

# Texas 4-H Food Show Resources

*Participants are encouraged to use the following resources as a foundation to learning nutrition, food safety, and food preparation knowledge. Participants should not solely rely on these resources but seek other credible resources to expand their knowledge and expertise.*

## NUTRITION RESOURCES

MyPlate

<http://www.choosemyplate.gov/>

Food Safety

<https://texas4-h.tamu.edu/projects/food-nutrition/>

Dietary Guidelines for Americans

<http://health.gov/DietaryGuidelines/>

Preparation Principles & Function of Ingredients

<https://texas4-h.tamu.edu/wp-content/uploads/Preparation-Principles-and-Function-of-Ingredients.pdf>

Know Your Nutrients

[https://texas4-h.tamu.edu/wp-content/uploads/Know-Your-Nutrients\\_FINAL.pdf](https://texas4-h.tamu.edu/wp-content/uploads/Know-Your-Nutrients_FINAL.pdf)

Nutrient Needs at a Glance

[http://fcs.tamu.edu/food\\_and\\_nutrition/pdf/nutrient-needs-at-a-glance-E-589.pdf](http://fcs.tamu.edu/food_and_nutrition/pdf/nutrient-needs-at-a-glance-E-589.pdf)

## THEME RESOURCES

10 Tips: Save More at the Grocery Store

<https://www.choosemyplate.gov/ten-tips-save-more-at-the-grocery-store>

20 Money Saving Grocery Shopping Tips

<https://www.eatright.org/food/planning-and-prep/eat-right-on-a-budget/20-money-saving-grocery-shopping-tips>

10 Tips for Healthy Grocery Shopping

<https://www.webmd.com/food-recipes/features/10-tips-for-healthy-grocery-shopping#1>

Eating Better on a Budget

<https://choosemyplate-prod.azureedge.net/sites/default/files/tentips/DGTipsheet16EatingBetterOnABudget.pdf>

Smart Shopping for Veggies and Fruits

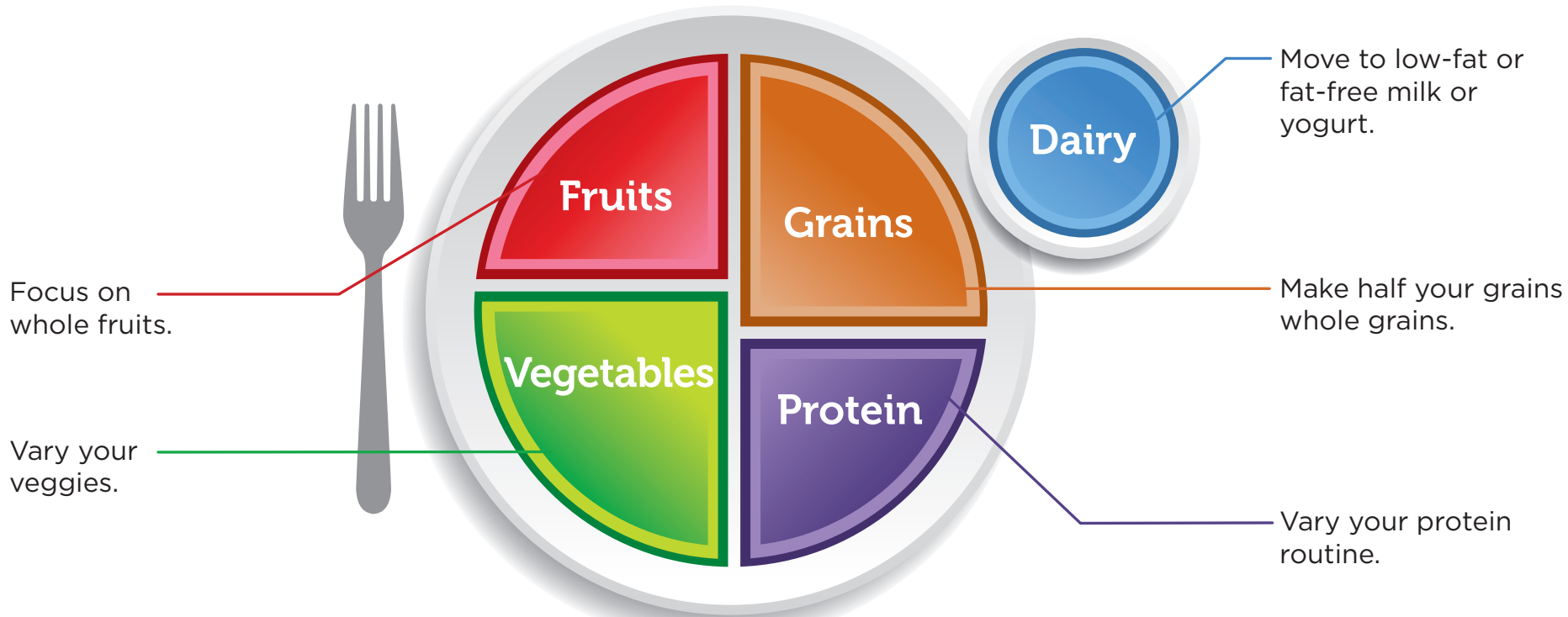
<https://choosemyplate-prod.azureedge.net/sites/default/files/tentips/DGTipsheet9SmartShopping.pdf>

Stretch Your Food Dollars At the Grocery Store

<https://hgic.clemson.edu/factsheet/stretch-your-food-dollars-part-2-at-the-grocery-store/>

# MyPlate, MyWins: Make it yours

Find your healthy eating style. Everything you eat and drink over time matters and can help you be healthier now and in the future.



Choose **MyPlate.gov**



**Limit**

**Limit the extras.**

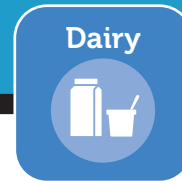
Drink and eat beverages and food with less sodium, saturated fat, and added sugars.



**MyWins**

**Create 'MyWins' that fit your healthy eating style.**

Start with small changes that you can enjoy, like having an extra piece of fruit today.



Focus on whole fruits and select 100% fruit juice when choosing juices.

Buy fruits that are dried, frozen, canned, or fresh, so that you can always have a supply on hand.

Eat a variety of vegetables and add them to mixed dishes like casseroles, sandwiches, and wraps.

Fresh, frozen, and canned count, too. Look for “reduced sodium” or “no-salt-added” on the label.

Choose whole-grain versions of common foods such as bread, pasta, and tortillas.

Not sure if it’s whole grain? Check the ingredients list for the words “whole” or “whole grain.”

Choose low-fat (1%) or fat-free (skim) dairy. Get the same amount of calcium and other nutrients as whole milk, but with less saturated fat and calories.

Lactose intolerant? Try lactose-free milk or a fortified soy beverage.

Eat a variety of protein foods such as beans, soy, seafood, lean meats, poultry, and unsalted nuts and seeds.

Select seafood twice a week. Choose lean cuts of meat and ground beef that is at least 93% lean.

### Daily Food Group Targets — Based on a 2,000 Calorie Plan

Visit [SuperTracker.usda.gov](http://SuperTracker.usda.gov) for a personalized plan.

#### 2 cups

1 cup counts as:

- 1 large banana
- 1 cup mandarin oranges
- ½ cup raisins
- 1 cup 100% grapefruit juice

#### 2½ cups

1 cup counts as:

- 2 cups raw spinach
- 1 large bell pepper
- 1 cup baby carrots
- 1 cup green peas
- 1 cup mushrooms

#### 6 ounces

1 ounce counts as:

- 1 slice of bread
- ½ cup cooked oatmeal
- 1 small tortilla
- ½ cup cooked brown rice
- ½ cup cooked grits

#### 3 cups

1 cup counts as:

- 1 cup milk
- 1 cup yogurt
- 2 ounces processed cheese

#### 5½ ounces

1 ounce counts as:

- 1 ounce tuna fish
- ¼ cup cooked beans
- 1 Tbsp peanut butter
- 1 egg

#### Water



#### Drink water instead of sugary drinks.

Regular soda, energy or sports drinks, and other sweet drinks usually contain a lot of added sugar, which provides more calories than needed.

#### Activity

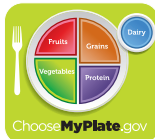


#### Don't forget physical activity!

Being active can help you prevent disease and manage your weight.

Kids ≥ 60 min/day

Adults ≥ 150 min/week



## MyPlate, MyWins

Healthy Eating Solutions for Everyday Life

Choose [MyPlate.gov/MyWins](http://MyPlate.gov/MyWins)

Center for Nutrition Policy and Promotion

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# Food Safety

## FACT SHEET



### BASIC GUIDELINES

No running around the preparation area

Keep trash off the floor and counters

Sanitize all work surfaces prior to starting food preparation

Start with clean utensils, totes, and equipment/supplies

Place eggs in a small bowl to prevent them from rolling onto the floor before you can use them

Before preheating an oven, move oven racks to the needed positions

Keep raw foods separate from ready to eat foods

Be sure an appliance is in the "off" position before plugging it in,

Keep portable appliances unplugged when not in use

Avoid using any appliance with a frayed or worn cord

Use a barrier when handling foods if possible. (Gloves, spoons, spatulas, tongs, deli tissue, wax paper etc.)

Gloves may only be used for one task and must be changed if damaged or anytime they become contaminated, this includes if a participant touches a part of their exposed skin, or if they perform a task such as touching trash

Hold by the edges to put on hands, do not blow into them or roll them up your hands

Have gloves that fit, and are not too big

Wipe up all spills immediately with paper towel, cloth or mop

Keep cupboard doors and drawers closed unless in use

Turn handles of sauce pans away from the walk area when being used

Clean and sanitize utensils between uses

Dry hands well before using electric cords or appliances

Use only dry hot pads or oven mitts, damp ones conduct heat

Always open oven, stove or microwave door/lid a crack to vent some steam before looking and tilt lid away from you so steam is released away from your face

Use a thermometer to determine doneness of foods, clean and sanitize after each use

Have a plan for where you'll go with a pan when you take it out of the oven or off the stovetop,

Have cooling racks and counter savers in place

Always turn the burners/skillet off when finished

Disconnect appliances by pulling out the plug, not by tugging on the cord

Unplug small appliances before cleaning

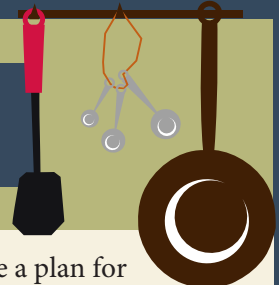
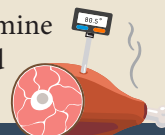
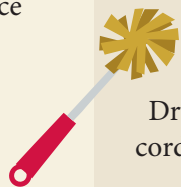
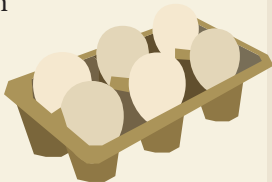
Always use a cutting board to protect yourself and the counter

Do not hold the food in your hand to cut it, even if it is only an apple


Wash knives and sharp objects separately

Never place knives in sink filled with soapy dish water

Store knives in a special compartment or holder



# PERSONAL HYGIENE



Have hair restraint cap, chef's hat, bandana, visor, or hair net etc. (keeps hair from contacting exposed food)

No jewelry or big ear rings (risk of contamination)

Do not wear clothing that is loose or drapes below your wrists

No chewing gum or eating while prepping or presenting

Open cuts/sores MUST be completely covered with waterproof bandage AND covered with a glove if on the hand

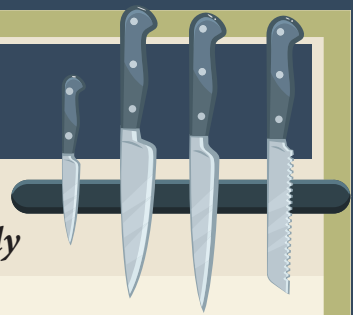


Do not compete if you have persistent discharge from eyes, nose and mouth or are exhibiting symptoms of a foodborne illness (ie. vomiting and/or diarrhea)

Use clean aprons/clothing and closed toed shoes

# KNIFE SAFETY

Select the correct knife for the job and cut into the cutting board away from your body



## CHEF'S KNIFE

A chef's knife is usually the largest knife in the kitchen, with a wide blade that is 8" to 10" long. Choose a knife that feels good and balanced in your hand. The knife should have a full tang. This means that the blade should go all the way through the handle for the best wear and stability.

## PARING KNIFE

Paring knives are generally 2-1/2-4" in length. The most often used knife in the kitchen. It is ideal for peeling and coring fruits and vegetables, cutting small objects, slicing, and other hand tasks.

## UTILITY KNIFE

Utility knives are longer than paring knives but smaller than chef's knives, usually around 5-8" long. They are also called sandwich knives because they are just the right size for slicing meats and cheeses.

## BONING KNIFE

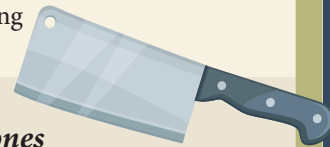
This knife has a more flexible blade to curve around meat and bone. Generally 4-5" long.

## BREAD KNIFE

Bread knives are usually serrated. Most experts recommend a serrated knife that has pointed serrations instead of wavy serrations for better control and longer knife life. You must use a sawing motion when using a serrated knife.

## CAN OPENER


Used to open sealed metal cans. Hold the handle of the can opener, not the sharp edge. After the lid has been cut off the can, pick it up carefully and discard. Look for pieces of the label or metal shavings from the can in the food after opening (physical contamination)



**Keep Knives sharp!**  
*Sharp knives are safer than dull ones*

# PREVENTATIVE MEASURES


## PREVENTING FIRE



Keep a fire extinguisher in the kitchen & know how to use it

Avoid leaving the kitchen if you have food cooking or baking, if you must leave, carry a timer with you to remind you to return on time

Always turn the oven or stove top to off when finished



Smother a grease fire with a tight-fitting lid, never use water it will spread

Clothing on fire: remember stop, drop, roll to smother it



## ELECTRIC SHOCK

Avoid using any appliance with a frayed or worn cord

Keep portable appliances unplugged when not in use

Be sure an appliance is in the "off" position before plugging it in

Never insert metal utensils in electrical appliances that are plugged in





# How to Build a Healthy Eating Pattern

**There are many different ways to eat healthy. You can eat healthy in a way that works for you and your family. Healthy eating can fit all tastes and traditions — and can be affordable, too.**

The key is to build a healthy eating pattern, which means choosing a variety of nutritious foods in the right amounts for you — and making these choices part of your everyday routine.

Follow these tips — based on the *2015–2020 Dietary Guidelines for Americans* — for making choices that can help you reach or keep a healthy body weight, get the nutrients you need, and lower your risk of health problems like heart disease, type 2 diabetes, and some types of cancers.

## Get a variety of nutritious foods and beverages.

Eating a variety of foods and beverages is important. It helps you get the range of nutrients you need to be healthy.

- **Eat a mix of foods across all food groups.**

Choose foods and beverages from all food groups — vegetables, fruits, grains, dairy, and proteins — not just 1 or 2 of them.



Vegetables



Fat-free and low-fat dairy, including milk, yogurt, cheese, and fortified soy beverages



Fruits, especially whole fruits



Protein foods, like seafood, lean meats and poultry, eggs, legumes (beans and peas), nuts, seeds, and soy products



Grains, especially whole grains

- **Eat a mix of foods within each food group.**

For example, each week try eating several types of vegetables, including dark green, red and orange, starchy ones, legumes, and others. Switch up the protein foods you eat, too — for example, consider fish, black beans, and peanut butter, not just lean meats and poultry.

## Try to eat and drink the right amounts for you.

How many calories you need to eat depends on your age, sex, height, weight, and how active you are. Use the MyPlate Daily Checklist at [www.choosemyplate.gov/calculator](http://www.choosemyplate.gov/calculator) to find a plan that is right for you.

## Limit foods and beverages higher in saturated fats, added sugars, and sodium.

Aim to get:

- **Less than 10% of calories each day from saturated fats**

Foods higher in saturated fats include butter, cheese, whole milk, meats higher in fat (like beef ribs, sausage, and some processed meats), poultry skin, and tropical oils like coconut and palm oil. Instead, go for foods with unsaturated fats — like seafood, avocados, most nuts, and canola or olive oil.

- **Less than 10% of calories each day from added sugars**

Added sugars are syrups or other sweeteners with calories that are added to foods and drinks when they're being made or prepared. Stick mostly to foods and drinks with naturally occurring sugars — like ones in unflavored milk and fruits — or no sugar at all. Choose water instead of sugary drinks and limit sweet treats like cake, cookies, brownies, and candy.

- **Less than 2,300 milligrams of sodium each day for adults and children ages 14 and up (less for younger children)**

Sodium comes from table salt — but most of the sodium we eat comes from foods that are packaged or served in restaurants. When buying foods in the store, check the Nutrition Facts label and choose the option with the lowest amount of sodium. To cut down on sodium, cook more at home or ask not to have salt added to your meal when eating out.

### Small changes = big benefits

Small *shifts* in your daily eating habits can improve your health over the long run. For example, try swapping out white bread for whole-wheat bread and reach for a handful of nuts instead of potato chips.



## Stick with it.

A lifetime of healthy eating can help prevent health problems like obesity, heart disease, type 2 diabetes, and some types of cancer. Think of every day and meal as an opportunity to make a healthy choice.

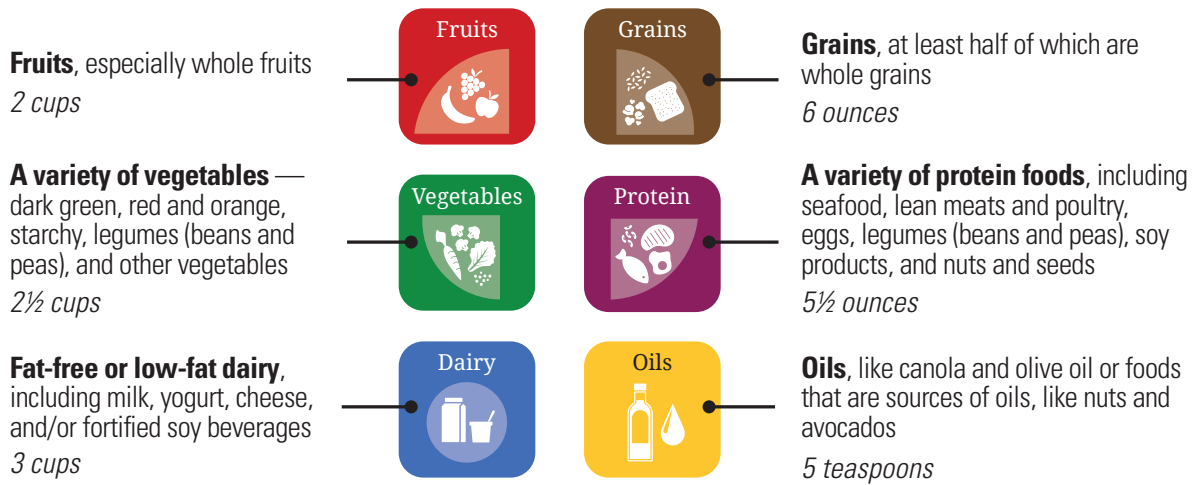
Want to learn more about how to find a healthy eating pattern that works for you?

Check out [DietaryGuidelines.gov](http://DietaryGuidelines.gov) for more information on the *Dietary Guidelines* and find recipes for healthy meals at [www.whatscooking.fns.usda.gov/](http://www.whatscooking.fns.usda.gov/).

# What's in a Healthy Eating Pattern?

The 2015–2020 Dietary Guidelines has recommendations for a healthy eating pattern.

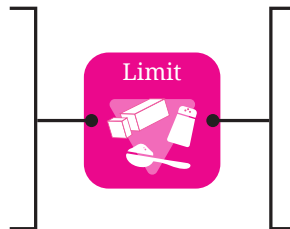
For someone who needs 2,000 calories a day, a healthy eating pattern includes:



And it has limits on:

**Saturated and trans fats** — limit saturated fats to less than 10% of daily calories and keep *trans* fat intake as low as possible

**Added sugars** — limit to less than 10% of daily calories



**Sodium** — limit to less than 2,300 mg a day for adults and children 14 years and up (less for younger children)

A variety of meals and snacks can fit within healthy eating patterns. Many meals have several food groups within one dish. Check out these examples.

## Taco salad



- ½ cup avocado   2 ounces tortilla chips
- 1 tsp lime juice
- 1 cup chopped lettuce   2 ounces cooked ground turkey
- 2 Tbsp salsa
- ½ ounce low-fat cheddar cheese   2 tsp corn oil for cooking turkey

## Tofu-vegetable stir-fry



- ¼ cup pineapple   1 cup cooked brown rice (2 ounces dry)
- ½ cup chopped Chinese cabbage   4 ounces firm tofu
- ¼ cup sliced bamboo shoots
- ¼ cup chopped sweet red and green peppers
- 1 cup fortified soy beverage   1 Tbsp canola oil for cooking stir-fry

## Tuna salad sandwich



- 1 medium peach   2 slices whole-wheat bread
- 1 Tbsp chopped celery   2 ounces canned tuna
- ½ cup shredded lettuce
- 1 cup fat-free milk   1 Tbsp mayonnaise





# Preparation Principles

Listed below for your information are some basic preparation principles. Items listed are certainly not all inclusive but touch on some of the common principles.

## Meats

- Overcooking results in dry meat and loss of flavor.
- Select proper cooking method - less tender cuts use moist heat method; tender cuts use dry heat method.
- Grinding cuts the meat fibers and tenderizes the meat.
- For dishes that include ground meat ( casseroles, etc.), brown meat lightly and spoon off excess fat to reduce excess calories.

## Milk

- Use low to medium temperatures and avoid prolonged heating.
- High temperature causes protein to coagulate with a film covering the top of the milk and A coating on sides of the pan.
- Prolonged high heat causes off flavors and sometimes scorching.
- Milk mixtures thickened with flour or cornstarch need constant stirring during cooking to prevent lumping.

## Cheese

- Heat briefly at low to moderate temperature. High temperatures and long cooking makes cheese tough and stringy and causes fat to separate.
- Blends more readily with other ingredients and melts more quickly if it is shredded or diced first.

## Egg Cookery

- Cooking time and temperature important in egg cookery as over cooking shrinks the protein and makes egg white tough and yellow mealy.
- Cool hard cooked eggs in cold water for 15 minutes to prevent yolk. Turning green.
- Use care when adding raw egg before putting egg into container of hot food.

## Breads

- Quick breads - Correct oven temperature important - not hot enough causes muffins to have flat top; too hot causes muffins to be lopsided.
- Important to avoid over - mixing - mixing too long develops the gluten in the flour resulting in quick bread being tough. Over - mixing also causes texture to have large air holes and irregular shape.
- Yeast Breads -Yeast needs to be exposed to lukewarm temperatures only as high temperatures will kill action of yeast.
- The purpose of kneading the dough is to develop the gluten which is desirable with breads.

## Fresh Fruit

- Some fruits - apples, peaches, pears, banana - turn brown if allowed to stand after being cut or peeled. To minimize discoloration, dip these fruits into citrus juice or use ascorbic acid or a commercial product to limit discoloration.
- Sugar - fruits placed in sugar syrup will not turn brown as air cannot reach fruit. Sugar syrup helps fruit hold shape. Too much sugar causes fruit to shrink as sugar draws moisture out of fruit.
- To maintain shape, cook fruits slowly.
- Rapid cooking causes fruit to lose its natural shape.

## Vegetables

- Take care to prevent loss of nutrients, especially Vitamin C.
  - 1) Use small amount of cooking water or liquid.
  - 2) Do not overcook.
  - 3) Cover most vegetables while cooking - so can use small amount of liquid and still cook quickly. Green vegetables such as broccoli, Brussel sprouts, cabbage should be cooked a few minutes uncovered to allow acids in vegetable to vaporize into air. If lid is used, the acid drips off the lid and turns the vegetables a dull olive green. Baking, steaming, cooking in the skins - good method to preserve nutrients.

**Function of Ingredient**

<b>Ingredient</b>	<b>In Baking</b>	<b>In Frying</b>	<b>How to Measure</b>
<b><u>Eggs</u></b>	add flavor; yolk helps emulsifying oil and liquid elements of batter; provide moisture and help bind other ingredients together; aid in browning; serve as thickening agent; serve as leavening agent.	Help coating to adhere to surface of food for proper frying.	Unless another size is designated in the recipe, use large eggs for cooking.
<b><u>Fats and Oils</u></b> butter margarine shortening vegetable oil olive oil	tenderize; add moisture; maintain freshness and extend keeping quality; shortening is a carrier of emulsifiers which help the oil and water in a batter to combine to make a smooth, creamy solution; help produce a tender and/or flaky product; add flavor. Fat is added to a recipe for richness, flavor, and tenderness to baked products. Fats come in two forms solid and liquid. Oils are Liquid Fats and shortening, lard and butter are Solid Fats. Solid and liquid fats cannot be substituted for each other.	prevent foods from sticking; help transfer heat; add flavor; moisture and a degree of brownness.	<u>Solid fats</u> - use nested cups - scoop fat from container with rubber scraper; press into cup firmly; level off with spatula; or, pour cold water into a cup up to the measure which will equal one cup when the desired amount of shortening is added. Drain off the water. <u>Liquid</u> - pour into proper measuring spoon.
<b><u>Flour</u></b> regular or all - purpose enriched flour cake flour self-rising pre-sifted whole grain	provides framework or structure; starch in flour absorbs and holds liquid; serves as a thickening agent; adds flavor	helps thicken products because starch particles absorb and hold liquid and then swell; used to coat food before frying; aids in developing a crust.	If instructed, sift by passing flour through a sieve or fine mesh to add air which was forced out as flour settled or packed during storage,; sifting insures accurate measurements; next scoop gently into nested cup of designated size; level off top with spatula.
<b><u>Leavening Agents</u></b> baking powder baking soda eggs	react with moisture or with sweetening agents to produce carbon dioxide which causes small bubbles to form within the product and make it rise or increase in volume. Air beaten into eggs acts as leavening agent. provide air, steam or gas to help baked products rise. This makes the baked product less compact and gives it a softer texture.	Same function as in baking for specialty fried items such as doughnuts.	Scoop with correct size measuring spoon; level off top with spatula.
<b><u>Liquids</u></b> water milk - whole evaporated, skim, dried, condensed juices - fruit, vegetable	add moisture; helps ingredients to react with each other; bind ingredients together.	Used to coat foods for frying	pour into a graduated measuring cup; read at eye level; scrape cup with a rubber spatula after pouring.
<b><u>Sweetening</u></b> granulated sugar, white brown sugar, light or dark confectioners or powdered sugar corn syrup honey molasses	adds flavor; provides tenderness, crispness and brownness as it melts during cooking due to caramelizing.	None	<u>granulated sugar</u> - spoon into nested measuring cup; level off with spatula. <u>brown sugar</u> - pack firmly in a nested measuring cup; level with a spatula. <u>confectioners or powdered sugar</u> - sift, then spoon into nested measuring cup; level off with a spatula. <u>syrups</u> - (liquids) - pour into a graduated measuring cup.

**Know  
Your  
Nutrients**

Julie Gardner, MEd.  
Extension Program Specialist  
Healthy Lifestyles  
4-H Youth Development  
Texas A&M AgriLife Extension  
.....  
Reviewed By:  
Danielle Krueger, MPH, RD, LD

**Minerals**

- Calcium
- Chromium
- Copper
- Flouride
- Iodine
- Iron
- Magnesium
- Phosphorus
- Selenium
- Zinc

**Electrolytes**

- Sodium
- Chloride
- Potassium
- Water

**Macro  
Nutrients**

- Protein
- Fat
- Carbohydrates
- Fiber

**Fat Soluble  
Vitamins**

- Vitamin A
- Vitamin D
- Vitamin E
- Vitamin K

**Water Soluble  
Vitamins**

- Vitamin C
- Vitamin B1 (Thiamin)
- Vitamin B2 (Riboflavin)
- Vitamin B6 Niacin
- Vitamin B12 Folate



# MACRO NUTRIENTS

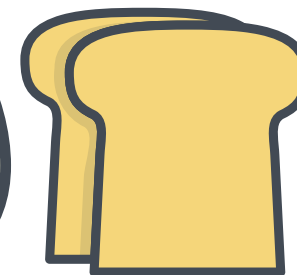
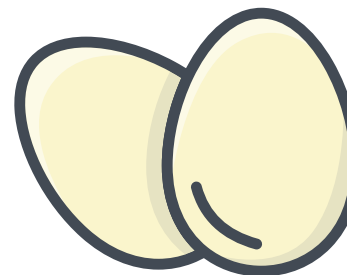
PROTEIN  
FAT  
CARBOHYDRATE  
FIBER



## LET'S TAKE A CLOSER LOOK...

PROTEIN		FIBER	
<p><b><u>AMINO ACIDS</u></b></p> <p>Protein is found in plant and animal foods. Protein is made up of units called amino acids, which are linked to one another in long chains. The sequence of amino acids determines each protein's unique structure and function. There are 20 different amino acids in two categories:</p>		<p><b><u>DIETARY FIBER</u></b></p> <p>Dietary fiber, or fiber, is a type of carbohydrate found in plant foods. Dietary fiber is bound together in such a way that it cannot be readily digested in the small intestine.</p> <p>There are two classifications of dietary fiber:</p>	
<p><b><u>ESSENTIAL AMINO ACIDS</u></b></p> <p>are required for normal body functioning, but cannot be made by the body. They must be obtained from food. Nine are considered essential.</p>	<p><b><u>NONESSENTIAL AMINO ACIDS</u></b></p> <p>can be made by the body from essential amino acids consumed in food or in the normal breakdown of body proteins. Eleven are considered nonessential.</p>	<p><b><u>SOLUBLE FIBER</u></b></p> <p>dissolves in water to form a thick gel-like substance in the stomach. It is broken down by bacteria in the large intestine and provides some calories.</p>	<p><b><u>INSOLUBLE FIBER</u></b></p> <p>does not dissolve in water and passes through the gastrointestinal tract relatively intact and, therefore, is not a source of calories.</p>

### FOOD SOURCES



<b>MACRO NUTRIENTS</b>	<b>FUNCTION:</b> <i>What does it do?</i>	<b>SOURCES:</b> <i>Where is it found?</i>	<b>DEFICIENCY:</b> <i>What happens if I don't get enough?</i>
<b>Protein</b>	<ul style="list-style-type: none"> <li>• Builds and repairs all body tissue</li> <li>• Helps build blood</li> <li>• Helps form antibodies to fight infection</li> <li>• Supplies energy at 4 calories per gram</li> </ul>	<ul style="list-style-type: none"> <li>• Animal Protein: meat, fish, poultry, eggs, milk, cheese, yogurt</li> <li>• Nuts and nut butters</li> <li>• Soy</li> <li>• Vegetable Protein: legumes (peas, beans), whole grain breads and cereals</li> </ul>	<ul style="list-style-type: none"> <li>• Fatigue</li> <li>• Loss of appetite</li> <li>• Edema</li> <li>• Poor growth</li> </ul>
<b>Fat</b>	<ul style="list-style-type: none"> <li>• Transports fat-soluble vitamins (A,D,E,K) and essential fatty acids needed for body's proper use and storage of fat</li> <li>• Supplies energy at 9 calories per gram</li> </ul>	<ul style="list-style-type: none"> <li>• Butter or Margarine</li> <li>• Egg yolk</li> <li>• Meat with fat</li> <li>• Shortening or oil</li> <li>• Palm and coconut oil</li> <li>• Salad dressing</li> <li>• Whole milk dairy products</li> </ul>	<ul style="list-style-type: none"> <li>• Eczema</li> <li>• Stunted growth</li> <li>• Diarrhea</li> <li>• Loss of hair</li> </ul>
<b>Carbohydrate</b>	<ul style="list-style-type: none"> <li>• Supply glucose to spare protein</li> <li>• Help the body use other nutrients</li> <li>• Good source of energy</li> <li>• Supplies energy at 4 calories per gram to all body cells</li> </ul>	<ul style="list-style-type: none"> <li>• Bananas</li> <li>• Breads and cereals</li> <li>• Corn</li> <li>• Dried fruits</li> <li>• Flours and cornmeal</li> <li>• Honey</li> <li>• Pasta</li> <li>• Potatoes and sweet potatoes</li> <li>• Sugar, syrup, jam, and jellies</li> <li>• Rice</li> </ul>	<ul style="list-style-type: none"> <li>• Loss of energy</li> <li>• Fatigue</li> <li>• Ketosis</li> </ul>
<b>Fiber</b>	<ul style="list-style-type: none"> <li>• May help lower cholesterol</li> <li>• Improves bowel motility (moves food through digestive tract)</li> <li>• Gives feeling of fullness without extra calories, promoting satiety and weight loss</li> </ul>	<ul style="list-style-type: none"> <li>• Beans</li> <li>• Broccoli</li> <li>• Carrots</li> <li>• Enriched grain products such as: cereals, bread, noodles, tortillas, brown rice, oatmeal</li> <li>• Peas</li> <li>• Spinach</li> <li>• Whole grains</li> </ul>	<ul style="list-style-type: none"> <li>• Diarrhea</li> </ul>

# WATER SOLUBLE VITAMINS

VITAMIN C

VITAMIN B1

(THIAMIN)

VITAMIN B2

(RIBOFLAVIN)

NIACIN

VITAMIN B6

VITAMIN B12

FOLATE



## LET'S TAKE A CLOSER LOOK...

### *Vitamins*

Vitamins are essential substances that the human body needs for proper growth, development, and function. Vitamins are organic substances which are made by plants and animals and then eaten by humans..

There are 13 known vitamins:

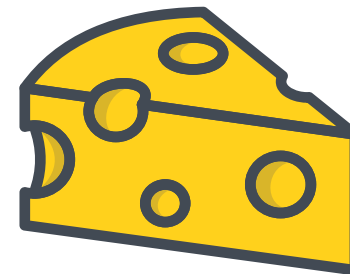
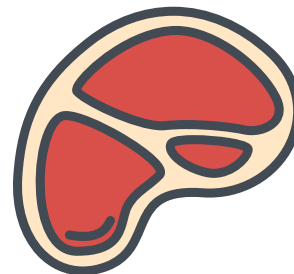
A,C,D,E,K, and the B vitamins (thiamin (B1), riboflavin (B2), niacin (B3), pantothenic acid (B5), pyridoxal (B6), cobalamin (B12), biotin, and folate/folic acid.

Vitamins are classified as water soluble and fat-soluble.

### *Water Soluble Vitamins*

Water Soluble vitamins require water for absorption into the body.  
The body flushes out excess water soluble vitamins in the urine.

### FOOD SOURCES



<b>WATER SOLUBLE VITAMINS</b>	<b>FUNCTION:</b> <i>What does it do?</i>	<b>SOURCES:</b> <i>Where is it found?</i>	<b>DEFICIENCY:</b> <i>What happens if I don't get enough?</i>
<b>Vitamin C</b>	<ul style="list-style-type: none"> <li>• Antioxidant</li> <li>• Collagen and connective tissue formation</li> <li>• Immune function</li> <li>• Wound healing</li> <li>• Promotes iron absorption</li> </ul>	<ul style="list-style-type: none"> <li>• Broccoli and brussels sprouts</li> <li>• Citrus fruits and juices</li> <li>• Green leafy vegetables</li> <li>• Green or red peppers</li> <li>• Kiwifruit or strawberries</li> <li>• Tomatoes</li> </ul>	<ul style="list-style-type: none"> <li>• Sore or bleeding gums</li> <li>• Poor wound healing</li> <li>• Pain in joints, bones, &amp; muscles</li> <li>• Bruising easily</li> <li>• Hair and tooth loss</li> </ul>
<b>Vitamin B1 (Thiamin)</b>	<ul style="list-style-type: none"> <li>• Helps produce energy from carbohydrates in all cells</li> <li>• Nervous system function</li> </ul>	<ul style="list-style-type: none"> <li>• Beans, Peas and Lentils</li> <li>• Nuts and seeds</li> <li>• Pork</li> <li>• Whole and enriched grain products</li> </ul>	<ul style="list-style-type: none"> <li>• Poor appetite</li> <li>• Constipation</li> <li>• Depression</li> <li>• Cardiac failure</li> </ul>
<b>Vitamin B2 (Riboflavin)</b>	<ul style="list-style-type: none"> <li>• Helps produce energy from carbohydrates in all cells</li> <li>• Growth and development</li> <li>• Red blood cell formation</li> </ul>	<ul style="list-style-type: none"> <li>• Eggs</li> <li>• Enriched grain products</li> <li>• Meats, poultry, and seafood</li> <li>• Milk and Yogurt</li> <li>• Mushrooms</li> </ul>	<ul style="list-style-type: none"> <li>• Sore tongue and mouth, swelling also</li> <li>• Burning and itching eyes</li> </ul>
<b>Niacin</b>	<ul style="list-style-type: none"> <li>• Cholesterol production</li> <li>• Helps produce energy from carbohydrates in all cells</li> <li>• Digestion</li> <li>• Nervous system function</li> <li>• Promotes normal appetite</li> </ul>	<ul style="list-style-type: none"> <li>• Beans</li> <li>• Beef</li> <li>• Nuts</li> <li>• Pork, poultry, and seafood</li> <li>• Whole and enriched grain products</li> </ul>	<ul style="list-style-type: none"> <li>• Loss of appetite</li> <li>• Diarrhea</li> <li>• Dermatitis (skin irritations)</li> <li>• Confusion and Disorientation</li> <li>• Anxiety</li> </ul>
<b>Vitamin B6</b>	<ul style="list-style-type: none"> <li>• Immune function</li> <li>• Nervous system function</li> <li>• Protein, carbohydrate, and fat metabolism</li> <li>• Red blood cell formation</li> <li>• Turns tryptophan into niacin</li> </ul>	<ul style="list-style-type: none"> <li>• Chickpeas</li> <li>• Fruits (other than citrus)</li> <li>• Potatoes</li> <li>• Salmon</li> <li>• Tuna</li> </ul>	<ul style="list-style-type: none"> <li>• Anemia</li> <li>• Nervous irritability</li> <li>• Dermatitis (skin irritations)</li> <li>• Convulsions</li> <li>• Weakness</li> <li>• Abdominal pain</li> </ul>
<b>Vitamin B12</b>	<ul style="list-style-type: none"> <li>• Conversion of food into energy</li> <li>• Nervous system function</li> <li>• Red blood cell formation</li> <li>• Regeneration of folate</li> </ul>	<ul style="list-style-type: none"> <li>• Dairy Products</li> <li>• Eggs</li> <li>• Fortified cereals</li> <li>• Meats, poultry, and seafood</li> </ul>	<ul style="list-style-type: none"> <li>• Anemia</li> <li>• Nerve damage</li> </ul>
<b>Folate</b>	<ul style="list-style-type: none"> <li>• Prevents neural tube defects (birth defects)</li> <li>• Red blood cell formation</li> </ul>	<ul style="list-style-type: none"> <li>• Asparagus</li> <li>• Avocado</li> <li>• Beans and peas</li> <li>• Green leafy vegetables</li> <li>• Orange juice</li> </ul>	<ul style="list-style-type: none"> <li>• Anemia</li> <li>• Fatigue</li> <li>• Brain and Spinal cord defects in infants due to mother's deficiency during pregnancy</li> </ul>

# FAT SOLUBLE VITAMINS

VITAMIN A  
VITAMIN D  
VITAMIN E  
VITAMIN K



## LET'S TAKE A CLOSER LOOK...

### *Vitamins*

Vitamins are essential substances that the human body needs for proper growth, development, and function. Vitamins are organic substances which are made by plants and animals; they are then eaten by humans.

There are 13 known vitamins:

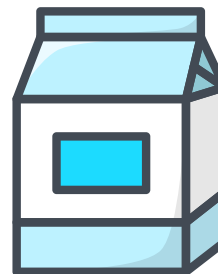
A, C, D, E, K, and the B vitamins (thiamin (B1), riboflavin (B2), niacin (B3), pantothenic acid (B5), pyridoxal (B6), cobalamin (B12), biotin, and folate/folic acid.

Vitamins are classified as water soluble and fat-soluble.

### *Fat Soluble Vitamins*

Fat soluble vitamins require fat for absorption and are stored in the liver and adipose (fatty tissue) of the body. By storing fat soluble vitamins in fatty tissues, the body can tap into these reserves when needed. Fat soluble vitamins are not excreted easily and when eating excess amounts levels can build up and become toxic.

## FOOD SOURCES





FAT SOLUBLE VITAMINS	FUNCTION: <i>What does it do?</i>	SOURCES: <i>Where is it found?</i>	DEFICIENCY: <i>What happens if I don't get enough?</i>
<b>Vitamin A</b>	<ul style="list-style-type: none"> <li>• Normal cell growth and development</li> <li>• required for immune function</li> <li>• supports reproduction</li> <li>• Promotes vision</li> <li>• Protects from infections</li> <li>• Red blood cell formation</li> <li>• Skin and bone formation</li> <li>• Helps keep skin healthy</li> </ul>	<ul style="list-style-type: none"> <li>• Cantaloupe</li> <li>• Carrots</li> <li>• Dairy products</li> <li>• Eggs</li> <li>• Fortified cereals</li> <li>• Green leafy vegetables</li> <li>• Pumpkin</li> <li>• Red peppers</li> <li>• Sweet potatoes</li> </ul>	<ul style="list-style-type: none"> <li>• Faulty bone and tooth development in infants</li> <li>• Poor growth</li> <li>• Night blindness</li> </ul>
<b>Vitamin D</b>	<ul style="list-style-type: none"> <li>• Promotes absorption of calcium and phosphorus</li> <li>• Helps keep bones and teeth strong</li> <li>• Helps cell growth</li> <li>• Immune function</li> <li>• Nervous system function</li> </ul>	<ul style="list-style-type: none"> <li>• Eggs</li> <li>• Exposure to sunlight</li> <li>• Fish</li> <li>• Fish liver oil</li> <li>• Fortified cereals and dairy products</li> <li>• Fortified orange juice</li> <li>• Fortified soy beverages</li> </ul>	<ul style="list-style-type: none"> <li>• Rickets (soft, fragile bones, enlarged joints, bowed legs)</li> <li>• Chest, spinal and pelvic bone deformities</li> <li>• Convulsions</li> </ul>
<b>Vitamin E</b>	<ul style="list-style-type: none"> <li>• Formation of red blood cells</li> <li>• Acts as an antioxidant to protect essential fatty acids and vitamin A</li> </ul>	<ul style="list-style-type: none"> <li>• Fortified cereals and juices</li> <li>• Green vegetables</li> <li>• Nuts and seeds</li> <li>• Peanuts and peanut butter</li> <li>• Vegetable oils</li> </ul>	<ul style="list-style-type: none"> <li>• Anemia in premature infants</li> <li>• Problems of nervous system</li> </ul>
<b>Vitamin K</b>	<ul style="list-style-type: none"> <li>• Assists in blood clotting</li> <li>• Regulates calcium metabolism</li> </ul>	<ul style="list-style-type: none"> <li>• Butterfat (is synthesized in intestine by beneficial bacteria)</li> <li>• Deep green leaves (alfalfa, spinach, cabbage)</li> <li>• Egg yolk</li> <li>• Liver</li> </ul>	<ul style="list-style-type: none"> <li>• Impairs blood clotting</li> <li>• May reduce bone strength</li> </ul>

# MINERALS

CALCIUM  
CHROMIUM  
COPPER  
FLUORIDE  
IODINE  
IRON  
MAGNESIUM  
PHOSPHORUS  
SELENIUM  
ZINC



## LET'S TAKE A CLOSER LOOK...

### MINERALS

Minerals are essential substances that the human body needs for proper growth, development, and function. Minerals are inorganic substances that are not made by living things, but rather are found naturally in soil and water. Minerals are absorbed by plants which are then eaten by humans or other animals. Humans can obtain minerals through plants or by eating animal products.

Only some minerals (listed below) are essential for body processes and functions. The other trace minerals not listed are not essential for the body and functions. Minerals can be broken down into two categories:

#### MAJOR MINERALS

(needed in 100 milligrams per day or more)

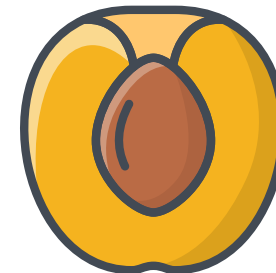
calcium  
phosphorus  
magnesium  
sulfur

#### TRACE MINERALS

(required in much smaller amounts by the body)

iron  
iodine  
zinc  
chromium  
manganese  
selenium  
fluoride  
copper

### FOOD SOURCES



MINERALS	FUNCTION: <i>What does it do?</i>	SOURCES: <i>Where is it found?</i>	DEFICIENCY: <i>What happens if I don't get enough?</i>
<b>Calcium</b>	<ul style="list-style-type: none"> <li>Blood clotting</li> <li>Bone and teeth formation</li> <li>Muscle and heart contraction</li> <li>Nervous system function</li> </ul>	<ul style="list-style-type: none"> <li>Dried peas and beans</li> <li>Fortified juice and soy milk</li> <li>Greens (kale, broccoli, collards, etc.)</li> <li>Milk and dairy products</li> </ul>	<ul style="list-style-type: none"> <li>Abnormal heart rhythms</li> <li>Fragile bones</li> <li>Osteoporosis</li> </ul>
<b>Chromium</b>	<ul style="list-style-type: none"> <li>Insulin function</li> <li>Protein, carbohydrate, and fat metabolism</li> </ul>	<ul style="list-style-type: none"> <li>Broccoli</li> <li>Fruits and fruit juices</li> <li>Meats and turkey</li> <li>Whole grains</li> </ul>	<ul style="list-style-type: none"> <li>Inability of cells to use glucose for energy</li> </ul>
<b>Copper</b>	<ul style="list-style-type: none"> <li>Collagen and connective tissue formation</li> <li>Aids in red blood cell formation from iron stores</li> <li>Nervous system function</li> </ul>	<ul style="list-style-type: none"> <li>Crustaceans and shellfish</li> <li>Nuts and Seeds</li> <li>Organ meats such as liver</li> <li>Whole grains and Lentils</li> </ul>	<ul style="list-style-type: none"> <li>Anemia</li> </ul>
<b>Flouride</b>	<ul style="list-style-type: none"> <li>Makes teeth resistant to decay; most effective in young children</li> </ul>	<ul style="list-style-type: none"> <li>Water (1 part per million is added to some municipal water supplies)</li> </ul>	<ul style="list-style-type: none"> <li>None known</li> </ul>
<b>Iodine</b>	<ul style="list-style-type: none"> <li>Growth and development</li> <li>Metabolism</li> <li>Thyroid hormone production</li> </ul>	<ul style="list-style-type: none"> <li>Iodized table salt (76 ug/g of salt)</li> <li>Seafood</li> </ul>	<ul style="list-style-type: none"> <li>Stunted growth</li> <li>Endemic goiter</li> </ul>
<b>Iron</b>	<ul style="list-style-type: none"> <li>Growth and development</li> <li>Immune function</li> <li>Red blood cell formation</li> <li>Helps change beta carotene to vitamin A</li> <li>Produces collagen</li> </ul>	<ul style="list-style-type: none"> <li>Beans and peas</li> <li>Dark green vegetables</li> <li>Meats, poultry, and seafood</li> <li>Raisins</li> <li>Whole grain, enriched, and fortified breads</li> </ul>	<ul style="list-style-type: none"> <li>Anemia</li> </ul>
<b>Magnesium</b>	<ul style="list-style-type: none"> <li>Immune function</li> <li>Muscle contraction</li> <li>Normal heart rhythm</li> <li>Aids in making body proteins</li> <li>Structural component of bones and teeth</li> <li>Regulates blood glucose levels and blood pressure</li> </ul>	<ul style="list-style-type: none"> <li>Avocados and Potatoes</li> <li>Bananas</li> <li>Beans and peas</li> <li>Dairy products</li> <li>Green leafy vegetables</li> <li>Nuts and seeds</li> <li>Wheat bran and whole grains</li> </ul>	<ul style="list-style-type: none"> <li>Tremors</li> <li>Growth failure</li> </ul>
<b>Phosphorus</b>	<ul style="list-style-type: none"> <li>Builds strong bones and teeth</li> <li>Energy production and storage</li> </ul>	<ul style="list-style-type: none"> <li>Beans and peas</li> <li>Dairy products</li> <li>Meats, poultry, and seafood</li> <li>Nuts and seeds</li> <li>Whole grain, enriched, and fortified breads</li> </ul>	<ul style="list-style-type: none"> <li>Bone loss</li> <li>Pain</li> </ul>
<b>Selenium</b>	<ul style="list-style-type: none"> <li>Antioxidant</li> <li>Promotes immune function</li> <li>Promotes thyroid function</li> </ul>	<ul style="list-style-type: none"> <li>Eggs</li> <li>Enriched pasta and rice</li> <li>Meats, poultry, and seafood</li> <li>Nuts and seeds</li> <li>Whole grains</li> </ul>	<ul style="list-style-type: none"> <li>Brittle hair and nails</li> <li>Hair loss</li> </ul>
<b>Zinc</b>	<ul style="list-style-type: none"> <li>Promotes tissue growth and development</li> <li>Immune function</li> <li>Nervous system function</li> <li>Protein formation</li> <li>Wound healing</li> </ul>	<ul style="list-style-type: none"> <li>Beans and peas</li> <li>Beef, poultry, and seafood</li> <li>Dairy products and fortified cereals</li> <li>Nuts</li> <li>Whole grains</li> </ul>	<ul style="list-style-type: none"> <li>Poor wound healing</li> <li>Decreased taste ability</li> </ul>

# ELECTROLYTES

SODIUM  
CHLORIDE  
POTASSIUM  
WATER



## LET'S TAKE A CLOSER LOOK...

### *Electrolytes*

Electrolytes are minerals in body fluids such as blood, tissues, sweat and urine.

Electrolytes help to transmit nerve impulses in your body.

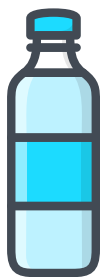
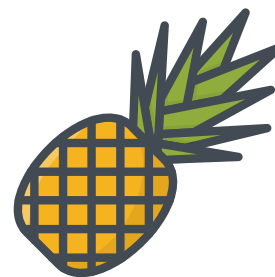
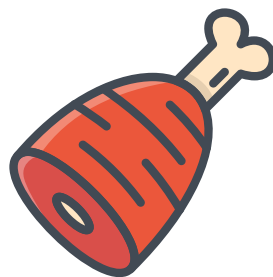
Electrolytes include sodium, potassium, and chloride.

When dehydrated, the body does not have enough fluid and electrolytes to function properly.

Electrolytes help:

- Balance the amount of water in the body
- Balance the body's acid/base (pH) level
  - Move nutrients to cells
  - Move wastes out of cells
- Help nerves, muscles, the heart, and brain function properly

### FOOD SOURCES



ELECTROLYTES	FUNCTION: <i>What does it do?</i>	SOURCES: <i>Where is it found?</i>	DEFICIENCY: <i>What happens if I don't get enough?</i>
<b>Sodium</b>	<ul style="list-style-type: none"> <li>Regulates fluid balance</li> <li>Influences blood pressure and blood volume</li> <li>Muscle contraction</li> <li>Nervous system function</li> </ul>	<ul style="list-style-type: none"> <li>Breads and rolls</li> <li>Cheese</li> <li>Cold cuts and cured meats</li> <li>Mixed meat dishes</li> <li>Mixed pasta dishes</li> <li>Pizza</li> <li>Poultry</li> <li>Sandwiches</li> <li>Savory snacks</li> <li>Soups</li> <li>Table Salt</li> </ul>	<ul style="list-style-type: none"> <li>Fatigue</li> <li>Profuse sweating</li> <li>Muscle cramps</li> <li>Dizziness</li> <li>Nausea</li> <li>Diarrhea</li> </ul>
<b>Chloride</b>	<ul style="list-style-type: none"> <li>Regulates fluid balance</li> <li>Helps nerve transmission.</li> </ul>	<ul style="list-style-type: none"> <li>Celery</li> <li>Green leafy vegetables</li> <li>Lettuce</li> <li>Olives</li> <li>Pineapple</li> <li>Rye</li> <li>Table salt and sea salt</li> <li>Tomatoes</li> </ul>	<ul style="list-style-type: none"> <li>Heat cramps</li> <li>Hair loss</li> <li>Tooth loss</li> <li>Muscle cramps</li> </ul>
<b>Potassium</b>	<ul style="list-style-type: none"> <li>Normalizes blood pressure regulation</li> <li>Regulates fluid balance</li> <li>Muscle contraction</li> <li>Nervous system function</li> </ul>	<ul style="list-style-type: none"> <li>Bananas and most fruits</li> <li>Dairy products</li> <li>Dried peas</li> <li>Meats</li> <li>Orange juice</li> <li>Peanuts and other nuts</li> <li>Potatoes</li> <li>Spinach</li> <li>Yogurt</li> </ul>	<ul style="list-style-type: none"> <li>Weakness</li> <li>Poor muscle tone</li> <li>Heart abnormalities</li> <li>Muscle cramps</li> <li>Loss of appetite</li> </ul>
<b>Water</b>	<ul style="list-style-type: none"> <li>Transports nutrients</li> <li>Transports waste</li> <li>Lubricates joints</li> <li>Regulates body temperature</li> <li>Cell hydration</li> </ul>	<ul style="list-style-type: none"> <li>High-moisture solid foods such as: soups, watermelon, and meats</li> <li>Juices</li> <li>Water</li> </ul>	<ul style="list-style-type: none"> <li>Dehydration</li> <li>Constipation</li> </ul>

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Adapted From:

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# Nutrient Needs at a Glance

Extension Nutrition Specialists  
 The Texas A&M System



## Glossary

<b>Adequate Intake (AI):</b>	set when there is no data to set the RDA	<b>Hemorrhagic:</b>	loss of blood from blood vessels
<b>Acceptable Macronutrient Distribution Range (AMDR):</b>	range of intake for an energy source that reduces risk of chronic disease while providing essential nutrients. Excess leads to weight gain and increased risk of chronic disease.	<b>Ketosis:</b>	a condition caused by abnormal burning of fat in the body
<b>Anorexia:</b>	loss of appetite	<b>Macronutrients:</b>	nutrients—proteins, fats, carbohydrates, others—needed by the body in large amounts
<b>Antioxidant:</b>	a substance that prevents the deterioration or rancidity of fats	<b>Microgram (µg - mcg):</b>	one millionth of a gram
<b>Ataxia:</b>	inability to coordinate voluntary muscles	<b>Milligram (mg):</b>	one thousandth of a gram
<b>Cachexia:</b>	general physical wasting and malnutrition	<b>Neural Tube Defects (NTD):</b>	birth defects due to failure of the neural tube to develop properly during fetal development
<b>Cheilosis:</b>	cracks at the corner of the mouth	<b>Osteomalacia:</b>	softening of bones in adults
<b>Coenzyme:</b>	compound that forms the actual part in an enzyme after combining with a protein component	<b>Osteoporosis:</b>	porous, brittle bones
<b>Daily Values (DVs):</b>	the amount of a nutrient needed daily as determined by the Food and Drug Administration (FDA)	<b>Photophobia:</b>	sensitivity to light
<b>Dermatitis:</b>	inflammation of the skin	<b>Recommended Dietary Allowances (RDA):</b>	the amount of nutrients needed to promote good growth and optimum health in people ages 25 to 50
<b>Desquamation:</b>	loss of a layer of skin	<b>Rickets:</b>	bone deformation in children
<b>Dietary Reference Intakes (DRIs)</b>	general term for a set of reference values for planning and assessing nutrient intakes of healthy people	<b>Scurvy:</b>	weakened cartilages and connective tissue
<b>Eczema:</b>	an inflammatory condition of the skin characterized by redness and itching	<b>Tolerable Upper Intake Level (UL):</b>	highest daily intake that will not cause adverse effects
<b>Edema:</b>	abnormal accumulation of fluid in the body	<b>Xerophthalmia:</b>	an eye condition that can lead to blindness
<b>Glucose Tolerance Factor (GTF):</b>	a dietary agent that facilitates the reaction of insulin		
<b>Gram (g):</b>	metric unit of mass equal to one thousandth (10 <sup>-3</sup> ) of a kilogram		

## References

Data compiled by the Standing Committee on the Scientific Evaluation of Dietary Reference Intakes for Nutrients Reports ([www.nap.edu](http://www.nap.edu)), the Food and Nutrition Board, Institute of Medicine, National Academy of Sciences, Washington, DC: National Academy Press, 1997-2010.

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Revised by Mary Kinney Bielamowicz, PhD, RD, LD, Regents Fellow, Professor and Extension Nutrition Specialist, and Sharon F. Robinson, PhD, RD, LD, Associate Professor and Extension Nutrition Specialist, The Texas A&M System, assisted by Dietetic Interns Kelsey Kinsella, Misty Cram, Kelly Vaughan, 2009; Molly Cernosek, 2011.

## Estimated safe and adequate daily dietary intakes of selected vitamins and minerals

DRI's	Age range	RDA* (bold)/AI*		AMDR*	Functions in the body	Sources	Deficiency
		Males	Females	M + F			
<b>Protein</b> (g/d) (grams*/day)	1–8 years	<b>13–19</b>	<b>13–19</b>	5–30	<ul style="list-style-type: none"> <li>Builds and repairs all body tissue</li> <li>Helps build blood</li> <li>Helps form antibodies to fight infection</li> <li>Supplies food energy at 4 calories per gram</li> </ul>	Animal protein: meat, fish, poultry, eggs, milk, cheese, yogurt Vegetable protein: legumes (peas, beans), whole grain breads and cereals, nuts, peanut butter, soy	Fatigue, loss of appetite, edema*, poor growth
	9–18 years	<b>34–52</b>	<b>34–46</b>	10–30			
	19–50 years	<b>56</b>	<b>46</b>	10–35			
	51–70 years	<b>56</b>	<b>46</b>	10–35			
<b>Fat</b> (g/d)	1–8 years	–	–	25–40	<ul style="list-style-type: none"> <li>Supplies 9 calories per gram (more energy in a small amount of food)</li> <li>Transports fat-soluble vitamins and essential fatty acids needed for body's proper use and storage of fat</li> </ul>	Butter, margarine, shortening, oil, salad dressing, palm and coconut oil, egg yolk, meat with fat, whole milk, cheese, peanut butter	Eczema*, retarded growth, diarrhea, loss of hair
	9–18 years	–	–	25–35			
	19–50 years	–	–	25–35			
	51–70 years	–	–	20–35			
<b>Carbohydrates</b> (g/d)	1–8 years	<b>130**</b>	<b>130**</b>	45–65	<ul style="list-style-type: none"> <li>Supply energy at 4 calories per gram to all body cells</li> <li>Supply glucose to spare protein</li> <li>Help the body use other nutrients</li> </ul>	Breads, cereals, flours, cornmeal, rice, macaroni, noodles, spaghetti, Irish and sweet potatoes, corn, dried fruits, bananas, sugar, syrup, jam, jellies, preserves, honey	Loss of energy, fatigue, ketosis*
	9–18 years	<b>130**</b>	<b>130**</b>	45–65			
	19–50 years	<b>130**</b>	<b>130**</b>	45–65			
	51–70 years	<b>130**</b>	<b>130**</b>	45–65			
<b>Fiber</b> (g/d)	1–8 years	14–20	14–17	None determined	<ul style="list-style-type: none"> <li>May help lower cholesterol</li> <li>Improves bowel motility</li> <li>Gives feeling of fullness without extra calories, promoting satiety and weight loss</li> <li>Contains phytic acids that tie up minerals, which can prevent absorption</li> </ul>	Whole grains (wheat, unmilled rice, oats) or enriched products: cereals, bread, noodles, tortillas, brown rice, oatmeal Vegetables: broccoli, spinach, carrots, beans, peas	Diarrhea; excess fiber makes bulk, which may prevent eating enough food energy or nutrients; high-fiber diets for elderly, very young or those on low-calorie diets may cause nutrient deficiencies
	9–18 years	25–31	22–25				
	19–50 years	31–34	25–28				
	51–70 years	28	22				
Water-soluble vitamins		RDA*/AI*		UL*	Functions in the body	Sources	Deficiency
		Males	Females	M + F			
<b>Vitamin C</b> <b>Ascorbic Acid</b> (mg/d) (milligrams*/day)	1–8 years	<b>15–25</b>	<b>15–25</b>	400–650	<ul style="list-style-type: none"> <li>Helps wounds heal</li> <li>Promotes iron absorption</li> <li>Helps the body maintain collagen (fibrous part of protein for cell structure)</li> <li>Acts as an antioxidant</li> </ul>	All citrus fruits, fruit juices, strawberries, cantaloupe; green or red peppers, raw cabbage, spinach, broccoli, turnip greens, collards, mustard greens, kale, tomatoes, Irish or sweet potatoes	Scurvy*, sore or bleeding gums, poor wound healing, pain in joints, bones, muscles
	9–18 years	<b>45–75</b>	<b>45–65</b>	1,200–1,800			
	19–50 years	<b>90</b>	<b>75</b>	2,000			
	51–70 years	<b>90</b>	<b>75</b>	2,000			
<b>Vitamin B<sub>1</sub> – Thiamin</b> (mg/d)	1–8 years	<b>0.5–0.6</b>	<b>0.5–0.6</b>	None determined	<ul style="list-style-type: none"> <li>Helps the body use carbohydrates for energy</li> <li>Maintains appetite and muscle tone</li> <li>Involved in nervous system function</li> </ul>	Meat (especially pork), liver, heart, kidney, poultry, eggs, milk, dried peas and beans, nuts, whole-grain or enriched bread and cereals	Poor appetite, constipation, depression, apathy, cachexia*, edema*, cardiac failure, cheilosis*
	9–18 years	<b>0.9–1.2</b>	<b>0.9–1.0</b>				
	19–50 years	<b>1.2</b>	<b>1.1</b>				
	51–70 years	<b>1.2</b>	<b>1.1</b>				
<b>Vitamin B<sub>2</sub> – Riboflavin</b> (mg/d)	1–8 years	<b>0.5–0.6</b>	<b>0.5–0.6</b>	None determined	<ul style="list-style-type: none"> <li>Functions as a part of a coenzyme* that assists in energy release</li> <li>Helps in metabolism of amino acids</li> </ul>	Milk, cheese, ice cream, organ meats, eggs, fish, dark green leafy vegetables, enriched breads and cereals	Cheilosis*, scaly desquamation* around nose and ears, sore tongue and mouth, burning and itching eyes, photophobia*
	9–18 years	<b>0.9–1.3</b>	<b>0.9–1.0</b>				
	19–50 years	<b>1.3</b>	<b>1.1</b>				
	51–70 years	<b>1.3</b>	<b>1.1</b>				
<b>Niacin</b> (mg/d NE*) <i>Nicotinic acid</i> <i>Nicotinamide</i>	1–8 years	<b>6–8</b>	<b>6–8</b>	10–15	<ul style="list-style-type: none"> <li>Coenzyme* for carbohydrate metabolism</li> <li>Promotes normal appetite</li> </ul>	Meat, liver, poultry, fish, dried peas and beans, nuts (especially peanuts), whole-grain or enriched cereals and breads, milk, cheese, yogurt	Anorexia*, diarrhea, dermatitis*, confusion, anxiety
	9–18 years	<b>12–16</b>	<b>12–14</b>	20–30			
	19–50 years	<b>16</b>	<b>14</b>	35			
	51–70 years	<b>16</b>	<b>14</b>	35			
<b>Vitamin B<sub>6</sub></b> (mg/d) <i>Pyridoxine</i> <i>Pyridoxal</i> <i>Pyridoxamine</i>	1–8 years	<b>0.5–0.6</b>	<b>0.5–0.6</b>	30–40	<ul style="list-style-type: none"> <li>Coenzyme* for protein utilization</li> <li>Helps convert the amino acid tryptophan to the vitamin Niacin</li> <li>Helps convert complex carbohydrates to simple carbohydrates</li> </ul>	Meat, poultry, fish, sweet potatoes, vegetables, whole grains, fortified cereals	Anemia, nervous irritability, convulsions, weakness, ataxia*, abdominal pain, dermatitis*
	9–18 years	<b>1.0–1.3</b>	<b>1.0–1.2</b>	60–80			
	19–50 years	<b>1.3</b>	<b>1.3</b>	100			
	51–70 years	<b>1.7</b>	<b>1.5</b>	100			
<b>Choline</b> (mg/d)	1–8 years	200–250	200–250	1,000	<ul style="list-style-type: none"> <li>Plays a role in cell structure in lipids in the cell membranes</li> <li>Promotes brain and memory functions</li> <li>Gives to own manufacture in the body</li> </ul>	Egg yolks, milk, peanuts, soy, wheat germ, livers (beef, veal and turkey)	When low during pregnancy, an increased risk of birth defects; low choline leads to increased risk of cardiovascular disease
	9–18 years	375–550	375–400	2,000–3,000			
	19–50 years	550	425	3,500			
	51–70 years	550	425	3,500			
<b>Vitamin B<sub>12</sub></b> (µg/d) (micrograms*/day) <i>Cobalamin</i>	1–8 years	<b>0.9–1.2</b>	<b>0.9–1.2</b>	None determined	<ul style="list-style-type: none"> <li>Helps maintain nerve tissue and normal blood formation</li> <li>Regeneration of folate</li> </ul>	Animal foods: organ meats, muscle meats, fish, poultry, eggs, milk; fortified cereals	Anemia, neurologic disorders
	9–18 years	<b>1.8–2.4</b>	<b>1.8–2.4</b>				
	19–50 years	<b>2.4</b>	<b>2.4</b>				
	51–70 years	<b>2.4</b>	<b>2.4</b>				



<b>Folate</b> (µg/d)	1–8 years	<b>150–200</b>	<b>150–200</b>	300–400	• Helps red blood cells mature	Organ meats, deep green leafy vegetables,	Anemia, fatigue, gastrointestinal disturbances,
<i>Folic acid</i>	9–18 years	<b>300–400</b>	<b>300–400</b>	600–800	• Interrelated with vitamin B <sub>12</sub> utilization	muscle meats, poultry, fish, eggs, whole-	inadequate intake during pregnancy related to
<i>Folacin</i>	19–50 years	<b>400</b>	<b>400</b>	1,000	• Folic acid supplement*** during pregnancy	grain or fortified cereals	neural tube birth defects (NTD)*
	51–70 years	<b>400</b>	<b>400</b>	1,000	recommended		
<b>Biotin</b> (µg/d)	1–8 years	8–12	8–12	None determined	• Coenzyme* in synthesis of fat, glycogen	Liver, and smaller amounts in meats and	Because data on biotin's adverse effects are
	9–18 years	20–25	20–25		(carbohydrate stored in muscle and liver), and	fruits	limited, caution may be needed
	19–50 years	30	30		amino acids (protein building blocks)		
	51–70 years	30	30				
Fat-soluble vitamins	RDA*/AI*		UL*	Functions in the body	Sources	Deficiency	
	Males	Females	M + F				
<b>Vitamin A</b> (µg/d RAE*)	1–8 years	<b>300–400</b>	<b>300–400</b>	600–900	• Promotes growth and normal vision, and protects	Dark leafy green or deep yellow vegetables	Faulty bone and tooth development in infants,
<i>Retinol, Retinal Carotene</i>	9–18 years	<b>600–900</b>	<b>600–700</b>	1,700–2,800	against night blindness	(carrots, winter squash, cushaw, pumpkin,	poor growth, xerophthalmia*, night blindness
*Retinol Activity	19–50 years	<b>900</b>	<b>700</b>	3,000	• Helps keep skin and mucous membrane linings	sweet potatoes); yellow fruits (peaches,	
Equivalent:	51–70 years	<b>900</b>	<b>700</b>	3,000	healthy and resistant to infection	cantaloupe, apricots); liver, fish liver oils,	
1 RAE = 1 µg Retinol					• Large amounts are toxic	dairy foods, butter, margarine, egg yolks	
<b>Vitamin D</b> (iu/d)	1–8 years	600	600	4,000	• Synthesized in skin by ultraviolet light	Fish liver oils and flesh, fortified milk,	Rickets* (soft, fragile bones, enlarged joints,
<i>D Calciferol</i>	9–18 years	600	600	4,000	• Functions to regulate amount of calcium/	exposure to sunlight. Minute amounts in	bowed legs); chest, spinal and pelvic bone
<i>D<sub>2</sub> Ergocalciferol</i>	19–50 years	600	600	4,000	phosphorus absorbed in the blood to mobilize	butter, liver, egg yolk, salmon and sardines	deformities; convulsions; osteomalacia*
<i>D<sub>3</sub> Cholecalciferol</i>	51–70 years	600	600	4,000	and mineralize the bone		
					• Large amounts are toxic		
					• Needed to fight off bacteria and viruses		
<b>Vitamin E</b> (mg/d)	1–8 years	<b>6–7</b>	<b>6–7</b>	200–300	• Not stored in body to any extent	Plant tissues: wheat or rice germ, vegetable	Anemia in premature infants, problems of
<i>Alpha<sup>2</sup>-, beta-,</i>	9–18 years	<b>11–15</b>	<b>11–15</b>	600–800	• Related to action of selenium	oils, green leafy vegetables, nuts, legumes;	nervous system
<i>gamma-tocopherol</i>	19–50 years	<b>15</b>	<b>15</b>	1,000	• Reduces oxidation of vitamin A, carotenes and	meats (other animal foods are poor sources)	
	51–70 years	<b>15</b>	<b>15</b>	1,000	polyunsaturated fatty acids		
<b>Vitamin K</b> (µg/d)	1–8 years	30–55	30–55	None determined	• Bile is necessary for absorption of the vitamin	Deep green leaves (alfalfa, spinach,	Prolonged clotting time, hemorrhagic* disease in
<i>Phylloquinone (K<sub>1</sub>)</i>	9–18 years	60–75	60–75		• Needed to form prothrombin in blood	cabbage), liver, egg yolk, butterfat, (is	newborn infants
<i>Menaquinone (MK<sub>n</sub>)</i>	19–50 years	120	90		• Sulfa drugs and antibiotics interfere with	synthesized in intestine by beneficial	
<i>Menadione</i>	51–70 years	120	90		absorption	bacteria)	
					• Large amounts are toxic		
Minerals/Elements	RDA*/AI*		UL*	Functions in the body	Sources	Deficiency	
	Males	Females	M + F				
<b>Calcium</b> (mg/d)	1–8 years	700–1,000	700–1,000	2,500	• Needed to build bones and teeth; helps clot blood	Milk, cheese, ice cream, greens (kale,	Retarded bone mineralization, fragile bones,
	9–18 years	1,300	1,300	2,500	• Helps muscles contract and relax normally. Delays	broccoli, collards, turnips, mustard), dried	rickets*, osteomalacia*, osteoporosis*
	19–50 years	1,000	1,000	2,500	fatigue	peas and beans, fortified juice, soy milk	
	51–70 years	1,200	1,200	2,500			
<b>Chromium</b> (µg/d)	1–8 years	11–15	11–15	None determined	• Works along with insulin in carbohydrate, protein	Brewer's yeast, liver, meat, cheese, whole-	Inability of cells to use glucose for energy
	9–18 years	25–35	21–24		and fat metabolism; glucose tolerance factor	grain cereals, broccoli	
	19–50 years	35	25		(GTF)*		
	51–70 years	30	20				
<b>Copper</b> (µg/d)	1–8 years	<b>340–440</b>	<b>340–440</b>	1,000–3,000	• Aids absorption and use of iron to form	Liver, shellfish, meats, nuts, legumes,	Anemia
	9–18 years	<b>700–890</b>	<b>700–890</b>	5,000–8,000	hemoglobin in red bloods cells	whole-grain cereals	
	19–50 years	<b>900</b>	<b>900</b>	10,000			
	51–70 years	<b>900</b>	<b>900</b>	10,000			
<b>Fluoride</b> (mg/d)	1–8 years	0.7–1	0.7–1	1.3–2.2	• Makes teeth resistant to decay; most effective in	Water (1 part per million is added to some	None known
	9–18 years	2–3	2–3	10	young children	municipal water supplies)	
	19–50 years	4	3	10	• Moderate levels in bone may reduce		
	51–70 years	4	3	10	osteoporosis*		
<b>Iodine</b> (µg/d)	1–8 years	<b>90</b>	<b>90</b>	200–300	• Integral part of thyroid hormones: thyroxine and	Iodized table salt (76 µg/g of salt), seafood,	Cretinism (stunted growth with mental
	9–18 years	<b>120–150</b>	<b>120–150</b>	600–900	triiodothyronine	plants grown in iodine-rich soils, dairy	retardation); endemic goiter
	19–50 years	<b>150</b>	<b>150</b>	1,100		products	
	51–70 years	<b>150</b>	<b>150</b>	1,100			
<b>Iron</b> (mg/d)	1–8 years	<b>7–10</b>	<b>7–10</b>	40	• Part of blood hemoglobin and myoglobin	Liver, organ meats, meat, poultry, egg yolk,	Anemia (frequent in infants, preschool children,
	9–18 years	<b>8–11</b>	<b>8–15</b>	45	• Enzyme involved in energy metabolism	enriched and whole-grain breads, cereals,	teenage girls and pregnant women)
	19–50 years	<b>8</b>	<b>18</b>	45	• Involved in oxygen transport	legumes, dark green vegetables, black strap	
	50–70 years	<b>8</b>	<b>8</b>	45		molasses, peaches, apricots, raisins, prunes,	
						oysters	

<b>Magnesium</b> (mg/d)	1–8 years 9–18 years 19–50 years 51–70 years	<b>80–130</b> <b>240–410</b> <b>400–420</b> <b>420</b>	<b>80–130</b> <b>240–360</b> <b>310–320</b> <b>320</b>	65–100 350 350 350	<ul style="list-style-type: none"> <li>• Activates enzymes involved in protein synthesis</li> <li>• Helps muscles and nerves work</li> <li>• Helps regulate blood sugar levels and promotes normal blood pressure</li> </ul>	Whole-grain cereals, nuts, legumes, meats, milk, green leafy vegetables	Tremors, growth failure
<b>Manganese</b> (mg/d)	1–8 years 9–18 years 19–50 years 51–70 years	1.2–1.5 1.9–2.2 2.3 2.3	1.2–1.5 1.6 1.8 1.8	2–3 6–9 11 11	<ul style="list-style-type: none"> <li>• Activates many enzymes used in carbohydrate and protein metabolism</li> <li>• Bone formation</li> </ul>	Legumes, whole-grain cereals, nuts, tea	None known
<b>Phosphorus</b> (mg/d)	1–8 years 9–18 years 19–50 years 51–70 years	<b>460–500</b> <b>1,250</b> <b>700</b> <b>700</b>	<b>460–500</b> <b>1,250</b> <b>700</b> <b>700</b>	3,000 4,000 4,000 4,000	<ul style="list-style-type: none"> <li>• Builds strong bones and teeth</li> <li>• Releases energy from fat, protein and carbohydrates during metabolism</li> <li>• Aids in formation of genetic material, cell membranes and enzymes</li> </ul>	Breads, cereals, lima beans, meat, poultry, fish, meat alternates, milk, cheese, yogurt	Found widely in foods, so deficiency is rare. Bone loss characterized by weakness, anorexia*, malaise, and pain
<b>Selenium</b> (µg/d)	1–8 years 9–18 years 19–50 years 51–70 years	<b>20–30</b> <b>40–55</b> <b>55</b> <b>55</b>	<b>20–30</b> <b>40–55</b> <b>55</b> <b>55</b>	90–150 280–400 400 400	<ul style="list-style-type: none"> <li>• Antioxidant</li> <li>• Lessens breakdown of vitamin E</li> </ul>	Organ meats, seafoods, cereal foods and plants grown in selenium-rich soil	Hair and nail brittleness and loss
<b>Zinc</b> (mg/d)	1–8 years 9–18 years 19–50 years 51–70 years	<b>3–5</b> <b>8–11</b> <b>11</b> <b>11</b>	<b>3–5</b> <b>8–9</b> <b>8</b> <b>8</b>	7–12 23–34 40 40	<ul style="list-style-type: none"> <li>• Component of many enzymes (carbonic anhydrase and anhydrase carboxypeptidase) and proteins</li> <li>• Controls information from gene to gene so living things develop and function</li> <li>• Plays role in immune function, protein synthesis, and wound healing.</li> </ul>	Seafoods, liver and other organ meats, meats, fish, wheat, yeast. Plant foods are generally low in zinc	Poor wound healing, decreased taste ability
<b>Electrolytes</b>		<b>RDA*/AI*</b>		<b>UL*</b>	<b>Functions in the body</b>	<b>Sources</b>	<b>Deficiency</b>
		<b>Males</b>	<b>Females</b>	<b>M + F</b>			
<b>Sodium</b> (g/d) <sup>4</sup>	1–8 years 9–18 years 19–50 years 51–70 years	1–1.2 1.5 1.5 1.3	1–1.2 1.5 1.5 1.3	1.5–1.9 2.2–2.3 2.3 2.3	<ul style="list-style-type: none"> <li>• Found in extracellular fluid (blood)</li> <li>• Maintains fluid balance and nerve transmission</li> </ul>	Table salt, cheddar cheese, ham, snack foods, most processed foods, salt (sodium chloride) and sodium benzoate/phosphate are added	Fatigue caused by profuse sweating, vomiting and diarrhea
<b>Chloride</b> (g/d)	1–8 years 9–18 years 19–50 years 51–70 years	1.5–1.9 2.3 2.3 2	1.5–1.9 2.3 2.3 2	2.3–2.9 3.4–3.6 3.6 3.6	<ul style="list-style-type: none"> <li>• Helps maintain normal pH of blood (7.35)</li> <li>• Maintains fluid balance and nerve transmission</li> </ul>	Table salt (sodium chloride), barley, wheat, green leafy vegetables, melon, pineapple	Heat cramps, hair loss, tooth loss
<b>Potassium</b> (g/d) <sup>4</sup>	1–8 years 9–18 years 19–50 years 51–70 years	3–3.8 4.5–4.7 4.7 4.7	3–3.8 4.5–4.7 4.7 4.7	None determined	<ul style="list-style-type: none"> <li>• Found inside the cell</li> <li>• Maintains fluid balance and nerve transmission</li> </ul>	Bananas, orange juice, most fruits, potatoes, dried peas, peanuts, nuts, dairy products, and meats	Weakness, poor muscle tone, heart abnormalities, apathy (lack of energy)
<b>Water</b> (liters/day)	1–8 years 9–18 years 19–50 years 51–70 years	1.3–1.7 2.4–3.3 3.7 3.7	1.3–1.7 2.1–2.3 2.7 2.7	None determined	<ul style="list-style-type: none"> <li>• Transports nutrients</li> <li>• Transports waste</li> <li>• Lubricates joints</li> <li>• Regulates body temperature</li> <li>• Cell hydration</li> </ul>	Water, juices, beverages, high-moisture solid foods (soups, watermelon, meats, etc.)	Dehydration, constipation

\* See Glossary for definitions

\*\*Average minimum amounts of glucose used by brain

\*\*\*Supplement during pregnancy of 400 µg or mcg folic acid plus folate intake of a varied diet

<sup>1</sup> NE (niacin equivalent) is equal to 1 mg of niacin or 60 mg of dietary tryptophan

<sup>2</sup> RAE = Retinol activity equivalents. 1 retinol equivalent = 1 µg retinol or 6 µg beta-carotene

<sup>3</sup> α-tocopherol includes the only form (RRR-α-tocopherol) that occurs naturally in foods and with variations of this form in fortified foods and supplements.

<sup>4</sup> Estimated sodium and potassium minimum requirements. AI\* has been set for healthy individuals and the UL\* may be too high for persons with hypertension.

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## 10 Tips: Save More at the Grocery Store

Using coupons and looking for the best price are great ways to save money at the grocery store. Knowing how to find them is the first step to cutting costs on food. Use the MyPlate coupon tips to stretch your budget.

- 1. Find deals right under your nose**  
Look for coupons with your receipt, as peel-offs on items, and on signs along aisle shelves.
- 2. Search for coupons**  
Many stores still send ads and coupons for promotion, so don't overlook that so-called "junk mail." You can also do a Web search for "coupons." Go through your coupons at least once a month and toss out any expired ones.
- 3. Look for savings in the newspaper**  
Brand name coupons are found as inserts in the paper every Sunday — except on holiday weekends. Some stores will double the value of brand name coupons on certain days.
- 4. Join your store's loyalty program**  
Signup is usually free and you can receive savings and electronic coupons when you provide your email address.
- 5. Buy when foods are on sale**  
Maximize your savings by using coupons on sale items. You may find huge deals such as "buy one get one free."
- 6. Find out if the store will match competitors' coupons**  
Many stores will accept coupons, as long as they are for the same item. Check with the customer service desk for further details.
- 7. Stay organized so coupons are easy to find**  
Sort your coupons either by item or in alphabetical order. Develop a system that's easiest for you and make finding coupons quick and hassle-free. Ideas for coupon storage include 3-ring binders, accordion-style organizers, or plain envelopes.
- 8. Find a coupon buddy**  
Swap coupons you won't use with a friend. You can get rid of clutter and discover additional discounts.
- 9. Compare brands**  
Store brands can be less expensive than some of the name brand foods. Compare the items to find better prices.
- 10. Stick to the list**  
Make a shopping list for all the items you need. Keep a running list on your phone, on the refrigerator, or in a wallet. When you're in the store, do your best to buy only the items on your list.



## 20 Money-Saving Grocery Shopping Tips

A trip to the grocery store may cost you a bit more these days. With rising prices and falling budgets, it's more challenging than ever to bring home the fixings for balanced meals. But, saving money at the supermarket doesn't mean giving up nutritious foods. Here are some tips to save you money while nourishing your family.

### Get into a Frugal Frame of Mind

- **Be healthier to be wealthier.** Consider the money you'll save down the road by eating well today and teaching your family to make wise food choices. Good nutrition means fewer days missed from work and school and fewer medical bills now and in the future.
- **Expect to spend a little extra time buying groceries – at least at first.** Making lists, checking store flyers and comparing unit prices on packages take time. Give it a few weeks, and you'll get faster.
- **Make your mantra: Raw, whole and bulk.** Raw and whole foods are not prepared or processed. So, these items usually cost less than buying their precooked and ready-to-eat counterparts. Buying staples in bulk also can mean some huge savings on those family favorites. Look for items such as breakfast cereals, which can really put a dent in your budget.
- **Start a Love Affair with Your Freezer.** When you prepare a recipe, double it and put the extra portions in the freezer. You'll be glad it's there on that night when nothing goes as planned. Instead of calling for home delivery, you can zap a delicious meal that you know your family loves. When freezing, add a date to the outside package and eat the items with the earlier dates first.

### At Home

- **Keep a running grocery list.** Each trip to the supermarket will cost you extra time and gas money. By keeping a list, you won't have to run out for single items. Plus, fewer trips to the grocery store means fewer impulse buys.
- **Plan your menus around the sales.** Planning is key. Review several supermarket flyers or look for their specials online. You'll save the most money on sales for meats. When creating your menus, have a plan for leftovers such as making sandwiches with extra servings of chicken or pot roast.
- **Follow your favorite brands on Twitter and friend them on Facebook.** You'll find some great bargains and coupons this way.
- **Grow your own.** Plant tomatoes, peppers, carrots, lettuce and more. Save money, have fun and get better flavor at the same time.
- **Cook more meals at home.** You get to control the ingredients, and you won't have the labor costs involved with restaurant meals.

- **Identify the foods you can prepare more cheaply at home.** There's no need to buy prepared gelatin, pudding and tea when they're simple and inexpensive to make yourself.
- **Serve appropriate portions, especially with higher-priced items like meats and cheeses.** Save money and take care of your waist by not overeating. Stretch chicken breast by cutting them into thin cutlets. Add lentils or oats to extend ground meat.
- **Do a 5-minute inventory of your refrigerator at least twice a week.** Find a use for everything before it goes bad. Toss wilting vegetables into a pot of soup or spaghetti sauce. Freeze leftovers for another day and ripe bananas for banana bread or smoothies.

### At the Grocery Store

- **Use coupons only for foods you normally buy.** Try to shop on double- and triple-coupon days.
- **Invite the kids.** Shop with your kids and show them how to choose healthy fruits and vegetables.
- **Don't shop when you're hungry — or when the kids are hungry.** Have snacks before heading out to help you resist those impulse buys.
- **Don't reward with candy.** Don't use candy as a reward for your kids' good behavior while shopping.
- **Stock up.** Buy extra canned and frozen goods, cereals and even meats and fish when they're on sale. Wrap meats in a freezer bag before freezing. Limit the use of pre-packaged foods, chips, cookies, candy, and soft drinks or sugary beverages.
- **Buy generic.** Store brands often are as good or better than the pricier name brand. Compare ingredients lists and Nutrition Facts panels.
- **Check unit prices or prices per serving.** Search high and low because often the least expensive items are on the top and bottom shelves.
- **Use these high-nutrition, low-cost foods.** Instead of expensive meats, try beans lentils, eggs, peanut butter, tofu and canned fish (salmon, tuna or crabmeat). You also can usually find good prices on grains including oats, brown rice and barley. Sweet and white potatoes are low-cost filling options. And, frozen fruit and vegetables are rich in nutrients and less expensive than their fresh counterparts.

<https://www.eatright.org/food/planning-and-prep/eat-right-on-a-budget/20-money-saving-grocery-shopping-tips>

# 10 Tips for Healthy Grocery Shopping

Good [nutrition](#) starts with smart choices in the grocery store. Cooking up healthy meals is a challenge if you don't have the right ingredients in your kitchen.

But who has time to read all the food labels and figure out which items are the most nutritious and the best buys? [Grocery shopping](#) can be a daunting task, simply because there are so many choices.

"Markets perform a great public service, but keep in mind they are designed to get you to buy (and, therefore, eat) more food, not less," says Marion Nestle, PhD, MPH, professor of [nutrition](#) at New York University and author of *What to Eat: An Aisle-by-Aisle Guide to Savvy Food Choices and Good Eating*.

But with a little guidance, healthy choices are a cinch to find in any supermarket.

The process starts even before you head to the grocery store, experts say. Before you set out for the market, plan your meals for the week, and create a list to shop from. It takes a few minutes, but saves time in running back to the store for missing ingredients.

To save money, use coupons, check the weekly grocery ads, and incorporate sale foods into your meal planning. And don't shop [hungry](#): An empty belly often results in impulse purchases that may not be the healthiest.

"When planning your grocery list, consult the guidelines of *MyPyramid* [the government nutrition web site [mypyramid.gov](#)] to make sure you are including all the foods you need for good health," advises Elizabeth Ward, RD, author of *The Pocket Idiot's Guide to the New Food Pyramids*.

To help meet the pyramid guidelines, you should be filling your cart with plenty of fruits, vegetables, whole grains, dairy, lean meat, fish, poultry, beans, and nuts, she says.

Most of us tend to eat the same foods over and over again. But variety really is the spice of life, says Ward.

"One of the tenets of the pyramid is variety, so instead of white potatoes, choose sweet potatoes, which are much richer in beta-carotene, or baby spinach instead of iceberg lettuce," she advises.

Be adventurous; aim to try a new fruit or vegetable each week, she advises.

Both Ward and Nestle say [organic foods](#) are a great option, but note that they may not be the most economical choice.

"You get the same nutritional benefits with fewer pesticides [with organics], but eating plenty of produce is more important than choosing [organic foods](#)," says Ward.

## Money Well Spent

Convenience is often worth the extra cost, especially when you're packing lunches or are trying to control portions. Ward relies on single-serve packages of pre-cut apples and carrot sticks for food to go for her three young daughters.

"Anything that will get you and your family to eat more [fruits and vegetables](#) is worth the extra expense, especially when you consider there is no waste associated with washed and prepped produce," says Ward.

Nestle also recommends splurging in the produce aisle for the best [fruits and vegetables](#).

## Supermarket Savvy

Ward offers this checklist for making healthier food choices in every department of your supermarket:

1. **Produce.** Spend the most time in the produce section, the first area you encounter in most grocery stores (and usually the largest). Choose a rainbow of colorful [fruits and vegetables](#). The colors reflect the different vitamin, mineral, and phytonutrient content of each fruit or vegetable.
2. **Breads, Cereals, and Pasta.** Choose the least processed foods that are made from whole grains. For example, regular oatmeal is preferable to instant oatmeal. But even instant oatmeal is a whole grain, and a good choice.

When choosing whole-grain cereals, aim for at least 4 grams of fiber per serving, and the less sugar, the better. Keep in mind that 1 level teaspoon of sugar equals 4 grams and let this guide your selections. Ward points out that cereals -- even those with added sugar -- make great vehicles for milk, yogurt, and/or fruit. Avoid granolas, even the low-fat variety; they tend to have more fat and sugar than other cereals.

Bread, pasta, rice, and grains offer more opportunities to work whole grains into your diet. Choose whole-wheat bread and pastas, brown rice, grain mixes, quinoa, bulgur, and barley. To help your family get used to whole grains, you can start out with whole-wheat blends and slowly transition to 100% whole-wheat pasta and breads.

3. **Meat, Fish, and Poultry.** The American [Heart](#) Association recommends two servings of fish a week. Ward recommends salmon because people often like it, and it's widely available, affordable, not too fishy, and a good source of omega-3 fatty acids. Be sure to choose lean cuts of meat (like round, top sirloin, and tenderloin), opt for skinless poultry, and watch your [portion sizes](#).
4. **Dairy.** Dairy foods are an excellent source of bone-building [calcium](#) and [vitamin D](#). There are plenty of low-fat and nonfat options to help you get three servings a day, including drinkable and single-serve tube yogurts, and pre-portioned cheeses. If you enjoy higher-fat cheeses, no problem -- just keep your portions small.

5. **Frozen Foods.** Frozen fruits and vegetables (without sauce) are a convenient way to help fill in the produce gap, especially in winter. Some of Ward's frozen favorites include whole-grain waffles for snacks or meals, portion-controlled bagels, 100% juices for marinades and beverages, and plain cheese pizza that she jazzes up with an extra dose of skim mozzarella cheese and a variety of veggies.
6. **Canned and Dried Foods.** Keep a variety of canned vegetables, fruits, and beans on hand to toss into soups, salads, pasta, or rice dishes. Whenever possible, choose vegetables without added salt, and fruit packed in juice. Tuna packed in water, low-fat soups, nut butters, olive and canola oils, and assorted vinegars should be in every healthy pantry.

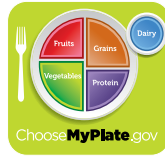
#### 4 Simple Shopping Rules

Nestle offers these simple solutions to savvy shopping without spending hours in the grocery store:

- Shop the perimeter of the grocery store, where fresh foods like fruits, vegetables, dairy, meat, and fish are usually located. Avoid the center aisles where junk foods lurk.
- Choose "real" foods, such as 100% fruit juice or 100% whole-grain items with as little processing and as few additives as possible. If you want more salt or sugar, add it yourself.
- Stay clear of foods with cartoons on the label that are targeted to children. If you don't want your kids eating junk foods, don't have them in the house.
- Avoiding foods that contain more than five ingredients, artificial ingredients, or ingredients you can't pronounce.

<https://www.webmd.com/food-recipes/features/10-tips-for-healthy-grocery-shopping#3>





# Eating better on a budget

**Get the most for your budget!** There are many ways to save money on the foods that you eat. The three main steps are planning before you shop, purchasing the items at the best price, and preparing meals that stretch your food dollars.

## 1 Plan, plan, plan!

Before you head to the grocery store, plan your meals for the week. Include meals like stews, casseroles, or soups, which “stretch” expensive items into more portions. Check to see what foods you already have and make a list for what you need to buy.



## 2 Get the best price

Check the local newspaper, online, and at the store for sales and coupons. Ask about a loyalty card for extra savings at stores where you shop. Look for specials or sales on meat and seafood—often the most expensive items on your list.

## 3 Compare and contrast

Locate the “Unit Price” on the shelf directly below the product. Use it to compare different brands and different sizes of the same brand to determine which is the best buy.

## 4 Buy in bulk

It is almost always cheaper to buy foods in bulk. Smart choices are large containers of low-fat yogurt and large bags of frozen vegetables. Before you shop, remember to check if you have enough freezer space.



## 5 Buy in season

Buying fruits and vegetables in season can lower the cost and add to the freshness! If you are not going to use them all right away, buy some that still need time to ripen.

## 6 Convenience costs... go back to the basics

Convenience foods like frozen dinners, pre-cut fruits and vegetables, and take-out meals can often cost more than if you were to make them at home. Take the time to prepare your own—and save!

## 7 Easy on your wallet

Certain foods are typically low-cost options all year round. Try beans for a less expensive protein food. For vegetables, buy cabbage, sweet potatoes, or low-sodium canned tomatoes. As for fruits, apples and bananas are good choices.



## 8 Cook once...eat all week!

Prepare a large batch of favorite recipes on your day off (double or triple the recipe). Freeze in individual containers. Use them throughout the week and you won't have to spend money on take-out meals.

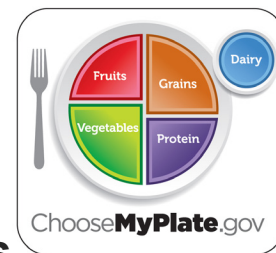
## 9 Get creative with leftovers

Spice up your leftovers—use them in new ways. For example, try leftover chicken in a stir-fry, over a garden salad, or in chili. Remember, throwing away food is throwing away your money!

## 10 Eating out

Restaurants can be expensive. Save money by getting the early bird special, going out for lunch instead of dinner, or looking for “2 for 1” deals. Ask for water instead of ordering other beverages, which add to the bill.

# smart shopping for veggies and fruits



## 10 tips for affordable vegetables and fruits

**It is possible to fit vegetables and fruits into any budget.** Making nutritious choices does not have to hurt your wallet. Getting enough of these foods promotes health and can reduce your risk of certain diseases. There are many low-cost ways to meet your fruit and vegetable needs.

### 1 celebrate the season

Use fresh vegetables and fruits that are in season. They are easy to get, have more flavor, and are usually less expensive. Your local farmer's market is a great source of seasonal produce.



### 2 why pay full price?

Check the local newspaper, online, and at the store for sales, coupons, and specials that will cut food costs. Often, you can get more for less by visiting larger grocery stores (discount grocers if available).

### 3 stick to your list

Plan out your meals ahead of time and make a grocery list. You will save money by buying only what you need. Don't shop when you're hungry. Shopping after eating will make it easier to pass on the tempting snack foods. You'll have more of your food budget for vegetables and fruits.

### 4 try canned or frozen

Compare the price and the number of servings from fresh, canned, and frozen forms of the same veggie or fruit. Canned and frozen items may be less expensive than fresh. For canned items, choose fruit canned in 100% fruit juice and vegetables with "low sodium" or "no salt added" on the label.



### 5 buy small amounts frequently

Some fresh vegetables and fruits don't last long. Buy small amounts more often to ensure you can eat the foods without throwing any away.

### 6 buy in bulk when items are on sale

For fresh vegetables or fruits you use often, a large size bag is the better buy. Canned or frozen fruits or vegetables can be bought in large quantities when they are on sale, since they last much longer.

### 7 store brands = savings

Opt for store brands when possible. You will get the same or similar product for a cheaper price. If your grocery store has a membership card, sign up for even more savings.

### 8 keep it simple

Buy vegetables and fruits in their simplest form. Pre-cut, pre-washed, ready-to-eat, and processed foods are convenient, but often cost much more than when purchased in their basic forms.



### 9 plant your own

Start a garden—in the yard or a pot on the deck—for fresh, inexpensive, flavorful additions to meals. Herbs, cucumbers, peppers, or tomatoes are good options for beginners. Browse through a local library or online for more information on starting a garden.



### 10 plan and cook smart

Prepare and freeze vegetable soups, stews, or other dishes in advance. This saves time and money. Add leftover vegetables to casseroles or blend them to make soup. Overripe fruit is great for smoothies or baking.

## **Stretch Your Food Dollars Part 2: At the Grocery Store**

Factsheet | HGIC 4221 | **Updated:** Apr 7, 2020 |

During challenging economic times, Americans try to stretch their dollars. Food is a flexible budget expense that can be reduced when money is tight.

Before going grocery shopping, figure out how much money you have for food, what foods you have on hand, and what is on sale. Make a menu plan for the week and write a shopping list based on your menus. With the planning done, you are now ready to shop.

### **When to Shop**

It's easier to stick to your shopping list and avoid impulse buys if you shop when:

- you are not rushed and have enough time to compare products and find bargains.
- you are not tired or hungry.
- you are alone, without children and other family members.
- the store is less crowded, such as mid-week, early morning or late evening.

Shop no more than once a week. The more trips you make to the store, the more you spend on groceries and gas.

### **Where to Shop**

The price of food is a primary factor in deciding where to shop. There is a variety of places to buy food items in more populated areas, including:

- supermarkets
- warehouse and bulk food stores
- wholesale clubs
- health food stores
- farmers' markets and co-ops
- drugstores
- specialty stores
- department stores
- convenience stores
- restaurants

When shopping in a supermarket, try to limit your purchases to food, unless you have extra money for nonfood items (e.g., cleaning supplies, pet food, paper products, spices, birthday and party supplies). Supermarkets often price nonfood household items, 20-40% higher than discount stores.

Rarely one grocery store has all the best prices. Store #1 may have the lowest prices on canned foods, store #2 the best buys on meats, and store #3 the freshest vegetables and fruits. If you shop at several grocery stores, go to one store this week, and then shop for bargains at a different store next week. Buy enough of each store's bargain items to last two or three weeks.

No-frills discount and warehouse stores can be less expensive because their cost of doing business is lower. Residents in rural communities may find that shopping in a warehouse store or wholesale club once a month saves money on staple foods that store easily and on nonfood household supplies.

Farmers' markets and co-ops can help families reduce food costs, although their selection of products may be more limited than in most supermarkets. Bulk foods can be lower in price than similar foods sold in packages, and you can buy just the amount you need.

Food prices in convenience stores are almost always higher, with the possible exception of items like dairy products and sodas. Although prices vary considerably, grocery items also are sold at health food stores, some drugstores, department stores, specialty stores, and restaurants.

It is a waste of your time, energy, and gasoline to shop at several stores within the same week just to pick up their specials unless these stores are en route to and from home. Besides, some stores will match advertised prices or honor coupons from other stores.

Wherever you shop, handle the merchandise with care and respect to help keep overhead down and food prices under control.

## **In the Store**

**Time is Money:** The more time you spend in the grocery store, the more money you spend! The Food Marketing Institute estimates that shoppers spend \$2.17 per minute in the store. Therefore, the most efficient way to shop is at one nearby store that has reasonable prices. By shopping at the same store, you learn their floor plan and can shop faster.

Stick to your shopping list, which is based on your week's menus. Organize your list according to the store layout or by food type and department (e.g., meats, canned foods, and dairy products). This saves time, keeps you from forgetting items, and reduces the temptation to buy foods that are not on the list.

Go up one aisle and down another, so you don't have to backtrack and won't miss any specials or needed items. Only go down the aisles that contain items on your list.

**Buy on Sale:** Unplanned purchases usually are budget wreckers. The only time to go off the shopping list is when you can get a good buy, such as a store sale or a double coupon offer.

Use in-store flyers to find items on sale. Check the flyer before your grocery store visit. If possible, stock up on sale items that you use regularly and shelf-stable items that you have space to store. A sale is easy to spot if you know the everyday prices of items you buy on a regular basis. If you can't remember, take a "cheat sheet" listing the prices you usually pay.

Pack a small calculator to compare prices quickly. If 4 cans of green beans are on sale for \$3.00, the cost is 75¢ per can. Another brand may be only 69¢ per can.

"Buy one, get one free" is not a bargain if the cost of the first item is more than a comparable brand. You don't always have to buy two items to get the savings on "two for the price of one" sales, so buy two only if you need them.

If you can use them in a timely manner, stock up on sale items and your store's weekly "loss-leaders." These are low-priced items that get you in the store, so you buy other higher-priced items. Different sections of the store are featured each week.

Beware of big displays and fancy ads. An item on a promotional table or in a bin is not always cheaper than a similar product at regular price.

End of aisle displays attracts your attention, although the prices are not always reduced. Sale items often are placed at the rear of the store, so you have to walk past all the higher-priced items to get to the sale items.

Avoid buying sample foods. Samples that are being handed out free to customers are often expensive convenience foods.

Buy larger sizes of staple foods if they are on sale, you have available storage space, and you have enough money in your food budget. Find the best buy in the size package you can use before it becomes stale or outdated. Buy only the amount you can use, or get large amounts and split the food and the cost with a friend.

Be sure to select food in the form that best fits your needs. Use chunky tuna instead of the more expensive solid-pack tuna to make a casserole, or make a congealed salad with canned "broken pieces" of peaches rather than sliced peaches. Use pineapple chunks and diced tomatoes instead of pricey pineapple rings and whole tomatoes when possible.

If the store is out of a sale item, ask for a "rain check." This is the store's promise to sell you the item at the sale price when more come in.

**Store Discount Cards:** In every supermarket where you shop, ask if you need to sign up for a store discount card to have instant access to sales. Cardholders usually are offered in-store discounts and may get extra coupons printed on the back of store receipts. In some stores, you can earn purchase points toward a reward (e.g., Thanksgiving turkey).

**Coupons:** The Sunday inserts in your local paper usually have \$50 to \$75 worth of coupons. If you use coupons, you can save at least 10 to 15 percent on your grocery bill, according to the Coupon Trends Analysis for Consumer Packaged Goods (CPG) year-end 2017 findings, consumers have saved over \$3.1 billion from the use of coupons. Using coupons for coffee, cereals, prepared foods, flour, and flour mix products adds up to about a 10 percent savings.

Use coupons only for foods you normally buy, and if a cheaper store brand is not available. If possible, shop on double or triple coupon days to stretch the value of coupons. Most coupons are good for at least three months, so you can use them during categorical sales, which are rotated on about a 12-week (three months) cycle.

Find out each store's rules for using coupons, and don't rely on cashiers to know. Ask whether a store honors coupons from other stores or matches advertised prices.

Have printed coupons ready when in-store. Printed coupons can be obtained from websites or by joining an internet coupon group and exchange coupons. Remember to mail in coupons for manufacturers' rebates and refunds.

Organize your coupons, circle the expiration dates, and use them before they expire. If it's too difficult for you to be a serious "couponer," then buy items that are on sale.

Look at the back of your grocery receipt. Sometimes it contains great coupons for future purchases. Also, find out if the store gives rebates for recycling or offers easy ways to go green.

**Convenience Foods:** These can increase your food bill and your waistline. You can buy a lot of nutritious carrots, apples, bananas, and potatoes for the price of a large bag of chips and a box of cookies.

Don't pay for convenience foods. Save money on groceries by taking a few minutes to do some of the work yourself. Lookup a recipe for pasta salad and make your own rather than buy the pasta meal kit. Make your own iced tea, wash your own lettuce, peel your own carrots, and chop your own onions.

Make your own "ready-to-eat" and convenience foods. Convenience foods are products like fancy baked goods, frozen meals, and vegetables with seasoning and sauces. The same foods made from scratch at home may contain less fat, sugar, and salt.

To save money and be healthier, select nutritious treats like nuts, sunflower seeds, and dried or fresh fruit. Skip the junk food aisle and pass up "empty calorie" foods (e.g., chips, candies, and soft drinks). Sweets, chips, and sodas do not contribute any real nutritional value to your diet.

Purchase large containers of applesauce, yogurt, cereal, and snacks and transfer individual servings into reusable containers or zip lock bags for bagged lunches and snacks. Those 100-calorie packs of crackers, chips, etc. cost an estimated 20% to 100% more than the regular-size packages.

Avoid foods that are packaged together (e.g., cheese and crackers, meat and cheese trays, and frozen garlic cheese bread) when you can buy the items separately for less. However, when your schedule is hectic, labor-saving, and step-saving ingredients often are worth the extra cost.

**Look High & Look Low:** You may have to do a little bending and stretching to find bargains. More expensive items are at “eye-level.” Store brands that may be cheaper and just as good are often placed higher or lower on the grocery shelves. Items that the store most wants to sell are located on the shelves between knee-height and shoulder-height. The highest markup items are at about chest level, making them easy to grab and toss in the cart. Sweet cereals are placed at children’s eye levels. Lower-priced items are on the bottom shelves.


**Buy Store & Generic Brands:** National brands usually cost more due to advertising costs. Many store brands are from the same processors as the national brands and sell for a lower price while matching the national brand’s quality. They often are less expensive than name brands bought with a coupon. The only way to know if a certain product will work at your house is to try it.

**Compare Unit Prices:** Similar foods may be packaged in different-size containers, making it hard to compare prices. The quick, easy way to find the best buy is to check the unit price of an item, and then choose the food that has the lowest price per unit. However, if the store does not provide the unit price, then calculate the old fashioned way by dividing the price by the weight of the item.

The unit price is the cost per pound, ounce, pint, quart, gallon, or some other unit of measure. Many grocery stores provide it on a printed label attached to the shelf directly below the product. Although the shelf sticker may look different from store to store, the unit price label provides the following basic information:

- size of package
- the total price of the item
- amount in the package
- unit price

This is an example of a unit price label, which is located below a product on a grocery store shelf.

Unit Price <b>\$.20 per oz.</b>	Total Price <b>\$2.40</b>
	12 oz.
Oat Bran Cereal	

Unit price helps you compare national brands with the store and generic brands, which almost always cost less than national brands and usually taste as good. It is also a handy tool for comparing different forms of the same food (e.g., canned, frozen, and fresh) and different package sizes of the same brand (e.g., economy-size, regular-size, single-serve, and bulk).

Figure the unit pricing for ready-to-eat breakfast cereal a different way. One cup is a serving size for most cereals, so compare the price per cup rather than the cost per ounce, as indicated by the unit price on the shelves of many stores. The Nutrition Facts label lists the number of servings per box.

**Buy in Bulk:** Pay for the food, not the package. Bulk items usually cost less, because you don't pay for packaging and handling. About 90 percent or more of the cost of a food item may be just for the package. This includes the packaging for advertised brands, individually packaged foods, canned foods, and convenience foods.

Large containers do not always cost less than small ones. Since stores know that shoppers may want to buy in bulk, they sometimes mix it up by pricing the bulk item to cost more. The only way to know for sure is to check the unit price. If your store doesn't provide the unit price label on the shelf, then use your calculator to figure it out for yourself.

**Check Food Labels:** The label is the "window" to the product and is the most accurate way to know what you are actually buying. It includes the common name of the item, the number of contents in the package, an ingredient list, nutrition labeling, and the name and address of the manufacturer, processor or distributors. In addition, many labels include safety guidelines, preparation tips, and freshness dating.

The Nutrition Facts label helps you find the most nutrition for your food dollar and plan healthy meals. It tells you how many servings are in the container and how many calories are in a serving.

Use the % Daily Value (DV) to compare amounts of nutrients in foods. Identify nutrient-dense foods that contain more fiber, vitamins, and minerals but contain low amounts of saturated fat, trans fat, cholesterol, sugar, and sodium. Less than five percent of the DV is considered low, and 20 percent or higher DV is considered high.

Read the ingredients label. Ingredients are listed from "most" to "least," or in order of their predominance by weight. If water is the first ingredient and sugar is the second, you know the item is mostly water and sugar and contains very little, if any, nutrients.

Appearance can be misleading, so check the quantity or amount of the contents. (e.g., How many ounces are in the bag?) Items that are packaged in individual servings are usually more expensive.

**Check Expiration Dates:** Buy foods at their peak. The freshest foods last longer. To identify the freshest foods at the market, check the dating information (e.g., "sell by" and "best used by" dates) stamped on the label. Most perishable items (e.g., milk, cheese, packaged meats, and other



refrigerated items) have a “sell by” or “pull by” date. This is the last date the product should be sold. If you store them properly, they will stay fresh and safe for a few days after this date.

Products that are reaching their “sell by” dates are often reduced in price (e.g., overripe bananas or meats that have turned dark). These are good buys only if you can use them before they spoil.

“Best used by” or “freshness” dates are stamped on products like bakery goods and packages cereals. After this date, the food may lose some freshness and nutritional value. Products such as yeast and refrigerated dough have a “use by” or “expiration” date that is the last date it should be eaten or used.

Canned goods and other foods that can be kept a long time have a “pack” date or the date it was manufactured, processed, and packaged. Go through kitchen cabinets regularly to make sure that canned and packaged foods are used before their expiration dates.

## **Food Shopping Guidelines**

**Shop the Store’s Perimeter:** Grocery stores are designed to encourage shoppers to spend money. Try to stick to the outer perimeter, or edges, of the grocery store. Fresh produce, meats, dairy, bread, and healthier, less processed foods usually are found in this area. Keep foods safe by shopping for cold items last.

Try not to go down every aisle, especially the “empty calorie aisles.” This reduces the temptation to buy foods that are not on your list, and it also saves time. The inner aisles contain items such as baking ingredients, ethnic foods, beverages, seasonings, and convenience foods.

**Use USDA’s MyPlate to Choose Foods:** The food groups in MyPlate are grains, vegetables, fruits, milk, meat, and beans. For more information, refer to [www.choosemyplate.gov](http://www.choosemyplate.gov).

Follow these guidelines to find the most nutrient-dense, economical foods from each group.

**Grains:** For nutrition, fiber, and variety at a low cost, choose more brown rice, whole-grain, and whole-wheat bread, cereals, pasta, and other grain products. Select white bread and rolls that are made from enriched flour. Plain bread and cereals are usually less expensive than fancy varieties.

Skip the quick-cooking and pre-seasoned varieties of rice, oatmeal, and grits. Cooking regular varieties saves money, sugar, and calories.

“Day-old” bread costs less but is still nutritious. Small households may buy small loaves of bread or wrap and freeze what isn’t used right away.

**Vegetables & Fruits:** Fresh produce varies more in price than food in other forms. Generally, in-season vegetables and fruits are fresher and cost less. Ask the store’s produce manager for delivery days so you can get your favorite items at their freshest. Always check fresh vegetables and fruits carefully to make sure they are in top shape with no bruising, wilting, etc. When possible shop, for locally grown produce at farmers’ markets and small food stores.

Buy a head of lettuce and wash it instead of buying pre-bagged lettuce or salad mixes. These are usually more expensive and spoil faster than salads you make from scratch.

Compare the cost per edible measure of fresh versus frozen, canned, dehydrated, and partly or completely prepared. Fresh produce may require extra preparation time, and there may be some waste (e.g., corn shucks). Smaller-sized fruits and vegetables may be cheaper than larger ones.

If fresh vegetables and fruits are out of season and cost too much, then buy frozen vegetables and fruits. They are picked when fully ripe and quickly frozen, which preserves their nutrition and flavor. Canned and frozen vegetables and fruits are healthy, will last longer, and are a smart choice all year long. Avoid items with added salt or sugars, and choose those canned in water or in their own juice rather than in heavy syrup. Do not buy dented or bulging cans and jars with bulging or cracked lids.

Buy large bags of frozen vegetables. To reduce waste, take out only what you need, close the bag tightly, and quickly return the rest to the freezer.

Foods at salad bars can be expensive. However, it could save you money if you need only a small amount of a vegetable, and it reduces the amount you waste.

**Dairy:** Choose low-fat milk and milk products. (However, children under two years of age should drink only whole milk.) Non-fat dry milk is the least expensive form of milk. It can replace the more expensive regular milk for cooking. Place the box of powdered milk inside a large freezer bag and store it in the freezer. Evaporated skim milk also is inexpensive and especially good for cooking.

When using instant non-fat dry milk as a beverage, mix it, and chill thoroughly for several hours for better taste. Or, mix an equal amount of regular milk with non-fat dry milk made by the directions.

Buy fresh, low-fat, or skim milk in the largest size you can use before it spoils because larger containers usually cost less than smaller sizes. Ultra-pasteurized milk has a longer expiration date and won't spoil as fast.

For quality purposes, dairy products are required to carry an open shelf removal date, although items are usually still usable for a short time following their shelf-removal date. Unless you plan to use an item immediately, look for a date that is as distant as possible. Select perishable dairy products last so they stay cold in your cart.

**Protein Foods:** Peanut butter, dried beans, and peas are good sources of protein and fiber, and they last a long time without spoiling. Eggs, turkey, and chicken are usually economical choices, especially if you buy whole chickens and cut them up yourself. Fish is a good protein source that is usually low in fat, particularly saturated fat.

Since meat is the most expensive item on the plate, look for ways to save money on it. Hamburger is often a good buy in red meats. Stretch meats by using them in sauces or casseroles.

Tenderize less expensive cuts of meat by marinating or slow cooking. Less expensive meats are good in stew, soup, and stir fry and are just as nutritious.

Look for special sales at the meat counter. Find out what day and time of day your store reduces meat prices for a quick sale, and shop at that time. Ask the butcher to run cheaper, tougher cuts of meat through the tenderizer. Request that they mark down a package that has a “sell-by” date today. Buy in large bulk packages and freeze portions you don’t use right away. Put raw meat in a plastic bag and keep it separate from other foods in the cart.

Lower-fat cuts of beef usually have “round” or “loin” in the name, and leaner cuts of pork or lamb contain the words “loin” or “leg.” Try chuck or bottom round roast, which is cheaper and has less fat than sirloin. To make these meats tender, cover, and cook them longer.

Compare the cost per serving, not cost per pound, of various cuts and types of meats. Ground turkey and beef have 4 servings per pound, but spare ribs have only 1½ serving. Bones and fat add a lot to the price, try to stretch your dollars by purchasing meat with little to no bones or fat.

Reduce portion sizes. A moderate-size portion is 3 ounces of cooked meat. Try alternative protein sources, such as beans, soy, tofu, cheese, and eggs.

### **At the Checkout**

**Ignore Magazines, Candy & Soda Displays:** These are the store’s last attempts to get you to spend money. Resist the urge to buy a magazine, read or check one out from the public library instead. If you ate the recommended healthy snack before shopping, you could resist buying a candy bar.

**Be Ready to Check out:** Save time by having your money, check, or credit card ready. Unload items with prices up and with multiple-priced items together. Shopping with a partner allows one person to unload, and the other to watch items get scanned.

**Watch the Register or Check Your Receipt:** Make sure prices ring up as advertised or as indicated on the shelf label. Watch for potential pricing errors such as:

- A product gets scanned twice.
- The sale price of an item hasn’t been entered into the computer.
- An item you thought was on sale was only out of place, so it rings up at the regular price.
- The checker enters the wrong code for a produce item they don’t recognize.

Some stores give you the item for free when they ring up the wrong price. Ask if your store does this. Make sure your change is correct, also.

Use itemized food receipts to track food costs. If you buy nonfood items at the grocery store, separate them from food items when checking out. This makes it easy to divide your bill to find out what you actually spent on food. Remember that nonfood items may be cheaper at a discount store.

**Bag Grocery Items Correctly:** Make sure that all your groceries get put into your bag or cart, and the breakable and crushable items are bagged correctly. Ask that cold foods be bagged together so you can spot them easily and unpack them first when you get home. Pack vegetables, fruits, and eggs on top or in separate bags. Put cold and frozen foods in your shopping cart last. This includes items such as frozen vegetables, meats, dairy products, eggs, and salad bar ingredients.

Ask if your grocery store gives a discount for bringing your own bag. If so, you'll save the planet and your money!

### **On the Way Home**

Protect the quality and safety of the food you purchased. Place fragile foods (e.g., fresh produce and eggs), so they will not be bruised or crushed.

Carry food home as quickly as possible, especially in warm weather. Make sure frozen foods don't thaw and keep cool any other highly perishable foods (e.g., meats, milk, and eggs). Keep perishables out of direct sunlight or a hot trunk. It's a good idea to have a cooler in your vehicle for keeping perishable foods safe on the way home, especially in warm weather. On cold winter days, don't leave fragile produce in the car and allow it to freeze.

### **For More Information**

To learn more about saving money on food, refer to [HGIC 4220, \*Stretch Your Food Dollars Part 1: Before Going to the Store\*](#) and [HGIC 4222, \*Stretch Your Food Dollars Part 3: At Home\*](#).

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### **Original Author(s)**

[Katherine L. Cason](#), PhD, Former Professor, State Program Leader for Food Safety and Nutrition, Clemson University.

[Janis G. Hunter](#), Retired HGIC Nutrition Specialist, Clemson University

### **Revisions by:**

[Faith C Isreal](#), Extension Agent Assistant, Richland County Extension

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<https://hgic.clemson.edu/factsheet/stretch-your-food-dollars-part-2-at-the-grocery-store/>