Veganism

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Vegan vs. Vegetarian

Vegan

- No meat, fish, or poultry
- No animal products and by-products including: eggs, dairy products, honey, leather, fur, silk, wool, cosmetics, and soaps derived from animal products

Vegetarian

- No meat, fish, or poultry
- Different variations of vegetarianism:
- Lacto-ovo Vegetarian-no animal flesh but consume eggs and dairy products
- Lacto Vegetarian- consume dairy but do not eat eggs
- Ovo Vegetarian- consume eggs but do not eat dairy products

Why do people choose

- **Health reasons**
  - -decreased risk of diseases
  - -lower total LDL levels
  - -reduced risk of obesity, hypertension, Type 2 diabetes, and certain cancers
- **Environmental reasons**
  - -GO Green
  - -Avoidance of toxins and hormones
- **Ethical**
  - -Non-violence for animals
  - -Against the growth of the Meat Industry
- **Religious Views/Spirituality**

Common Vegan Foods

- Oatmeal
- Stir Fried Vegetables
- Cereal
- Sorbet
- Lentil Soup
- Salads
- Fruits
- Vegetables
- Macaroni
- Chili
- Spaghetti
- Popcorn
- Chickpeas

- Three bean salad

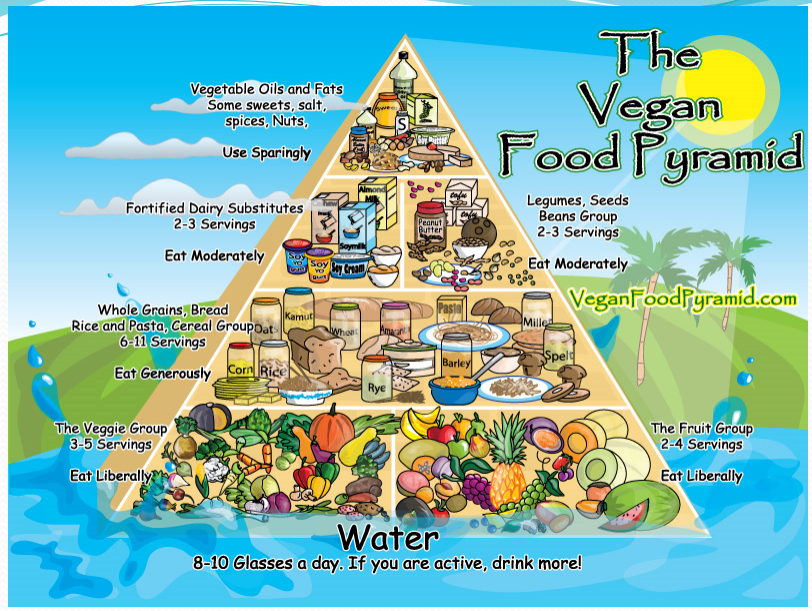
- Nuts

- Whole Grains

Common Vegan Substitutes

- Replacements for dairy
  - -soy milk
  - -rice milk
  - -potato milk
  - -tofu
  - -soy cheese without casein

- Replacements for eggs in recipes
  - -apple sauce (1/4 cup/1 egg)
  - - 1 small banana per one egg
  - -potato starch
  - -mashed potatoes
  - -tofu



http://myveganquest.blogspot.com/

Sample Vegan Menu

Breakfast
Sausage(Gardenburger sausage patties) and bagel sandwich with soy cheese slices

Lunch
Ready-made vegan chili
Tortilla chips
Guacamole

Dinner
Potato Leek Soup
Caesar Salad
Crusty French bread

Vegan Nutrition

Protein

- Common misconception of vegans is that they don't get enough protein but as long as they maintain a varied diet and adequate calorie intake it is actually very easy for vegans to consume enough protein.
- RDA recommends 46 grams/day for Females and 56grams/day for Males

http://www.iom.edu/Global/News%20Announcements/~/media/C5CD2DD7840544979A549EC47E56A02B.ashx
http://vegetarian.about.com/od/healthnutrition/tp/protein.htm

Common Foods Vegans use for protein:

- Quinoa (1 cup contains 18 grams and is a complete protein)
- Whole Grains
- Beans (1 cup canned kidney beans contains 13.4 grams protein)
- Lentils
- Legumes
- Tofu (1/2 cup contains 10 grams protein)
- Soy products (1 cup soy milk contains 7 grams protein)
- Nuts and Nut Butters (2 tbs. peanut butter contains 8 grams protein)
- Seeds

Fat

- Diets are free of cholesterol and low in saturated fat but still contain healthier fats.

- Healthy fats consumed by vegans:
  - Cooking oils: canola, flaxseed, and soybean (high in omega-3 fatty acids and monounsaturated fats)
  - Nuts
  - Margarine
  - Avocado
  - Nut Butters

Calcium

- The RDA for calcium is 1000 mg/day.
- Since the vegan diet does not contain dairy the primary source of calcium comes from:
  - green leafy vegetables
    - Oxalic acid reduces calcium absorption. It is found in spinach, beet greens, and rhubarb.
  - Tofu made with calcium
  - Calcium fortified soy milk
  - Calcium fortified orange juice

Vitamin B_{12}

- The RDA recommends 2.4µg/day.
- Usually found in animal products therefore vegans would have an insufficient amount.
- Can be found in tempeh, seaweed, and miso but it depends on the processing
- B_{12} supplements are available for those who do not consume the recommended intake

Iron

- The RDA recommends:
  Males: 8 mg/day Females: 18 mg/day
  Vegan males:14 mg/day Vegan females: 33 mg/day

- Heme iron is more easily absorbed in the body than non heme iron. Vegans only consume non heme iron, so they need more to meet their recommended daily allowance.

- It is recommended for vegans to consume more Vitamin C because it helps the absorption of non heme iron.

Iron Sources for Vegans

Non heme sources of iron:

- Dried beans
- Dark leafy vegetables
- Soy beans
- Lentils
- Kidney beans
- Chick peas
- Tempeh
- Prune juice
- Bok Choy
- Raisins

Dietary Intake and Biochemical, hematologic, and Immune Status of Vegans Compared with Nonvegetarians

Ella H Haddad, Lee S Berk, James D Kettering, Richard W Hubbard, and Warren R Peters

- Purpose: compare the dietary and nutritional status of individuals practicing a vegan diet with those of a nonvegetarian diet by using biochemical, hematological, and immunologic measures

Participants

45 healthy volunteers from Loma Linda University

Needed to meet the requirements of:

- ages 20-60
- Be within 120% of the ideal body weight
- Followed a consistent dietary pattern for at least one year
- Not have a metabolic disease or take medication that could effect nutritional status
- Not exercising more than 7 hrs/wk
- Not consume more than 1 alcoholic drink per day

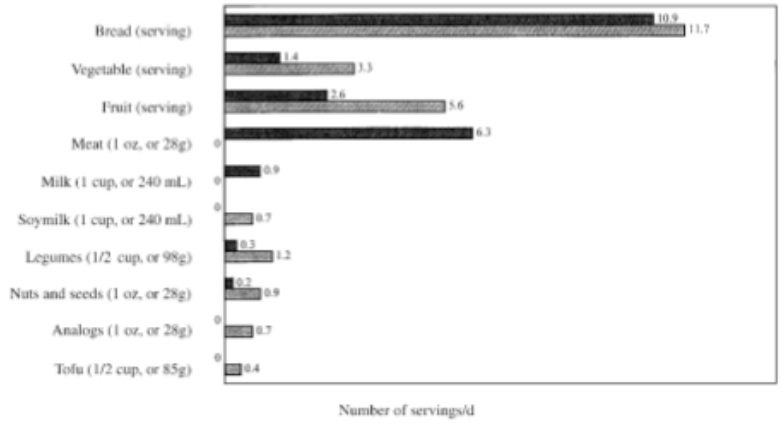


FIGURE 1. Food patterns of vegan (□) compared with nonvegetarian (■) diets based on 4-d food records. The number of servings of meat, bread vegetable, fruit, and milk were computed by using NUTRITIONIST IV (version 2.01). Serving of legumes, nuts, seeds, analogs (meat substitutes), anc tofu were computed manually on the basis of the serving sizes shown.

Iron Concerns

- A concern with the vegan diet is the development of an iron deficiency that could result in anemia.
- Low amounts of iron are found in plants
- Inorganic iron binds to phytates, tannins, and phosphates that are found in plants. These inhibit iron absorption.
- Vitamin C aids in iron absorption

TABLE 3
Iron and zinc nutritional status indicators in male and female vegans compared with nonvegetarians

	Males		Females	
	Nonvegetarians ($n = 10$)	Vegans ($n = 10$)	Nonvegetarians ($n = 10$)	Vegans ($n = 15$)
Hemoglobin (g/L)	156 ± 7[1]	154 ± 7	133 ± 10	132 ± 10
Subjects with hemoglobin ≤ 120 g/L	0	0	1	2
Hematocrit	0.45 ± 0.02	0.45 ± 0.02	0.40 ± 0.02	0.39 ± 0.03
Mean cell volume (fL)	88.2 ± 2.6	91.5 ± 3.8[2]	90.1 ± 4.0	90.7 ± 4.4
Ferritin (μg/L)	141 ± 93	72 ± 32[2]	22 ± 13	27 ± 16
Subjects with ferritin ≤ 12 μg/L	0	0	2	4
Plasma zinc (μmol/L)	16.2 ± 2.6	15.1 ± 2.7	13.8 ± 1.1	13.7 ± 1.4

[1] $\bar{x}$ ± SD.
[2] Significantly different from nonvegetarians, $P < 0.05$.

Iron continued…

The study found that:

- Vegan men had a relatively high intake of dietary iron, but lower ferritin concentrations than nonvegetarians

- Iron is not only a problem for vegans, but women in general
  - $\leq$ 120 µg/L borderline iron deficiency
  - Plasma ferritin levels below 12µg/L suggests depletion of iron stores

Zinc

- “In the U.S. 65% of dietary zinc comes from animal products such as meat, poultry, eggs, oysters, and other seafood.”
- Insoluble fiber intake negatively correlated with plasma zinc concentrations
- Vegans can easily become deficient if they do not have knowledge about the nutrients their bodies need to function properly.

Vitamin B_{12}

- There is no surprise that 10 of the 25 vegans had at least one sign of B_{12} deficiency.
- Is required for DNA synthesis and erythropoiesis
- A borderline low B_{12} intake can result in paresthesia, weakness, fatigue, and poor mental concentration

Vegan Immune Status

- Results showed lower leukocyte, lymphocyte, and platelet counts
  - Similar results have been found in protein malnutrition and energy restriction
- Had significantly higher mean serum albumin and lower blood urea nitrogen concentrations
  - Lower blood urea nitrogen concentrations reflects on the low protein intake

Veganism and Disease

Cardiovascular Disease

- “People following a plant based diet have 2.5 times fewer cardiac events including heart attack, strokes, bypass surgery, and angioplasty. “

- Since the vegan diet is free of meats and animal products the intake of cholesterol and saturated fat is low which contributes to a much lower risk for the development of atherosclerosis.

http://www.peta.org/issues/animals-used-for-food/heart-disease.aspx

CVD continued…

- Vegan diets are high in fruits and vegetables which contribute to high intake of fiber, folic acid, antioxidants, and phytochemicals which lower cholesterol, stroke, and stroke mortality.
- Diets are found to be high in whole grain and nuts which have cardio protective properties.

Cancer

- “A vegan diet maximizes the intake of foods that help us fight cancer, like fiber-packed grains and beans and phytochemical-packed fruits and vegetables. The diet also eliminates the foods that promote cancer.”
- Fruits and vegetables contain high amounts of phytochemicals which interfere with cellular processes in the progression of cancer.
- Tobacco, diet and obesity, and sedentary lifestyle are the main causes of cancer and vegans tend to not smoke and live a healthy and active lifestyle.

Diabetes

- Generally vegans are lighter in weight which decrease their risk of obesity and diabetes.

- When individuals with type 2 diabetes are put on a plant based vegan diet they are able to cut blood sugar levels, and improve insulin sensitivity. If the diet is continued it can possibly stop the need for medication.

A low-fat vegan diet and a conventional diabetes diet in

- A study done in the Washington DC area that compared a low fat vegan diet and the recommendations/guidelines set by the American Diabetes Association (2003).

Low Fat Vegan Diet vs Conventional Diabetes Diet

- There were two groups, the volunteers (that had to fall under a certain criteria) were randomly selected to participate in one of the two diets for 74 weeks.
  - -49 people were placed on the low fat vegan diet.
  - -50 people were placed on the conventional diabetes diet.

- Glycated hemoglobin (Hb A_{1c}) was measured at weeks 0, 11, 22, 35, 48, 61 and 74. Weight, waist & hip circumference, and blood pressure was measured at 0, 11, 22, and 74 weeks.

Low Fat Vegan Diet

- The vegan diet consisted of:
  - approx 10% of energy from fat
  - approx 15% of energy from protein
  - approx 75% of energy from carbohydrates

They were told to avoid:

animal products:

-meat
-dairy
-eggs

They were told to limit:

fatty foods:

-added oils
-fried products
-nuts & seeds

- They were told to focus on low-glycemic index foods like:
  - -beans
  - -green vegetables
- They were also given a B_{12} supplement of 100µg to take every other day, to avoid deficiency.

Conventional Diabetes Diet (based on ADA guidelines)

- The conventional diet consisted of:
  - approx 15-20% of energy from protein
  - <7% of energy from saturated fat
  - approx 60-70% of energy from carbohydrates & monounsaturated fat
  - < 200 mg of cholesterol per day

- They were told to favor:
  - fruits
  - vegetables
  - whole grains
  - low fat milk
  - lean meats

For Both Groups

- Both groups were free-living
- They were not provided with meals
- Women limited 1 alcoholic drink/ day, men were limited to 2.
- At the start of the study each participant met with a registered dietician for 1 hour to become familiar with their diet and establish an appropriate meal plan.
- For the first 22 weeks of the study the groups each met with a RD, physician, or cooking instructor for 1 hour each week to talk about cooking options/instruction and nutrition education.
- The last 52 weeks had an optional biweekly sessions.

Both Groups cont.

- Both groups were asked to not alter their physical activity for the first 22 weeks, but were then allowed to for the remaining weeks.

- During the study a RD made 7 unannounced phone calls to the participants and requested a 24-hour food recall & if the participant was not following the diet plan they may have addition guidance and counseling.

- Also, each participant was asked to do a 3 day dietary recall (2 week days & 1 weekend) at weeks 0, 11, 22, and 74 using a food scale. A RD then took the information and analyzed their record. This is another way they kept track of the participants following the diet plans.

Following the Low Fat Vegan Diet

- To be considered following the meal plan in the low fat vegan group you must be:
  - continuing the absence of:
    - meat
    - fish
    - poultry
    - dairy
    - eggs
    - < 5% saturated fat and <25% total fat
    - mean daily cholesterol <50g

Following the Conventional

- To be considered following the conventional diabetes diet:
  - <200 kcal over the the prescribed intake
  - <10% saturated fat (of total energy)

- **Both Groups**: would not be considered following their diet if they attended less than 10 of the sessions from the first 22 weeks.

Medications

Each participant was asked to stay on their same medication regimen unless there was a patient safety issue determined by an endocrinologist (that was blind to the study). In these cases there was protocol that needed to be followed.

- Insulin was reduced by 20%
- Oral agents were reduced by 50%

Medications continued…

Participants' Hb A_{1c}, which measures the average blood glucose over the previous 90-180 days, was measured 7 times throughout the 74 weeks.

- If participants' Hb A_{1c} levels were >8%, there was another protocol followed for their medications:
  - if on insulin: 10-20% increase
  - if on oral agents can take the maximum recommended dose
  - if not on any medications: prescribed 2 mg/d glimepiride (a T2DM medication)

- The analysis took any medications and medication changes

Results

- **Both groups:**
  - lowered energy intake
  - significant weight loss
  - lower Hb A_{1c} levels
- **Low fat vegan group:**
  - decreased total, saturated, monounsaturated, and trans fat
  - increased carbohydrate and fiber
  - increased Vitamin C, folate, magnesium, and iron.
  - lowered overall cholesterol
  - decreased Vitamin D, calcium and zinc
- **Conventional diabetes group:**
  - had some of the same results but not nearly as significant

TABLE 2

Nutrient, fruit, and vegetable intakes for individuals completing 74 wk of study[1]

	Vegan group (n = 40)			Conventional diet group (n = 43)				
	Baseline	Final	Change	Baseline	Final	Change	Effect size[2]	P[3]
Energy (kcal)	1798 ± 72[4]	1366 ± 81	−432 ± 81[5]	1840 ± 91	1422 ± 65	−418 ± 79[5]	−14 (−239 to 211)	0.90
Fat (% of energy)	36.3 ± 1.3	22.3 ± 1.4	−14.0 ± 1.8[5]	34.7 ± 1.2	33.7 ± 1.3	−1.0 ± 1.7	−13.0 (−18.0 to −8.1)	<0.0001
Saturated fat (% of energy)	11.9 ± 0.5	5.1 ± 0.5	−6.7 ± 0.7[5]	10.8 ± 0.5	9.9 ± 0.5	−0.9 ± 0.6	−5.9 (−7.6 to −4.1)	<0.0001
Monounsaturated fat (% of energy)	14.1 ± 0.70	8.2 ± 0.7	−5.9 ± 0.9[5]	13.7 ± 0.6	13.1 ± 0.7	−0.6 ± 0.8	−5.3 (−7.7 to −3.0)	<0.0001
Polyunsaturated fat (% of energy)	7.4 ± 0.4	7.0 ± 0.4	−0.4 ± 0.5	7.1 ± 0.3	7.7 ± 0.5	0.5 ± 0.5	−0.9 (−2.4 to 0.6)	0.25
trans Fat (% of energy)	2.3 ± 0.2	1.1 ± 0.1	−1.2 ± 0.2[5]	2.0 ± 0.1	1.7 ± 0.2	−0.3 ± 0.2	−0.9 (−1.4 to −0.3)	0.002
Cholesterol (mg/1000 kcal)	159.0 ± 15.9	36.3 ± 8.8	−122.7 ± 16.9[5]	168.2 ± 10.8	170.3 ± 13.4	+2.2 ± 12.5	−124.9 (−166.2 to −83.6)	<0.0001
Carbohydrate (% of energy)	47.7 ± 1.7	66.3 ± 1.8	+18.6 ± 2.4[5]	46.3 ± 1.4	46.5 ± 1.6	+0.2 ± 1.9	18.5 (12.5 to 24.4)	<0.0001
Protein (% of energy)	17.0 ± 0.6	14.8 ± 0.5	−2.2 ± 0.7[6]	19.0 ± 0.6	21.1 ± 0.7	+2.1 ± 0.9[7]	−4.3 (−6.6 to −2.0)	0.0003
Total fiber (g/1000 kcal)	10.8 ± 0.7	21.7 ± 1.2	+10.8 ± 1.1[5]	11.0 ± 0.7	13.4 ± 0.8	+2.4 ± 0.9[6]	8.5 (5.8 to 11.2)	<0.0001
Soluble fiber (g/1000 kcal)	2.9 ± 0.2	5.5 ± 0.3	2.5 ± 0.3[5]	2.9 ± 0.2	3.3 ± 0.2	0.4 ± 0.3	2.1 (1.3 to 2.9)	<0.0001
Insoluble fiber (g/1000 kcal)	7.8 ± 0.5	16.0 ± 1.0	8.3 ± 0.8[5]	8.0 ± 0.5	10.0 ± 0.6	2.0 ± 0.6[6]	6.3 (4.2 to 8.4)	<0.0001
Total vitamin A activity (IU/1000 kcal)	5129 ± 659	8188 ± 1360	3059 ± 1401[7]	5653 ± 803	7276 ± 711	1624 ± 1132	1435 (−2127 to 4997)	0.43
Vitamin D (μg/1000 kcal)	2.4 ± 0.2	1.5 ± 0.2	−0.9 ± 0.3[6]	2.9 ± 0.3	3.2 ± 0.3	0.3 ± 0.5	−1.2 (−2.3 to −0.03)	0.04
Vitamin E (α-tocopherol) (mg/1000 kcal)	5.6 ± 1.7	5.1 ± 0.3	−0.5 ± 1.7	4.0 ± 0.3	4.9 ± 0.4	0.9 ± 0.5	−1.4 (−4.8 to 2.0)	0.44
Vitamin K (μg/1000 kcal)	71.3 ± 9.8	154.9 ± 25.6	83.7 ± 27.0[6]	94.5 ± 12.6	148.4 ± 18.4	53.9 ± 19.6[6]	29.7 (−36.0 to 95.4)	0.37
Vitamin C (mg/1000 kcal)	44.3 ± 4.7	88.6 ± 8.8	44.3 ± 8.2[5]	50.3 ± 5.4	69.0 ± 6.1	18.7 ± 7.6[7]	25.6 (3.3 to 47.9)	0.03
Vitamin B-6 (mg/1000 kcal)	1.0 ± 0.1	1.2 ± 0.1	0.2 ± 0.1[6]	1.0 ± 0.1	1.2 ± 0.1	0.2 ± 0.1[7]	−0.04 (−0.3 to 0.2)	0.74
Folate (μg/1000 kcal)	260 ± 18	363 ± 18	103 ± 24[8]	249 ± 14	265 ± 14	16 ± 20	87 (25 to 149)	0.007
Vitamin B-12 (μg/1000 kcal)	3.2 ± 0.4	1.9 ± 0.4	−1.2 ± 0.6[7]	3.8 ± 0.7	3.9 ± 0.5	0.1 ± 0.9	−1.4 (−3.6 to 0.9)	0.21
Calcium (mg/1000 kcal)	432 ± 29	412 ± 19	−20 ± 33	380 ± 21	478 ± 32	97 ± 32[6]	−118 (−209 to −26)	0.01
Magnesium (mg/1000 kcal)	159 ± 10	243 ± 11	84 ± 11[5]	161 ± 7	195 ± 10	34 ± 11[6]	50 (20 to 80)	0.001
Iron (mg/1000 kcal)	8.7 ± 0.6	11.5 ± 0.5	2.8 ± 0.7[8]	8.4 ± 0.4	8.4 ± 0.4	0.0 ± 0.6	2.8 (1.1 to 4.6)	0.002
Zinc (mg/1000 kcal)	6.0 ± 0.4	5.2 ± 0.2	−0.8 ± 0.4	6.1 ± 0.3	6.7 ± 0.4	0.6 ± 0.5	−1.5 (−2.7 to −0.2)	0.02
Sodium (mg/1000 kcal)	1824 ± 63	1840 ± 100	16 ± 119	1989 ± 88	1854 ± 62	−134 ± 97	151 (−152 to 453)	0.32
Potassium (mg/1000 kcal)	1374 ± 55	1973 ± 87	599 ± 81[5]	1414 ± 61	1780 ± 77	365 ± 90[8]	234 (−8 to 475)	0.06
Fruit (servings/d)[9]	1.3 ± 0.2	2.8 ± 0.3	1.6 ± 0.3[5]	1.4 ± 0.1	2.0 ± 0.2	0.5 ± 0.2[7]	1.0 (0.3 to 1.8)	0.005
Vegetables (servings/d)[10]	2.5 ± 0.2	4.7 ± 0.5	2.2 ± 0.5[5]	3.2 ± 0.2	3.6 ± 0.4	0.4 ± 0.4	1.9 (0.6 to 3.1)	0.004

Results

- Fasting Plasma Glucose
  - -Vegan: -14.1 mg/dL
  - -Conventional: -6.5 mg/dL

- LDL cholesterol levels
  - -Vegan: -13.5 mg/dL
  - -Conventional: -3.4 mg/dL

- Total cholesterol
  - -Vegan: -20.4mg/dL
  - -Conventional: -6.8mg/dL

Results

TABLE 4

Glycemia, plasma lipids, and blood pressure before medication changes[1]

	Vegan group (n = 49, except as noted)			Conventional diet group (n = 50, except as noted)				
	Baseline	Final[2]	Change	Baseline	Final	Change	Effect size[3]	P[4]
Hb A_{1c} (%)	8.05 ± 0.16[5]	7.65 ± 0.15	−0.40 ± 0.14[6]	7.93 ± 0.14	7.94 ± 0.16	+0.01 ± 0.13	−0.41 (−0.78 to −0.04)	0.03
Fasting plasma glucose (mg/dL)	163.5 ± 7.6	149.4 ± 8.1	−14.1 ± 5.8[7]	160.4 ± 5.8	153.9 ± 8.1	−6.5 ± 6.7	−7.6 (−25.3 to 10.1)	0.40
Total cholesterol (mg/dL)	187.0 ± 5.3	166.6 ± 4.0	−20.4 ± 3.3[8]	198.9 ± 6.2	192.1 ± 6.4	−6.8 ± 4.3	−13.7 (−24.4 to −2.9)	0.01
Non-HDL cholesterol (mg/dL)	134.7 ± 5.6	115.2 ± 4.2	−19.5 ± 2.9[8]	149.0 ± 6.2	142.9 ± 6.3	−6.1 ± 4.6	−13.4 (−24.2 to −2.6)	0.02
LDL cholesterol (mg/dL; n = 49 conventional)	104.4 ± 4.7	90.8 ± 3.7	−13.5 ± 2.6[8]	117.7 ± 5.9	114.3 ± 5.9	−3.4 ± 3.9	−10.1 (−19.4 to −0.8)	0.03
HDL cholesterol (mg/dL)	52.3 ± 2.8	51.4 ± 2.8	−0.9 ± 1.1	49.8 ± 2.1	49.2 ± 2.1	−0.7 ± 1.7	−0.3 (−4.3 to 3.8)	0.90
Total cholesterol-to-HDL ratio	4.0 ± 0.2	3.6 ± 0.2	−0.4 ± 0.1[9]	4.3 ± 0.2	4.2 ± 0.2	−0.1 ± 0.2	−0.3 (−0.7 to 0.1)	0.14
VLDL cholesterol (mg/dL; n = 47 vegan, n = 47 conventional)	26.2 ± 2.1	22.2 ± 1.7	−3.9 ± 1.3[6]	26.8 ± 2.0	24.6 ± 1.8	−2.2 ± 1.8	−1.8 (−6.2 to 2.7)	0.43
Triglycerides (mg/dL)	148.1 ± 16.1	120.0 ± 10.2	−28.1 ± 10.3[6]	158.1 ± 18.8	158.1 ± 29.1	0.0 ± 28.7	−28.1 (−89.0 to 32.9)	0.36
Log triglycerides	2.08 ± 0.04	2.01 ± 0.03	−0.07 ± 0.02[6]	2.12 ± 0.04	2.08 ± 0.04	−0.03 ± 0.03	−0.03 (−0.11 to 0.05)	0.41
Blood pressure, systolic (mm Hg; n = 48 vegan)[10]	123.8 ± 2.5	123.3 ± 2.5	−0.6 ± 1.5	122.9 ± 2.1	121.8 ± 2.2	−1.1 ± 1.3	0.5 (−3.4 to 4.5)	0.79
Blood pressure, diastolic (mm Hg; n = 48 vegan)[10]	77.9 ± 1.6	75.1 ± 1.5	−2.8 ± 1.1[7]	80.0 ± 1.5	77.7 ± 1.4	−2.3 ± 1.1[7]	−0.5 (−3.6 to 2.5)	0.73

Conclusions of Study

- Both groups had successful weight loss, averages were approximately:
  - Vegans: -4.4kg (9.7lbs)
  - Conventional: -3.0kg (6.6lbs)

- Both groups also maintained their weight loss

- Weight loss of the Conventional group seemed to come more from the portion sizes and less from the changes in actual food being eaten.

Conclusion continued…

- Weight loss is very beneficial to type 2 diabetes, therefore both diets successfully helped in the process of lowering BMI and reaching a lower weight.

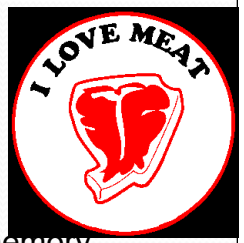
- The low fat vegan diet seemed to improve glycemia and plasma lipids more than the conventional diabetes diet.

Pros of Veganism

- Vegans tend to be lighter in weight and have lower BMI's.
- Lower cholesterol and LDL levels.
- Blood pressure tend to be low.
    - All result in lower risk of CVD
- Lower risk of cancer, diabetes, and hypertension.
- Vegan diets are higher in dietary fiber, folic acid, Vitamin C and E, and phytochemical.
- Vegans are usually health conscious so they are less likely to smoke and more likely to exercise and eat healthy.

Cons of Veganism

- Can be deficient in calcium and Vitamin D which can also lead to the risk of osteoporosis.
- Lack of nutrition knowledge could lead to health consequences and deficiencies.
- Can be deficient in Vitamin B_{12}.
  - Can lead to dementia, lack of coordination, memory loss, nerve dysfunction, and difficulty concentrating.



In conclusion, if you are considering veganism for the obvious health benefits be sure to be knowledgeable about the possible nutrient deficiencies that can occur when following this lifestyle.

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