



Nutrition For Families

PLANT-BASED NUTRITION GUIDE FOR CHILDREN

A practical guide to understanding the basics of plant-rich eating, nutrition recommendations for stages of childhood, and tips for transitioning your family to health-promoting diets.



— **Intro**

Why diet is so important

Diet can dramatically affect growth, learning, performance, immunity, and much more! Nutrients are required for all our body's critical functions, so many processes are impaired without proper nutrition. It is no wonder that a poor diet contributes to diseases, including obesity, cardiovascular disease, type 2 diabetes, and many cancers.(1)

Many children consume very few fruits, vegetables, whole grains, and other nutrient-rich plant foods, and they eat far too many sweets, highly-processed and fast foods.(2)

These unhealthy eating habits have resulted in many children having poor nutrition and excessive calorie intake. Dramatic rises in childhood obesity continue: 41% of U.S. and nearly 20% of children globally are now overweight or obese (about five times higher than in 1975). (2,3)

The diets of many children and adolescents have worsened during the Covid-19 pandemic.(4)

Sadly, even children with normal weight are not spared from the consequences of a diet loaded with fat, salt, and sugar; many have at least one cardiovascular disease risks factor, such as insulin resistance, high blood pressure, and high cholesterol.(5)



These health concerns highlight the importance of good nutrition in childhood.

This guide explains the fundamentals of plant-rich diets, nutrition recommendations for stages of childhood, and tips for transitioning your family to health-promoting diets.



Diets rich in whole plants support health

Diets rich in fruits, vegetables, whole grains, legumes, nuts, and seeds promote health. They also reduce the risk of obesity and many diseases, including certain cancers (6-8), because:

- Plants are loaded with vitamins, minerals, and fiber.
- Plants have many compounds not found in animal foods, including anti-inflammatory, antioxidant, heart-protective, and immune-boosting compounds (e.g., beta-carotene, flavonoids).
- Whole plant foods are typically better for the cardiovascular system.
- Plant-rich diets are healthier for the planet. They typically use fewer resources (e.g., land, water) and create less pollution, greenhouse gases, and habitat loss than most animal foods.(9)

Benefits of Whole, Plant Foods

- Low/No Sodium
- No Cholesterol
- High in healthy, unsaturated fats
- High in vitamins, minerals, and fiber
- Heart-protective and immune-boosting compounds
- Abundance of antioxidant and anti-inflammatory compounds





Parents and guardians have a tremendous opportunity to optimize their family's health by providing nutritious food and being role models.

Since childhood eating habits often last into adulthood,(10) when children get in the habit of eating healthy foods, they are on the path to living healthy lives.

Increasing plants in the diet and reducing animal foods is also one of the most powerful ways to affect human and environmental health.(9)



When children get in the habit of eating healthy foods, they are on the path to living healthy lives.

— ***Nutritionally-adequate plant-rich diets***

A healthy diet can be achieved based on plants, including vegetarian and vegan diets. Plant-based diets are appropriate for all life stages, including while pregnant and breastfeeding, and during infancy, childhood, adolescence, and adulthood.(7)

All diets must be balanced to provide all the nutrients required for growth, development, and repair.



— *The Basics*

Plant-Rich Diets

A plant-rich diet consists primarily of a variety of plant foods. In a vegan diet, animal products are excluded, and in a whole food plant-based diet, refined products (e.g., white flour, sugar, and highly-processed foods) are typically consumed in low amounts or are excluded.



Food categories in a plant-based diet



Fruits

Fresh, frozen, canned, and 100% juice with no added sugar - fruits contain antioxidants, vitamins, potassium, and fiber. Choose 100% juice over juice “cocktails,” and limit daily juice intake to ½ cup (for children under 6 years of age) to 1 cup (for older children).



Vegetables

Fresh, frozen, canned, and dried - vegetables contain many nutrients, including fiber, vitamins, and minerals. Focus on eating many red, orange, and green vegetables.



Whole Grains

Whole grains and cereals, such as brown rice, whole wheat, oats, barley, quinoa, amaranth, buckwheat, and millet, are good sources of protein, fiber, B vitamins, selenium, and magnesium. Make at least half of grains consumed whole grains.



Legumes

Beans, lentils, soybeans, soy products (e.g., soymilk, tofu, tempeh), chickpeas, and peas - legumes are excellent protein sources. They also contain many other nutrients, such as fiber, iron, and zinc.



Nuts and Seeds

Whole, ground, and butters - nuts and seeds are good sources of healthy fats, protein, fiber, vitamins, and minerals (e.g., vitamin E, magnesium, selenium).



Fats

Flax, chia, and hemp seeds, avocados, walnuts, olive, canola, and other healthy plant oils enhance the absorption of fat-soluble nutrients and contribute vitamin E and omega-3 fats. Oils rich in monounsaturated fats (e.g., olive), omega-3 fats (e.g., canola, flax), and plant sterols (e.g., avocado) are also heart-healthy.

What does a plant-rich meal look like?

A plant-based meal focuses on a variety of plant foods, especially colorful fruits and vegetables, legumes (beans, lentils, soy), and whole grains.

Calcium-rich foods, such as calcium-fortified soy milk, are included, and healthy fats (e.g., nuts, avocados) are consumed in moderation (except for children under 3 years of age who need higher amounts of fat).

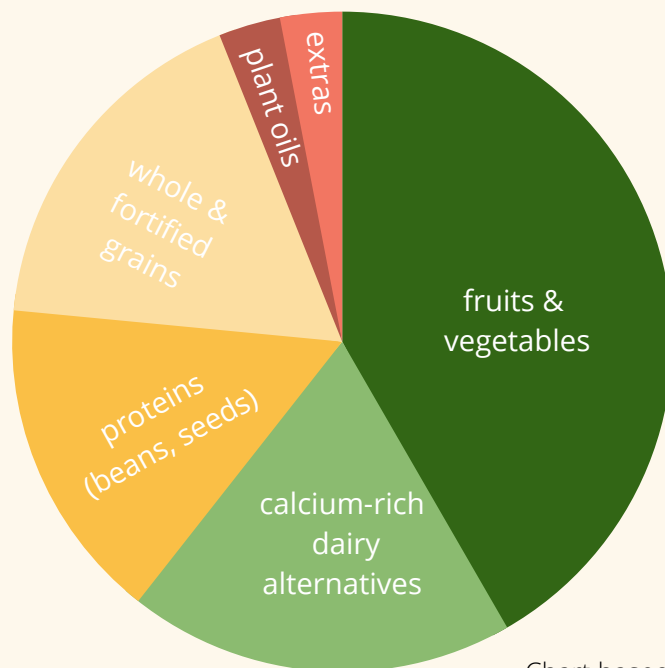


Chart based on (9)



While some processed foods can be a part of a nutritious diet, particularly when fortified (e.g., calcium-enriched plant-based milks, plant-based meat alternatives), many highly-processed foods are often higher in salt and calories and lower in nutrients and beneficial phytonutrients than whole, unprocessed, or minimally-processed foods.

However, it may take time to find a balance of convenience, cost, taste, and nutrition. With many exciting cookbooks, websites, and new plant-based products available, it has never been easier to adopt delicious healthy eating!

Meeting nutrition needs using food groups

Meeting nutritional requirements requires a diet that is diverse in many types of food from various food groups.

Since food comes in multiple shapes, volumes, and densities, it can take **different amounts of food to get enough nutrients from each group.**

For example, **one tablespoon of peanut butter** provides the same amount of protein as **¼ cup (four tablespoons) of beans** because peanut butter is more densely packed.



The term “ounce-equivalents” is used to compare the nutritional value of foods. In other cases, such as with fruits and vegetables, the term “cup-equivalents” is used to compare foods.

For more information on what counts as a cup or ounce for each food group, appropriate serving sizes for meals by age, and personalized food plans based on age, sex, and weight, see the “Resources” section.

Note that a serving may be smaller or larger than an “ounce- or cup-equivalent,” and the amounts listed in the following table do not necessarily need to be consumed in one meal. The goal is to include them as part of the total foods eaten in a day.

Nutrition Facts

Serving size 1/2 cup
Servings per container 3.5

Serving size 1/2 cup
per container 3.5

The following tables provide recommendations for the amount of each food group to help meet nutrition requirements for children 2 to 18 years of age. (2)

2-4 years	Food Group	Daily recommended amount by age
	Whole grains	3 – 5.5 (oz-equivalent)
	Protein	1 – 2.5 (oz-equivalent)
	Calcium-enriched soy milk/ products	2 – 3 (cup-equivalent)
	Vegetables	1 – 2 (cup-equivalent)
	Fruits	1 – 1.5 (cup-equivalent)
	Plant oils/fats	1-2 (tablespoons)

5-8 years	Food Group	Daily recommended amount by age
	Whole grains	4 - 6.5 (oz-equivalent)
	Protein	1.5 - 4.5 (oz-equivalent)
	Calcium-enriched soy milk/ products	2.5 - 3 (cup-equivalent)
	Vegetables	1.5 – 2.5 (cup-equivalent)
	Fruits	1 – 2 (cup-equivalent)
	Plant oils/fats	1 - 2 (tablespoons)

9-13 years	Food Group	Daily recommended amount by age
	Whole grains	5 - 9.5 (oz-equivalent)
	Protein	2 – 5.5 (oz-equivalent)
	Calcium-enriched soy milk/ products	2.5 – 3 (cup-equivalent)
	Vegetables	1.5 – 3 (cup-equivalent)
	Fruits	1.5 – 2 (cup-equivalent)
	Plant oils/fats	1-2.5 (tablespoons)

14-18 years	Food Group	Daily recommended amount by age
	Whole grains	6.5-10.5 (oz-equivalent)
	Protein	4-8 (oz-equivalent)
	Calcium-enriched soy milk/ products	3 (cup-equivalent)
	Vegetables	2.5 - 3.5 (cup-equivalent)
	Fruits	1.5 – 2.5 (cup-equivalent)
	Plant oils/fats	2 - 4 (tablespoons)

Food Group	Amount equal to to 1-ounce or 1-cup equivalent (11)
Whole grains <i>At least half should be whole grains. Choose iron- & zinc-fortified when using refined grains.</i>	1 slice (30 g) of bread, tortilla, or flatbread ½ cup (70 g) cooked pasta, rice, or cereal 1 oz. (30 g) dried pasta or rice 1 oz. (30 g) ready-to-eat cereal 1 cup (50 g) flaked cereal
Protein <i>Include a wide variety of plant foods to obtain all of the necessary essential amino acids.</i>	¼ cup (50 g) cooked beans or tofu ½ oz. (15 g) nuts or seeds 1 Tbsp (15 g) nut/seed butters 1 oz. (30 g) tempeh 1 oz. (30 g) plant-based meat alternatives 6 Tbsp (90 g) hummus
Calcium-enriched soy milk/ products	1 cup (250 mL) fortified soy milk 1 cup (170 g) of fortified soy yogurt <i>Check labels for added calcium and other ingredients (e.g., sugar content)</i>
Vegetables <i>Focus on red, orange, and dark green vegetables.</i>	1 cup (250 mL) raw, cooked, or juiced 2 cups (70 g) leafy greens ½ cup (80 g) dried
Fruits <i>Focus on whole fruit, and limit juice to ½ cup (younger than 6 years old) to 1 cup daily.</i>	1 medium fruit 1 cup (160 g) raw fruit 1 cup (250 mL) fruit juice ½ cup (80 g) dried fruit
Plant oils/fats	1 Tbsp (15 mL) plant oil (e.g., olive, canola) or margarine; many other foods, such as avocados, nuts, and seeds, also provide healthy fats.

Diet Recommendations ARE Plant-based

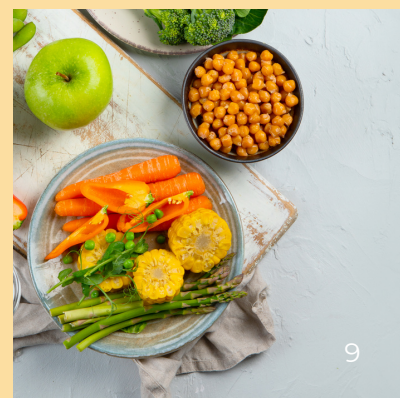
The average Western diet exceeds recommended intakes of meats, poultry, and eggs and lacks fruits, vegetables, whole grains, and other nutritious plant foods.(2,9)

As such, obesity rates and diet-related diseases continue to rise. (1,2,9) The nutritional benefits of a well-planned plant-based diet are clear – it reduces the risk of numerous chronic diseases.(6–8)

The most comprehensive research on human health and environmental sustainability (i.e., EAT-Lancet) suggests that a healthy diet consists of at least 90% plants (9) (when calcium-enriched soy milk substitutes replace dairy, considered an equivalent to dairy by the Dietary Guidelines for Americans(2)).

These estimates are similar to a healthy, nutritionally-adequate diet that follows the US Dietary Guidelines (2) (when calcium-enriched soy milk replaces dairy) and many international recommendations on nutrition.(19) Thus, a balanced diet based mainly or entirely on plants (with some supplementation for fully plant-based diets) would benefit the planet while meeting human nutritional needs.

A plant-based diet benefits human AND environmental health.(9) Shifting away from a diet high in animal products, especially meat and dairy, is recommended as the best way to mitigate environmental damage and improve human health. (9,12,15)



— *The Specifics*

Plant-based diets in different stages of childhood

A well-planned, plant-based diet is appropriate for all ages and can start from the first foods.(7)

Since children form their eating habits early in life,(10) you are your child's first role model and teacher on their journey to enjoying healthy plant-rich meals.



PREGNANCY

Nutrition during pregnancy and breastfeeding is vital to the health of the mom and the infant. Almost all nutrient needs increase during this time, and consuming adequate amounts of nutrients from most diets can be challenging. For information on nutrient requirements, key nutrients to pay more attention to on a plant-based diet, and infant feeding, please see our *Plant-based Nutrition Guide During Pregnancy & Breastfeeding.* Also, see the "Resources" section.



CHILDREN UP TO 2 YEARS OLD

The first two years of life are a critical time of growth and development, and proper nutrition is essential. During this time, important dietary practices include offering breast milk or iron-fortified infant formula as the only source of nutrition for about the first 6 months. Include foods high in iron and zinc with the first foods and focus on key nutrients that may be challenging to obtain with a plant-based diet (see the "Key Nutrients" section). For a detailed guide on infant feeding, including breastfeeding, infant formulas, first foods, and nutrient needs by age, please see our *Plant-based nutrition guide for babies and toddlers.* Also, see the "Resources" section.



CHILDREN 2-4 YEARS OLD

At this age, children require about 1,000 to 1,600 calories per day.⁽²⁾ (See the “Resources” section for more information). **Since children have small tummies, it is important to get nutrient-rich foods in first.** Offer the same foods that the rest of the family is eating, and let your child decide how much to eat.

It is normal for young children to refuse meals, want to eat the same foods every day or change their minds about foods they liked the day before.

Make fruits and vegetables available and accessible throughout the day, and try different ways of preparing vegetables, such as raw, steamed, or baked in foods.

! Safety concerns

To minimize the risk of choking, avoid giving babies:

- Popcorn or raisins
- Hard vegetables or fruits
- Cooked or raw whole corn
- Uncut small tomatoes, grapes, or berries
- Whole or chopped nuts and seeds
- Pieces of hot dogs or plant-based alternatives
- Chunks or spoonfuls of nut/seed butters or other sticky foods (consider thin amounts applied to other foods or sauces made with these ingredients that a child can chew and swallow)

Picky Eating

Most children go through a phase where they are unwilling to try new foods or reject foods they have previously eaten and enjoyed. This “picky eating” phase often takes place around 2 years of age.

Be patient and continue to offer the same foods the rest of your family is eating. Most children grow out of the picky-eating phase and will gradually accept family meals again. Some of these ideas may help your child overcome picky eating and develop a renewed interest in healthy food:

- Involve your little one in the kitchen. Give them small tasks, like tearing lettuce, mixing batter, or spreading dips on crackers.
- Plant a garden. Cucumbers, green beans, and zucchini grow well in most climates. Herbs are also a fun plant for your child to nurture. No space or supplies for a garden? Reuse plastic containers for pots and grow plants from seeds or cuttings from food scraps. See the “Resources” section for easy ways to grow food.
- Get your child involved! Visit a farm, farmer’s market, or grocery store together. Talk about how plants grow, the resources it took to get them to your plate, and how they keep us strong and healthy.
- Continue to offer new foods. Remember that a child may try a new food ten times or more before deciding that they like it!⁽²⁾
- Don’t pressure, praise, or punish. The long-term goal is to teach children to be independent with food. Allow your child to decide how much they want to eat. Let them learn how to respond to their hunger signals and never force them to finish their plate.



CHILDREN 5-13 YEARS OLD

Children 5 to 8 years old need between 1,200 and 2,000 calories per day, while 9 to 13-year-olds need 1,400 to 2,600 calories (higher for males, for more physically active children, and during puberty).(2) (See the “Resources” section for more information.)

At this age, children are more independent in their food choices. As such, diet quality often declines as children get older.(2) **Providing healthy snacks and placing healthy foods front and center in the refrigerator and cupboards can make healthy eating the easy choice.**

To develop a healthy relationship with food, avoid talking about food in terms of “healthy” or “good” and “unhealthy” or “bad.” Instead, encourage them to notice how certain foods make their body feel, give them energy, or leave them feeling tired. Try to be non-judgmental about their food preferences. Ask your children what they like and don’t like about a particular food. Talk about ways to improve the taste of foods by adding sauces, mixing healthier items into their favorite foods, and trying new recipes. Involving children in buying and preparing food can also increase their willingness to accept meals. No rigid food rules are necessary to have a healthy child; the broad trend of what they eat most often influences their health more than an occasional dessert.



CHILDREN 14-18 YEARS OLD

Adolescent girls require about 1,800 to 2,400 calories daily, while males require about 2,000 to 3,200.(2) (See the “Resources” for more information.)

Teenagers have the widest gap between what is recommended as a healthy diet and what they eat; thus, diet quality is typically at its lowest in life for most adolescents.(2) High intakes of processed foods, added sugars, and sodium is very common, while fruit, vegetables, whole grains, and calcium-rich foods are often extremely low.(2) Consequently, many adolescents lack several nutrients in their diet.

Thus, a well-balanced, plant-rich diet can improve diet quality as well as increase nutrient intake. As teens become more independent in their food choices, providing support on choosing healthy foods, especially when they are away from home, can make a difference.

Key Nutrients

Children can meet their daily nutritional requirements by eating a well-planned, plant-rich diet, which may need to include fortified foods and supplements (e.g., vitamin B12 in vegan diets).(7)

However, like any diet, a plant-based diet needs all the essential nutrients and adequate calories. It can be challenging to get sufficient amounts of nutrients in many children's diets. Thus, it is important to focus on getting these "key" nutrients into their meals.



KEY NUTRIENTS

These are the nutrients to pay particular attention to when consuming a plant-based diet. Ask your healthcare provider for advice before starting a new diet or giving your children any supplements.

VITAMIN B12

Needed for brain and nervous system development and health and supports DNA and red blood cell production. **Irreversible nerve damage can occur with a B12 deficiency.**

Plant foods are not reliable sources of vitamin B12 unless they are fortified, which varies widely. **Therefore, a B12 supplement is usually needed if on a mostly or entirely plant-based diet.**

Foods with added vitamin B12 include some plant milks and yogurts, plant-based meat alternatives, cereals, and nutritional yeast (check labels)

CALCIUM

Calcium is involved in muscle contraction, blood clotting, and strengthens bones & teeth. Calcium can be challenging to get from the diet, needs increase as children age, and intake is often insufficient.(2) Eating a wide variety of calcium-rich or fortified foods or taking a supplement may help to meet calcium needs.

Food sources: tofu made with calcium, calcium-fortified plant milks & yogurt, calcium-enriched 100% fruit juice, tempeh, edamame, dark leafy greens, white beans, some varieties of mineral water

CHOLINE

Supports nerve cell health, cell communication, fat metabolism

Foods rich in choline: tofu, soy milk, broccoli, cabbage, peanut butter, quinoa, Brussels sprouts

VITAMIN D

Vitamin D works with calcium to form bones and teeth, & supports the immune system and cell growth. The skin can produce vitamin D when exposed to sunlight; however, a supplement may be needed.(2)

Few foods contain vitamin D: Vitamin D-fortified foods (100% juice and plant milks), mushrooms exposed to UV light.

IODINE

Supports brain and nerve health; involved in growth and metabolism.

Iodine is necessary in the diet. Switching to iodized table salt but not adding extra salt to the diet can be a potential source, particularly for those who do not regularly consume dairy, eggs, or seafood.(2)

Sources: iodized salt, seaweed†, and some multivitamin supplements

OMEGA-3 FATS

Supports brain, eye, and nervous system health and development; has anti-inflammatory properties

Sources: chia seeds, ground flaxseeds, walnuts, and hemp seeds and their oils; fortified foods and supplements containing omega-3 fats (e.g., EPA, DHA), such as those made from algae, can also be a good source for those not consuming fish. Ask your healthcare provider what is right for your family before taking supplements.

IRON

Critical for growth and development, energy production, and red blood cells that transport oxygen, iron can be challenging to get from the diet. A supplement may be needed. Ask your healthcare provider before taking supplements.

Foods: iron-fortified cereals and grain products, whole grains, beans, lentils, nuts and seeds, nut and seed butters, potatoes, dark leafy vegetables

Pair iron-rich foods with vitamin C sources, such as citrus fruits and tomatoes, for better absorption. Soaking (discard the water), sprouting, fermenting, and cooking foods can help improve iron absorption.

ZINC

Supports tissue growth and function, immune function, wound healing, and vitamin A transport

Food sources: zinc-fortified cereals, fortified and whole grains, beans, soy, peas, and nuts and seeds and their butters

Sprouting beans, chickpeas, and lentils helps increase zinc absorption. Cook sprouted foods before eating to reduce the risk of foodborne illness.

†Caution some types of seaweed contain iodine levels that exceed recommendations



Daily recommended intakes for key nutrients^(2,20) by age.

Nutrient Unit	Age			
	2-3 years	4-8 years	9-13 years	14-18 years
B12 mcg	0.9	1.2	1.8	2.4
Calcium mg	700	1000	1300	1300
Choline mg	200	250	375	400 female 550 males
Vitamin D IU	600	600	600	600
Iodine mcg	90	90	120	150
Iron mg	7	10	8	15 females 11 males
Omega-3 fats g from all types	0.7	0.9	1.0 females 1.2 males	1.1 females 1.6 males
Zinc mg	3	5	8	9 females 11 males

— *Healthy Habits*

Establishing healthy eating behaviors

Children are exposed to peers and adults who may introduce them to unfamiliar and perhaps unhealthy foods. One of the best ways to reinforce healthy eating habits is to sit down together for regular family meals. Talk to your children about the connection between their diet, their health, the health of the planet, and compassion for animals.

You can read a plant-based children's book with your younger child to help start a conversation about nutrition. The older child may be interested in learning more about how food production impacts our environment. Watch a documentary together and discuss how a plant-based diet can help fight climate change and protect natural resources.

Parents and children play a role in decision-making when it comes to food. Your job as a parent or guardian is to decide what the child may eat, and your child decides if and how much they will eat. Parents and guardians must trust that their children know how much food they need. Forcing them to eat certain foods or finish their plates can promote unhealthy eating patterns.

Your goal is to help your child develop a healthy relationship with food.

Tips for establishing healthy eating practices

- Offer regularly scheduled meals and snacks. Most kids need about three meals and two snacks per day.
- Eat together as a family when possible.
- Discourage grazing or eating between planned meals and snacks.
- Lead by example. Be open to trying new foods.
- Eliminate distractions. Turn off the television and put electronics away at mealtimes.
- Make eating a pleasant and social time.
- Encourage foods to give the body needed nutrients, and avoid using them as a reward or punishment.
- Allow children to respond to signals of being full or hungry to help naturally regulate food intake, and never force them to finish their plate.

Building Healthy Habits

Younger children need more guidance in selecting healthy snacks.

Encourage their growing independence by letting them choose snacks from a variety of healthy foods in the kitchen.



Older children tend to eat more meals and snacks away from home. Therefore, older children may benefit by learning to read nutrition labels to choose healthy, kid-friendly snacks, such as flavored water instead of soda or whole grain crackers instead of potato chips.

Healthy Snacks Ideas

- Fruit slices with nut butter
- Avocado toast
- Cashew yogurt with granola and fresh berries
- Edamame
- Falafel with tahini dip
- Freshly made popcorn (for kids over 4 years old)
- Frozen bananas dipped in chocolate
- Guacamole, hummus, or salsa with tortilla or pita chips
- Mixed fruit kebabs
- Oven-baked sweet potato “chips” with reduced sugar ketchup
- Roasted chickpeas (for kids over 3 years old)
- Rice cakes with almond or cashew butter and banana slices
- Fresh fruit with soy or almond yogurt (look for calcium-enriched)
- Frozen fruit popsicles
- Homemade carrot or zucchini muffins
- Red bell pepper and cucumber sticks with cashew dip
- Steamed vegetables served with tahini lemon dip
- Whole wheat crackers with hummus
- Fruit smoothies with calcium-fortified plant milk or 100% juice

Healthy Meal Ideas

Breakfast

- Whole grain cereal with fresh fruit & calcium-fortified soy milk
- Whole wheat pancakes with sunflower butter and berries
- Tofu scramble with veggies & calcium-fortified plant yogurt

Lunch

- Veggie burgers on whole wheat buns with oven “fries”
- Minestrone soup with beans, whole grain crackers, and sliced fruit
- Whole wheat bread with nut butter and banana slices

Dinner

- Cauliflower bake with tomato sauce and whole wheat pasta
- Vegetarian chili over a baked potato with guacamole
- Black bean guacamole tacos with shredded cabbage and a calcium-fortified beverage

Healthy lifestyle behaviors

In addition to healthy, well-balanced nutrition, a number of other lifestyle behaviors can help optimize children's overall wellbeing.

Eat Breakfast

Start the day off right! Studies show that children who eat breakfast tend to have higher academic achievement and mental performance.(21)

Get Enough Sleep

Sleep is critical to mental and physical health. Be sure that your child is getting enough sleep each night: (23,24)

- 2-year-olds need **11 to 14 hours** (including naps)
- 3 to 5-year-olds need **10 to 13 hours** (including naps)
- 6 to 12-year-olds need **9 to 12 hours**
- 13 to 18-year-olds need **8 to 10 hours**

Prioritize Activity

Preschool children need **3 hours** of physical activity every day. Older children need at least **1 hour** of moderate to vigorous activity per day.

Stay Hydrated

Many foods, such as vegetables, fruits, beverages, and soups, have high water content and count towards your child's total fluid intake. However, most fluid should come from drinking water and other healthy beverages.(22)

Total fluid needs depend on a child's age, size, gender, physical activity, and other factors (e.g., outside temperature, illness).

Age	Total fluid from all foods and beverages	Fluids from water & beverages
1-3 years	6 cups (1.3 L)	4 cups (0.9 L)
4-8 years	7 cups (1.7 L)	5 cups (1.2 L)
9-13 years	9 cups (2.1 L) females 10 cups (2.4 L) males	7 cups (1.7 L) females 8 (1.8 L) males
14-18 years	10 cups (2.3 L) females 14 cups (3.3 L) males	8 cups (1.8 L) females 11 cups (2.6 L) males

— **Common Concerns**

Setting the record straight

WELL-PLANNED PLANT-RICH DIETS ARE SAFE FOR CHILDREN

A balanced plant-rich diet is nutritious and safe for children.(7) As shown in several studies, **Children who follow plant-rich diets can grow and thrive just as well as children who eat meat and dairy foods when their diet is appropriately planned.**(25,26) Furthermore, a plant-based diet may reduce their risk of diet-related diseases.(6-8)

As with any diet, it should include a variety of nutrient-rich foods to ensure adequate nutrition. Some key nutrients are challenging to get from many diets, including those that contain animal products (e.g., vitamin D, iron). Fortified foods and/or supplements, such as vitamin B12, are needed for children on a diet that excludes all animal products.



PLANT-RICH DIETS PROVIDE ENOUGH PROTEIN

Protein is found in nearly all foods, and it is very rare to suffer from a protein deficiency if your child is eating a varied diet. However, some plant foods are better sources of essential amino acids than others. Thus, including a variety of good protein sources in meals, such as legumes, grains, nuts, and seeds, can help ensure that all essential amino acids are consumed.

Setting the record straight

ALL DIETS NEED TO BE BALANCED TO MEET NUTRIENT NEEDS

The typical U.S. diet does not follow recommendations for health or meet all nutrient needs as it lacks fruits, vegetables, whole grains, and other plant foods.⁽²⁾ Adopting a plant-based diet may improve diet quality and increase nutrient intake. However, several nutrients, such as iron and vitamin D, are challenging to get from many diets, including those containing animal products. Thus, complementing the diet with supplements and/or fortified foods may be needed to meet nutrient needs.

For example, vitamin B12 is absent from most plant foods, although some products can be fortified with vitamin B12, such as plant milks and yogurts, veggie meat alternatives, cereals, and nutritional yeast (check labels). However, these fortified foods need to be consumed in sufficient amounts every day to meet the needs of children; therefore, it might not be the most efficient way to meet vitamin B12 requirements. Thus, including a B12 supplement can ensure that children on an entirely plant-based diet consume adequate amounts. Consider asking your healthcare provider about the need for supplements and testing for vitamin B12 status.



Adopting a plant-based diet may improve diet quality and increase nutrient intake.

SOY IS HEALTHY FOR CHILDREN

Soy is a high-quality source of protein that has been part of a traditional diet for centuries in many parts of the globe. Comprehensive analyses of soy research indicate it has beneficial effects on health, including on the cardiovascular system, female reproductive system, muscles and skeleton, and kidneys.⁽²⁷⁾ Infants that consume soy-based diets do not have differences in the onset of puberty.⁽²⁸⁾ Furthermore, many soy products are a good source of calcium, including tofu made with calcium and fortified soy milks.



— **Common Concerns**

Preventing Obesity in Children

Regardless of which diet they are eating, children can develop obesity if they consume more calories than they can burn. Gaining a little extra weight before puberty is not unusual, so encourage your child to be relaxed about changes in their bodies. Children will often lose the excess weight during a growth spurt, or for females after they start menstruating.

Studies show that children who follow plant rich-diets tend to be leaner than their peers(26), and research suggests healthy plant-based diets may help promote weight loss, help to keep weight off, and prevent obesity.(26,29,30)

Plant-centered diets should be carefully planned so your child gets a range of health-promoting whole foods. After all, some highly-processed foods, such as candy and potato chips, are also plant-based!

Instead of eliminating these foods from your child's diet, teaching them a healthy approach to dealing with less nutritious foods is much more important. There is no need to avoid sweets and snacks altogether, as they can be part of an overall healthy balanced diet, as long as they are consumed in low to moderate amounts.



What if my child is overweight?

Helping an overweight child can be challenging for the entire family. Although your first instinct may be to restrict access to certain foods, this strategy often backfires, leading your child to consume even more "forbidden" food. The best help you can give is to be a good role model, encouraging healthful foods and regular exercise.

Shift the focus from weight to health.

Talk to your healthcare provider if you are concerned about your child's weight. You may be referred to a dietitian who can help develop a healthy, balanced meal plan for your child.

Practical advice to help your child achieve a healthy weight

Children are especially susceptible to messages about their body, so it's important to keep most conversations regarding food emotionally and morally neutral. **Focus on building healthy habits and emphasize the short- and long-term impact of food on overall wellbeing, and model how to prioritize health-promoting meals.**

- Talk about the principles of healthy eating, not dieting. Avoid conversations about dieting around your children.
- Stock the kitchen with healthful foods and limit the availability of processed foods high in calories and low in nutrients.
- Place nutritious foods front and center in your fridge, cabinets, and on counters to make them the easy choice.
- Eat healthful foods first; discourage low-nutrient foods with empty calories.
- Mute or turn off food commercials designed to encourage unhealthy eating.
- Encourage your child to drink water rather than sugary drinks and soda.
- Avoid using food as a reward (e.g., ice cream, candy). Instead, consider other non-food items, such as visiting a park or going to the movies.
- Consider portion sizes; it can be easy to overeat, especially at restaurants.
- Avoid eating out of the bag, carton, or box because it encourages overeating. Instead, serve a reasonable portion and put the package away.
- Remind children that they should stop eating when they are no longer hungry rather than finishing everything on their plates.
- It can take 10 minutes before the stomach tells our brain we are full, and being distracted may cause us to overeat. Practice eating mindfully - eat slowly and pay attention when you start to feel full.
- Encourage exercise! Find activities they like, such as sports, dance, biking, or martial arts. Including the family in fun physical activities can encourage active lifestyles.
- Get enough sleep; it is critical to prevent injuries, attention and behavior problems, obesity, type 2 diabetes, and poor mental health.(23)

Promoting healthy body image

As adolescents become more aware of their body shape and appearance, they may begin doubting whether they are “attractive” or “thin” enough. Dissatisfaction with their body can lead to feelings of low self-esteem and attempts at dieting. **As parents and guardians, you can play a role in building a healthy, positive self-image for your child.**

- Share your views on the difference between healthy eating and dieting.
- If your child is dieting, ask them why they want to lose weight.
- Explain how skipping meals or cutting calories will not be effective in the long run; **emphasize the importance of wellness and health over thinness.**
- Avoid speaking about dieting or weight loss in front of your child, and compliment them for their skills and talents rather than appearance.
- Help your child navigate social media and content that shows glamorized and unrealistic body images and emphasizes appearance over health.
- More importantly, be a good role model by learning to love and accept your body and enjoy the healthy foods you prepare for your child.

Both males and females are susceptible to and can develop eating disorders. Speak with your healthcare provider if your child regularly skips meals, restricts calories, or has experienced rapid weight loss. (See the “Resources” for more information.)

Feeding the Young Athlete

Children are naturally energetic and benefit tremendously from regular exercise. In addition to improving their physical health, exercise helps their self-esteem, academic performance, sleep, and well-being.

Most children do not need to modify their diet if they participate in regular physical activity. However, high-performance athletes may have greater energy needs than their peers.

Recommendations are not that different from those of other children. A high-performance plant-based diet is composed of adequate calories and a variety of complex carbohydrates, protein, and healthy fats. Ensure your child consumes good sources (or supplements) of iron, vitamin B12, vitamin D, calcium, and other key nutrients described herein.

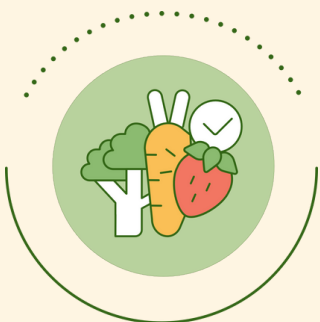
CARBOHYDRATES AND PROTEIN: BUILDING BLOCKS OF ENDURANCE & STRENGTH

Carbohydrates (aka carbs) are sugars, starches, and fibers. Complex carbohydrates (e.g., whole grains) release energy into the body slower than simple sugars (e.g., fruit juice, white bread) to provide more sustained energy.



Carbs are present in all plant foods, especially whole grains, legumes (beans, lentils, soy), and fruit. The body uses carbs for energy. For example, muscles use stored carbs, called glycogen, as fuel during exercise. Think of glycogen as “batteries” that provide your child with the long-term energy needed for endurance sports. These batteries can be recharged by resting and consuming carbohydrate-rich plant foods.

Very active children will have increased protein requirements. Although proteins are in all plants, legumes (beans, peas, lentils, and soy), nuts, seeds, and whole grains are good sources. Young athletes should consume a variety of different plant foods to meet all of their protein requirements.(7)



PLANT-BASED DIETS TEND TO BE VERY HIGH IN VOLUME AND FIBER

High-fiber diets make you feel full quickly, which could be a problem for growing athletes since they may not get all the calories they need. However, you can make simple dietary adjustments to increase their overall calories by offering more nutrient-dense foods, such as nuts and seeds, nut/seed butters, dried fruits, and avocados. You can also use more oil when preparing meals.

Feeding the Young Athlete

PRE-ACTIVITY PORTIONS

Large meals should be avoided just before participating in active sports, such as soccer, cycling, or running. Instead, a smaller, 200-calorie snack and a large glass of water about one to two hours beforehand are better options. Some examples are soy yogurt with berries or a nut butter-and-banana sandwich. If exercise lasts longer than 60 to 90 minutes, offer your child a small carbohydrate snack, such as a banana, to “refuel.”

HYDRATION IS KEY

Most importantly, ensure your child drinks plenty of fluids before and during physical activity. This is especially critical in warm weather.

As a rule, your child should take water breaks every 10 to 20 minutes during vigorous exercise. (See also "hydration" in this guide.)

KEY MESSAGES FOR YOUNG ATHLETES

- Athletes consuming a whole-foods, plant-rich diet should slightly increase their calorie, carbohydrate, and protein intake.
- Include good sources of key nutrients, including iron and calcium.
- Pay attention to fluid intake, particularly during warm weather or prolonged physical activity.



— *The Takeaways*

Key messages for a balanced plant-rich diet in childhood

ON THE PLATE



Young children have small tummies. **Encourage whole plant-based foods first.**



Guide children to **respond to their hunger and satiety signals** and never force them to finish their plate.



Offer a **variety of foods, and pay extra attention to key nutrients** described herein as they may be challenging to consume in adequate amounts.



Offer a **variety of plant-based proteins** to obtain all of the essential amino acids. Some plant proteins are less digestible than animal protein, although low-fiber plant foods like tofu and peanut butter are highly digestible sources. Sprouting, soaking, fermenting, and cooking grains and legumes can improve their digestibility and increase many nutrients (e.g., iron, zinc).

NUTRIENTS



B12 supplements can ensure adequate intake for those on an exclusively plant-based diet since plants are not a reliable source of this nutrient, and food fortification varies widely.

Vitamin D is challenging to get from most diets, and many people do not make enough vitamin D from the sun (e.g., in winter months; with darker skin). Thus, **supplementation may be needed in some people.**

Iron is challenging to get from many diets. **Pairing iron-rich plants with sources of vitamin C (e.g., citrus, tomatoes), and soaking, sprouting, fermenting, and cooking foods** can also help release iron from many plant foods.

Make sure your child meets iodine requirements. **Good iodine sources include iodized salt, seaweed with moderate iodine content (e.g., nori), and some multivitamins.**

Calcium intake is often low in older children and adolescents.(2) **Calcium-enriched plant products may help to improve intake.**



Include sources of healthy fats, such as nut/seed butters, avocados, low-sodium olives, and high-quality plant oils. Note that low-fat diets are not suitable for small children.

Include good sources of omega-3 fats every day, particularly those with DHA and EPA.

— ***Additional Benefits***

Diet and planetary health

Raising animals for food uses considerably more resources than directly eating plants, and they often have greater environmental impacts.

For example:

- Livestock is responsible for 32% of global methane gas emissions.(12) Methane is 10 to 86 times more dangerous in trapping heat than CO2 (depending on how it is measured), creates harmful ground-level ozone, and is responsible for half a million premature deaths per year worldwide.(12)
- Nearly 60% of the world's harvested biomass goes into animal feed and bedding.(13)
- Greenhouse gases from animal feed production are substantial, with 60-80% of these gasses coming from pork, chicken, and egg production.(13)
- 90% of fisheries are harvested at or beyond maximum sustainable limits, have caused complete collapses of fisheries, and have severely impacted many vulnerable populations worldwide that rely upon marine ecosystems.(14)
- The amount of water needed to produce animal-sourced foods can be 10 to 20 times more than growing nutritionally-equivalent plant-based foods for humans. (14,15)
- Between 6 and 14.5 million tons of nitrogen pollution from animal production contaminates global freshwater each year(15), and it is often the source of harmful algae blooms that cause massive marine life deaths.



Raising animals for food uses considerably more resources than directly eating plants.

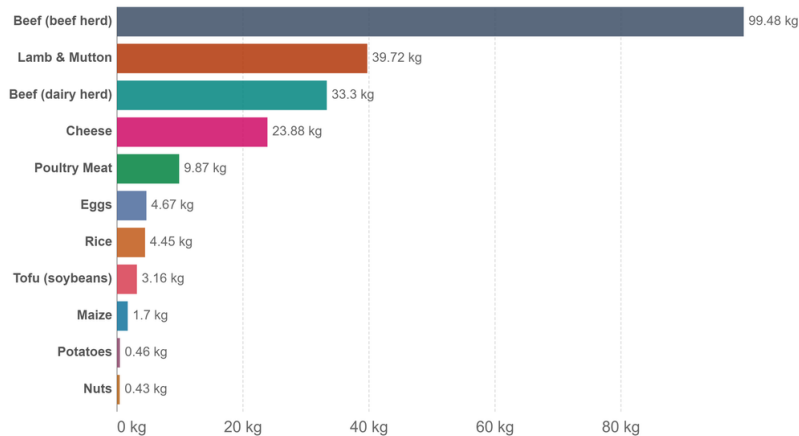
Rise of Industrial Agriculture

As the global demand for animal-based foods has tripled over the past 50 years, a dramatic rise in industrial agriculture has followed. Industrial farming systems, where animals are closely confined in cages or warehouses, create living conditions that often negatively impact animal health and welfare and can increase environmental damage.(13)

Industrial farms are often the perfect breeding ground for diseases, such as respiratory illnesses (e.g., flu), to spread to humans(16), and the use and misuse of antibiotics have led to many infectious diseases becoming untreatable. (17,18)

Greenhouse gas emissions per kilogram of food product

Greenhouse gas emissions are measured in kilograms of carbon dioxide equivalents (kgCO₂e) per kilogram of food product. This means non-CO₂ greenhouse gases are included and weighted by their relative warming impact.



Source: Poore, J., & Nemecek, T. (2018). Reducing food's environmental impacts through producers and consumers. OurWorldInData.org/environmental-impacts-of-food • CC BY

Dairy and red meat are the largest sources of persistent pollutants in the diet that are harmful to humans, such as dioxins and PCBs, and widespread mercury contamination of seafood is readily absorbed into the body, particularly accumulating in the brains of developing babies.(14)

Thus, reducing or eliminating animal foods in the diet can substantially impact animal welfare, planetary health, and human health.(9)

In summary, a plant-based diet uses fewer natural resources, reduces animal suffering, and causes less environmental damage. Plant-rich diets are better for your family's and the planet's health.

— *How To*

Tips to transition your family to a plant-rich diet

Adopting a whole-food, plant-rich diet has many wonderful effects on children. They learn that their eating behaviors have an impact on their health and the sustainability of the planet. They enjoy a variety of colorful foods, and you are giving them the tools for a lifetime of good health.

Imagining a family diet with less meat and dairy may seem challenging. What is there left to eat? Will it still taste good? Remember that it takes time to adopt a new eating pattern. Begin by expanding your collection of plant-based recipes. Plenty of cookbooks and websites are available to inspire you with delicious ideas.

Rather than changing your family diet all at once, replacing some animal products with plant-based foods can improve diet quality.

Start with one or two meals per week and move on from there. Meal changes with younger children are often easier since you have more control over what they eat. Older children may resist the change or need time to adjust to meat- or dairy-free meals.

Have an honest conversation with your children to explain your reasons for reducing or eliminating animal foods from the family diet. Most children care about animals and do not want them to suffer. Explain, in general terms, how industrial farming harms animals and negatively affects our environment. Many children's books are available to help you with the conversation.



Tips for Getting Started with a Plant-Forward Diet

- Offer meals with various fresh fruits, vegetables, whole grains, legumes, nuts, and seeds.
- If you still use meat or dairy, let it become a smaller part of the meal rather than the main feature. Stews, stir fries, and soups are usually adaptable and can be made with little or no meat.
- The key to healthy eating is meal planning. Choose 3-4 plant-rich meals to make each week and organize your shopping list.
- Stock your kitchen with staple ingredients that can be used for quick and healthy meals.
- Buy a vegetarian cookbook or research some plant-based recipe websites.
- Experiment with plant-based ingredients. Try veggie burgers, tofu sausages, and seitan in your favorite dishes. Sample different kinds of plant milk to find the flavor you like.
- Visit a vegetarian or vegan restaurant to try out dishes you haven't made at home. Many cuisines, such as Indian, Vietnamese, and Thai, have plant-based options on the menu.



- Initially, it may be helpful to stick with familiar recipes and swap out animal-based ingredients for plant-based alternatives. Some examples are bean chili, vegetable lasagna, and tofu stir-fry.
- Be patient with yourself! Changes take time. Small steps add up to big results. Celebrate your progress in moving toward a healthier, more sustainable diet!

Additional Resources

Visit [NutritionforFamilies.org](https://www.nutritionforfamilies.org) for additional resources on:

- Plant-based diets for infants up to 2 years of age
- Plant-based diets during pregnancy and breastfeeding
- Nutrient Library with detailed information on key nutrients
- Food group amounts to meet the nutrition needs of children
- Appropriate serving sizes by age
- The difference between portions and serving sizes
- Calorie and nutrient calculators
- Growth charts for children and what they mean
- Choking hazards
- Easy ways to grow food (including from scraps)
- How to read nutrition labels
- Eating disorder information
- Organizations with health and nutrition advice
- Plant-based books and other resources

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The material provided in this guide is for informational purposes only and is not medical advice. Consult your healthcare provider before making any dietary changes or taking supplements.