1-Page Summary 1-Page Book Summary of How Not to Die

Plant Diets Reduce Disease

Our genes only account for 10-20% of the risk for most leading causes of death, like high blood pressure, heart attacks, cancer. As evidence of this, when people move from low- to high-risk countries, their disease rates change to those of the new environment. For example, a Japanese person who moves to America raises her risk of heart disease, even though she is genetically Japanese.

But aren't we dying less, and living longer? Not necessarily. Even though lifespan in America has increased slightly over the past decades, the quality of life at the end of life is worse.

The author Michael Greger argues diet is behind all of this. Specifically, that a diet heavy in meat, dairy, eggs, and processed foods is much less healthy than a diet based on whole foods and plants.

Here's some evidence of how plant-based diets increase health:

- People who used to be vegetarians but who went back to eating meat increased their risk of disease significantly—they increase heart disease odds by 146%, stroke by 152%, diabetes by 166%, weight gain by 231%. Their life expectancy drops by 3.6 years.
- Women who eat more whole plant foods reduce odds of breast cancer by 90%.

In total, lifestyle accounts for 78% of risk of chronic disease. Not smoking, having normal body weight, exercising half an hour a day, and maintaining a healthy diet can reduce the risk of chronic disease by a huge margin.

A plant-based, whole-food diet has been shown to decrease your likelihood of getting a large panel of diseases, from heart disease to Alzheimer’s. Here's a selection of the many research results cited in the book:

- Drinking 3-4 shots of kale juice a day over 3 months lowers bad LDL cholesterol and boosts HDL cholesterol as much as running 300 miles does.
- Increasing fiber by 7 grams/day reduces risk of stroke by 7%. For the maximum reduction in stroke risk, eat 25 grams/day of soluble fiber and 47 grams/day of insoluble fiber.
- The more plant-based foods you eat, the lower your hypertension rates. Flexitarians show 23% reduced risk of hypertension; vegans show 75% reduced risk.
- Japanese men showed a 25x increase in prostate cancer risk after World War II. This is also associated with a 7x, 9x, and 20x increase in egg, meat, and dairy consumption respectively.
- Premenopausal women who ate 6g of fiber a day had 62% lower odds of breast cancer, compared to those eating <4g a day.

Diet can reverse disease, not just halt it. It's not too late if you already have heart disease or diabetes. Studies have shown that switching to a plant-based diet can reverse atherosclerotic plaques, reverse the influence of smoking on lung cancer, and decrease the inflammation that leads to many cancers.

Preventing disease is better than treating it. Drugs have side effects, and some disease is irreversible

Nuances to Plant Diets and What We Eat

Why does plant-based diet improve health? Humans evolved over millions of years eating primarily vegetables, so many of our biological responses to food were wired to prehistoric diets.

Today's modern environment is unnatural, in the sense that we haven't evolved to handle the new types of food available to us, as well as the quantity available.

- Processed foods now contain much more fat, sodium, and caloric density than we evolved eating. Our normal biological processes haven't adapted to surviving on modern diets.
- Modern foods are so nutrient dense that they amplify the dopamine reward circuit. After eating ice cream, ordinary mangos are nowhere near as enjoyable. By eating whole foods, you can reset this sensitivity.

Regulation of food is often strongly influenced by industry. Just like how the tobacco industry fought to show smoking didn't cause cancer, there is a strong agriculture lobby promoting meat and processed foods.

Why Plants Help and Meat Hurts

Meat itself seems negatively correlated with health and mortality, even controlling for vegetable intake. In other words, if group 1 eats vegetables, and group 2 eats the same amount of vegetables but adds meat, group 2 shows higher mortality and risk of
In these research studies, are vegetarians healthier simply because they tend to be skinnier? No—in population studies, plant-based diets show lower mortality even controlling for BMI, wealth, and other confounding factors.

Even More Reasons to Eat Vegetables and Fruit

Think of your diet everyday as a bank account of 2000 calories you can spend everyday. Eating one 800 calorie hamburger displaces eating 7 sweet potatoes or 26 cups of broccoli. Which one would benefit your body more?

Some might shy away from a plant-based diet because it seems expensive. This is partly true—on a calories-per-dollar basis, junk food and fat are the cheapest. But on a nutrients-per-dollar basis, vegetables offer 6x more nutrition compared to processed food.

- Meat costs 3x more than vegetables but deliver 16x less nutrition. Thus, meat is 48x more expensive on a nutrient basis than vegetables.

Diet by Traffic Light

Eating a plant-based diet doesn't have to be complicated. Michael Greger suggests thinking of food as a traffic light system:

- Unprocessed means nothing bad is added, and nothing good is taken away.
- Sometimes, processing actually makes food healthier. Tomato juice may be healthier than whole fruit because the nutrient lycopene is...

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READ FULL SUMMARY OF HOW NOT TO DIE

Here's a preview of the rest of Shortform's How Not to Die summary:

How Not to Die Summary Shortform Introduction

Caveats

How Not to Die contains many good ideas, and it's one of the most rigorously cited mass-market books on nutrition out there.

That said, because it's written for a wide audience and doesn't want to bog readers down in scientifically precise language, Michael Greger sometimes cuts corners on his claims. Here are issues to note:

- The magnitude of effects is important. Does eating organic blueberries have a 5% effect or a 50% improvement of health, compared to conventionally grown blueberries? Does meat-eating cost 1 year of life, or 5 years? Often Greger simply says the difference "is significant"—but this is a statistical term, which laymen may misconstrue as "the difference is huge." He often does this more when the difference is small (below 5%). When the difference is big, he'll use the actual number ("a 20% difference!"). This is misleading and over-represents the effects of some diet choices.

- Whenever Greger says something has "up to a [X%] difference", this is misleading. When doing statistical analysis, science uses confidence intervals—"the effect can be as low as 1%, as high as 10%, and an average of 5%." Greger would sometimes represent this to mean "up to 10% improvement." This is misleading as it over-represents the likely effect.

- Many of the underlying cited studies are questionable in scientific rigor. This includes issues such as small sample sizes, unclear controls, unclear selection of the patient group, funding by the agricultural group that would benefit from positive
results, and only one study done for the conclusion. Remember that all scientists have an agenda and naturally bias toward publishing positive results. But based on a single study, he might say confident blanket statements like “citrus protects DNA from damage.” By far the most convincing studies are large population studies, or large randomized controlled trials, which are highlighted in the next section.

Occasionally his interpretations of research is questionable. For instance, to promote organic foods, he says “organic fruits and vegetables do…

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How Not to Die Summary Preface

The US healthcare system runs on a fee-for-service model: doctors get paid for pills and procedures they perform, not for patient health outcomes. Thus, actually preventing disease and improving patients’ lifestyle is undervalued in medical care.

To wit, most medical schools don't have any courses on nutrition. Doctors receive very little training on how diet can reduce the risk of serious disease and death. No wonder the medical establishment has paid so little attention to the value of nutrition.

Introduction

Our genes only account for 10-20% of the risk for most leading causes of death, like high blood pressure, heart attacks, cancer. As evidence of this, when people move from low- to high-risk countries, their disease rates change to those of the new environment. For example, a Japanese person who moves to America raises her risk of heart disease, even though she is genetically Japanese.

But aren't we dying less, and living longer? Not necessarily. Even though lifespan in America has increased slightly over the past decades, the quality of life at the end of life is worse.

The author Michael Greger argues diet is behind all of this. Specifically, that a diet heavy in meat, dairy, eggs, and processed foods is much less healthy than a diet based on whole foods and plants.

Here's some evidence of how plant-based diets increase health:

- People who used to be vegetarians but who went back to eating meat increased their risk of disease significantly—they increase heart disease odds by 146%, stroke by 152%, diabetes by 166%, weight gain by 231%. Their life expectancy drops by 3.6 years.
- Women who eat more whole plant foods reduce odds of breast cancer by 90%.
- Whole plant foods have been associated with longer telomeres (parts of your DNA that are associated with aging), while refined foods...

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How Not to Die Summary Part 1: How Not to Die from Disease | Heart Disease, Lung Disease

Heart Disease

Annual deaths from heart disease: 375,000

About Heart Disease

Coronary heart disease didn't use to exist in some populations. It appears to be predominantly an environmental problem—when people move from low-risk areas to high-risk areas, their disease rates increase to match their new homes.

Atherosclerotic plaque—the hardening of blood vessels and a contributor to heart attacks—can start to be seen in childhood.

Elevated cholesterol and LDL is the only risk factor for atherosclerotic plaque. To reduce LDL, you need to reduce intake of trans fat, saturated fat, and dietary cholesterol
A single unhealthy meal can stiffen your arteries within hours.

Ideally, your optimal LDL is 50-70 mg/dL, and your total cholesterol under 150 mg/dL. The usual recommendation from doctors is below 100 mg/dL and 200 mg/dL, respectively, but keep in mind this is the average recommendation in a country where heart disease is the #1 killer. It's better to aim for better than average, if you want to beat the average statistics on heart disease deaths.

**Heart disease itself is reversible**—plaques can actually shrink in size! Your body actually wants to heal itself. But if you cut yourself and keep slicing open the cut 3 times a day, it's not going to heal

**How Not to Die from Heart Disease**

Meat eating is associated with heart disease and atherosclerotic plaques. A possible mechanism is that bacterial endotoxins in meat might trigger inflammation, even when the meat is cooked.

Foods shown to reduce heart disease:

- Brazil nuts lower LDL cholesterol within hours, and the effects persist a month later.
- Drinking 3-4 shots of kale juice a day over 3 months lowers LDL and boosts HDL as much as running 300 miles does.
- A diet of 6-8 sweet potatoes a day lowered blood pressure by 5 points.

Things that don't reduce heart disease:

- Fish oil shows no proven benefit for overall mortality, heart attack, or stroke.
- Statin medications are good for patients who won't comply with diet, but they have side effects of liver and...

**How Not to Die Summary Part 1-2: Brain Diseases, Digestive Cancers**

**Brain Diseases**

Annual deaths from brain disease: 215,000

This includes:

- Stroke: 130,000 deaths per year
- Alzheimer's: 85,000 deaths per year

**Stroke**

Strokes are caused by a clogged artery in the brain, leading to a lack of oxygenation of the brain and death of part of the brain. Like heart disease, hardening of the blood vessels through atherosclerotic plaques is a contributor to the risk of strokes.

**How Not to Die from Strokes**

Reduce your risk of strokes by 1) reducing cholesterol and blood pressure and 2) improving blood flow and antioxidants.

**Fiber**

- Increasing fiber by 7 grams/day reduces risk of stroke by 7%. For the maximum reduction in stroke risk, eat 25 grams/day of soluble fiber and 47 grams/day of insoluble fiber.
- It's not known exactly why fiber reduces risk of stroke. It might help control cholesterol and blood sugar, which in turn reduces atherosclerotic plaque.
- It may also lower blood pressure, reducing risk of brain bleeds.

**Potassium**

- 1,640 mg increase of potassium is associated with a 21% reduction in stroke
  - Best source of potassium: greens, beans, sweet potatoes. Not bananas.

**Citrus**

- Citrus reduces stroke risk, possibly through the compound hesperidin, which increases blood flow throughout the body.
- In one study, there were three experimental groups given different treatments: 1) orange juice, 2) hesperidin solution, and 3) control. Hesperidin lowered blood pressure and increased endothelial reactivity (a measure of blood vessel health).
Orange juice performed best, better than the chemical extract of hesperidin.

- In another study, women with poor extremity circulation were placed in a cold room. Those who drank orange juice cooled half as fast, suggesting it improves circulation.

**Sleep**

- Those at lowest risk of stroke sleep 7-8 hours a night. Much more or much less sleep than this increases risk of stroke.

**Antioxidants**

- Your body needs energy to function, and oxygen normally plays a critical role. Because oxygen is very reactive, it also...

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**How Not to Die Summary Part 1-3: Infectious, Diabetes**

**Infectious Disease**

Many infectious diseases resulted from human domestication of animals. We got tuberculosis from goats, measles and smallpox from cattle, typhoid fever from chickens, and the cold virus from horses.

Your immune system consists of a few types of cells:

- **White blood cells**
  - Neutrophils destroy pathogens like bacteria and parasites directly.
  - Natural killer cells kill your body's cells that are infected.

- **B cells**
  - Produce antibodies that bind to a specific antigen (like a bacterial protein).
  - These antibodies then deactivate pathogens, or signal to natural killer cells that a cell is infected.

For some reason, people suffering from allergies have lower risk for some cancers. One theory is that an overactive immune system also protects against threats like cancer cells.

**Reducing Infections and Boosting Immune System**

**Fruits and vegetables**

- An evolutionary theory for the relationship between eating plants and the immune system: to reduce energy expenditure, the immune system activates itself periodically at times of greatest risk—including eating food with potential pathogens. As cavepeople, we evolved over millions of years mainly eating plants, not meat—therefore, plants serve as better triggers to activate our immunity.

  - A host of experiments show the benefits:
    - In an experiment, people over 65 who ate 5+ servings of fruits and vegetables had a 82% greater protective antibody response to vaccine, compared to people who ate <3 servings.
    - Raw kale extract stimulates 5x greater antibody production *in vitro*
    - Broccoli activates intraepithelial lymphocytes.
    - Phytoneutrients from plants reduce the toxicity of dioxins (common in pollution) *in vitro*, but the effects only last for a few hours.
    - Blueberries (1.5 cups per day for 6 weeks) doubled natural killer counts in athletes after intense exercise, when normally exercise cuts those cell counts in half.

**Other diet**
How Not to Die Summary Part 1-4: High Blood Pressure, Liver Disease

High Blood Pressure

Annual deaths from high blood pressure: 65,000

The Disease

High blood pressure, or hypertension, is cited as the #1 risk factor for death in the world, leading to 9 million deaths worldwide annually (source: the Global Burden of Disease Study in the Lancet). 78 million Americans have hypertension.

Blood pressure consists of two numbers: systolic is the pressure when blood pumps through the artery, and diastolic is the pressure between beats.

- 110/70 is an ideal blood pressure, even though 120/80 is cited as normal
- 140/90 is hypertensive

Hypertension promotes atherosclerosis (which leads to heart attacks and strokes). It also puts strain on the heart leading to heart failure; it damages blood vessels and leads to kidney disease.

Blood pressure tends to increase with age—65% of Americans age 60 or above have hypertension. But Kenyans of that age eating a low-sodium diet based around whole plant foods had normal blood pressure.

Sodium

Evolutionarily, we ate plant-based diets consisting of 500mg of sodium a day.

Now, average daily consumption is 3,500mg, and the AHA recommends 1,500mg. (Remember that it might not be wise to follow the standard guidelines in a country where heart disease is the #1 killer.)

The relationship is simple: sodium raises blood pressure.

- Double-blind randomized trials show that salt increases blood pressure.
- A single meal increases blood pressure over the next 3 hours, and decreases endothelial function within 30 minutes.

Inversely, cutting sodium from diet lowers blood pressure:

- Dietary changes alone reversed malignant hypertension (240/150) down to 105/80.

The mechanism of action could be free radicals.

- In Doppler flowmetry, sodium reduces blood flow, but vitamin C (an antioxidant that scavenges free radicals) blocks the sodium effect.
- Sodium suppresses an antioxidant enzyme called superoxide dismutase.

How to Reduce Sodium Intake

Understand the major dietary sources of sodium:

- ¾ of salt in the average diet comes from processed...

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How Not to Die Summary Part 1-5: Blood Cancers, Kidney Disease

Blood Cancers

Annual deaths from blood cancers: 56,000
This includes a range of diseases:

- **Leukemia:** 52,000 diagnosed each year, 24,000 die
  - In leukemia, bone marrow produces abnormal white blood cells, crowding out the ability to produce red blood cells and white blood cells. Leads to anemia, infection, death.

- **Lymphoma:** 70,000 diagnosed, 19,000 die
  - Lymphoma is the proliferation of lymphocytes, which are white blood cells.
  - These cells collect in lymph nodes and disrupt immunity.

- **Myeloma:** 24,000 diagnosed, 11,000 die
  - Myeloma is the proliferation of plasma cells, which are antibody-secreting white blood cells.
  - These cells displace bone marrow and make abnormal levels of antibodies that clog kidneys.
  - Multiple myeloma happens when cancer is discovered in multiple bones.
  - This is particularly resistant to treatment; most people diagnosed do not survive beyond 5 years.

**Animal Viruses Causing Cancer**

Of all foods in the large population EPIC study, poultry showed the greatest risk for blood cancers. For every 50g of poultry you consume daily, your risk of blood cancer increases between 56 and 280 percent. By comparison, a chicken breast weighs 350 g.

Why could this happen? A hypothesis: poultry viruses cause cancer. The viruses include avian herpesvirus, avian leukemia virus, and lymphoproliferative disease.

- People who grow up on poultry farms show almost 3x the odds of blood cancer.
- Farmers, slaughterhouse workers, and butchers all show higher rates of blood cancers.
- Some other animal products like milk show no such cancer risk, so it's not from exposure to toxins like dioxins.
- Eating well-done meat lowers the risk of lymphoma compared to rare meat, even though it increases exposure to cooked meat carcinogens.
- There's still no smoking gun yet on viruses directly causing cancer through infection and genetic mutation. This is an area of active research.

**How Not to Die from Blood Cancers**

Besides reducing your consumption of poultry, eating specific things helps...

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**How Not to Die Summary Part 1-6: Breast Cancer, Suicide**

Annual deaths from breast cancer: 41,000
- 230,000 are diagnosed each year.

**Risk Factors for Breast Cancer**

**Alcohol**
- The metabolic product of alcohol, acetaldehyde, is the carcinogen.
- Even moderate drinking—one drink a day—shows a small increase in risk of breast cancer.
- Red wine is exempt from this effect, possibly because of compounds in grape skins that suppress estrogen synthase.

**Decreased melatonin**
- Melatonin regulates sleep and circadian rhythm and is secreted in the dark. Melatonin suppresses cancer growth.
- Blind women (who secrete melatonin constantly) shows half the odds of breast cancer.
- Women who work on night shifts show an increased relative risk (1.14) for breast cancer.
- Higher vegetable intake increases melatonin levels; meat lowers melatonin.

**Heterocyclic amines (HCAs)**
- HCAs are produced when cooking meat at high temperatures.
- Meat eaters who eat well-done meat eaters show 5x the odds of breast cancer compared to people who eat rare meat.
  - Well-done meat eaters also show a higher risk of colon, esophagus, lung, pancreas, prostate, and stomach cancer.
- Mechanism of action: a particular HCA (PhIP) has estrogen-like effects and induces breast-cancer cell growth.
Cholesterol
- LDL may be used by breast cancer to synthesize estrogen or tumor membranes for cell growth.
- Women with total cholesterol >240 show a 17% increased risk of breast cancer vs. those with cholesterol <160.

How Not to Die from Breast Cancer

Exercise
- Five hours a week of vigorous aerobic exercise lowers estrogen and progesterone by 20%.
- Walking an hour a day shows reduced relative risk (0.91) when controlled for BMI.

Fiber
- Premenopausal women who ate 6g of fiber a day had 62% lower odds of breast cancer vs those eating <4g a day.
- Every 20g fiber/day showed a 15% lower risk of breast cancer.
- Getting up to a minimum of 25g/day may be required to show an effect. The average vegetarian may only get 20g/day.

Apples
- Daily apple eaters show 24% lower...

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How Not to Die Summary Part 1-7: Prostate Cancer, Parkinson's

Prostate Cancer
Annual deaths from prostate cancer: 28,000

Prostate Function and Disease
The prostate surrounds the urethra and secretes the fluid part of semen.

Half of men over 80 have prostate cancer, but most die with the disease.

Dietary Risks for Prostate Cancer
Milk and hormones
High intake of dairy products increases total prostate cancer risk with a relative risk of 1.07.
Overall, each daily glass of milk showed higher rates of premature death, heart disease, and cancer in women.
- 3 or more glasses of milk a day show a mortality hazard ratio of 1.93!

Women who drink milk have 5x the rate of twin births.
Japanese men showed a 25x increase in prostate cancer risk after World War II. This is also associated with a 7x, 9x, and 20x increase in egg, meat, and dairy consumption respectively.
Cow's milk stimulates human prostate cancer cells in vitro by 30%.
The culprit could be D-galactose, which induces premature aging in lab animals and causes acute symptoms in patients with galactosemia, possibly from oxidative stress.

Eggs and choline
- Men eating 2.5+ eggs/week show 81% increased risk of dying from prostate cancer.
- The culprit could be choline, which is converted into the toxin trimethylamine.
- Overall, men eating poultry showed 4x the risk of prostate cancer progression (like metastasis) which could be due to cooked-meat carcinogens like HCAs.

Meat and IGF-1
- IGF-1 (insulin-like growth factor 1) stimulates cell production. This is useful for growth as a child, but less helpful in adulthood.
  - Laron syndrome is caused by a natural inability to produce IGF-1. These patients almost never get cancer.
- IGF-1 is triggered by animal protein consumption.
  - After 11 days of avoiding animal protein, IGF-1 levels drop by 20%, and IGF-1 binding protein levels increase by 50%.
- An increase in animal protein consumption of 3% is associated with a 15% increased risk of bladder cancer.
- Vegetarians who include eggs...

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How Not to Die Summary Part 1-8: Deaths from Medical Treatment

Annual deaths from iatrogenic causes: 225,000

Iatrogenic causes relate to illness caused by medical treatment. This includes:
- 106,000 deaths from side effects from medications
- 99,000 deaths from hospital-acquired infections
- 20,000 deaths from hospital errors
- 12,000 deaths from unnecessary surgery complications
- 7,000 deaths from wrong medication
- 199,000 deaths from drug side effects

How Not to Die from Medical Treatment

Reduce medical error.
- Residents used to have 36-hour shifts until they were shortened. Residents who undergo all-nighters increase serious medical errors by 36% and diagnostic errors by 5x.

Reduce radiation through diet and reducing exposure.
- Medical treatment and diagnose entail many sources of radiation:
  - A single CT scan for a baby girl could cause cancer at a rate of 1 out of 150.
  - A chest CT has the same cancer risk as 700 cigarettes.
  - An angiogram could cause cancer in 1 out of 270 women.
  - A cross-country flight could expose you to as much radiation as a chest x-ray.
- Reduce radiation damage through antioxidants in foods like spinach and kale. Vitamin C and E supplements don't seem to help.
- Survivors of the Hiroshima and Nagasaki bombings show that plant-rich diets cut cancer risk by 36%.
- Ginger, garlic, turmeric, goji berries, mint leaves, and lemon may also be protective against radiation.
Use diet instead of drugs.

- Patients routinely overestimate the power of drugs to treat disease.
- Patients believe statins are 20x more effective than they actually are. In reality, the benefit of preventing heart attack is <5% over a period of 5 years.
- In comparison, a plant-based diet may reduce the risk of heart attack by 60% over 4 years
- Patients who overtrust drugs may be less likely to adopt lifestyle changes.

Reconsider taking aspirin.

- Salicylic acid (the active ingredient in aspirin) acts as a blood thinner by inhibiting pro-coagulant enzymes. It also suppresses proinflammatory prostaglandins. People at risk...

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Shortform Exercise: Reflect On Your Health Concerns

You've just read about the top 15 causes of death. Think about what you took away.

Which of the causes of death covered so far are you personally most worried about? Why?

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How Not to Die Summary Part 2: What to Eat | Main Ideas

As you've seen throughout Part 1, the themes of How Not to Die include:

- Eating a plant-based diet decreases your risk of a host of diseases.
- Eating supplements that extract the active ingredient from fruits and vegetables leads to less benefit than eating the whole plants themselves.
- Meat and animal products increase your risk of disease, even after controlling for calories eaten and weight.

Even More Reasons to Eat Vegetables and Fruit

If the massive health benefits aren't enough to convince you to eat more plant-based foods, here are a few more.

Think of your diet everyday as a bank account of 2000 calories you can spend everyday. Eating one 800 calorie hamburger displaces eating 7 sweet potatoes or 26 cups of broccoli. Which one would benefit your body more?

Some might shy away from a plant-based diet because it seems expensive. This is partly true—on a calories-per-dollar basis, junk food and fat are the cheapest. But on a nutrients-per-dollar basis, vegetables offer 6x more nutrition compared to processed food.

- Meat costs 3x more than vegetables but deliver 16x less nutrition. Thus, meat is 48x more expensive on a nutrient basis than vegetables.
- Increasing fruit and veg spending by 50 cents/day can decrease mortality by 10%.

And if you're the type to dislike the influence of big corporations, remember that dietary guidelines are often influenced by the industries themselves.

- When regulators discourage the public from buying certain products, they talk about biochemical components rather than what foods to avoid. For example, guidelines tend to say “eat less saturated and trans fats” instead of “eat less meat and junk food.” This is likely to appease agricultural groups.
- Remember how the meat, milk, and egg industries successfully lobbied to remove a federal recommendation to eat less animal-based foods.

Today’s Foods Work Against Us
Modern foods are optimized to develop unhealthy eating habits.

Our primate brains have...

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**How Not to Die Summary Part 2-2: Beans, Berries, and Other Fruits**

**Beans**

**Daily Recommendations**

3 servings per day

**Serving sizes**

- ¼ cup of hummus or bean dip
- ½ cup cooked beans, tofu, tempeh
- 1 cup of fresh peas, sprouted lentils

**What to eat:** Black beans, black-eyed peas, butter beans, cannellini/garbanzo beans, chickpeas, edamame, kidney beans, lentils (beluga, French, red), miso, navy beans, peas, pinto beans, small red beans, tempeh

**Nutrients and Benefits**

Nutrients: protein, iron, zinc, fiber, folate, potassium

- Canned beans are as nutritious as boiled beans, except for the salt they contain.

Studies show:

- Beans drop LDL and total cholesterol.
- Every 20g increase in daily legume intake reduces premature death by 8%.

**Specific Choices**

**Soy**

- Half of nutrients are lost when soybeans are converted into tofu or soy milk.
  - For tofu, choose ones made with calcium.

- Tempeh or miso are whole soy foods that are preferable to tofu and soy milk.
  - Don't boil miso since it has probiotics.
  - Despite its salt, miso may have protective effects that cancel out the increased risk of stomach cancer and hypertension.

**Lentils**

- There is a healthy “lentil effect”—when eaten, lentils blunt the sugar spike of foods eaten hours later. Compounds in lentils seem to relax the stomach and slow the rate of sugar absorption.
- When lentils are sprouted, the level of antioxidants doubles.

**Black beans**

- Have more phenolic phytonutrients than other legumes.

**Berries**

**Daily Recommendations**

1 serving per day

**Serving sizes**

- ½ cup fresh or frozen
- ¼ cup dried
**What to eat:** Acai berries, barberries, blackberries, blueberries, cherries, concord grapes, cranberries, goji berries, kumquats, mulberries, raspberries, strawberries

**Nutrients and Benefits**

Nutrients: 10x more antioxidants than other fruits and vegetables by density

- Compared to fresh berries, frozen berries are [roughly the same in...](#)

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**How Not to Die Summary Part 2-3: Green, Leafy, and Other Vegetables**

**Cruciferous Vegetables**

**Daily Recommendations**

1 serving per day

**Serving sizes**

- ½ cup chopped
- ¼ cup Brussels or broccoli sprouts
- 1 tablespoon horseradish

**What to eat:** Arugula, bok choy, broccoli, Brussels sprouts, cabbage, cauliflower, collard greens, horseradish, kale, mustard greens, radishes, turnip greens, watercress

**Nutrients and Benefits**

Nutrients: sulforaphane is thought to be the main beneficial component.

- Protects against DNA mutations and ability to form tumors
- Protects brain, eyesight, immunity
- May help with autism

Sulforaphane requires the enzyme myrosinase to be produced.

- Raw cruciferous vegetables suppress cancer cell growth *in vitro*, but not cooked vegetables.
- Michael Greger suggests a “hack and hold” technique—chop, then wait forty minutes while sulforaphane is produced.
- *Frozen cruciferous vegetables lose much of the antiproliferative anti-cancer effect*, because tyrosinase is destroyed before packaging. Powdered mustard seeds have tyrosinase and increase sulforaphane production.

Supplementing sulforaphane seems ineffective.

- Bioavailability is 8x better when eating broccoli sprouts vs. supplements that contain the same amount of precursor chemical.

Too much sulforaphane could cause DNA damage.

- How much is too much? Over 4 cups of broccoli sprouts.

**Specific Choices**

**Red cabbage**

- More antioxidants per dollar than other foods

**Broccoli sprouts**

- When grown yourself, these are a very cheap source of sulforaphane.

**Greens**

**Daily Recommendations**

2 servings per day
Serving sizes

- 1 cup raw
- ½ cup cooked

What to eat: Arugula, beet greens, collard greens, kale, mesclun mix, mustard greens, sorrel, spinach, swiss chard, turnip greens

Nutrients and Benefits

Nutrients:

- Chlorophyll blocks carcinogen activity, possibly by regenerating coenzyme Q10
- Warning: Greens contain vitamin K. If...

What Our Readers Say

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How Not to Die Summary Part 2-4: Nuts, Seeds, and Spices

Flaxseeds

Daily Recommendations

1 serving per day

Serving size

- 1 tablespoon ground

What to eat: Golden or brown flaxseeds

Nutrients and Benefits

Nutrients

- Contains lignans and omega-3 fatty acids
- It's best to blend flaxseeds for better digestion. Ground flaxseed should last at least 4 months at room temperature.

Studies show:

- A double-blind, placebo-controlled, randomized trial showed blood pressure drop from 158/82 to 143/75 after eating a few tablespoons of flaxseed a day, compared to no change in control.
- Prostate cancer patients eating 3 tablespoons per day of flaxseed after a month show lower cancer proliferation rate.

Nuts and Seeds

Daily Recommendations

1 serving per day

Serving sizes

- ¼ cup nuts or seeds
- 2 tablespoons nut or seed butter

What to eat: Almonds, Brazil nuts, cashews, chia seeds, hazelnuts, hemp seeds, macadamia nuts, pecans, pistachios, pumpkin seeds, sesame seeds, sunflower seeds, walnuts

Nutrients and Benefits

Studies show:

- ¼ cup of nuts daily may lead to lifespan extension of 2 years+
- Nuts have high caloric density, but studies show that adding nuts to diet cause lower weight gain than control. Where do the high calories from nuts go?
  - 70% of nut calories displace other foods.
  - 10% of calories are not absorbed by the gut.
  - 20% may come from nuts boosting metabolism.
Specific Choices

Walnuts
- Have the highest antioxidant and omega-3 levels and suppress cancer proliferation in vitro.
- The PREDIMED study showed the Mediterranean diet with nuts reduced stroke risk by 50%, and lowered all-cause mortality risk by 39%, while olive oil did not reduce all-cause mortality.

Peanuts
- Women at high risk for heart disease who eat nuts or peanut butter daily halve their risk of heart attack compared to non-eaters.

Pistachios
- Erectile dysfunction is...

How Not to Die Summary Part 2-5: Whole Grains and Beverages

Whole Grains

Daily Recommendations
3 servings per day

Serving sizes
- ½ cup hot cereal or cooked grains, pasta
- 1 cup cold cereal
- 1 tortilla or slice of bread
- ½ bagel or English muffin
- 3 cups popcorn

What to eat: Barley, brown rice, buckwheat, millet, oats, popcorn, quinoa, rye, teff, whole-wheat pasta, wild rice

Nutrients and Benefits

Studies show:
- From the Nurses' Health Study, the highest quintile of whole grain intake showed a reduced total mortality and reduced cardiovascular mortality.
- Whole grains reduce the risk of heart disease, type 2 diabetes, obesity, and stroke.
- Whole grains reduces inflammation across a panel of markers (e.g. CRP, interleukins, TNF-alpha).

Eat whole grains according to the Five-to-One rule:
- The ratio of grams of carbohydrates to dietary fiber should be 5 or less.
- When grains are processed into flour, they are digested more rapidly, and glycemic index increases.

Specific Choices

Gluten
- Outside of celiac disease, is gluten sensitivity real? Two randomized controlled trials show most people who claim to feel better on a gluten-free diet feel worse on a no-gluten placebo. Exposure to gluten can induce feelings of depression. So it appears gluten sensitivity isn't just in people's imagination.
- But some people showed wheat sensitivity, which is correlated to sensitivity to other foods like eggs and milk. If you remove eggs and milk from the diet and challenge with gluten, there's no effect. So going on a healthier diet may be the reason gluten-free diets work.
- About 2% of the population may have celiac disease or wheat allergies. For the other 98%, there is no evidence that a gluten-free diet has benefits, and it may actually negatively affect gut flora.

Pigmented grains
Pigmented rice (red, purple) may have antioxidant benefits over brown rice.

Oats
- Contain avenanthramides, which are anti-inflammatory compounds.
- They suppress inflammation for skin...

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How Not to Die Summary Part 2-6: Exercise and Supplements

Exercise

Daily Recommendations
1 serving per day

Serving sizes
- 90 minutes of moderate-intensity activity
- 40 minutes of vigorous activity

What to do
- Moderate-intensity activity includes cycling, hiking, housework, ice skating, shoveling snow, walking briskly (4 mph), yard work, yoga.
- Vigorous activity includes basketball, jogging, rock climbing, running, vigorous swimming, tennis, and weightlifting.

Nutrients and Benefits
Is exercise more important than eating for body weight? No—eating is still the principal cause of obesity.

- Compared to past times, people may actually be increasing physical activity over time, but foods are more calorically dense now and cause a net increase in calories eaten.
- Compared to exercising away 100 calories, simply not eating those 100 calories is usually much easier.
- Diet is the #1 risk factor for decreasing lifespan, responsible for 26% of deaths and 14% disability-adjusted life years, compared to tobacco smoking at 22% and 12% respectively.
- Losing 1% of the nation’s body-mass index could reduce 2 million cases of diabetes, 1.5 million cases of heart disease, and 127,000 cases of cancer.

Specific Choices

Sit less.
- Every extra hour spent watching TV per day is associated with 11% increased risk of death.
- Men who sit for >6 hours per day have a 20% higher death rate compared to men sitting <3 hours. Women show a larger increase in mortality at 40%. This is true even among people who exercise daily for an hour.
- A possible mechanism is endothelial dysfunction—when active, blood flow increases, and blood vessels signal to arteries to relax. This effect doesn't happen when a person is inactive.
- Walking 300 minutes per week reduces mortality by 14%. Walking 150 minutes per week reduces mortality by 7%, and walking 60 minutes/week reduces mortality by 3%.

Other options for activity:
- Switch to a standing desk—this causes an extra 30,000 calories burned per year.
- Have walking meetings or stand-up meetings instead of...

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