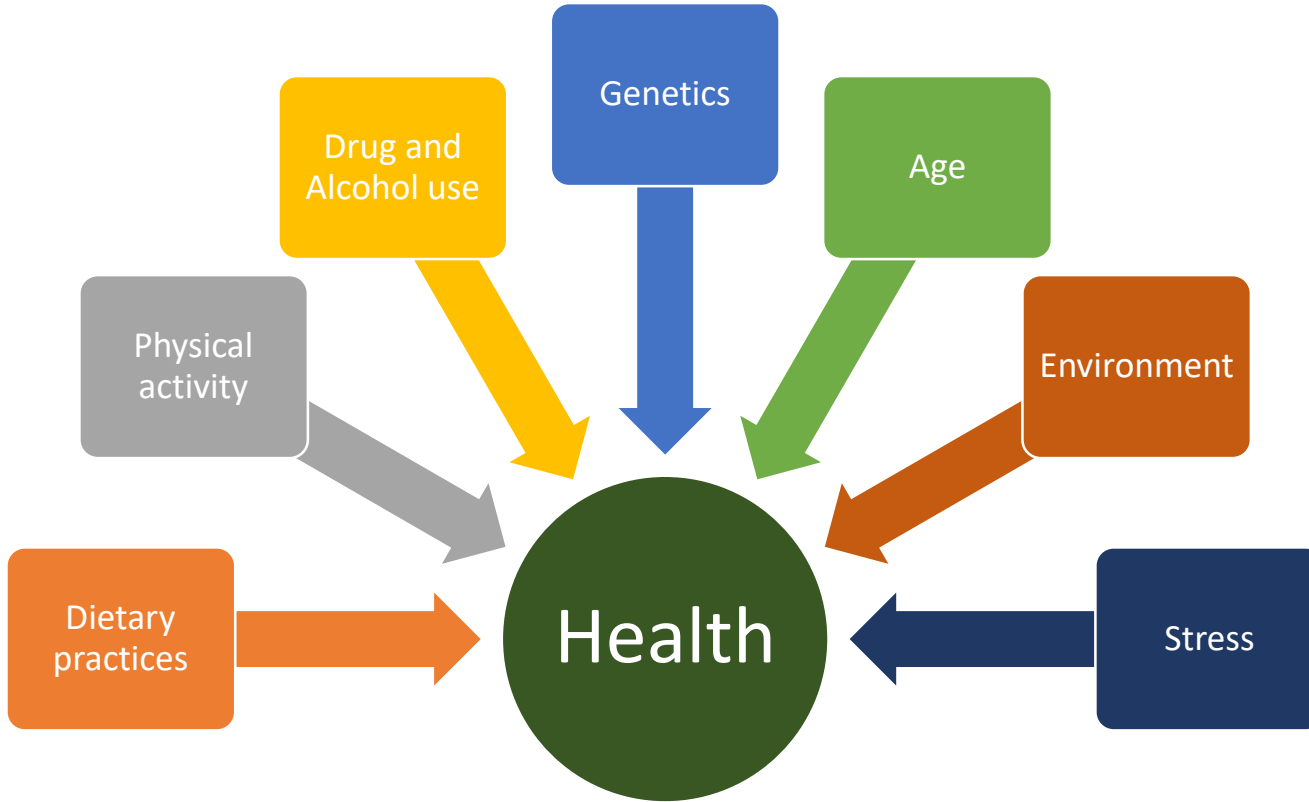




Nutrition and Cooking

Presented by:
Lindsey Menge, MS
Dietetic Intern

Factors that Influence Health



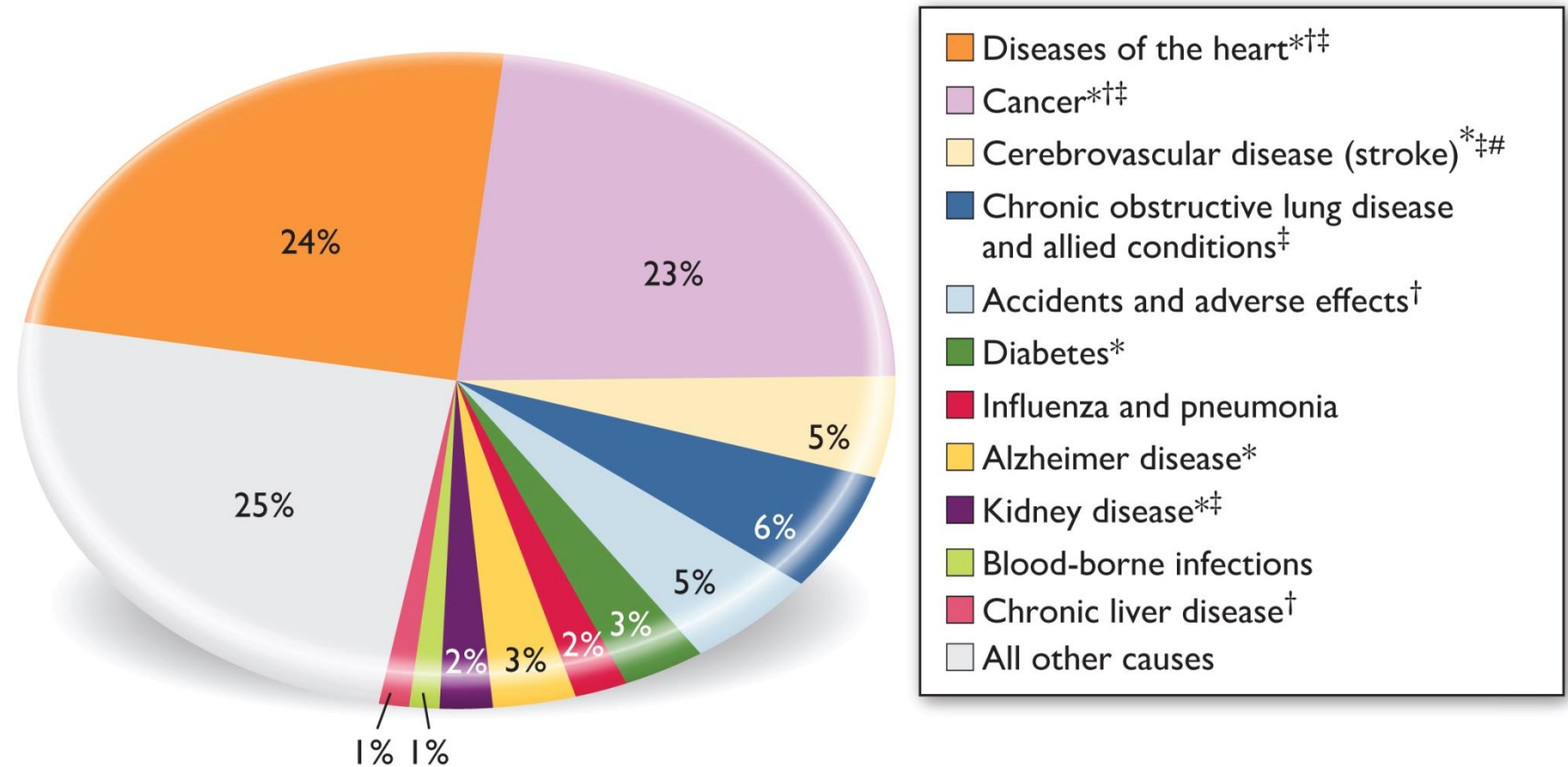
A *healthy* diet has been shown to treat and prevent the onset of many chronic diseases

An *unhealthy* diet is a **risk factor** for development of chronic diseases

Leading Causes of Death in the U.S.

Most are
largely
influenced by:

- **Poor diet**
- **Excessive energy intake**
- **Inadequate physical activity**



* Causes of death in which diet plays a part

† Causes of death in which excessive alcohol consumption plays a part

‡ Causes of death in which tobacco use plays a part

Diseases of the heart and cerebrovascular disease are included in the more global term *cardiovascular disease*.

Why Does this Matter for Cooks?

- The body requires a variety of foods to function and be healthy
- People are becoming more concerned with fitness and health
- A balanced menu may help attract customers
- Menu Planners should have basic understanding of nutrition
- Food service workers should provide nutritious food and well-balanced meals
- Restaurateurs have obligation to offer a choice



Definitions

- Nutrition defined is the ***science of food***
- Nutrients:
 - Provide energy for body functions
 - Promote growth and development
 - Regulate body processes
 - Essential for health

Six Classes of Essential Nutrients



Carbohydrates



Protein



Lipids



Water



Vitamins

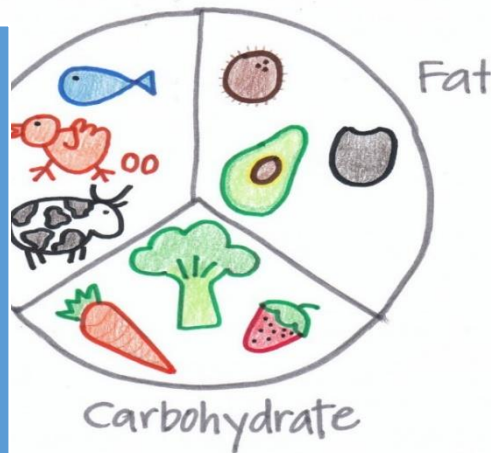


Minerals

Nutrients General Categories

Macronutrients

- Needed in large amounts (grams)
 - *Carbohydrates*
 - *Lipids*
 - *Proteins*
 - *Water*



Micronutrients:

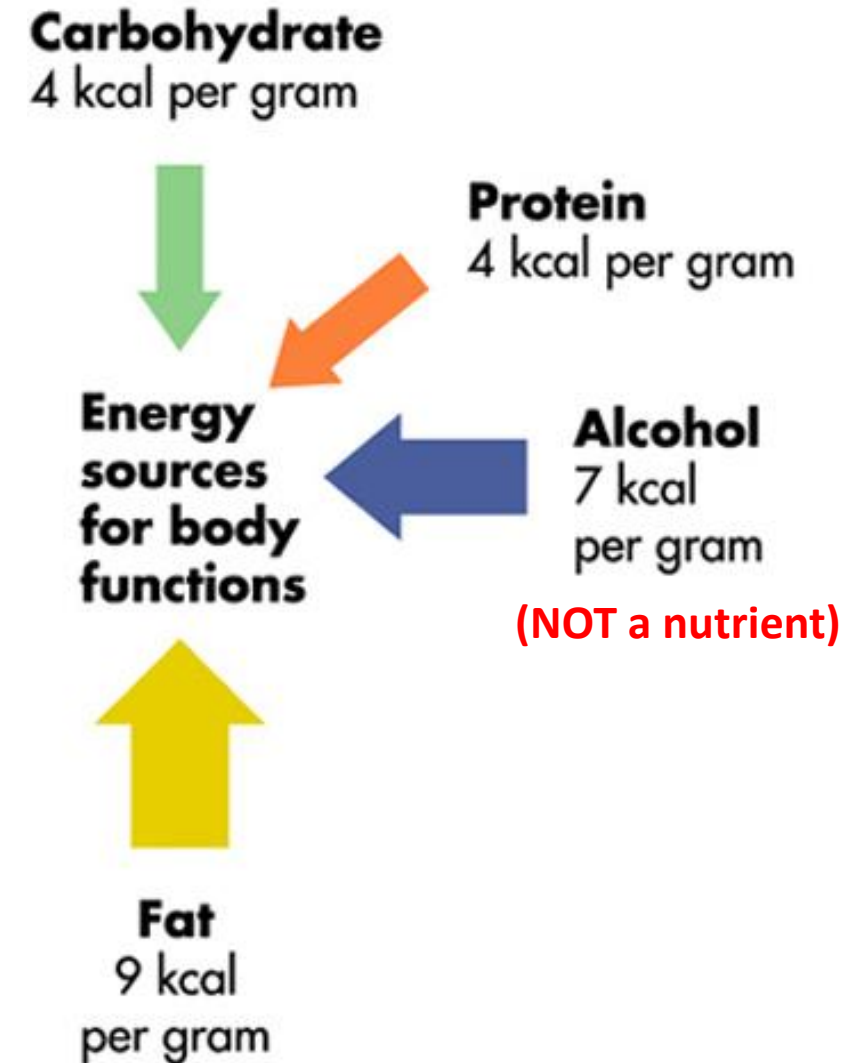
- Needed in small amounts (mg or mcg)
 - *Vitamins*
 - *Minerals*



Energy Sources: Macronutrients

We use energy to DO WORK:

- 1) Build new compounds
- 2) Perform muscular movements
- 3) Promote nerve transmissions
- 4) Maintain ion balance within cells



Carbohydrates

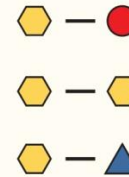
- Primarily obtained from fruits, vegetables, grains, and beans
- Provide 4 kcal/g
- Most important source of food energy in most cells
- Two Main Types
 - **Simple**
 - Table sugar (sucrose)
 - Blood glucose
 - **Complex (healthier for you)**
 - Starch (dense energy)
 - Glycogen (body storage of glucose)
 - Fiber (bulk, not digested)

Simple Carbohydrates



Sugar

Readily usable form of carbohydrates



The simple sugars are represented by the yellow hexagons (glucose), blue triangles (fructose), and red circles (galactose).

Complex Carbohydrates

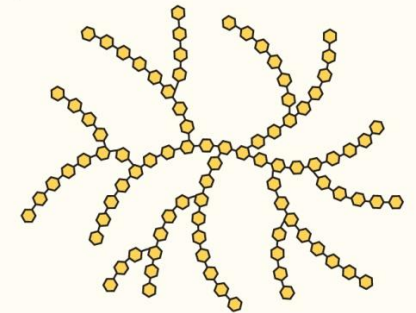


Starch

Storage form of carbohydrate in foods

Fiber

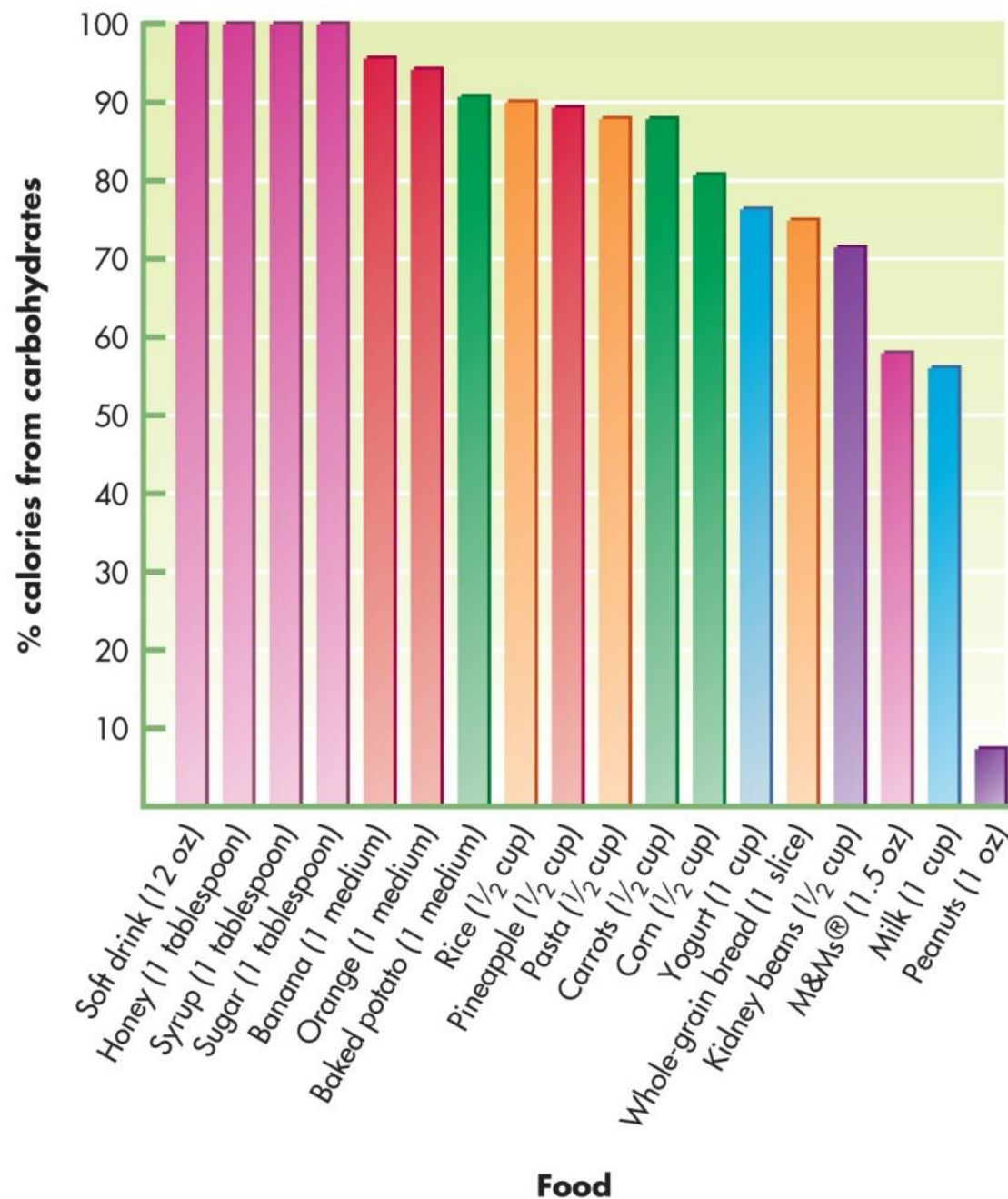
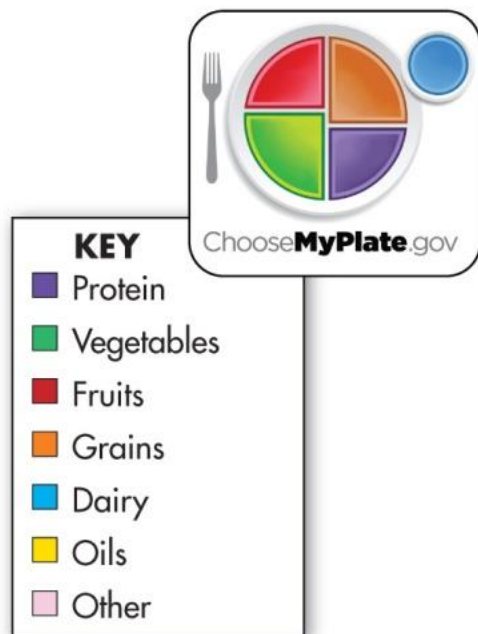
Indigestible carbohydrate that forms structure of plant cell walls



The yellow hexagons represent the glucose molecules that make up starch and fiber. As you'll see in Chapter 5, starch and fiber differ in the way the glucose molecules are linked together.

Food Sources

Copyright © The McGraw-Hill Companies, Inc. Permission required for reproduction or display






Indigestible Polysaccharides: Dietary and Functional Fiber

Soluble fibers: Dissolve (gel) in water

- Found inside and around plant cells
- Pectins, gums, mucilages, and some hemicelluloses
- Oat bran, fruits, legumes, and psyllium

Soluble fiber



Fruits: thickener in jams and jellies

Oat bran

Legumes, seaweed, psyllium

Pectins

Some hemicellulose

Gums and mucilages

Physiological effects: Lowers blood cholesterol levels, delays gastric emptying, decreases blood glucose levels

Indigestible Polysaccharides: Dietary and Functional Fiber

Insoluble fibers: Do not dissolve in water

- Form structural part of the plant cell
- Cellulose, hemicellulose, lignins
- Seeds, whole grains

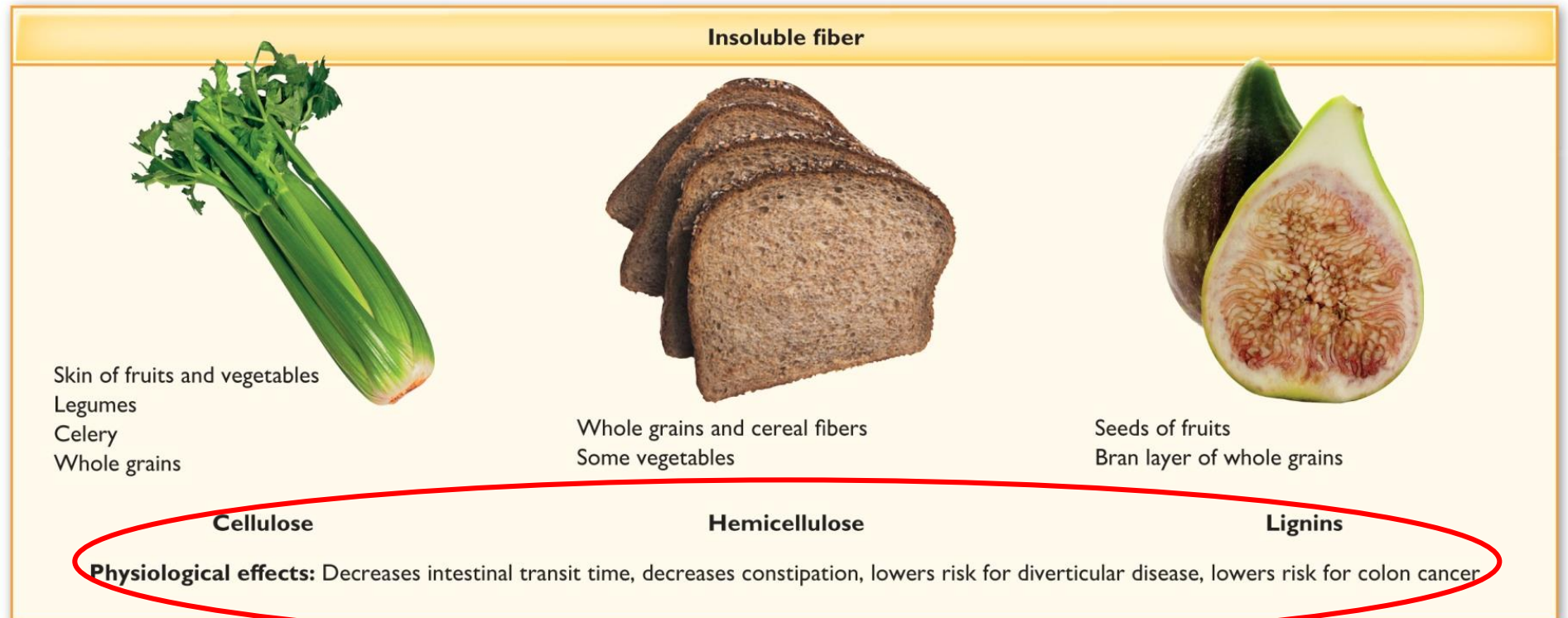


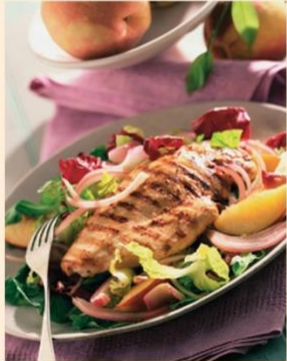


Table 5-3 Sample Menus Containing 1600 kcal with 25 g of Fiber and 2000 kcal with 38 g of Fiber*

			25 g Fiber Plan		38 g Fiber Plan		
	Menu	Serving Size	Carbohydrate Content (g)	Fiber Content (g)	Serving Size	Carbohydrate Content (g)	Fiber Content (g)
Breakfast							
	Muesli cereal	1 cup	60	6	1 cup	60	6
	Raspberries	½ cup	11	2	½ cup	11	2
	Whole-wheat toast	1 slice	13	2	2 slices	26	4
	Margarine	1 tsp	0	0	1 tsp	0	0
	Orange juice	1 cup	28	0	1 cup	28	0
	1% milk	1 cup	24	0	1 cup	24	0
	Coffee	1 cup	0	0	1 cup	0	0
Lunch							
	Bean and vegetable burrito	2 small	50	4.5	3 small	75	7
	Guacamole	¼ cup	5	4	¼ cup	5	4
	Monterey Jack cheese	1 oz	0	0	1 oz	0	0
	Pear (with skin)	1	25	4	1	25	4
	Carrot sticks	—	—	—	¾ cup	6	3
	Sparkling water	2 cups	0	0	2 cups	0	0
Dinner							
	Grilled chicken (no skin)	3 oz	0	0	3 oz	0	0
	Salad	½ cup red cabbage ½ cup romaine ¼ cup peach slices	7	3	½ cup red cabbage ½ cup romaine 1 cup peach slices	19	6
	Toasted almonds	—	—	—	½ oz	3	2
	Fat-free salad dressing	2 tbsp	0	0	2 tbsp	0	0
	1% milk	1 cup	24	0	1 cup	24	0
	Total		247	25		306	38

Our Carbohydrate Intake

- Many individuals lack knowledge about fiber-rich foods and their benefits.
- Food labels can be confusing:
 - “Wheat flour” or “wheat bread” may be enriched white flour.
 - *Product is not truly whole-wheat bread and does not contain as much fiber as it should.*
 - “Whole-wheat flour” should be listed first:
 - Ensures product is truly a whole-wheat bread and contains more fiber

Whole Grain WHOLE WHEAT

Nutrition Facts

Serving size 1 slice (30g)
Servings Per Container 18

Amount per serving

Calories 90 Calories from Fat 14

% Daily Value*

Total Fat 1.5g 2%

Trans Fat 0g

Sodium 135mg 6%

Total Carbohydrate 15g 5%

Dietary fiber 2g 8%

Sugars 2g

Protein 4g

MADE FROM: UNBROMATED STONE GROUND 100% WHOLE WHEAT FLOUR, WATER, CRUSHED WHEAT, HIGH FRUCTOSE CORN SYRUP, PARTIALLY HYDROGENATED VEGETABLE SHORTENING (SOYBEAN AND COTTONSEED OILS), RAISIN JUICE CONCENTRATE, WHEAT GLUTEN, YEAST, WHOLE WHEAT FLAKES, UNSULPHURED MOLASSES, SALT, HONEY, VINEGAR, ENZYME MODIFIED SOY LECITHIN, CULTURED WHEY, UNBLEACHED WHEAT FLOUR AND SOY LECITHIN.

Natural Wheat Bread

Nutrition Facts

Serving size 1 slice (30g)
Servings Per Container 15

Amount per serving

Calories 90 Calories from Fat 14

% Daily Value*

Total Fat 1.5g 2%

Trans Fat 0g

Sodium 220mg 9%

Total Carbohydrate 15g 5%

Dietary fiber less than 1g 2%

Sugars 2g

Protein 4g

INGREDIENTS: UNBLEACHED ENRICHED WHEAT FLOUR [MALTED BARLEY FLOUR, NIACIN, REDUCED IRON, THIAMIN MONONITRATE (VITAMIN B1), RIBOFLAVIN (VITAMIN B2), FOLIC ACID], WATER, HIGH FRUCTOSE CORN SYRUP, MOLASSES, PARTIALLY HYDROGENATED SOYBEAN OIL, YEAST, CORN FLOUR, SALT, GROUND CARAWAY, WHEAT GLUTEN, CALCIUM PROPIONATE (PRESERVATIVE), MONOGLYCERIDES, SOY LECITHIN.

Multi-fiber Low carb

Nutrition Facts

Serving size 1 slice (30g)
Servings Per Container 21

Amount per serving

Calories 60 Calories from Fat 15

% Daily Value*

Total Fat 1.5g 2%

Trans Fat 0g

Sodium 135mg 6%

Total Carbohydrate 9g 3%

Dietary fiber 3g 12%

Sugars 0g

Protein 5g

INGREDIENTS: UNBLEACHED ENRICHED WHEAT FLOUR, WATER, WHEAT GLUTEN, CELLULOSE, YEAST, SOYBEAN OIL, CRACKED WHEAT, SALT, BARLEY, NATURAL FLAVOR PRESERVATIVES, MONOCALCIUM PHOSPHATE, MILLET, CORN, OATS, SOYBEANS, BROWN RICE, FLAXSEED, SUCRALOSE.

Lipids

- Supply energy in highly concentrated form
- Act as carriers of fat soluble vitamins (A,D,E,K)
- Provide 9 kcal/g
- **Fat** (mostly saturated FAs)
 - Lipids that are **solid** at room temperature.
 - Mainly found in animal sources
 - Raise blood cholesterol levels
 - Can lead to cardiovascular disease
- **Oil** (mostly unsaturated FAs)
 - Lipids that are **liquid** at room temperature.
 - Mainly found in plant sources
 - Healthier than saturated fats
 - Can be **mono or polyunsaturated**

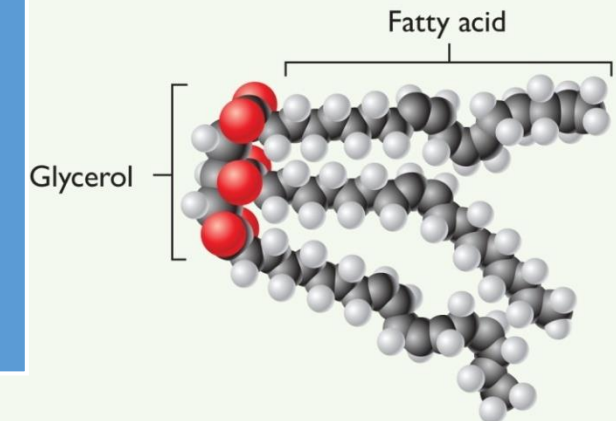
Triglycerides (type of lipid)

- Major form of fat in food and body
- Major energy source for the body
- Major form of energy stored in the body
- Composed of 3 fatty acids attached to a glycerol backbone

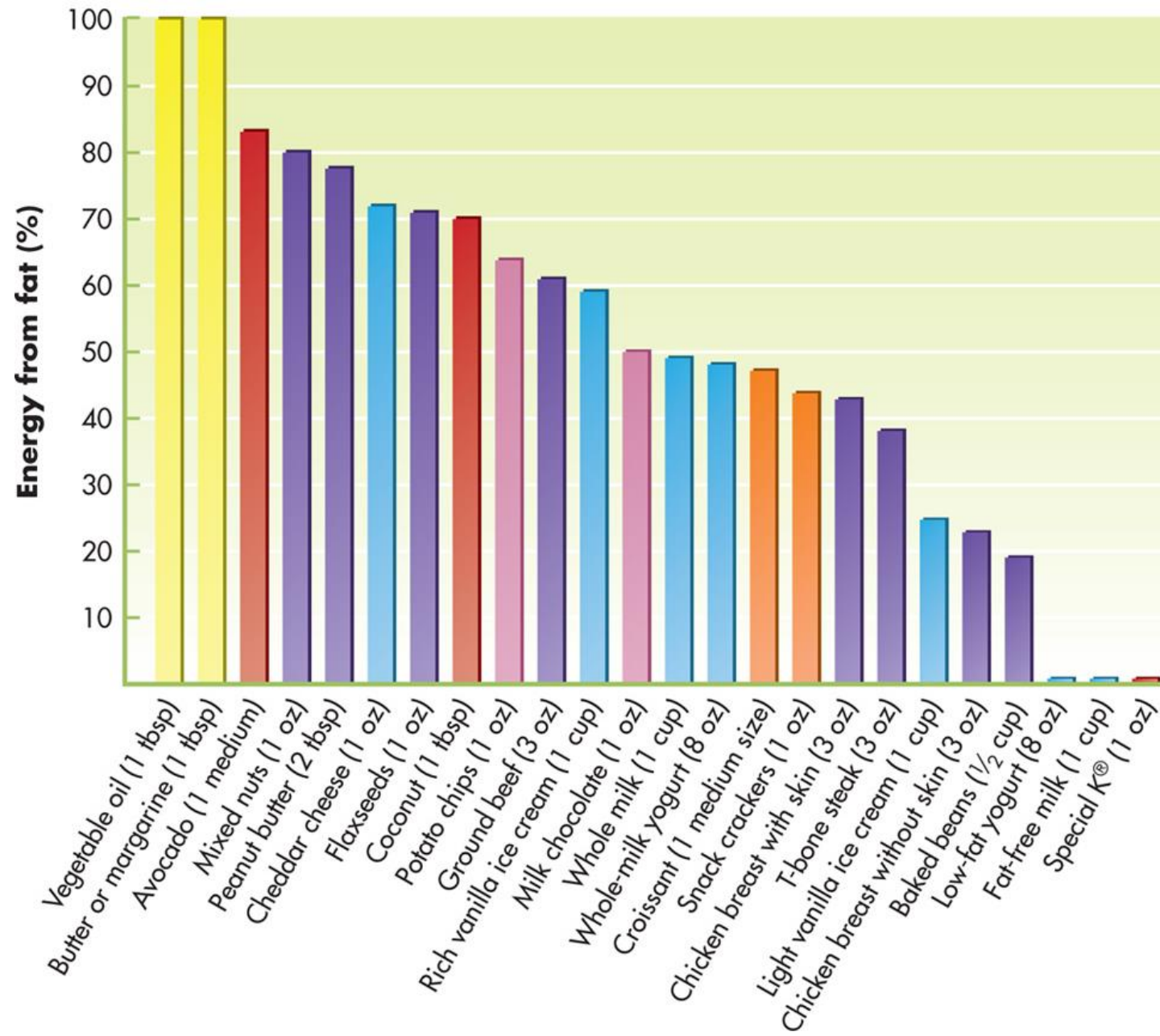
Lipids



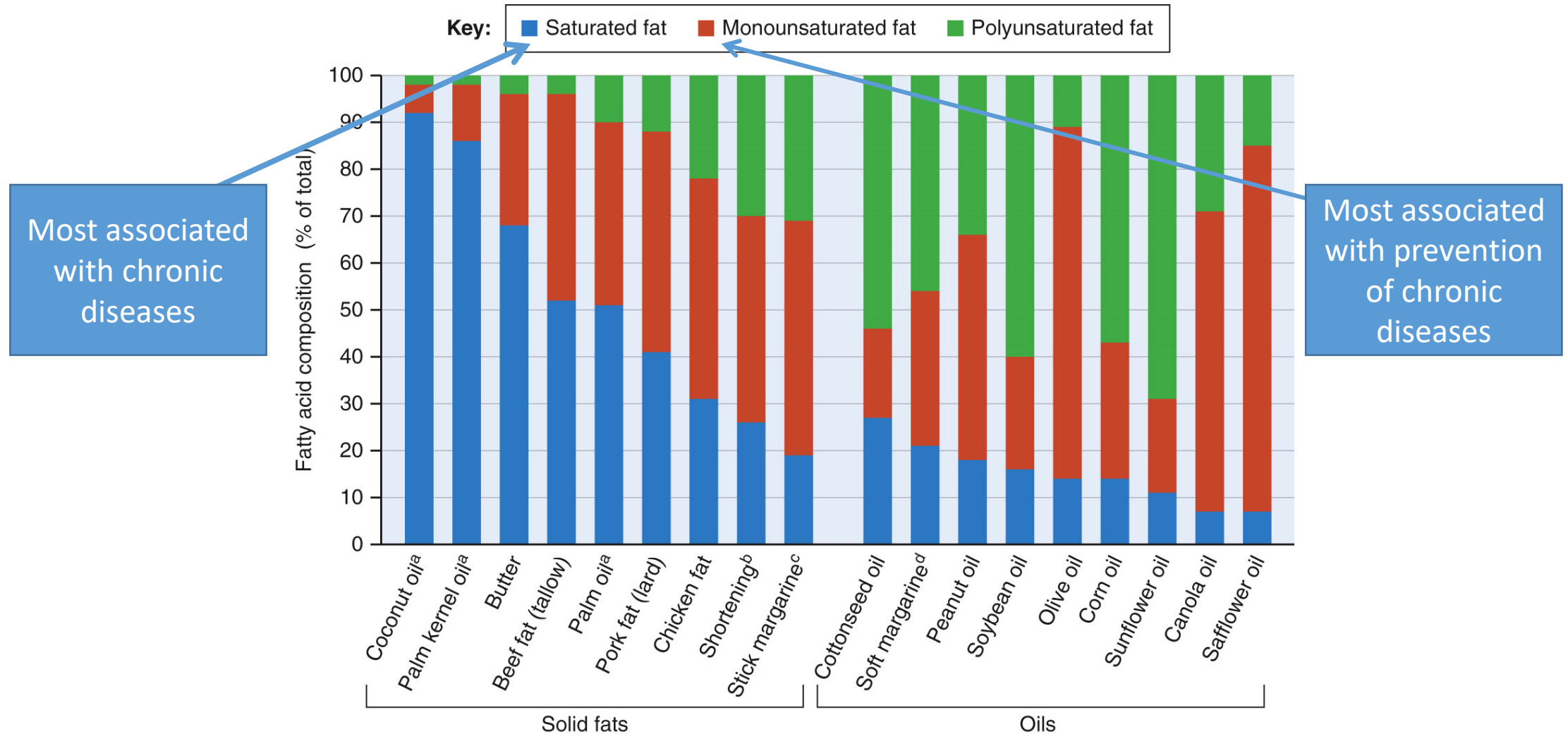
Triglyceride



The black, white, and red circles represent carbon, hydrogen, and oxygen atoms, respectively, in the triglyceride molecule.



Fatty Acid Distribution in Selected Foods



Diets High in Total Fat

Increase risk of:

- Obesity
- Some cancers:
 - Colon
 - Prostate
 - Breast
- Cardiovascular disease





Healthy For Good™

THE FACTS ON FAT

The American Heart Association recommends replacing bad (saturated) fats with good (unsaturated) fats as part of a healthy eating pattern.

LOVE IT

UNSATURATED
(POLY & MONO)



- Lowers rates of cardiovascular and all-cause mortality
- Lowers bad cholesterol & triglyceride levels
- Provides essential fats your body needs but can't produce itself

LIMIT IT

SATURATED



- Increases risk of cardiovascular disease
- Raises bad cholesterol levels

LOSE IT

ARTIFICIAL TRANS FAT,
HYDROGENATED OILS
& TROPICAL OILS



- Increases risk of heart disease
- Raises bad cholesterol levels

EAT SMART ADD COLOR MOVE MORE BE WELL

LEARN MORE AT
[HEART.ORG/EATSMART](https://heart.org/eatsmart)

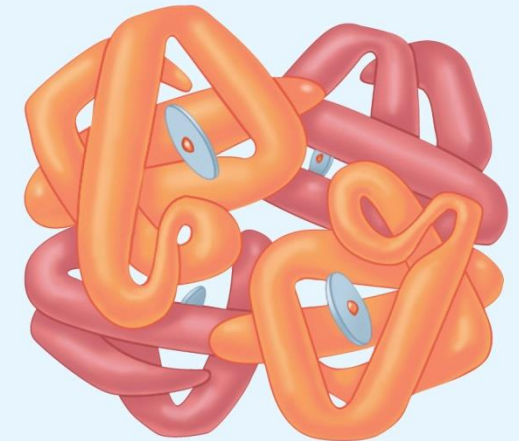
Proteins

- Formed by chains of amino acids
- Main structural components in the body:
 - Bone
 - Muscle
 - Blood
 - Cell membranes
 - **Enzymes**
 - Immune factors
- Protein from food provides **4** kcal/g
- 20 amino acids found in food, **9 are essential**

Proteins



Hemoglobin
(protein found in red blood cells)



Amino acids (protein building blocks) are used to build body proteins like this one.

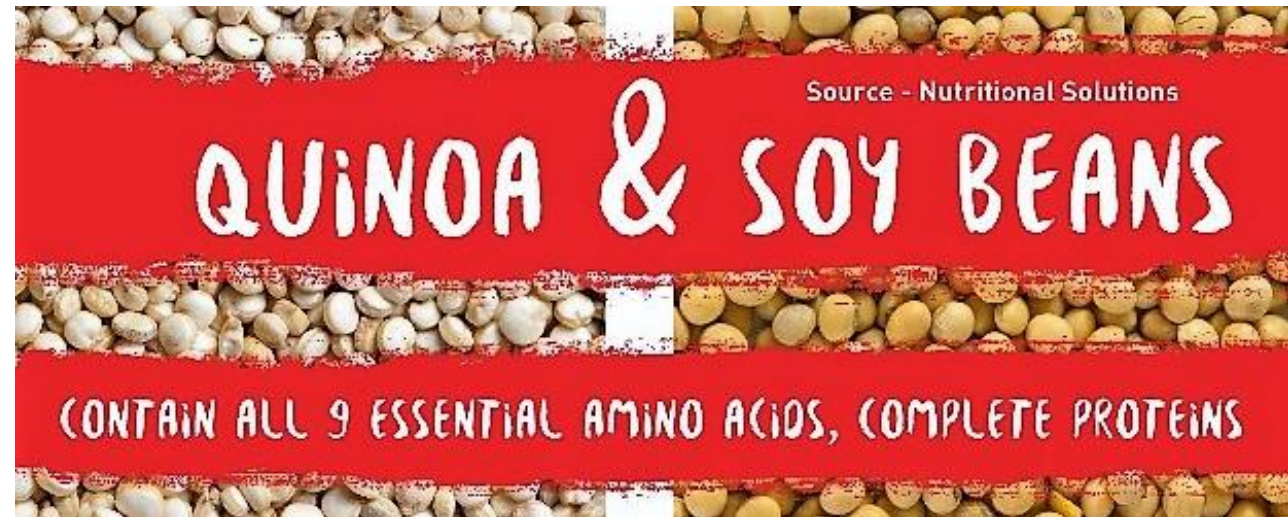
Amino Acid Composition:

Complete protein

- Animal proteins (except gelatin) **contain all 9** essential amino acids:
 - Classified as complete, or high quality, proteins

Incomplete protein

- Plant proteins (except quinoa and soy) **do not** contain all 9 essential amino acids or are



Amino Acid Composition: Complete and Incomplete Proteins

Two or more plant protein sources can be combined to compensate for deficiencies in essential amino acid:

- **Complementary proteins**



Sources of Protein

Plants can provide protein as well as:

- Vitamins
- Minerals
- Fiber
- Phytochemicals

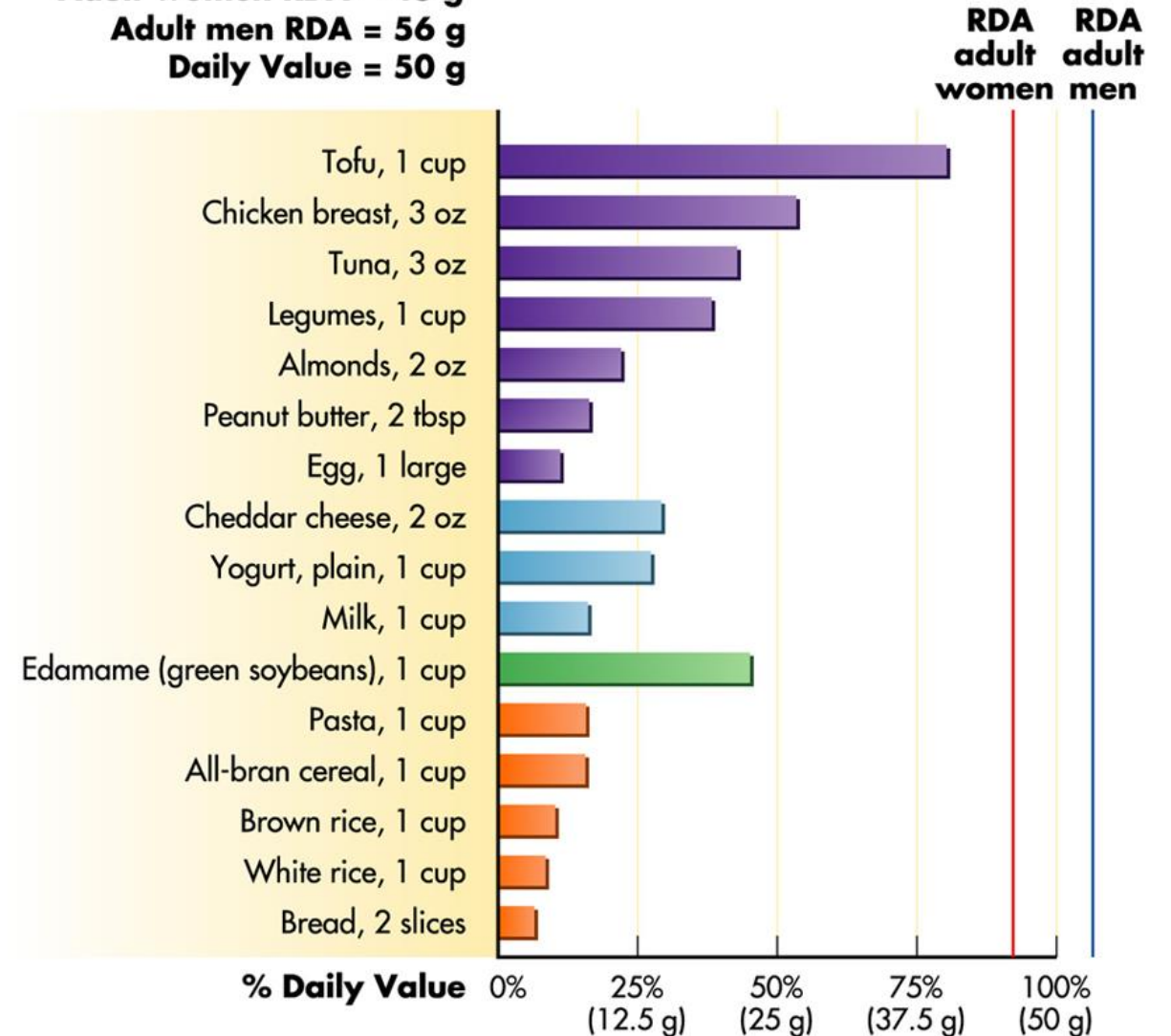
Have little saturated fat

May help decrease risk of:

- Cardiovascular disease
- Risk of certain cancers
- Obesity
- Diabetes

Copyright © The McGraw-Hill Companies, Inc. Permission required for reproduction or display.

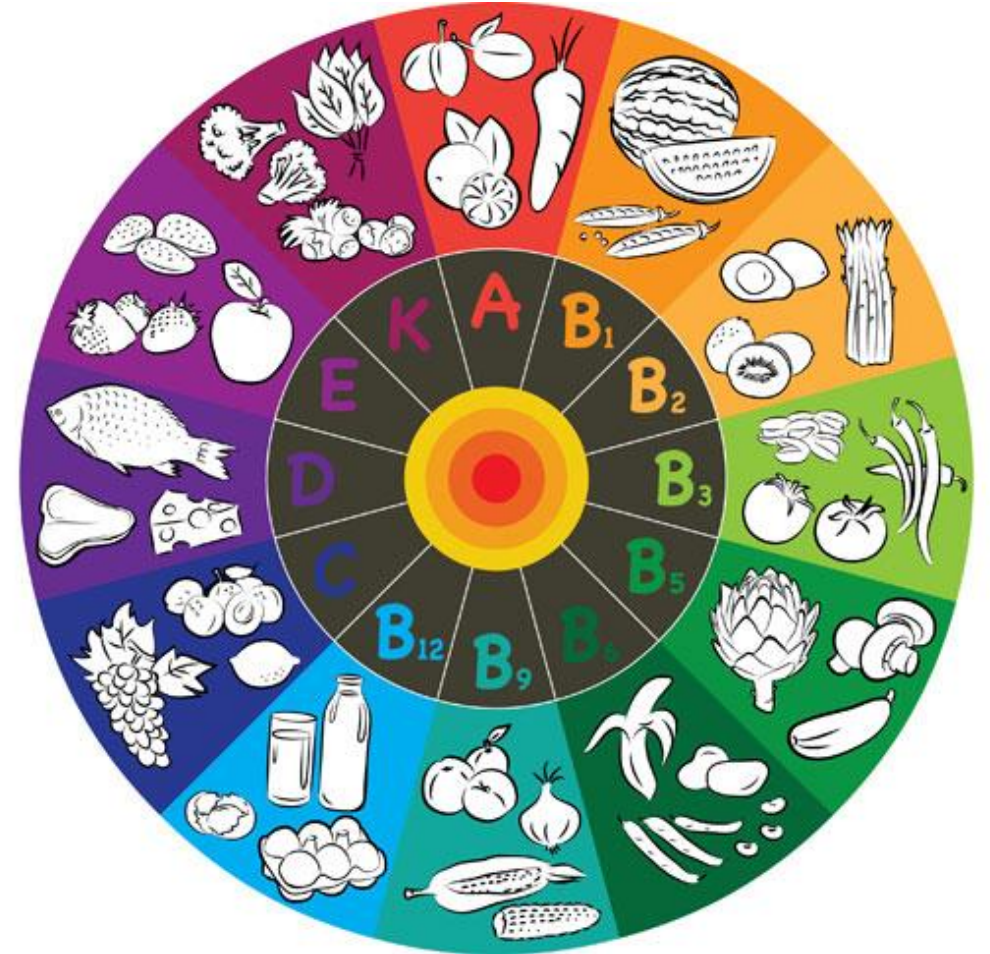
Adult women RDA = 46 g*
Adult men RDA = 56 g
Daily Value = 50 g



* RDA based on 0.8 g/kg body weight for 125-lb (57-kg) woman and 154-lb (70-kg) man

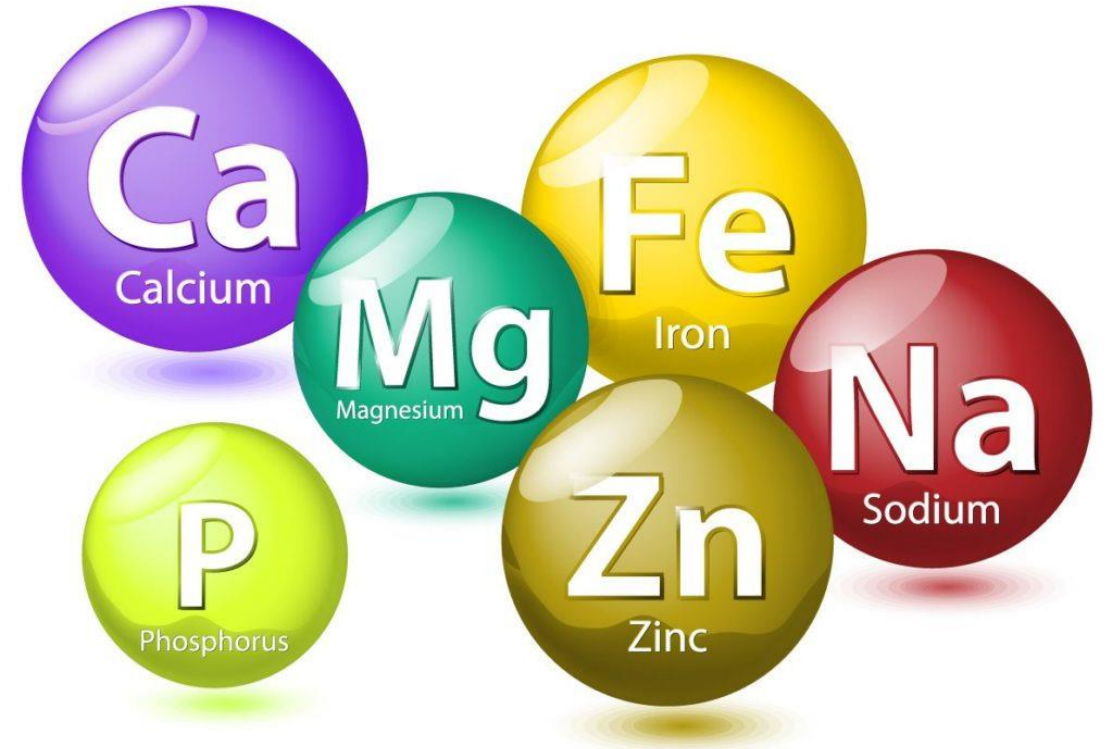
Vitamins

- Enable chemical reactions to occur
 - **Does not provide energy**
- 13 vitamins, 2 groups
 - **Fat-soluble** (dissolve in fat):
 - Vitamins A, D, E, and K
 - Vision, immune system, bone density, antioxidant activity
 - **Water-soluble** (dissolve in water):
 - Vitamin C and the B-vitamins
 - More likely destroyed by cooking
 - Healthy skin, RBC formation, cell division, repairing DNA, nervous system function



Minerals

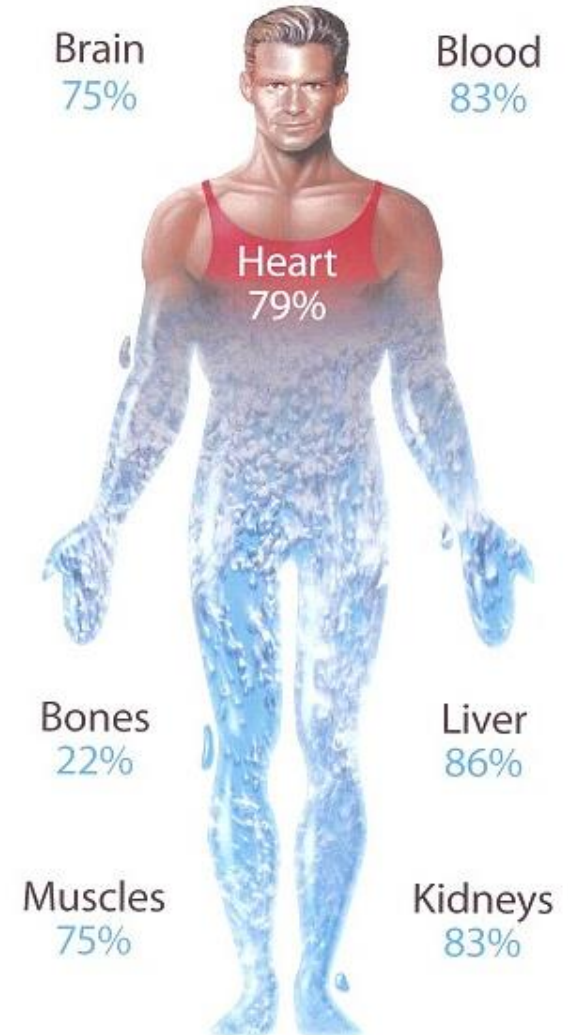
- Inorganic substances
- Not destroyed by cooking
- Yield no energy
- Required for normal body function
 - Key roles in nervous system, skeletal system, and water balance
- Two major groups:
 - **Major minerals** (needed in grams)
 - Ex. Na, K, Cl, Ca, P
 - **Trace minerals** (<100 mg daily)
 - Ex. Fe, Zn, Cu, Se



Water

- Nutrient needed in the largest quantity
- Several vital functions:
 - Solvent
 - Lubricant
 - Medium for nutrient transport to cells
 - Regulates body temperature
- Sources:
 - Food and drink
 - Byproduct of metabolism

Your Body is 60–70% Water



Characteristics of the North American Diet

Too many calories

Too much protein
from animal
sources

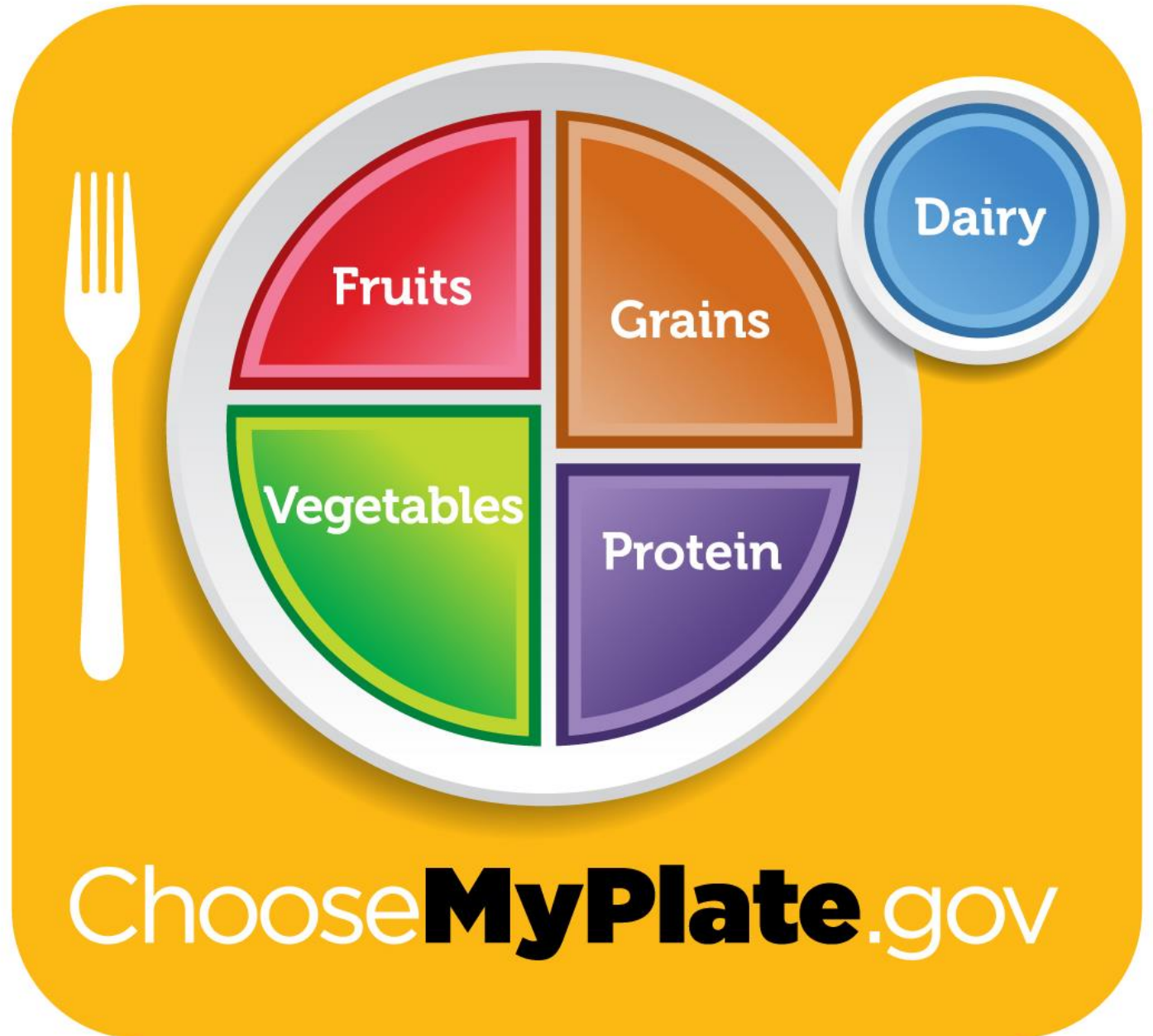
Too many
carbohydrates
from simple sugars

Too much fat from
animal sources



Dietary Guidelines for Americans

- Evidence-based Guidelines
- Outline a Balanced Diet
- Used by USDA, HHS food programs, National School Lunch Program and School Breakfast Program, WIC, Department of Defense, Veteran Affairs, etc.
- Informs Americans on healthy choices in their daily lives to prevent chronic disease



DGA's Key Elements of Healthy Eating Patterns

Follow a healthy eating pattern across the lifespan

Focus on variety, nutrient density, and amount

Limit calories from added sugars, saturated fats, and reduce sodium

Shift to healthier food and beverage choices

Support healthy eating patterns for all

1 Follow a healthy eating pattern across the lifespan. All food and beverage choices matter. Choose a healthy eating pattern at an appropriate calorie level to help achieve and maintain a healthy body weight, support nutrient adequacy, and reduce the risk of chronic disease.

Follow a healthy eating pattern over time to help support a healthy body weight and reduce the risk of chronic disease.

A healthy eating pattern includes:

- Fruits
- Vegetables
- Protein
- Dairy
- Grains
- Oils

A healthy eating pattern limits:

- Saturated fats and trans fats
- Added sugars
- Sodium

2 Focus on variety, nutrient density, and amount. To meet nutrient needs within calorie limits, choose a variety of nutrient-dense foods across and within all food groups in recommended amounts.

3 Limit calories from added sugars and saturated fats and reduce sodium intake. Consume an eating pattern low in added sugars, saturated fats, and sodium. Cut back on foods and beverages higher in these components to amounts that fit within healthy eating patterns.

4 Shift to healthier food and beverage choices. Choose nutrient-dense foods and beverages across and within all food groups in place of less healthy choices. Consider cultural and personal preferences to make these shifts easier to accomplish and maintain.

5 Support healthy eating patterns for all. Everyone has a role in helping to create and support healthy eating patterns in multiple settings nationwide, from home to school to work to communities.

DGA's Key Recommendations

Get adequate nutrients within calorie needs (nutrient density)

A healthy eating pattern includes: **VARIETY**

- Vegetables from all of the subgroups
 - dark green, red and orange, legumes (beans and peas), starchy, and other
- Whole fruits
- Grains (**at least half** of which are whole grains)
- Fat-free or low-fat dairy, including milk, yogurt, cheese, and/or fortified soy beverages
- Proteins: seafood, lean meats, poultry, eggs, legumes (beans and peas), nuts, seeds, soy
- Oils



A healthy eating pattern limits:

- Saturated fats and *trans* fats, added sugars, and sodium
- Consume <10% of calories from added sugars
- Consume <10% of calories from saturated fats
- Consume less than 2,300 milligrams (mg) per day of sodium
- Alcohol in moderation—up to one drink per day for women and up to two drinks per day for men



DGA by Food Group

Healthy U.S.-Style Eating Pattern: Recommended Amounts of Food From Each Food Group at Different Calorie Levels

Calorie Level	1,400	1,600	1,800	2,000
Vegetables	1.5c	2c	2.5c	2.5c
Fruit	1.5c	1.5c	1.5c	2c
Dairy	2.5c	3c	3c	3c
Protein	4oz	5oz	5oz	5.5oz
Grains	5oz	5oz	6oz	6oz
Oils	17g	22g	24g	27g
Calories for other uses	110	130	170	270



Cooking Healthful Meals

Use Less Fat in Cooking

- **Consider methods that require no added fat**
 - Simmering, poaching, steaming, baking, grilling
- **Use ingredients with less fat**
 - Trim external fat from meats and poultry
 - Lower fat sauces such as salsas, vegetable purees
 - Modify recipes to reduce fat (substituting healthier items for bacon, cheese, butter)
- **Using unsaturated fats**
 - Opt for monounsaturated fats like olive oil or canola oil when appropriate



Cooking Healthful Meals

Emphasize Flavor and Use Fresh Ingredients

- **Rely more on natural flavors of foods rather than on salt or other additives**
 - Have an understanding of what foods pair well together
- **Use fresh, high-quality foods**
 - Ensures ingredients are at their peak flavor
 - Lets true flavors of foods dominate
- **Add fresh herbs, spices, and seasonings**
 - Chiles, ginger, pepper, browned onion, garlic, cinnamon, and more!



Cooking Healthful Meals

Store Foods Properly

- **Pay attention to how food should be stored**
 - Foods in storage lose nutrients as they age
 - Can be slowed with proper storage
 - Especially refrigeration
 - Check foods you use to understand how they should be stored



Train Staff

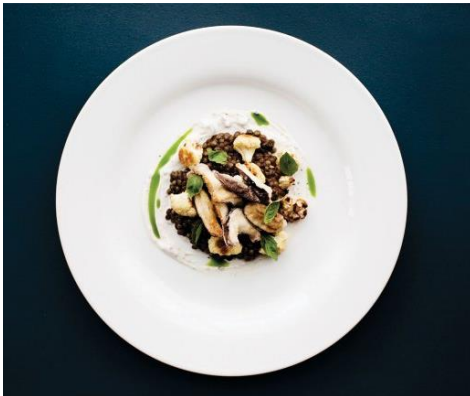
- **Chef best practice: train personnel**
 - Provide details on the ways foods are prepared so staff can answer customer questions about the menu
 - Can also provide suggestions to customers when asked



Cooking Healthful Meals

Modify Portion Sizes

- **Serve smaller portions**
 - Large plates of meat are not necessary to serve satisfying meals
 - Well-trimmed meat, poultry, and fish nicely balance on a plate with vegetables and complex carbohydrates
 - Consider MyPlate when crafting plates
 - Make a great sauce but serve less



Provide Heathy Choices


- **Offer a menu with variety**
 - Customers can choose a well-balanced meal suited to their needs
 - Emphasize vegetables, whole grains, and fruits
 - Think the rainbow with choices
 - Be flexible in the kitchen and willing to modify items to meet requests of customers



Cooking Healthful Meals

Use Nutritional Information

- **Study nutritional content of foods**
 - This will help craft healthy menus
 - Many sites list nutritional content of common food items
- **Hire a Registered Dietitian**
 - Many restaurants have sought out RDs to analyze their menus and give advice on how to make food more healthful

Individual Meals									
	Serving Size (g)	Serving Size (oz)	Calories	Fat Calories	Total Fat (g)	Sat Fat (g)	Trans Fat (g)	Cholest (mg)	Sodium (mg)
									
Rotisserie Chicken - Half Chicken	341	12	640	290	33	10	0	340	1380
Rotisserie Chicken - Quarter White	187	6.5	320	110	13	4	0	165	710
Rotisserie Chicken - Three Piece Dark	208	7.3	390	190	22	6	0	290	1270
Rotisserie Chicken - Three Piece Dark (2 Thighs & Drumstick)	253	9	540	320	36	11	0	280	1080
Rotisserie Chicken - Three Piece Dark Skinless (Thigh & 2 Drumsticks)	171	6	280	110	12	3.5	0	200	630
Rotisserie Chicken - Three Piece Dark Skinless (2 Thighs & Drumstick)	203	7	340	150	17	5	0	220	720
Rotisserie Chicken - Quarter White, No Skin	181	6.8	220	20	2.5	1	0	145	700
Rotisserie Chicken - 1 Thigh & 1 Drumstick	154	5	310	180	20	6	0	175	870
Turkey Breast - Large	198	7	260	40	5	2	0	100	870
Turkey Breast - Regular	142	5	180	30	3	1	0	70	620
Beef Brisket - Large	198	7	400	210	23	6	0	165	990
Beef Brisket - Regular	113	4	230	120	13	3.5	0	95	570
Meatloaf - Large	323	7.20	405	45	20	3	2	145	1090
Meatloaf - Regular	215	7.5	480	270	30	13	2	145	1090
Pastry Top Chicken Pot Pie	425	15	800	430	48	24	0	115	1120
Pastry Top Turkey Pot Pie	425	15	790	410	46	23	0	90	1220

Nutrition Facts

Serving Size 1 bagel (142g)
Servings Per Container 1

Amount Per Serving

Calories 380 **Calories from Fat** 25

% Daily Value*

Total Fat 2.5g **4%**

Saturated Fat 1.5g **8%**

Trans Fat 0g

Cholesterol 0mg **0%**

Sodium 780mg **33%**

Total Carbohydrate 77g **26%**

Dietary Fiber 3g **12%**

Sugars 6g

Protein 14g

Vitamin A 0% • Vitamin C 15%

Calcium 15% • Iron 25%

*Percent Daily Values are based on a 2,000 calorie diet. Your daily values may be higher or lower depending on your calorie needs:

Calories: 2,000 2,500

Total Fat Less than 65g 80g

Saturated Fat Less than 20g 25g

Cholesterol Less than 300mg 300mg

Sodium Less than 2,400mg 2,400mg

Total Carbohydrate 300g 375g

Dietary Fiber 25g 30g

Calories per gram:
Fat 9 • Carbohydrate 4 • Protein 4

Reliable Nutrition Information

- **USDA Food Database**
<https://ndb.nal.usda.gov/ndb/search/list>
- Scientific books
- Government, professional, educational, consumer groups
- Websites: .gov; .edu; org; use caution with .com sites
- Scientific journals
- Consultants

The Internet café

Where do I find reliable information about diet, exercise, and health?

Although there are many reliable websites, those listed here are government agencies or professional organizations.

Healthfinder: A guide to reliable health information sponsored by the U.S. Department of Health and Human Services.
<http://www.healthfinder.gov>

MedlinePlus®: Trusted health information sponsored by the National Library of Medicine and the National Institutes of Health. **<http://www.medlineplus.gov>**

Nutrition.gov: “Smart Nutrition Starts Here” sponsored by the National Agricultural Library and the Food and Nutrition Information Center. **<http://www.nutrition.gov>**

American College of Sports Medicine: Professional organization whose mission is to advance health through science, education, and medicine has resources for the general public at **<http://www.acsm.org>**

American Dietetic Association: Professional organization committed to helping people enjoy healthy lives through good nutrition. Food and nutrition information for consumers can be found at **<http://www.eatright.org>**