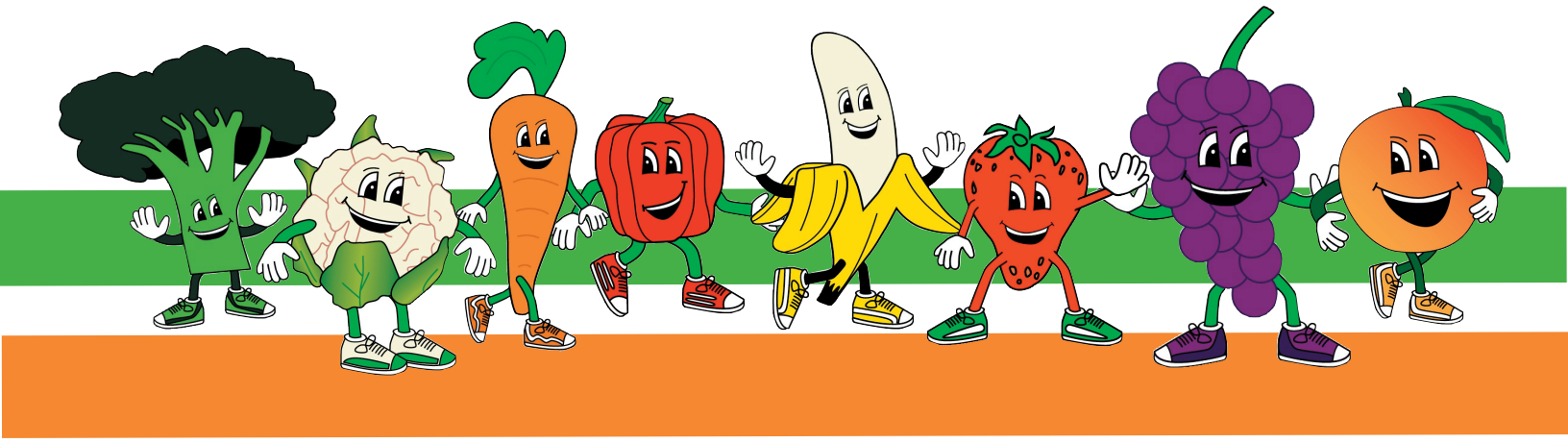
Nebraska
Fresh Fruit & Vegetable Program

Lessons K-5
&
Classroom Activities



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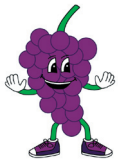
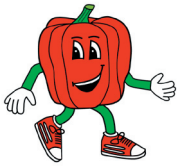
Lessons K-5 & Classroom Activities
Binder Contents





Fruit and Veggies Lesson Plans for Grades K-5

The lesson plans and resources within this notebook will help you to effortlessly include fruit and veggie nutrition education into the classroom. The combination of fresh fruit and veggie snacks, nutrition education and promotion gives schools an opportunity to establish the importance of eating fruits and veggies every. Active role modeling and positive interactions within the classroom will the stage for students to adopt lifelong healthy eating behaviors.

The enclosed K-5 curriculum combines fruit and veggie education with Math and English Language Arts activities. Resources that can be used with all grades can be found in the introduction and resource section as well as background nutrition information for the teacher. At the end of the notebook, additional ideas on promoting fruits and veggies with students can be found in the Classroom Activities section.

Each lesson includes the following sections:

- **Learning Objectives:** related to Math and English Language Arts
- **Teacher Resources:** background information to help prepare the lesson
- **Materials Needed:** additional items have been kept to a minimum
- **Handouts:** all student handouts are included in this notebook for easy reproduction
- **Focus:** an activity designed to get students focused on the topic covered in the lesson
- **Teacher Input:** material to be presented by the teacher
- **Practice and Assessment:** handouts and activities to be completed by students

Using these materials:

- Copy directly from the notebook
- Use the CD to print materials you need

Enclosed CD:

- FFVP Resource CD

Grade	Lesson	Teacher Resources	Handouts
K	**Naming Fruits and Veggies**	• What foods are in the fruit group? • What foods are in the vegetable group?	• Fruits and Veggies • Pyramid Go Fish • Where Do Fruits and Veggies Grow?
	Tasting Fruits and Veggies	• Promoting Fresh Fruits and Veggies: Story Time Follow-up Activities • What foods are in the fruit group? • What foods are in the vegetable group? • Fruit and Veggie Nutrients • Making Sense of Fruit and Veggie Nutrients • Fruit and Veggie Colors	• Graphing Fruits and Veggies
1	**The Color of Fruits and Veggies**	• What foods are in the fruit group? • What foods are in the vegetable group? • Fruit and Veggie Nutrients • Making Sense of Fruit and Veggie Nutrients • Fruit and Veggie Colors	• How Many Fruits and Veggies? • Fruit and Veggie Math Workout • The White Carrot and the Purple Potato
	Fruit and Veggie Diary	• What foods are in the fruit group? • What foods are in the vegetable group? • Fruit and Veggie Colors	• My Fruit and Veggie Snack Diary • Fresh Fruit and Veggie Snacks
2	**Focus on Fruits and Vary Your Veggies**	• What foods are in the fruit group? • What foods are in the vegetable group? • Fruit and Veggie Nutrients • Making Sense of Fruit and Veggie Nutrients • Fruit and Veggie Colors • Focus on Fruits • Vary Your Veggies • MyPyramid for Kids • Anatomy of MyPyramid • Teaching MyPyramid	• Vegetable Menu • Boxing Up Fruits and Veggies • Which Fruit
	My Fruit and Veggie Goals	• What foods are in the fruit group? • What foods are in the vegetable group? • Fruit and Veggie Nutrients • Making Sense of Fruit and Veggie Nutrients • Fruit and Veggie Colors • Focus on Fruits • Vary Your Veggies	• My Fruit and Veggie Snack • Eat More Fruits and Veggies • My Fruit and Veggie Goals

Grade	Lesson	Teacher Resources	Handouts
3	**Focus on Fruits, Vary Your Veggies**	• What foods are in the fruit group? • What foods are in the vegetable group? • MyPyramid for Kids • Anatomy of MyPyramid • Teaching MyPyramid	• It's in the Dictionary • Sarah's Birthday Lunch • Who Has What Fruit?
	Put a Rainbow in Your Day	• What foods are in the fruit group? • What foods are in the vegetable group? • Fruit and Veggie Nutrients • Making Sense of Fruit and Veggie Nutrients • Fruit and Veggie Colors	• Put a Rainbow in Your Day Questionnaire • Put a Rainbow in Your Day Math • Put a Rainbow in Your Day Sentences • Rainbow Shopping
4	**Finding Fiber**	• What foods are in the fruit group? • What foods are in the vegetable group? • Fruit and Veggie Nutrients • Fruit and Veggie Colors • MyPyramid for Kids • Anatomy of MyPyramid • Teaching MyPyramid	• Finding Fiber • Finding Fiber Word Problems • Vegetable Orders • Fruit and Vegetable Identification
	The Sweet, Sweet Potato	• Home Sweet Home, Sweet Potato • Fruit and Veggie Nutrients • Making Sense of Fruit and Veggie Nutrients • Dietary Reference Intakes	• Sweet Potato Math Puzzle • The Sweet Potato and Your Daily Nutritional Needs • Sweet Potato DRI Graph • Grow a Sweet Potato House Plant
5	**Is It a Fruit or Veggie?**	• What foods are in the fruit group? • What foods are in the vegetable group? • MyPyramid for Kids • Anatomy of MyPyramid • Teaching MyPyramid • Is It a Fruit or a Veggie?	• Nutritional Seed Search • How Does Your Garden Grow?
	From the Garden	• MyPyramid for Kids • Anatomy of MyPyramid • Teaching MyPyramid • What foods are in the fruit group? • What foods are in the vegetable group? • Making Sense of Fruit and Veggie Nutrients • Digging Up Fruits and Veggies	• From the Garden • Garden of Foods • Fractions in the Garden • Perimeters in the Garden • Areas in the Garden

What foods are in the vegetable group?

Any vegetable or 100% vegetable juice counts as a member of the vegetable group. Vegetables may be raw or cooked; fresh, frozen, canned, or dried/dehydrated; and may be whole, cut-up, or mashed. Vegetables are organized into 5 subgroups, based on their nutrient content. Some commonly eaten vegetables in each subgroup are:

Dark green vegetables
bok choy
broccoli
collard greens
dark green leafy lettuce
kale
mesclun
mustard greens
romaine lettuce
spinach
turnip greens
watercress

Orange vegetables
acorn squash
butternut squash
carrots
hubbard squash
pumpkin
sweet potatoes

Dry beans and peas
black beans
black-eyed peas
garbanzo beans (chickpeas)
kidney beans
lentils
lima beans (mature)
navy beans
pinto beans
soy beans
split peas
tofu (bean curd made from soybeans)
white beans

Starchy vegetables
corn
green peas
lima beans (green)
potatoes

Other vegetables
artichokes
asparagus
bean sprouts
beets
Brussels sprouts
cabbage
cauliflower
celery
cucumbers
eggplant
green beans
green or red peppers
iceberg (head) lettuce
mushrooms
okra
onions
parsnips
tomatoes
tomato juice
vegetable juice
turnips
wax beans
zucchini

Why is it important to eat vegetables?

Eating vegetables provides health benefits — people who eat more fruits and vegetables as part of an overall healthy diet are likely to have a reduced risk of some chronic diseases. Vegetables provide nutrients vital for health and maintenance of your body.

Health benefits

- Eating a diet rich in fruits and vegetables as part of an overall healthy diet may reduce risk for stroke and perhaps other cardiovascular diseases.
- Eating a diet rich in fruits and vegetables as part of an overall healthy diet may reduce risk for type 2 diabetes.
- Eating a diet rich in fruits and vegetables as part of an overall healthy diet may protect against certain cancers, such as mouth, stomach, and colon-rectum cancer.
- Diets rich in foods containing fiber, such as fruits and vegetables, may reduce the risk of coronary heart disease.
- Eating fruits and vegetables rich in potassium as part of an overall healthy diet may reduce the risk of developing kidney stones and may help to decrease bone loss.
- Eating foods such as vegetables that are low in calories per cup instead of some other higher-calorie food may be useful in helping to lower calorie intake.

Nutrients

- Most vegetables are naturally low in fat and calories. None have cholesterol. (Sauces or seasonings may add fat, calories, or cholesterol.)
- Vegetables are important sources of many nutrients, including potassium, dietary fiber, folate (folic acid), vitamin A, vitamin E and vitamin C.
- Diets rich in potassium may help to maintain healthy blood pressure. Vegetable sources of potassium include sweet potatoes, white potatoes, white beans, tomato products (paste, sauce, and juice), beet greens, soybeans, lima beans, winter squash, spinach, lentils, kidney beans, and split peas.
- Dietary fiber from vegetables, as part of an overall healthy diet, helps reduce blood cholesterol levels and may lower risk of heart disease. Fiber is important for proper bowel function. It helps reduce constipation and diverticulosis. Fiber-containing foods such as vegetables help provide a feeling of fullness with fewer calories.
- Folate (folic acid) helps the body form red blood cells. Women of childbearing age who may become pregnant and those in the first trimester of pregnancy should consume adequate folate, including folic acid from fortified foods or supplements. This reduces the risk of neural tube defects, spina bifida, and anencephaly during fetal development.
- Vitamin A keeps eyes and skin healthy and helps to protect against infections.
- Vitamin E helps protect vitamin A and essential fatty acids from cell oxidation.
- Vitamin C helps heal cuts and wounds and keeps teeth and gums healthy. Vitamin C aids in iron absorption.

How many vegetables are needed daily or weekly?

Vegetable choices should be selected from among the vegetable subgroups. It is not necessary to eat vegetables from each subgroup daily. However, over a week, try to consume the amounts listed from each subgroup as a way to reach your daily intake recommendation. The amount of vegetables you need to eat depends on your age, sex, and level of physical activity. Recommended total daily amounts are shown in the chart below.

Children	2-3 years old 4-8 years old	1 cup 1½ cups
Girls	9-13 years old 14-18 years old	2 cups 2½ cups
Boys	9-13 years old 14-18 years old	2½ cups 3 cups
Women	19-30 years old 31-50 years old 51+ years old	2½ cups 2½ cups 2 cups
Men	19-30 years old 31-50 years old 51+ years old	3 cups 3 cups 2½ cups

What counts as a cup of vegetables?

In general, 1 cup of raw or cooked vegetables or vegetable juice, or 2 cups of raw leafy greens can be considered as 1 cup from the vegetable group.

Tips to help you eat vegetables

In general:

- Buy fresh vegetables in season. They cost less and are likely to be at their peak flavor.
- Stock up on frozen vegetables for quick and easy cooking in the microwave.
- Buy vegetables that are easy to prepare. Pick up pre-washed bags of salad greens and add baby carrots or grape tomatoes for a salad in minutes. Buy packages of such as baby carrots or celery sticks for quick snacks.
- Use a microwave to quickly “zap” vegetables. White or sweet potatoes can be baked quickly this way.
- Vary your veggie choices to keep meals interesting.
- Try crunchy vegetables, raw or lightly steamed.

For the best nutritional value:

- Select vegetables with more potassium often, such as sweet potatoes, white potatoes, white beans, tomato products (paste, sauce, and juice), beet greens, soybeans, lima beans, winter squash, spinach, lentils, kidney beans, and split peas.
- Sauces or seasonings can add calories, fat, and sodium to vegetables. Use the Nutrition Facts label to compare the calories and % Daily Value for fat and sodium in plain and seasoned vegetables.
- Prepare more foods from fresh ingredients to lower sodium intake. Most sodium in the food supply comes from packaged or processed foods.
- Buy canned vegetables labeled "no salt added." If you want to add a little salt it will likely be less than the amount in the regular canned product.

At meals:

- Plan some meals around a vegetable main dish, such as a vegetable stir-fry or soup. Then add other foods to complement it.
- Try a main dish salad for lunch. Go light on the salad dressing.
- Include a green salad with your dinner every night.
- Shred carrots or zucchini into meatloaf, casseroles, quick breads, and muffins.
- Include chopped vegetables in pasta sauce or lasagna.

- Order a veggie pizza with toppings like mushrooms, green peppers, and onions, and ask for extra veggies.
- Use pureed, cooked vegetables such as potatoes to thicken stews, soups and gravies. These add flavor, nutrients, and texture.
- Grill vegetable kabobs as part of a barbecue meal. Try tomatoes, mushrooms, green peppers, and onions.

Make vegetables more appealing:

- Many vegetables taste great with a dip or dressing. Try a low-fat salad dressing with raw broccoli, red and green peppers, celery sticks or cauliflower.
- Add color to salads by adding baby carrots, shredded red cabbage, or spinach leaves. Include in-season vegetables for variety through the year.
- Include cooked dry beans or peas in flavorful mixed dishes, such as chili or minestrone soup.
- Decorate plates or serving dishes with vegetable slices.
- Keep a bowl of cut-up vegetables in a see-through container in the refrigerator. Carrot and celery sticks are traditional, but consider broccoli florettes, cucumber slices, or red or green pepper strips.

Vegetable tips for children:

- Set a good example for children by eating vegetables with meals and as snacks.
- Let children decide on the dinner vegetables or what goes into salads.
- Depending on their age, children can help shop for, clean, peel, or cut up vegetables.
- Allow children to pick a new vegetable to try while shopping.
- Use cut-up vegetables as part of afternoon snacks.
- Children often prefer foods served separately. So, rather than mixed vegetables try serving two vegetables separately.

Keep it safe:

- Wash vegetables before preparing or eating them. Under clean, running water, rub vegetables briskly with your hands to remove dirt and surface microorganisms. Dry after washing.
- Keep vegetables separate from raw meat, poultry and seafood while shopping, preparing or storing.

What foods are in the fruit group?

Any fruit or 100% fruit juice counts as part of the fruit group. Fruits may be fresh, canned, frozen, or dried, and may be whole, cut-up, or pureed. Some commonly eaten fruits are:

Apples
Apricots
Avocado
Bananas

Berries:
strawberries
blueberries
raspberries
cherries

Grapefruit
Grapes
Kiwi fruit
Lemons
Limes
Mangoes

Melons:
cantaloupe
honeydew
watermelon

Mixed fruits:
fruit cocktail

Nectarines
Oranges
Peaches
Pears
Papaya
Pineapple
Plums
Prunes
Raisins
Tangerines

100% Fruit juice:
orange
apple
grape
grapefruit

Why is it important to eat fruit?

Eating fruit provides health benefits — people who eat more fruits and vegetables as part of an overall healthy diet are likely to have a reduced risk of some chronic diseases. Fruits provide nutrients vital for health and maintenance of your body.

Health benefits

- Eating a diet rich in fruits and vegetables as part of an overall healthy diet may reduce risk for stroke and perhaps other cardiovascular diseases.
- Eating a diet rich in fruits and vegetables as part of an overall healthy diet may reduce risk for type 2 diabetes.
- Eating a diet rich in fruits and vegetables as part of an overall healthy diet may protect against certain cancers, such as mouth, stomach, and colon-rectum cancer.
- Diets rich in foods containing fiber, such as fruits and vegetables, may reduce the risk of coronary heart disease.
- Eating fruits and vegetables rich in potassium as part of an overall healthy diet may reduce the risk of developing kidney stones and may help to decrease bone loss.
- Eating foods such as fruits that are low in calories per cup instead of some other higher-calorie food may be useful in helping to lower calorie intake.

Nutrients

- Most fruits are naturally low in fat, sodium, and calories. None have cholesterol.
- Fruits are important sources of many nutrients, including potassium, dietary fiber, vitamin C and folate (folic acid).
- Diets rich in potassium may help to maintain healthy blood pressure. Fruit sources of potassium include bananas, prunes and prune juice, dried peaches and apricots, cantaloupe, honeydew melon, and orange juice.
- Dietary fiber from fruits, as part of an overall healthy diet, helps reduce blood cholesterol levels and may lower risk of heart disease. Fiber is important for proper bowel function. It helps reduce constipation and diverticulosis. Fiber-containing foods such as fruits help provide a feeling of fullness with fewer calories. *Whole or cut-up fruits are sources of dietary fiber; fruit juices contain little or no fiber.*

- Vitamin C is important for growth and repair of all body tissues, helps heal cuts and wounds, and keeps teeth and gums healthy.
- Folate (folic acid) helps the body form red blood cells. Women of childbearing age who may become pregnant and those in the first trimester of pregnancy should consume adequate folate, including folic acid from fortified foods or supplements. This reduces the risk of neural tube defects, spina bifida, and anencephaly during fetal development.

How much fruit is needed daily?

The amount of fruit you need to eat depends on age, sex, and level of physical activity. Recommended daily amounts are shown in the chart. Recommended amounts are shown in the table below.

Children	2-3 years old 4-8 years old	1 cup 1 to 1½ cups
Girls	9-13 years old 14-18 years old	1 ½ cups 1½ cups
Boys	9-13 years old 14-18 years old	1½ cups 2 cups
Women	19-30 years old 31-50 years old 51+ years old	2 cups 1½ cups 1½ cups
Men	19-30 years old 31-50 years old 51+ years old	2 cups 2 cups 2 cups

What counts as a cup of fruit?

In general, 1 cup of fruit or 100% fruit juice, or ½ cup of dried fruit can be considered as 1 cup from the fruit group.

Tips to help you eat fruits

In general:

- Keep a bowl of whole fruit on the table, counter or in the refrigerator.
- Refrigerate cut-up fruit to store for later.
- Buy fresh fruits in season when they may be less expensive and at their peak flavor.
- Buy fruits that are dried, frozen, and canned (in water or juice) as well as fresh, so that you always have a supply on hand.
- Consider convenience when shopping. Buy pre-cut packages of fruit (such as melon or pineapple chunks) for a healthy snack in seconds. Choose packaged fruits that do not have added sugars.

For the best nutritional value:

- Make most of your choices whole or cut-up fruit rather than juice, for the benefits dietary fiber provides.
- Select fruits with more potassium often, such as bananas, prunes and prune juice, dried peaches and apricots, cantaloupe, honeydew melon, and orange juice.
- When choosing canned fruits, select fruit canned in 100% fruit juice or water rather than syrup.
- Vary your fruit choices. Fruits differ in nutrient content.

At meals:

- At breakfast, top your cereal with bananas or peaches; add blueberries to pancakes; drink 100% orange or grapefruit juice. Or, try a fruit mixed with low-fat or fat-free yogurt.
- At lunch, pack a tangerine, banana, or grapes to eat, or choose fruits from a salad bar. Individual containers of fruits like peaches or applesauce are easy and convenient.
- At dinner, add crushed pineapple to coleslaw, or include mandarin oranges or grapes in a tossed salad.

- Make a Waldorf salad, with apples, celery, walnuts, and dressing.
- Try meat dishes that incorporate fruit, such as chicken with apricots or mango chutney.
- Add fruit like pineapple or peaches to kabobs as part of a barbecue meal.
- For dessert, have baked apples, pears, or a fruit salad.

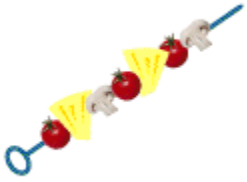
As snacks:

- Cut-up fruit makes a great snack. Either cut them yourself, or buy pre-cut packages of fruit pieces like pineapples or melons. Or, try whole fresh berries or grapes.
- Dried fruits also make a great snack. They are easy to carry and store well. Because they are dried, ¼ cup is equivalent to ½ cup of other fruits.
- Keep a package of dried fruit in your desk or bag. Some fruits that are available dried include apricots, apples, pineapple, bananas, cherries, figs, dates, cranberries, blueberries, prunes (dried plums), and raisins (dried grapes).
- As a snack, spread peanut butter on apple slices or top frozen yogurt with berries or slices of kiwi fruit.
- Frozen juice bars (100% juice) make healthy alternatives to high-fat snacks.

Make fruit more appealing:

- Many fruits taste great with a dip or dressing. Try low-fat yogurt or pudding as a dip for fruits like strawberries or melons.
- Make a fruit smoothie by blending fat-free or low-fat milk or yogurt with fresh or frozen fruit. Try bananas, peaches, strawberries, or other berries.
- Try applesauce as a fat-free substitute for some of the oil when baking cakes.
- Try different textures of fruits. For example, apples are crunchy, bananas are smooth and creamy, and oranges are juicy.
- For fresh fruit salads, mix apples, bananas, or pears with acidic fruits like oranges, pineapple, or lemon juice to keep them from turning brown.

Fruit tips for children:



- Set a good example for children by eating fruit everyday with meals or as snacks.
- Offer children a choice of fruits for lunch.
- Depending on their age, children can help shop for, clean, peel, or cut up fruits.
- While shopping, allow children to pick out a new fruit to try later at home.
- Decorate plates or serving dishes with fruit slices.
- Top off a bowl of cereal with some berries. Or, make a smiley face with sliced bananas for eyes, raisins for a nose, and an orange slice for a mouth.
- Offer raisins or other dried fruits instead of candy.
- Make fruit kabobs using pineapple chunks, bananas, grapes, and berries.
- Pack a juice box (100% juice) in children's lunches versus soda or other sugar-sweetened beverages.
- Choose fruit options, such as sliced apples, mixed fruit cup, or 100% fruit juice that are available in some fast food restaurants.
- Offer fruit pieces and 100% fruit juice to children. There is often little fruit in "fruit-flavored" beverages or chewy fruit snacks.

Keep it safe:

- Wash fruits before preparing or eating them. Under clean, running water, rub fruits briskly with your hands to remove dirt and surface microorganisms. Dry after washing.
- Keep fruits separate from raw meat, poultry and seafood while shopping, preparing, or storing.

Fruit and Veggie Nutrients

Focus on Fruits and Vary Your Veggies

Just Do It...It's Essential

Fruits and veggies provide us with many of the nutrients we need for good health. These nutrients include essential vitamins and minerals, fiber, and other substances such as phytonutrients (plant nutrients).

Common Nutrients

Vitamin A, vitamin C, folic acid and potassium are just a few of the nutrients that are common in fruits and veggies. Dark green leafy vegetables, deeply-colored fruits, and dried peas and beans are especially rich in a variety of these nutrients.

Variety Is Key

Each fruit and veggie provides a unique blend of the nutrients we need every day. Some fruits and veggies are excellent sources of vitamin A, while others are more rich in vitamin C, for example. To get the most out of your fruits and veggies, mix it up!

Any Form Will Do

You can get the nutrients you need from fruits and veggies in any form—fresh, frozen, dried or canned! Try whole varieties more often than juice. Juices contain little or no fiber.

Make a Plan

- Select one vitamin C-rich fruit or veggie every day
- Go for one vitamin A-rich fruit or veggie every day
- Choose from one of the variety of high fiber selections every day
- Eat cabbage family veggies, such as broccoli, Brussels sprouts, cauliflower, cabbage, and kohlrabi several times a week

Cooking Losses

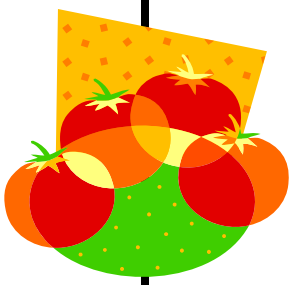
Prolonged heating can cause a loss of some of the B vitamins and vitamin C. Most other nutrients are not affected by the cooking process. Try quick heating methods such as steaming or microwaving if you are concerned about losses during cooking.

Nebraska Fresh Fruit and Vegetable Program
Adapted from North Carolina Nutrition Services

Common Fruit and Veggie Nutrients

Nutrient	Function in Body	Fruit and Veggie Sources
Vitamin A	Essential for vision, skin and the immune system. Promotes growth. Protects against some types of cancer.	Cantaloupe, apricots, dark green and deep yellow veggies such as pumpkin, carrots, sweet potatoes, spinach, greens and bell peppers.
Vitamin C	Strengthens blood vessels, improves wound and bone healing, increases the resistance to infections and increases the absorption of iron—another important nutrient for growth.	Cantaloupe, honeydew melon, peaches, oranges, strawberries, kiwifruit, asparagus, sweet potatoes, bell peppers, broccoli, Brussels sprouts.
Antioxidants and Phytonutrients	Antioxidants are vitamins, minerals, and other substances that fight free radicals, which may play a role in the progression of cancer and heart disease. Phytonutrients are the color pigments in fruits and veggies that either act as antioxidants or enhance the antioxidant benefits.	Fruits and veggies bursting with color, such as berries, tomatoes, and dark green and deep yellow veggies.
Fiber	Important to maintain digestive health as well as reduce blood cholesterol.	Raspberries, peas, blackberries, Brussels sprouts, parsnips, raisins, broccoli, black beans.
Folate	Important for normal cell division, wound healing and prevention of birth defects.	Orange juice, dried peas and beans, green leafy veggies, such as mustard and turnip greens, collards and spinach.
Calcium	Important for strong bones, blood clotting, muscle contraction and nerve function.	Rhubarb, okra and green leafy veggies, such as mustard and turnip greens, collards, kale and spinach.

Fruit and Veggie Colors



Focus on Fruits and Vary Your Veggies

By eating a variety of colorful fruits and veggies, you can get many of the nutrients your body needs for good health.

- Create a rainbow on your plate. Think red tomatoes, orange cantaloupe, yellow pineapple, white onions, green collards, blue blueberries and purple plums!
- Choose fresh, frozen, dried or canned fruits and veggies. Any kind will do!
- Go for juice less often because it contains little or no fiber. Make sure to look for "100% juice" on the label when you do select juice.
- For children, set a goal to eat at least 2½ cups of veggies and 1½ cups of fruits each day, particularly focusing on dark green leafy vegetables and bright orange fruits and veggies. Adults need 2 to 3 cups of veggies and 1½ to 2 cups of fruits.

What are phytonutrients and why do you need them?

- Phytonutrient simply means plant (phyto-) nutrient.
- Phytonutrients act as a natural defense system for our bodies, helping to prevent chronic diseases.

REDS

Deep reds and bright pinks add powerful antioxidants called lycopene and anthocyanins to your diet. Diets rich in these nutrients are being studied for their ability to fight heart disease, diabetes, high blood pressure, Alzheimer's Disease as well as skin, breast and prostate cancers.

Lycopene: tomato-based products (tomato juice, spaghetti sauce, tomato soup, tomato paste), watermelon, pink grapefruit, raw tomatoes, guava

Anthocyanins: red raspberries, sweet cherries, strawberries, cranberries, beets, red apples (with skin), red cabbage, red onion, kidney and red beans

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GREENS

Green veggies are rich in the phytonutrients lutein, zeaxanthin and indoles. They also provide essential vitamins (folate), minerals and fiber. These nutrients protect your eyes, and may reduce the risk of cancerous tumors.

Lutein: kale, spinach, leafy greens (turnip, collard, mustard), romaine lettuce, broccoli, green peas, kiwifruit, honeydew melon

Indoles: broccoli, cabbage, Brussels sprouts, bok choy, arugula, Swiss chard, turnips, rutabaga, watercress, cauliflower, kale

YELLOW & ORANGE

The colors of the blazing sun are a must have in your daily diet. Yellow and orange fruits and veggies contain beta-carotene (which turns into vitamin A), vitamin C, vitamin E, folate (a B vitamin) and bioflavonoids. Research shows that these nutrients reduce the risk for cancer and heart attacks, boost immunity, help maintain good vision and strong bones/teeth/skin.

Beta-carotene: carrots, sweet potatoes, pumpkin, butternut squash, cantaloupe, mangos, apricots, peaches

Bioflavonoids: oranges, grapefruit, lemons, tangerines, clementines, peaches, papaya, apricots, nectarines, pineapple, yellow raisins, yellow pepper

BLUES AND PURPLES

Blues and purples not only add beautiful shades of tranquility and richness to your plate, they add health-enhancing flavonoids and antioxidants, such as anthocyanins, vitamin C, folic acid and polyphenols. These nutrients help your body defend against cancer, reduce the risk of age-related memory loss, help control high blood pressure and reduce the risk of diabetes complications and heart attacks.

Anthocyanins: blueberries, blackberries, purple grapes, black currants, elderberries

Phenolics: dried plums (prunes), raisins, plums, eggplant

WHITE

White fruits and veggies vary from sweet to strong. Veggies from the onion family, which include garlic, chives, scallions, leeks and any variety of onion, contain the phytonutrient allicin. Research is being conducted on allicin to learn how it may help lower cholesterol and blood pressure and increase the body's ability to fight infections and cancer. Indoles and sulfaforaphanes in cruciferous veggies like cauliflower may also inhibit cancer growth.

Allicin: garlic, onions, leeks, scallions, chives, cauliflower, shallots

Phytonutrients: bananas, pears, cauliflower, jicama, mushrooms, parsnips, potatoes, turnips

Vary Your Veggies

Focus on Fruits and Vary Your Veggies

12 Delicious, Easy Ways to Enjoy Veggies

From a health standpoint, veggies are a five-star food group: naturally nutrient-rich; better tasting than a vitamin pill; low in calories and fat; cholesterol-free and packed with disease-fighting phytonutrients. Here are a dozen daily ways to treat yourself to good health!

1. **Broccoli and cauliflower:** Versatile and very healthful – eat them raw (with dip if you like) or cooked, in a salad or even a slaw.
2. **Carrots:** Sweet, crunchy, good for your teeth, eyes and heart! Perfect raw (as a snack or salad) or cooked in a stew.
3. **Peppers:** Green, red, yellow, orange or even purple! Enjoy peppers in a salad, stir-fry, casserole or as a snack.
4. **Spinach:** A salad of baby spinach leaves with pears or apples can turn anyone into a real spinach lover.
5. **Onions:** The zesty onion family (scallions, leeks and garlic, too!) offer some powerful antioxidant nutrients.
6. **Peas:** Fresh, frozen or even canned, peas are a treat to eat and they are very popular with small children.
7. **Beets:** If you've never liked beets, try them in a new way – like roasted, grilled or lightly steamed in the microwave.
8. **Sweet potatoes and yams:** Switch the color of your usual baked potato and you'll get a lot more nutrients, along with great taste.
9. **Mushrooms:** Just a mushroom or two adds rich flavor to a casserole, soup, stew, stir-fry or even a tossed green salad.
10. **Leaf and romaine lettuce:** Rule of thumb for a healthy salad – the darker the green or the red of the lettuce leaves, the more nutrients you get.
11. **Green, yellow or purple beans:** Like their pea 'cousins', beans offer some fiber and a little bit of protein, along with vitamins and minerals.
12. **Tomatoes:** Cooking increases the availability of some tomato nutrients – so enjoy canned sauce, paste and chunks.

National Nutrition Month® - March 2005; Adapted by the NC NET Program from Eat Right Montana materials

Focus on Fruits

Focus on Fruits and Vary Your Veggies

12 Delicious, Easy Ways to Enjoy Fruit

Fruit is a double-sweet treat. It's a delicious treat for your taste buds and a nutrition treat for your whole body. Below are a dozen easy ways to treat yourself to good health and great taste!

1. **Berries, berries, berries:** Canned blueberries in muffins, dried cranberries in a salad, or fresh, juicy strawberries for dessert.
2. **Citrus fruit:** Oranges, pink and white grapefruit, tangerines, tangelos, clementines, lemons and limes.
3. **Melons and more melons:** Slices of watermelon, cantaloupe, honeydew or Crenshaw – in a fruit cup or for a sweet snack.
4. **Bananas:** Bananas, nature's fast food, come in their own wrapper – convenient to take in the car or eat at your desk.
5. **Kiwifruit:** Slice kiwifruit into a mixed fruit or fresh spinach salad or just scoop them out of their thin, brown peel.
6. **Pineapple:** One of the most versatile fruits, pineapple is perfect fresh, canned, dried, as juice or on a pizza!
7. **Tropical fruit:** Fresh produce departments and canned food aisles now serve up mangos, papaya and star fruit.
8. **Apples and pears:** A fresh, crisp snack, a juicy addition to green salad, and in a tasty pie, tart or cobbler for dessert.
9. **Summer tree fruit:** Nectarines, peaches and apricots are fabulous when fresh and still quite tasty when canned in their own juice.
10. **Plums and prunes:** Fresh plums are another juicy taste of summer. Dried or made into juice, prunes are very nice for regularity!
11. **Cherries and grapes:** Fresh or dried, cherries and grapes make a great snack or addition to salads (mixed fruit or tossed green).
12. **Trendy tomatoes:** Tomatoes are a fruit and now they come in sweet, fruit-shaped cherry, grape and strawberry varieties.

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Making Sense of Fruit and Veggie Nutrients

Like most all foods, fruits and veggies are made up of a mixture of many different nutrients. These nutrients include water, carbohydrate, protein, fat, fiber, vitamins and minerals. Below you will find information about each of these nutrients found in fruits and veggies.

Water

Fruits and veggies are made up of a great deal of water. Juicy fruits and veggies typically contain more than 90% water, which can contribute to total daily fluid intake.

Water is the most abundant substance in the human body as well as the most common substance on earth. Like oxygen, you cannot live without water. On average, body weight is 50 to 75% water or about 10-12 gallons. Water is a simple substance containing two parts hydrogen and one part oxygen (H_20). It has no calories, but every body process needs water to function.

Water regulates your body temperature, keeping it constant at about 98.6 F. Many body processes produce heat, including any physical activity. Through perspiration, heat escapes from your body as water evaporates on your skin.

- Water transports nutrients and oxygen to your cells and carries waste products away.
- Water helps with the digestion of foods.
- Water moistens body tissues such as those in your mouth, eyes and nose.
- Water is the main part of every body fluid including blood, stomach juices and urine.
- Water helps cushion your joints and protects your body's organs and tissues.

Of all the nutrients in the body, water is the most abundant. Water and other beverages are the main sources. But you also eat quite a bit of water in solid foods. Juicy fruits and veggies such as celery, lettuce, tomatoes and watermelon contain more than 90% water. Even dry foods such as bread supply some water.

The average adult loses about two quarts of water daily through perspiration, urination, bowel movements and even breathing. One and one-half cups of water is lost just through breathing. **Most people need 8 to 12 cups of water daily from drinking water and other beverages.**

When we are really active outside in the hot weather we need to be especially careful to avoid dehydration. No matter what you do - biking, running, swimming, walking or just playing outside - make sure you get enough fluids.

- Drink plenty of fluids before, during and after activity. Carry a water bottle especially if you do not have a water source available.
- Drink fluids by schedule (every fifteen minutes) even when you do not feel thirsty.
- Wear light colored clothing.
- Be especially careful if you exercise in warm, humid weather.
- Signs of dehydration are flushed skin, fatigue, increased body temperature and increased breathing and pulse rate.

Nebraska Fresh Fruit and Vegetable Program
Adapted from North Carolina Nutrition Services

Carbohydrates

When comparing energy-yielding nutrients, fruits and veggies are made up of predominantly carbohydrates. From the simple sugar of fruits to the starch of roots and legumes, fruits and veggies are one of the best sources of this nutrient.

Carbohydrates are organic molecules constructed in the ratio (CH_2O) in a variety of lengths and shapes. Carbohydrates are the body's preferred source of energy; the other potential energy sources being proteins and fats. Carbohydrates are broken down in the body into sugars, starches and fiber. The sugars are known as simple carbohydrates, and the starches and fiber are known as complex carbohydrates.

Function

Carbohydrates perform three important functions in the body:

- Supply energy
- Supply fiber
- Aid in the digestion of fats

Monosaccharides	Disaccharides	Polysaccharides
Monosaccharides are the simplest form of carbohydrates. The monosaccharides are glucose, galactose, and fructose. Sugars and starches are broken down in the body into the simple sugar glucose. Glucose is the major sugar found in the bloodstream and supplies energy for the body. Some body tissues, such as red blood cells and parts of the brain, are able to get energy only from glucose. Fructose is found in honey and fruits and is known as the sweetest of the sugars. Galactose is not found in nature, but it is one of the two monosaccharides available after the breakdown of lactose (milk sugar).	*Disaccharides* are formed when two monosaccharides are joined together. They are broken down into their monosaccharide components during digestion. The disaccharides are sucrose, maltose, and lactose. Sucrose (glucose + fructose) is found in white, refined table sugar, brown sugar, confectioner's sugar, cane sugar, beet sugar, molasses, and maple syrup. Maltose (glucose + glucose) is malt sugar which is found in sprouting cereal grains. Lactose (glucose + galactose) is milk sugar and is found only in milk.	*Polysaccharides* are the complex carbohydrates often consisting of very long chains of glucose monomers. They include starch, cellulose and glycogen. Starch is the most abundant polysaccharide and is an important storage form of energy in plants. Starch can be found in roots (such as potatoes), legumes, grains, and veggies, but must be broken down into glucose by the body before it can be utilized. Cellulose is the fibrous material found in plants, such as the strings in celery, and is commonly referred to as fiber or roughage. Cellulose cannot be digested by humans. Sources of cellulose include veggies, fruits, and whole grain cereals. Glycogen, also known as animal starch, is the storage form of carbohydrates found in the liver and muscles. Glycogen in the liver is easily broken down into blood glucose, and muscle glycogen supplies glucose for muscle use. This is especially important during periods of intense exercise.

Forty-five to sixty-five percent of calories should come from complex carbohydrates. Preferred carbohydrate sources include veggies, fruits, grains and grain products, legumes, and dairy products. Current recommendations suggest half of all grain and grain products consumed should be whole grains.

Protein

While most fruits and veggies are not rich sources of protein, legumes <u>are</u> a great source.

Without protein, the human body would not be able to survive. Protein performs four very important functions.

Function

The body uses protein for:

- Growth and repair of new and damaged tissues. Skin, muscles, hair, finger nails, and blood clots are all made of protein.
- Regulating all body functions through the actions of enzymes, hormones, and other functional molecules.
- Transporting other nutrients and oxygen throughout the body.
- Supplying energy when adequate amounts are not supplied by carbohydrates and fat. Providing immune system defenses; antibodies are made of proteins.

Protein is an organic macromolecule comprised of compounds called amino acids. Amino acids are often referred to as the building blocks of protein. They consist of an amino group (H2N-), a carboxyl group (-COOH), a hydrogen (-H), and what is called a "side group" (usually denoted chemically as "R") attached to a central carbon atom. There are 22 different amino acids; they differ by the type of "R" group attached.

Thirteen of the 22 amino acids can be manufactured by the body. The remaining nine amino acids – often called essential amino acids – must by supplied by the diet. People in developing countries may suffer from diet-related diseases and other health problems because of the shortage of protein foods.

Protein foods that supply all nine of the essential amino acids are called complete proteins. Foods that supply only some of the nine essential amino acids are called incomplete proteins. Two incomplete protein foods can be eaten together to form a complete protein source. Most generally, animal proteins are complete protein sources and plant proteins are incomplete protein sources. However, animal proteins also provide more fat and calories than plant proteins. It is a wise dietary practice to consume combinations of plant proteins to fulfill some of the body's need for complete proteins. Some examples of combining incomplete proteins to form complete proteins are:

- Legumes (dried beans, lentils, split peas) and rice
- Pinto beans and corn tortillas
- Peanut butter sandwich (peanuts are a legume).

The amino acids are joined together by peptide bonds to form polypeptides. A protein consists of one or more of the polypeptide chains. Enzymes are globular proteins that catalyze chemical reactions within the body. For enzymes and all proteins, shape determines function – and the shape is determined by the sequence of the different amino acids.

Denaturation is the disruption of the bonds and the three-dimensional shape of a protein. This is often accomplished by changes in pH or temperature. To see denaturation in process, cook an egg white. The visible differences (moving from translucent to opaque, from watery to rubbery) are due to protein denaturation caused by heat.

It is recommended for adults that 10-35% of calories come from protein; for teenagers and children over the age of four, it is recommended that 10-30% of calories come from protein. Additional protein is needed by women during times of pregnancy and lactation. People should consult the Dietary Reference Intake charts for their gender and age group for specific protein requirements.

Fats

Fruits and veggies tend to be very low in fat and have no cholesterol. Exceptions to the low-fat feature of fruits and veggies include avocados and peanuts, for example. Of significance, the type of fat found in these foods is heart healthy and can be part of a healthy diet if eaten in moderation.

Fats are semisolid, energy-filled organic macromolecules found in animal and plant tissues. The term lipid is often used interchangeably with the term fat, but it is also used to describe a larger group that includes fats (solids, semisolids at room temperature), oils (liquids at room temperature), and fat-related substances. The major form of fat in the body and in foods is known as triglycerol or triglyceride. Triglycerides are organic compounds containing a glycerol backbone and three attached fatty acid chains. Other forms of fat in the body include sterols, a class of fats consisting of fused carbon rings without fatty acid chains, and phospholipids (such as lecithin). Steroids include cholesterol, Vitamin D, and sex hormones (estrogen and testosterone).

Functions of fat in the body include:

- provide energy
- transport and absorb fat-soluble vitamins
- cushion vital organs in the body
- important part of the membranes of cells
- supply essential fatty acids
- add flavor to foods
- satisfy the appetite by delaying hunger
- insulate the body
- serve as protection for nerves and blood vessels

Fatty acid chains are classified as saturated, monounsaturated, or polyunsaturated depending on the number of double bonds they possess. Every time a double bond is formed, one of the hydrogen molecules is removed and a tiny bend or kink forms in the chain. The more saturated the fat, the fewer kinks it has, the more closely the molecules can pack, and the more solid it is at room temperature.

- ***Saturated fats*** have no double bonds and the most hydrogen. Saturated fats are found in animal meats, butter, chocolate, egg yolks, lard, coconut and palm oil (the only saturated oils), and many other foods. The Dietary Guidelines for Americans suggest that 10% or fewer of calories should come from saturated fat.
- ***Monounsaturated fats*** have one double bond and less hydrogen than saturated fats. Example sources include canola, olive, and sunflower oils, and nuts.
- ***Polyunsaturated fats*** have multiple double bonds and even less hydrogen than monounsaturated fats. Polyunsaturated fats can be found in soybean, corn, and safflower oil, walnuts, and flaxseeds.

Trans fats are a special category of fats. Trans fats occur naturally in small amounts in meat and dairy foods, but the majority of trans fats in the American diet come from hydrogenation. When liquid oils are hydrogenated, treated with hydrogen to become semi-solid or solid fats, trans fats can be created. Trans fats are most commonly found in veggie shortening, hard (stick) margarine, and manufactured foods such as crackers, cookies and baked goods. Consumption of trans fats should be limited, as they have been linked to an increased risk in coronary heart disease.

Children ages 4 to 18 years should receive between 25 and 35% of their calories from fat; adults should receive between 20 and 35% of their calories from fat.

Fiber

Fruits and veggies are rich sources of fiber. Eating whole fruits and veggies offers more fiber than drinking fruits and veggies in the form of juice. Furthermore, fresh fruits and veggies tend to provide more fiber than canned versions.

Dietary fiber is a type of carbohydrate consisting of the parts of a plant that cannot be digested. There are two categories of fiber: soluble and insoluble. Soluble fiber is dissolved in water and may help control diabetes and lower blood pressure in some people. Soluble fiber is found in some fruits, beans, and oat bran. Insoluble fiber is not able to be dissolved in water and therefore has different functions from soluble fiber. Insoluble fiber helps move food through the digestive tract. It aids in the prevention of colon and rectal cancer, helps to control diverticulosis, and helps prevent constipation. Diverticulosis is caused when bulging pockets form on the intestinal wall and can become inflamed. Sources of insoluble fiber are fruits, veggies, wheat bran, whole wheat, and some beans.

Function

Fiber has a number of functions in the digestive system:

- Because fiber cannot be absorbed, it essentially contributes no calories to the diet. It can give a feeling of fullness in the stomach, without adding extra calories.
- Fiber slows the emptying of food from the small intestine. Because sugars in the food are not moving through your digestive system so quickly, fiber has a positive effect on blood glucose levels.
- Fiber can interfere with the absorption of fats and cholesterol. By sweeping the fats out of the body, fiber can help lower blood cholesterol levels.

Many types of beans (black, navy, kidney, pinto, lima, etc.) are very high in fiber. Bran and shredded wheat cereals are also good fiber sources. Many fruits and veggies, including sweet and plain potatoes, pears, peas, berries (raspberries, blackberries), pumpkin, spinach, apples, bananas, oranges, and broccoli, are good sources of fiber. Additionally, some foods you might not expect – such as almonds, soybeans, and tomato paste – also provide fiber to the diet.

Vitamins

Fruits and veggies are rich sources of vitamins, especially vitamin A, vitamin C and folate.

Vitamins are organic compounds necessary for normal growth, maintenance of health and reproduction. There are 13 vitamins currently identified as essential for maintaining good health; the body cannot survive without them.

Function

Vitamins help the body convert carbohydrates and fat into energy and assist in the formation of bones and tissues. Vitamins are either fat-soluble or water-soluble. Fat-soluble vitamins cannot be dissolved in water, so they are stored in the body fat until they are transported to the cells by the blood. Because these vitamins can accumulate in the body, it is especially important for a person's regular daily nutrient intake of fat soluble vitamins not to exceed the Tolerable Upper Intake Levels (UL). Water-soluble vitamins are easily dissolved by water and therefore are not significantly stored by the body. Water-soluble vitamins must be replenished frequently.

Fat-Soluble Vitamin Alternative Names	Description	Sources
Vitamin A Retinol Beta-carotene (a precursor)	Responsible for night and color vision, growth of bones and teeth, immune function, maintenance of epithelial tissues, and embryonic development. Excessive amounts of certain forms of Vitamin A (found in some skin medications) can cause fetal abnormalities.	Dark green and dark yellow veggies, yellow fruits, egg yolks, whole milk, liver, and fish oils.
Vitamin D Calciferol	Important for the normal growth and development of bones and teeth. Aids in the absorption and utilization of calcium and phosphorus. With exposure to the sun, the body is able to make its own Vitamin D.	Egg yolks, liver, fish liver oils, fortified cereals, and fortified milk.

Vitamin E Tocopherol	Protects cells from oxidation and is important in cell membranes. Oxidation is a chemical change that occurs as a result of exposure to oxygen. When blood cells or tissue cells are exposed to oxygen, the resulting chemical change causes a weakening of the cell walls and thus damages the tissues. Vitamin E is most effective in protecting the red blood cells in the lungs and the cells of the lung tissue because of their continuous exposure to oxygen.	Veggie oils, whole grains, nuts and seeds, liver, fish oils, and green leafy veggies (spinach, kale, etc.).
Vitamin K	Necessary for protein synthesis involved in blood clotting and other body processes.	Green veggies (leafy veggies, broccoli, Brussels sprouts), cabbage, plant oils, margarine. Can be produced by bacteria in the gastrointestinal tract.

Water-Soluble Vitamin Alternative Names	Description	Sources
B1 Thiamin Aneurin	Helps the body breakdown carbohydrates and release energy from food. It is necessary for cell respiration, promotion of normal appetite and digestion, and maintenance of a healthy nervous system. Thiamin is heat sensitive and is easily leached into the cooking liquid.	Enriched or fortified whole grain products, green leafy veggies, legumes, and pork.
B2 Riboflavin	Important for the breakdown of foods and the release of energy (oxidation-reduction reactions). Riboflavin is easily destroyed by exposure to light, especially sunlight.	Fortified cereals and bread products, eggs, fish, organ meats, and milk.
B3 Niacin Nicotinic acid	Helps cells convert food into energy, and is important in the nervous and digestive systems.	Lean meats, poultry, fish, nuts, enriched or fortified bread products and cereals, eggs, and dairy products.

Folate Folic acid Folacin	Necessary for the body to produce normal red blood cells and for amino acids and nucleic acid metabolism. Key in preventing neural tube defects, such as spina bifida, during pregnancy.	Dark leafy green veggies, enriched grain and cereal products, yeast.
Biotin	Essential in the metabolism of fats and amino acids.	Liver and eggs are important sources of biotin; it is also found in baker's yeast, and legumes.
B5 Pantothenic acid	Aids in the metabolism of fats and the formation of cholesterol and hormones.	Eggs, milk, whole-grain products, sweet potatoes, and lean beef.
B6 Pyridoxine	Important in maintaining nervous tissue function and muscle cells, DNA and RNA production, and the metabolism of carbohydrates, proteins, and fats.	Sources include poultry, fish, fortified whole grain cereals, and lentils.
B12 Cobalamin Cyanocobalamin	Important in red blood cell formation, nucleic acid metabolism and the prevention of pernicious anemia.	Animal products (meat, fish, poultry, milk), fortified cereals.
Vitamin C Ascorbic acid	Aids in the formation of collagen, the healing of wounds, and the absorption of iron and calcium. Vitamin C is also an important antioxidant.	Sources include citrus fruits, parsley, broccoli, green and red peppers, and tomatoes.

Research continues into the role vitamins and minerals play in preventing chronic disease and in maintaining health and wellness. The **Dietary Reference Intakes** serve as guidelines for determining the amounts of nutrients that a person needs each day.

Minerals

Fruits and veggies are sources of several essential minerals, notably potassium, calcium, iron and magnesium.

Minerals are inorganic substances necessary for building bones, tissues, and other compounds as well as for regulating body processes. Minerals found in large amounts in the body or those with high daily intake requirements (at least 100 milligrams per day) are called macrominerals. Macrominerals include calcium, phosphorus, magnesium, sodium, potassium, and chloride.

Function

Minerals perform a number of functions in the body:

- Calcium is used to make the bones and teeth
- Iron is used to make the hemoglobin in red blood cells
- Minerals become part of tissue structure, like in bone and teeth
- Minerals help maintain acid-base balance, to keep the body pH neutral
- Minerals help regulate body processes, such as in enzyme systems
- Minerals function in nerve impulse transmission and muscle contraction
- Minerals help release energy from food

Macromineral	Function	Sources
Calcium	Needed for bone rigidity, blood clotting, muscle contraction, normal nerve function; Just because an individual eats food containing calcium does not mean that the body absorbs the calcium. Factors that increase calcium absorption include: an overall balanced diet; intake of vitamins C and D; intake of certain amino acids Factors that decrease calcium absorption include: vitamin D deficiency; fat malabsorption; eating large amounts of fiber; lack of exercise; stress; lactose deficiency or lactose intolerance	Milk and dairy products, soft-boned fish, calcium-fortified orange juice, leafy dark green veggies, and broccoli.
Phosphorus	Helps build strong bones and teeth, important in cell membranes, a significant factor in energy production and storage, and in maintaining pH levels in the body	Dairy products, meat, eggs, fish, lentils, almonds
Magnesium	Metabolism of carbohydrates and fats; synthesis of DNA, RNA, enzymes; structure of bone, cell membranes; movement of potassium and calcium	Green leafy veggies, nuts, whole grains, meat, fish, dairy products
Sodium, Chloride, Potassium	These three work together to regulate: the flow of fluids in the body, help regulate nervous system, regulate muscle function (including the heart), regulate nutrient absorption in the cells	Sodium and chloride are found together in table salt, and in foods with added salt (processed meats, butter, etc.). Potassium is found in meat, milk, bananas, leafy green veggies, citrus fruits.

Minerals found in small amounts in the body are called trace elements or microminerals. Trace elements that appear to be needed by the body include: arsenic, boron, chromium, copper, fluoride,

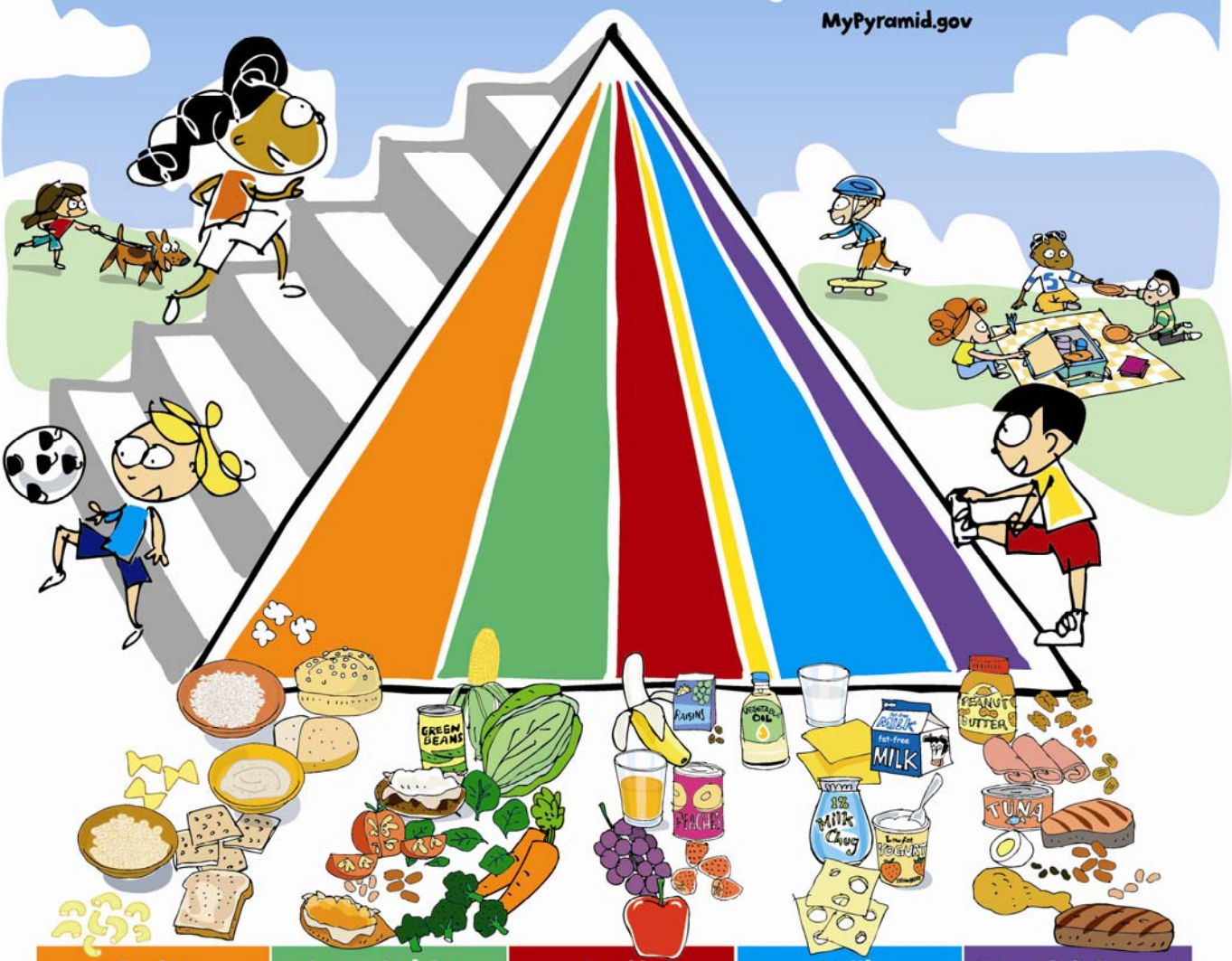
iodine, iron, manganese, molybdenum, nickel, selenium, silicon, vanadium, and zinc. We know they are needed because of the results of animal studies; when the elements are completely removed from the diets of laboratory animals, the animals begin to show ill effects. However, some of these elements are needed in such small amounts that scientists are still trying to determine their exact functions within the body. Please see below for more information about some of the best researched microminerals.

Micromineral	Function	Sources
Chromium	Maintains normal glucose uptake into cells; helps insulin bind to cells	Meat, poultry, fish, some cereals
Copper	Necessary for the formation of hemoglobin and melanin.	Organ meats, seafood, bran products, cocoa products, nuts.
Fluoride	Prevents dental caries (decay); stimulates bone formation	Fluoridated drinking water, dental products; tea, marine fish
Iodine	Required by the thyroid gland for hormone creation	Iodized salt; marine fish, seaweed
Iron	Component of hemoglobin (oxygen-carrying protein in the blood) and cytochrome.	Meat, poultry, eggs (heme sources; more readily absorbed); leafy green veggies, fortified bread and grain products, dried fruit (non-heme).
Manganese	Involved in bone formation, metabolism of carbohydrates, protein	Nuts, legumes, whole grains, tea
Molybdenum	Helps enzymes break down amino acids	Legumes, grain products, nuts
Selenium	Defends against oxidation; regulates thyroid hormones	Seafood, organ meats, grains and plants grown in selenium-rich soil
Zinc	Involved in protein and DNA synthesis; metabolism; part of many enzymes	Fortified cereal, red meat, oysters, herring

MyPyramid For Kids

Eat Right. Exercise. Have Fun.

MyPyramid.gov



Grains
Make half your grains whole

Start smart with breakfast. Look for whole-grain cereals.

Just because bread is brown doesn't mean it's whole-grain. Search the ingredients list to make sure the first word is "whole" (like "whole wheat").

Eat 6 oz. every day; at least half should be whole

Vegetables
Vary your veggies

Color your plate with all kinds of great-tasting veggies.

What's green and orange and tastes good? Veggies! Go dark green with broccoli and spinach, or try orange ones like carrots and sweet potatoes.

Eat 2 ½ cups every day

Fruits
Focus on fruits

Fruits are nature's treats – sweet and delicious.

Go easy on juice and make sure it's 100%.

Eat 1 ½ cups every day

Milk
Get your calcium-rich foods

Move to the milk group to get your calcium. Calcium builds strong bones.

Look at the carton or container to make sure your milk, yogurt, or cheese is lowfat or fat-free.

Get 3 cups every day; for kids ages 2 to 8, it's 2 cups

Meat & Beans
Go lean with protein

Eat lean or lowfat meat, chicken, turkey, and fish. Ask for it baked, broiled, or grilled – not fried.

It's nutty, but true. Nuts, seeds, peas, and beans are all great sources of protein, too.

Eat 5 oz. every day

For an 1,800-calorie diet, you need the amounts below from each food group. To find the amounts that are right for you, go to MyPyramid.gov.

Oils Oils are not a food group, but you need some for good health. Get your oils from fish, nuts, and liquid oils such as corn oil, soybean oil, and canola oil.

Find your balance between food and fun

- Move more. Aim for at least 60 minutes everyday, or most days.
- Walk, dance, bike, rollerblade – it all counts. How great is that!

Fats and sugars – know your limits

- Get your fat facts and sugar smarts from the Nutrition Facts label.
- Limit solid fats as well as foods that contain them.
- Choose food and beverages low in added sugars and other caloric sweeteners.

MyPyramid.gov
STEPS TO A HEALTHIER YOU

U.S. Department of Agriculture
Food and Nutrition Service
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USDA

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Anatomy of MyPyramid

One size doesn't fit all

USDA's new MyPyramid symbolizes a personalized approach to healthy eating and physical activity. The symbol has been designed to be simple. It has been developed to remind consumers to make healthy food choices and to be active every day. The different parts of the symbol are described below.

Activity

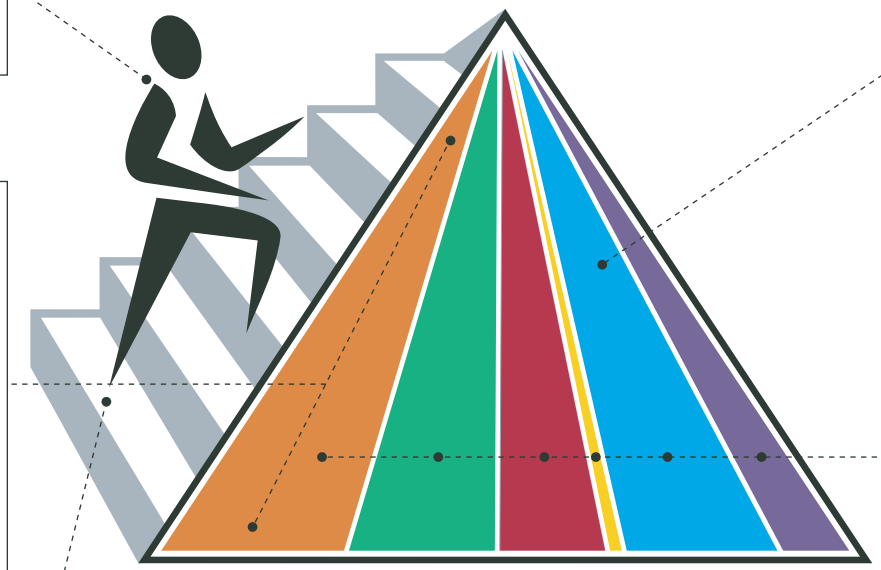
Activity is represented by the steps and the person climbing them, as a reminder of the importance of daily physical activity.

Moderation

Moderation is represented by the narrowing of each food group from bottom to top. The wider base stands for foods with little or no solid fats or added sugars. These should be selected more often. The narrower top area stands for foods containing more added sugars and solid fats. The more active you are, the more of these foods can fit into your diet.

Personalization

Personalization is shown by the person on the steps, the slogan, and the URL. Find the kinds and amounts of food to eat each day at MyPyramid.gov.



Proportionality

Proportionality is shown by the different widths of the food group bands. The widths suggest how much food a person should choose from each group. The widths are just a general guide, not exact proportions. Check the Web site for how much is right for you.

Variety

Variety is symbolized by the 6 color bands representing the 5 food groups of the Pyramid and oils. This illustrates that foods from all groups are needed each day for good health.

Gradual Improvement

Gradual improvement is encouraged by the slogan. It suggests that individuals can benefit from taking small steps to improve their diet and lifestyle each day.

USDA U.S. Department of Agriculture
Center for Nutrition Policy and Promotion
April 2005 CNPP-16

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GRAINS | VEGETABLES | FRUITS | OILS | MILK | MEAT & BEANS

Teaching MyPyramid

MyPyramid is one way for people to understand how to eat healthfully. A rainbow of colored, vertical stripes represents the five food groups plus fats and oils. Here's what the colors stand for:

- orange - grains
- green - vegetables
- red - fruits
- yellow - fats and oils
- blue - milk and dairy products
- purple - meat, beans, fish, and nuts

The U.S. Department of Agriculture (USDA) changed the pyramid in spring 2005 because they wanted to do a better job of telling Americans how to be healthy. The agency later released a special version for kids. Notice the girl climbing the staircase up the side of the pyramid? That's a way of showing kids how important it is to exercise and be active every day. In other words, play a lot! The steps are also a way of saying that you can make changes little by little to be healthier – one step at a time.

The Pyramid Speaks

Let's look at some of the other messages this new symbol is trying to send:

Eat a variety of foods. A balanced diet is one that includes all the food groups. In other words, have foods from every color, every day.

Eat less of some foods and more of others. You can see that the bands for meat and protein (purple) and oils (yellow) are skinnier than the others. That's because you need less of those kinds of foods than you do of fruits, vegetables, grains and dairy foods.

You also can see the bands start out wider and get thinner as they approach the top. That's designed to show you that not all foods are created equal, even within a healthy food group like fruit. For instance, apple pie might be in that thin part of the fruit band because it has a lot of added sugar and fat. A whole apple would be down in the wide part because you can eat more of those within a healthy diet.

Make it your own. Through the USDA's MyPyramid website (www.mypyramid.gov), people can get personalized recommendations about the mix of foods they need to eat and how much they should be eating. There is a kids' version of the website (www.mypyramid.gov/kids) available too.

How Much Do I Need to Eat?

Everyone wants to know how much they should eat to stay healthy. It's a tricky question, though. It depends on your age, whether you're a girl or a boy, and how active you are. Kids who are more active burn more calories, so they need more calories. But we can give you some ideas for how much you need of each food group.

Adapted from: www.kidshealth.org and www.mypyramid.gov/kids

Grains

Bread, cereal, rice, pasta, oatmeal, pancakes and tortillas are some foods in the grain group. Foods in the grains group give our bodies and our brains energy we need to move and think. Grain servings are measured in ounce equivalents. Ounce equivalents are just another way of showing a serving size. Here are ounce equivalents for common grain foods. An ounce equivalent equals:

- 1 piece of bread
- ½ cup of cooked cereal, like oatmeal
- ½ cup of rice or pasta
- 1 cup of cold cereal

This is how many grain ounce equivalents kids need each day:

- 4- to 8-year-olds need 4-5 ounce equivalents each day
- 9- to 13-year-old girls need 5 ounce equivalents each day
- 9- to 13-year-old boys need 6 ounce equivalents each day

And one last thing about grains: try to eat a lot of whole grains, such as 100% wheat bread, brown rice and oatmeal.

Vegetables

Of course, you need your vegetables, especially those dark green and orange ones. Vegetables are all different colors and provide us with lots of vitamins, minerals and fiber. Our bodies use these vitamins, minerals and fiber to keep us healthy and give us energy. They also can help protect us from getting sick. It's important to eat vegetables of all different colors so we can get as much of the good stuff as possible. But how much is enough? Vegetable servings are measured in cups. This is how many vegetables kids need each day:

- 4- to 8-year-olds need 1½ cups of veggies each day
- 9- to 13-year-old girls need 2 cups of veggies each day
- 9- to 13-year-old boys need 2½ cups of veggies each day

Fruits

Sweet, juicy fruit is definitely part of a healthy diet. Just like vegetables, fruits are all different colors and provide us with lots of vitamins, minerals and fiber. Our bodies use these vitamins, minerals and fiber to keep us healthy and give us energy. They also can help protect us from getting sick. It's important to eat fruits of all different colors so we can get as much of the good stuff as possible. But how much is enough? Fruit servings are measured in cups. This is how many fruits kids need each day:

- 4- to 8-year-olds need 1-1½ cups of fruit each day
- 9- to 13-year-old girls need 1½ cups of fruit each day
- 9- to 13-year-old boys need 1½ cups of fruit each day

Milk and Other Calcium-Rich Foods

Milk, smoothies, yogurt, cheese, milkshakes, ice cream and cottage cheese are some of the foods in this group. Dairy products give us calcium and protein and help make our teeth and bones strong. Dairy products are measured in cups. This is how much dairy kids need each day:

- 4- to 8-year-olds need 1-2 cups of milk (or another calcium-rich food) each day
- 9- to 13-year-old girls need 3 cups of milk (or another calcium-rich food) each day
- 9- to 13-year-old boys need 3 cups of milk (or another calcium-rich food) each day

Adapted from: www.kidshealth.org and www.mypyramid.gov/kids

If you want something other than milk, you can substitute yogurt, cheese, or calcium-fortified orange juice - just to name a few.

Meats, Beans, Fish, and Nuts

These foods contain protein, iron and lots of other important nutrients. Meats like beef and pork are in this group. Fish, chicken, eggs, beans, nuts and seeds are also in this group. Dried peas and beans are included in the meat group because they are a source of protein. Like grains, these foods are measured in ounce equivalents. An ounce equivalent of this group would be:

- 1 ounce of meat,poultry, or fish
- ¼ cup cooked dry beans
- 1 egg
- 1 tablespoon of peanut butter
- a small handful of nuts or seeds

This is how many meat ounce equivalents kids need each day:

- 4- to 8-year-olds need 3-4 ounce equivalents each day
- 9- to 13-year-old girls need 5 ounce equivalents each day
- 9- to 13-year-old boys need 5 ounce equivalents each day

Oils

Oils are not a food group, but you need some for good health. It is best to get your oils from fish, nuts and liquid oils such as corn oil, soybean oil and canola oil.

Find Your Balance between Food and Fun

Move more. The person climbing the stairs reminds you to do something active every day. You can run, walk the dog, play, swim, ride your bike, dance, rollerblade or even climb the stairs. It all counts! Kids should aim for at least 60 minutes every day.

Adapted from: www.kidshealth.org and www.mypyramid.gov/kids

Home Sweet Home, Sweet Potato

The sweet potato has great historical significance in the United States and in North Carolina. Below are some of the historical highlights of this veggie that was once a staple in the U.S.

Sweet Potato Historical Facts:

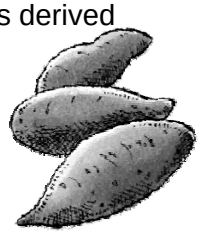
- Native Americans were growing sweet potatoes in Louisiana and the Carolina area of North America before European colonization.
- In colonial times, sweet potatoes were traded and shipped to northern cities.
- During the Revolutionary and Civil Wars, sweet potatoes were a staple food. They even were used to replace coffee during shortages in the South. The potato was cut into pieces, dried, ground and brewed.
- Most large plantations had a sweet potato "lot". These fenced-in lots enclosed several hills of sweet potatoes heaped and covered with straw or soil to protect them from the cold and frost of winter. These were called "tater hills". Today, storage houses protect the potatoes.
- Sweet potato patches were commonly seen on most all farms in North Carolina from colonial times until World War II. Today, sweet potatoes are grown in fields rather than patches.
- Among veggie crops in the U.S., the sweet potato ranked second only to the Irish potato in the early part of this century.
- Why aren't sweet potatoes as popular today? It may be because the sweet potato was associated with hard times. As North Carolinians gained wealth, the sweet potato lost favor.
- The per capita consumption of sweet potatoes in the U.S. was 31 pounds in 1920; in recent years it dipped below 4 pounds per capita.
- Today more than 40 percent of the country's supply of sweet potatoes comes from North Carolina.
- Sweet potatoes are a Thanksgiving favorite. For recipes, go to www.ncsweetpotatoes.com.
- The sweet potato is the official vegetable of North Carolina. In 1993, Representative Gene Arnold visited Mrs. Celia Batchelor's fourth grade civics class at Elvie Street School in Wilson, NC. He inspired her students to become involved in their state government. These fourth grade students, along with their parents and teachers began a letter writing campaign to the State Legislature requesting that the sweet potato be named as the state vegetable. The entire community became involved in the campaign. After two years of letter writing and a lot of hard work, the bill passed in the general Assembly's summer session of 1995. At last, the sweet potato was declared the official vegetable of the State of North Carolina.

Sweet Potato Nutritional Facts:

In the realm of fruits and veggies, the sweet potato is nutrient king. Even in colonial times, some doctors recognized that sweet potatoes had the ability to combat childhood nutritional diseases. Sweet potatoes are an excellent source of Vitamin A. In fact, one sweet potato can provide nearly 150 percent of an adult's daily vitamin A needs! Additionally, sweet potatoes offer about one quarter of an adult's daily vitamin C needs and are a rich source of fiber and minerals, such as potassium. With no fat, but plenty of complex carbohydrates, sweet potatoes are an excellent choice as an accompaniment to almost any meal.

Yam or Sweet Potato?

There is generally a lot of confusion surrounding the difference between yams and sweet potatoes. A true yam is a starchy root native to the Caribbean. "Yams" sold in the U.S. are actually a variety of sweet potato that tends to be vivid orange with a soft, moist consistency and very sweet taste when cooked. Several decades ago, use of the word "yam" for orange-fleshed sweet potatoes was derived from the African word for the true yam ("nyami") to disguish it from white-fleshed varieties.



Sources:

1. North Carolina Sweet Potato Commission at www.ncsweetpotatoes.com
2. USDA at www.usda.gov

Nebraska Fresh Fruit and Vegetable Program
Adapted from North Carolina Nutrition Services

Is It a Fruit or a Veggie?

What do you think of when you hear the words tomato or squash? Veggies, right? Surprisingly, they may or may not be depending upon who you ask. Below you will find in-depth information to help you identify fruits and veggies with confidence.

Dictionary Definitions

fruit: the fleshy product of a tree or other plant that contains a seed or seeds and can be eaten as food; the seed-bearing structure of a plant

vegetable: a plant or part of a plant used as food

The Culinary Perspective

Given the definitions above, why do we think of some seed-bearing structures of plants, such as tomatoes and squash, as veggies? This can be explained by how we typically use a fruit or veggie in cooking. For example, tomatoes and squash tend to be more savory than sweet, making them similar in this respect to true veggies. Conversely, the vegetable rhubarb is often considered a fruit from the culinary perspective because it is used in pies and other sweet desserts.

The Botanical Perspective

From the botanical perspective, whether a food is a fruit or a veggie is more clear-cut. Fruits develop from the ovary found in the base of a flower. And, as described above, they are the fleshy material that covers a seed or seeds. Veggies, on the other hand, are essentially all the other parts of an edible plant, including the stems, leaves and roots. Think cabbage leaves, celery stalks and potato tubers. Knowing these botanical facts, true fruits include several foods we think of as veggies, such as tomatoes, cucumbers, beans (green beans), peas, green peppers, corn, eggplant and squash.

. Fruit and Veggie Twists

- The California legislature once passed a law declaring tomatoes a vegetable in order to impose a tariff on Mexican imports.
- Some cultivated forms of fruits may be seedless, like grapes and watermelons, for example.
- Some plants have a soft part which supports the seeds, though the “fruit” is not developed from the ovary. Strawberries are an example.
- Many “nuts” are actually fruits. Examples include almonds, coconuts, cashews and pistachios.

Sources:
1. Department of Horticulture Website at Cornell University at http://www.hort.cornell.edu/extension/question.html#1
2. Oxford Dictionaries at www.askoxford.com

Digging Up Fruits and Veggies

Most of us purchase fruits and veggies at the grocery store, but there are several alternative ways to obtain them. Whether it's from a personal garden or from a local farm, fruits and veggies acquired outside of grocery stores are sure to be in season. This means fresher and tastier produce! What's more, buying local produce benefits our communities by supporting a sustainable local economy for future generations. Read below to discover how to skip the grocery store and go just next door!

Farmers' markets

Selling fruits and veggies through farmers' markets is one of the oldest means of getting produce from the fields directly to the people. Typically, markets are set up at a park or parking lot where farmers, family members and hired helpers can sell farm fresh products.

Farm Stands

A farm stand is a place where one farm sells its produce. It may take the form of a roadside stand or even the back of a truck parked on the side of a central road within a community.

U-Picks

A U-Pick is a farm that opens it fields to the public during harvest time. Common crops offered at U-Picks are strawberries, apples and pumpkins.

Food Cooperatives (Co-ops)

Food co-ops offer local produce and the convenience of a regular grocery store. They are employee- or customer-owned entities that focus on high-quality, best-value products. Food coops may resemble retail stores or buying clubs. They are known for their commitment to consumer education and member control.

Community Supported Agriculture (CSA)

CSAs enable farmers to sell produce directly to people in their communities via weekly allotments of goods available usually from late spring through early fall. A relationship with a farm is begun after a community of supporters makes a financial commitment to that farm. This commitment secures CSA "membership". Some CSAs require members to work a small number of hours on the farm during the growing season, while others offer "working shares" whereby members can receive a discount on membership for working on the farm. CSAs are an innovative way to create an economically stable farm operation in which members are provided high-quality and, often, low-cost produce. Before joining a CSA, it is important to consider the abundance of produce that may be provided each week during the harvest time. Learning different cooking, storing and preserving techniques can be helpful to members.

Go to LocalHarvest.com to find farmers markets', farms, coops and CSAs in your area.

Sources:

1. LocalHarvest at www.localharvest.org
2. Project Green Leaf at http://greenleaf.uncg.edu/community_supported_agriculture.html#CSA_info_for_Consumers

Nebraska Fresh Fruit and Vegetable Program
Adapted from North Carolina Nutrition Services