oil found its way into either lunch or dinner, which was another salad or fish and vegetable.

When I did eat out, there was no guarantee that the results would be healthy. Many of the restaurants during the week were the only ones available around campus, but I did my best. At Subway, I got nearly every vegetable offered and chose red wine vinegar as my sauce. Many of the meat options at Panda Express are fried and processed, but I tried to choose healthier options such as mandarin chicken and also opted for a side

of vegetables instead of the usual fried rice or chow mien. Of course, my decisions were not always the healthiest, for reasons I will discuss in the next section.

Is Knowledge Enough?

The information we have may be the largest part of our struggle to eat well. For years, we steadily starved ourselves of healthy fats and cholesterol on the basis of incorrect information. No matter how carefully we adhered to the recommended food guidelines, we would be wrong. In fact, we may be less healthy than if we had stayed with our original diets. Knowing the foods that are essential to a healthy diet is essential to eating a healthy diet.

Still, the information we have is only one part of the struggle to eat well, and the other factors can be show-stoppers. In 2010, Congress passed the Healthy, Hunger-Free Kids Act of 2010 as part of Michelle Obama's campaign against obesity (Wootan 2012). At the celebratory event announcing the new "healthy" changes to school lunch programs, many were thrilled. Experts applauded the act, calling it a "step in the right direction" and celebrating a healthier future for America's children. After all, the Act was seen by many as a long-awaited solution to America's great childhood obesity epidemic (Concannon 2012).

In years prior to its passing, the USDA responded to growing concern over childhood obesity by issuing an in-depth review of school lunch programs. Conducted over a two year period, the study's purpose was to recognize strengths of the current programs while identifying areas for potential improvement. At the same time, the U.S.

Department of Health and Human Services (HHS), in collaboration with the USDA's Center for Nutrition Policy and Promotion (health.gov), released the "Dietary Guidelines for Americans." Based on recent nutrition research, the Dietary Guidelines were a set of nutritional recommendations that set the foundation for the Healthy, Hunger-Free Kids Act (Congress 2010; Cooper 2010; Schindler 2012).

For months, members of Congress worked to endow the bill with the necessary components for healthy change among America's children. At long last, school lunches had calorie limitations, requirements for fruit and vegetable servings, and a variety of other changes for a mere eleven cents of increase in cost. Schools reduced portions of tater tots, made pizza from whole-wheat crust, and stopped ordering anything other than reduced fat or fat-free milk.

At this point, there is a slight discrepancy. In section three, I said that one of the few blanket statements we can make is that grains are a poor choice for health, and that fat is in fact beneficial, yet both grains and low-fat milk were supported for being healthier options. Similarly, grains and dairy, low-fat or not, are not recommended by all of the diets, and only the vegetarian diet allows both of them. How can they be lauded as healthy?

The point in discussing the Healthy, Hunger-Free Kids Act is not to say that the changes were the healthiest, were supported by all of the science, or were in line with the diets which are currently in vogue. The Act better serves as an example of the confusion inherent in nutrition. Even dietary recommendations which are purportedly evidence-based may be wrong or disagreed upon, and may be quickly overturned - those found in

the school lunch amendment have been refuted multiple times since the Act was passed in 2010.

Nonetheless, the changes were an answer to the call for a healthier nation, and represent a desire for the appropriate information, which is a start. The science in this paper, for example, likely does not provide the whole picture on what we should be eating. In any case, acting on what we currently believe to be healthy is a necessary start, and adjustments can be made as necessary. Unfortunately, a portion of the difficulty is in acting on the available information. As we will see, this can often be the hardest part of eating well.

Whether or not they were the healthiest, the changes found in the Healthy, Hunger-Free Kids Act were finally implemented in August of 2012 (Erbacher 2012; Knoll 2011; Piekarski 2012). Results were underwhelming. By analyzing news articles from major publications following the bill's implementation, I discovered something interesting. Despite the excitement of policy makers and nutrition advocates, the general public was not optimistic. Parents, who generally care about their children's health, resented being told what they could or could not eat (Wootan 2012). Children, who had previously subsisted on pizza, chicken nuggets and French fries for school lunch, had trouble stomaching the new lunch options; trash cans overflowed with the required servings of fruits and vegetables, and purchases of *a la carte* and vending machine items increased (Wootan 2012).

In Kansas, children boycotted, complained about the increase in lunch prices, made a video parodying the new lunch restrictions, and snuck off-campus at lunch to fill their backpacks with junk food from gas stations (Piekarski 2012). These problems only

existed in school districts that could afford the changes, which highlights another problem – changes to the program were costly and unsupported by the budgets of various school districts.

We learn two important things from the implementation of the Healthy, Hunger-Free Kids Act. The first is that, despite great information, changing an individual's lifestyle is no easy task. Even if an individual wishes to eat healthier food, a number of factors may keep them from doing so. I will address these in more detail later.

The second thing we learn from school lunch implementation has to do with the way in which lifestyle changes are implemented. While children in some districts were busy boycotting lunches, other schools successfully made the transition to healthier lunches. The children were in the same age groups, the budgets were, as far as we know, similar, and the restrictions on what schools could serve were the same. The difference, it turns out, was in the timeline. When the USDA did an in-depth investigation of schools throughout the country, they found that certain districts took took very few measures to improve meals prior to the implementation of the Healthy, Hunger-Free Kids Act (Piekarski 2012). It was not until the act was passed that they made health a priority. Even then, these same schools even took their time in aligning themselves with the new standards. Ironically, it was many of the same schools that experienced widespread rebellion, such as those in Kansas.

Schools that made a smooth transition had a different game-plan. For example, they were quick to align themselves with the changes recommended by the Healthy, Hunger-Free Kids Act, and went as far as to have school-wide taste-tests of healthy recipes to determine what types of foods kids would actually eat. The most meaningful

differences, though, were begun even before the bill was enacted; schools that were successful with the changes had already begun making healthy changes before school lunch policy required them. It is likely that it was this slow transition that resulted in their reception by students and parents (Piekarski 2012).

Perhaps these two lessons can be woven together; developing a healthy lifestyle is a process, there is no correct way to do it, but some ways work better than others. With good intentions and a plan to improve the health of America's children, school lunch programs failed where factors like student habits and preferences were not taken into account. It is likely that similar challenges arise when trying to change our own eating patterns.

During my week of food tracking, my decisions were impacted by noteworthy factors. Time constraints often resulted in eating out more. If I set aside a couple of hours to prepare and store larger quantities of healthy meals for the week, it is easy enough to grab them on the way out the door. When there is insufficient time, meals are not packed, and hunger is satiated through impromptu trips to restaurants. Fast-food restaurants are not known for having healthy food, so lunch nutrition was sub-optimal. This was also the case on days where I ended up being busier than I expected; I planned to eat at home, got caught up at school, and dinner out was the quick solution.

As a college student, my schedule is flexible; I have real obligations, and am busy, but outside of class times can more or less choose when and where things get accomplished. I can work while cooking dinner, or I can leave later on some mornings in order to cook food for the rest of the day. Not all schedules are flexible, and if time constraints are a roadblock in my diet, they are for others as well.

Finances were another factor at play in my decision making. I understand that wild, fresh salmon is far healthier than farmed fish, but it is expensive. The healthiest meats are grass-fed, organic and free of hormones, but I can buy roughly two and a half times as much if I ignore this piece of information. All of the trump cards are the same – there is evidence that coconut oil is healthier than olive oil, raw or fermented dairy more nutritious than pasteurized diary, and whole grains less toxic than refined grains, but all of them are more expensive. I may be able to buy the healthiest fish *or* the healthiest dairy *or* the healthiest meat, but eating all of the healthiest options would be unsustainable. As of yet, we have not even mentioned wine, or dark chocolate, or several servings of fruit. You see the problem.

Granted, there are those my age that have salaries more than capable of supporting the healthiest options. But there are those who have less-capable salaries. Or, they have the same salaries and more obligations. I am a graduate student, working two jobs, without children, a house, a car payment, or a spouse. I hesitate to mention my phone and insurance bill because they take up such a small portion of my income. Finances are a real barrier to health for some, and probably the majority of the country. Or at least they seem to be.

Fortunately, the Harvard School of Public Health went through the trouble to attach numbers to health eating. Through a meta-analysis of 27 articles on the cost of healthy eating, they surmised that buying healthier options of common foods costs $1.50 more per day, or a little over five hundred dollars a year. This is per person. For larger families, particularly during troubling economic times, these figures are a greater obstacle, or can at least be perceived as such.

The last factor explains the red velvet cupcakes I ate throughout the week. In some situations, I know a food is unhealthy but choose to eat it anyways. Most of the time, this involves foods high in fat or sugar. This makes sense. Good sources of fat and protein were historically scarce and hard to obtain than other forms of food. Thus, humans evolved to crave them, and to stock up on them when they become available. Unfortunately, we also crave the junk food that we now have in abundance.

Herein lies a reason for the failure of school lunch changes. You can tell somebody what is nutritious, but you cannot change preferences overnight, and especially not when new options are more costly than the old ones. Finance alone makes it hard to eat healthy, even when it is desired.

Conclusion

It is important to eat well and maintain health, but the amount of information makes it difficult to know exactly what it means to eat healthy. It would be one thing if diets promoted the same foods and differed only in recommended portion size or calorie intake; but that is not the case. All of the diets listed in this paper say very different things about what we should be eating. Even diets that follow the same philosophy on health, such as the Paleo and Perfect Health Diet, have meaningful differences. When we add the rest of the diets back in – the U.S. News and World Report lists 27 "best" diets – it becomes much more difficult. On one hand, we need to start somewhere. On the other hand, there is no clear place to start.

The diets which exist today do a service in that each of them corrects the misinformation present in government recommendations. At a certain point, however, the onslaught of correct information becomes as debilitating as having the wrong

information. Each new attempt deserves praise for attempting the next best interpretation of the data, but we cannot shoot for perfection in nutrition. The diet that science identifies as the "best" for health may be the healthiest, but it may also be difficult to follow. In any case, cultures have thrived on drastically different diets, and it is probable that there is no *best* diet; creating one leads to frustration as we fail to hit our mark. What we do not want to happen is for people to quit trying to improve their health because it has become too difficult to do so.

This is important, because complex information is not the only barrier to success in health. When I conducted my week-long study, I was not following any specific diet. I was only implementing the basic concepts we outlined earlier; switch to healthy oils, eat a large quantity of fruits and vegetables, eat plenty of fish, and avoid processed foods and sugars as much as possible. It was simple - I still had trouble following them due to financial constraints, personal food preferences, and availability of time. Of course, there are those who will have no trouble changing their dietary habits – each of the diets mentioned has followers who quit their previous habits cold turkey and started eating well – but this is not the majority. The majority likely have the same struggles.

Nobody is to blame for the nutritional chaos, or the blame is spread so thin as to be negligible. What is important now is that we make steps towards untangling our mess. The first step is clarifying that there is no one solution, which is done well in *Death by Food Pyramid*, among other books. The next step is on the individual level – identifying factors that interfere with our ability to act on the information, and making an attempt to lessen them.

In the end, success in nutrition relies on our ability to understand the answer to our question; what should we eat, and why don't we? Well, it's complicated.

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Monday, February 3, 2014

Breakfast	Calories	Carbs	Fat	Protein	Sodium	Sugar
Ham - Honey, smoked, cooked, 90.7 g	111	7	2	16	816	0
Bulk - Coconut, Dried Unsweetened, 3 TBS	150	8	14	2	8	2
Fruit Gala Apple - Gala Apple - Small (154g), 1 (154g)	80	22	0	0	0	16
Fruit - Pear Bartlett - Raw - Medium, 0.5 pear (177g)	56	11	0	0	1	9
Muscletech Six Star Pro Nutrition Elite Series - Whey Protein Powder, 1 Scoop	170	8	2	30	100	2
Generic - Coffee With 2% Milk, 12 oz	62	10	1	2	41	12
Add Food Quick Tools	629	66	19	50	966	41
Lunch						
Fresh Fish - Mahi Mahi, 3.5 oz	109	0	1	24	113	0
Beans - Snap, green, cooked, boiled, drained, without salt, 2 cup	88	20	1	5	3	4
Oil - Olive, 2 tablespoon	239	0	27	0	1	0
Add Food Quick Tools	436	20	29	29	117	4
Dinner						
Panda Express - Orange Chicken, 5.7 oz	420	43	21	15	620	18
Panda Express - Steamed Mixed Veggies Side, 8.6 oz	70	13	1	4	530	4
Panda Express - Grilled Teriyaki Chicken, 6 oz	300	8	13	36	530	8
Raw Vegetable - Whole Green Bell Pepper, 1 WHOLE	25	6	0	1	4	4
Great Value (Walmart) - Vitamin D Milk, 0.5 cup	75	6	4	4	60	6
Add Food Quick Tools	890	76	39	60	1,744	40
Snacks						
Trader Joe's - Dry Roasted Unsalted Almonds, Per Almond, 8 almond	56	1	3	2	0	0
Home Made - Red Velvet Cupcake With Cream Cheese Frosting, 2 cupcake	720	122	64	10	316	91
Home Made - Red Velvet Cupcake With Cream Cheese Frosting, 2 cupcake	720	122	64	10	316	91
Trader Joe's - Dry Roasted Unsalted Almonds, Per Almond, 13 almond	91	2	5	3	0	0
Add Food Quick Tools	1,587	247	136	25	632	182
Totals	3,542	409	223	164	3,459	267
Your Daily Goal	2,870	359	96	144	2,300	108

Remaining	-672	-50	-127	-20	-1,159	-159
	Calories	Carbs	Fat	Protein	Sodium	Sugar

Tuesday, February 4, 2014

Breakfast	Calories	Carbs	Fat	Protein	Sodium	Sugar
Sprouts Farmers Market - Hot Italian Chicken Sausage - Ground, 4.2 oz	137	0	4	21	693	2
Generic - Onion Cooked White Medium, 2 OZ	23	7	0	1	3	3
Scrambled - Large Egg, 3 large egg, 61g	306	0	22	20	210	0
Spinach - Raw, 1.5 cup	10	2	0	1	36	0
Bell Pepper, Green - Raw Medium (Net Carbs), 0.5 pepper	12	2	0	0	2	0
Roma Tomato, Sliced/chopped - Roma Tomato (Per Nutritiondata.self.com), 62 g	11	2	0	1	3	2
Generic - Coffee With 2% Milk, 12 oz	62	10	1	2	41	10
Oil - Olive, 2 tablespoon	239	0	27	0	1	0
Add Food Quick Tools	800	23	54	46	989	17
Lunch						
Sprouts - Raw Almonds (About 28 Almonds), 28 almonds	192	7	16	7	1	1
Avocado - Hass Medium), 1 medium avocado	250	13	23	3	10	0
Coors Lite - 12 oz - Beer, 12 oz	102	5	0	0	11	0
Tostitos - White Corn Tortilla Chips, 56 g (7 chips)	280	38	14	4	230	0
Add Food Quick Tools	824	63	53	14	252	1
Dinner						
Vegetable - Asparagus - Baked With Olive Oil & Seasoning, 8 medium stalks	66	6	4	5	105	0
Fresh Fish - Mahi Mahi, 4.2 oz	131	0	1	29	136	0
Add Food Quick Tools	197	6	5	34	241	0
Snacks						
Add Food Quick Tools						
Totals	1,821	92	112	94	1,482	18
Your Daily Goal	2,870	359	96	144	2,300	108
Remaining	1,049	267	-16	50	818	90
	Calories	Carbs	Fat	Protein	Sodium	Sugar

Wednesday, February 5, 2014

Breakfast	Calories	Carbs	Fat	Protein	Sodium	Sugar
Sprouts Farmers Market - Hot Italian Chicken Sausage - Ground, 4.2 oz	137	0	4	21	693	2
Spinach - Raw, 2 cup	14	2	0	2	47	0
Scrambled - Large Egg, 3 large egg, 61g	306	0	22	20	210	0
Generic - Onion Cooked White Medium, 4 OZ	47	13	0	1	7	5
Generic - Coffee With 2% Milk, 24 oz	124	20	3	3	82	20
Mushrooms - Sliced Raw From A 9 oz Pkg, 1.5 oz	10	1	0	1	18	1
Fresh - Bell Pepper, Red - Large, 0.5 pepper	26	4	0	1	4	4
Add Food Quick Tools	664	40	29	49	1,061	32
Lunch						
Chik Fil-a - Original Chicken Sandwich, 1 sandwich	440	41	18	28	1,390	5
Chik-fil-a - 12 Count Chicken Nuggets, 12 nuggets	400	15	19	41	1,590	2
Chik-Fil-A - Medium Coke, 15.3 oz	170	47	0	0	15	47
Add Food Quick Tools	1,010	103	37	69	2,995	54
Dinner						
Snowcat Subway - 12" Spicy Italian, Wheat, Bell Peppers, Banana Peppers, Onions, Pickles, Black Olives, Pepperjack, 1 Sandwich	890	87	42	36	2,770	12
Kroger - Red Wine Vinegar, 1/8 cup	3	0	0	0	0	0
Dos Equis Xx - Special Lager, 12 oz	130	9	0	0	10	0
Coca-Cola - 12oz Canned Regular Coke, 12 FL OZ (355 mL)	140	39	0	0	45	39
Add Food Quick Tools	1,163	135	42	36	2,825	51
Snacks						
Homemade - Red Velvet Cake With Cream Cheese Icing , 2 slice	260	46	16	6	440	0
Add Food Quick Tools	260	46	16	6	440	0
Totals	3,097	324	124	160	7,321	137
Your Daily Goal	2,870	359	96	144	2,300	108
Remaining	-227	35	-28	-16	-5,021	-29
	Calories	Carbs	Fat	Protein	Sodium	Sugar

Thursday, February 6, 2014

Breakfast	Calories	Carbs	Fat	Protein	Sodium	Sugar
Muscletech Six Star Pro Nutrition Elite Series - Whey Protein Powder, 1 Scoop	170	8	2	30	100	2
Coffee - Brewed from grounds, 0.5 cup (8 fl oz)	1	0	0	0	2	0
Lucerne - Whole Milk Vitamin D, 0.13 cup	20	2	1	1	16	2
Gala - Red Apple (Medium), 1 Apple	71	19	0	0	1	14
Bulk - Coconut, Dried Unsweetened, 2 TBS	100	5	9	1	5	1
Generic - Bosc Pear - Large Usda 09414, 1 large pear - 219 g	147	35	0	1	2	22
Add Food Quick Tools	509	69	12	33	126	41
Lunch						
Generic - Unsweetened Iced Black Tea, 16 fluid oz	4	1	0	0	14	0
Jack In the Box - Medium Root Beer, 32 oz	284	77	0	0	58	77
Minute Maid - Lemonade, 16 oz	220	58	0	0	70	54
Daphne's Greek Cafe - Gyro Plate With Fries, 1 plate	938	80	40	40	1,232	10
Add Food Quick Tools	1,446	216	40	40	1,374	141
Dinner						
Panda Express - Orange Chicken 78 g (Half Serving), 78 g	210	21	14	12	405	7
Panda Express - Steamed Rice 1/2 Portion, 4 oz	190	43	0	4	0	0
Add Food Quick Tools	400	64	14	16	405	7
Snacks						
Keurig - Tully's Italian Roast Extra Bold Coffee, 8 oz	2	0	0	0	0	0
Homemade - Red Velvet Cake With Cream Cheese Icing , 1 slice	130	23	8	3	220	0
Add Food Quick Tools	132	23	8	3	220	0
Totals	2,487	372	74	92	2,125	189
Your Daily Goal	2,870	359	96	144	2,300	108
Remaining	383	-13	22	52	175	-81
	Calories	Carbs	Fat	Protein	Sodium	Sugar

Friday, February 7, 2014

Breakfast	Calories	Carbs	Fat	Protein	Sodium	Sugar
Mushrooms - Sliced Raw From A 9 oz Pkg, 2.2 oz	15	1	0	1	26	1
Generic - Coffee With 2% Milk, 18 oz	93	15	2	2	62	15
Scrambled - Large Egg, 3 large egg, 61g	306	0	22	20	210	0
Sprouts Farmers Market - Hot Italian Chicken Sausage - Ground, 5.9 oz	192	0	6	30	974	3
Generic - Coffee With 2% Milk, 15.96 oz	82	13	2	2	55	13
Add Food Quick Tools	688	29	32	55	1,327	32
Lunch						
Add Food Quick Tools						
Dinner						
Bun Bo Nuong - Vietnamese Grilled Beef With Vermicelli, 1 Bowl	800	33	37	84	930	6
Diet Coke - Can, 1 Can	0	0	0	0	40	0
Add Food Quick Tools	800	33	37	84	970	6
Snacks						
Trader Joe's - Dry Roasted Unsalted Almonds, Per Almond, 90 almond	630	15	38	18	0	3
Kroger - Extra Sharp Cheddar Cheese, 3 oz	330	2	27	21	540	0
Beer - Tecate, 12 oz.	138	12	0	0	0	0
Homemade - Sweet Iced Tea, 2 cup	192	0	0	0	0	0
Generic - Green Olive-Large, 4 green olives large	40	1	1	0	112	2
Costco - Pita Pal Organic Spicy Roasted Red Pepper Hummus, 2 tbsp	70	8	4	3	75	1
Chip - Tortilla Chips, 6 chips	93	11	5	1	80	0
Add Food Quick Tools	1,493	49	75	43	807	6
Totals	2,981	111	144	182	3,104	44
Your Daily Goal	2,870	359	96	144	2,300	108
Remaining	-111	248	-48	-38	-804	64

	Calories	Carbs	Fat	Protein	Sodium	Sugar

Saturday, February 8, 2014

Breakfast	Calories	Carbs	Fat	Protein	Sodium	Sugar
Scrambled - Large Egg, 3 large egg, 61g	306	0	22	20	210	0
Generic - Bosc Pear - Large Usda 09414, 1 large pear - 219 g	147	35	0	1	2	22

Bulk - Coconut, Dried Unsweetened, 3 TBS	150	8	14	2	8	2
Gala - Red Apple (Medium), 1 Apple	71	19	0	0	1	14
Muscletech Six Star Pro Nutrition Elite Series - Whey Protein Powder, 1 Scoop	170	8	2	30	100	2
Ham - Honey, smoked, cooked, 53.9 g	66	4	1	10	485	0
Add Food Quick Tools	910	74	39	63	806	40
Lunch						
Gala - Red Apple (Medium), 1 Apple	71	19	0	0	1	14
Mushrooms - Sliced Raw From A 9 oz Pkg, 2 oz	13	1	0	1	23	1
Fresh - Bell Pepper, Red - Large, 0.5 pepper	26	4	0	1	4	4
Spinach - Raw, 3 cup	21	3	0	3	71	0
Avocado - Hass Medium), 1 medium avocado	250	13	23	3	10	0
Roma Tomato, Sliced/chopped - Roma Tomato (Per Nutritiondata.self.com), 62 g	11	2	0	1	3	2
Shamrock Farms - Reduced Fat Milk (2%) 236ml (8 oz), 2 Cup (240ml)	240	24	9	16	240	24
Generic - Coffee With 2tbsp Creamer, 10 oz	72	6	6	4	0	12
Add Food Quick Tools	704	72	38	29	352	57
Dinner						
Mimi's Cafe - Dinner Roll, 2 Dinner Roll	308	52	6	8	550	2
Mimi's Cafe - Chicken Pot Pie (Per Website), 1 pie	1,300	122	66	54	2,756	15
Mimi's Cafe - - Les Artichokes Frites (6.5 Oz), 6.5 oz	600	28	49	11	770	2
Mimi's Cafe - Petite Triple Chocolate Brownie, 2.9 oz	276	40	12	4	145	32
Add Food Quick Tools	2,484	242	133	77	4,221	51
Snacks						
Generic - Chopped Beef / Brisket Sandwich, 1 sandwich w/bun	341	31	49	34	816	7
Brown Wood Farms - Cherry Barbecue Sauce, 3 Tablespoon	165	51	0	3	270	21
Beans - Baked, home prepared, 1 cup	382	54	13	14	1,068	0
Coleslaw - Coleslaw, 1 cup	90	14	4	1	120	11
Add Food Quick Tools	978	150	66	52	2,274	39
Totals	5,076	538	276	221	7,653	187
Your Daily Goal	2,870	359	96	144	2,300	108
Remaining	-2,206	-179	-180	-77	-5,353	-79
	Calories	Carbs	Fat	Protein	Sodium	Sugar

Sunday, February 9, 2014

Breakfast	Calories	Carbs	Fat	Protein	Sodium	Sugar
Trader Joe's - Dry Roasted Unsalted Almonds, Per Almond, 60 almond	420	10	25	12	0	2
Generic - Coffee With 2% Milk, 12 oz	62	10	1	2	41	10
Add Food Quick Tools	482	20	26	14	41	12
Lunch						
Subway - 12" Oven Roasted Chicken Breast on 9 Grain Wheat. - Pepper Jack and All Veggies Except Black Olives and Cucumbers, With No Dressing., 12 inch sandwich	730	94	17	52	2,000	14
Add Food Quick Tools	730	94	17	52	2,000	14
Dinner						
Homemade - Beef or Calf Liver & Onions, 4 ounces	211	12	5	29	464	3
Add Food Quick Tools	211	12	5	29	464	3
Snacks						
Add Food Quick Tools						
Totals	1,423	126	48	95	2,505	29
Your Daily Goal	2,870	359	96	144	2,300	108
Remaining	1,447	233	48	49	-205	79
	Calories	Carbs	Fat	Protein	Sodium	Sugar

Figure 1

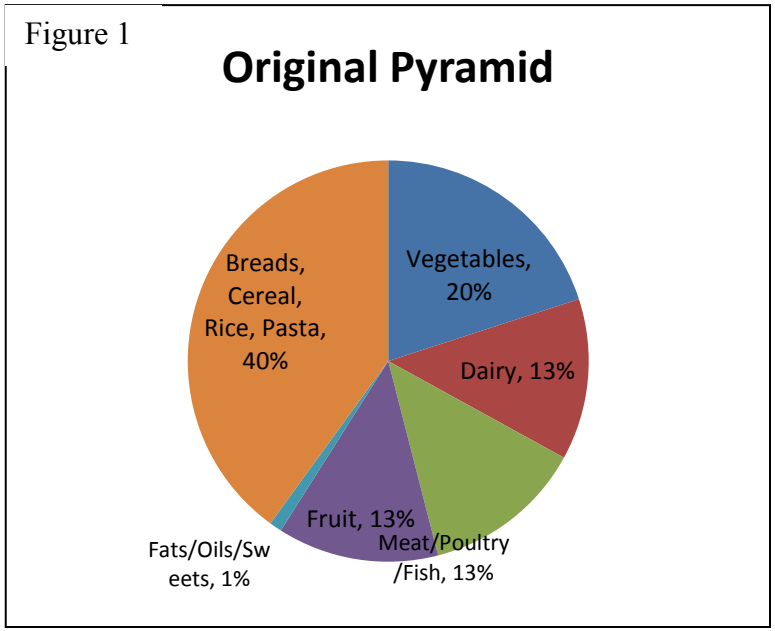


Figure 2

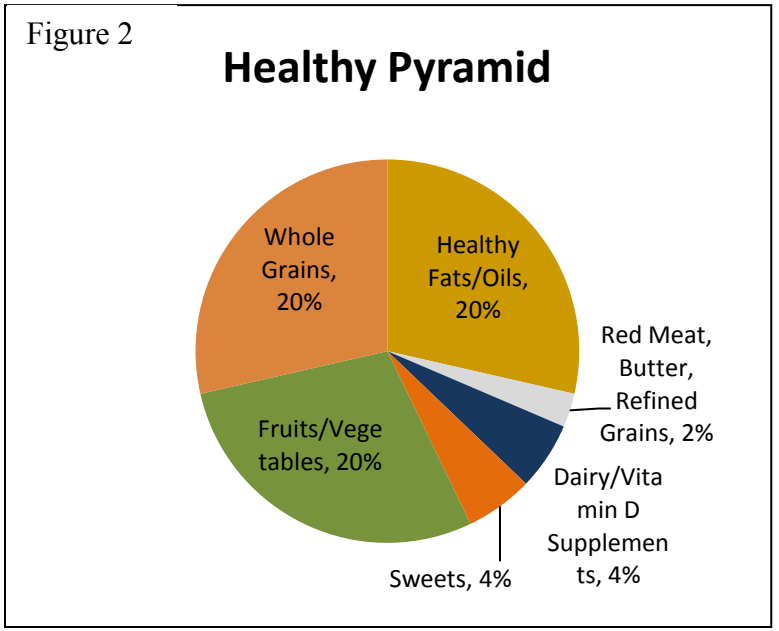
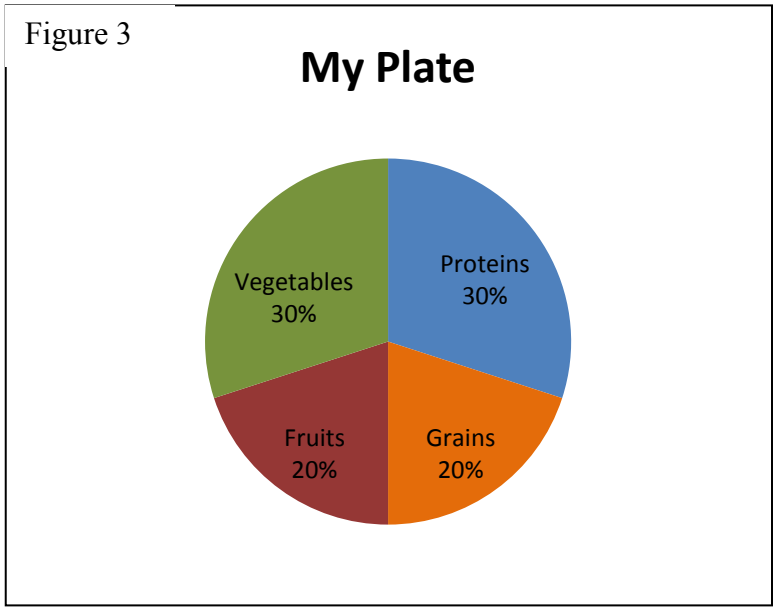
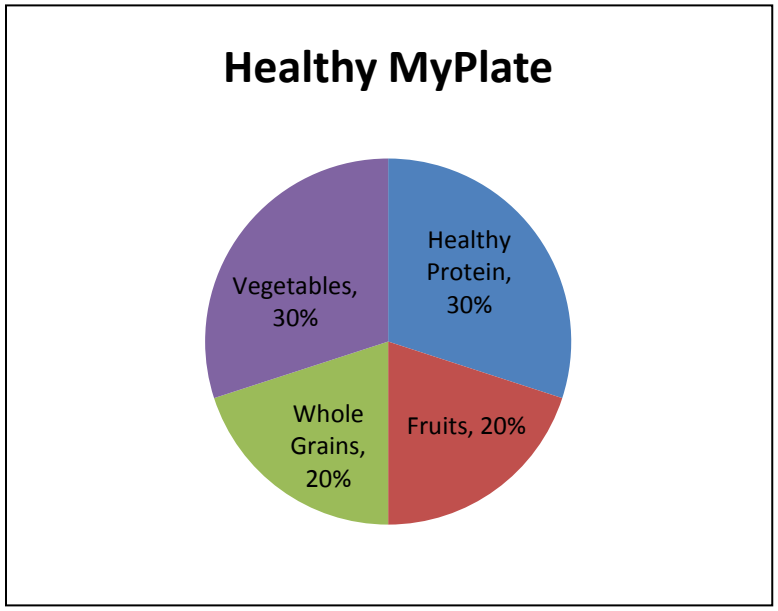
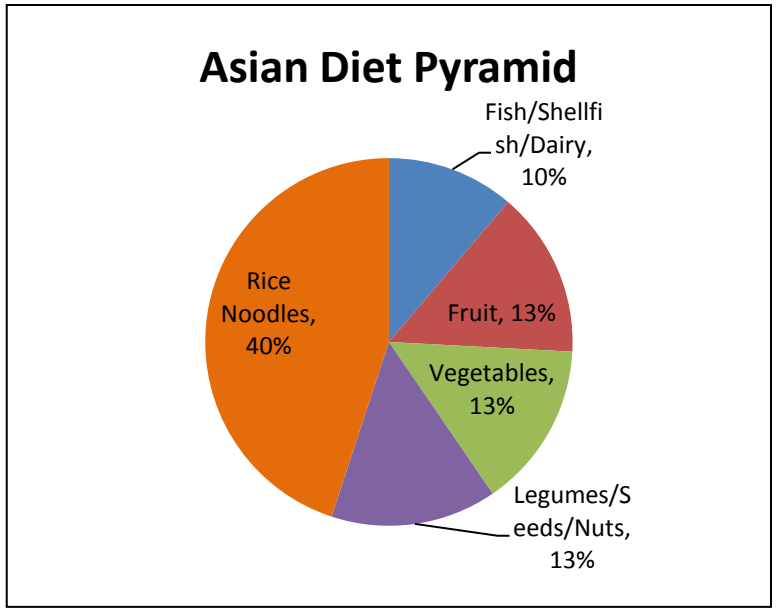
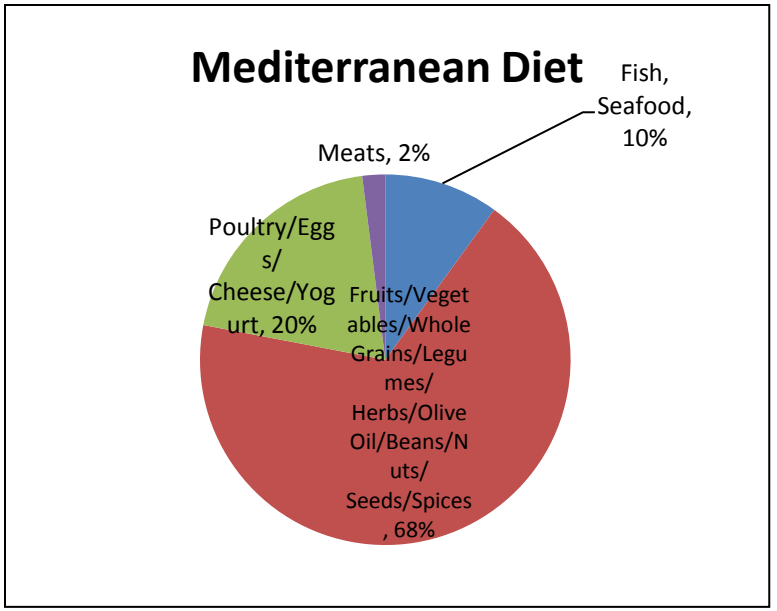


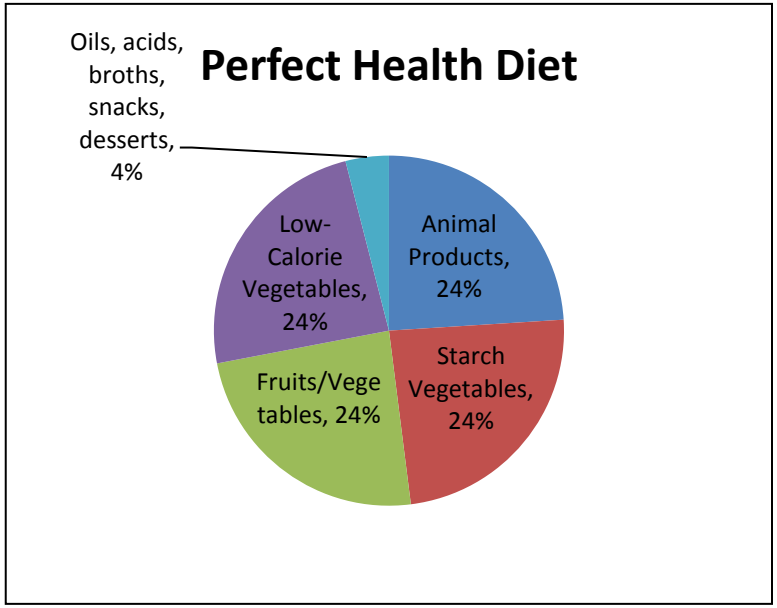
Figure 3

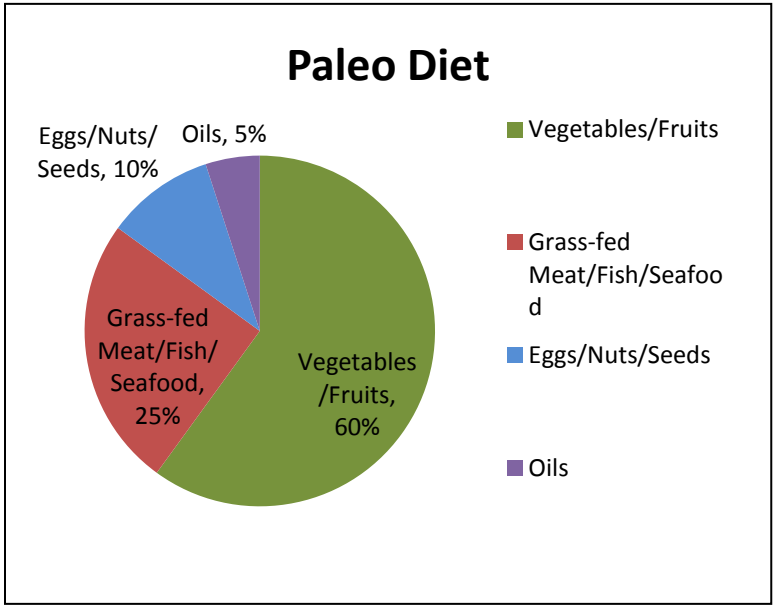


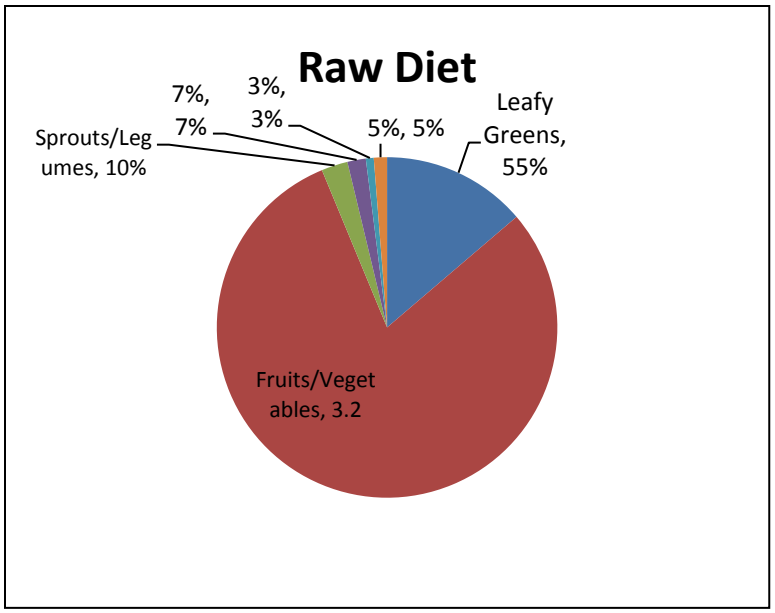


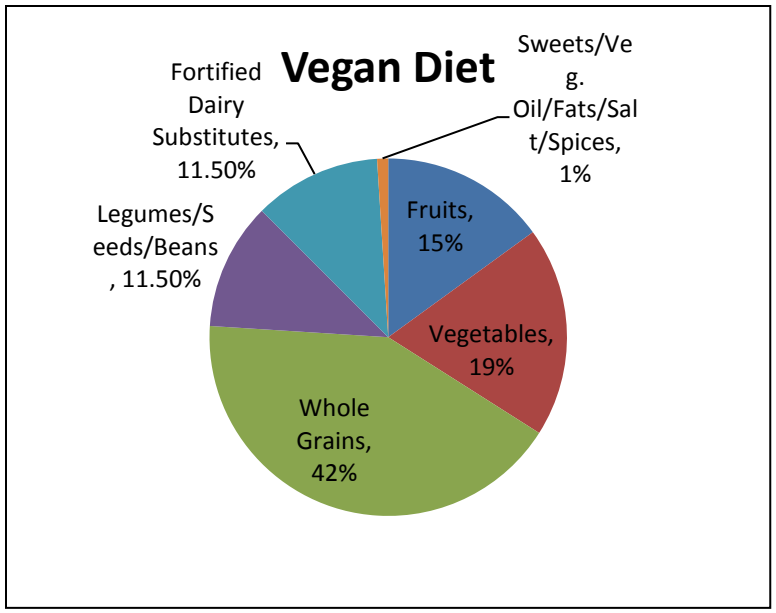

Asian Diet Pyramid
Fish/Shellfish/Dairy, 10%
Fruit, 13%
Vegetables, 13%
Legumes/Seeds/Nuts, 13%
Rice Noodles, 40%


Mediterranean Diet
Fish, Seafood, 10%
Meats, 2%
Poultry/Eggs/Cheese/Yogurt, 20%
Fruits/Vegetables/Whole Grains/Legumes/Herbs/Olive Oil/Beans/Nuts/Seeds/Spices, 68%


Perfect Health Diet
Oils, acids, broths, snacks, desserts, 4%
Low-Calorie Vegetables, 24%
Animal Products, 24%
Fruits/Vegetables, 24%
Starch Vegetables, 24%


Paleo Diet
Eggs/Nuts/Seeds, 10%
Oils, 5%
Grass-fed Meat/Fish/Seafood, 25%
Vegetables/Fruits, 60%
Vegetables/Fruits
Grass-fed Meat/Fish/Seafood
Eggs/Nuts/Seeds
Oils


Raw Diet
7%, 7%
3%, 3%
5%, 5%
Leafy Greens, 55%
Sprouts/Legumes, 10%
Fruits/Vegetables, 3.2


Vegan Diet
Fortified Dairy Substitutes, 11.50%
Sweets/Veg. Oil/Fats/Salt/Spices, 1%
Legumes/Seeds/Beans, 11.50%
Fruits, 15%
Vegetables, 19%
Whole Grains, 42%