Nutrition

**The Six Essential Nutrients**

**MACRONUTRIENTS**—**\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

**1.** *\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_* (CHO)

* Most important energy source; \_\_\_\_\_\_\_ calories per gram; inexpensive
* \_\_\_\_\_\_\_\_\_\_\_\_% of total calories should come from CHO; 10% or less of total CHO should come from simple sugars
* Monosaccharides or “Simple Sugars”: Glucose, Galactose, Fructose
* Disaccharides: Maltose, Sucrose, Lactose
* Polysaccharides or “Complex CHO”
  + \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ and \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ in plants;

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ in animals

* + Glycogen is the storage form of glucose found in skeletal muscle (approx. 350g) and the liver (90g)

**2.** *\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_*

* Lipids—generic term for all fats; \_\_\_\_\_\_ calories per gram
* \_\_\_\_\_\_\_\_\_\_\_\_% of calories should come from fat
* \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_—storage tissue of fat
* Cholesterol—\_\_\_\_\_\_\_\_\_\_ (bad) vs. \_\_\_\_\_\_\_\_\_ (good)
* \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ (TG)—composed of glycerol and 3 fatty acids; glycerol base is the part broken off and converted to glucose for energy production:
  + *Saturated*—Each carbon has its full complement of \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_; solid at room temperature; animal sources; hard to break down and increase blood cholesterol
  + *Monounsaturated*—\_\_\_\_\_\_\_\_\_\_\_\_ double bond missing, not completely full of hydrogen; liquid at room temperature; vegetable sources
  + *Polyunsaturated*—\_\_\_\_\_\_\_\_\_\_\_\_ double bonds missing; liquid at room temperature; vegetable sources; easiest to break down

**3.** *\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_*

* \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ important energy source; \_\_\_\_\_\_\_ calories per gram.
* \_\_\_\_\_\_\_\_\_\_\_\_\_% of total calories should come from protein (most people get more than RDA)
* Made up of amino acids:
  + \_\_\_\_\_\_\_ *Essential* Amino Acids—\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
  + \_\_\_\_\_\_\_ *Non-Essential* Amino Acids
* Critical for many functions (tissue growth and repair, antibodies, enzymes, etc) outside of energy; Note: *Time* eatenmay be more important than *amount* eaten in terms of muscle/tissue repair

*Metabolism*

* Chemical reactions that occur in an organism for the sake of energy production
* Two types:
  + \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_—the decomposition of “stuff” in the body
  + \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_—the synthesis of new “stuff” in the body

*Where Our Energy Goes*

* \_\_\_\_\_\_\_\_\_\_\_% Basal Metabolic Rate or Resting Energy Expenditure (REE)
* 5-10% Thermal Effect of Food (digestion)
* \_\_\_\_\_\_\_\_\_\_\_% Physical activity
* A calorie is \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**micronutrients**—**\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

**4. *\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_***

* Vitamins aid various processes throughout the body and are particularly important for chemical reactions
* Can protect against oxidative damage (anti-oxidants) by capturing free radicals, thus reducing risk of cancer
* Two classes of vitamins:
  + \_\_\_\_\_\_\_\_\_\_\_\_\_-Soluble Vitamins (difficult to overdose on); \_\_\_\_\_ vitamins and vitamin \_\_\_\_\_
  + \_\_\_\_\_\_\_\_\_\_\_\_\_-Soluble Vitamins (risk of overdose is higher); vitamins \_\_\_\_\_, \_\_\_\_\_, \_\_\_\_\_ & \_\_\_\_\_

**5. *\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_***

* Act as *catalysts* for many chemical reactions; come from plant and animal food sources
* There are 24 minerals needed for good health, including Ca, Na, K, Mg, P, Cl, S and *trace minerals* (i.e. iron, iodine and copper)

**Neither a Macro- nor Micro- Nutrient**

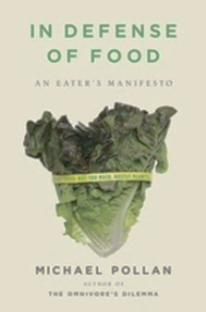
**6.** \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

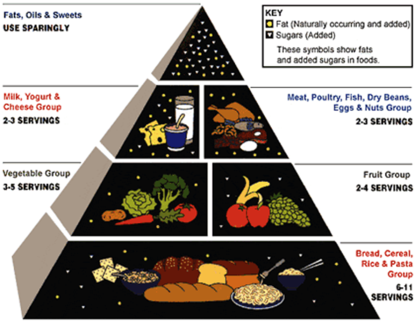
* Necessary for chemical reactions (such as hydrolysis)
* The primary component of blood (plasma) and interstitial/cellular fluids
* Lubricates your joints (synovial fluid)
* Body temperature regulation (sweating)
* Maintains homeostasis
* Amount requirements vary from person to person; urine color (a pale yellow as opposed to clear or dark yellow/amber) and thirst are key indicators of hydration; when thirsty drink WATER
* Can live about \_\_\_\_\_\_ days without water (as opposed to ~\_\_\_\_\_\_ days without food)
* Dehydration may result in the following: muscle cramps, headaches, fatigue, decreased blood volume, constipation, poor complexion, stiff joints and hallucinations

**Eating Behaviors and Food Choices**

*Influences:* People*,* Medical Needs*,* Geography*,* Occasions*,* Holidays, Culture*,* Mood*,* Time, Money*,* Advertising…the list goes on and on!

* You CAN eat cake, candy, French fries, etc.! You just need to keep it in *moderation*
* To improve your meals, try substituting healthier ingredients when preparing your favorite foods/meals
* To manage how much you eat:
  + Eat enough food to cease hunger, not appetite
  + Know foods higher in fiber/protein combat hunger better than refined
  + Use a smaller plate or bowl
  + Have a glass of water or half a piece of fruit before a meal
  + Eat slowly (put your fork down between each bite)—It takes approximately \_\_\_\_\_\_\_\_ minutes for your brain to realize you are full
  + Prepackage your servings

*Michael Pollan’s “Eating Guidelines”:*

* “Don’t eat anything your great grandmother wouldn’t recognize as food”
* “Eat mostly plants, especially leaves”
* “You are what what you eat eats”
* “Eat wild foods when you can”
* “Pay more, eat less”
* “Do all your eating at a table”
* “Try not to eat alone”
* “Cook and, if you can, plant a garden”

**Dietary Guidelines: Friend or Foe?**

*The Food Pyramid* (USDA)—1992

* Tried to emphasize groups on bottom as a “foundation” to a balanced diet
* One-size-fits-all serving suggestions; what constitutes a “serving”?
* Does not denote between “good” and “bad” fats/oils and carbohydrates

WARNING: Guidelines were influenced by the food industry



*MyPyramid* (USDA)—2005

* Tried to get away from the cookie cutter food pyramid; more

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ based on age, sex, height, weight and activity level.

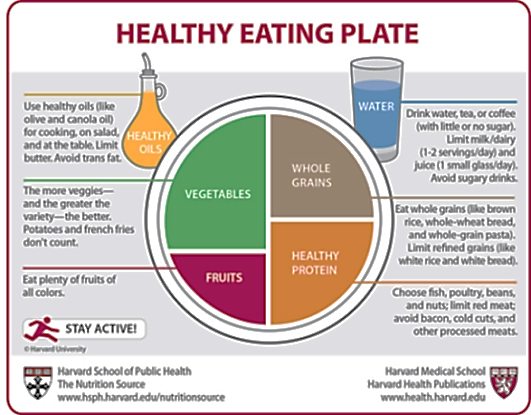
* Accounted for \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
* Too complicated for users to understand; lots of subtle nuances

WARNING: Guidelines also influenced by the food industry

*MyPlate* (USDA)—2011

* Still avoids cookie-cutter; personalized
* Emphasizes balancing calories
* Enjoy food, but eat less
* Avoid oversized portions
* ½ your plate should be fruits and veggies
* Drink fat-free or 1% milk
* Make half of your grains, whole grains
* Limit foods high in fat, sugar and sodium
* Drink water instead of sugary drinks
* Physical activity not emphasized

WARNING: Still influenced by the food industry



*Healthy Eating Plate* (Harvard School of Public Health)—2011

* \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
* \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
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* Based exclusively on the best available science; not subject to political/commercial pressure from food industry lobbyists

**Food Packaging: Claims & Terms**

|  |  |
| --- | --- |
| **Claim/Term** | **Definition/Description** |
|  | The food is raw, unprocessed, contains no preservatives and has never been frozen or heated |
|  | Calories have been reduced by at least 1/3, or the fat or sodium by at least ½ |
|  | The food contains 25% less of a nutrient or of calories than a comparable food |
|  | Product contains no amount, or only trace amounts, of fat, cholesterol, sodium, sugars or calories |
|  | Low in fat, saturated fat and limited amounts of cholesterol and sodium |
|  | Minimally processed with no artificial or synthetic ingredients; no FDA definition, but working towards one |
|  | No growth hormone/antibiotics used, produced without using most conventional pesticides, fertilizers with synthetic ingredients or sewage sludge, bioengineering, or ionizing radiation |
|  | Proteins formed when white, rye, barley and/or crossbred hybrids of such grain flours are mixed with fluids and physically manipulated; to be considered “free,” product must contain less than 20 parts per million (ppm) gluten |
|  | Chemically/enzymatically hydrogenated unsaturated fats; rarely found occurring naturally; *partially hydrogenated oils* are the major source in the food industry |
|  | Genetically modified organism; an organism whose genetic material has been altered to achieve a particular goal |

**Food Packaging: Nutrition Facts Label**

* Established by the FDA; changed in June 2018
* \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_(RDA)—the amounts for various nutrients recommended to prevent deficiencies and excesses in most healthy people
* \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ (%DV)—per day for a 2,000C diet; <5%=low and >20%=high for a given nutrient

**Food Packaging: Ingredients List**

* Ingredients are listed in order of weight (most to least); pay attention to the first 3-5 ingredients…are they sugar, fat, salt/sodium and/or unrecognizable ingredients?
* Can be used to determine if the product likely contains GMO’s
* It can identify *hidden sugars* (high fructose corn syrup, dextrose, maltodextrin, etc.) and *trans fats* (partially hydrogenated canola oil); the nutrition facts label may be misleading regarding these ingredients
* Provides food additives—substances added to food intentionally to produce a desired effect:
  + \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ (i.e. gums, waxes, gelatins; hydrogenated)



* + \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ (i.e. vitamins, minerals, protein)
  + \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ (preservatives)
  + \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ (i.e. natural flavor, Red 4)
  + Control food’s acidity (i.e. alkali)
  + Help age foods

**Investigating Food Packaging Worksheet Toolkit:**

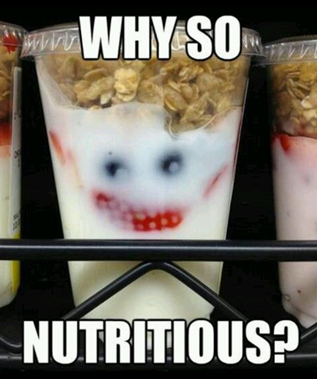
* **% Calories from Fat** (30% or less is recommended)=

Calories from Fat ÷ Total Calories

* **Complex Carbohydrates** (or “Other Carbohydrates”; 50% or greater is

recommended) = Total Carbohydrates - (Sugars + Fiber)

* **% Daily Values** are to add up to 100% for the day
* The table at the bottom of the nutrition label is *universal* to all foods and food products (not present on new label)
* **Ingredients** are listed in order of amount/weight, greatest to least
* Potential **allergens** *identified by the food company* are bolded at the end of or beneath the ingredients list
* 1g **protein** or **CHO** = 4 calories; 1g **fat** = 9 calories
* **GMO’s** = any corn, soy, wheat, rice, etc. ingredient or derivative is likely a GMO unless the product is certified organic



**Key**

**Green** = probable GMO

**Yellow** = added nutrients

**Blue =** color additive

**Red** = texture additive

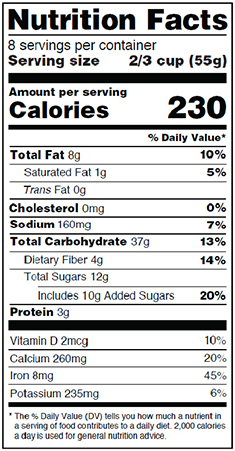
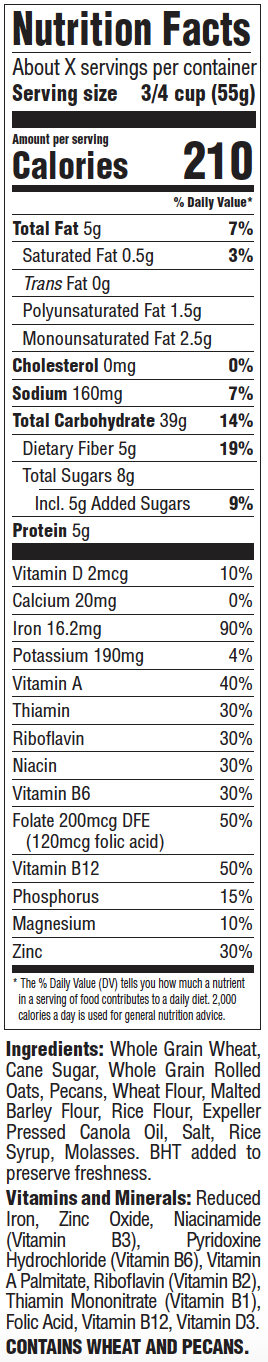
**Purple** = preservative additive

**Orange** = acid control additive

**Pink** = flavor additive

**Red Circle** = trans fat

**Blue Circle** = hidden sugar



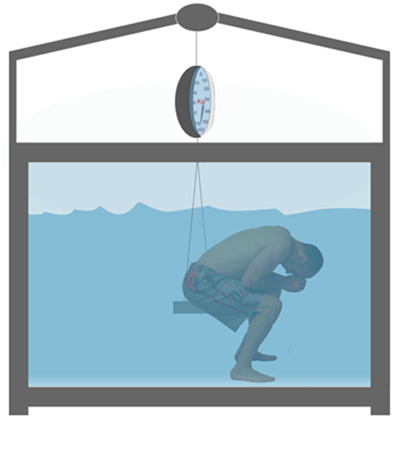
**Grocery Shopping with Michael Pollan:**

* “Avoid food products that make health claims”
* “Shop the peripheries of the supermarket and stay

out of the middle”

* “Get out of the supermarket whenever possible”
* “Avoid food products containing ingredients that are:
  + \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
  + \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
  + more than \_\_\_\_\_\_\_\_ in number or include
  + \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ and other hidden forms of refined sugars”

***Good* Measures of Health/Fitness**

* \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
* Basic Medical Diagnostics:
  + \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
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**Fad Diets**

* Atkin’s Diet, South Beach Diet, Grapefruit Diet, Liquid Diet, Cereal Diet, Cabbage Diet, dietary programs, supplements, starvation, etc…
* Reasons fad diets don’t work and/or aren’t healthy: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

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**The *AMAZING* “Secret” Diet**

How to lose FAT weight *healthfully*…

* \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ caloric intake and \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ caloric expenditure (i.e. if you eat 2,000 calories, burn 2,500+ to utilize stored glycogen and fat)
* Modify personal eating behaviors (see “Eating and Food Choices” section)
* Choose mono-/poly- unsaturated fats, limit saturated fats and avoid trans fats
* Remain hydrated by drinking W-A-T-E-R (*aim* for a pale yellow urine color)
* Do \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ activities mixed with some strength training (more muscle means more calories can be burned)
* The rule of thumb for weight loss/gain is to lose/gain no more than \_\_\_\_\_\_\_\_\_ pounds a week