Antioxidants
Fight Aging with Food!

What are antioxidants?
≈ Antioxidants are substances that stabilize free radicals
≈ Free radicals are chemicals produced by pollution, UV light, radiation, and toxic substances and cause damage to cells in the body

Diseases linked to free radicals:
- Cancer
- Heart disease (also referred to as cardiovascular disease)
- Type 2 diabetes
- Arthritis and rheumatoid arthritis
- Cataracts
- Alzheimer's disease
- Parkinson's disease
- Urinary tract infections (also referred to as UTIs)
- Lowered immune response to infection

Antioxidants primarily come from vitamins, minerals, and phytochemicals

Vitamins
- Vitamin A (retinol): liver, fortified milk, eggs, butter, and cheese
- Beta-carotene (vitamin A precursor, considered a phytonutrient): carrots, sweet potatoes, pumpkin, spinach, apricots, broccoli, kale, and cantaloupe
- Vitamin C (ascorbic acid): bell peppers, strawberries, citrus fruits, kiwi, pineapple, sweet potatoes, and broccoli
- Vitamin E (tocopherol): vegetable oils, nuts, seeds, soybeans, avocado and wheat germ

Minerals
- Selenium: organ meats, tuna, pork, seafood, fish, ricotta cheese, couscous, whole wheat spaghetti, and nuts
- Zinc: beef, crab, fortified breakfast cereals, pork, cashews, lobster, and baked beans

Phytochemicals (also referred to as phytonutrients)
- Lycopene: tomatoes/tomato products, red peppers, watermelon
- Organosulfur compounds: onions, leeks, shallots, and garlic
- Lutein: spinach, broccoli, artichokes, Brussels sprouts
## Top 3 Phytochemical Groups

<table>
<thead>
<tr>
<th>Phytochemical(s)</th>
<th>Colors</th>
<th>Food source</th>
<th>Potential Health Benefits</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Carotenoids:</strong></td>
<td></td>
<td></td>
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</tr>
<tr>
<td>Beta-carotene</td>
<td>Yellow/Orange &amp; Dark Green</td>
<td>Pumpkin, sweet potatoes, carrots, spinach, broccoli, kale</td>
<td>Immune system, vision, skin health, bone health</td>
</tr>
<tr>
<td>Lycopene</td>
<td>Red</td>
<td>Watermelon, tomatoes/tomato products, red peppers</td>
<td>May help prevent prostate cancer, promotes heart health</td>
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<tr>
<td>Lutein</td>
<td>Green</td>
<td>Brussels sprouts, lettuces, broccoli, spinach</td>
<td>Eye health, heart health, may prevent certain cancers</td>
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<tr>
<td>Zeaxanthin</td>
<td>Green &amp; Yellow/Orange</td>
<td>Spinach, kale, corn, nectarines, tangerines</td>
<td>May help prevent macular degeneration</td>
</tr>
<tr>
<td><strong>Flavonoids:</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Anthocyanidins</td>
<td>Blue/Purple &amp; Red</td>
<td>Blueberries, plums, red potatoes, blackberries, cranberries, raspberries, red onions, strawberries</td>
<td>Blood vessel health, may inhibit inflammation and tumor growth</td>
</tr>
<tr>
<td>Proanthocyanidins</td>
<td>Blue/Purple &amp; Red</td>
<td>Berries, grapes/juice, cocoa, tea, red wine, dark chocolate cranberries/juice</td>
<td>May reduce the risk of heart disease and cancer, may protect against UTIs</td>
</tr>
<tr>
<td>Flavon-3-ols</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>Flavones</td>
<td>Green &amp; Red</td>
<td>Celery, lettuce, parsley, Brussels sprouts, cabbage, spinach, beets, cauliflower</td>
<td>May have anti-inflammatory and anti-cancer effects</td>
</tr>
<tr>
<td>Flavanones</td>
<td>White, Red &amp; Yellow/Orange</td>
<td>Citrus fruits and juices</td>
<td>May help lower blood pressure, inflammation, and cholesterol</td>
</tr>
<tr>
<td>Flavonols</td>
<td>Blue/Purple, Green, White, Yellow/Orange &amp; Red</td>
<td>Berries, spinach, onions, apples, cranberries, grapes, broccoli</td>
<td>May have anti-inflammatory and anti-cancer effects</td>
</tr>
<tr>
<td><strong>Other Groups:</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Resveratrol</td>
<td>Red &amp; Blue/Purple</td>
<td>Grape skin, grape juice, red wine</td>
<td>May have anti-inflammatory effects</td>
</tr>
<tr>
<td>Indoles &amp; Isothiocyanates</td>
<td>White &amp; Green</td>
<td>Broccoli, kale, cauliflower, cabbage</td>
<td>May protect against cancer</td>
</tr>
<tr>
<td>Organosulfur compounds</td>
<td>White &amp; Green</td>
<td>Chives, leeks, garlic, onions/shallots</td>
<td></td>
</tr>
<tr>
<td>Ellagic Acid</td>
<td>Red &amp; Blue/Purple</td>
<td>Berries</td>
<td></td>
</tr>
</tbody>
</table>

**Note:** This is not an exhaustive list of antioxidants and this information not intended to replace medical advice pertaining to your health or disease management or prevention. **Resource:** Produce for Better Health Foundation
# Veggies

## ARTICHOKE
### How to Select
Choose plump artichoke heads with tightly closed leaves, heavy for size. Pull back one leaf to check heart for black blemishes. During winter, white, blistered or bronze appearance does not affect quality.

### How to Store
Refrigerate artichokes in plastic bag up to one week. Keep dry to prevent mold growth.

## CAULIFLOWER
### How to Select
Choose cauliflower with compact, creamy white curds and bright green, firmly attached leaves. Avoid brown spots or loose sections that are spread out.

### How to Store
Refrigerate cauliflower in plastic bag up to 5 days.

## ASPARAGUS
### How to Select
Choose odorless asparagus stalks with dry, tight tips. Avoid limp or wilted stalks.

### How to Store
Refrigerate asparagus for up to four days by wrapping ends of stalks in wet paper towel and placing in plastic bag.

## CELERY
### How to Select
Choose straight, rigid celery stalks with fresh leaves. Avoid pithy, woody or limp stalks. Should smell fresh, not musty.

### How to Store
Refrigerate celery in a plastic bag for a week or more.

## BELL PEPPER
### How to Select
Choose firm, brightly colored peppers with tight skin that are heavy for their size. Avoid dull, shriveled or pitted peppers.

### How to Store
Refrigerate bell peppers in plastic bag for use within 5 days.

## COLLARD GREENS
### How to Select
Choose bunches with dark green leaves with no yellowing.

### How to Store
Refrigerate collard greens in a plastic bag for up to 5 days.

## BROCCOLI
### How to Select
Choose odorless broccoli heads with light, bluish-green florets.

### How to Store
Refrigerate broccoli and use within 3-5 days.

## CUCUMBER
### How to Select
Choose firm, well shaped cucumbers with dark green color, heavy for size.

### How to Store
Refrigerate cucumbers in plastic bag up to 1 week.

## BRUSSELS SPROUTS
### How to Select
Choose firm, compact, bright green brussels sprouts heads. Buy on stalk when possible.

### How to Store
Refrigerate brussels sprouts in plastic bag up to 1 week.

## GREEN BEANS
### How to Select
Choose fresh, well colored beans that snap easily when bent.

### How to Store
Refrigerate beans in plastic bag, use within 1 week.

## CARROT
### How to Select
Choose well-shaped, smooth, firm, crisp carrots with deep color and fresh, green tops. Avoid soft, wilted or split carrots.

### How to Store
Refrigerate carrots in plastic bag with tops removed up to 2 weeks.

## GREEN CABBAGE
### How to Select
Choose green cabbage heads with compact leaves that are heavy for their size.

### How to Store
Refrigerate green cabbage for up to 7 days.
GREEN ONION
- How to Select: Choose stalks with fresh, green tops and slightly white ends.
- How to Store: Refrigerate green onions in plastic bag for use as soon as possible.

RHUBARB
- How to Select: Choose flat stalks that are not cut or limp. Deep red stalks are sweeter and richer. Tenderness is not related to size.
- How to Store: Refrigerate rhubarb in a plastic bag, use within a few days.

ICEBERG LETTUCE
- How to Select: Choose plump heads, heady for their size, with tightly closed leaves. Pull back one leaf to check heart for any black blisters. During winter, white blistered or bronze appearance does not affect quality.
- How to Store: Refrigerate in plastic bag up to one week. Keep dry to prevent mold growth.

LEAF LETTUCE
- How to Select: Choose lettuce with crisp leaves. Avoid brown edges.
- How to Store: After purchase, rinse well and dry with paper towels. Refrigerate leaf lettuce in plastic bag up to 1 week.

ROMAINE LETTUCE
- How to Select: Choose fresh, crisp, green bunches with no evidence of insect damage.
- How to Store: Loosely wrap spinach in damp paper towel. Refrigerate in plastic bag for use within 3-5 days.

MUSHROOMS
- How to Select: Choose well shaped mushrooms with firm texture. Avoid spots and slime.
- How to Store: Refrigerate mushrooms in original container or paper bag up to 1 week.

LEAF SQUASH
- How to Select: For all squash varieties, choose glossy, small- to medium-sized squash, heavy for size.
- How to Store: Refrigerate summer squash for use within 3-4 days.

ONION
- How to Select: Choose onions that are firm and dry with bright, smooth outer skins.
- How to Store: Store whole onions in a cool, dark, well ventilated place for use within 4 weeks. Refrigerate cut onions in a tightly sealed container for use within 2-3 days.

SWEET CORN
- How to Select: Choose ears with green husks, fresh silks and tight rows of kernels.
- How to Store: Refrigerate corn with husks on for use as soon as possible or within 1-2 days.

POTATO
- How to Select: All potato varieties should be clean, firm, smooth, dry and uniform in size.
- How to Store: Store potatoes in a cool, dark, well ventilated place for use within 3-5 weeks.

RADISHES
- How to Select: Choose smooth, brightly colored, medium sized radishes. Attached tops should be green and fresh looking.
- How to Store: Refrigerate radishes in plastic bag for use within 5 weeks. Remove tops before storing.

SWEET POTATO
- How to Select: Choose firm, small- to medium-sized potatoes with smooth skin. Avoid cracks, soft spots and blemishes.
- How to Store: Store sweet potatoes in a cool, dark place for use within 3-5 weeks.

TOMATO
- How to Select: Choose tomatoes with bright, shiny skins and firm flesh.
- How to Store: Store at room temperature away from direct sunlight, for use within 1 week after ripe. Tomatoes taste best if not refrigerated; refrigerate only if you can't use them before they spoil.
Leafy Greens: Inflammation Fighters!

Is inflammation good or bad? Both! Acute inflammation is a necessary part of healing; it sends white blood cells to the scene when we’re injured or ill. Chronic inflammation, however, is unhealthy; it can cause problems in almost every organ in the body and is thought to be a root cause of many chronic conditions from diabetes and arthritis to hay fever and heart disease.

The good news is that eating a wide range of healthy, whole foods can help fight dangerous chronic inflammation. One good inflammation-fighting choice most of us don’t get enough of is dark, leafy greens.

Leafy greens like spinach, kale, chard, arugula, endive, turnip greens, beet greens, and collard greens all contain significant concentrations of vitamins and other nutrients that have been found to reduce chronic inflammation. Vitamin A, vitamin D, vitamin E and vitamin K, just to name a few, have all shown, in research, that they can fight inflammation. Many leafy greens also contain alpha-linolenic acid, an omega-3 fat that is known for its anti-inflammatory benefits.

When you’re choosing leafy greens, keep these tips in mind:

▲ **Choose darker greens.** In general, the darker the color of greens, the more healthy nutrients they contain. Iceberg lettuce is a lightweight compared to spinach and kale, for instance.

▲ **Pair greens with olive oil.** Many of the important vitamins in greens can only be absorbed by our bodies in the presence of oil. In one study, researchers found that people eating a salad of spinach, romaine, tomatoes and carrots absorbed plenty of nutrients with a full-fat salad dressing – but only a “negligible” amount when they chose fat-free salad dressing.¹

▲ **Enjoy greens both raw and cooked.** While cooking makes some nutrients easier to absorb, heat diminishes or destroys others. So eat some of your greens cooked, and enjoy others in salads.

¹ *American Journal of Clinical Nutrition*, Brown et al., 2004 Aug;80(2):396-403
What Color Are Your Fruits and Vegetables?

You’ve probably heard the old cliché, “Variety is the spice of life.” Well, when it comes to food and nutrition, variety helps ensure we get all the nutrients our bodies need for good health. Vegetables and fruits come in a multitude of colors, textures, shapes, and flavors. They provide a variety of vitamins and minerals, as well as fiber. So go ahead: liven up your plate with a range of colors to provide a nutritious meal.

<table>
<thead>
<tr>
<th>Color</th>
<th>Fruit</th>
<th>Vegetable</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Green</strong></td>
<td>Avocados, green apples, green grapes, honeydew melons, kiwi, and lime</td>
<td>Artichoke, asparagus, broccoli, cabbage, green beans, green peppers, okra, and leafy greens, such as kale and spinach</td>
</tr>
<tr>
<td><strong>Orange and deep yellow</strong></td>
<td>Apricots, cantaloupe, grapefruit, mangoes, oranges, papayas, peaches, pineapples, yellow apples, and yellow figs</td>
<td>Carrots, yellow and orange peppers, yellow corn, sweet potatoes, and winter squash</td>
</tr>
<tr>
<td><strong>Purple and blue</strong></td>
<td>Blackberries, blueberries, plums, purple figs, Concord grapes and raisins</td>
<td>Eggplant, purple cabbage, purple-fleshed potatoes</td>
</tr>
<tr>
<td><strong>Red</strong></td>
<td>Cherries, cranberries, pomegranate, red/pink grapefruit, red grapes, and watermelon</td>
<td>Beets, red onions, red peppers, red potatoes, rhubarb, and tomatoes</td>
</tr>
<tr>
<td><strong>White, tan, and brown</strong></td>
<td>Bananas, pears, dates, and white peaches</td>
<td>Cauliflower, jicama, mushrooms, onions, parsnips, turnips, white-fleshed potatoes, and white corn</td>
</tr>
</tbody>
</table>
Cucumber  Pinto beans  Eggplant
Green pepper  Mushrooms  Onions
Kidney beans  Green peas  Pumpkin
Garlic  Olives  Beets
Vegetable Subgroups Matching Activity (INSTRUCTIONS)
Test your participants knowledge of vegetables and their benefits by matching them to their subgroup category.

The five vegetable subgroups associated with 2015-2020 DGA are:
1. Dark-Green Vegetables
2. Red & Orange Vegetables
3. Legumes (Beans & Peas – Tip: not all “peas” are considered legumes)
4. Starchy Vegetables
5. Other Vegetables

Activity instructions for a small group (15 people or less):
✓ Print copies of the 24 vegetables (pages 1-2) for about half of the participants in the group and have them partner up
(Note: if there is an odd number of people present, have a group of three people)
✓ Provide scissors for participants to cut out the vegetables OR pre-cut the vegetable pictures so they are ready for the activity
✓ Provide sheets with the labeled 5 subgroups for vegetable pictures to be attached (pages 4-5)
✓ Provide tape, glue sticks, or glue to attach the vegetables to the subgroup categories

Activity instructions for a large group (15 people or more):
✓ Ask participants to form groups of 5 to 10 people (can be at the same table)
✓ Print several copies of the 24 vegetables (pages 1-2) and provide 12 or more vegetable cut outs per group (or 1 page to cut out per table)
✓ Provide scissors for participants to cut out the vegetables OR pre-cut the vegetable pictures so they are ready for the activity
✓ Provide sheets with the labeled 5 subgroups for vegetable pictures to be attached (pages 4-5)
✓ Provide tape, glue sticks, or glue to attach the vegetables to the subgroup categories

Ask participants to attach the vegetable cut-outs on the sheets of paper with their respective subgroup
Allow 10-15 minutes for them to do this
Review the correct vegetables for all five subgroups (see page 7 for answer key)
Finally review and discuss the vitamins, minerals, and antioxidants associated with each vegetable subgroup (page 6)
Place the vegetable cut-outs in the correct subgroup

1. Dark-Green Vegetables

2. Red & Orange Vegetables

3. Legumes (Beans & Peas – Tip: not all “peas” are considered legumes)
Place the vegetable cut-outs in the correct subgroup

4. Starchy Vegetables

5. Other Vegetables (please use back side of this sheet for any that do not fit on this page)
Nutrients & Potential Benefits for each Vegetable Subgroup

Please also refer to “Fight Aging with Food” handout for additional vitamin and antioxidant information

1. Nutrients found in certain **Dark-Green Vegetables:**
   - Beta-carotene, zeaxanthin, lutein, vitamin E, iron, vitamin K, folic acid – important for eye health, skin health, heart health, blood health, may help prevent macular degeneration (eye disease common with aging) and certain types of cancer

2. Nutrients found in certain **Red & Orange Vegetables:**
   - Vitamin A, beta-carotene, lycopene, flavonoids, vitamin C – important for eye health, skin health, may help to prevent certain types of cancer

3. Nutrients found in certain **Legumes** (Beans & Peas – Tip: not all “peas” are considered legumes):
   - Thiamin, iron, fiber, zinc, vitamin E and vitamin K (soybeans) – important for blood health, bowel health/regularity, heart health

4. Nutrients found in certain **Starchy Vegetables:**
   - Zeaxanthin, anthocyanidin, vitamin B3 (niacin), vitamin B5 (pantothenic acid), vitamin B6 (pyridoxine) – important for blood vessel health, may inhibit inflammation and tumor growth, energy metabolism, immune health

5. Nutrients found in certain **Other Vegetables:**
   - Organosulfur compounds (found in onions, garlic, leeks) may protect against certain cancers
   - Flavones (found in celery, cabbage, beets, cauliflower) may have anti-inflammatory and anti-cancer effects
   - Folic acid, vitamin K (found in asparagus) important for blood health
   - Riboflavin, pantothenic acid, (found in mushrooms) important for energy metabolism
Answer Key: Vegetables That Belong in Each Subgroup:

1. Dark-Green Vegetables
   - Broccoli

2. Red & Orange Vegetables
   - Pumpkin
   - Sweet potato
   - Carrots
   - Tomatoes
   - Red pepper

3. Legumes (Beans & Peas – Tip: not all “peas” are considered legumes)
   - Black beans
   - Pinto beans
   - Kidney beans

4. Starchy Vegetables
   - Russet potato
   - Corn
   - Green peas

5. Other Vegetables
   - Beets
   - Olives
   - Garlic
   - Onions
   - Mushrooms
   - Green pepper
   - Eggplant
   - Cucumber
   - Celery
   - Iceberg lettuce
   - Avocado
Blueberry Chicken Salad
Number of Servings: 4  Preparation/Cook Time: 20 minutes

Ingredients:
• 2-4oz chicken breasts, cooked, diced (grilled, boiled or baked)
• 1/2 cup red onion, chopped
• 1 tablespoon white vinegar
• 1/2 cup minced green onion
• 1/4 cup flat leaf parsley, chopped
• 1/4 cup dried cranberries
• 1 cup fresh blueberries (or frozen, thawed and drained)
• 1/2 cup low fat mayonnaise
• 2 tablespoons non-fat plain yogurt or plain Greek yogurt
• 1/4 cup Dijon mustard
• 1/4 cup sliced almonds, toasted (or sunflower seeds)

Recipe in part, courtesy of the Chilean Fresh Fruit Association
Blueberry Chicken Salad

Instructions:
1. Place diced chicken breast in a mixing bowl.
2. Sprinkle red onion with vinegar and add to the bowl.
3. To the same bowl, add green onion, parsley, cranberries and blueberries. Fold gently to mix ingredients.
4. In a small mixing bowl add mayonnaise, yogurt, and mustard. Blend well and fold dressing into salad.
5. Garnish with toasted almonds (or sunflower seeds) and serve with whole grain crackers, whole grain bread or pita bread.

Tips:
- For a nut-free version, swap the almonds for sunflower seeds.
- Try chopped dried apricots or golden raisins in place of the cranberries.

Nutrition Facts (per serving and does not include crackers or bread):
- Calories: 220
- Protein: 16gm
- Total Carbohydrates: 21gm
- Fiber: 3gm
- Total Fat: 7gm
- Cholesterol: 36mg
- Sodium: 663mg
**Chipotle-Lime Three Bean Salad**

Number of Servings: 8  Preparation/Cook Time: 30 minutes

**Ingredients:**
- 1-15 ounce can black beans, drained and rinsed (no-added-salt preferred)
- 1-15 ounce can garbanzo beans, drained and rinsed (no-added-salt preferred)
- 1-15 ounce can red kidney beans, drained and rinsed (no-added-salt preferred)
- 1 tablespoon, finely chopped green onion
- 1 red bell pepper, chopped
- ½ cup cilantro, finely chopped
- 2 teaspoons chipotle in adobo sauce*
- 1 teaspoon sugar
- Pinch of salt (optional)
- Juice of 2 limes and zest of 1 lime

*Chipotle in adobo sauce is a bold, smoky ingredient often used in Mexican cuisine, adding depth and flavor to dishes.
Chipotle-Lime Three Bean Salad

Instructions:
1. Place the black beans, garbanzo beans and kidney beans in a large bowl. Add the green onion, bell pepper, and cilantro and stir to combine.
2. In a small dish, stir together the chipotle in adobo sauce, sugar, salt (if using), lime juice and lime zest.
3. Pour the lime dressing over the beans and stir to combine. Place in the refrigerator for at least 15 minutes before serving to let the flavors infuse.

*Tip: this is the sauce from canned chipotle peppers in adobo. If you want to add spicier flavor add a whole chipotle pepper to a food processor with the sauce, puree and add to bean dressing. For a quick substitute, use 1 teaspoon chipotle chili powder for the sauce.

Nutrition Facts (per serving):
Calories: 171  Protein: 9gm  Total Carbohydrates: 31gm
Fiber: 9gm  Total Fat: 1gm  Cholesterol: 0mg  Sodium: 359mg