The Science of Nutrition

Module 1

Learning Objectives

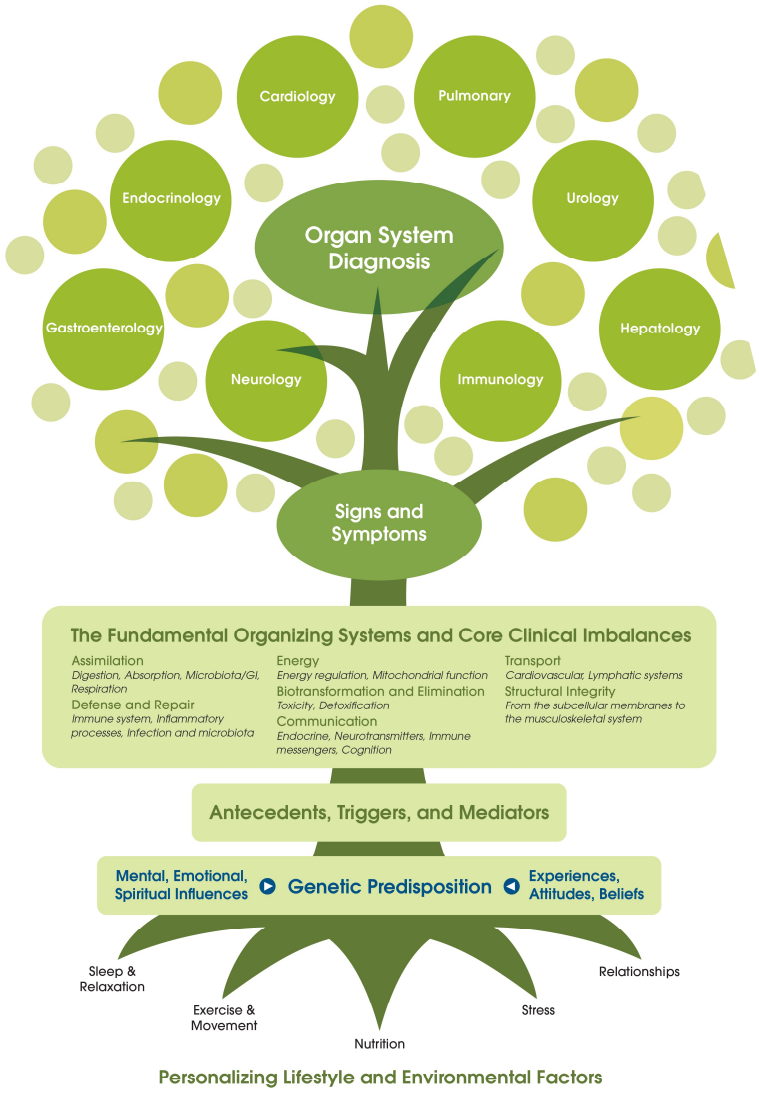
1. Introduce myself and the role of the Registered Dietitian
2. Define terms such as nutrition, carbohydrates, proteins, lipids, and calories.
3. Be able to calculate the number of calories in a certain food or meal.
4. Describe the factors that determine food choice and the major characteristics of the North American diet.
5. Discuss the components and limitations of nutritional assessment.
6. List the attributes of a healthy diet and those that contribute to nutrition related diseases.
7. Describe the role of genetics in the development of nutrition-related diseases.
8. Explain how the scientific method is used in developing hypotheses and theories in the field of nutrition.
9. Identify reliable sources of nutrition information.

Becky Levin, MS, RDN, LD

- Pediatric Clinical Dietitian, University Hospitals Rainbow Babies and Children's
  - Neonatal intensive care unit
  - Pediatric inpatient floors, medical nutrition therapy
- GCAND board member
- Adjunct Professor, CWRU
- Education
  - BS Dietetics, Michigan State University
    - Minor in Health Promotion
  - Dietetic Internship, UH
  - MS Nutrition, CWRU

Lifestyle Medicine

Lifestyle medicine is a medical approach that uses evidence-based behavioral interventions to prevent, treat and manage chronic disease.



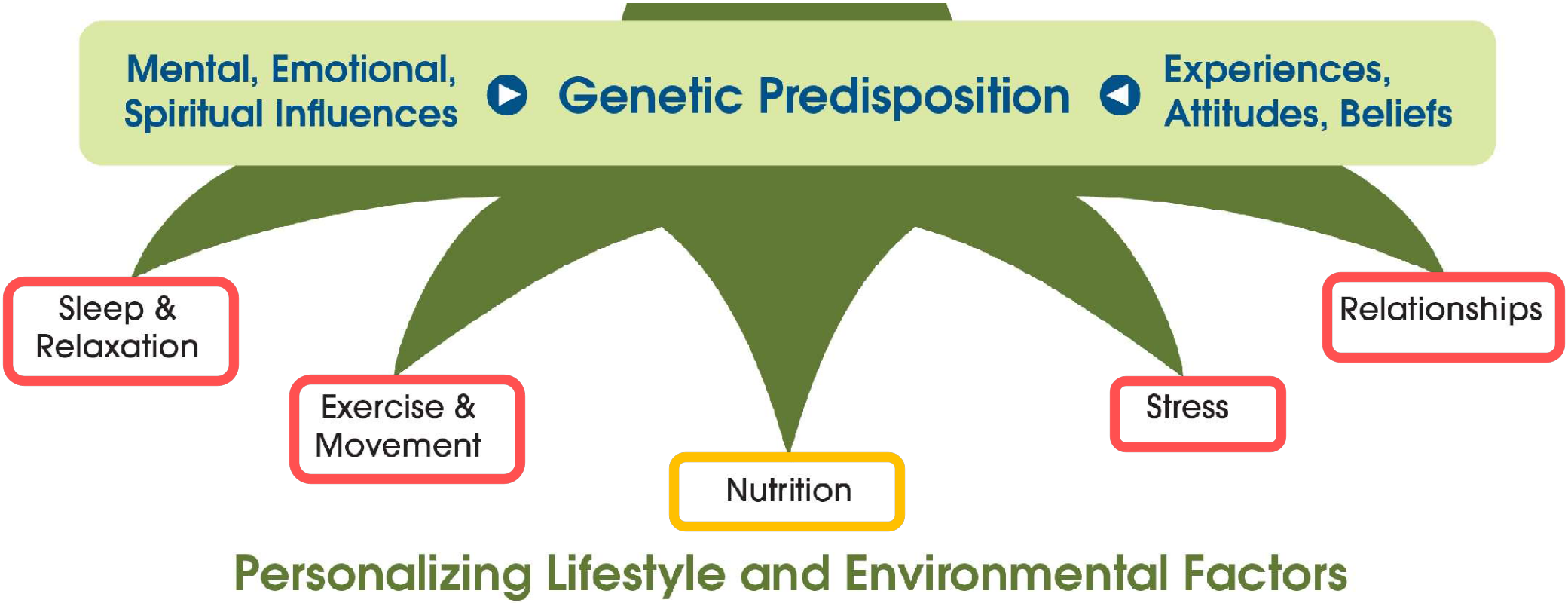
Functional Medicine

Looks to the root cause of disease

Complements conventional medicine

Views the body as one whole system

Focus on the root system to build health



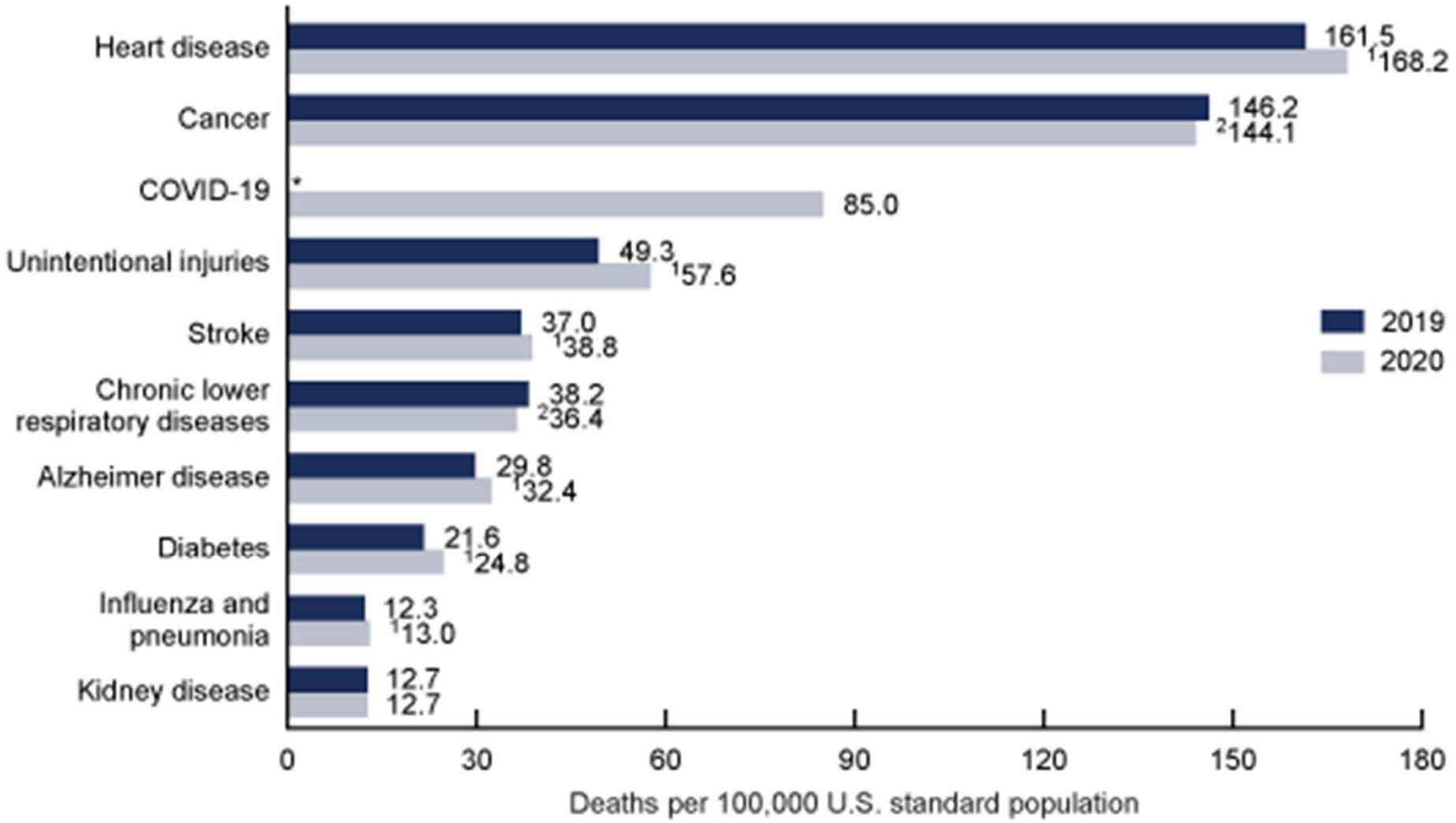
Personalizing Lifestyle and Environmental Factors

Why Study Nutrition?

- Nutrition is a lifestyle factor key to promoting an **optimal state of health**
  - Chronic disease and complications of chronic disease are top of the list in terms of preventable causes of death
  - Chronic diseases are defined broadly as conditions that last 1 year or more and require ongoing medical attention or limit activities of daily living or both (CDC)
- Risk factors:
  - Tobacco use and exposure to secondhand smoke.
  - Poor nutrition, including diets low in fruits and vegetables and high in sodium and saturated fats.
  - Physical inactivity.
  - Excessive alcohol use.

Source:https://www.cdc.gov/chronicdisease/about/index.htm

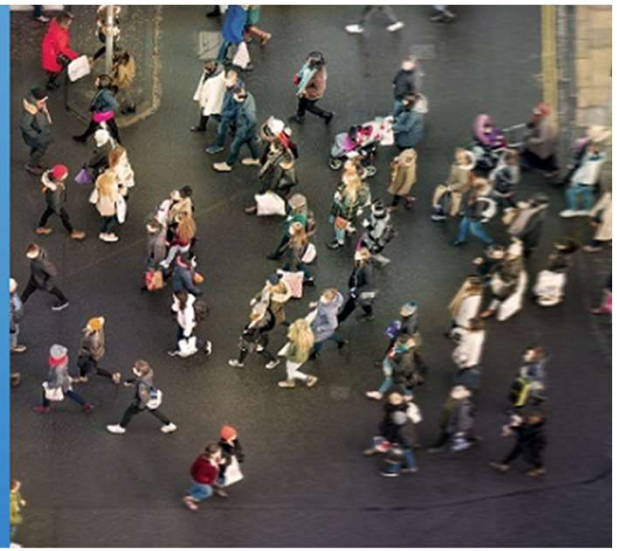
Age-adjusted death rates for the 10 leading causes of death in 2020: United States, 2019 and 2020



Source: https://www.cdc.gov/nchs/fastats/leading-causes-of-death.htm

Six in ten adults in the US have a chronic disease and **four in ten adults** have two or more.

HEART DISEASE | CANCER | CHRONIC LUNG DISEASE | STROKE | ALZHEIMER'S DISEASE | DIABETES | CHRONIC KIDNEY DISEASE

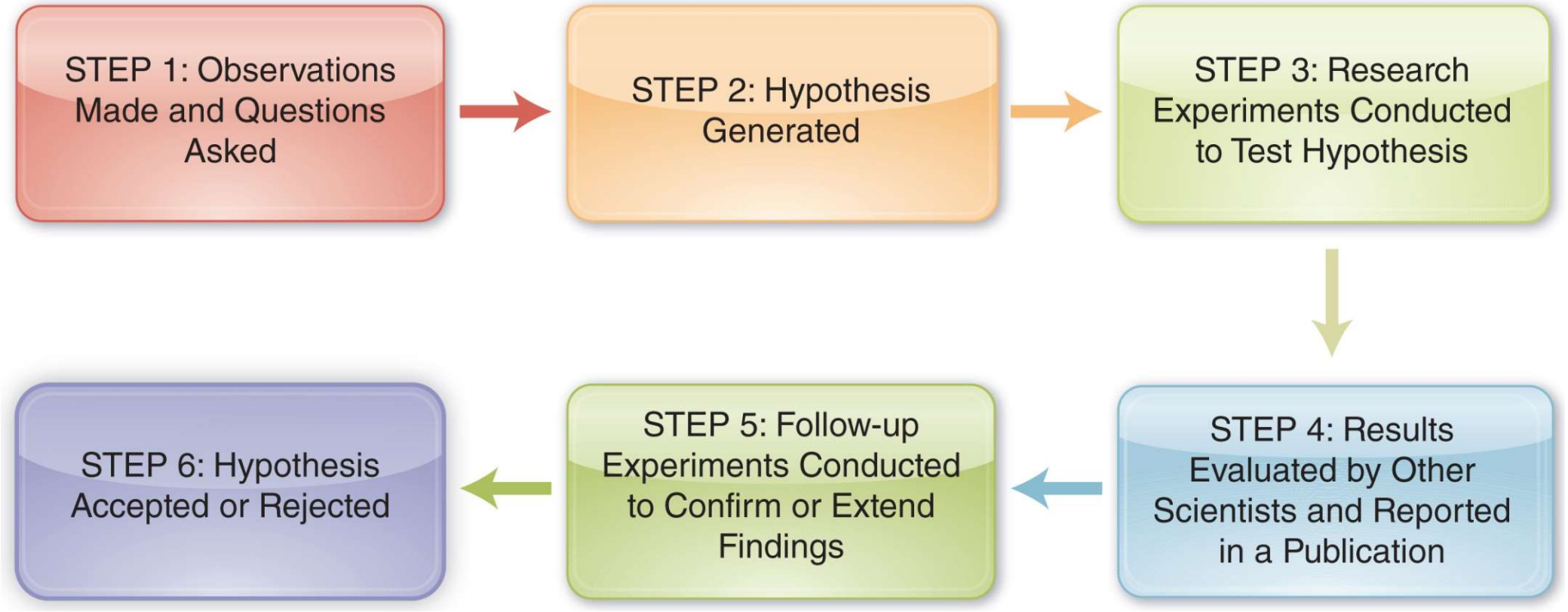


Nutrition Is…

The science that links foods to health and disease. It includes digestion, absorption, transportation, and excretion of food substances and waste products.

How Do We Know What We Know About Nutrition?

The Scientific Method



- **Hypotheses:** Scientists' "educated guesses" or tentative explanations to explain phenomena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CALIFORNIA
Sardinia,
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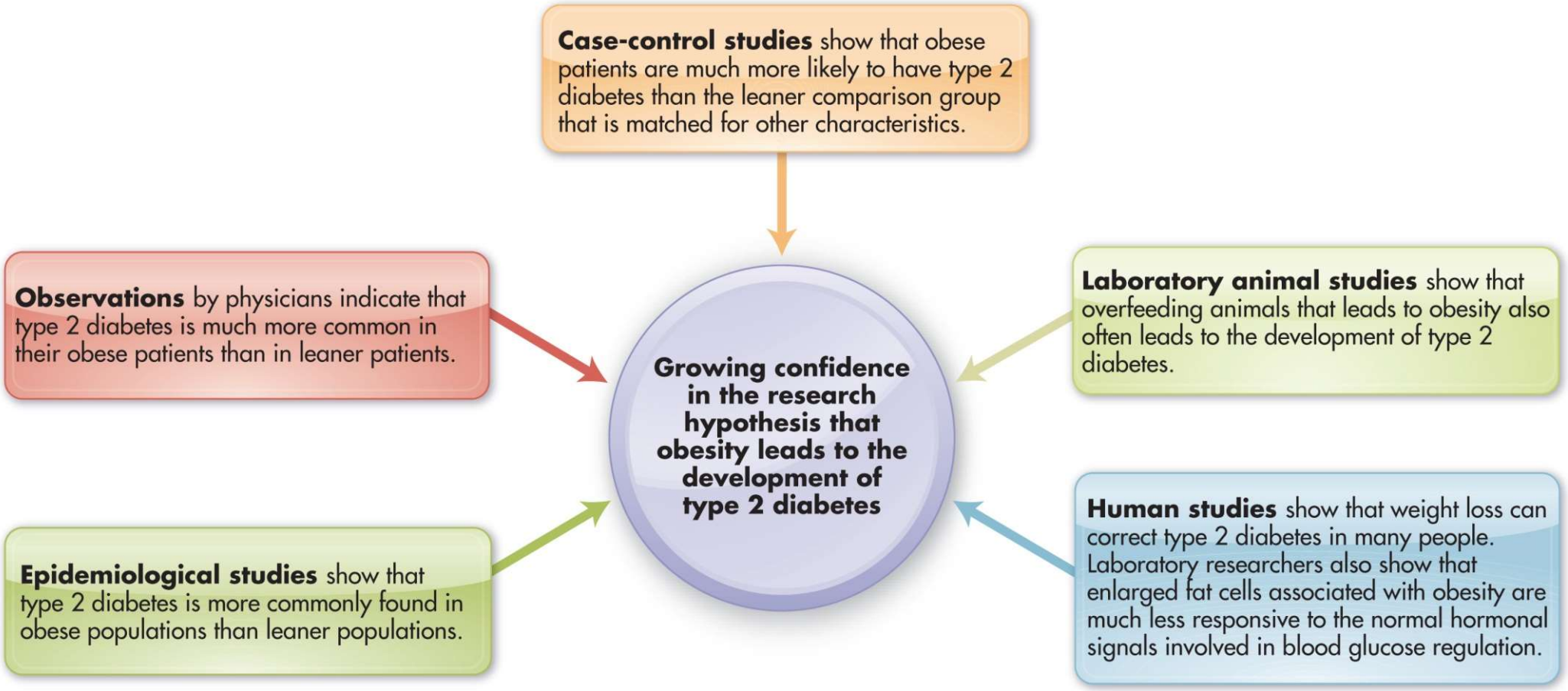
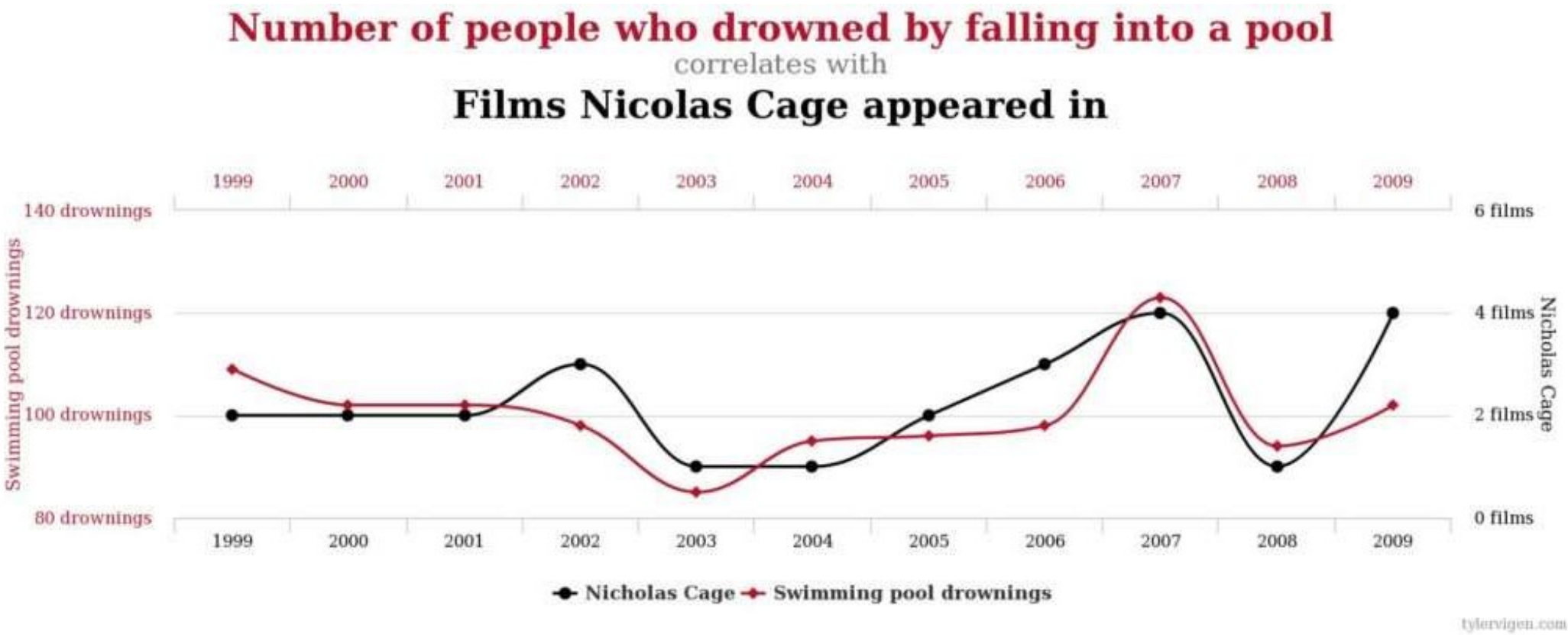
Okinawa
JAPAN
Ikaria,
GREECE
Nicoya,
COSTA RICA

Types of Studies



Double-blind study – "gold standard" of nutrition research

Correlation ≠ Causation



Consider the Source

- Questions to ask:
  - What is at stake?
  - Who is involved and why?
- Studies
  - Note the size, type, & duration
- Author
  - Credible?
- Publication
  - Peer Reviewed?

Weight Control and the "Freshman 15"

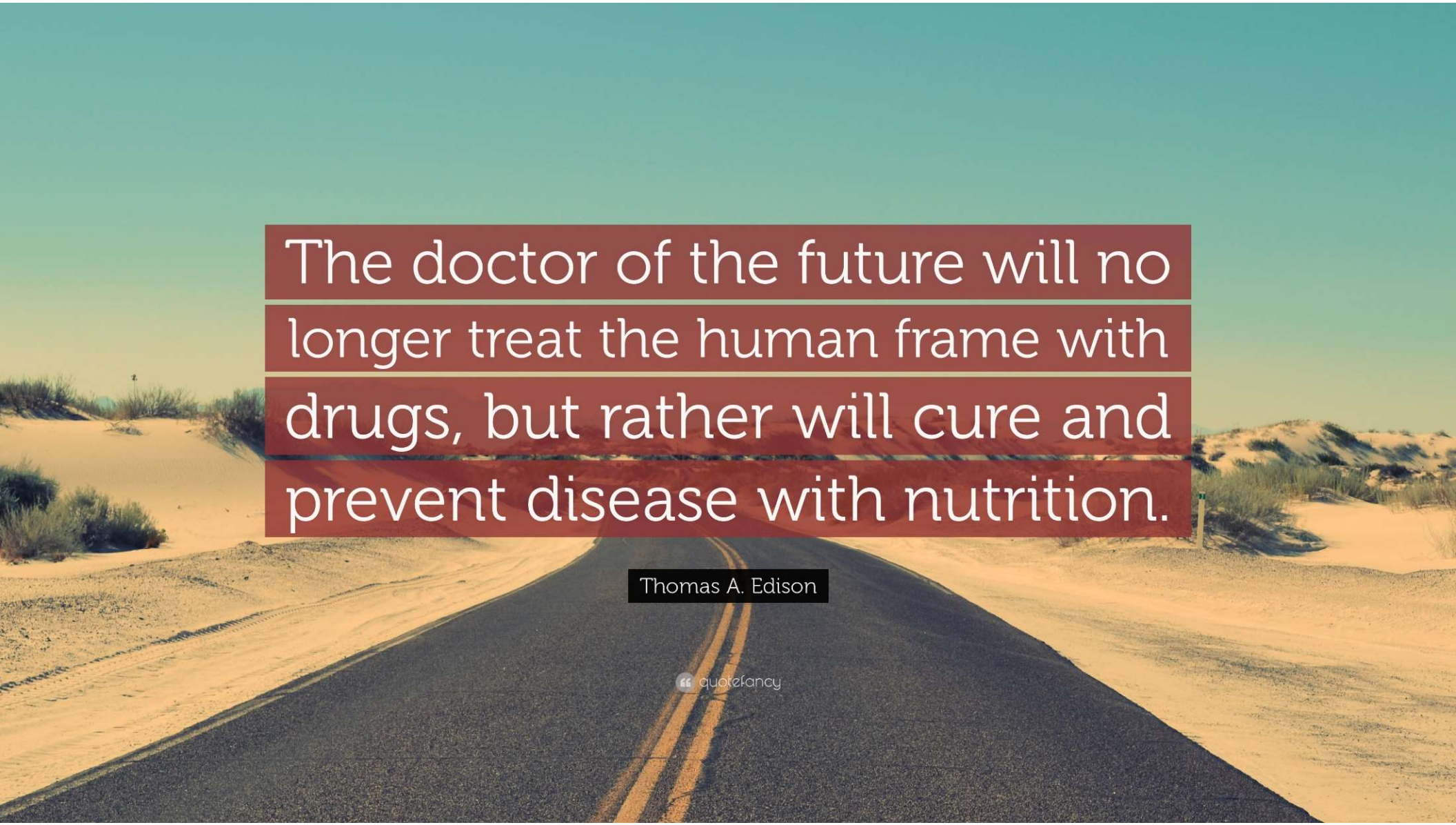
- Most students gain weight during the first year
- Most do not gain 15 pounds
  - Studies show it is an average of 2.4 – 3.5 pounds
  - Just under 10% gained 15 or more pounds

Source: Mihalopoulos NL, Auinger P, Klein JD. The Freshman 15: is it real?. *J Am Coll Health*. 2008;56(5):531-533. doi:10.3200/JACH.56.5.531-534

Nutrition, Health & Disease

Terms

- Disease
- Chronic
- Acute
- Risk factor
- Symptom
- Lifestyle
  - Nutrition
  - Sleep
  - Exercise
  - Stress
  - Relationships


The doctor of the future will no longer treat the human frame with drugs, but rather will cure and prevent disease with nutrition.
Thomas A. Edison
quotefancy

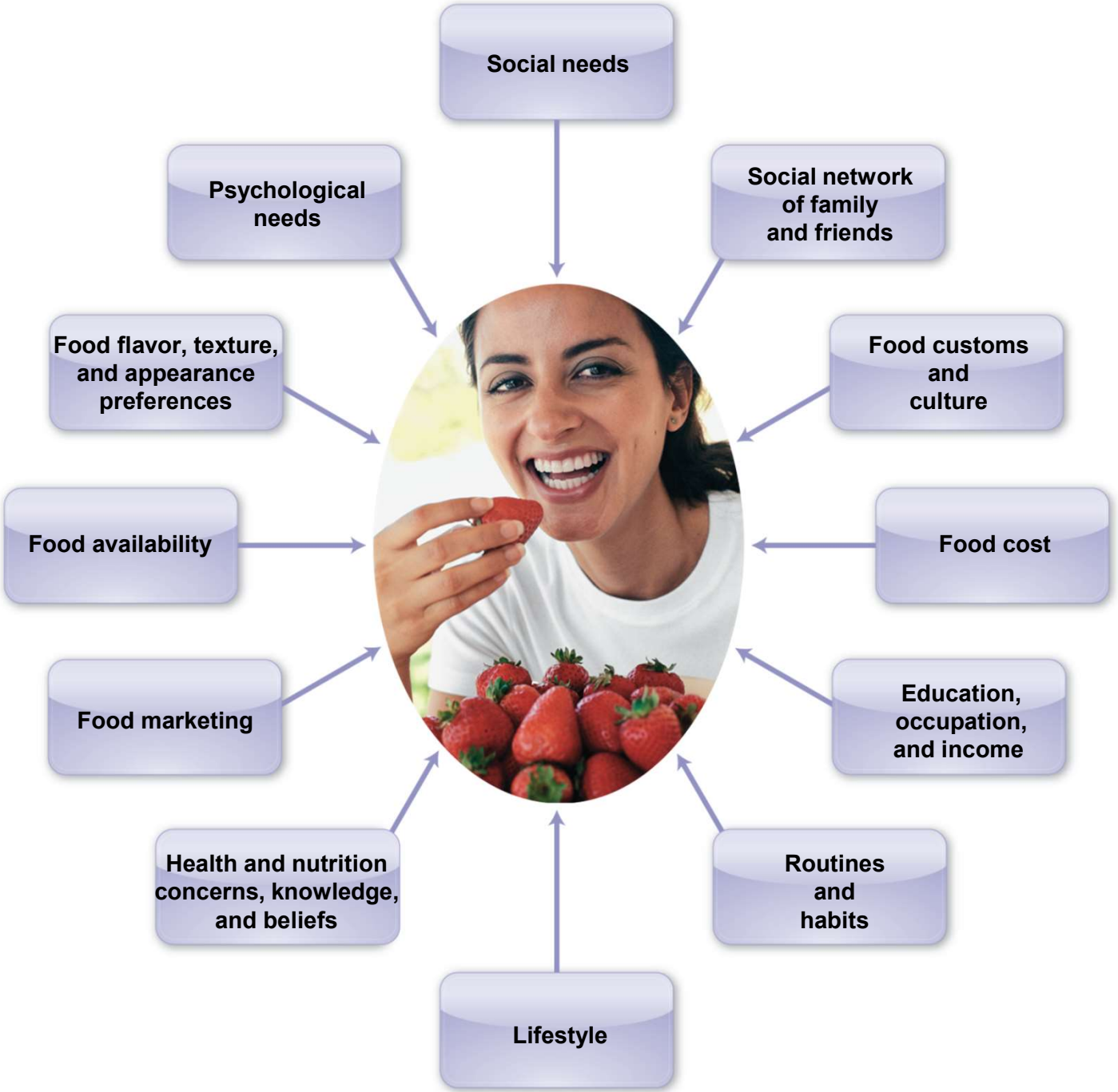
	Low-carbohydrate	Low-fat/ vegetarian/vegan	Low-glycemic	Mediterranean	Mixed/balanced	Paleolithic
Health benefits relate to:	Emphasis on restriction of refined starches and added sugars in particular.	Emphasis on plant foods direct from nature; avoidance of harmful fats.	Restriction of starches, added sugars; high fiber intake.	Foods direct from nature; mostly plants; emphasis on healthful oils, notably monounsaturates.	Minimization of highly processed, energy-dense foods; emphasis on wholesome foods in moderate quantities.	Minimization of processed foods. Emphasis on natural plant foods and lean meats.
Compatible elements:	Limited refined starches, added sugars, processed foods; limited intake of certain fats; emphasis on whole plant foods, with or without lean meats, fish, poultry, seafood.					
And all potentially consistent with:	**Food, not too much, mostly plants[a,b,c].**					

[a]From Reference 135.
[b]Portion control may be facilitated by choosing better-quality foods which have the tendency to promote satiety with fewer calories.
[c]While neither the low-carbohydrate nor Paleolithic diet need be "mostly plants," both can be.

Source: Katz DL, Meller S. Can we say what diet is best for health?. *Annu Rev Public Health*. 2014;35:83-103. doi:10.1146/annurev-publhealth-032013-182351

What did you have for breakfast this morning?

Factors Affecting Food Choices



Factors Affecting Food Choices

- ***Restaurant*** food is often calorie-dense, in large portions, and of poorer nutritional quality compared to foods made at home.
- ***Time and convenience*** have become significant influences affecting food choices and stem from a lifestyle that limits the amount of time spent in food preparation.
- ***Economics*** play a role in our food choices. A 2012 Food and Health Survey indicates that after taste, cost is now the number two reason why people choose the food they do.
- ***Nutrition*** directs people's food purchases. Those who tend to make health-related food choices are health-oriented and have active lifestyles too.

Factors Affecting Food Choices

- ***Advertising*** is a major media tool for capturing the food interest of the consumer.

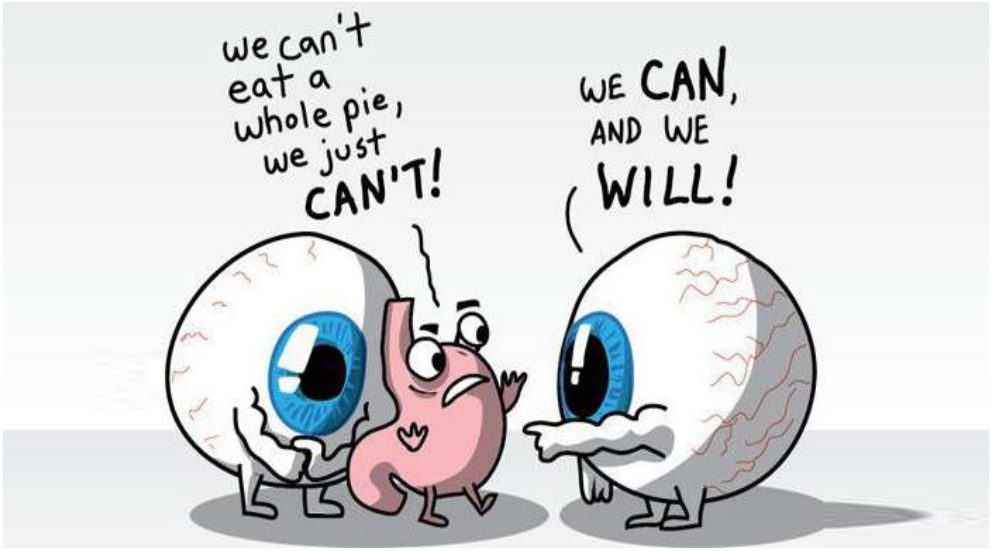
Why Do We Eat?

Hunger - Primarily a physiological (internal) drive to find and eat food, mostly regulated by internal cues to eating.

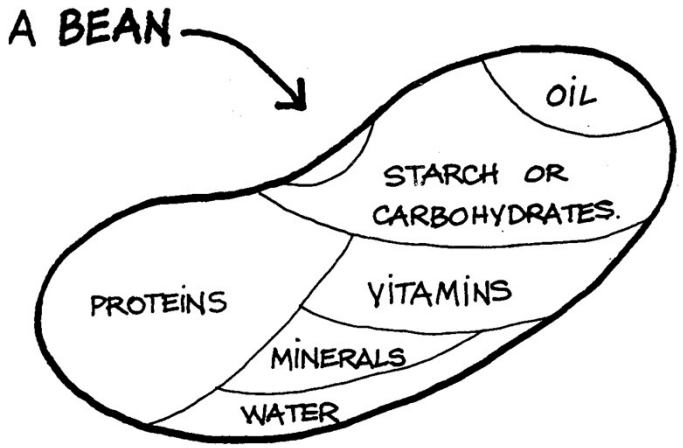
Appetite - Primarily a psychological (external) influence that encourages us to find and eat food, often in the absence of obvious hunger.

Satiety: State in which there is no longer a desire to eat; a feeling of satisfaction.

- Regulated by the brain
- Feeding center
- Satiety center



Food Provides…



Calories to meet energy needs

-Carbohydrates, fats, and protein

Nutrients for:

1. Growth, development, and maintenance
2. Regulate body processes

Essential Nutrient

Has a biological function

Omission results in decline of function

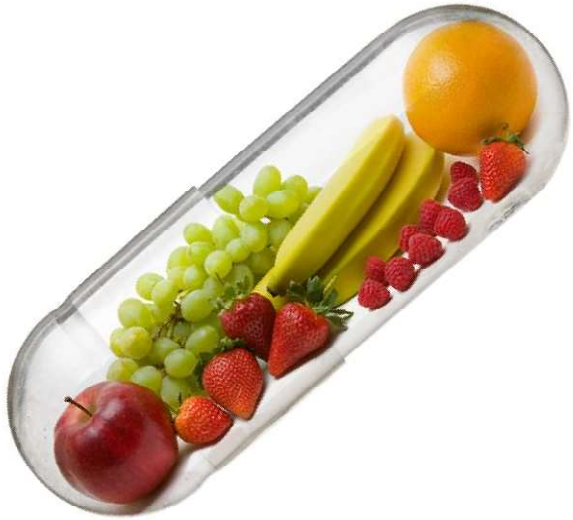
Replenishing restores biological function


WHAT ARE MACRONUTRIENTS
AND MICRONUTRIENTS?

The Six Classes of Nutrients

- **Macronutrients provide calories**
  - Needed in gram quantities in a diet.
    - *Carbohydrates*
    - *Protein*
    - *Lipids/Fat*
- **Micronutrients do not provide calories**
  - Needed in milligram or microgram quantities in a diet.
    - *Vitamins*
    - *Minerals*

Water- also essential.
Does not provide calories



Carbohydrates

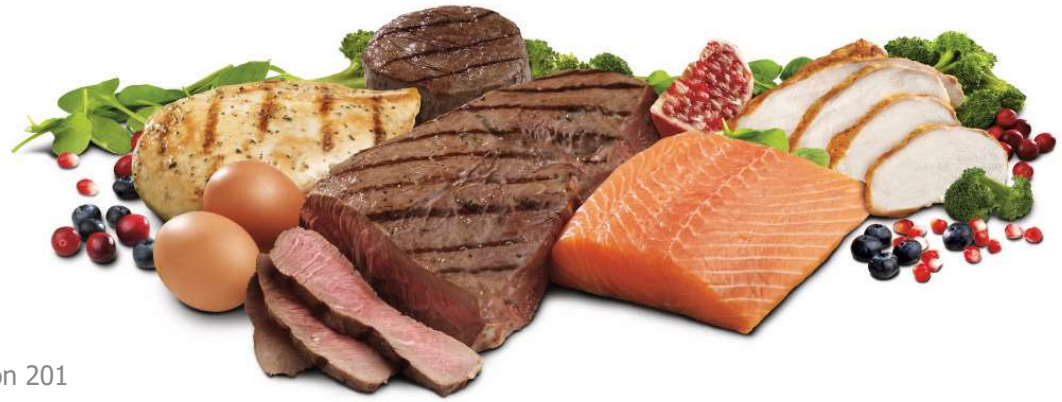
- Provide majority of calories (energy) in our diet (~4 kcal/g)
- **Simple** sugar
  - Monosaccharides and disaccharides
- **Complex** carbohydrates (polysaccharides)
  - Glycogen, starch and fiber

Fats/Lipids

- Energy yielding (~9 kcal/gm)
- Fats and oils
- Both plant & animal sources
  - Animal fats
  - Plant oils
- Do not dissolve in water
- Essential Fatty Acids

Proteins

- Energy yielding (~4 kcal /gm)
- Main structural material in the body (bone & muscle)
- Form when amino acids bonded together
- Dietary sources include plants and animals
- Excess consumption in U.S - Why?



Vitamins

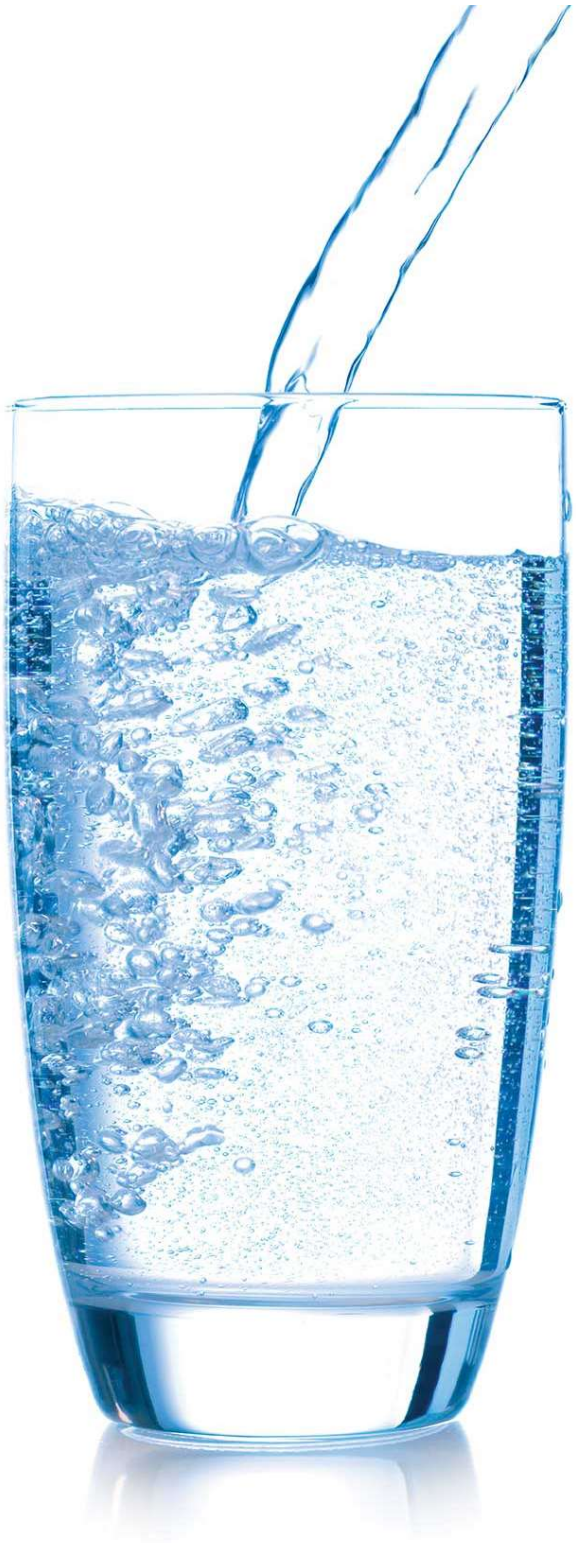
- Micronutrient
- Enable chemical reactions to occur in the body
- Fat soluble - A, D, E, and K – stored; dairy, nuts, seeds, oil, breakfast cereals
- Water soluble – B's and C – fruits and vegetables
- Cooking destroys water soluble more readily than fat soluble
- <u>Contain no useable energy</u>

Minerals

- Micronutrient
- Inorganic substances - do not contain carbon atoms
- Numerous functions in the body – nervous system functioning, water balance, musculoskeletal processes
- Not destroyed during cooking
- Major and trace minerals:
    - Major: ≥ 100 mg/d required – dairy products and fruits
    - Trace: < 100 mg/d required – meats, poultry, fish and nuts
- Perform electrolyte functions – electrical charge when dissolved in water (sodium, potassium, chloride)
- Produce no calories/energy

Water

- Acts as solvent and lubricant
- Transports nutrients and waste
- Medium for temperature regulation
- Majority of our body weight (~60%)
- Found in foods (fruits and vegetables)
- Provides no calories/energy



Phytochemicals

- Chemical found in plants; contribute to reduced risk of cancer and cardiovascular disease in people who consume them regularly
- Not considered essential*

Calories

- The energy we need for involuntary body functions and voluntary physical activity comes from various sources:
  - **Carbohydrate 4** kcal per gram
  - **Fats: 9** kcals per gram
  - **Protein: 4** kcals per gram
  - **Alcohol: 7** kcals per gram,
    not considered an essential nutrient

What is a Calorie?

- **Little c** "The amount of heat it takes to raise the temperature of 1 gram of water by 1 degree Celsius"
- The measurement of energy in food is expressed in terms of Calories (**capital C**) on food labels
- **Little c** calorie is a tiny measure of heat so food energy is more conveniently expressed in terms of the **kilocalorie (kcal)**, which equals 1000 calories.
  - 1,000 calories = 1 kcal = 1(food) Calorie

Calculating Calories

1 Grilled Chicken Sandwich

Carbohydrate	46 grams	x 4 = 184 kcal
Fat	14 grams	x 9 = 126 kcal
Protein	45 grams	x 4 = 180 kcal
Alcohol	0 grams	x 7 = 0 kcal
		Total 490 kcal

Sample Calculation of a Nutrition Label

WHOLE WHEAT BREAD

Nutrition Facts

Serving Size 1 slice (36g) — Servings Per Container 19

Amount Per Serving

Calories 80 — Calories from Fat 10

	% Daily Value*		% Daily Value*
Total Fat 1g	**2**%	**Total Carbohydrate** 15g	**5**%
Saturated Fat 0g	**0**%	Dietary Fiber 2g	**8**%
Trans Fat less than 1g **			
Cholesterol 0mg	**0**%	Sugars less than 1g	
Sodium 200mg	**8**%	**Protein** 3g	

Vitamin A 0% — Vitamin C 0% — Calcium 0% — Iron 4%

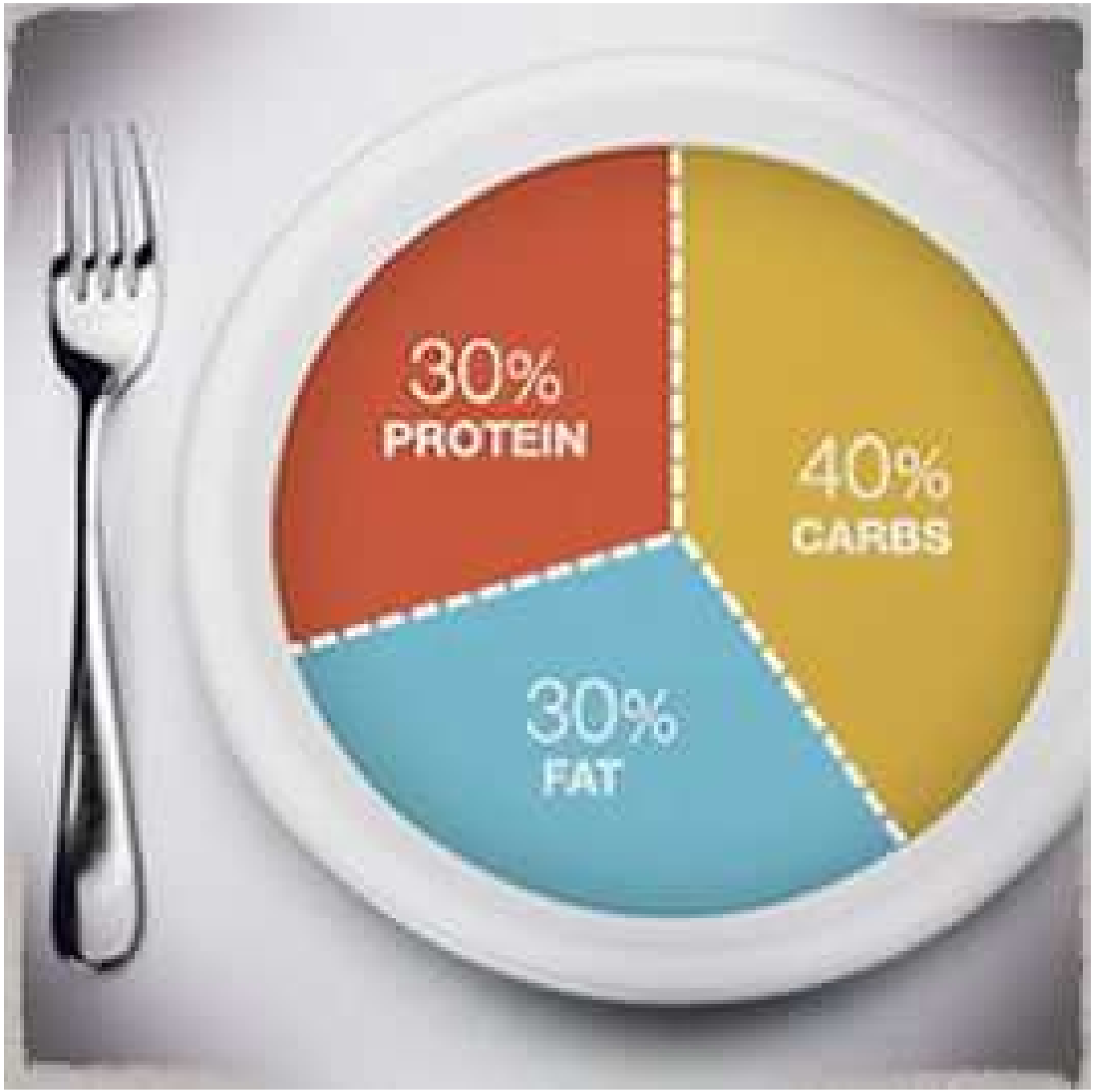
*Percent Daily Values (DV) are based on a 2,000 calorie diet. Your daily values may be higher or lower depending on your calorie needs:

	Calories:	2,000	2,500
Total Fat	Less than	65g	80g
Sat 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

INGREDIENTS: WHOLE WHEAT, WATER, ENRICHED WHEAT FLOUR [FLOUR, MALTED BARLEY, NIACIN, REDUCED IRON, THIAMINE MONONITRATE (VITAMIN B1) AND RIBOFLAVIN (VITAMIN B2)], CORN SYRUP, PARTIALLY HYDROGENATED COTTONSEED OIL, SALT, YEAST.

** Intake of *trans* fat should be as low as possible.

- Based on carbohydrate, fat, and protein content:
  - A serving of Whole Wheat Bread contains 81 kcal ([15 x 4] + [1 x 9] + [3 x 4] = 81). The label lists 80, suggesting that the calorie value was rounded down.


30%
PROTEIN
40%
CARBS
30%
FAT

Percentages

- *Percent* (%) refers to a part of the total when the total represents 100 parts
- **An example**: if you earn 80% on your first nutrition examination, you will have answered the equivalent of 80 out of 100 questions correctly

Question	**Answer**
What is 6% of 45?	6% = 0.06, so 0.06 x 45 = 2.7
What percent of 99 is 3?	3/99 = 0.03 or 3% (0.03 x 100)

Contribution to Total Kcal

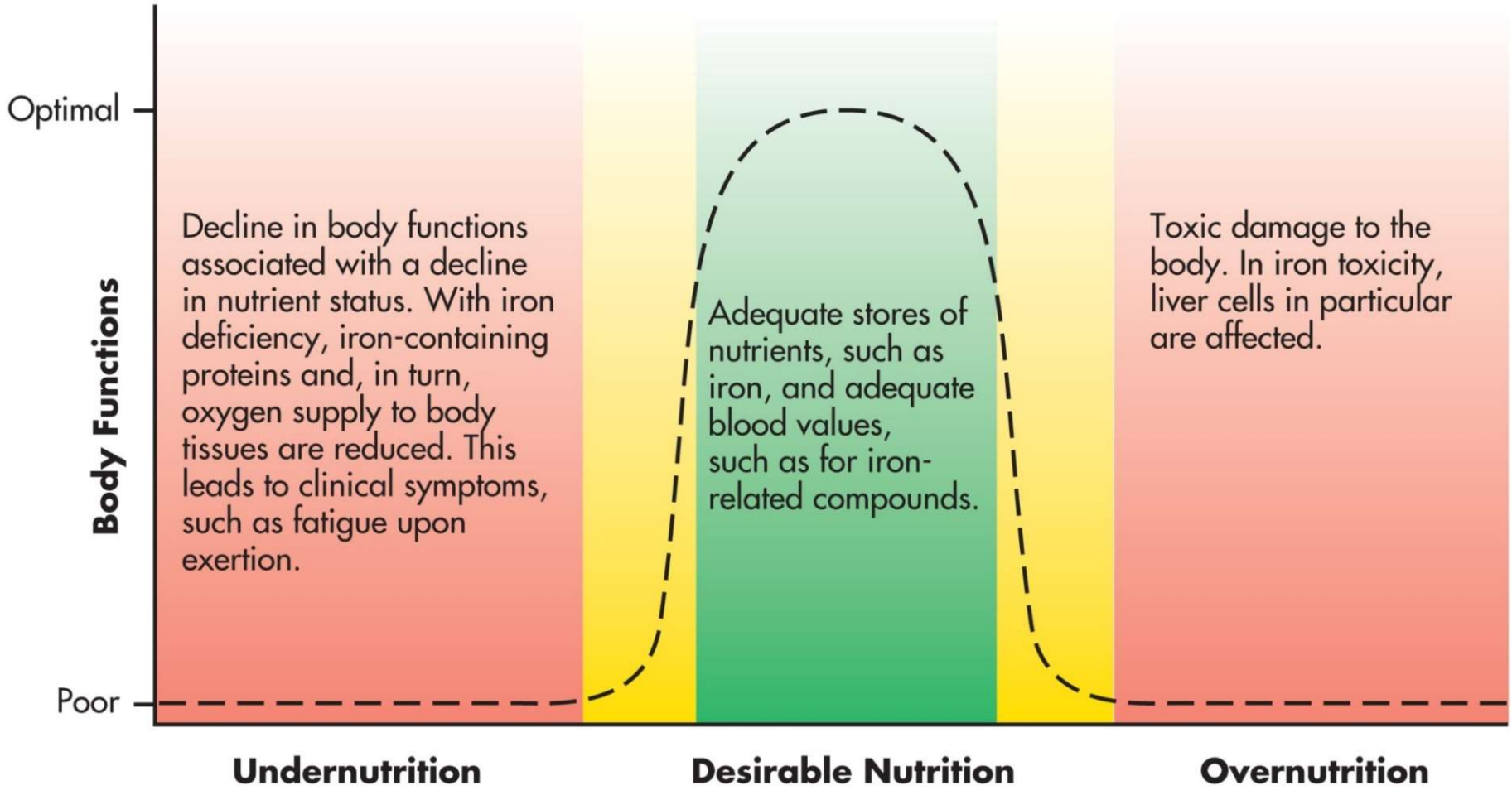
One day's intake = **1980 kcal**

290 gm of CHO (carb) x 4 kcal/gm = 1160
60 gm of fat x 9 kcal/gm = 540
70 gm of protein x 4 kcal/gm =280

% of kcal as CHO (carb) = (290 x 4)/1980 = 0.59 or **59%**
% of kcal as fat= (60 x 9)/1980 = 0.27 or **27%**
% of kcal as protein= (70 x 4)/1980 = 0.14 or **14%**

How do we measure nutritional status as it relates to human health?

Nutritional Status



Nutrition Terms

- **Nutritional state:** Nutritional health of a person determined by anthropometric measurements, biochemical measurements of nutrients, their by-products in blood and urine, clinical examination, dietary analysis, and economic evaluation; also called nutritional status (ABCDE)
- **Malnutrition:** Failing health from long-standing dietary practices that do not coincide with nutritional needs – can refer to overnutrition or undernutrition
  - **Overnutrition:** A state in which nutritional intake greatly exceeds the body's needs
  - **Undernutrition:** Failing health that results from a long-standing dietary intake that is not enough to meet nutritional needs

Assessing Nutritional Status Using the ABCDEs

- **Anthropometric assessment**
  Body weight, lengths, circumferences, and thicknesses of parts of the body

Anthropometric

Assessing Nutritional Status Using the ABCDEs

- **Biochemical assessment**
  Biochemical functions related to a nutrient's function
  - Concentrations of nutrient by-products or enzyme activities in blood or urine

Biochemical

Assessing Nutritional Status Using the ABCDEs

- **Clinical assessment**
  General appearance of skin, eyes, and tongue; evidence of rapid hair loss; sense of touch; ability to cough, walk

Clinical

Assessing Nutritional Status Using the ABCDEs

- **Dietary assessment**
  Estimation of typical food choices relying on the recounting of one's usual intake or record of previous days' intake

Dietary

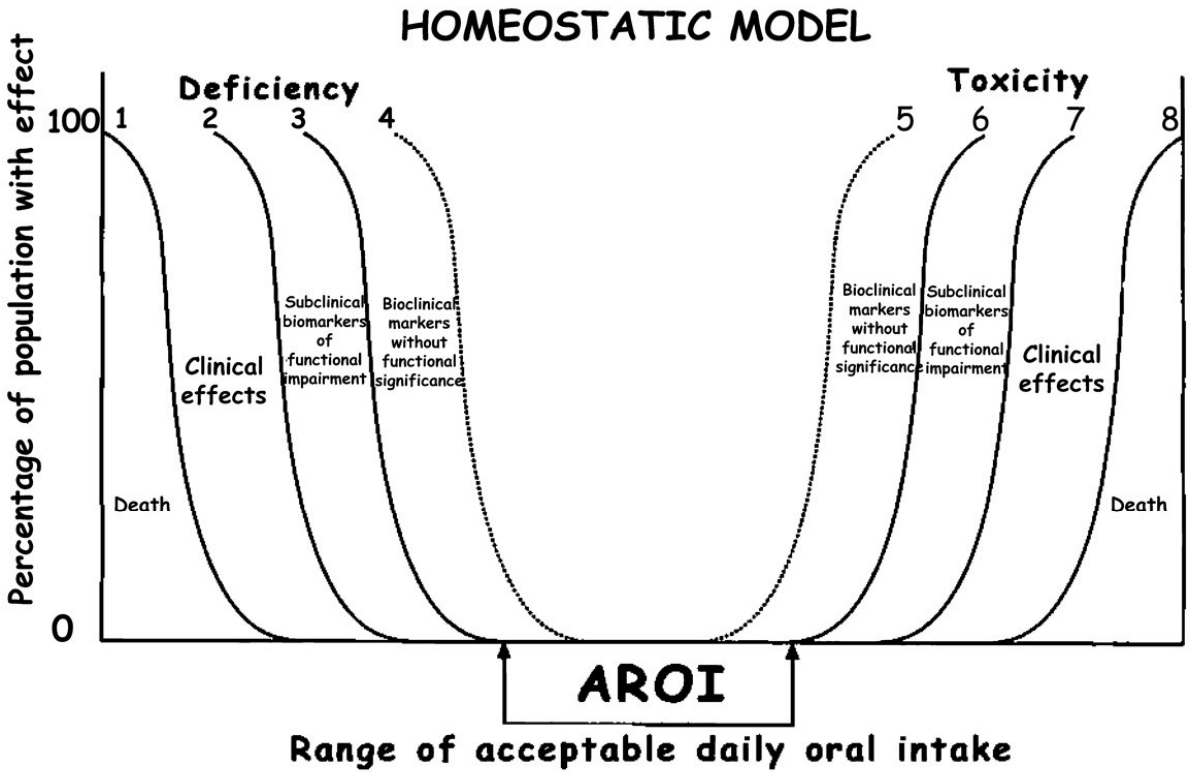
Assessing Nutritional Status Using the ABCDEs

- **Environmental assessment**
  Living conditions, education level, ability to purchase, transport, and cook food. Weekly budget for food purchases

Environmental

Limitations of Nutritional Assessment

- A long time between poor nutritional habits and the onset of first clinical evidence health problem



Theoretical dose-response curves for various effects occurring in a population at various levels of intake (doses) of an essential trace element.

The lower end the dose response curve for such critical effects related to deficiency (curve 3) and toxicity (curve 6) defines the range of acceptable daily oral intakes.

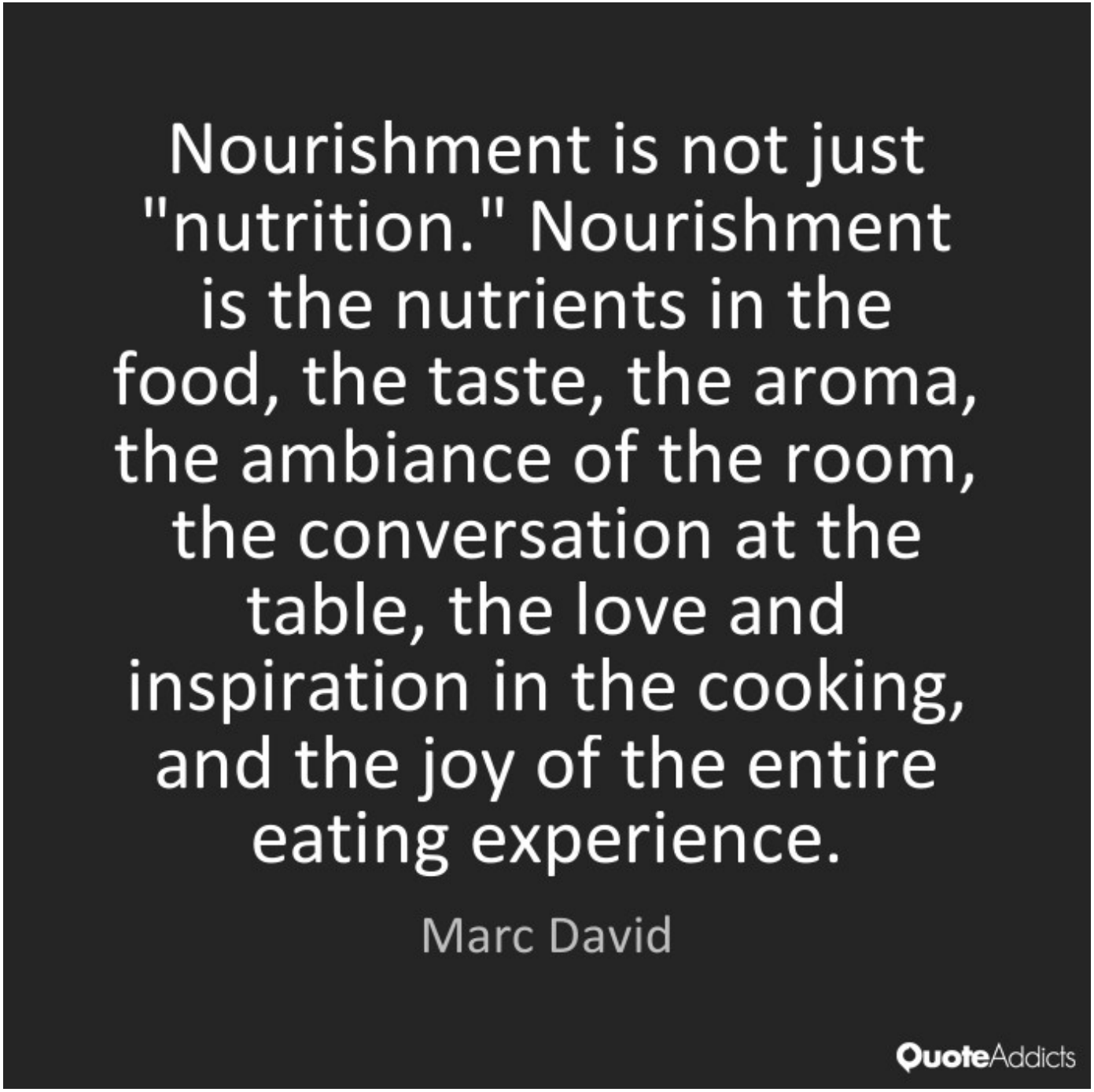
Adapted from IPCS, 2002

Designing a Healthy Eating Pattern

Philosophy That Works

- It has been the basic diet and health plan for years:
  - **Quantity:** Control **how much** you eat
  - **Quality:** Pay attention to **what** you eat: choose whole grains, fruits, and vegetable
  - **Activity:** Stay **physically active**

There are **no exclusively "good" or "bad"** foods (TRUE?)


Nourishment is not just "nutrition." Nourishment is the nutrients in the food, the taste, the aroma, the ambiance of the room, the conversation at the table, the love and inspiration in the cooking, and the joy of the entire eating experience.
Marc David
QuoteAddicts

Variety Means Eating Many Different Foods

- No one food meets all nutrient needs
- Eat a variety of whole foods for nutrient diversity
    1. Grains
    2. Fruits
    3. Protein
    4. Vegetables
    5. Dairy

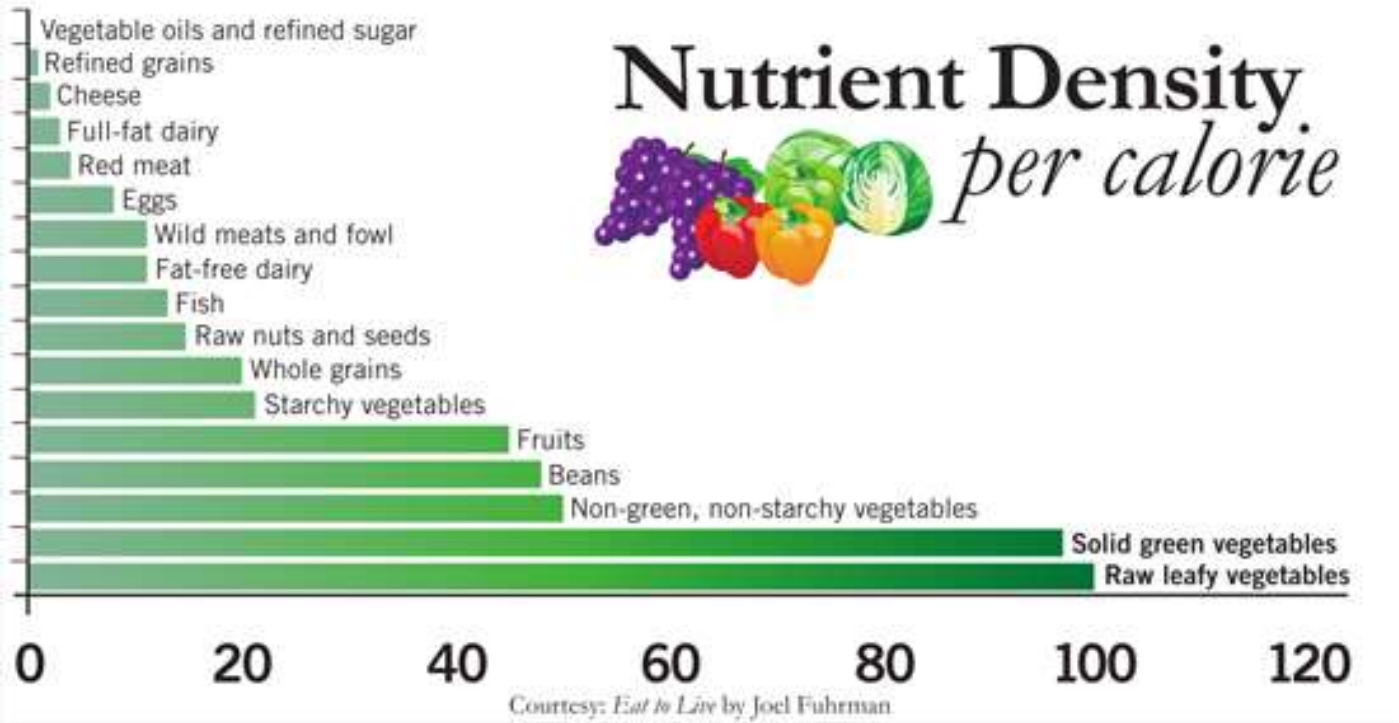
Balance Means Eating More Nutrient-Dense Foods

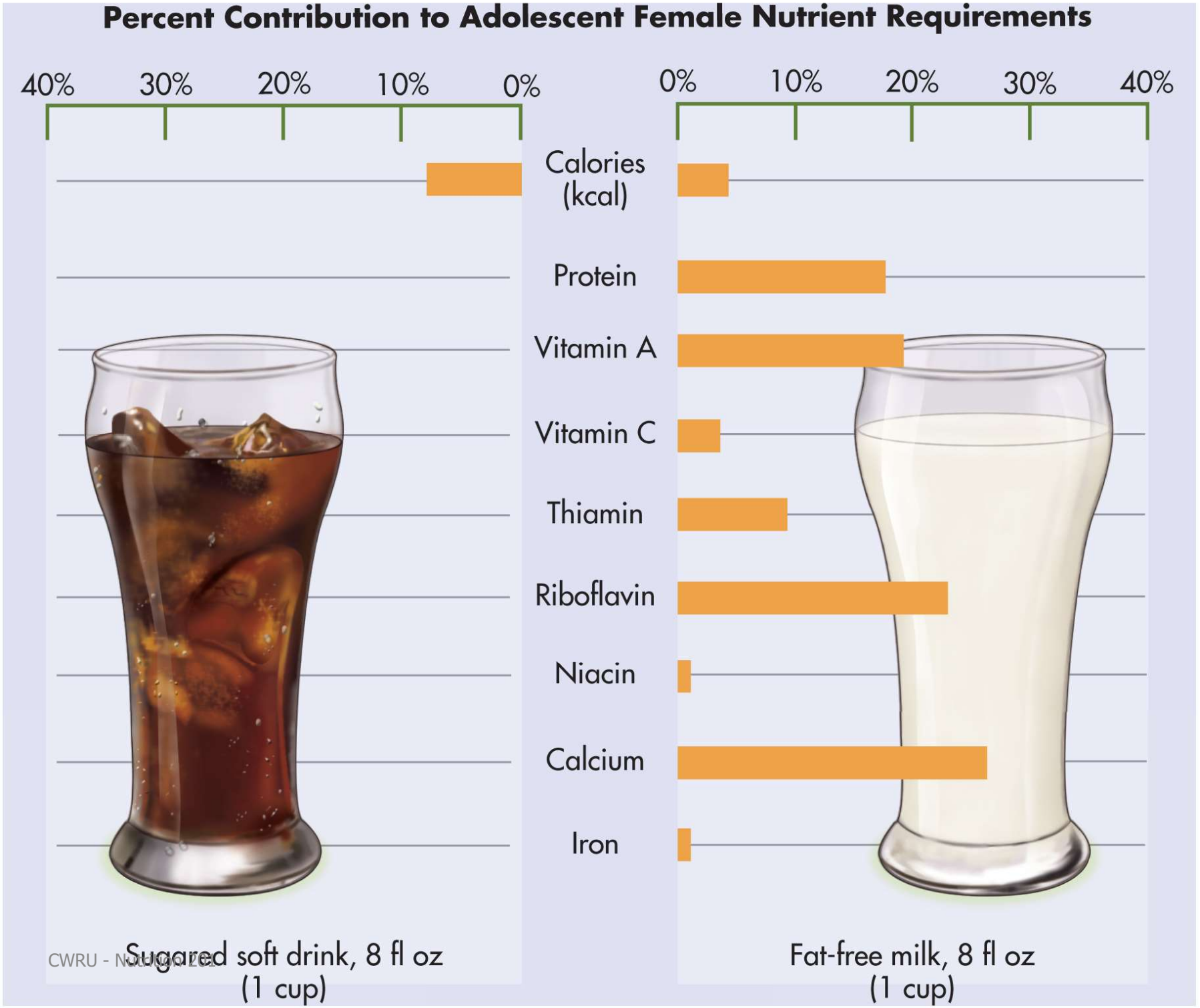
- Balance
  - Eat more nutrient-dense foods and beverages such as fruit, vegetables, whole grains, legumes (beans), seafood, and less foods high in certain types of fat, sugars, cholesterol, salt, and alcohol (empty calories)
  - Match your energy intake with energy expenditure

What is nutrient density?

Nutrient Density

- Derived by dividing a food's nutrient content by its calorie content



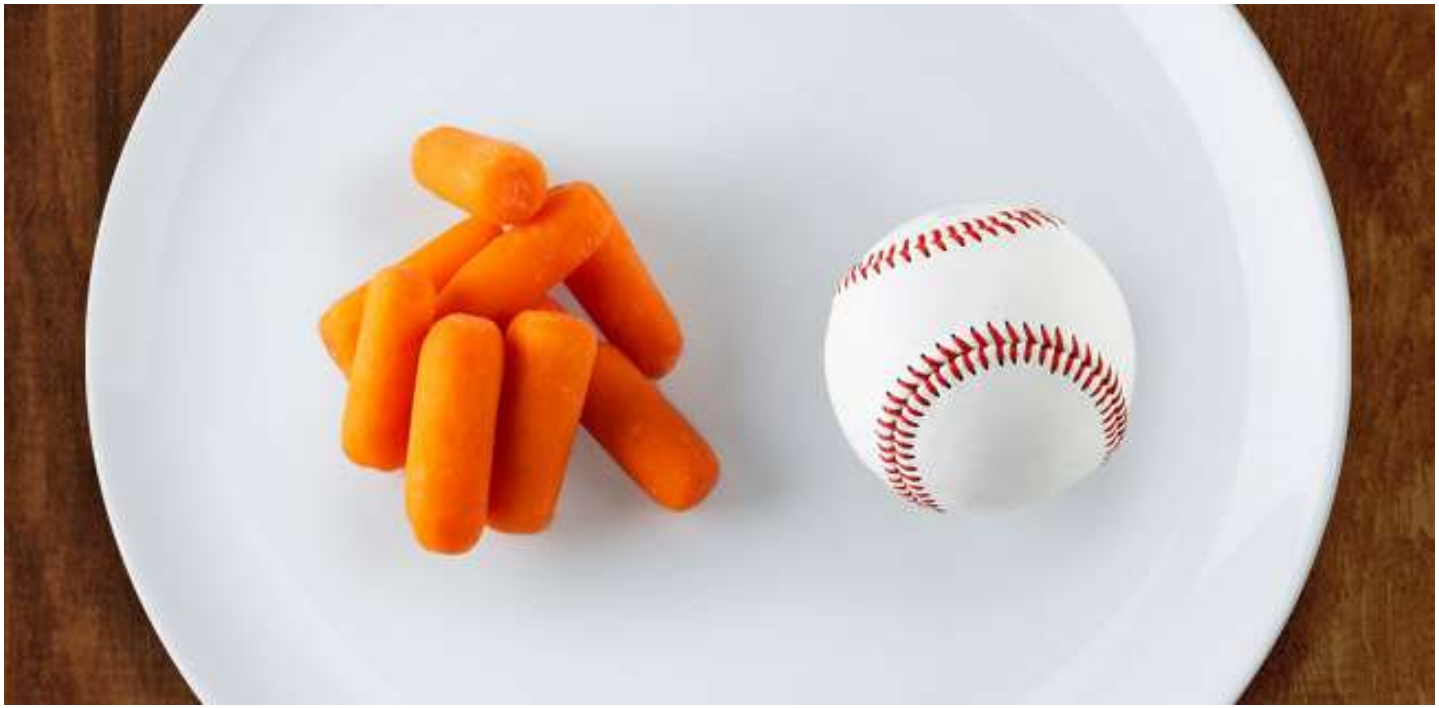


Functional Foods

- Provide health benefits beyond those supplied by the traditional nutrients they contain

Moderation Refers Mostly to Portion Size

- Pay attention to portion sizes and planning your day's diet so that you do not over consume any nutrients



Energy Density

- Energy density of a food is determined by comparing the calorie (kcal) content with the weight of food

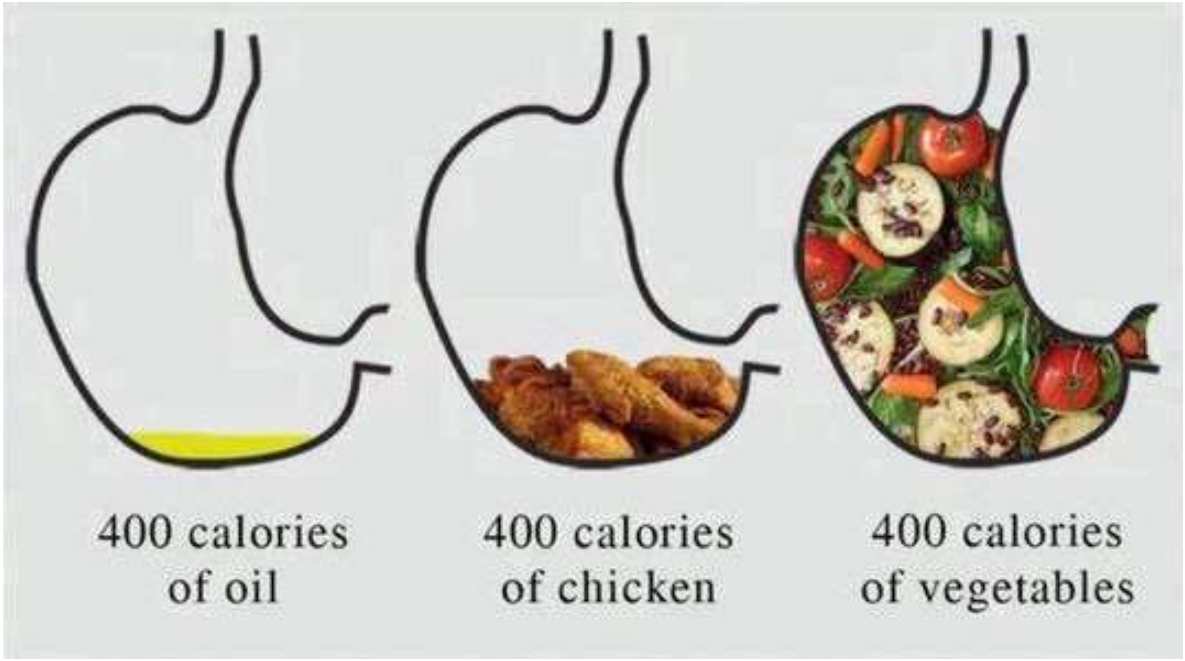


TABLE 2-2 ▶ Energy Density of Common Foods (Listed in Relative Order)

Very Low Energy Density (less than 0.6 kcal per gram)	Low Energy Density (0.6 to 1.5 kcal per gram)	Medium Energy Density (1.5 to 4 kcal per gram)	High Energy Density (greater than 4 kcal per gram)
Lettuce	Whole milk	Eggs	Graham crackers
Tomatoes	Oatmeal	Ham	Fat-free sandwich cookies
Strawberries	Cottage cheese	Pumpkin pie	Chocolate
Broccoli	Beans	Whole-wheat bread	Chocolate chip cookies
Salsa	Bananas	Bagels	Tortilla chips
Grapefruit	Broiled fish	White bread	Bacon
Fat-free milk	Fat-free yogurt	Raisins	Potato chips
Carrots Vegetable soup	Ready-to-eat breakfast cereals with 1% low-fat milk	Cream cheese Cake with frosting Pretzels	Peanuts Peanut butter Mayonnaise
Celery	Plain baked potato	Rice cakes	Butter or margarine
Cabbage	Cooked rice		Vegetable oils
Melon	Spaghetti noodles		

Data adapted from Rolls B, *The Ultimate Volumetrics Diet.* New York: HarperCollins, 2012.

1575 Kcal
High Energy Density

1575 Kcal
Low Energy Density

Used with permission from Dr. Barbara Rolls, Penn State University

About the *Dietary Guidelines for Americans*

- The *Dietary Guidelines* provides science-based advice on what to eat and drink to promote health, help reduce risk of chronic disease, and meet nutrient needs.
- Serves as the cornerstone of federal nutrition programs and policies.
- Mandated to reflect the preponderance of scientific evidence, and published jointly by USDA and HHS every five years.
- Written for a professional audience, including policymakers, healthcare professionals, nutrition educators, and federal nutrition program operators.

The Guidelines

1

Follow a healthy dietary pattern at every life stage.

2

Customize and enjoy nutrient-dense food and beverage choices to reflect personal preferences, cultural traditions, and budgetary considerations.

3

Focus on meeting food group needs with nutrient-dense foods and beverages, and stay within calorie limits.

4

Limit foods and beverages higher in added sugars, saturated fat, and sodium, and limit alcoholic beverages.

DGA DietaryGuidelines.gov

DGA Dietary Guidelines for Americans

Key Dietary Principles

- Meet nutritional needs primarily from foods and beverages
- Choose a variety of options from each food group
- Pay attention to portion size

Dietary Guidelines for Americans

What is a Dietary Pattern?

- Represents the totality of what individuals habitually eat and drink.
- The parts of the pattern act synergistically to affect health.
- May better predict overall health status and disease risk than individual foods or nutrients.
- A healthy dietary pattern consists of nutrient-dense forms of foods and beverages across all food groups, in recommended amounts, and within calorie limits.

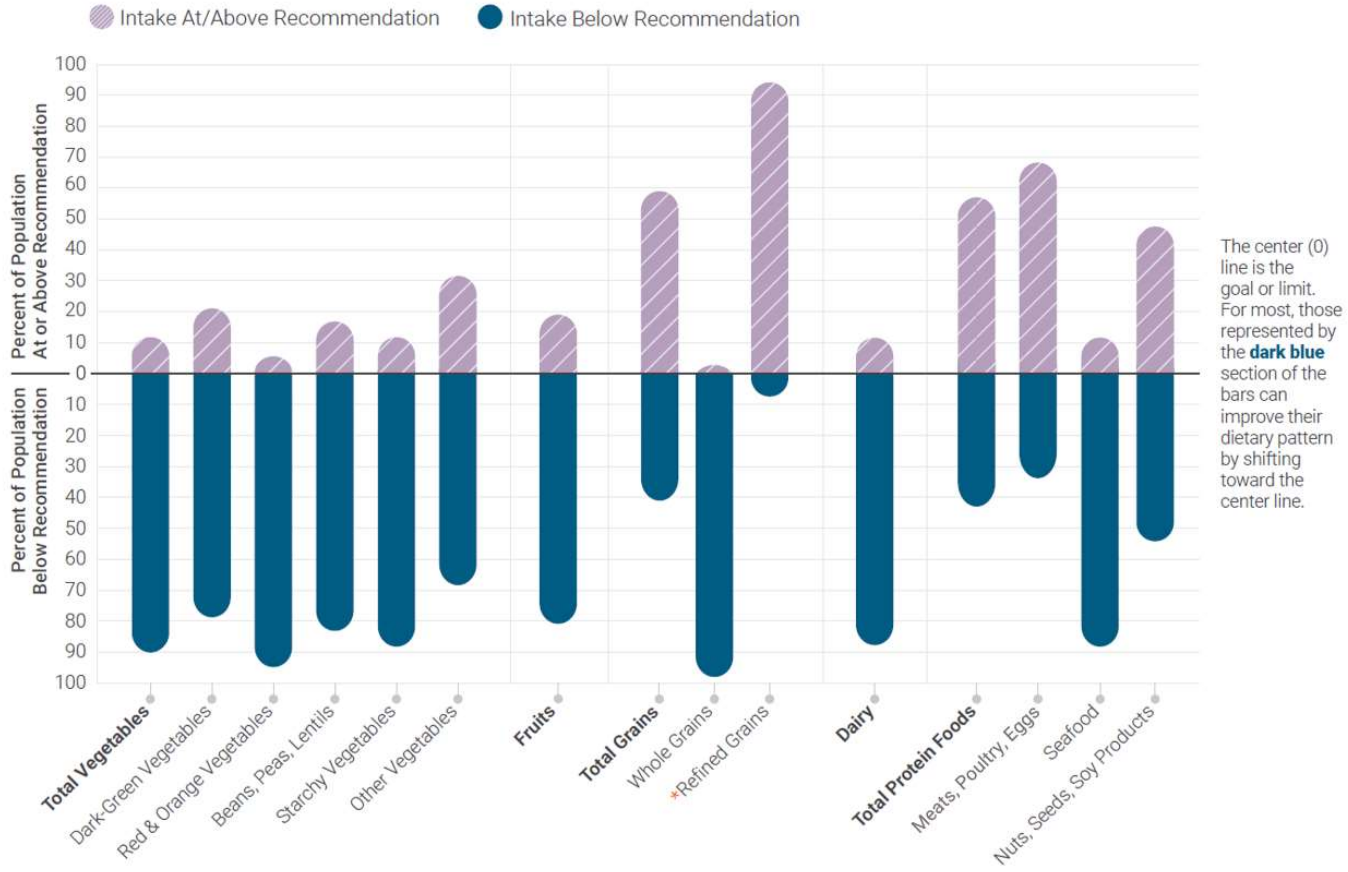
USDA Dietary Patterns

- The primary USDA Dietary Pattern is the **Healthy U.S.-Style Dietary Pattern**, which provides a framework for healthy eating that all Americans can follow.
  - Based on the types and proportions of foods typically consumed, but in nutrient-dense forms and appropriate amounts.

- Variations of the **Healthy U.S-Style Dietary Pattern** that have the same core elements include:
  - **Healthy Mediterranean-Style Dietary Pattern**
  - **Healthy Vegetarian Dietary Pattern**

Guideline 3

Dietary Intakes Compared to Recommendations



***NOTE:** Recommended daily intake of whole grains is to be at least half of total grain consumption, and the limit for refined grains is to be no more than half of total grain consumption.

Data Source: Analysis of What We Eat in America, NHANES 2013-2016, ages 1 and older, 2 days dietary intake data, weighted. Recommended Intake Ranges: Healthy U.S.-Style Dietary Patterns

DGA Dietary Guidelines for Americans

Making Nutrient-Dense Choices: One Meal At a Time

Slight changes to individual parts of a meal can make a big difference. This meal shows examples of small shifts to more nutrient-dense choices that significantly improve the nutritional profile of the meal overall while delivering on taste and satisfaction.

Typical Burrito Bowl Total Calories = 1,120	Nutrient-Dense Burrito Bowl Total Calories = 715
White rice (1½ cups)	Brown rice (1 cup) + Romaine lettuce (½ cup)
Black beans (⅓ cup)	Black beans, reduced sodium (⅓ cup)
Chicken cooked with sauce (2 ounces)	Grilled chicken with spice rub (2 ounces)
No grilled vegetables	Added grilled vegetables (⅓ cup)
Guacamole (½ cup)	Sliced avocado (5 slices)
Jarred salsa (¼ cup)	Fresh salsa/pico de gallo (¼ cup)
Sour cream (¼ cup)	No sour cream
Cheese (⅓ cup)	Reduced-fat cheese (⅓ cup)
Jalapeño (5 slices)	Jalapeño (5 slices)
Iced tea with sugar (16 ounces)	Iced tea, no sugar (16 ounces)

MyPlate Consumer Messaging

Dietary Guidelines for Americans

Small Changes Matter. Start Simple With MyPlate Today.

2020-2025 DGA call to action ("what")

MyPlate call to action ("how")

Make every bite count with the Dietary Guidelines

Encourages people to choose foods, beverages, meals that are full of important nutrients

Start Simple with MyPlate

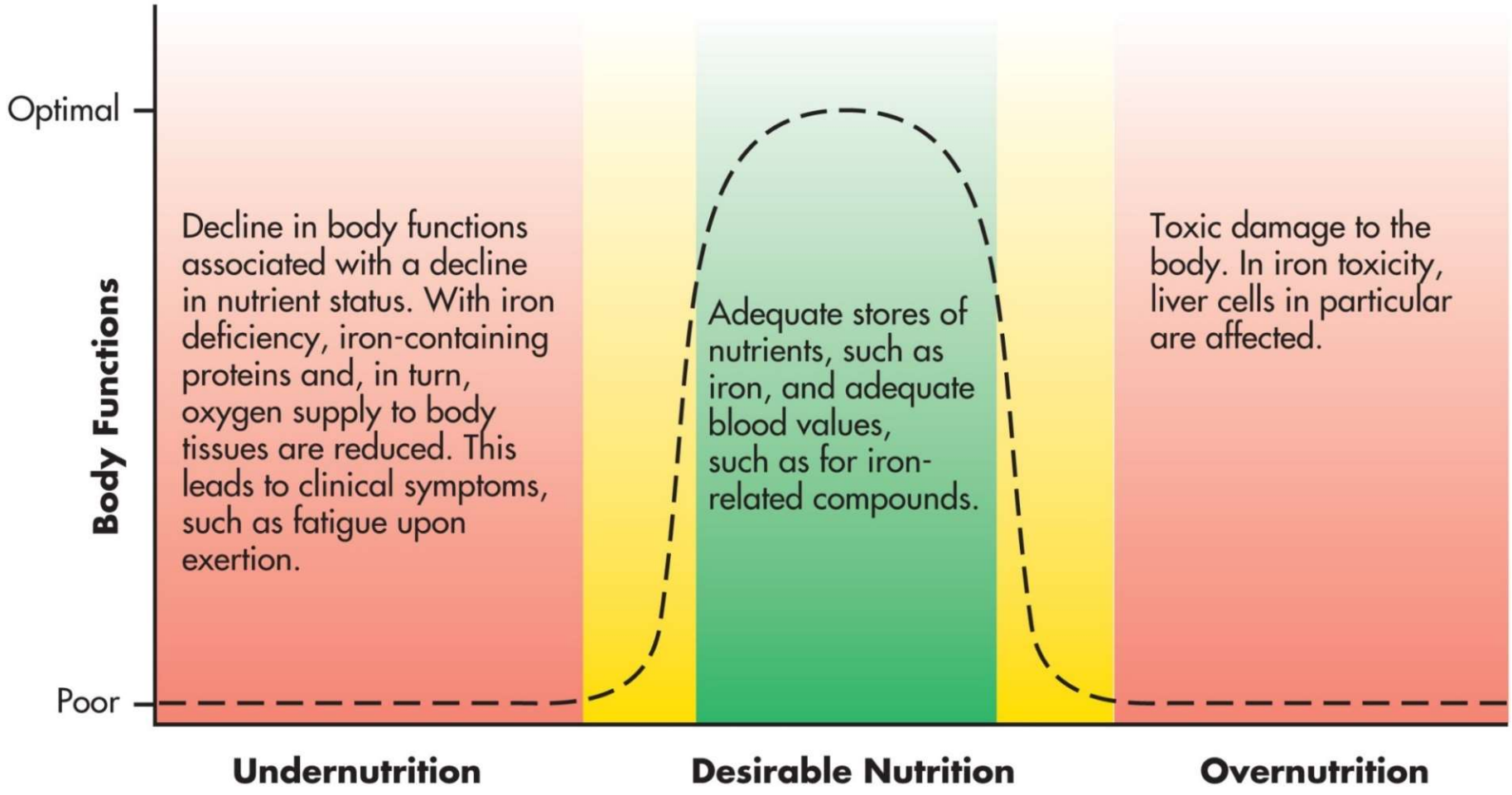
Provides inspiration and simple ideas people can incorporate into their busy lives to help them improve their health and well-being over time

Healthy eating is important at every stage of life.

MyPlate.gov

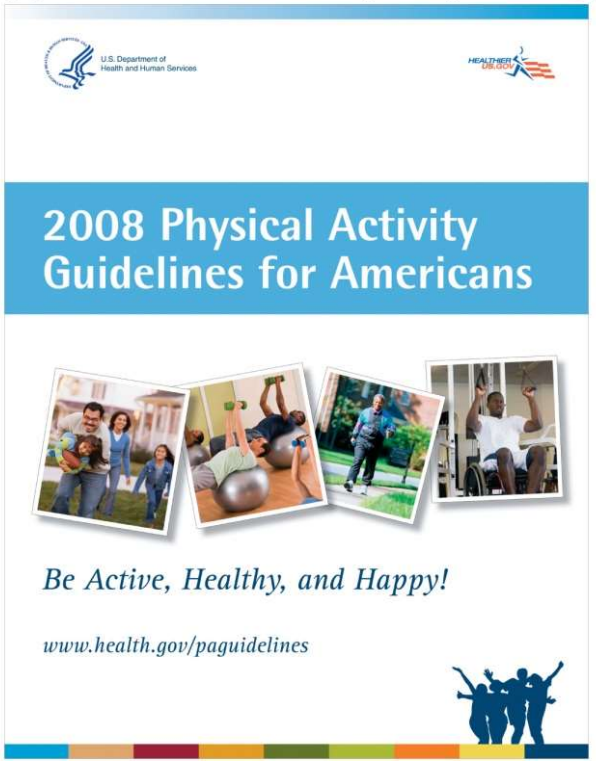
The benefits add up over time, bite by bite.

Nutritional Status



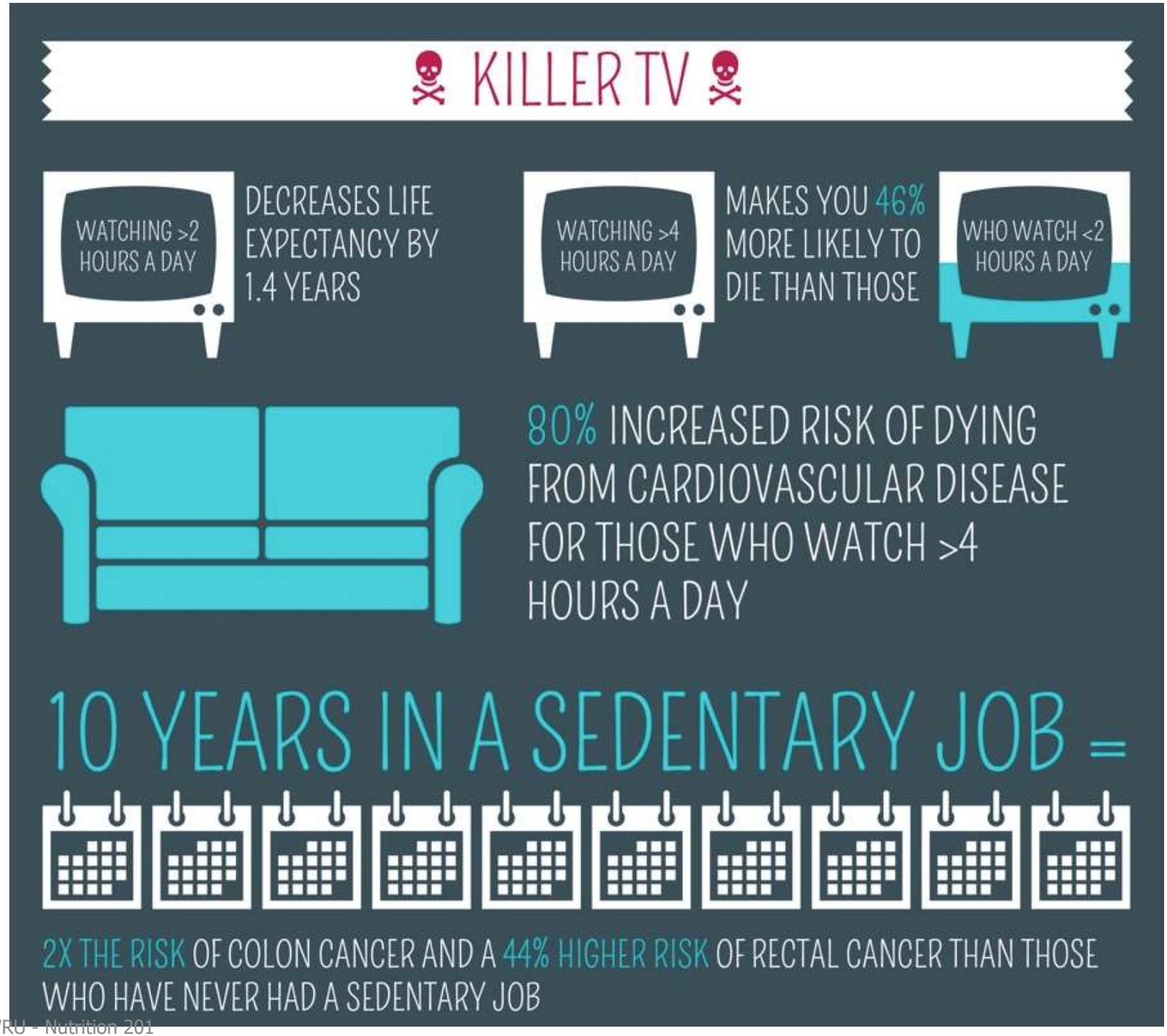
Physical Activity Guidelines for Americans

- U.S. Department of Health and Human Services issued Physical Activity Guidelines for Americans in 2008
- Adults: health benefits occur with **at least 150 minutes per week** of moderate-intensity physical activity
- Children/adolescents should include **60 minutes** of physical activity per day



Benefits of Physical Activity

- Control your weight
- Reduce your risk of
  - cardiovascular disease
  - type 2 diabetes
  - metabolic syndrome
  - some cancers
- Improve
  - mental health and mood
  - ability to do daily activities
  - prevent falls, if you're an older adult
- Increase the odds of living longer
- Strengthen your bones and muscles


KILLER TV
WATCHING >2 HOURS A DAY
DECREASES LIFE EXPECTANCY BY 1.4 YEARS
WATCHING >4 HOURS A DAY
MAKES YOU 46% MORE LIKELY TO DIE THAN THOSE
WHO WATCH <2 HOURS A DAY
80% INCREASED RISK OF DYING FROM CARDIOVASCULAR DISEASE FOR THOSE WHO WATCH >4 HOURS A DAY
10 YEARS IN A SEDENTARY JOB =
2X THE RISK OF COLON CANCER AND A 44% HIGHER RISK OF RECTAL CANCER THAN THOSE WHO HAVE NEVER HAD A SEDENTARY JOB

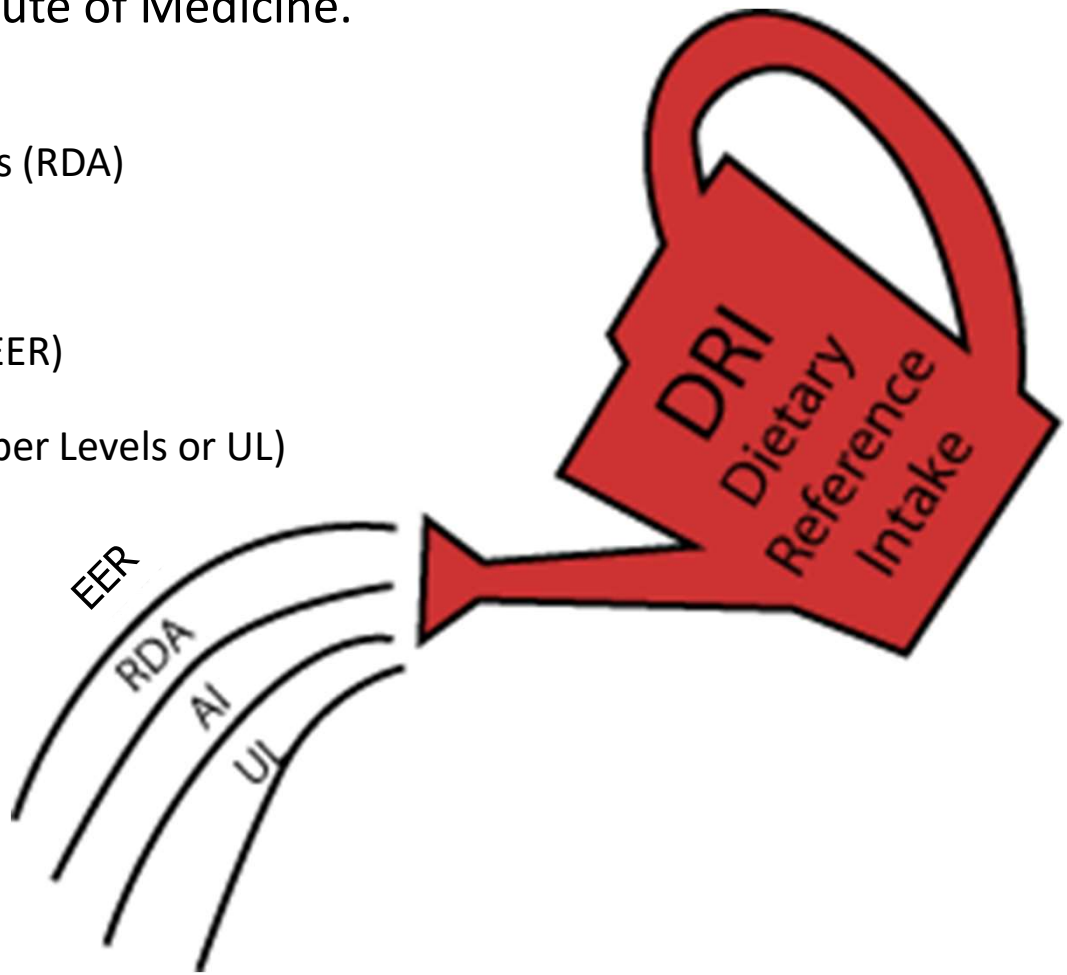
What do you think about the plate?

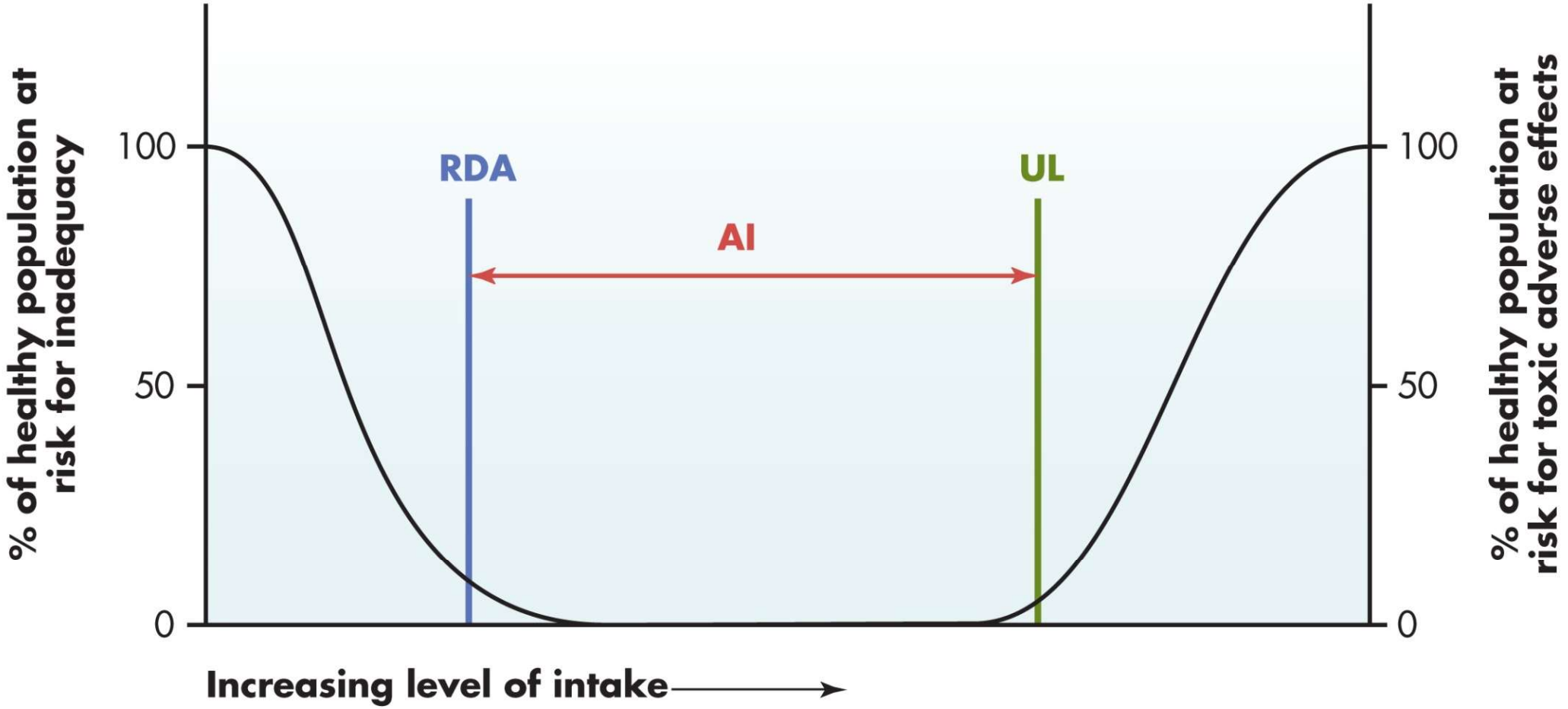
Pros?

Cons?

Specific Nutrient Standards & Recommendations

- Dietary Reference Intakes (DRI): term used to encompass nutrient recommendations by the Food and Nutrition Board of the Institute of Medicine. Includes the following:
  - Recommended Dietary Allowances (RDA)
  - Adequate Intakes (AI)
  - Estimated Energy Requirements (EER)
  - Tolerable Upper Intake Levels (Upper Levels or UL)





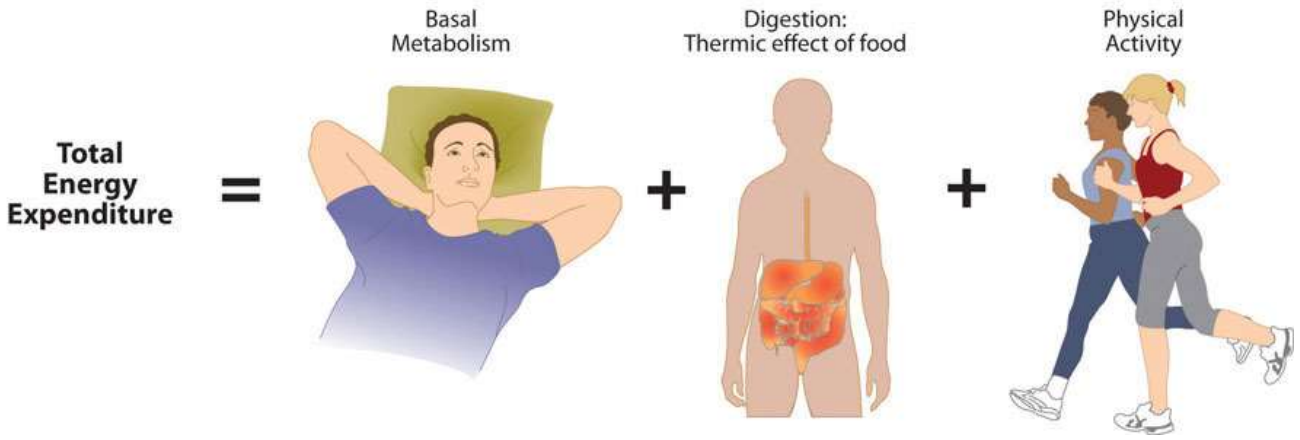
Recommended Dietary Allowance (RDA): The dietary intake level that is sufficient to meet the nutrient requirement of nearly all (97% to 98%) healthy individuals in a particular life stage and gender group. When set for a nutrient, aim for this intake.

Adequate Intake (AI): A recommended intake value based on observed or experimentally determined approximations or estimates of nutrient intake by a group (or groups) of healthy people that is assumed to be adequate; used when an RDA cannot be determined. When set for a nutrient, aim for this intake.

Tolerable Upper Intake Level (Upper Level or UL): The highest level of nutrient intake that is likely to pose no risk of adverse health effects for almost all individuals in the general population. As intake increases above the Upper Level, the risk of adverse effects increases.

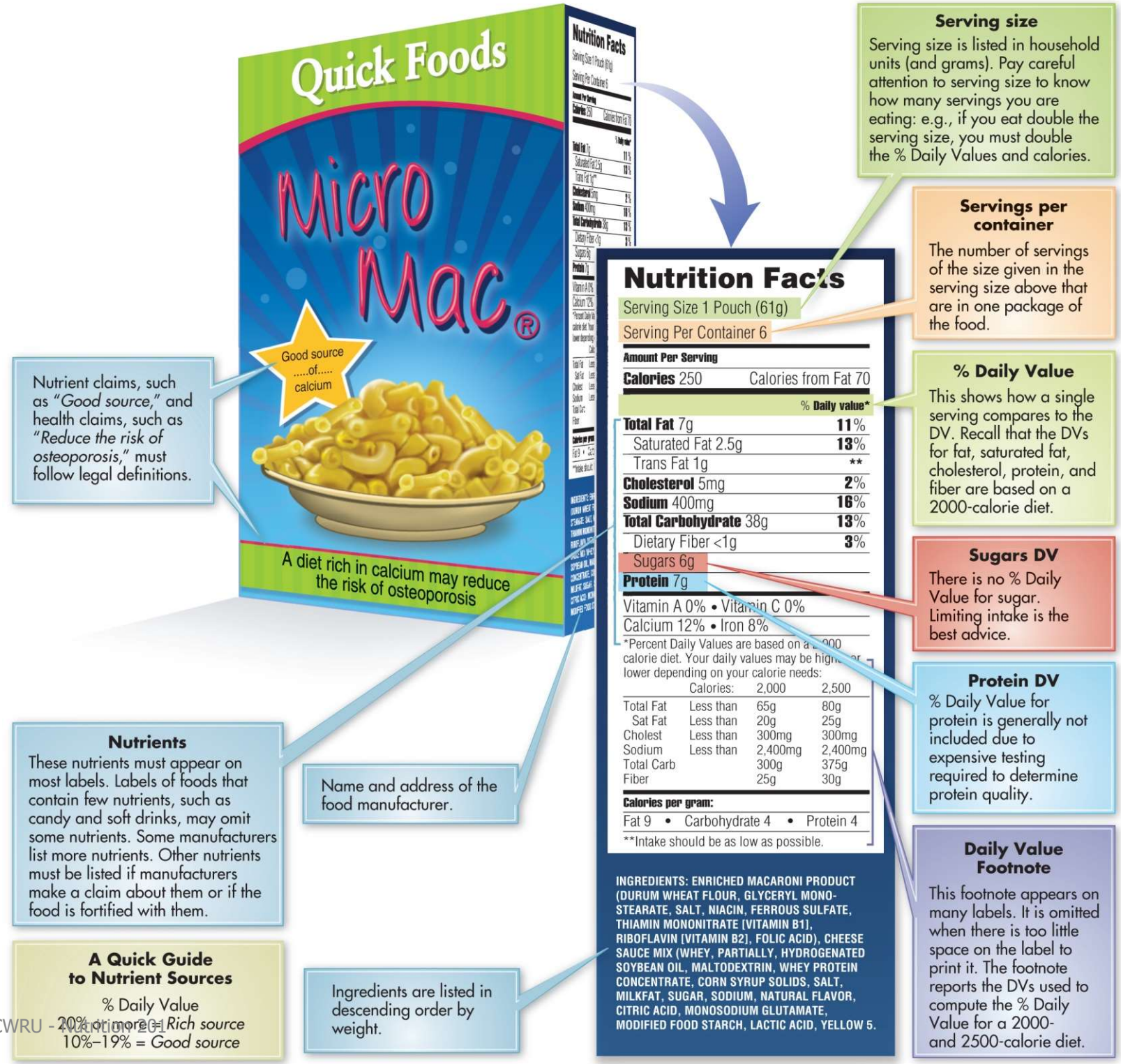
Estimated Energy Requirement (EER)

- Estimates energy (kcal) intake needed to match the energy use of an average person in a specific life stage
- EER needs to be specific, taking into account age, gender, height, weight, and physical activity
- Serves as a starting point for estimating calorie need



Daily Value (DV)

- Daily Value is the nutrient standard used on the Nutrition Facts portion of the food label
- The percent Daily Value for each nutrient is based on consuming a 2000-kcal diet
- Set at or close to the highest RDA value or related nutrient standard
- DVs have been set for vitamins, minerals, protein, other dietary components
- Allow intake comparison from a specific food to desirable (or maximum) intakes



Health Claims on Food Labe

- Health claims—closely regulated by FDA
- Preliminary health claims—regulated by FDA but evidence may be scant for the claim
- Nutrient claims—closely regulated by FDA
- Structure/function claims—these are not FDA-approved or necessarily valid

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Other Terms

- **Fortified or enriched:** Vitamins and/or minerals have been added to the product in amounts in excess of at least 10% of that normally present in the usual product. *Enriched* generally refers to replacing nutrients lost in processing, whereas *fortified* refers to adding nutrients not originally present in the specific food.
- **Healthy:** An individual food that is low fat and low saturated fat and has no more than 360 to 480 mg of sodium or 60 mg of cholesterol per serving can be labeled "healthy" if it provides at least 10% of the Daily Value for vitamin A, vitamin C, protein, calcium, iron, or fiber.
- **Light or lite:** The descriptor *light* or *lite* can mean two things: first, that a nutritionally altered product contains one-third fewer kcal or half the fat of reference food (if the food derives 50% or more of its kcal from fat, the reduction must be 50% of the fat) and, second, that the sodium content of a low-calorie, low-fat food has been reduced by 50%. In addition, "light in sodium" may be used for foods in which the sodium content has been reduced by at least 50%. The term *light* may still be used to describe such properties as texture and color, as long as the label explains the intent; for example, "light brown sugar" and "light and fluffy."

Other Terms

- **Diet:** A food may be labeled with terms such as *diet, dietetic, artificially sweetened,* or *sweetened with nonnutritive sweetener* only if the claim is not false or misleading. The food can also be labeled *low calorie* or *reduced calorie.*
- **Good source:** *Good source* means that a serving of the food contains 10% to 19% of the Daily Value for a particular nutrient. If 5% or less, it is a *low source.*
- **High:** *High* means that a serving of the food contains 20% or more of the Daily Value for a particular nutrient.

Other Terms

- **Organic:** Federal standards for organic foods allow claims when much of the ingredients do not use chemical fertilizers or pesticides, genetic engineering, sewage sludge, antibiotics, or irradiation in their production. At least 95% of ingredients (by weight) must meet these guidelines to be labeled "organic" on the front of the package. If the front label instead says "made with organic ingredients," only 70% of the ingredients must be organic. For animal products, the animals must graze outdoors, be fed organic feed, and cannot be exposed to large amounts of antibiotics or growth hormones.

- **Natural:** The food must be free of food colors, synthetic flavors, or any other synthetic substance.


REAL FOOD DOESN'T HAVE INGREDIENTS, REAL FOOD IS INGREDIENTS
JAMIE OLIVER
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