WHOLE FOOD, PLANT-BASED DIETS

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EAT LIKE A CHAMPION

Optimal athletic performance and health are dependent on many key factors such as rest, exercise and nutrition (17,18,19). Sports champions such as LeBron James, and Olympic Gold medalists like Michael Phelps, Simone Biles, and Usain Bolt, must all balance healthy lifestyle habits in order to achieve peak performance. The same underlying principles used by professional athletes can be leveraged by anyone (17). Any age or gender can reap the benefits of a strategically aligned fitness plan.

Although a person's spiritual, mental, emotional, social, and physical health are all tied closely together, healthy eating habits are essential. One nutrition strategy gaining the attention of athletes, coaches, and the medical community is a whole food, plant-based diet. This diet claims it has the potential to improve both athletic performance and overall health (4,10,20). A careful evaluation of this diet is warranted based on its growing popularity. In a research book entitled, "The China Study," Colin Campbell and Thomas Campbell II suggest eating "a whole foods, plant-based diet, which minimizes the consumption of refined foods, added salt, and added fat," (3). They encourage foods such as fruits, vegetables, legumes, mushrooms, nuts, and whole grains; suggest minimizing refined carbohydrates, added vegetable oils and fish; and recommend avoiding meat, poultry, dairy, and eggs (Table 1).

The whole food, plant-based diet is slightly different from the three main variations of a vegetarian-eating plan: lacto-ovo-vegetarian (no meat), lacto-vegetarian (no meat or eggs), or vegan (no meat, eggs or dairy) (7). A whole food, plant-based diet stipulates that added fat and refined sugar be minimized.

PLANT-BASED DIET – BENEFITS

As with any type of diet however, it is important to weigh the pros and cons in an effort to determine if a whole food, plant-based diet is a nutritious and effective option for athletes. This is a difficult task considering that expert nutrition research scientists do not always agree on the basic components of a healthy diet (30). Furthermore, dietary research is hampered by environmental control. Some studies do not have full monitoring surveillance over participants (21).

Limited research exists on a whole food, plant-based diet and athletic performance, but considerable evidence exists on vegetarian diets. Vegetarian diets are considered safe and effective for athletes by the Academy of Nutrition and Dietetics and in some situations, may improve athletic performance (7,9). The American College of Sports Medicine (ACSM) also supports a vegetarian diet for athletes (27). Other researchers have hypothesized that a vegan diet enhances the immune system from eating adequate micronutrients. Through their experience working with amateur and professional athletes, they noted that the vegan diet was often chosen by athletes in an attempt to improve immunocompetence (9).

Further evidence has indicated that a vegetarian diet may specifically enhance long-duration aerobic endurance

performance. In 1893, two vegetarians were the first to complete a 599-km walking race from Berlin, Germany to Vienna, Austria (22). Also, Native Americans of northwestern Mexico (Tarahumara) have been reported to possess unprecedented stamina (1,5,11). They play a game called raripuri, which involves kicking a wooden ball 150 – 300 km. It is thought that their diet was the primary means by which they achieved such remarkable endurance. They mainly ate corn and beans for about 90% of their total diet; they also ate a few greens, squash, 2 – 3 eggs per week, and very small servings of meat, fish, poultry, dairy, and lard making up the other 10% of their total diet (1,5,6,11,22). Other studies also support the effectiveness of a vegan diet on enhanced cardiovascular performance (9,12,13).

The research that does exist on a whole food, plant-based diet has been done almost exclusively in clinical settings. Several studies show evidence that eating this way can minimize the chance of stroke, obesity, hypertension, type 2 diabetes, cancer, heart disease, arthritis, cataracts, Alzheimer's disease, impotence, and mortality when compared to the typical American diet, which includes meat products, high fat intake, and high sugar intake (8,21,28,31,34). It has also been reported to actually reverse heart disease, cancer, and diabetes (8,16,23). Another piece of evidence supporting a plant-based diet is found in a review article by Caldwell Esselstyn (Figure 1) (8). Here, he shows a picture of a coronary artery before (A), which is thin and constricted, and after 32 months of a whole food, plant-based diet (B), which is thick and expanded (8). This thick and expanded change is a dramatic improvement in coronary artery function and structure.

FIGURE 1. COMPARISON OF CORONARY ARTERY BEFORE AND AFTER WHOLE FOOD, PLANT-BASED DIET (8)

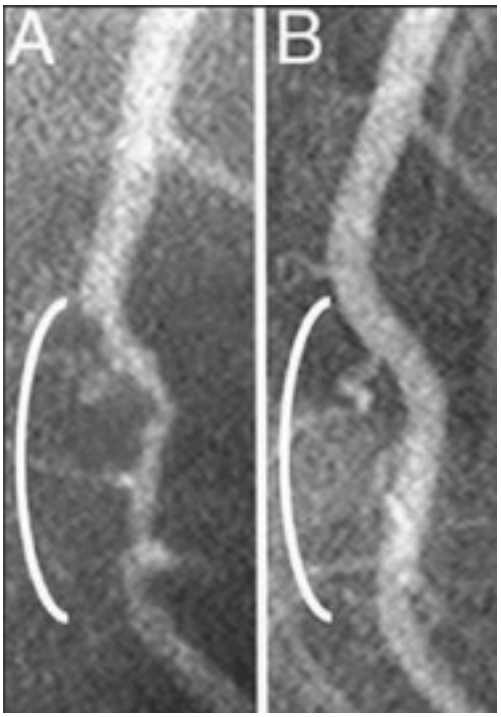

TABLE 1. WHOLE FOOD, PLANT-BASED DIET FOOD EXAMPLES

RECOMMENDATION	GENERAL CATEGORY	SPECIFIC EXAMPLES
Add	Fruits	Orange, okra, kiwi, red pepper, apple, cucumber, tomato, avocado, zucchini, blueberries, strawberries, green peppers, raspberries, butternut squash, pumpkin, blackberries, mangos, eggplant, pear, watermelon, cranberries, acorn, squash, papaya, grapefruit, and peach
	Flower vegetables	Broccoli and cauliflower (not many of the huge variety of edible flowers are commonly eaten)
	Stems and leaf vegetables	Spinach, artichokes, kale, lettuce (all varieties), cabbage, Swiss chard, collard greens, celery, asparagus, mustard greens, Brussels sprouts, turnip greens, beet greens, bok choy, arugula, Belgian endive, basil, cilantro, parsley, rhubarb, and seaweed
	Root vegetables	Potatoes (all varieties), beets, carrots, turnips, onions, garlic, ginger, leeks, radish, and rutabaga
	Legumes (seed bearing nitrogen fixing plants)	Green beans, soybeans, peas, peanuts, adzuki beans, black beans, black-eyed peas, cannellini beans, garbanzo beans, kidney beans, lentils, pinto beans, and white beans
	Mushrooms	White button, baby bella, cremini, portobello, shiitake, and oyster
	Nuts	Walnuts, almonds, macadamia, pecans, cashew, hazelnut, and pistachio
	Whole grains (in breads, pastas, etc.)	Wheat, rice, corn, millet, sorghum, rye, oats, barley, teff, buckwheat, amaranth, quinoa, kamut, and spelt
Minimize	Refined carbohydrates	Pastas (except whole grain varieties), white bread, crackers, sugars, and most cakes and pastries
	Added vegetable oils	Corn oil, peanut oil, and olive oil
	Fish	Salmon, tuna, and cod
Avoid	Meat	Steak, hamburger, and lard
	Poultry	Chicken and turkey
	Dairy	Cheese, milk, and yogurt
	Eggs	Eggs and products with a high egg content (e.g., mayonnaise)

Studies have reported the health benefits from a whole foods plant based diet. Chinese people who followed a whole food, plant-based diet had very low incidences of coronary artery disease (3,4). Comparably, those following the typical American diet (high in animal protein) showed a 16.7 greater chance of death from coronary artery disease (4). A few studies have indicated that there may be a link between animal protein and cancer (15,29,35,37). It has been reported that higher levels of animal protein (20%) were harmful and promoted liver cancer in rats, while lower levels (5%) were beneficial (25,35,36). However, these studies have not been replicated in humans.

PLANT NUTRITION STUDIES – LIMITATIONS

On the other hand, there is evidence that suggests a vegetarian, vegan, and whole food, plant-based diet may not be the gold standard. Moderation and variety may actually be a safer eating strategy. Some research shows that those who follow a vegetarian, vegan, or whole food, plant-based diet have lower intakes of vitamin B-12, calcium, vitamin D, zinc, omega-3 fatty acids, creatine levels, riboflavin, iron, lysine, threonine, tryptophan, and methionine (2,7,14,32). It has also been found that vegan and whole food, plant-based diets might not provide the high-quality protein that meat or dairy does, which might negatively affect endurance performance (13). One research study showed that VO_2 was significantly higher at 40, 60, and 80% of VO_2max cycling performance after eating vegan protein, indicating that animal protein provides more energy (12). As a result, proponents of vegan diets suggest an increase of 10% plant protein intake for athletes and people doing regular exercise (27).

ENVIRONMENTAL CONSIDERATIONS

Environmental concern also might affect diet choice. According to some predictions, it may eventually become difficult, or impossible, to feed the worlds growing population on a meat-based diet. This is because a cow needs to eat 11 lb of grain feed for it to gain one pound of meat. For instance, if the grain were eaten by humans as bread, cereal, or pasta, it would provide 11 times as much food as it would to feed it to a cow. To put things into perspective, the grain fed to livestock each year in the United States could instead be used to feed 840 million people (24). Currently 9 billion livestock are needed each year to feed 316 million people. The livestock population outweighs the human population in the United States 5 to 1 (24).

PRACTICAL APPLICATION

In summary, optimal health and athletic performance are greatly affected by many factors. Four powerful controllable factors include rest, exercise, diet, and overall lifestyle. Perhaps the most dramatic modification one can make to improve athletic performance and overall health is altering food intake. However, before adopting a vegan or whole food, plant-based diet, it would be wise to consult with a physician or other qualified healthcare professional. Any restrictive eating practices must be carefully monitored to ensure that all required nutrient intake is met (33). By following the guidelines of the American Dietetic Association, a vegan or whole food, plant-based diet can be a viable option for athletes as well as non-athletes to maintain health, support athletic performance, and positively impact the environment (7,26).

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