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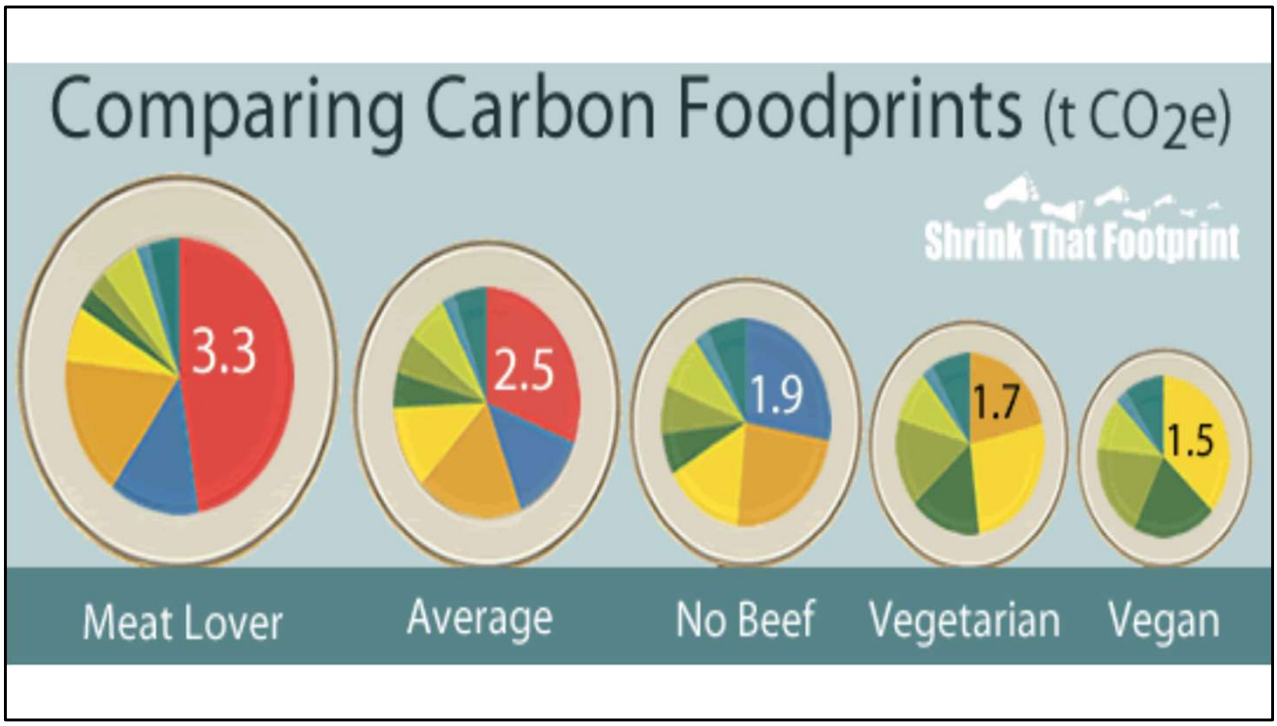
-plant-based since 1985

e-Cornell Plant-based Nutrition certificate

Thank you for attending our presentation!

Since this is a short talk today, we'll just say a few words to begin regarding some of the most common concerns regarding the benefits of a plant-based diet, then spend the rest of the time focusing on the practicalities.



The primary benefits of a plant-based diet for humans can be summarized into 3 basic topics: animal welfare, human health & protection of the planet's environment.

Since this is a Green Action group, the benefits to the environmental are of primary interest. While we could say much more about this topic, for now, this one slide gives us a representative sample of the information available on this topic.

The moral of this story is that eating a plant-powered diet cuts our green house gas production by at least half. Eating this way is one of the most important things we can each do for the environment. Happily, it is also THE best thing we can do for animal welfare and human health.

http://shrinkthatfootprint.com/food-carbon-footprint-diet
https://www.jhsph.edu/research/centers-and-institutes/johns-hopkins-center-for-a-livable-future/projects/meatless_monday/resources/meat_consumption.html
Data from USDA, ERS (economic research service), LCA (life cycle assessment

commons) & EIO-LCA
http://www.fao.org/news/story/en/item/197623/icode/
https://www.downtoearth.org/go-veggie/environment/top-10-reasons

Reducing the Environmental Impact of Dietary Choice: Perspectives from a Behavioural and Social Change Approach
https://www.hindawi.com/journals/jeph/2012/978672/

https://nutritionstudies.org/impact-of-food-choices-on-the-environment/
https://chooseveg.com/blog/eating-vegan-still-one-best-things-can-environment/

We sympathize with the question! We were there too at the beginning! Like most folks in affluent societies, we were also raised in families who believed that meat & dairy products were necessary for optimal human health, so we tended to think of them as the "important" things on our plates. We thought of milk as a basic, meat as the center of the meal. Anyone else?

Switching to a plant-powered diet was an adjustment for us too. The cool news is that more & more people ARE making this adjustment. If this is what you are doing, please know you are in good company! Please give yourself credit for making an important upgrade, maybe even saving your own life; absolutely saving the lives of innocent animals and contributing to the protection of the planet's environment. So please give yourselves a round of applause!

The point of this cartoon is to illustrate that there are far more plant foods to eat than the animal products we eliminate. The variety in our diet expands rather than contract by choosing to eat foods from the plant rather than animal kingdom.

You may notice that the younger lady is proudly sporting a "vegan" motif on her t-shirt. That means that she avoids eating all animal products, without telling us what

she does eat. Personally, I generally avoid using this term because labels alienate people. I'm just an ordinary human like anyone else. So, when I need to refer to my dietary choices, I prefer to talk about what I do rather than what I am. For example, I may say "I eat a low-fat diet of whole plant foods". That has given me better results than telling someone I'm vegan.

Some of the most common questions….

When we eat a plant-based diet, does it have to be all organic?

It's certainly a good option when available and within your budget. Even so, ordinary grocery-store whole plant foods are safer & cleaner than animal products, even when compared to products from organically-raised animals. This is because animal products typically have about 10x more contamination from persistent environmental toxins, due to bio-accumulation. In addition, even organic animal products come with a horrifying list of zoonotic pathogens, hormones & disease promoting fats, all of which are unique to the animal kingdom. Eliminating animal products in favour of even just ordinary whole plant foods reduces intake of toxins significantly.

Registered dietitian Jeff Novick explains the choices that are far worse than regular, grocery-store plant foods.
https://www.drmcdougallforums.com/viewtopic.php?f=22&t=42831&sid=f3543d57af07e5d1f0c81e996a37461f

Registered dietitian Susan Levin explains why organic meat, dairy & eggs are more contaminated than regular, grocery store produce.
https://www.forksoverknives.com/wellness/will-switching-to-organic-meat-dairy-and-eggs-save-your-health/#gs.9Q0QBjI

Is eating a diet of whole plant foods expensive?

Usually, a plant-powered diet is cheaper. For example, a kilogram of kidney beans costs about $2.00 whereas a kg of meat may cost over $40.00. Just avoid the processed junk food! For example, a 100 grams of potato chips may be about $4.00, while 100 grams of whole fresh potatoes cost about 60 cents. When berries are out of season, buying frozen is much cheaper. MOST people report that their grocery bill goes down when they eliminate the expense of animal products from their diet.

Chef Vicki Brett-Gach offers many ideas for stretching our grocery dollars farther than you may have ever thought possible.
https://nutritionstudies.org/plant-based-on-a-budget/

Without dairy products, where do we get our calcium?

There is calcium in all whole plant foods. When we eat our day's calories from a variety of whole plant foods, including greens & beans, we consume more than enough calcium.

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A complete overview of how & why a low-fat diet of whole plant foods provides us plenty of calcium and helps us keep our bodies strong.
https://www.pcrm.org/good-nutrition/nutrition-information/health-concerns-about-dairy/calcium-and-strong-bones

Without meat, where do we get our protein?

There are literally whole books written on the topic of how a normal variety of whole plant foods supply plenty of protein. If you would like a deep-dive into this topic, the book "Proteinaholic" by Dr. Garth Davis is a good option. Consuming plenty of protein happens automatically just by eating a varied diet of whole plant foods sufficient for one's energy needs.

For example, a day's meals containing a pleasing assortment of fruit, vegetables, whole grains & legumes contains about 10% protein. While that may sound like too little, according to the World Health Organization, humans only need about 5% of our calories from protein. As further confirmation of that, the Perfect First Food for human infants (human breast milk), on which they double their size in the first 6 months of their lives, is only 5% protein. For many reasons, it is optimal to consume enough without excess.

Dr. Garth Davis "Proteinaholic" http://proteinaholic.com/

Without oil, where do we get our fat?

There is some fat in all whole plant foods. Edible oil is just the fat from a whole plant food, pressed out. So, although it is a plant product, it is a fractionated product: just the fat from the plant food stripped of the other health-promoting nutrients normally in that plant food.

Even without eating any of the higher fat plant foods like nuts or avocado, when we add up all the small amounts of fat in our day's intake of whole plant foods, there is enough for our needs without excess. An oil-free diet of low-fat whole plant foods typically has about 10% of calories from fat.

Instead of oil, we use a few tablespoons of water or broth for sauteing veggies in a good quality, non-stick fry pan. Baking paper or silicon bakeware can work even better than oil for baking.

Chef Darshana Thacker explains more about why oil-free diet of whole plant foods is beneficial, and how to cook delicious food oil-free.
https://www.forksoverknives.com/wellness/plant-based-cooking-how-to-cook-without-oil/

Without fish, where do we get our omega 3 fatty acid?

Humans have two Essential Fatty Acids, omega 3 & omega 6. These are the only fats we need to consume in our diets. & they are unsaturated. They are both in all whole plant foods, even lettuce & mangoes, so getting enough of each is easy when we eat an abundance & variety of whole plant foods. The important thing is avoiding consuming too much omega 6 which can be inflammatory in excess. This is one of the many reasons to avoid consuming oils because they have high concentrations of omega 6.

https://www.pcrm.org/news/blog/get-omega-3s-plants-not-fish-oil

Without meat, where do we get our iron?

There is non-heme iron in all whole plant foods. Greens & beans are among the best sources, enough for our needs without the inflammatory excess of the heme-form in flesh foods.

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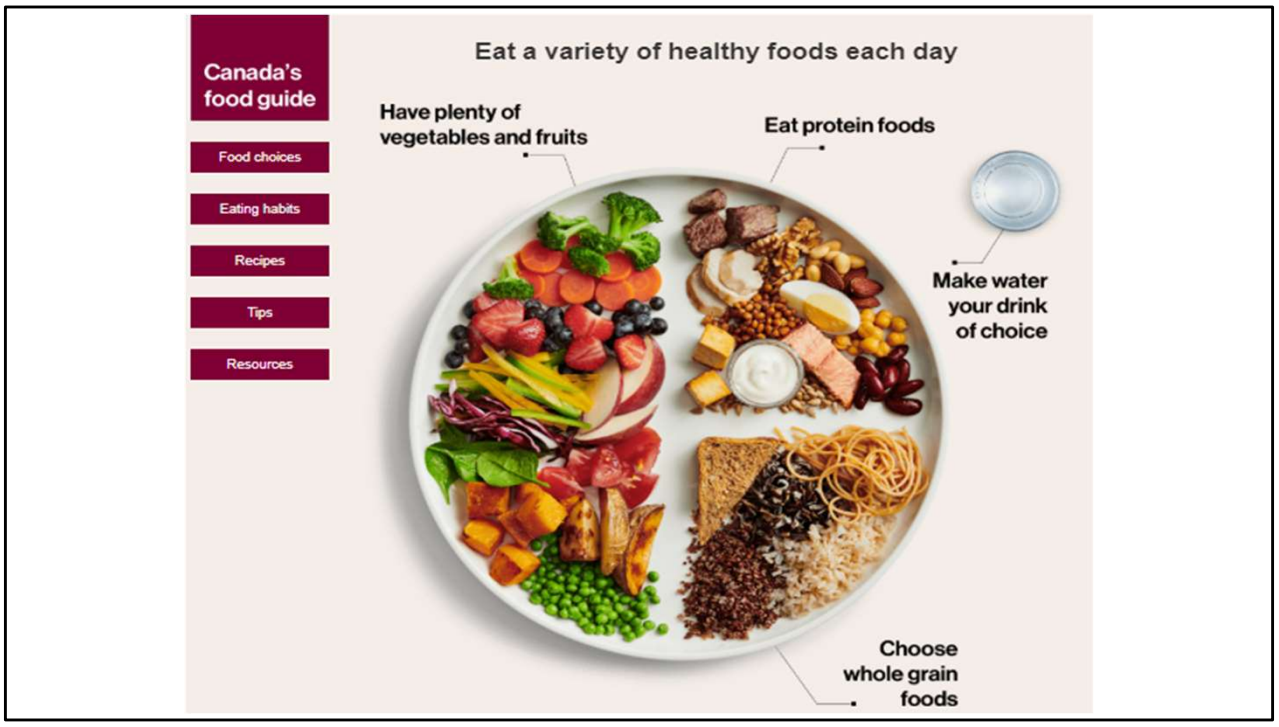
Physician Dr. Michael Greger explains why the type of iron in whole plant foods is healthier for humans than the type of iron in flesh foods.
https://nutritionfacts.org/video/the-safety-of-heme-vs-non-heme-iron/



Here we go, into the nitty gritty of what to eat.

This is the current Canada's Food Guide, published January 2019 https://food-guide.canada.ca/en/

It looks quite different now than in previous generations. Now, there are no groups for animal products, meat or dairy. It is functionally, a plant-based guide. Yay!

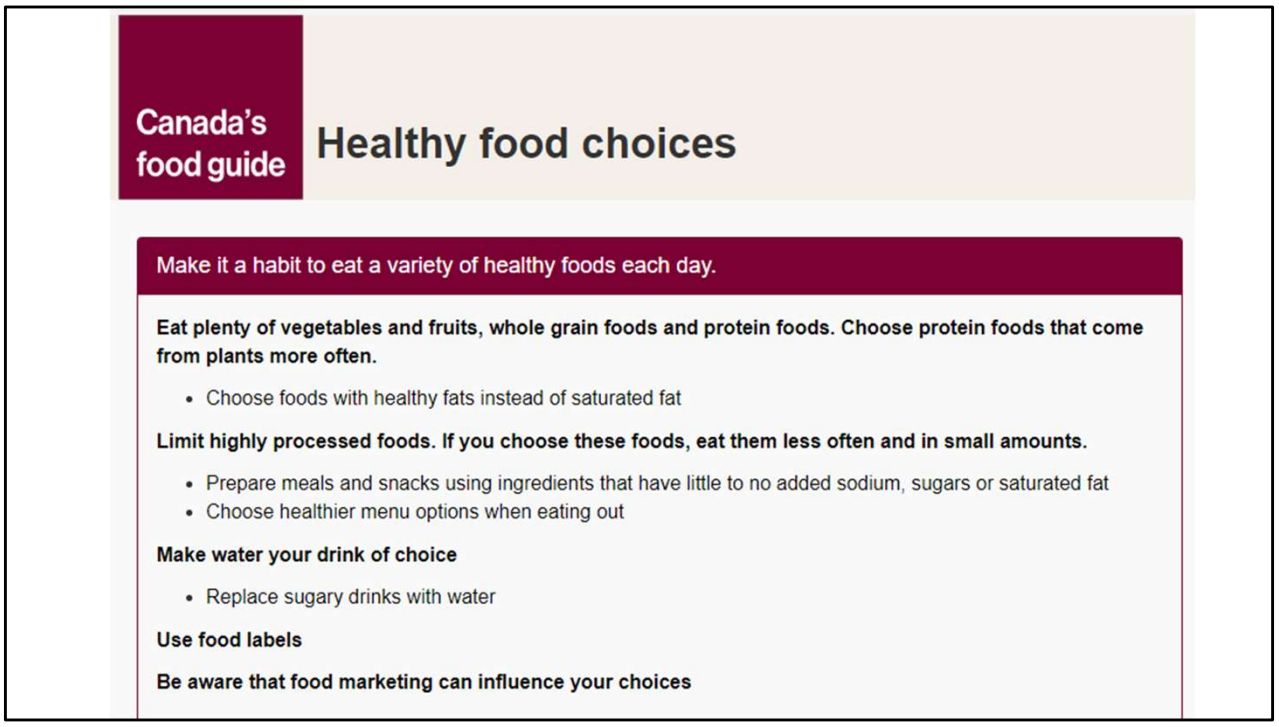
Of the 3 food groups, the largest, most colourful section on the left is fruits & vegetables. This what dietitians mean when they ask us to "eat the rainbow!". This Health Canada guide recommends that we fill half our plate with fruits & vegetables, fresh or frozen, raw or cooked… and please make it a BIG plate! One of the most common errors at the beginning of eating a plant-based diet, is eating too little. Whole plant foods are lower in calorie density than animal products & processed foods, so we need to increase the amount of food we are eating.

The other two sections are whole grains & what they are calling "protein" foods. In the "protein" section, legumes (beans, peas & lentils) are the primary elements, with a few small portions of animal products. So, IF (and that's a big if) you want to eat

any animal products, Health Canada is saying “Please keep the serving VERY small.”

Just to clarify about that, is Health Canada wanting us to eat these very small quantities of animal products?

Let’s look at page two of the guide for that answer.



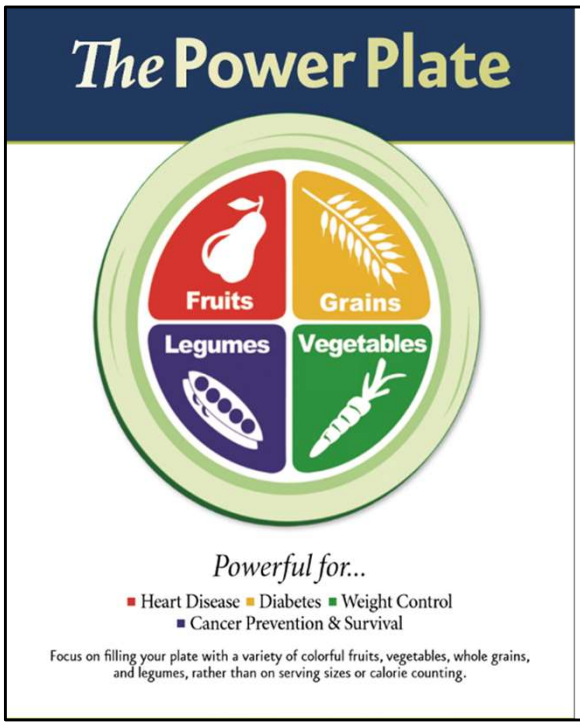
This is the Food Choices page on the Health Canada Food Guide website. It advises us to choose plant sources of protein in preference to animal sources.

What are plant sources of protein? WHOLE plant foods because all of them have protein, yes even watermelon & lettuce. In fact, vegetables, beans, peas & lentils have as much or more protein than animal products.

The guide also advises us to limit intake of saturated fat.

Since none of us buy jars of stuff labelled "Saturated Fat", we need to know what foods contain it. All animal products contain significant amounts. In the plant kingdom, palm oil, coconut & chocolate are the few plant foods high in saturated fat; so yes, that means it is wise to avoid the use of coconut oil, despite it being trumpeted as a "super food" by those who profit from selling it.

Water can be in the form of herbal teas or sparkling water. … and certainly, avoiding alcohol.



https://www.pcrm.org/veganstarterkit

For people wanting to eliminate animal products, we have the Power Plate graphic from the Physicians Committee for Responsible Medicine, known as the PCRM.

Like Canada's Food Guide, it also recommends half the plate be fruits & vegetables, with ¼ from whole grains. The only difference is that instead of leaving people to figure out what "protein foods from plants" are for the protein group, the Power Plate simply calls it the legume section.

If you like to draw, you can make yourself a nice chart like this. If you have access to a printer, you can go to the PCRM website and print off a copy for yourself. It's a great visual to post on the fridge! I think of this as "training wheels" for plant-based diet.

To make this seem a bit more real, on your own copy, I would suggest writing names of the foods you like in each group, using the area around the power plate, the more the better. You can include the starchy veggies like potatoes, sweet potatoes and squash in the whole grain section.

If you like, one's meals can be as simple as this, with the foods served separately. Some folks like it this way.

For those who like recipes & combination meals, the foods can be mixed in casseroles, soups or stews. For example, a veggie/bean burrito may have a whole grain wrapper, stuffed with seasoned veggies & beans, and the meal completed with a serving of fruit for dessert. Another way of mixing them up might be as a veggie stir-fry served on brown rice with some fruit for appetizer or dessert. A combination breakfast could be a hot whole grain cereal topped with soy milk, berries & cooked greens.

There's lots of recipes & more information on the PCRM website about how eating this way is powerful for heart health, blood sugar control, weight management & cancer prevention.

https://p.widencdn.net/ktho8u/Power-Plate-Brochure

This slide gives us some more suggestions for how appetizing and ordinary a plant-powered diet can be. You may already be eating more plant-based than you realized, and with a little thought, you may be able to adapt many of your favourite recipes. I'll happily email you plant-based versions of your favourite recipes, if you put your address on the signup sheet.

Sandwiches: finding egg-free, dairy-free, oil-free bread may take some sleuthing, so if you are inclined to make your own at home, that can be a wonderful & very affordable solution to that problem. If you need to buy it, label reading (aka grocery store yoga), is essential to find some acceptable brands. Grocery store yoga is reaching up to the shelf, grasping the product firmly, turning it around to the side or back to read the ingredients list, and then deciding if it goes back on the shelf or in your cart. Silver Hills bakery has some good products, and they are made in BC. Most flat breads such as pita, are fully plant based. Please check the label to avoid oil, salt & sugar.

100% veggie sushi is easy to order off the regular menu at Japanese restaurants. With a little practice, it's fun & very economical to make at home. When we entertain friends, we often have a "roll your own" sushi dinner as we sit together,

chatting and enjoying each others company. One can buy the nori seaweed wrapper at most grocery stores these days, the pickled ginger, the sticky or “glutinous” rice and of course, an assortment of veggies for inside. Fong’s market in Lower Gibsons has all these items.

Yummy marinara sauce for pasta is made with an assortment of veggies, maybe some crumbled tofu or cooked lentils, tomato & seasonings. When we want chili, we just add some cooked kidney or pinto beans and serve that with potatoes. Most pasta are 100% plant based, and again, reading the label on the back of the package will alert you to the few brands which contain egg.

An excellent dairy-free frozen “nice” cream is made with frozen bananas & other fruits or berries in the blender. In the freezer section of MOST grocery stores, you may also find some decadently delicious commercial dairy-free brands. I call them decadent because they will be made with various types of sweeteners & oils, so NOT whole foods, but a better choice than dairy-based ice creams in many ways.

Variety

30 different plant foods per week

for a happy, healthy microbiome

Variety is more than just the spice of life, it is one of the primo tools for nurturing our microbiome. The microbiome is the trillions of bacteria living in our intestines. Maintaining a healthy microbiome is of critical importance to our health. To do that, they need us to feed them with the fiber in whole plant foods.

The healthiest microbiome is one with a largest diversity of plant-loving bacteria. This is where variety comes in because each of the different bacteria types needs different types of plant foods to flourish. The target of at least 30 different types of plant foods in a week comes from studies on humans eating different amounts of variety. The studies show that people eating at least 30 different plant foods a week had more diverse gut microbes than people who ate less than 10 different types of plant foods in a week.

Thirty is not a hard-and-fast number, it is a target, widely recommended by gastroenterologists, and seems to be reasonably do-able for most folks in affluent societies.

While I know it may seem daunting initially, when we tally it up, you may be surprised by how well you are already doing in this way.

There are 30 different foods as in the photo. So, what do you think? Are you doing better than you thought? … or are you realizing there is room for improvement?

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Photo: Tomatoes, mushrooms, broccoli, sweet peppers, corn, Spinach, potato, onion, green peas, carrot, Grapes, apricot, strawberries, watermelon, blueberries, Raspberries, apple, banana, orange, kiwi. Oats, brown rice, quinoa, buckwheat, wholewheat flour. Black beans, chickpeas, kidney beans, lentils, ground flax seed.

Other options: pears, soy & pinto beans, wild rice & sorghum, summer & winter squash, sweet potatoes, kale & different types of lettuce, red & green cabbage, cucumber, arugula & cauliflower, chestnuts, celery & garden beans, leeks, turnip & rutabaga, papaya & mango, cantaloupe & honey dew melons, Brussels sprouts.

Dr Megan Rossi https://www.theguthealthdoctor.com/how-to-get-your-gut-loving-30-plant-points-a-week/

Dr. Angie Sadeghi https://www.youtube.com/watch?v=iD3e8EbeApA

Dr. Alan Desmond https://www.devongutclinic.com/healthy

Dr. Michael Greger https://nutritionfacts.org/2019/10/29/how-to-increase-gut-bacterial-richness/

Dr. Will Bulsiewicz https://www.youtube.com/watch?v=RbyNxrV4Liw

Here are a few of the common egg substitutes that work remarkably well in most baking recipes.

Depending on what effect you want, you might choose one or the other. For example, mashed tofu has a neutral flavour, and adds some density and richness, whereas bananas and apple sauce have a lighter effect & add sweetness.

If you begin with a recipe that is already plant-based, it will recommend the right one.

All the resources in the handout have recipe sections & I would be happy to email you with many more.

http://www.pcrm.org/health/diets/vsk/vegetarian-starter-kit-eggs
http://www.theveganjunction.com/19-healthy-vegan-cookbooks-you-wont-want-to-go-without/
https://www.drmcdougall.com/health/education/free-mcdougall-program/10-day-

meal-plan/
http://kidtestedfirefighterapproved.com/resources/

If you want a plant-based milk for baking or for wetting dry breakfast cereal in a bowl, as you can see, there are many options. By doing your Grocery Store Yoga, you can see the ingredients in each product and choose one that is free of added oil, sugar & salt. After reading the labels on the back & locating one with an acceptable nutrition profile, I suggest trying it. Please remember it will taste different than dairy milk. Many people like it better.

Different types have different flavours & textures, and your choice may depend on the use for which you intend it.

Please enjoy the journey of exploring which one suits you best; and remember, it is entirely optional. These products are NOT intended for drinking as beverages. As you may have noted in the Health Canada Food Guide, the recommended beverage is water.

Stocking Your Kitchen

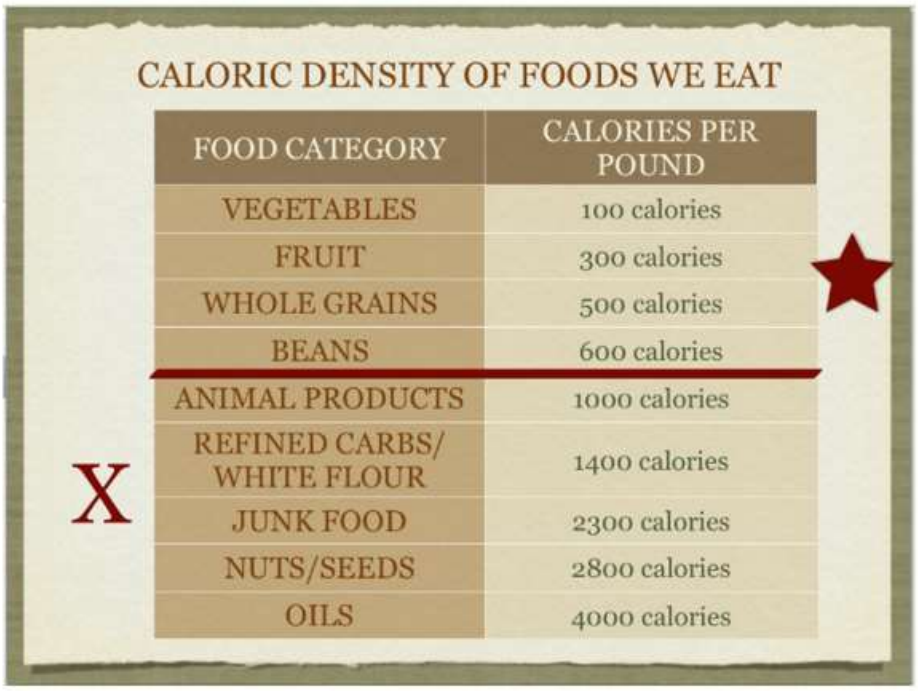
Setting up a plant-powered kitchen can be done quickly over a couple of days, or it can gradually evolve as we discover our preferences.

Sometimes folks begin by adding more plant foods as they use up whatever they have in their freezer. For others who have a blazing ah-ha moment, giving the contents of the freezer to the Food Bank can be a useful way to make good use of products they no longer want.

Canned beans are convenient at the beginning. In time, you may prefer to rely on dried beans because they are cheaper and can be prepared in large batches and stored in the freezer in useful quantities.

Salt-free herbs & seasonings are very tasty & more health-promoting than more folks may realize because they have very high levels of disease-fighting antioxidants.

https://www.drmcdougall.com/articles/information/stocking-your-kitchen/



Are you concerned about weight management?

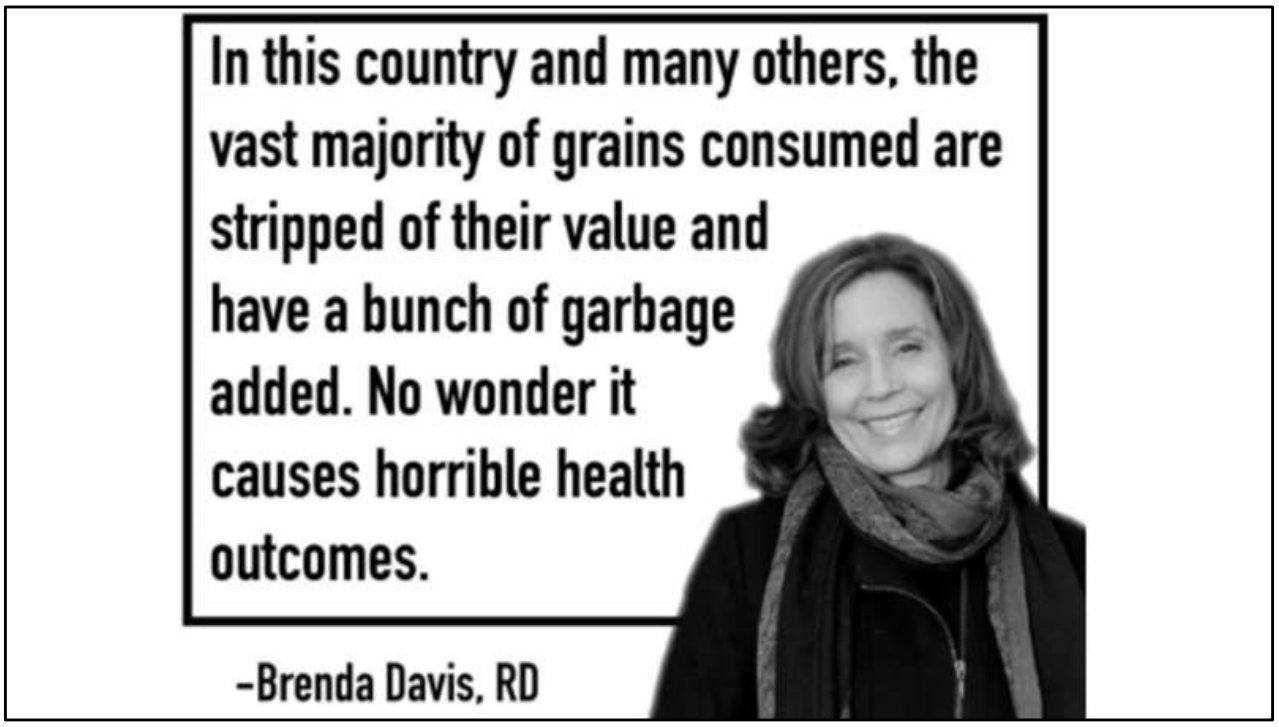
To address those concerns, this is a Calorie Density chart from registered dietitian Jeff Novick. Happily, we see that the foods lowest in **calorie** density (above the red line) are all WHOLE plant foods: fruits, vegetables, whole grains & legumes (beans, peas & lentils) recommended by the Power Plate & Health Canada. Interestingly, these are also the most nutrient-dense foods. The calorie density factor is why eating a low-fat diet of whole plant foods is often called the eat-more-weigh-less program. It is also the most sustainable environmentally, the most health-promoting & the kindest way to eat from the point of view of animal welfare.

Animal products & refined plant foods especially oil are much higher in calorie density; these are the foods below the red line. Oil is the worst because it is 100% fat. This is because fat has 9 calories per gram whereas carbohydrates & protein only have 4 calories per gram.

What about the popular advice about avoiding carbohydrate-rich foods for fear of them being fattening?

Chart credit Jeff Novick RD
http://www.cdc.gov/nccdphp/dnpa/nutrition/pdf/r2p_energy_density.pdf

Plant-Based Dr. Jules, MD https://www.plantbaseddrjules.com/post/weight-loss-and-plant-based-diets



This slide is a short-and-concise summary of why choosing whole grains is healthier for us than refined grains. This is why the healthiest recommendations are for WHOLE plant foods rather than highly processed products. For example, Oreo cookies are vegan but sure aren't health food.

As often as possible, please choose whole grains such as brown rice rather than white & whole wheat instead of white flour. Other whole grains to choose are millet, quinoa, buckwheat & sorghum.

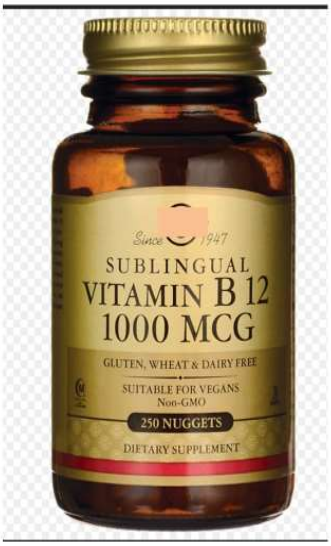
Canadian registered dietitian Brenda Davis is the coauthor of "Becoming Vegan", a useful beginner text for plant-based diet.

http://www.brendadavisrd.com/faq/

Recommended Supplements

Vitamin D is a hormone!

Vitamin B12



These are the only two supplements normally recommended for anyone eating a plant-based diet: vitamin B12 & D.

Of interest, neither of these are exclusively plant-based diet issues. In fact, Vitamin B12 is recommended for everyone in their senior years, whatever their diet. B12 is different than the other B-vitamins because it is made by cyanobacteria, rather than by either plants or animals. All the **other** B-vitamins are made by plants, so people eating a varied diet of whole plant foods consume lots of them.

For more information about B12, registered dietitian Jack Norris has an excellent B12 section on his on his website. A link to this is in the handout.

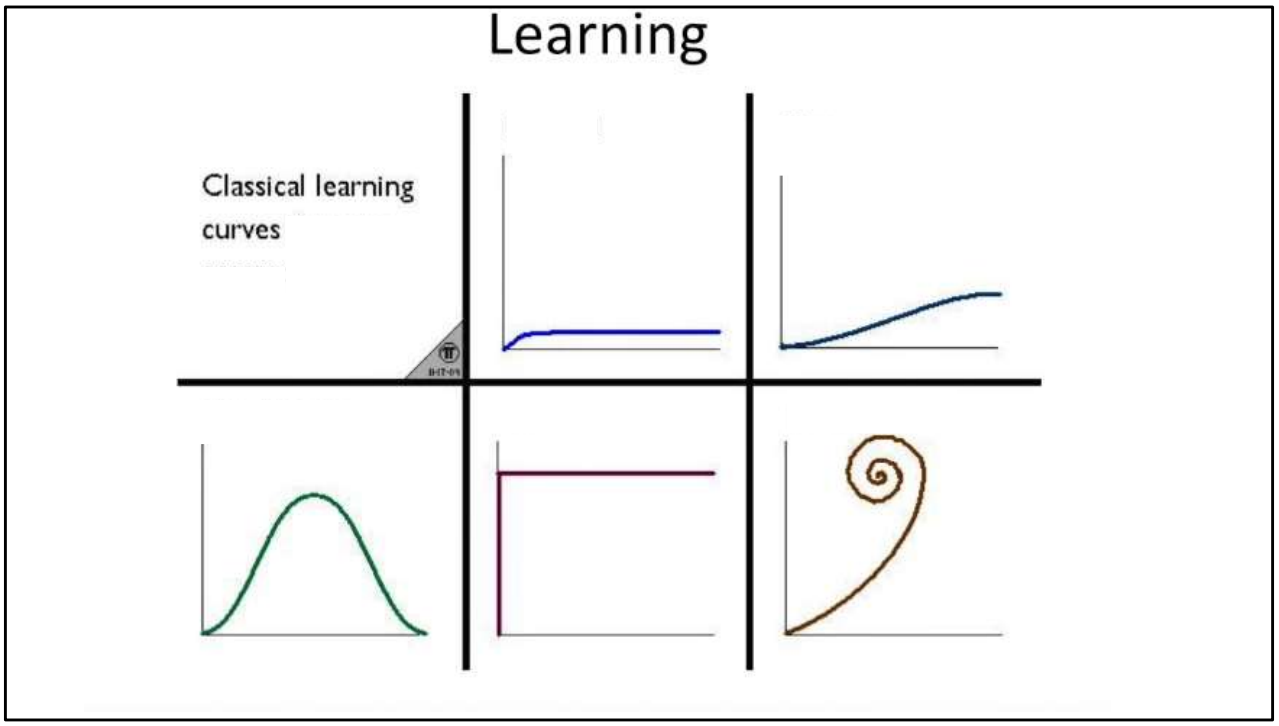
Regarding vitamin D: The human species evolved in the tropics, where covering the body was optional. Therefore, this is our natural source of vitamin D: a photosynthetic reaction between the cholesterol in our skin & sunshine. Regular, controlled exposure of our skin to direct daily summer sunshine **without burning** can produce enough for the entire year.

However, in northern winters and for people without access to sunshine, vitamin D

status may decline. Maintaining a functional level of vitamin D promotes longevity, optimistic attitude, helps us maintain bone density & a strong immune system.

https://veganhealth.org/vitamin-b12/
https://www.dietitians.ca/your-health/nutrition-a-z/b-vitamins.aspx
https://www.livestrong.com/article/22253-foods-high-b-vitamins/

http://www.pcrm.org/health/health-topics/vitamin-d-fact-sheet
http://nutritionstudies.org/shining-light-vitamin-d/
https://ods.od.nih.gov/factsheets/VitaminD-HealthProfessional/
4. http://ajcn.nutrition.org/content/80/6/1689S.full



How does one go about making the transition?

There are as many styles of transition as there are families making them.

Some folks make a very small change and just stick with that. Some people make slow and steady progress over a long period of time, continuing to learn as they go along. Others enter with enthusiasm and then power out. Then there's those who make HUGE changes instantly, overnight even, and they are set for life! And then there's the ones who don't seem really know where they are going, wonder around and get lost in the process.

We began by eliminating dairy products. That helped. A year later, we eliminated all processed foods, including sugar & white flour. THAT gave us serious relief from health issues and inspired us to push on. Our next step was eating fully plant-based one day per week, then two days, then 3, etc. For us, the whole process of transition took about 2 years. At that point, we actually felt rather surprised to find ourselves eating 100% plant-based!

We've also known people who went 100% vegan overnight for the sake of animal

welfare, but then took many years to make further adjustments from processed to WHOLE plant foods for the sake of their own personal health.

I think the most common learning curve I've seen is a more zig zag progression of two steps forward, one step back.

Some folks begin by focusing on one meal of the day. For example, making breakfast fully plant-powered, doing that consistently throughout the week until that feels comfortable, then moving on to transitioning lunches, etc.

Some folks go about it by learning how to use plant foods instead of animal products in one of their favourite recipes at a time.

Finding the style, pace and extent that works best for you, is part of the adventure. ☺

If you are taking medication, please inform your doctor when you begin eating a low-fat diet of whole plant foods.
Medications for diabetes & blood pressure will need to be REDUCED  quickly.

You will need to take regular readings so your doctor can know how quickly & how much to reduce the medication to avoid overdose.

https://www.pcrm.org/news/health-nutrition/plant-based-diets-reduce-medication-use-among-seniors

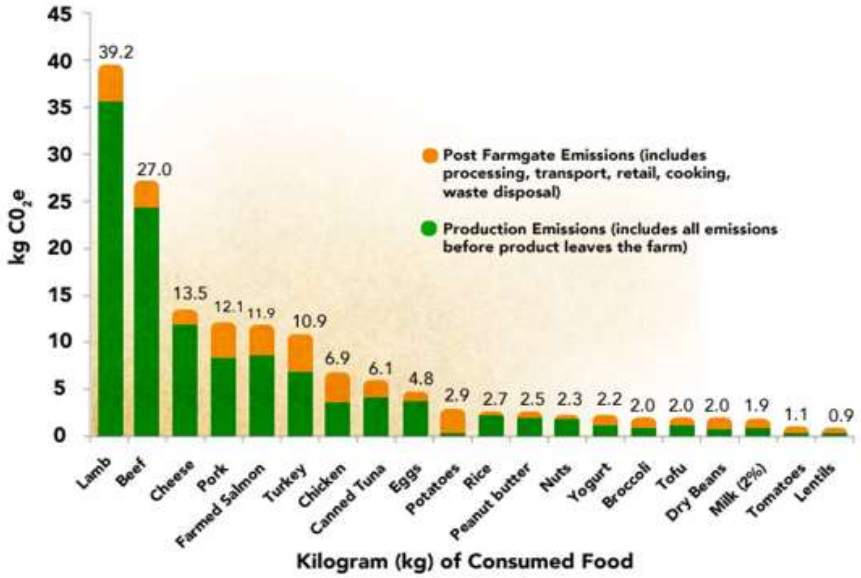
Homework! ☺

The documentary *Forks Over Knives* examines the profound claim that most, if not all, of the chronic diseases afflicting people in affluent societies can be controlled or even reversed by rejecting animal-based & processed foods in favour of a whole foods plant-based diet.

https://www.forksoverknives.com/the-film/

Bonus info for geeks

- Why do Green House Gas (GHG) estimates differ?
- In the USA, the EPA estimated animal agriculture to make up 6% of total GHG emissions. That estimate takes into account enteric fermentation (burping & passing wind of animals), manure management and soil management sources of CO_2, methane and Nitrous Oxide. They used a factor of 1 for global warming potential (GWP) of CO_2 and 21 for GWP of methane which is its impact compared to an equal mass of CO_2 averaged over 100 years.
- The UN FAO estimated the contribution of animal agriculture to be 18% because they used a life cycle analysis methodology. This meant that in addition to the GHG contributions considered by the EPA, they also included the GHG impact of land use changes, feed production, on-farm fossil fuel, processing and international transport.
- The World Watch Institute estimate is highest because they made two significantly different assumptions. Instead of using the 100 year GWP methane factor of 21, they used the 20 year factor which is 86. Many believe this is a better estimate of methane's impact because we want to reduce GHG by 2030, not 100 years from now. Their second assumption is more controversial as they included animal respiration in their calculations. Most consider respiration to be part of short-term carbon cycle so exclude respiration from GHG calculations.
- In conclusion, even the most conservative estimates of the GWP of animal agriculture indicate that it contributes significantly more to climate change than plant-based agriculture. Since humans can produce more plant foods at a lower cost to the environment, we submit that eating a plant-based diet is the logical ecological choice.



Greenhouse gas lifecycle assessment for common proteins and vegetables (Environmental Working Group 2011).

Consuming local animal products?

When confronted with the shocking facts about GHG emissions from their products, the meat industry tries to insist that the real problem is just having to get their products to market.

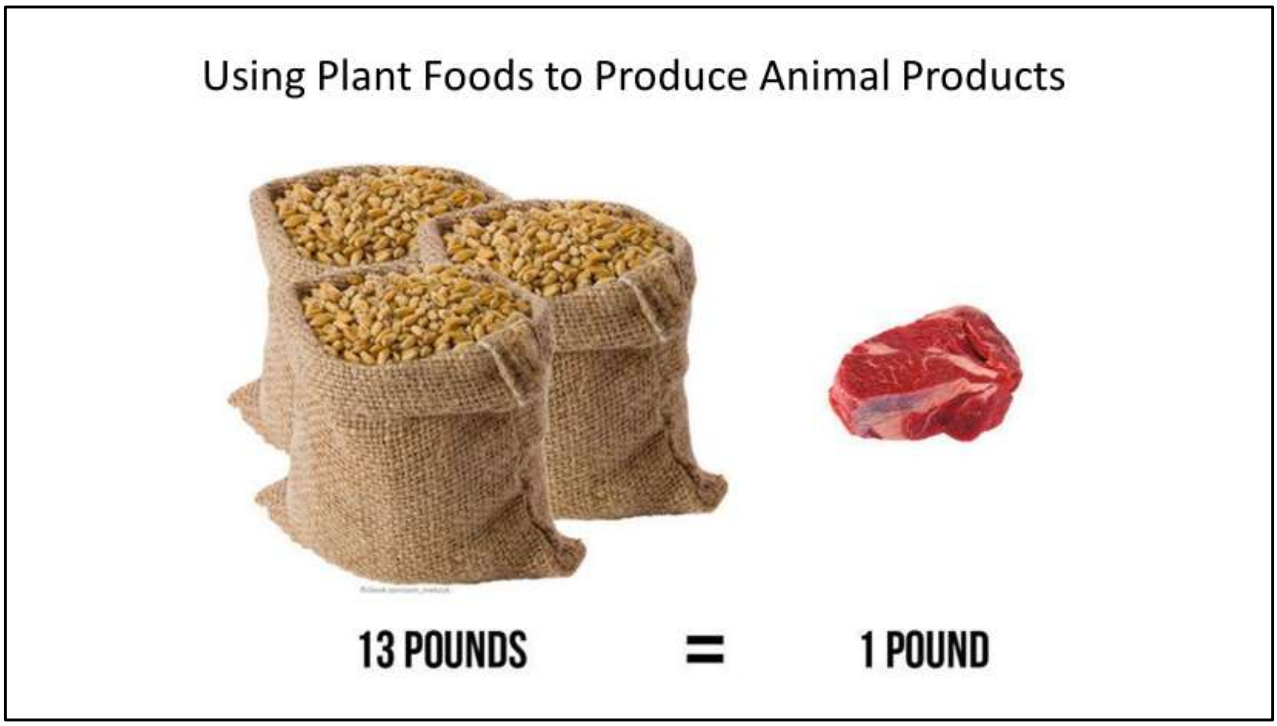
So, the Environmental Working Group did the calculations demonstrated in this slide, which indicate that it is the animals themselves rather than their transportation & processing which are the primary source of the problem.

The top orange part of the bars shows the emissions after the product leaves the farm, which includes processing, transportation, retail, cooking & waste disposal. The lower green section of the bars shows all emissions before the product leaves the farm.

As we can see, the trend is that animal products produce far more GHG's at all stages.

This is partly why eating locally produced animal products only side-steps the problem and ignores the root cause & it's solution.

https://skepticalscience.com/animal-agriculture-meat-global-warming.htm



Resource efficiency.

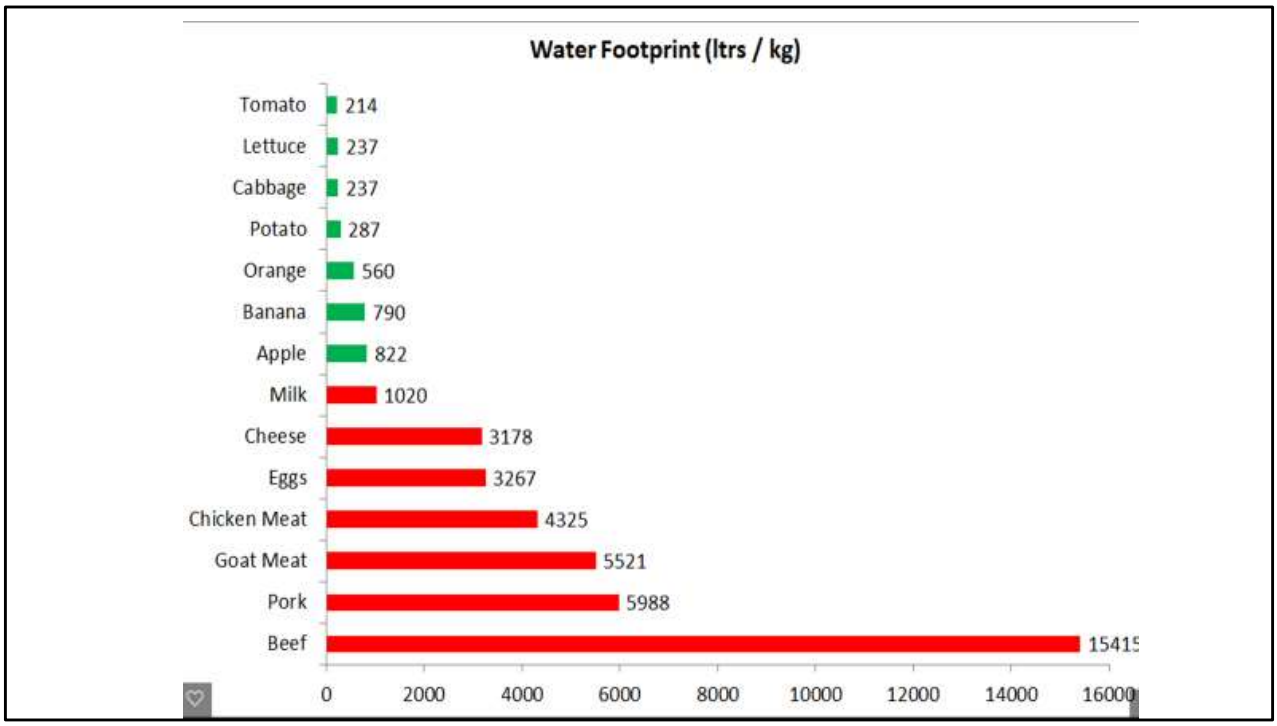
When animals are raised for human consumption, they have to be fed daily over a period of time to grow their flesh or secretions (ie eggs and milk). That takes far more food to feed an animal than if the people just eat the plant foods themselves. The slide shows the inefficiency of beef. This illustrates how it requires about 13 pounds of plant foods to produce only 1 pound of edible cow flesh.

This dismal ratio holds true for all forms of animal flesh: they require more food than what we get from them. For example, chicken requires about 5 lbs. of feed to grow 1 lb. of edible flesh, pigs require 6 pounds of feed for 1 pound of edible flesh.

To look at this from the point of view of a human family of four: if they are very conservative in how much meat they would eat at a typical meal, if each member is served ¼ pound of meat, one pound of beef would do them only for a single meal.

If that same family were to eat a vegan diet, the thirteen pounds of grain that went into producing the single pound of beef, would feed them for a week. Now THAT's resource efficiency!

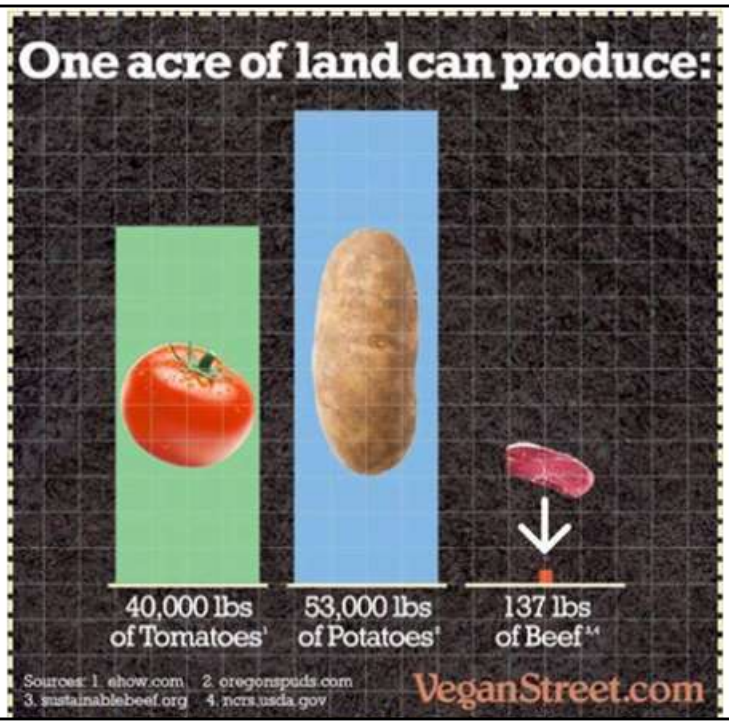
1. http://www.beefresearch.ca/blog/cattle-feed-water-use/
2. http://www.new-terra-natural-food.com/raising-chickens-for-meat.html
3. http://usatoday30.usatoday.com/news/nation/environment/2009-04-21-carbon-diet_N.htm
4. http://www.earth-policy.org/data_highlights/2011/highlights22



Water usage.

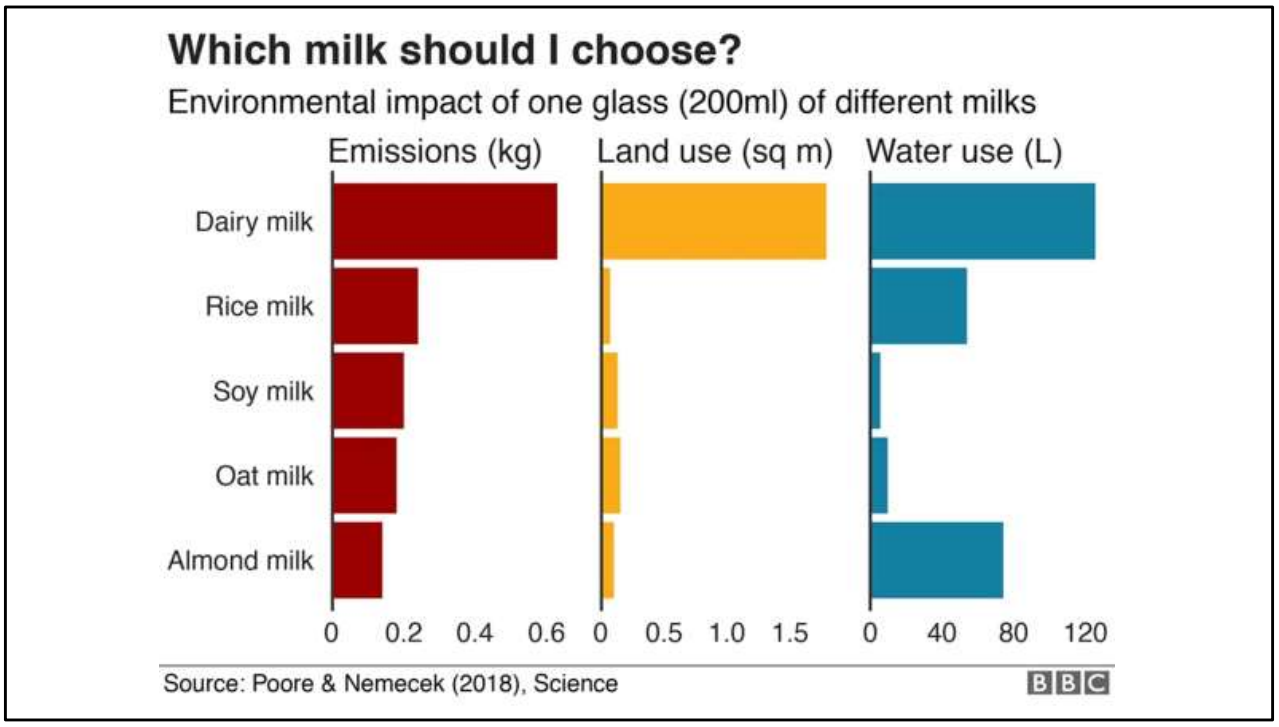
As you can see, it takes significantly more water to raise animals for humans to eat than to raise plant crops for humans to eat. According to a National Geographic report on water conservation, eating a fully plant-based diet saves nearly 600 gallons of water per day compared to a diet based on animal products.

http://waterfootprint.org/media/downloads/Report-48-WaterFootprint-AnimalProducts-Vol1.pdf
https://waterfootprint.org/media/downloads/Hoekstra-2012-Water-Meat-Dairy.pdf



Land use.
According to the Food & Agriculture Organization (FAO) of the United Nations, the livestock sector is THE world's largest user of agricultural land. They need it for grazing and production of animal feed crops. As the slide suggests, growing plant foods for humans to eat requires much less land than raising animal products.

1. http://nutritionstudies.org/fifty-shades-of-green/
2. http://www.greenpeace.org.uk/blog/forests/how-cattle-ranching-chewing-amazon-rainforest-20090129
3. http://www.fao.org/livestock-environment/en/
4. http://www.fao.org/ag/againfo/themes/en/Environment.html
5. https://www.youtube.com/watch?v=fnh9zT41wWo (grazing, William Ripple, PhD)



Although all plant milks have a lower ecological footprint than dairy products, soy and/or oat milks have the lowest, with rice also being a good choice.

http://environmath.org/2018/06/17/paper-of-the-day-poore-nemecek-2018-reducing-foods-environmental-impacts/
https://www.bbc.com/news/science-environment-46654042
https://bloguofto.sa.utoronto.ca/2021/02/26/which-milk-is-best/
https://ediblebrooklyn.com/2020/plant-milks-sustainability/
https://ourworldindata.org/environmental-impact-milks