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Choosing the healthiest diet for a single day: A literature review

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Abstract
The aim of this study was to systematically review the range, nature, and extent of current research activity exploring the influence of diet on health. The problem is most people are too limited in their knowledge about nutrition to stay healthy for their lifetime. Also, this literature review has wider implications in scientific research by assembling the latest information from several epidemiological and experimental studies on the agents found in nutrients that theoretically lower incidence of type 2, cardiovascular disease (CVD), and cancer. Many relevant theories on the mechanisms behind these protective effects will be in one convenient location for all to study. The research question: If a person wanted to consume the healthiest diet possible for one day, what type and how much nutrients should they choose?

Keywords: balanced diet, adequacy, green leafy vegetables, cruciferous vegetables, isothiocyanates

1. Introduction

Instructing in nutrition and diet therapy for seven years, it is astonishing just how little students and the general population know about consuming a healthy diet. Daily food choices impact health and cumulative effects over years and decades become even a more significant influence on health. Positive nutritional choices can help to enhance health for a lifetime and poor nutritional choices, on daily basis, increase risks of developing disease. There many factors that influence people's food choices such as habit, social interactions, age, body image, taste preferences, ethnicity, and emotional state of mind. However, the most important reason to choose your daily essential nutrients is to enhance health for a lifetime. Out of the six leading causes of death in the United States (US), four are nutrition related which includes heart disease, cancers, strokes, and diabetes mellitus [1]. It has been shown in several peer-reviewed manuscripts that consuming certain fruits and vegetables, especially green leafy vegetables (GLF), will significantly reduce the incidences of these four deadly diseases [2, 3, 4, 5, 6]. Individual's diets should include a variety of nutrient-dense foods with intake being adequate, balanced, and kilocalorie (shortened to calorie in the US) controlled via moderation. People are wise to think of "health and nutrition" when making food choices and selections. Essential nutrients must be obtained from food sources because body production cannot yield sufficient amounts to meet need. The six essential nutrients are carbohydrates, proteins, fats, vitamins, minerals, and water. With only carbohydrates and protein containing 4 calories (cal) /gram (g), fats containing 9 cal/g, and the remaining nutrients containing no cal [7]. People should try to consume a higher nutrient-dense diet which is more essential nutrients and fewer cal per meal. This diet provides all the essential nutrients, fiber, and energy necessary to maintain health and a healthy body mass index (BMI). Each meal during the day should be well balanced with all the essential nutrients included. Recommended daily percentages of energy-yielding macronutrients are carbohydrates (45-65% of total cal), fats (20-35% of total cal), and proteins (10-35% of total cal) [8]. Try to eliminate saturated and trans-fatty acids from the diet because these two fats have been linked to heart disease [9, 10], and keep intake of cholesterol to <300 milligrams (mg) per day [11]. High blood low density lipoprotein (LDL) cholesterol concentration is a predictor of the likelihood of fatal heart attack or stroke, and high saturated fat and high trans-fat intakes are the main dietary factors associated with elevated blood LDL cholesterol levels [12]. Hydrated red meat, poultry, fish, legumes, eggs, and nuts should be kept to 140 to 200 g (5 to 7 ounces) per day, selected from lean or low-fat choices, and prepared with little or no added fat [11]. Fiber-rich carbohydrates should predominate in the diet with empty-cal foods (containing added sugar) kept at a minimum. Studies have shown that increasing dietary fiber protects against colon cancer [6, 13].

The aim of this study was to systematically review the range, nature, and extent of current research activity exploring the influence of diet on health. The problem is most people are too limited in their knowledge about nutrition to stay healthy for their lifetime. Also, this literature review has wider implications in scientific research by assembling the latest information from several epidemiological and experimental studies on the agents found in nutrients that theoretically lower incidence of type 2, cardiovascular disease (CVD), and cancer. Many relevant theories on the mechanisms behind these protective effects will be in one convenient location for all to study. The research question: If a person wanted to consume the healthiest diet possible for one day, what type and how much nutrients should they choose?

2. Literature Review

2.1 Carbohydrates

Fruits and vegetables, citrus fruits, cantaloupe, strawberries, Brussels sprouts, broccoli, and potato are all nutritious

carbohydrates that are especially high in vitamin C [11]. Green leafy and cruciferous vegetables are high in folate which is needed in cell growth and to prevent neural tube defects such as Spina bifida [14]. Purchased spaghetti, rice, flour, and other grains should be enriched with folic acid (an absorbable synthetic form of folate), iron, thiamine, and riboflavin [15]. Other good sources of folate are legumes, oranges, orange juice, and cantaloupe [1]. Iron is critical to prevent anemia and improve brain development, especially in the embryo, fetus, infant, and children [16]. It is critical that sexually active and pregnant women get 27 mg of iron daily to prevent irreversible brain damage, however, adult men only need 8 mg/day [1]. Remember, vitamin C eaten at the same meal triples iron absorption [17]. Some fortified cereals contain >10 mg of iron per 75 g (1/2 cup) of cereal (read the food labels) [1].

GLV such as spinach, turnip greens, mustard greens contain vitamins, minerals, and phytochemicals that may reduce the incidence of cancer, and these same GLV are high in Vitamin C, Vitamin E, Vitamin K, and Vitamin A [3, 4, 5, 6]. There are potentially thousands of phytochemical compounds from extracts of plant roots, leaves, and stems that have shown promising potential as anticancer drugs, or for serving as lead compounds in the synthesis of new drugs [1, 6]. Cruciferous vegetables (CV) are from the family *Cruciferae* which are widely cultivated, with many genera, species, and cultivars being raised for food production such as cauliflower, cabbage, cress, bok choy, broccoli, kale, collard greens and similar leafy vegetables and their roots such as turnips and radishes [1, 4]. They are separated from GLV because only CV contain isothiocyanates which are plant phytochemicals that are known to be potent chemo-preventives possessing the ability to prevent and inhibit tumorigenesis [1, 6, 11]. Skimmed cow's milk is about 60% carbohydrates and 40% protein. Daily consumption of low-fat or fat-free milk products are recommended, and adolescents and adults need 720 milliliters (ml) which are about 3 cups/day [1]. This milk should be fortified with vitamin D to improve calcium absorption for bone and teeth density, growth, and maintenance [18]. Yogurt is a dairy product that has a high nutritional value because it contains large amounts of easily digestible protein, vitamins, and milk fat. Associated with probiotics, yogurt has a positive impact on the human body and high levels of its consumption amongst consumers present an excellent opportunity to introduce new and healthy products into people's diets [19].

2.2 Lipids (fats)

Linoleic (omega-6 fatty acid) and linolenic (omega-3 fatty acid) are the only essential fats [1]. These unsaturated fats help regulate body functions, blood pressure, clot formation, blood lipid concentration, immune response, inflammatory response and serve as structural components of cell membranes [20]. Studies have found evidence α-linolenic acid is related to a lower risk of CVD, readily available from fish oil, and plays a vital role in many metabolic processes [20]. People generally consume adequate amounts of omega-6 fatty acids because they are found in seeds of plants and their oils, vegetable oils, nuts, and whole-grain foods [1]. US diet is higher in omega-6 fatty acids and low in omega-3 fatty acid so the American Heart Association recommends at least 2 servings of fatty fish each week which contains eicosapentaenoic acid (EPA) and docosahexaenoic acid (DHA) omega-3 fatty acid [21]. Canned salmon or sardines are high in omega-3 fatty acid, low in mercury, and affordable [1]. A standard portion of hydrated salmon or sardines (200 g) provides approximately 2 g EPA and DHA, which is approximately two times higher than the minimum daily intakes recommended by the World Health Organization [22, 23]. Men need 1.6 g/day and women need 1.1 g/day of omega-3 fatty acid [24]. Men need 17 g/day and women need 12 g/day of omega-6 fatty acid [24]. Nuts and seeds with high omega-6 fatty acid content include sunflower seeds at 10 g per ounce (28.2 g) serving, pine nuts (9 g), and pecans (6 g) [24].

Fats not to consume are saturated fatty acids and trans-fatty acids (partially hydrogenated cooking oil) because both have been linked to heart disease [10]. Major sources of saturated and trans fats are whole milk, cheese, butter, cream, cream cheese, ice cream, fatty cuts of beef and pork, processed meats, tropical oils, shortening, and lard. When it comes to fat, trans-fat is the worst type of fat. Unlike other fats, trans-fat both raises your "bad" LDL cholesterol and lowers your "good" high-density lipoprotein (HDL) cholesterol [25].

2.3 Proteins

Use fish, black beans, and egg whites to replace high-fat meats and other saturated fats and avoid commercial frying fats. As mentioned, salmon and sardines are high in protein and omega-3 fatty acid. Hen egg whites contain almost all essential nutrients (except vitamin C and dietary fiber), known to be of high nutritive value, and contain all the essential amino acids [26]. There are 5 g of protein in 46 g of hydrated egg white with no carbohydrates or fat [27]. Black beans which contain rich protein, a variety of minerals, and trace elements play an important role in healthcare [28]. One cup (38 g) of dehydrated black beans have 9 g of protein, 23 g of carbohydrates including 15 g of total fiber, and no fat [29].

2.4 Vitamins and Minerals

Differences between vitamins and minerals as compared to fats, proteins, and carbohydrates are that vitamins and minerals do not yield energy but facilitate the release of energy. Vitamins and minerals are needed in smaller quantities than energy nutrients, however, deficiencies can be devastating to sound nutritional health. The relationship between low intake of vitamins and minerals are negatively correlated with high incidences of chronic diseases, including cancer and heart disease [30, 31]. Foods generally contain adequate supplies of vitamins and minerals for children and adults provided their diet contains a variety of food choices [32]. Meeting nutrient needs from foods, rather than supplements is best because foods can provide all needed nutrients, so supplements are poor 2nd choice [33]. Table 1 shows recommended daily allowances (RDA) of essential vitamins, minerals, and dehydrated macronutrients developed by the Food and Drug Administration (FDA) [1].

Table 1: List of essential vitamins and minerals RDA are for adults and children over four and based on a 2000 cal/day (micrograms = μg).

RDA Vitamin & Minerals	
Biotin	300 μg
Calcium	1000 mg
Chloride	3400 mg
Chromium	120 μg
Copper	2 mg
Fluoride	4 mg
Folate (folic acid)	400 μg
Iodine	150 μg
Iron	18 mg
Magnesium	400 mg
Manganese	2 mg
Molybdenum	75 μg
Niacin	20 mg
Pantothenic acid	10 mg
Phosphorus	1000 mg
Potassium	3500 mg
Riboflavin	1.7 mg
Selenium	70 μg
Sodium	2400 mg
Thiamin	1.5 mg
Vitamin A	900 μg
Vitamin B_{12}	6 μg
Vitamin B_6	2 mg
Vitamin C	60 mg
Vitamin D	10 μg
Vitamin E	20 mg
Vitamin K	80 μg
Zinc	15 mg

	Cholesterol
Fat (lipids)	65 g (30% of total cal)
Saturated fat	< 20 g
Cholesterol	< 300 mg
Carbohydrates	300 g (60% of total cal)
Fiber	25 g
Protein	50 g (10% of total cal)

2.5. Water and Drinking Alcohol (ethanol)

Estimated total water requirement for healthy adults is about 2000 ml/day [11]. The formula is 30-40 ml of water per kilogram (kg) of body weight. So, a 73 kg (160 pounds) adult needs an estimated 2200 ml (0.5 gallons) of water/day. Total water includes all fluids hydrated with water such as milk, orange juice, grape juice, etc. Water should be rigorously purified by a bottling manufacturer or by a county municipal water district. All drinking water consumed should be fluoridated [34]. Diets high in fluoride during growing years produce crystalline deposits in bones and teeth making them stronger and more resistant to decay [35]. Fluoridated water by county municipal water districts is considered one of 10 most important public health measures of the 20th and 21st centuries [1]. Moderate use of any type of ethanol has shown to reduce deaths from coronary heart disease in middle-aged and older adults [36]. Non-pregnant adult women should limit ethanol intake to one drink/day and adult men two drinks/day [1]. Red wine is probably the best to reduce the incidence of coronary heart disease because of the added antioxidants found in this style of ethanol [37, 38]. One drink of ethanol in the US is considered 12 ounces of beer (5% ethanol), or 1.5 ounces of hard liquor (40% ethanol), or 5 ounces of wine (12% ethanol) [39]. One US liquid ounce is approximately 29.6 ml.

3. Methods

To achieve this review article objective, I conducted a systematic search of bibliographic electronic databases, namely PubMed Central, Academic Search Complete, Medline, Proquest Central, ScienceDirect, Google Scholar, and Yahoo online. The criteria for including studies, government websites, and nutrition textbooks in this literature review included: (1) a period for collecting source studies which were from 1998 until 2018; (2) only full-text scholarly journal studies; (3) only studies appearing in peer-reviewed journals; (4) data from official US government websites; and (5) only nutrition textbooks used in US colleges.

The search results were closely inspected to select those with appropriately-related significant diet and nutrition data. The selected studies and review articles specifying the role of diet therapy in improving health. Data from selected results were organized, summarized, and analyzed carefully to reach conclusive remarks.

4. Results

The purpose of this literature review was to attempt to answer the research question: If a person wanted to consume the healthiest diet possible for one day, what type and how much nutrients should they choose? After a seven-year review and study of the relevant literature, Table 2 shows a daily meal plan that should help to enhance health for a lifetime, decrease risks of developing disease, and maintain a healthy BMI (18.5-24.9) [40]. Information on Table 2 was retrieved from the United States Department of Agriculture (USDA) via Agricultural Research Service by using their USDA food composition databases [41]. This meal plan is adequate because it provides all the essential nutrients, fiber, and 2000 calories necessary to maintain health. People also need to focus on the Tolerable Upper Intake Levels of all the nutrients because of the toxic effects. None of the nutrients in Table 2 go beyond this level which can increase the risk of adverse health effects including death.

5. Discussion

5.1 Overweight and Obesity

The meal plan listed in Table 2 contains 18 different food groups with a total of 2000 nutrient-dense calories for the day. Overweight (BMI 25-29.9) and obesity (BMI ≥ 30.0) has

Table 2: Follow this daily meal plan to prevent disease and maintain a healthy BMI throughout your lifetime. Break this total amount of hydrated food into five or six separate small meals throughout the day.

Food Group	Amount	Cal	Critical Nutrients	Fat	Protein	Fiber
3 Cups Fat-Free Milk	708 ml	270	Ca 900 mg	0 g	27 g	0 g
Black Beans	36 g	60	Ca 60 mg; Fe 2.7	0 g	8 g	15 g
Boiled Egg Whites	tsp 46 g	25	Na 75 mg	0 g	5.0 g	0 g
Brown Bread (2 Slices)	112 g	260	Ca 80 mg; Fe 2.1 mg	1 g	6 g	4 g
Canned Salmon	200 g	280	Omega-3 fat 2 g; Fe 2 g	4.7 g	42 g	0 g
Clean Water	2000 ml	0	Fluoride 2mg	0 g	0 g	0 g
Enriched Brown Rice	140 g	120	Fe 1.5 mg; Ca 20 mg	0.3 g	3.0 g	2.5 g

Fat-Free Yogurt	170 g	90	Ca 150 mg	0 g	5 g	0 g
Multivitamin	1 tablet	0	Iron 8-18 mg; Ca 200 mg	0 g	0 g	0 g
Olive Oil	21 ml	156	Monounsaturated fat	17.3 g	0 g	0 g
Raw Apple with Skin	100 g	52 g	Ca 6 mg; K 109 mg	0.2 g	0.26 g	2.4 g
Raw Banana	100g	89	K 420 mg	0.3 g	1.0 g	2.6 g
Raw Broccoli	100 g	34	Isothiocyanates	0.37	2.8 g	2.6 g
Raw Orange	70 g	32	Ca 30 mg	0.15 g	0.5 g	1.6 g
Raw Spinach	115 g	30	Ca 100 mg; Fe 1.08 mg	0 g	2.0	2.0 g
Red Wine	147.8 ml	100	Ethanol	0 g	0 g	0 g
Sunflower Seeds	50 g	292	Omega-6 fat 19 g; Ca 39 mg	25 g	10 g	4.3 g
Total Cereal (WG)	30 g	110	Iron 18 mg; Vit. C 60 mg	0.1 g	2 g	3 g

become a worldwide health problem because both are considered a disease by themselves. This is because overweight and obesity increase the incidence of hypertension, CVD, type 2 diabetes, high blood lipids, sleep apnea, osteoarthritis, musculoskeletal problems, abdominal hernias, some cancers, gout, gallbladder disease, kidney stones, respiratory problems, liver malfunction, and complications in pregnancy and surgery [11]. According to the World Health Organization (WHO), one in six people worldwide (approximately one billion) are overweight and, more than 300 million of them are obese [40]. This is due to more sedentary lifestyle, excessive intake of calorie-rich diet, and genetic factors. To stay healthy, people need to maintain 2000 cal/day and become more active. The activity does not need to be strenuous because of basal metabolic rate (BMR). BMR of an average 50-year-old male that weighs 72 kg (160 lbs.) is approximately 1580 cal/day [42]. BMR is a measure of metabolism which means a 72 kg male will burn 1580 cal/day even if they never moved a muscle all day. What can we do about overweight and obesity? Two occurrences; maintain daily cal at approximately 2000/day and become more active. There are no pills, supplements, herbs, or food groups that will "shrink" a human fat cell (diet pills curb appetite). To lose 0.45 kg (1 pound) of fat an obese person needs to burn 3500 cal more than they consume [1]. If that obese person can burn 2500 cal/day for a year and maintain an intake of 2000 cal/day for a year, they will lose 23.5 kg (52 pounds) in the first year of dieting. Table 2 shows that a person can consume "a lot" of food/day and still maintain that recommended 2000 cal/day.

5.2 Carbohydrates

The meal plan has approximately 250 g of total carbohydrates [41] (1000 cal) which is 50% of total meal plan's cal. Recommended daily percentages are 45-65% of 2000 cal should come from carbohydrates [8]. Do not reduce cal from carbohydrates below 45% because the human central nervous system (brain and spinal cord) almost exclusively uses the carbohydrate glucose for cellular respiration and energy. If carbohydrates are reduced too much, the body will convert protein amino acids into glucose via gluconeogenesis. People need to spare approximately 90% of protein intake for synthesizing more proteins such as muscle, enzymes, antibodies, hemoglobin, and plasma proteins, not for energy. Low carbohydrates diets can cause nausea, fatigue, constipation, low blood pressure, high uric acid, and gout [11]. However, if a person has type II diabetes or gestational diabetes, they should reduce intake of black beans, brown bread, brown rice, and cereal on Table 2 by half and replace those cal with a lower glycemic index food such as fruits and GLV. Carbohydrates with a low glycemic index are more slowly digested, absorbed, metabolized, and cause a lower and slower rise in blood glucose and insulin levels.

Fiber is a carbohydrate that humans do not have the enzymes for catabolizing fiber to glucose. People receive some calories from soluble and insoluble fibers through bacteria enzymatic digestion. The meal plan contains approximately 40 g of total fiber, which is marginally high. The American Dietetic Association recommends 20-35 g/day of total fiber intake, which is approximately twice the average intake in the US, and the WHO recommends an upper limit of 40 g/day [11]. Fiber-rich carbohydrates should predominate in the diet because high-fiber diets can reduce the incidence of constipation, hemorrhoids, diverticulosis, diarrhea, obstructions of appendix and colon, and colon cancer [11, 13]. However, unreasonable intake of total fiber (>40 g/day) can cause some minerals to bind with fiber causing malabsorption, dehydration, and obstruction of the gastrointestinal (GI) tract [13].

5.3 Lipids (Fats)

The meal plan has approximately 49 g of fat which is 444 cal. So, 22% of the cal come from fat, which is in recommended range (20-35%) [8]. Due to the worldwide overweight and obesity health problem, fat intake should be approximately 20% of total caloric intake because the only cal-energy dense foods are fats (9 cal/g) and pure ethanol (7 cal/g). Our meal plan provides approximately 2 g EPA and DHA omega-3 fatty acid and >20 grams of omega-6 fatty acid which is higher than the minimum daily intakes recommended [22, 23, 24]. Olive oil when used in moderation is a healthy monounsaturated fat used in frying and baking. Replacing saturated and trans fats with monounsaturated fats can help lower the incidence of heart disease [2, 3, 43].

5.4 Proteins

The meal plan contains approximately 114 g (456 cals) from protein which is 23% of total cal. This percentage conforms to the recommended range of cal from protein (10-35%) [1, 8], and contains all the essential amino acids [27]. However, the FDA recommends 50 g/day (10% of cal) should come from protein. This review article demonstrates it is impossible to eat healthy for a chosen day and only consume 50 g/day of dehydrated protein. It is recommended we consume 720 ml of cow's milk/day [1], 200 g of cold-water fish for the omega-3 oil [1, 22, 23], and vegetables containing proteins. The total amount of protein just from the milk, fish, and beans total 77 g which are 1.5 times over FDA recommendations. To reduce protein intake, omega-3 supplements could be included, however,

supplements are always a poor second choice. According to the Environmental Protection Agency (EPA) and the FDA, omega-3 from supplements often contain high toxic levels of vitamins A and D, pesticides, heavy metals, mercury, and other industrial contaminates [11]. However, if a person has kidney disease they should reduce protein intake to FDA recommendations. A high-protein diet does not cause kidney disease but increases its work to eliminate excess nitrogen waste such as urea and ammonia [44]. Another reason the FDA recommends 50 g/day of high-quality proteins is that several studies clearly show that high-protein intake increases urinary calcium excretion [45]. However, our diet plan includes a high calcium diet (>1790 mg) which should compensate for the effects of high-protein intake on increased urinary calcium excretion [11, 46, 47].

5.5 Vitamins and Minerals

All vitamins and minerals listed in Table 1 are essential to life. The discussion will be limited to vitamins and minerals that people tend to be unfamiliar, and are extremely important for health. Sodium (Na) and chloride (Cl) if present will combine to form table salt and too much salt can increase hypertension (high blood pressure), a leading cause of CVD. However, most causes of hypertension are unknown. The Dietary Approaches to Stop Hypertension (DASH) diet plan stresses nuts, fish, chicken, whole grains, fruits and vegetables, and low-fat milk to reduce hypertension [48]. The Tolerable Upper Intake Level for sodium in the DASH plan is 2300 mg.

Information on Table 3 was retrieved from the USDA via Agricultural Research Service by using their USDA food composition databases [41]. Table 3 shows that there is 2004 mg sodium in our daily meal plan which would be approved by DASH.

Iron deficiency anemia is the most common nutritional deficiency worldwide because men need 8 mg/day of iron, menstruating women need 18 mg/day, and during pregnancy 27 mg/day is needed [49]. The 27 mg/day is needed maternally and for brain development in the embryo and fetus. Deficiency of iron during pregnancy will cause irreversible brain damage later in life to infant, child, adolescent, and adult [11]. Our diet plan has approximately 31 mg of iron not including the multivitamin supplement. Thirty-one mg/day of iron is not too much because normally, only about 10-15% of dietary iron is absorbed into the blood plasma [1]. The Tolerable Upper Intake Level for iron intake is 45 mg/day for both adolescents and adults [50]. Never leave iron supplements where infants and children can ingest them because excess iron is a deadly poison. It is probably best not to use iron supplements because of the potentially harmful toxic effects, and excess iron can result in cell and tissue damage [49]. Iron should be consumed only through food groups such as in Table 3. Adequate consumption of calcium early in life contributes to growth of bone density and reduces the incidences of osteoporosis later [51]. Maintaining lifelong adequate intake of calcium is essential to achieving optimal peak bone mass. The best means to consume 1000 mg of calcium/day is 708 ml (3 cups) of fat-free cow's milk. The milk should be fortified with vitamin D because this fat-soluble vitamin assists body to regulate absorption of calcium [18].

Table 3: This is a list of 18 food groups in our meal plan and their amounts of vitamin and minerals that are extremely important for health.

Food Group	Amount	Na	Folate	Iron	Ca
3 Cups Fat-Free Milk	708 ml	453 mg	0	0	900 mg
Black Beans	36 g	25 mg	0	2.7mg	60 mg
Boiled Egg Whites	tsp 46 g	75 mg	0	0	0
Brown Bread (2 Slices)	112 g	400 mg	0	2.1 mg	80 mg
Canned Salmon	200 g	710 mg	0	2.0 mg	150 mg
Clean Water	2000 ml	0	0	0	0
Enriched Brown Rice	140 g	0	240 μg	1.5 mg	20 mg
Fat Free Yogurt	170 g	80 mg	0	0	150 mg
Multivitamin	1 tablet	0	400 μg	8-18 mg	200 mg
Olive Oil	21 ml	0	0	0	0
Raw Apple with Skin	100 g	0	4 μg	0.1 mg	6 mg
Raw Banana	100g	1 mg	24 μg	0.3 mg	5 mg
Raw Broccoli	100 g	33 mg	170 μg	0	24 mg
Raw Orange	70 g	0	24 μg	0.06 mg	30 mg
Raw Spinach	115 g	80 mg	260 μg	1.08 mg	100 mg
Red Wine	147.8 ml	7 mg	1 μg	0.7 mg	10 mg
Sunflower Seeds	50 g	0	110 μg	3 mg	39 mg
Total Cereal (W. Grain)	30 g	140 mg	400 μg	18 mg	20 mg

Non-growing adults, at best, only absorb approximately 25% of all calcium intake even with adequate vitamin D consumption [18]. Calcium has many more functions such as regulation of muscle contractions, transmission of nerve impulses, assists with blood clotting, assists in secretion of some hormones, and is a cofactor for several enzymes [51]. Our diet plan contains approximately 1790 mg of calcium from 15 different food sources which is well over the suggested minimal daily intake for adults 51 and older (1200 mg/day) [1]. The Tolerable Upper Intake Level for calcium intake is 2500 mg/day for aged 19-50 years and 2000 mg/day for aged 50+ years [52].

Lack of folate or folic acid is number one cause of neural tube defects such as spina bifida, anencephaly, and encephalocele [53]. Folate or folic acid is critical in the activation of cell mitosis, so deficiencies can be fatal. The neural tube (brain

and spinal cord) fully develops within eight weeks at the end of the embryonic stage. Women could be unaware of pregnancy during the embryonic stage, and lacking folate or folic acid intake during this period could cause neural tube defects [53]. FDA has set the RDA of folate or folic acid intake to 400 μg/day and a pregnant woman needs 600 μg/day. Since the 1990s, FDA mandated that enriched grains be fortified with folic acid (an absorbable synthetic form of folate) [11]. Our diet plan contains 430 μg/day of folate just from the spinach and broccoli.

Deficiencies of iodine and fluoride are a common worldwide problem. More than two billion people worldwide are iodine deficient [54]. The human thyroid gland synthesizes several hormones that regulate reproduction, metabolic rate, growth, production of blood cells, and muscle-nerve function. Without at least 150 μg/day of iodine, the thyroid gland cannot produce these important hormones. Iodine is an integral part of these hormones and deficiencies can cause enlargement of thyroid gland, weight gain, and fetal mental-physical retardation [54]. The major source of iodine is seafood which most people cannot afford or obtain. Our meal plan contains about 2000 mg/day of sodium which is 400 mg/day below the RDA. When choosing table salt, make a point to purchase iodized salt and sprinkle approximately 400mg/day on some of the food groups to meet requirements. As mentioned previously, 3-4 mg/day of fluoride is needed for building strong bones and teeth. Fluoride also can reduce the incidence of tooth decay if carbohydrates are not left on enamel too long. If your county municipal water districts do not fluoridate, then purchase a brand of purified bottled water that contains fluoride. New standards for optimal levels of fluoride is 0.7 mg/liter of water [55]. Tolerable Upper Intake Level for adults is 10 mg/day [1], so be careful with fluoride because it can be a deadly poison.

Multivitamin supplements are used by at least half of US adults, and generally a harmless practice [1]. Consult your healthcare provider before taking a multivitamin supplement. Our meal plan contains adequate supplies of vitamins and minerals; however, it is recommended to take just one multivitamin tablet per day. Excessive doses of any supplement can be harmful. Due to bioavailability concerns, take the multivitamin with food for better absorption and utilization of the vitamins and minerals from a supplement. To reduce the risk of deficiency and toxicity, purchase highly rated multivitamin supplements such as Centrum Complete, Pluravit, and Avon Women's Complete [56].

6. Conclusion

Worldwide diets need to be more nutrient dense meaning containing all the essential nutrients and phytochemicals without the excess energy from high-calorie foods like fats and drinking ethanol. Diet should also include fiber and energy necessary to maintain health and body weight. Diets should not depend on supplements to obtain the essential nutrients. Supplements should supplement the diet not substitute for it. Our diet plan in this manuscript is well balanced and adequate with a variety of tasty nutritious food. However, if we are going to reduce the worldwide obesity epidemic, some gustatory sense of tastes will have to be sacrificed. Sucrose (table sugar), fried foods, and drinking ethanol are very addictive causing cravings and binge eating and drinking. If people would severely restrict these types of foods and drinks, they could eventually conquer their addictions and become healthier.

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