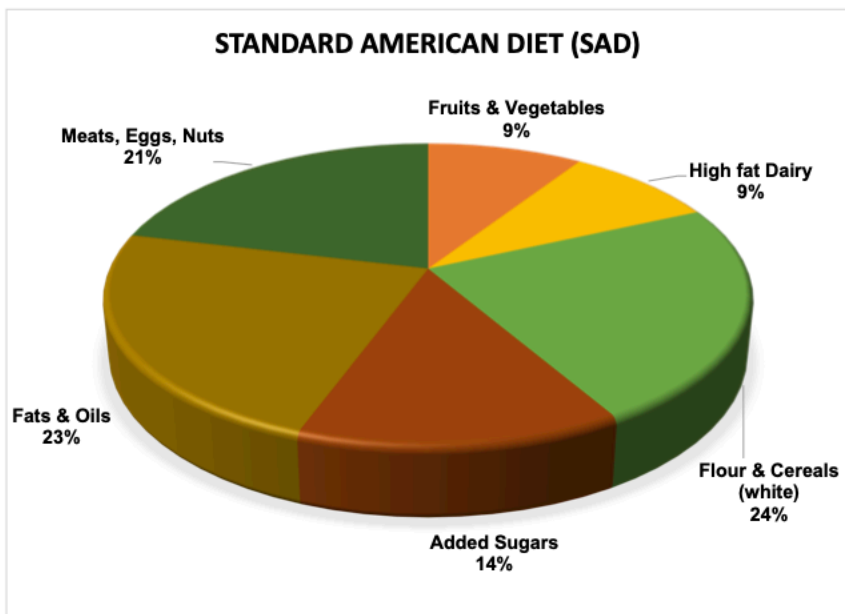


portions because they believe a good value is the largest size possible at the cheapest price, also known as supersizing. There is too often little or no consideration of the nutritional value. The combination of consumers purchasing super-sized food products and food manufacturers continually improving the efficiency of the production of those foods (via mechanization), leads to a further and further shift in our culture to consume cheap, unhealthy foods. The Standard American Diet (SAD) is associated with an increased caloric consumption. Compared to the 1970 SAD, the 2010 SAD consisted of less beef, more chicken, less whole milk and ice cream, triple the cheese, fewer vegetables, more corn-derived sweeteners; triple the cooking oil, and 26% more grain foods – primarily in the form of pastries and other baked goods (DeSilver, 2016).

According to the most recent statistics available, the relative proportions of food types in the Standard American Diet (SAD) are: 9.2% fruits and vegetables; 9% high fat dairy; 23.4% grain and cereal products; 14% added sugars; 23.2% added fats and oils; and 21.2% meats, eggs, and nuts (DeSilver, 2016). Refer to **Figure 5-3.1. Standard American Diet (SAD)**. Also, refer to **Figure 5-3.2. Healthy vs Sad Gut**, a gibe at the Standard American Diet (SAD). The average adult's SAD has significantly increased in calories, from 2020 calories in 1970 (DeSilver, 2016), to 2360 calories in 1983 (Campbell et al, 1998), and to 2480 calories in 2010 – the most recent year measured (DeSilver, 2016). Because obesity is increasing in the USA (ODPHP, 2020a), I would venture the average caloric intake has continued to climb.

**Figure 5-3.1. Standard American Diet (SAD)**



## CHINA DIET (AKA WHOLE-FOOD, PLANT-BASED DIET)

The China Project (which was conducted by Cornell University via lead investigator Campbell, the Chinese Academy of Preventative Medicine via lead investigator Chen, and the Oxford University) investigated and compared the healthful effects of the plant-based diet of the people indigenous to China and the Standard American Diet (SAD) (Root, 2015). The China Project found the daily SAD consisted of 36% fat, 42% carbohydrate, 7% alcohol, 5% plant protein, and 10% was animal protein; while the average daily rural China diet, akin to the WFPBD, consisted of 14% fat, 71% carbohydrate, 5% alcohol, 9% plant protein, and 1% was animal protein (Campbell et al, 1998). Refer to **Figure 5-4.1. Macronutrient Composition of SAD vs WFPBD**. It further found the daily SAD consisted of 2,360 calories and 11 grams of fiber, while the average daily rural China diet, or the WFPBD, consisted of 2,630 calories and 33 grams of fiber – and, the mean body mass index (BMI) was 20.5 in rural China and 25.8 in the USA (Campbell et al, 1998). Refer to **Figure 5-4.2. SAD vs WFPBD Caloric Intake**

and **Figure 5-4.3. SAD vs WFPBD Fiber Intake**. In terms of effects of the two diets on health, the SAD was associated with increased chronic diseases and mortality, while the China / WFPBD was associated with better health and longevity (Campbell et al, 1998). For instance, the mean serum total cholesterol was 203 mg/dL on the SAD (specifically, adults aged 20-74 in the USA) and 127 mg/dL on the WFPBD (specifically, people living in rural China); coronary artery disease (CAD) was 16.7-fold greater for SAD men and 5.6-fold greater for SAD women than their WFPBD counterparts; and CAD mortality was inversely related with the frequency of consumption of green vegetables (Campbell et al, 1998). One broad conclusion of the study was the risk of CAD is positively related to animal-based foods and negatively correlated with consumption of plant-based foods (Campbell et al, 1998). Since the original China Project publications, copious trials have investigated the health benefits of the WFPBD – and some of this research is provided and discussed in ‘Section 4: Benefits of Plant Based Diets.’

**Figure 5-4.1. Macronutrient Composition of SAD vs WFPBD**

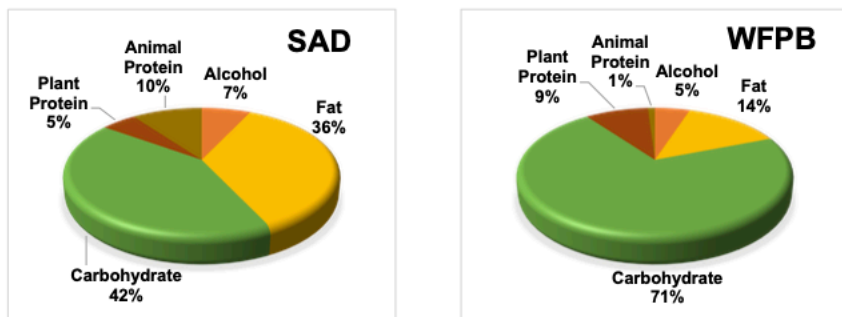
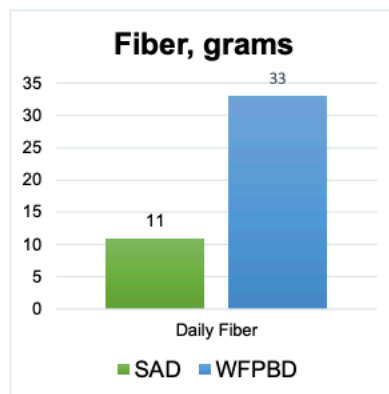


Figure 5-4.2. SAD vs WFPBD Caloric Intake



Figure 5-4.3. SAD vs WFPBD Fiber Intake



Before we discuss the various plant-based (aka vegetarian) diets, we will examine our definition of WFPBD. According to the T. Colin Campbell Center for Nutrition Studies:

- “The **whole-food, plant-based diet (WFPBD)** doesn’t include any meat, poultry, fish, dairy, or eggs. It’s not, however, a **vegan diet**, which is defined only by what it eliminates. A WFPBD is defined also by what it emphasizes: a large variety of whole foods.
- The terms “**whole**” in WFPBD describes foods that are minimally processed. This includes as many whole grains, fruits, veg-

etables, and legumes as you want. It also includes, in moderation: nuts, seeds, avocados, natural sweeteners, and certain soy or wheat products that don’t contain added fat (e.g., tofu).

- Heavily **processed** foods, on the other hand, are not included in a WFPBD. This means avoiding highly refined grain products (e.g., white rice, white flour), foods containing added sugars or artificial sweeteners (e.g., confectioners’ sugar, high fructose corn syrup), and foods containing added fat. Yes, even olive oil” (Huber-Distal, 2021, para2-4).

## PLANT-BASED DIET / VEGETARIAN DIET

The **plant-based diet** and the **vegetarian diet** are synonymous, and differ from the WFPBD in that they do *not* require foods to be healthy. In other words, refined foods (e.g., white rice), processed foods (e.g., French fries), and ‘junk foods’ (e.g., cake and candy) *are* allowed. This type of diet is sometimes referred to as the ‘**anything but animal**’ (ABA) diet. The WFPBD is superior not only to the Standard American Diet (SAD), but also to the ABA diet.

For instance, one large scale (almost 5 million person-years of follow-up) Harvard study, found a plant-based diet intervention reduced the risk of coronary artery disease (CAD), but *only* if healthful plant-foods (such as whole grains, fruits, vegetables, nuts, legumes, and oils) were selected rather than less healthy plant-foods (such as sweetened beverages, refined grains, French fries, candy, sweets) (Satija et al, 2017). Further, dietary patterns with less

## PLANT-BASED DIET AND CARDIOVASCULAR DISEASES (CVDs)

Excessive dietary fat consumption, as in the Standard American Diet (SAD), contributes to **cardiovascular diseases (CVDs)**, including hypercholesterolemia, atherosclerotic heart disease of native coronary artery / coronary artery disease (CAD), angina, hypertension (HTN), and stroke. In contrast, the whole-food, plant-based diet (WFPB) diet decreases the risk of CVD (Kahleova et al, 2018; Patel et al, 2017; Tuso et al, 2013) and can lessen the severity of and even reverse or 'cure' certain CVDs (Esselstyn et al, 2014; Tuso et al, 2013). Research indicates that when the WFPBD is utilized by CVD-compromised individuals, it significantly decreases LDLs and total cholesterol (Jenkins et al, 2003c; Yokoyama et al, 2017). A specific type of WFPBD, the Portfolio diet (a diet that contains almonds or is low in saturated fat or is high in plant sterols, soy proteins or high in viscous fibers), improves the LDL: HDL cholesterol ratio and reduces LDL cholesterol to the extent that in lovastatin, a 'go-to' anti-hypercholesterolemia medication, are no longer necessary (Jenkins et al, 2003s; Jenkins et al, 2005). Remarkably, the WFPBD has been found to actually *reverse* CVD (Esselstyn et al, 2014). The suggested mechanism may lie in the lower consumption of saturated fat, heme-iron, and trimethylamine N-oxide (TMAO), which is a compound produced by the and converted in the liver after high choline consumption of foods like red meat, eggs, and fish (Esselstyn et al, 2014). The ability of the WFPB diet to lower weight, reduce waist circumference, and lower total cholesterol results in improved cardiovascular health (Morin et al, 2019), CAD risk reduction by 40% (Kahleova et al, 2018; Patel et al, 2017), and reduced ischemic heart disease mortality (Crowe et al, 2013). The WFPBD also reduces the prevalence of HTN (Orlich & Fraser, 2014; Dinu et al, 2016), and better controls blood pressure in those with HTN (Lubitz et al, 2016; Pettersen et al, 2012) – even better than the DASH diet (Pettersen et al, 2012). In Pettersen's (2012) study of participants with HTN, the WFPBD reduced mean systolic blood pressure by 6.9mm of Hg. Further, they had a lower odds ratio ( $or=0.37$ ) of HTN than that of lacto-

ovo vegetarians ( $or=0.57$ ), flexivevegetarians ( $or=0.97$ ), and omnivores ( $or=1.0$ ). Logically, the WFPBD as a treatment modality to prevent and help manage HTN reduces the risk of stroke. Afterall, HTN, CAD, obesity, and heavy alcohol use are some of the largest contributors to stroke risk – and each of these factors are closely related to proper nutrition and diet (Pettersen et al, 2012).

A case study authored by Massera (et al, 2015) perfectly illustrates the power of the WFPB on CVDs. Massera reported on a 60-year-old man who presented to his physician with typical angina and had a positive stress test. The patient declined invasive testing and drug therapy, but agreed to replace his prior 'healthy' diet (which consisted of fish, skinless chicken, and low-fat dairy with some nuts, fruits, and vegetables) with a WFPBD consisting primarily of vegetables, whole grains, fruits, potatoes, legumes, beans, and nuts. Following four months on the WFPBD, the patient's BMI dropped from 26 to 22 kg/m<sup>2</sup>, his LDL cholesterol dropped from 158 to 69 mg/dL, his blood pressure normalized, and he could now ambulate one mile without angina. After two years on the WFPBD, the patient remained asymptomatic and was able to jog more than four miles without incident. Massera and his colleagues (2015) concluded that adoption of a WFPBD should be among the first recommendations given to patients with atherosclerosis.

**Application to physical therapy:** In the form of a Brief Teach, a physical therapist can provide basic information to patients with CVD about the WFPBD encourage them to speak with their physician about adopting a plant-based diet.

