Nutrition Update for Nurses: Research, Recommendations, and References You Can Use

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Nutrition Update for Nurses: Research, Recommendations, and References You Can Use

- Overview and review of the Dietary Reference Intakes (DRI)
- Highlights and takeaways from the 2020-2025 Dietary Guidelines for Americans
- Dietary supplements – considerations and resources
- Nutrition information and resources – evaluating nutrition news and credible references
- As time permits, a bit on popular weight loss diets and programs
- Part 2! Wednesday, June 15 – 6pm – watch for info and registration details

What are the most common nutrition and diet related questions you receive from patients?

Sample nutrition questions from Vanderbilt undergraduate students

- Does one's nutrition/diet affect how COVID-19 impacts his or her body? If so, how?
- How necessary is it to have three meals a day and which one is the priority?
- How many carbs on average should one eat during a day?
- What foods are best to avoid?
- Which fad diets are actually good for you?
- What is the relationship between your diet and your mood and/or mental health (if there is one)?
- How much protein is too much?
- Are multivitamins helpful?
- Are there benefits of dairy in the human diet or is it healthier to altogether eliminate dairy?
- What are the true benefits of a plant-based diet?
- How I can I ensure I'm getting all my required nutrients on a plant-based diet?
- I would like to learn more about the effects of red meat on health and cancer.
- **What does a healthy diet look like**
- What types of food aid in better performance???
- I am curious about coffee. What are the nutritional benefits? How much is too much coffee?
- How should what one consumes change over the lifespan?
- is diet soda actually that bad for you?
- Is there any science behind Omega-3 and fish oil consumption.
- How can I maintain a healthy gut with my diet?
- Does diet or exercise play a larger role in overall health and weight?
- What are some careers or jobs in nutrition? What education is required?
- **How can you have a healthy and good diet while still eating what you want?**

Sampling of YOUR questions!

- How to talk about weight loss in a non-judgmental way?
- What fruits create satiety feeling?
- Please address a plant-based diet
- interested in info to promote gut health for post sleeve surgery
- Can you speak to updates on diet for kids with ADHD?
- Supplements/diet for adhd/OCD/anxiety/depression
- For those 60 & older, how can current nutritional guidelines be applied appropriately + medication effects on absorption?
- Calorie deficit diets have been shown to be strong predictors of future weight gain, why are they still recommended?
- Do you have any new dietary recommendations for osteoporosis?
- Any commentary on the common supplements people take (e.g., Omegas, vitamin D, turmeric, etc.)
- Good resources for nutrition for toddlers
- Is the recent trend toward plant-based eating supported by current literature?
- What are your view on keto diets?
- Can you please speak on the changes to FDA MyPlate?
- What about intermittent fasting and the keto diet? What to tell patients.
- Are there foods or supplements proven to help inflammation or arthritis? Does collagen supplement help skin& joint elasticity?
- Is keto diet a healthy one?

IFIC Food and Health Survey

Source: www.foodinsight.org

HALF OF THOSE POLLED BELIEVE IT IS EASIER TO DO THEIR TAXES THAN TO FIGURE OUT HOW TO EAT HEALTHFULLLY

THE BREAKDOWN:

52%* **OF THOSE POLLED**
Think it is harder to figure out **what you should and shouldn't eat to be healthier.**

VS.

48% **OF THOSE POLLED**
Think it is harder to figure out **how to do your own taxes.**

Those most in need of learning how to eat healthfully, those with high BMI, heart disease or cholesterol issues, or high blood pressure – ARE MORE APT TO FIND IT DIFFICULT.

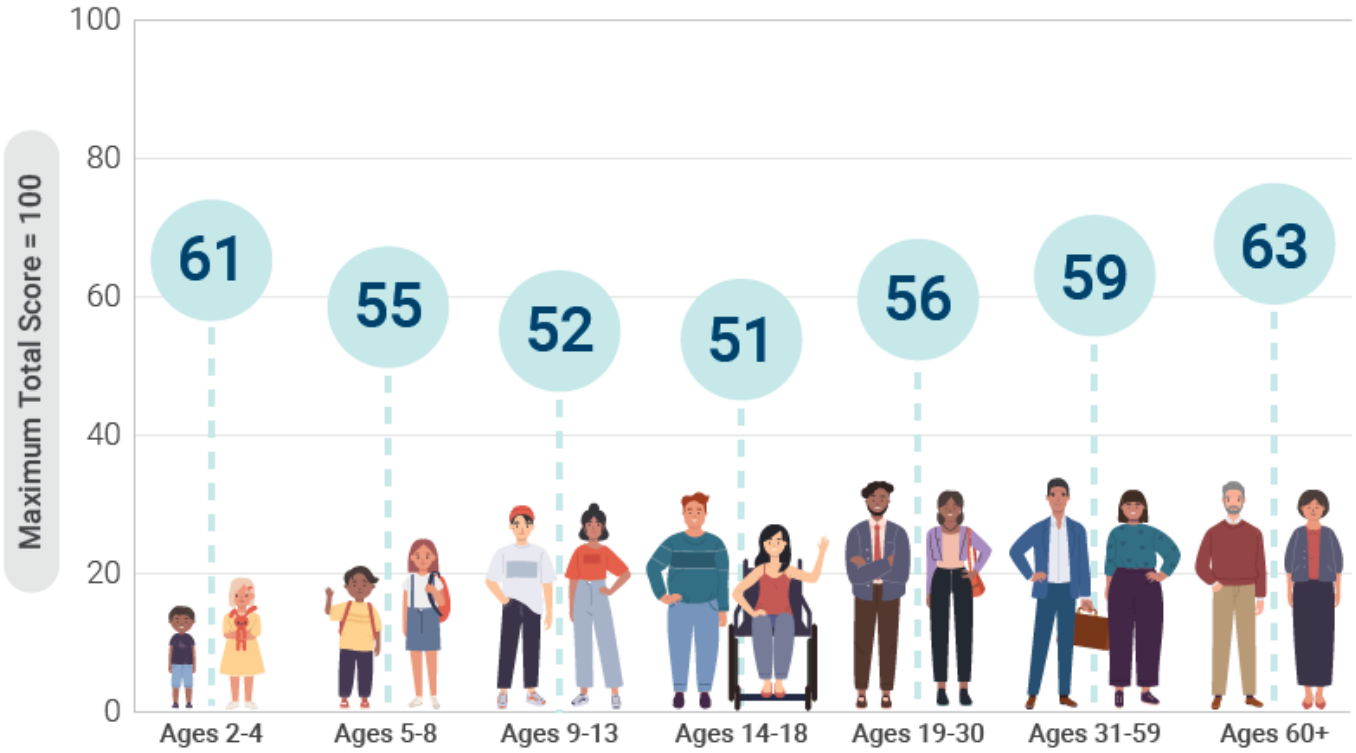
GROUPS MORE LIKELY TO SAY FIGURING OUT WHAT TO EAT IS HARDER:

MEN (55%) vs. 48% of WOMEN
NO COLLEGE DEGREE (56%) vs. 40% of COLLEGE GRADS
BMI in the OBESE (60%) or OVERWEIGHT (54%) range vs. 42% low BMI
HEART DISEASE (59%) or HIGH CHOLESTEROL (54%) and HIGH BLOOD PRESSURE (57%) vs. 48% NO HEALTH CONDITIONS

Most Americans Do Not Follow a Healthy Dietary Pattern

Figure 1-4

Adherence of the U.S. Population to the *Dietary Guidelines* Across Life Stages, as Measured by Average Total Healthy Eating Index-2015 Scores

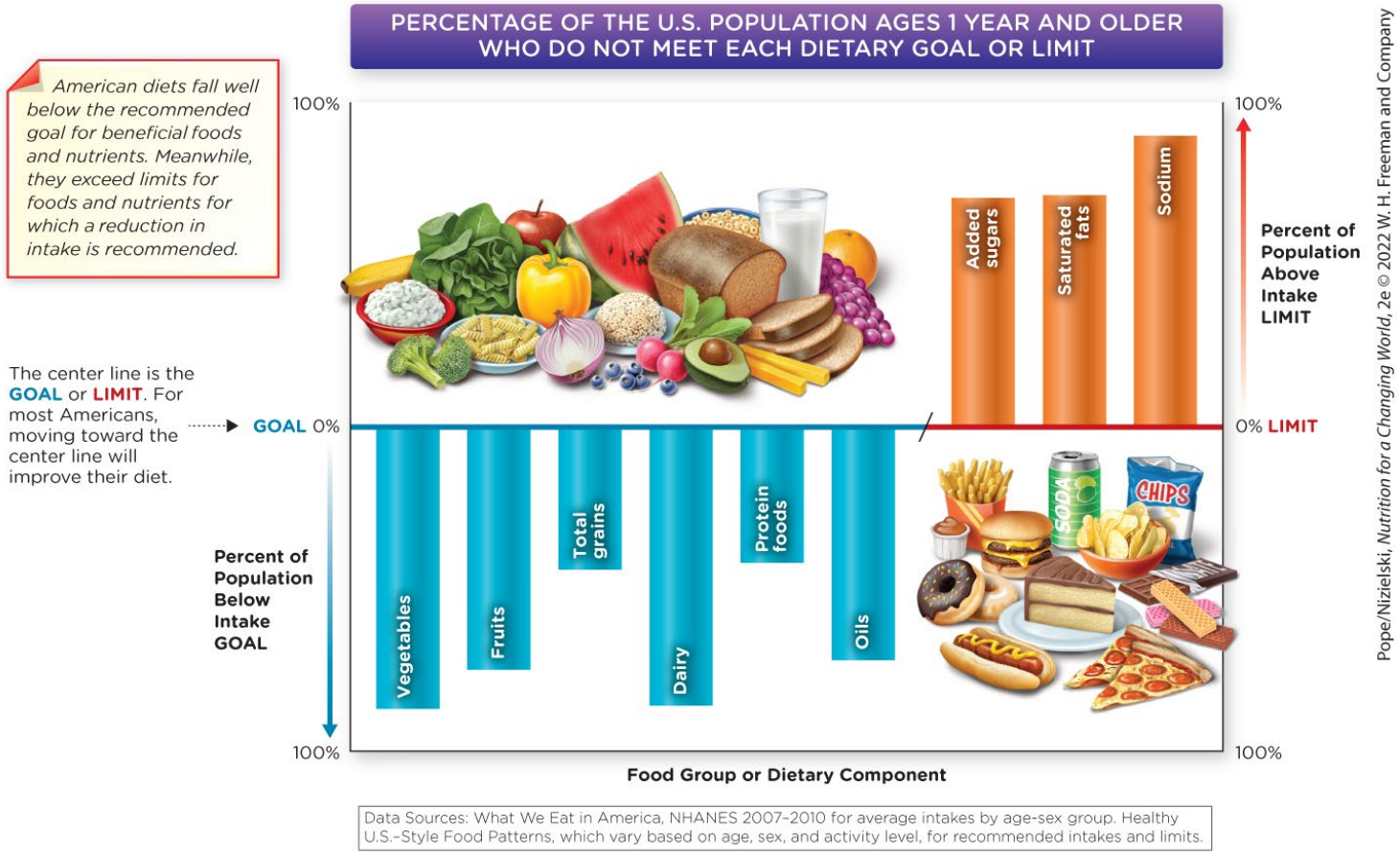


NOTE: HEI-2015 total scores are out of 100 possible points. A score of 100 indicates that recommendations on average were met or exceeded. A higher total score indicates a higher quality diet.

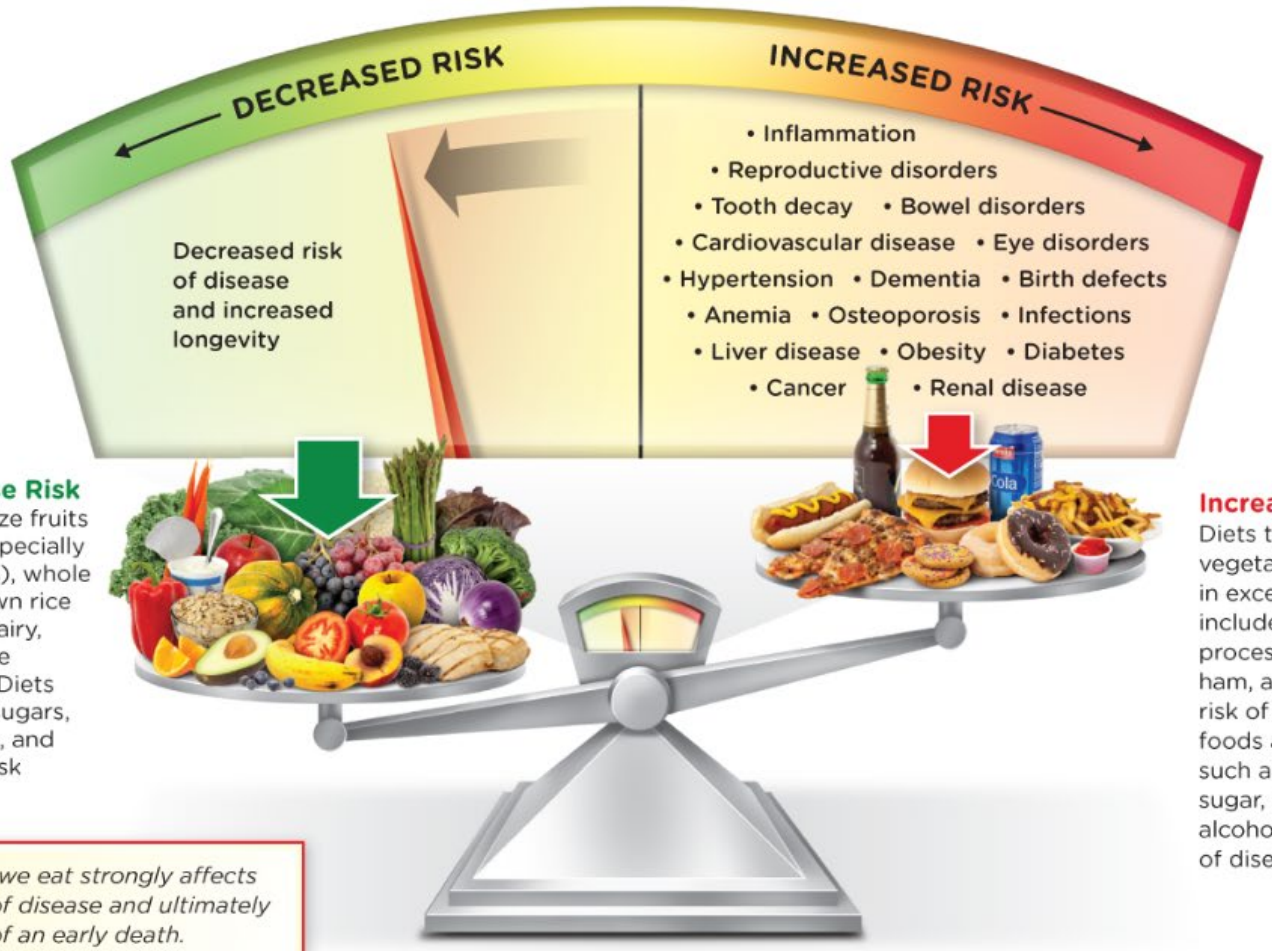
Data Source: Analysis of What We Eat in America, NHANES 2015-2016, ages 2 and older, day 1 dietary intake data, weighted.

The typical American diet does not align with recommended limits or goals

- Excessive amounts of energy-dense foods
- Insufficient amounts of nutrient-dense foods



The quantity and variety of nutrients in foods can either promote health or increase risk of disease



Decrease Disease Risk
Diets that emphasize fruits and vegetables (especially colorful vegetables), whole grains such as brown rice and oats, low-fat dairy, fish, and poultry are health-promoting. Diets low in added salt, sugars, solid and trans fats, and alcohol decrease risk of disease.

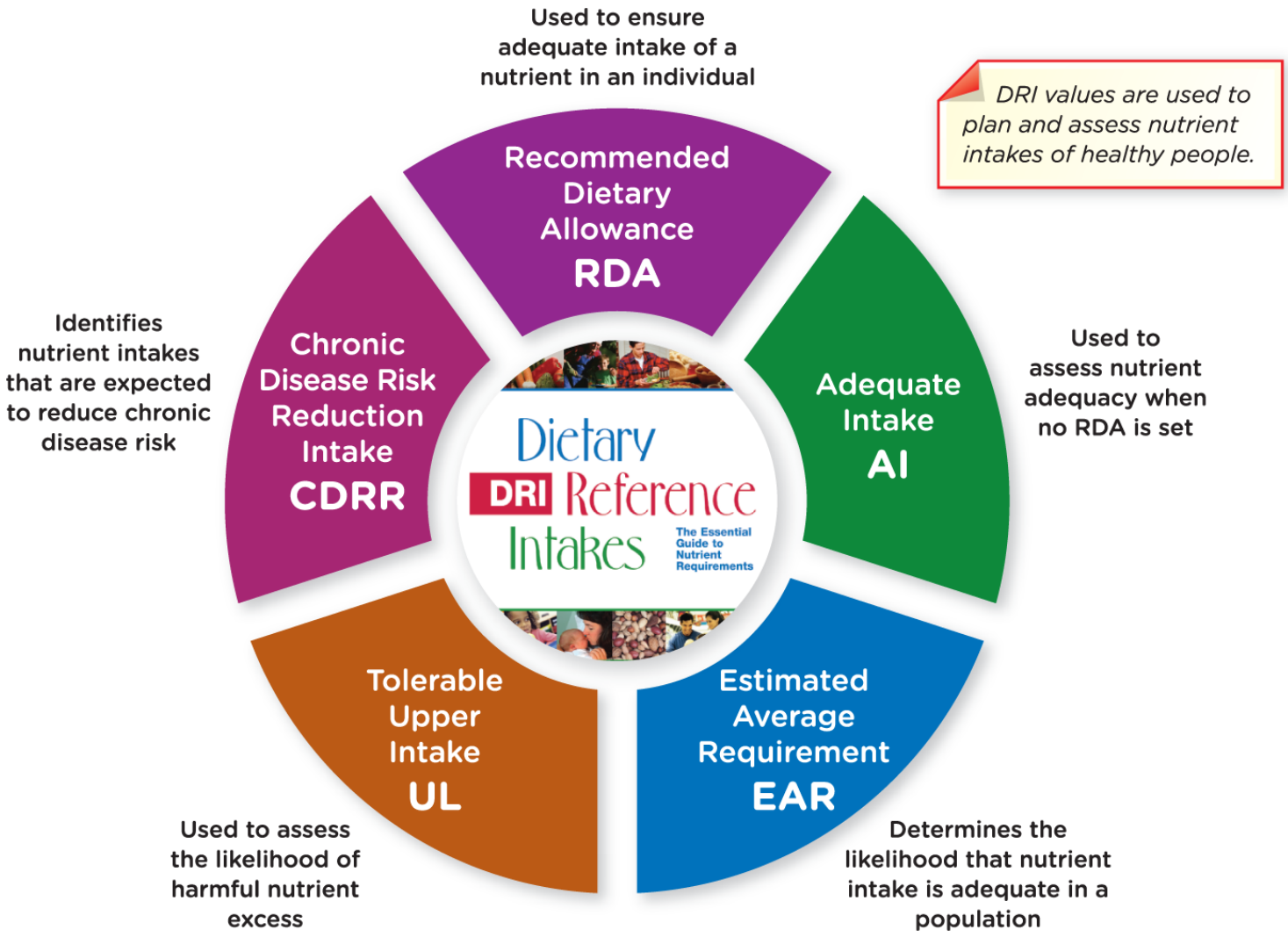
Increase Disease Risk
Diets that lack fruits and vegetables, contain calories in excess of need, and include too much red and processed meats (bacon, ham, and sausage) increase risk of disease. Processed foods and refined grains such as white bread, added sugar, trans fats, salt, and alcohol also increase risk of disease.

What we eat strongly affects our risk of disease and ultimately our risk of an early death.

The Health and Medical Division of the National Academy of Sciences provides guidance for nutrient intake

- **Dietary Reference Intake (DRI)** values
  - Recommended daily levels of intake to:
    - Meet the nutrient needs of almost all healthy people
    - Optimize health and prevent chronic disease
    - Avoid consuming too much of any one nutrient
  - The DRIs provide recommendations by age, sex, and lifestage https://ods.od.nih.gov/HealthInformation/Dietary_Reference_Intakes.aspx
    - https://www.nal.usda.gov/legacy/fnic/dri-calculator/

DRIs include five values for nutrient intakes



DRIs provide recommendations for nutrient intake to meet needs and reduce risk of chronic disease

DIETARY REFERENCE INTAKES (DRI)

Potential DRI Values for Most Nutrients

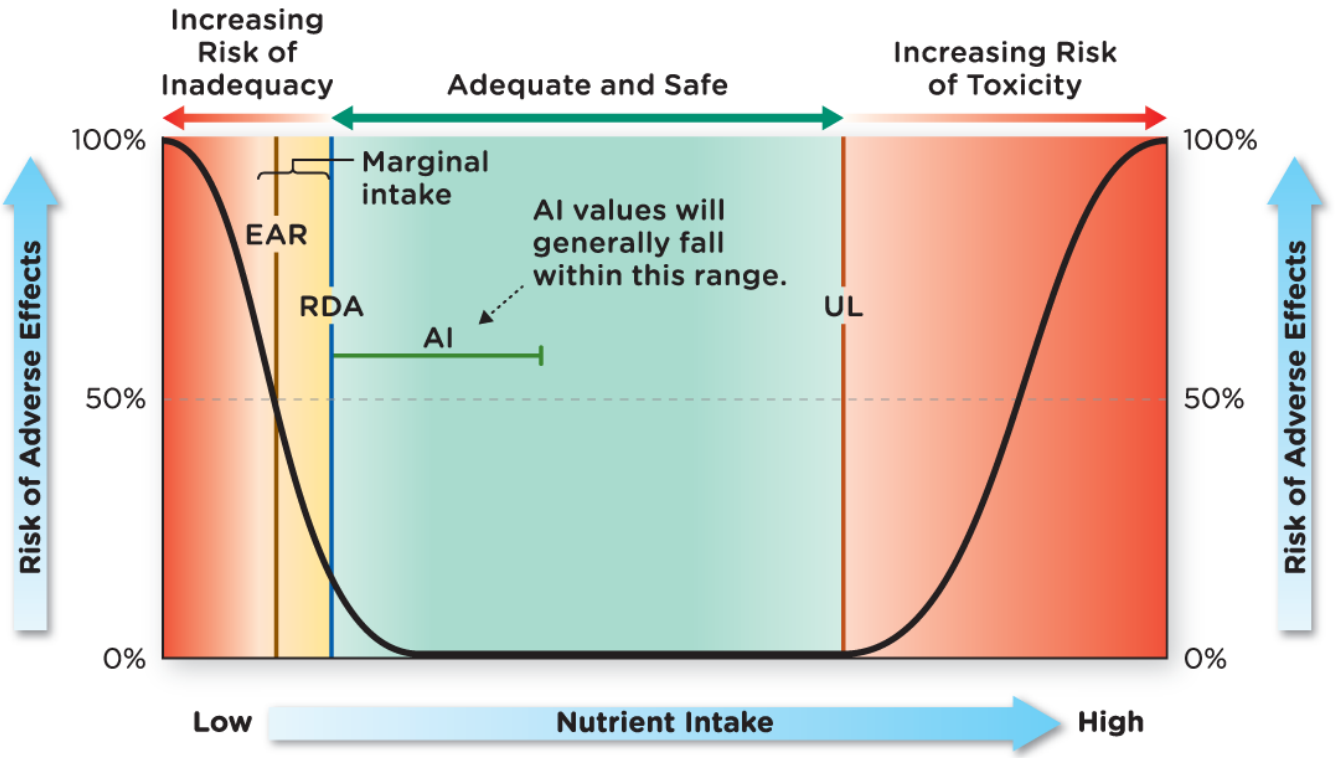
Reference Value	Description	When Planning Your Diet
Recommended **D**ietary **A**llowance (**RDA**)	The nutrient intake that is sufficient to meet the needs of nearly all healthy individuals in a given age and sex	✓ Goal for **average** daily intake over time
Adequate **I**ntake (**AI**)	Nutrients for which the available data are not sufficient to confidently determine an EAR (and thus an RDA). The AI is the best estimate of the amount that is adequate to meet the needs of most healthy people.	✓ Aim for this if an RDA isn't available
Chronic **D**isease **R**isk **R**eduction Intake (**CDRR**)	The nutrient intake level that is expected to reduce chronic disease risk in an apparently healthy population	✓ A goal or limit for average daily intake over time
Estimated **A**verage **R**equirement (**EAR**)	The nutrient intake that is estimated to meet the needs of 50% of healthy individuals in a given age and sex	✗ Do not use this amount
Upper **L**imit (**UL**)	The highest level of daily nutrient intake that is unlikely to cause adverse effects for nearly all individuals in the population	✗ Do not exceed this amount from all sources

Additional DRI Values for Energy and Macronutrients

Reference Value	Description	When Planning Your Diet
Acceptable **M**acronutrient **D**istribution **R**ange (**AMDR**)	Intake ranges for energy-yielding macronutrients that are consistent with good health, expressed as a percent of total calories	✓ Follow these guidelines for the percent of calories from carbohydrates, fat, and protein
Estimated **E**nergy **R**equirement (**EER**)	The average energy intake predicted to maintain current body weight in a healthy adult of a specific age, sex, weight, height, and activity level. Fifty percent of individuals will have energy needs higher or lower than this value.	✓⚠ Use cautiously as an initial planning goal only

Intake between the RDA and the UL for a nutrient is likely adequate and safe

As nutrient intake drops below the RDA or rises above the UL, the risk of malnutrition increases.



USDA

Dietary Guidelines for Americans

2020 - 2025

Make Every Bite Count With the *Dietary Guidelines*

DietaryGuidelines.gov

2020-2025 Dietary Guidelines for Americans (DGA)

- Updated and released every five years by the USDA and HHS to reflect the current body of nutrition science.
  - Each edition of the DGA builds on the one that came before it, with the scientific basis for revisions informed by the scientific report from the DGA Advisory Committee, and review of public and agency comments.
  - Grounded in science and focused on public health
- Provides advice on what to eat and drink to meet nutrient needs, promote health, and prevent disease.
  - A fundamental premise DGA is that everyone, no matter their age, race, or ethnicity, economic circumstances, or health status, can benefit from shifting food and beverage choices to better support healthy dietary patterns.
- First time the DGA has provided guidance by stage of life, from birth to older adulthood, including pregnancy and lactation.
- Developed and written for a professional audience, including policymakers, healthcare providers, nutrition educators, and Federal nutrition program operators.

https://www.dietaryguidelines.gov/about-dietary-guidelines/purpose-dietary-guidelines

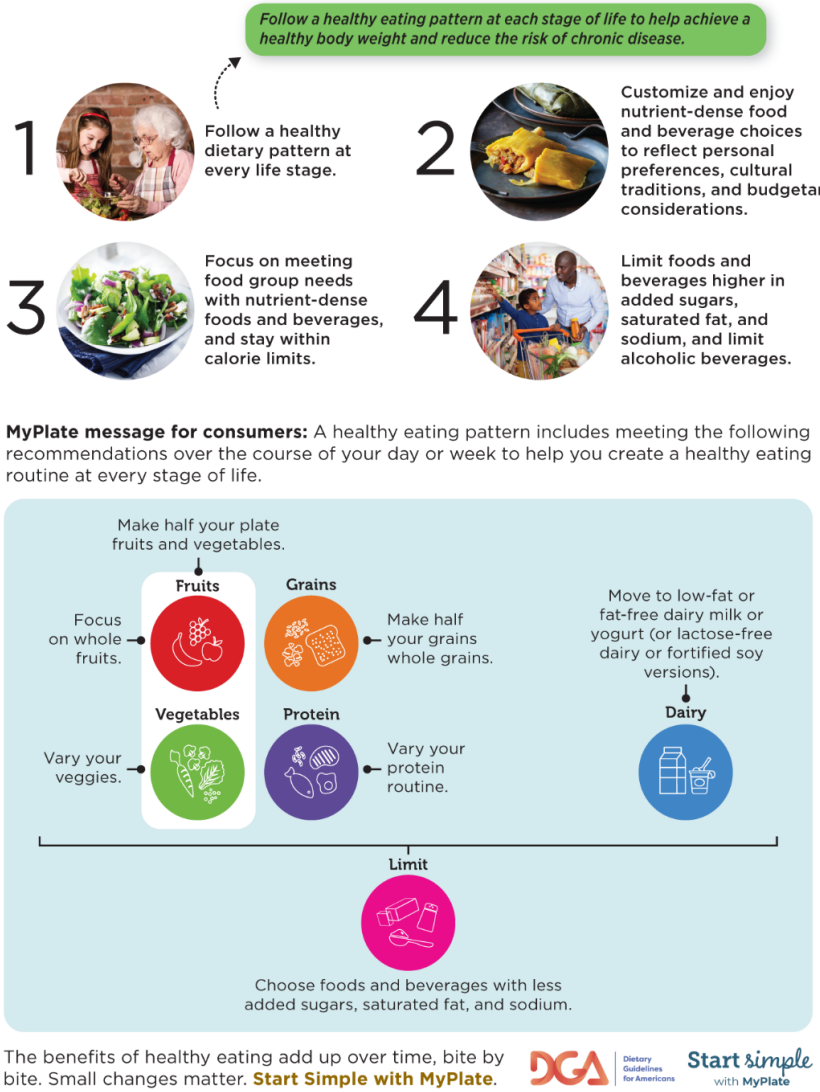
A Roadmap to the *Dietary Guidelines for Americans, 2020-2025*

https://www.dietaryguidelines.gov/

- Executive Summary
- Introduction
- Chapter 1. Nutrition and Health Across the Lifespan: The Guidelines and Key Recommendations
- Chapter 2. Infants and Toddlers
- Chapter 3. Children and Adolescents
- Chapter 4. Adults
- Chapter 5. Women Who Are Pregnant or Lactating
- Chapter 6. Older Adults
- Appendixes
  - Appendix 1: Nutritional Goals for Age-Sex Groups
  - Appendix 2: Estimated Calorie Needs
  - Appendix 3: USDA Dietary Patterns

There are 4 overarching Guidelines in the 2020-2025 edition

1. Follow a healthy eating 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



1 Follow a healthy dietary pattern at every life stage.

At every life stage—infancy, toddlerhood, childhood, adolescence, adulthood, pregnancy, lactation, and older adulthood—it is never too early or too late to eat healthfully.

- For about the first 6 months of life, exclusively feed infants human milk. Continue to feed infants human milk through at least the first year of life, and longer if desired. Feed infants iron-fortified infant formula during the first year of life when human milk is unavailable. Provide infants with supplemental vitamin D beginning soon after birth.
- At about 6 months, introduce infants to nutrient-dense complementary foods. Introduce infants to potentially allergenic foods along with other complementary foods. Encourage infants and toddlers to consume a variety of foods from all food groups. Include foods rich in iron and zinc, particularly for infants fed human milk.
- From 12 months through older adulthood, follow a healthy dietary pattern across the lifespan to:
  - **Meet nutrient needs**
  - **Help achieve a healthy body weight**
  - **Reduce the risk of chronic disease**

The *Dietary Guidelines for Americans, 2020-2025* includes nearly all the science-based recommendations of the 2020 Dietary Guidelines Advisory Committee

- The 2020-2025 edition of the *Dietary Guidelines* emphasizes the *importance of limiting intakes of added sugars and alcoholic beverages as recommended by the Committee but does not include changes to quantitative recommendations.*
- *Any revisions to previous editions of the Dietary Guidelines must have sufficient scientific justification, and by law, must be based on the preponderance of scientific and medical knowledge current at the time.*
- The preponderance of evidence supports limiting intakes of added sugars and alcoholic beverages to promote health and prevent disease; however, the evidence reviewed since the 2015-2020 edition does not substantiate quantitative changes at this time.
- USDA and HHS encourage more research on the relationship between added sugars and alcoholic beverages and health, and plan to monitor these topics.

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

- A healthy dietary pattern can benefit all individuals regardless of age, race, or ethnicity, or current health status.
- The *Dietary Guidelines* provides a framework intended to be customized to individual needs and preferences, as well as the foodways of the diverse cultures in the United States.

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

- Nutritional needs should be met primarily from nutrient-dense foods and beverages.
  - Nutrient dense foods are those that provide a higher amount of nutrients in relation to number of calories
- Nutrient-dense foods provide vitamins, minerals, and other health-promoting components and have no or little added sugars, saturated fat, and sodium.
- Does not exceed UL or CDRR level for 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.

The core elements that make up a healthy dietary pattern include:

- **Vegetables of all types**—dark green; red and orange; beans, peas, and lentils; starchy; and other vegetables
- **Fruits**, especially whole fruit
- **Grains**, at least half of which are whole grain
- **Dairy**, including fat-free or low-fat milk, yogurt, and cheese, and/or lactose-free versions and fortified soy beverages and yogurt as alternatives
- **Protein foods**, including lean meats, poultry, and eggs; seafood; beans, peas, and lentils; and nuts, seeds, and soy products
- **Oils**, including vegetable oils and oils in food, such as seafood and nuts

About 85% of calories needed per day to meet food group recommendations healthfully, in *nutrient-dense forms*

- Remaining 15% of calories are available for added sugars and saturated fat

Figure 1-7

The 85-15 Guide: Percentage of Calories Needed To Meet Food Group Needs With Nutrient-Dense Choices and Percentage Left for Other Uses

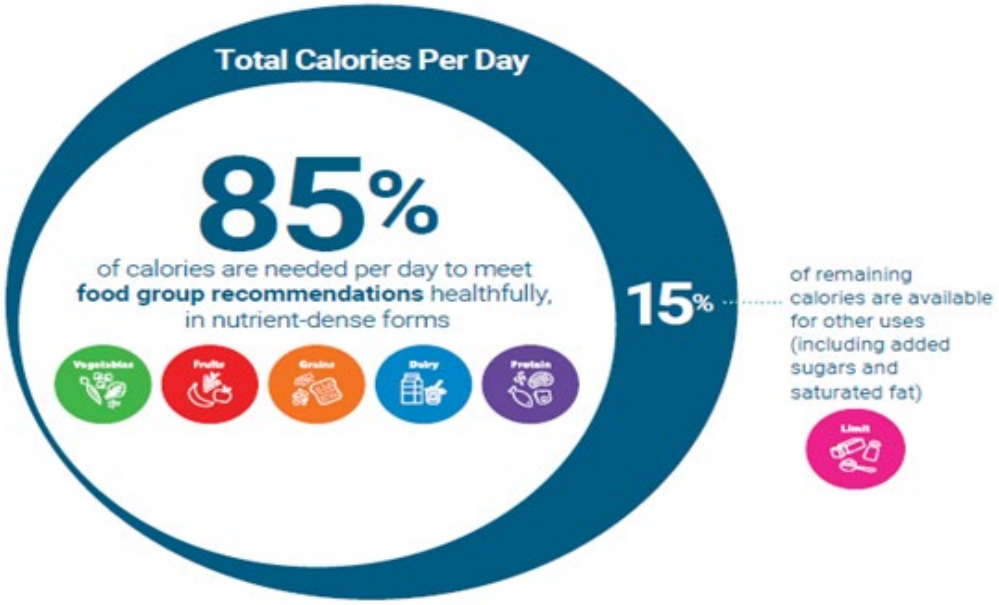
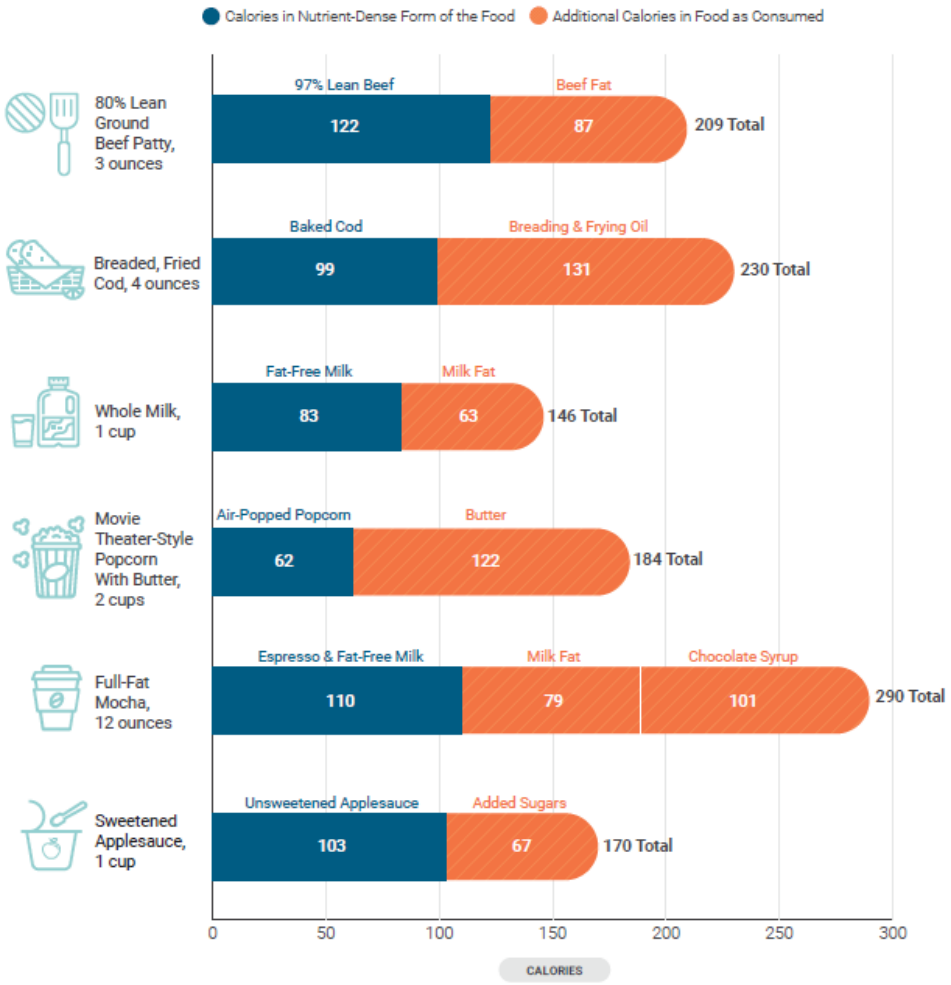


Figure 1-1

Examples of Calories in Food Choices That Are Not Nutrient Dense and Calories in Nutrient-Dense Forms of These Foods



Data Source: U.S. Department of Agriculture, Agricultural Research Service. FoodData Central, 2019. fdc.nal.usda.gov.

Eating a low-energy-dense diet allows you to eat a larger volume of food, while still maintaining energy balance

- **Energy density** (caloric density)
  - Number of calories in a given volume of food
    - Calories divided by food's weight in grams
      - Example: 107 calories in 20 grams of potato chips
      - Energy density: 107/20 = 5.4
  - Fat, sugar, and alcohol tend to increase energy density
  - Fluid (water) and fiber tend to decrease energy density

Energy Density of Common Foods

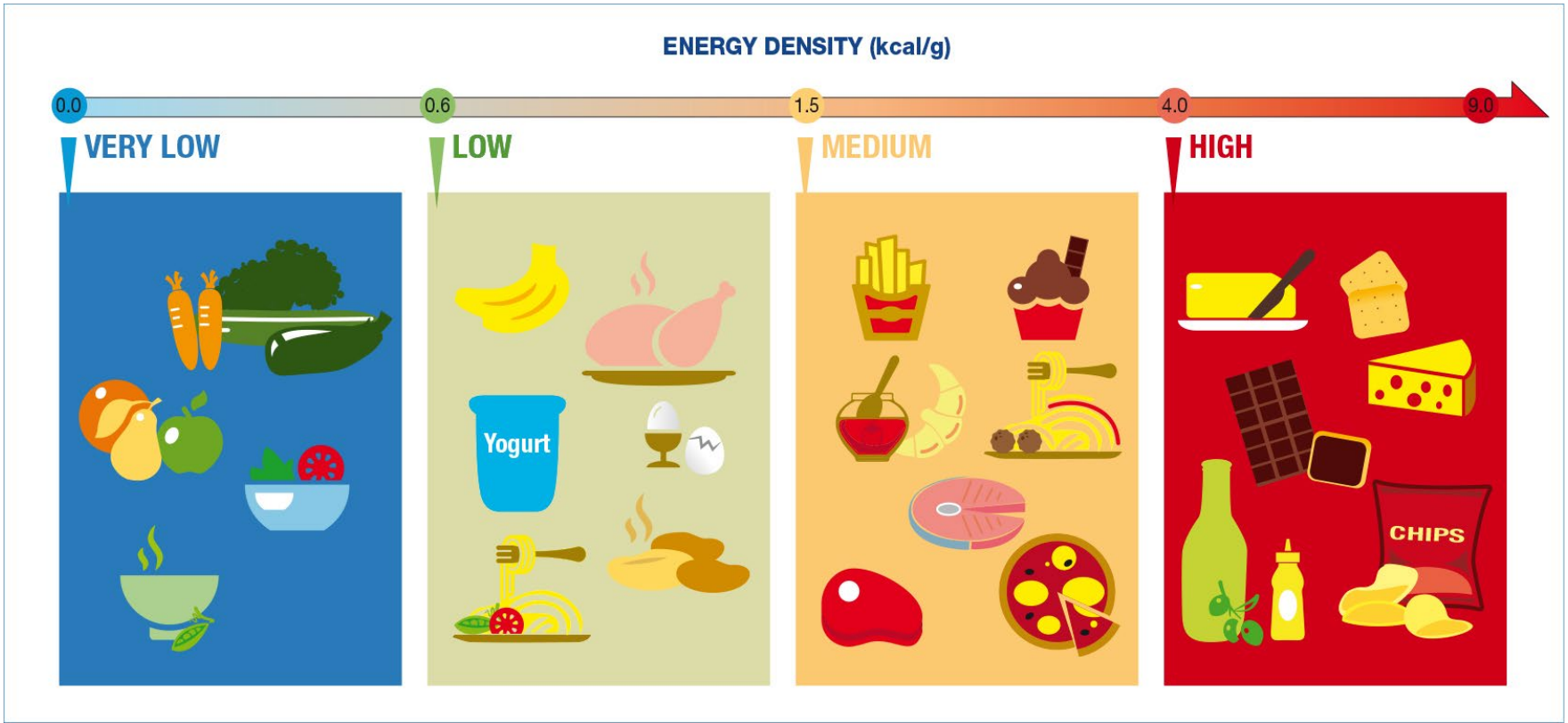
Higher energy-dense food	calories/g	Lower energy-dense food	calories/g
Taco shell	4.7	Corn tortilla	2.2
Bologna	3.1	Sliced turkey breast	0.9
Fried chicken	2.8	Grilled chicken	1.7
Fried pork chop	2.8	Broiled pork chop	2.0
Cheeseburger	2.7	Bean burrito	1.9
Hash brown potatoes	2.2	Boiled potato	0.9
Fried fish	2.2	Broiled fish	1.2
Fried rice	1.6	Rice	1.3
Potato salad	1.4	Tossed salad with salad dressing	1.1
Frozen, sweetened strawberries	1.1	Fresh strawberries	0.3

https://www.cdc.gov/nccdphp/dnpa/nutrition/pdf/r2p_energy_density.pdf

Comparison of three methods to reduce energy density: effects on daily energy intake (Appetite) https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3666187/

1575 Kcal
High Energy Density

1575 Kcal
Low Energy Density



Reducing energy density to aid in weight management

- Dietary Management of Obesity: Cornerstones of Healthy Eating Patterns
  - https://pubmed.ncbi.nlm.nih.gov/29156179/
  - Several dietary patterns, both macronutrient and food based, can lead to weight loss. A key strategy for weight management that can be applied across dietary patterns is to reduce energy density. Clinical trials show that reducing energy density is effective for weight loss and weight loss maintenance. A variety of practical strategies and tools can help facilitate successful weight management by reducing energy density, providing portion control, and improving diet quality. The flexibility of energy density gives patients options to tailor and personalize their dietary pattern to reduce energy intake for sustainable weight loss.

Summary of nutritional goals and practical dietary strategies for weight loss

Element	Nutritional Goal	Recommendation
Fat	20 to 35% of total calorie intake	•Fat is high in energy density. Choose appropriate portions of healthy fats to improve diet quality and meet nutritional needs. Substitute lower-fat foods for those higher in fat •Include monounsaturated and polyunsaturated fats
Protein	10 to 35 % of total calorie intake	•Include protein to create satisfying meals and meet nutrient needs.Include lean meats, poultry without skin, fish, eggs, legumes, tofu, and low-fat dairy products
Carbohydrate	45 to 65% of total calorie intake	•Switch to whole grains instead of refined grains. Examples include wheat, brown rice, oats, barley, corn
Fiber	20 to 35 grams per day	•Include fiber to help increase satiety. Add legumes, fruits, vegetables, and whole grains
Added Sugar	Limit to less than 10% of total calorie intake	•Limit foods and beverages containing added sugars.Main sources of added sugars are snacks, sweets and beverages •Nonnutritive sweeteners can be a substitute
Beverages		•Select low-calorie beverages.Water is the best choice •Limit intake of alcoholic beverages
Dietary Strategy		**Recommendation**
Monitor portions		•Choose appropriately sized portions to help meet daily energy requirements.Serve large portions of very low- and low-energy-dense foods •Serve smaller, less frequent portions of medium energy-dense foods •Limit portions of high-energy-dense foods
Increase the proportion of lower-energy-dense foods		•Lower-energy-dense foods provide satisfying portions to help increase satiety. Fill half the plate with fruits and vegetables •Start the meal with a first course broth-based soup or salad (pre-loading) •Substitute fruits and vegetables for higher-energy-dense ingredients

4 Limit Foods and Beverages Higher in Added Sugars, Saturated Fat, and Sodium and Limit Alcoholic Beverages

- **Added sugars <**10 percent of calories per day starting at age 2
  - Avoid foods and beverages with added sugars for those younger than age 2.
- **Saturated fat <**10 percent of calories per day starting at age 2
- **Sodium <**2,300 milligrams per day - CDRR (Chronic Disease Risk Reduction)
  - and even less for children younger than age 14
  - The CDRR for sodium was established using evidence of the benefit of reducing sodium intake on cardiovascular risk and hypertension risk
- **Alcoholic beverages**—Adults of legal drinking age can choose not to drink, or to drink in moderation by limiting intake to 2 drinks or less in a day for men and 1 drink or less in a day for women, when alcohol is consumed.
  - Drinking less is better for health than drinking more.
  - There are some adults who should not drink alcohol, such as women who are pregnant.
  - Emerging evidence suggests that even drinking within the recommended limits may increase the overall risk of death from various causes, such as from several types of cancer and some forms of cardiovascular disease.

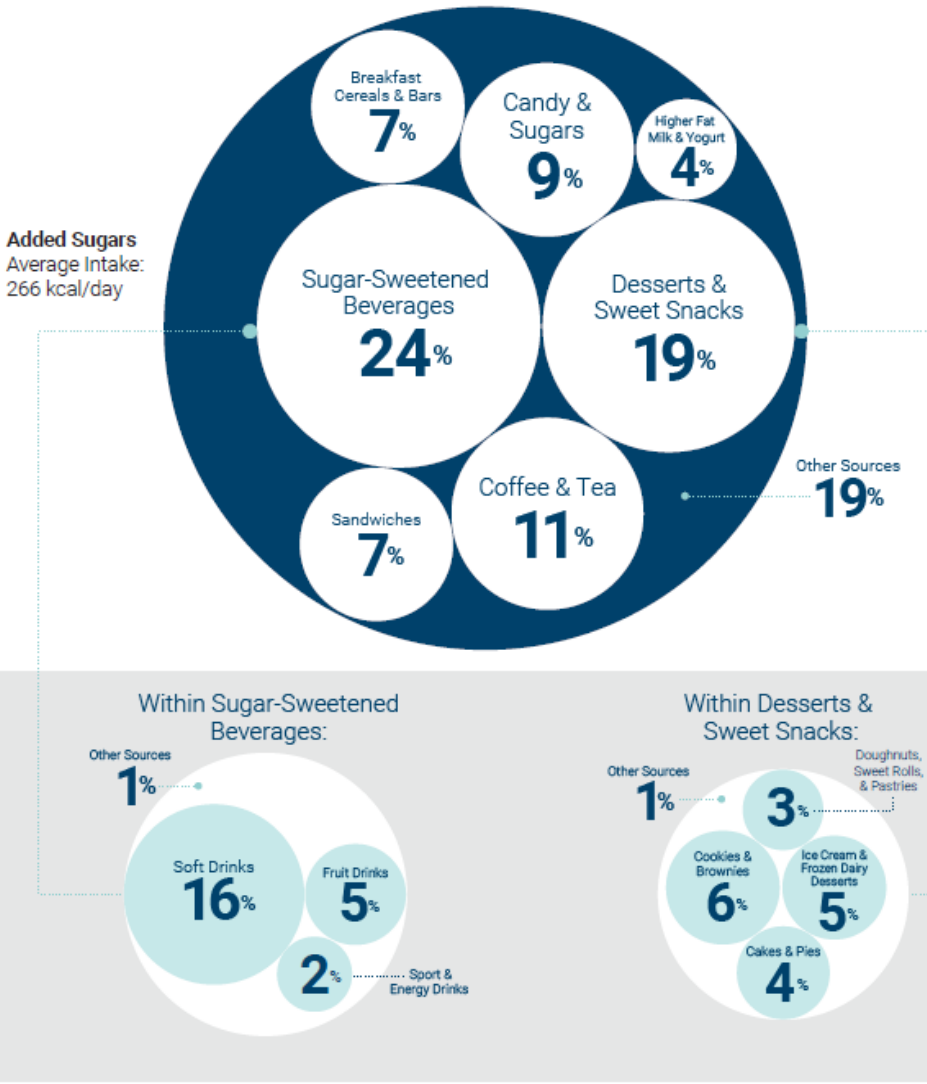
A healthy dietary pattern limits added sugars to <10 percent of calories per day.

Guideline 4

- Added sugars can help with preservation; contribute to functional attributes such as viscosity, texture, body, color, and browning capability, and/or help improve the palatability of some nutrient-dense foods.
- Foods and beverages high in calories from added sugars should be limited to help achieve healthy dietary patterns within calorie limits.
- When added sugars in foods and beverages exceed 10 percent of calories, a healthy dietary pattern within calories limits is very difficult to achieve.
- Most Americans have less than 8 percent of calories available for added sugars, including the added sugars inherent to a healthy dietary pattern.
- The limit for added sugars is based on the following assumptions
  - Most calorie levels have less than 15 percent of calories remaining after meeting food group recommendations through nutrient-dense choices.
  - Approximately half of remaining calories are consumed as saturated fat and half consumed as added sugars.
  - Total saturated fat intakes meet the recommendation for less than 10 percent of total calorie intake.
  - No alcoholic beverages are consumed.
  - Overall calorie intake does not exceed intake needs to maintain or achieve a healthy weight.

Figure 1-10

Top Sources and Average Intakes of Added Sugars: U.S. Population Ages 1 and Older



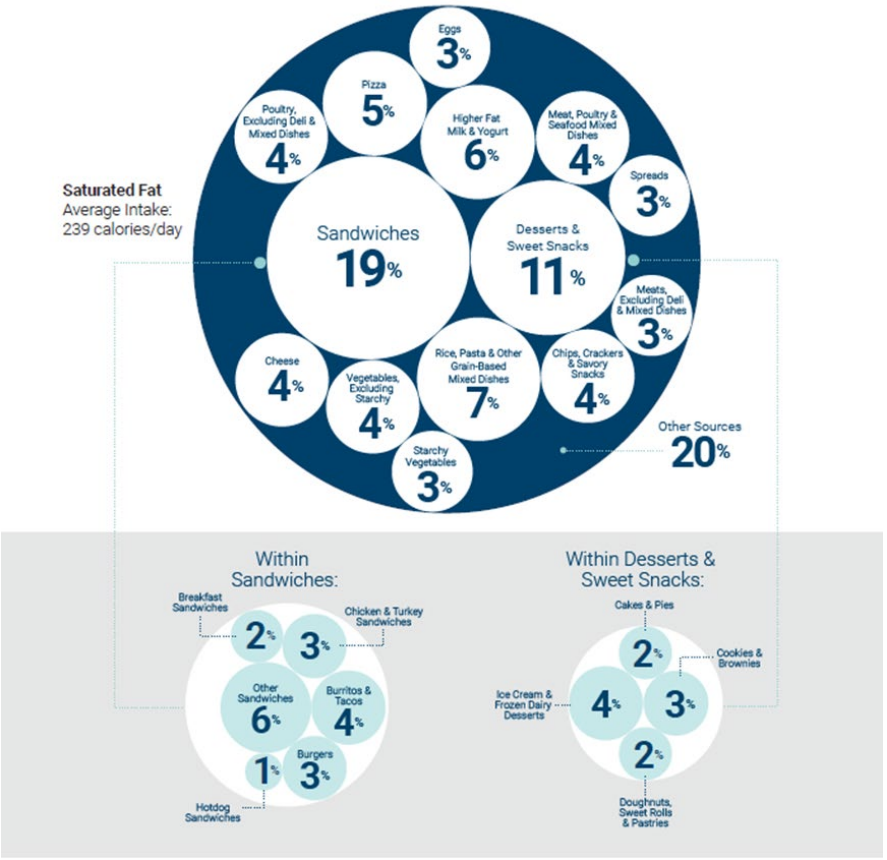
Data Source: Analysis of What We Eat in America, NHANES, 2013-2016, ages 1 and older, 2 days dietary intake data, weighted.

A healthy dietary pattern limits saturated fat to <10 percent of calories per day.

- Replace saturated fats with unsaturated fats, particularly polyunsaturated fats

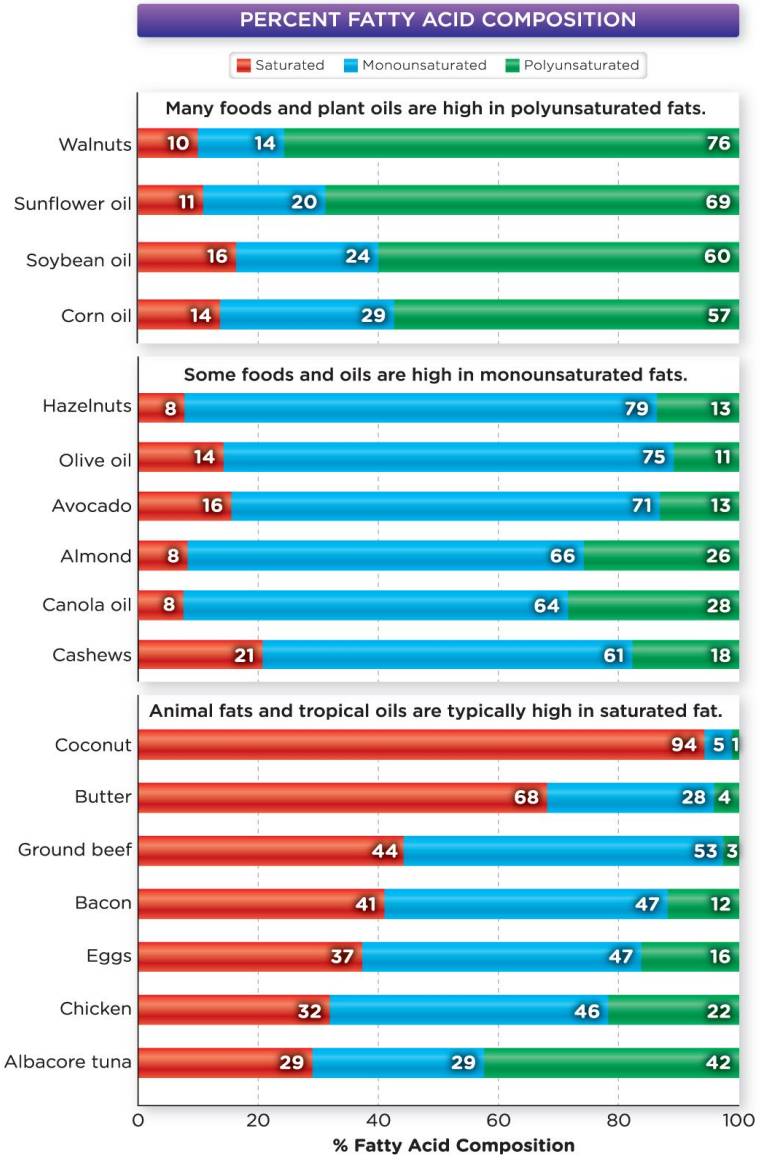
Figure 1-11

Top Sources and Average Intakes of Saturated Fat: U.S. Population Ages 1 and Older



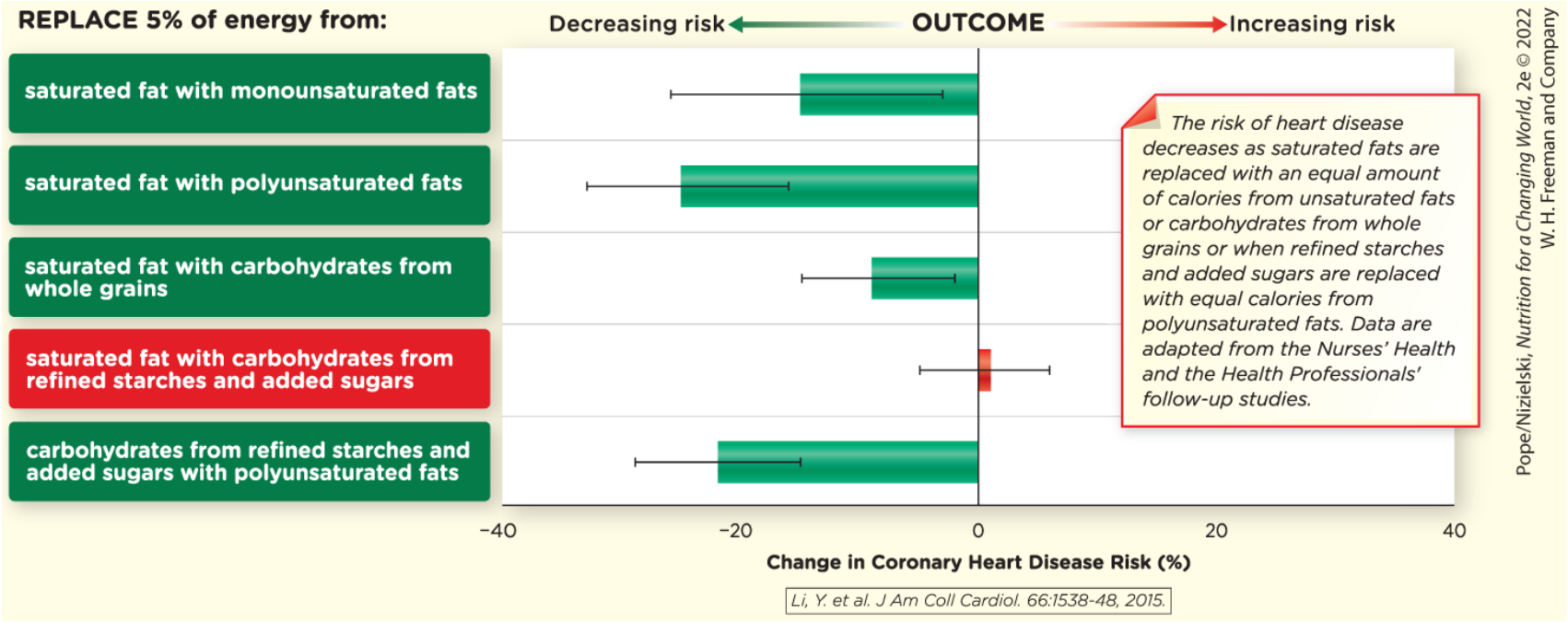
Data Source: Analysis of What We Eat in America, NHANES, 2013-2016, ages 1 and older, 2 days dietary intake data, weighted.

All dietary fats contain saturated, monounsaturated, and polyunsaturated fatty acids in varying proportions



The composition of fats in our diet affects our health. Choose cooking oils and foods that are low in saturated fat and provide a mixture of the remaining types of fatty acids.

The risk of heart disease decreases when saturated and trans fats are replaced with healthier fats



There are
3 Key Dietary Principles
that can help people achieve the Dietary Guidelines

Key Dietary Principles

To help people meet the Guidelines and Key Recommendations, the following are important principles when making decisions about nutrient-dense food and beverage choices to achieve a healthy dietary pattern.

MEET NUTRITIONAL NEEDS PRIMARILY FROM FOODS AND BEVERAGES

The *Dietary Guidelines* are designed to meet the Recommended Dietary Allowances and Adequate Intakes for essential nutrients, as well as Acceptable Macronutrient Distribution Ranges, all set by the National Academies. An underlying premise of the *Dietary Guidelines* is that nutritional needs should be met primarily from foods and beverages—specifically, nutrient-dense foods and beverages. In some cases, when meeting nutrient needs is not otherwise possible, fortified foods and nutrient-containing dietary supplements are useful. It is important to note that the nutrient density and healthfulness of what people eat and drink often is determined ultimately by how a food item, dish, or meal is prepared, at home and away from home or produced by a manufacturer. Based on the U.S. food supply and marketplace, the examples of healthy dietary patterns in this edition are achievable through thoughtful, informed choices one decision, one meal, one day at a time—and consistently over time.

CHOOSE A VARIETY OF OPTIONS FROM EACH FOOD GROUP

Enjoy different foods and beverages within each food group. This can help meet nutrient needs—and also allows for flexibility so that the *Dietary Guidelines* can be tailored to meet cultural and personal preferences. All forms of foods, including fresh, canned, dried, frozen, and 100% juices, in nutrient-dense forms, can be included in healthy dietary patterns.

PAY ATTENTION TO PORTION SIZE

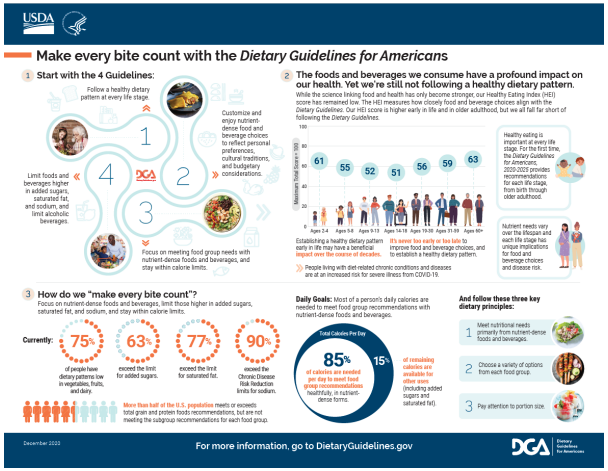
Portion size is a term often used to describe the amount of a food or beverage served or consumed in one eating occasion. It is important to pay attention to portion size when making food and beverage choices, particularly for foods and beverages that are not nutrient-dense. A concept that can help people choose appropriate portions is ***serving size***. This term is included on the Nutrition Facts label and refers to the amount of a food or beverage that is customarily consumed—it is not a recommendation of how much to eat or drink. Consuming less than the stated serving size results in consuming fewer calories and other nutrients or food components. Some products may have multiple servings per package.

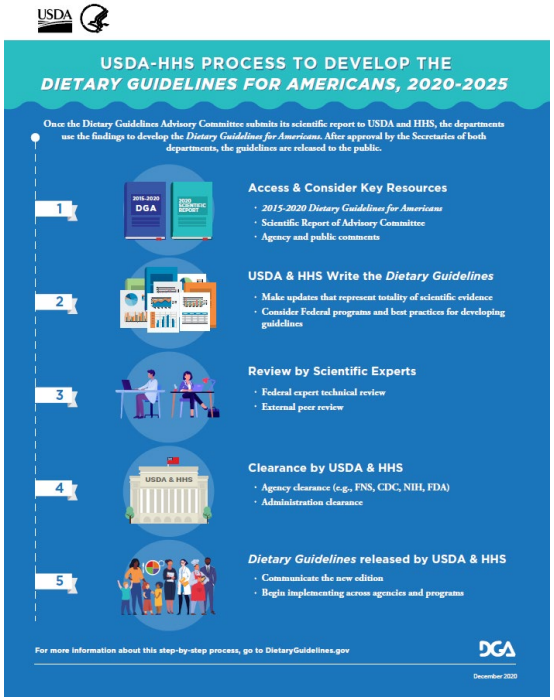
USDA Healthy Dietary Patterns carried forward from 2015 DGA

- The Healthy U.S.-Style Dietary Pattern
  - framework for healthy eating based on the types and proportions of foods Americans of all ages, genders, races, and ethnicities typically consume, but in nutrient-dense forms and appropriate amounts.
- The Healthy Mediterranean-Style Dietary Pattern and the Healthy Vegetarian Dietary Pattern
  - variations of the Healthy U.S.-Style Dietary Pattern

Access the New Edition

- Visit DietaryGuidelines.gov to access the new edition and free online-only supporting materials.

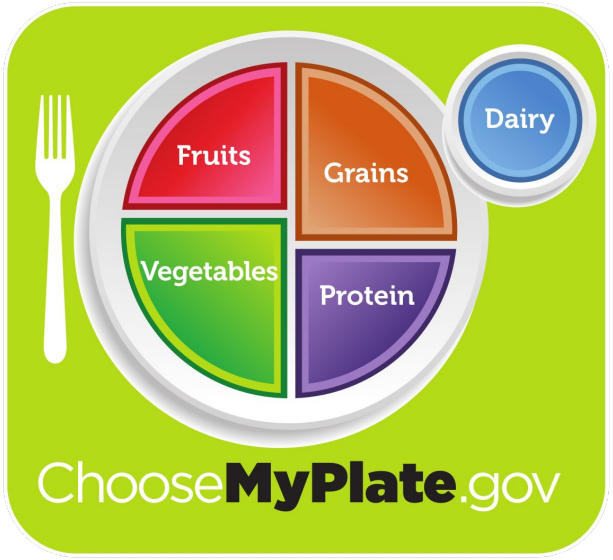




DGA Dietary Guidelines for Americans

Implementing the *Dietary Guidelines* Through MyPlate

- MyPlate is used by professionals to help people become more aware of and informed about making healthy food and beverage choices over time. Visit MyPlate.gov to learn more.
- https://www.myplate.gov/
- USDA's *Start Simple with MyPlate* campaign offers resources to help Americans put these Guidelines into practice starting today.
- The benefits of healthy eating add up over time, bite by bite. Small changes matter. Start Simple with MyPlate



Dietary Guidelines for Americans

More than 100 countries have food-based guidelines

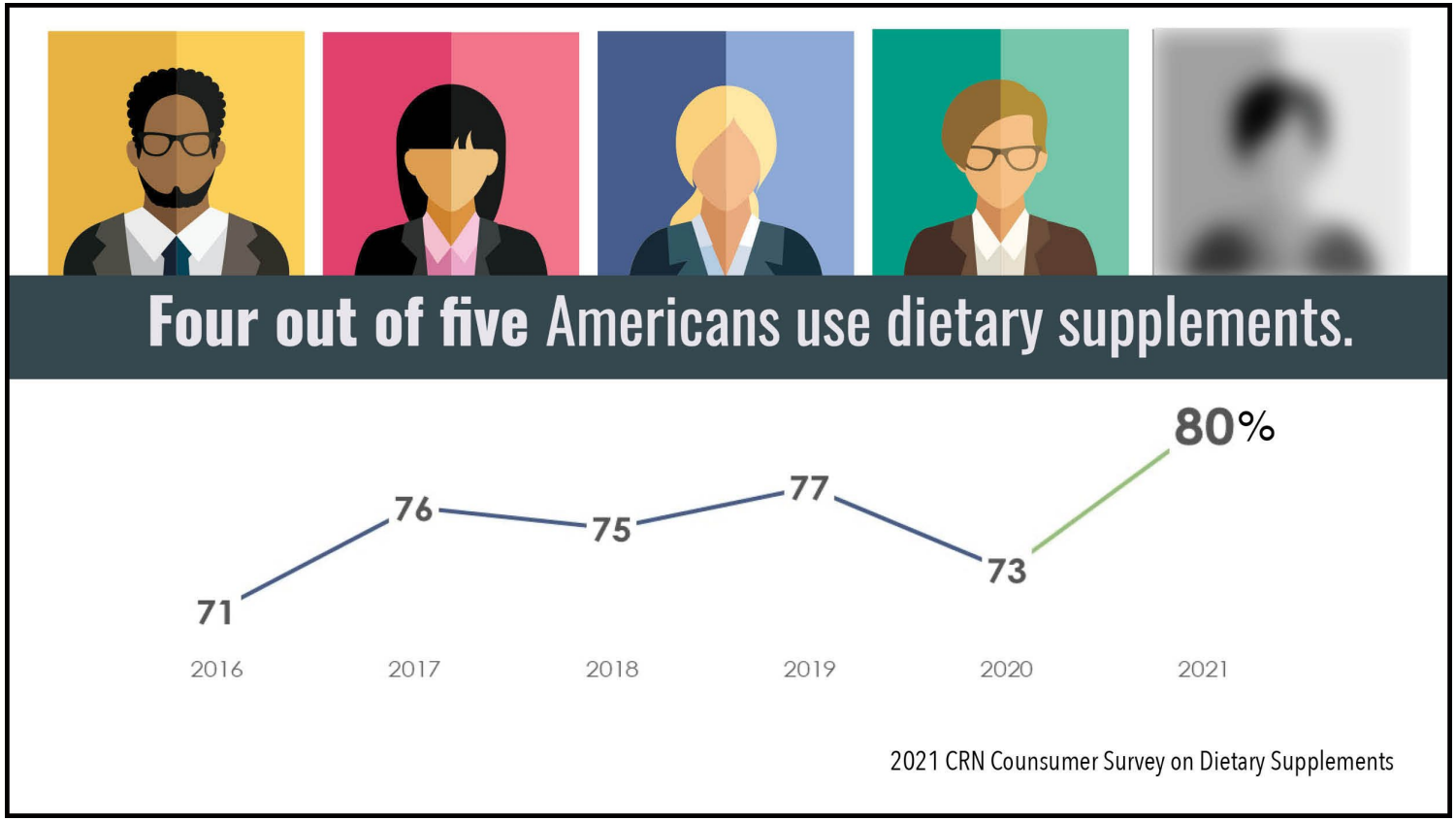
- Food and Agriculture Organization (FAO) of the United Nations
  - http://www.fao.org/nutrition/education/food-dietary-guidelines/home/en/
- Most healthy-diet plans emphasize the following:
  - Eat more plant foods, including fruits, vegetables and whole grains.
  - Choose lean protein from a variety of sources.
  - Limit sweets and salt.
  - Control portion sizes.
  - Be physically active.


Caltrate
Citracal
Calcium
Move Free
Glucosamine Chondroitin

Dietary supplements are a huge industry

Unnumbered 12 p261b
Scientific American: Nutrition for a Changing World
Keith Brofsky/Getty Images

- The dietary supplement industry contributes more than $50 billion to the national economy
  - More than 65,000 products are marketed in the United States as dietary supplements.
- More than half of Americans report using dietary supplements regularly (NHANES) – Newer statistics > 80%
  - Fewer than 25% do so at the recommendation of a qualified health provider
- Most commonly used supplements: multivitamin mineral (MVM), vitamin D, calcium, omega-3, vitamin C



https://www.crnusa.org/newsroom/crn-reveals-initial-data-2021-consumer-survey-dietary-supplements

Dietary Supplement Use in Middle-aged and Older Adults

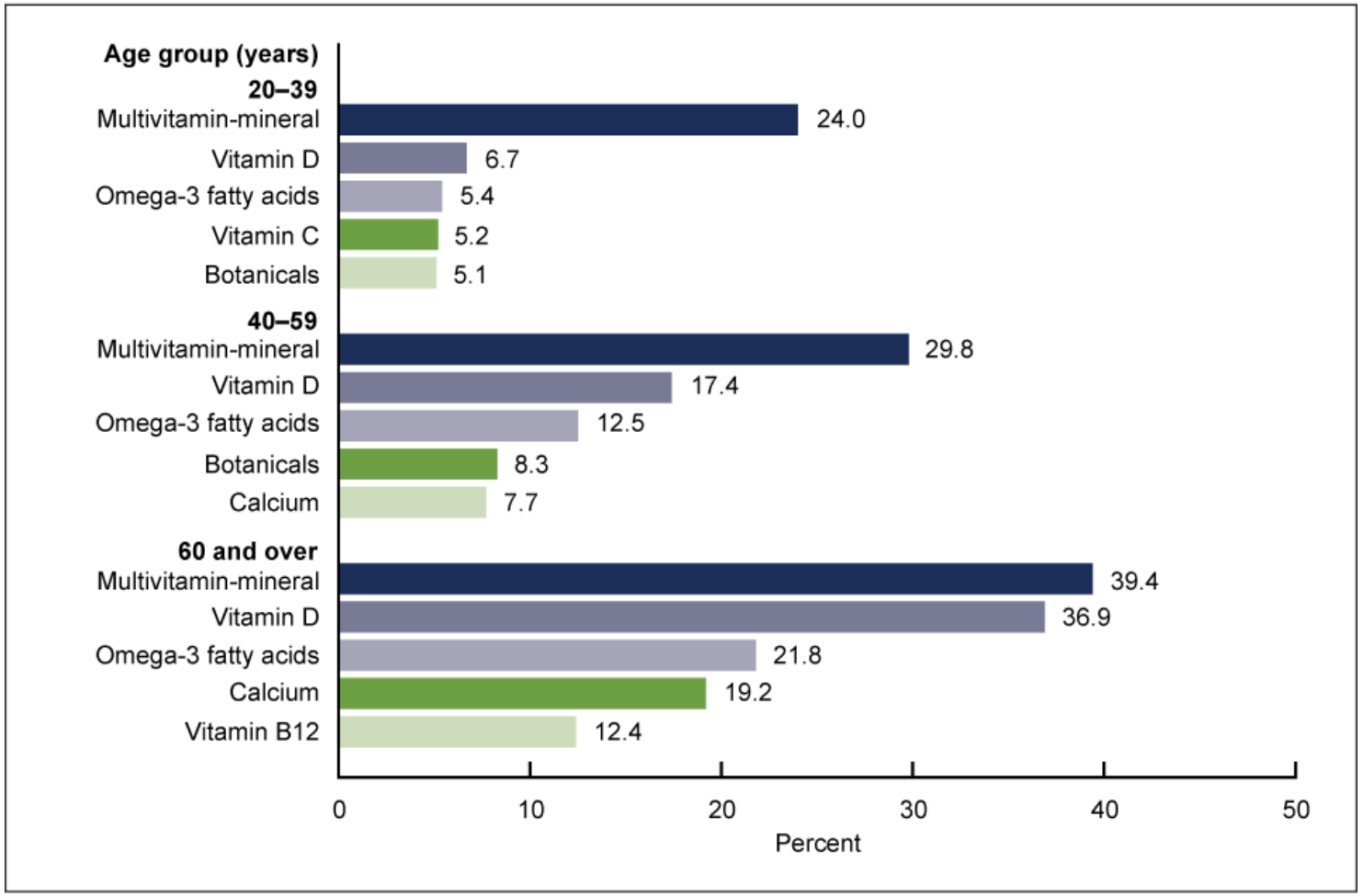
- https://pubmed.ncbi.nlm.nih.gov/35166304/ (2022)
- A total of 6045 participants (weighted n = 71,268,015) were included in the final analytical sample (mean age 67.7 years, 59.3% female). Of these, 84.6% (n=60,292,704) were regular dietary supplement users, with participants taking a mean of 3.2±0.1 different dietary supplements and 41.9% taking four or more. Multivitamins were the most common, used by 57.5% (n=41,147,146) of participants. Other commonly used dietary supplements were vitamin D, fish oil, calcium, vitamin C, and vitamin B12. Older age (75+ years), female sex, higher education, daily alcohol use, vigorous physical activity, regular medication use, and arthritis were associated with higher odds of dietary supplement use.

- Conclusions: In this sample of middle-aged and older Americans, more than 4 out of 5 used a dietary supplement. Certain demographic, behavioural, and clinical factors were associated with their use. Given the lack of evidence for improving health outcomes, our findings suggest potential overuse of dietary supplements in people over the age of 50.

Most common types of dietary supplements used by U.S. adults

- https://www.cdc.gov/nchs/products/databriefs/db399.htm

Figure 3. Most common types of dietary supplements used by adults aged 20 and over, by age: United States, 2017–2018



NOTE: Access data table for Figure 3 at: https://www.cdc.gov/nchs/data/databriefs/db399-tables-508.pdf#3.
SOURCE: National Center for Health Statistics, National Health and Nutrition Examination Survey, 2017–2018.

Survey: Supplement Use Widespread Among Americans

- http://www.nlm.nih.gov/medlineplus/news/fullstory_131502.html
- *Most common reasons for taking supplements:*
  - To promote or maintain health
  - To improve energy
  - Boost the immune system
- Perception of benefits rather than quantifiable, research-based evidence appears to drive many people to take supplements.
  - Even if a government-funded study were to denounce claims made by supplement manufacturers, one-fourth of respondents said they would disregard it.
  - More than 80% said it was important that they have access to supplements.
  - Less than 25% take supplements on advice of or under supervision of a health care professional.

Those who might benefit from dietary supplements are most often the ones least likely to take them

- Supplement versus non-supplement users:
  - Have healthier habits
  - More likely to report very good or excellent health
  - More favorable health indicators
    - Normal blood pressure
    - Healthier body weight for height
    - Exercise more frequently
    - Do not smoke
    - Use alcohol moderately
  - Have higher educational and socioeconomic level
  - Are more likely to be of Asian and non-Hispanic, white descent

"Dietary supplement" is defined by the 1994 Dietary Supplement Health and Education Act (DSHEA)

- Food or substance that supplements the diet and contains one or more dietary ingredients or their constituents
  - Vitamins, minerals, herbs, other botanicals, amino acids, or enzymes
- Intended to be taken by mouth
  - Pill, capsule, tablet, liquid, powder, and bar

Eli Ensor

Dietary supplements do not have to be approved by the FDA for effectiveness or safety

- Regulated by FDA differently than foods or drugs
  - *Do not undergo the same rigorous testing as prescription or over-the-counter drugs*
- DSHEA requirements
  - The manufacturer is responsible for ensuring that the product is safe, unadulterated, produced with good manufacturing practices, and properly and truthfully marked with a label
  - Dietary ingredients have to be federally regulated and *GRAS (generally recognized as safe)*
  - Once a dietary supplement is marketed, FDA has to prove that the product is *not* safe to restrict its use or remove it from the market

"GRAS" substances don't need FDA approval before being marketed

- **G**enerally **R**ecognized **A**s **S**afe
  - Dietary supplement ingredients (and food additives) that were present in the food supply prior to October 15, 1994, are presumed safe and "grandfathered" in
  - Published studies show their safe consumption
  - However, many dietary ingredients legally present in supplements have not been reliably demonstrated to be safe
- Info and listings for GRAS substances (FDA)
  - https://www.fda.gov/food/food-ingredients-packaging/generally-recognized-safe-gras

Dietary supplements manufacturers are responsible for ensuring product safety

- 1994 FDA's Dietary Supplement and Education Act (DSHEA)
  - Supplements must be safe
  - Be unadulterated
  - Be properly labeled
  - Be produced with good manufacturing practices
  - Promoted with label information that is truthful
- The Food Safety Modernization Act (FSMA) of 2011 expands some of the FDA's authority over supplement manufacturers
  - http://www.fda.gov/Food/Dietarysupplements/default.htm

The FDA does not monitor supplements for quality assurance, potency, purity, or efficacy

- FDA does track reports of illness, injury, or reactions
- Supplement manufacturers are required to report serious harmful effects to the FDA
- FDA does not regulate terms
  - "Pure"
  - "Natural"
  - "Quality assured"

Vadim.Petrov/Shutterstock

Independent labs may test supplements for strength, quality, and purity

- The product is voluntarily submitted by the manufacturer
- U.S. Pharmacopeia Convention (USP) sets standards and provides seals of quality
- Other labs provide quality seals
  - NSF International (NSF)

Editorial Image, LLC/Alamy

The FDA allows use of qualified health claims on supplement labels

- Emerging evidence linking a food, food component, or supplement to a reduced risk of disease
  - Not well enough established to meet SSA standard
- Selected qualified health claims
  - "Supportive but not conclusive research shows that consumption of EPA and DHA omega-3 fatty acids may reduce the risk of coronary heart disease."
  - "Vitamin C may reduce the risk of gastric cancer. The FDA has concluded that there is very little scientific evidence for this claim."

Position of the Academy of Nutrition and Dietetics: Micronutrient Supplementation

- https://pubmed.ncbi.nlm.nih.gov/30366569/
- It is the position of the Academy of Nutrition and Dietetics that micronutrient supplements are warranted when requirements are not being met through the diet alone.
- Those with increased requirements secondary to growth, chronic disease, medication use, malabsorption, pregnancy and lactation, and aging may be at particular risk for inadequate dietary intakes.
- However, the routine and indiscriminate use of micronutrient supplements for the prevention of chronic disease is not recommended, given the lack of available scientific evidence.

Supplements may be useful in some circumstances, but they cannot replace a healthy diet

Population Group *Do you fit into one of these categories?*	**Dietary Concerns**
Infants and children	Breastfed children and any child consuming less than 1 qt/day of vitamin D–fortified milk should receive a vitamin D supplement.
Women who may become pregnant	Supplemental folic acid reduces the occurrence of neural tube defects.
Pregnant women	A folic acid supplement is recommended during pregnancy. A multivitamin/mineral (MVM) supplement is recommended for anemia, women carrying multiple fetuses, or women consuming little or no animal proteins.
Vegans	The only source of B_{12} is animal proteins and fortified foods, so vegans who eat no animal products may need a supplement as well as supplementary calcium, iron, and zinc.
Those who do not consume dairy products	Because milk and other dairy products are an important source of vitamin D and calcium, a supplement providing these nutrients may improve bone health.
Adults older than 50 years	B_{12} and vitamin D supplements are recommended because B_{12} absorption tends to decline with age and older individuals synthesize less vitamin D when exposed to UV light.
Those with dark skin	Vitamin D supplements are recommended because skin pigments block UV light and decrease the synthesis of vitamin D.
Individuals on restricted diets	Those with low food intake or limited food choices may benefit from an MVM supplement.
Individuals who smoke, alcohol-dependent individuals, and those taking some medications	Nutrient absorption, utilization, and excretion can be affected by prescription or recreational drug use. Therefore, an MVM supplement may be warranted.
Women who are pregnant; women with heavy menstrual periods; individuals who frequently donate blood, as well as those with some stomach and intestinal conditions (food sensitivity, hookworms)	Iron supplementation may be necessary.

J Am Diet Assoc. 109: 2073–2085, 2009.

Supplements may be beneficial for some individuals (1 of 2)

- Those who cannot meet their nutritional requirements because of disease, increased need, or restricted diets
  - Infants and children (vitamin D)
  - Women who may become pregnant (folic acid)
  - Pregnant women (folic acid, iron, multivitamin)
  - Vegans (vitamin B_{12} and D, calcium, iron, zinc)
  - Those who do not consume dairy products (vitamin D and calcium)


SpeedKingz/Shutterstock

Supplements may be beneficial for some individuals (2 of 2)

- Adults older than 50 years (vitamins B_{12} and D)
- People with dark skin (vitamin D)
- Individuals on restricted or limited diets (multivitamin)
- Smokers, alcohol-dependent individuals, and those taking some medications (multivitamin)
- Women with heavy menstrual periods (iron)
- Individuals who frequently donate blood, as well as those with stomach and intestinal conditions (iron)

Vitamin and mineral recommendations for people over 50

- https://www.nia.nih.gov/health/dietary-supplements-older-adults
- The Dietary Guidelines for Americans, 2020-2025 (PDF, 30.9M) recommends how much of each vitamin and mineral men and women of different ages need. For example:
- **Vitamin B12**: 2.4 mcg (micrograms) each day. If you are taking medicine for acid reflux, you might need a different form, which your health care provider can give you information about.
- **Calcium**: Women over age 50 need 1,200 mg (milligrams) each day. Men need 1,000 mg between age 51 and 70 and 1,200 mg after 70, but not more than 2,000 mg a day.
- **Vitamin D**: 600 IU (International Units) for people age 51 to 70 and 800 IU for those over 70, but not more than 4,000 IU each day.
- **Vitamin B6**: 1.7 mg for men and 1.5 mg for women each day.

Helpful and credible websites on supplementation

- National Institutes of Health
  - Office of Dietary Supplements: http://ods.od.nih.gov/index.aspx https://ods.od.nih.gov/factsheets/list-all/
  - National Center for Complementary and Integrative Health: https://www.nccih.nih.gov/health/dietary-and-herbal-supplements
- Linus Pauling Institute: https://lpi.oregonstate.edu/mic
- National Institute on Aging:
  - https://www.nia.nih.gov/health/vitamins-and-minerals-older-adults
  - https://www.nia.nih.gov/health/dietary-supplements-older-adults
- Medline Plus: https://medlineplus.gov/dietarysupplements.html
- FDA: https://www.fda.gov/food/dietary-supplements

U.S. Department of Health & Human Services | National Institutes of Health

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Strengthening Knowledge and Understanding of Dietary Supplements

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COVID-19 is an emerging, rapidly evolving situation.

Get the latest public health information from CDC: https://www.coronavirus.gov
Get the latest research information from NIH: https://www.nih.gov/coronavirus | en español: https://salud.nih.gov/covid-19

combat COVID. hhs.gov

Health Information

Share:

Home › Making Decisions › Dietary Supplement Fact Sheets › Vitamin and Mineral Supplement Fact Sheets

Vitamin and Mineral Supplement Fact Sheets

This collection of fact sheets and other resources from the NIH Office of Dietary Supplements and other federal government sources presents information about dietary supplements and their ingredients. These include vitamins, minerals, herbs and botanicals, probiotics, and more. Many of these resources are available in versions written for consumers (in both English and Spanish) and also for health professionals.

5 A B C D E F G H I K L M N O P Q R S T V W Y Z

A

- Antioxidants (see Exercise and Athletic Performance)
- Vitamin A

B

- Beta-carotene (see Vitamin A)
- Biotin
- Boron
- Vitamin B1 (see Thiamin)
- Vitamin B12
- Vitamin B2 (see Riboflavin)
- Vitamin B3 (see Niacin)
- Vitamin B5 (see Pantothenic acid)
- Vitamin B6
- Vitamin B7 (see Biotin)
- Vitamin B9 (see Folate)

C

- Calcium
- Cesium
- Choline
- Chromium
- Cobalamin (see Vitamin B12)
- Copper
- Vitamin C

D

- Vitamin D

E

- Energy drinks
- Exercise and Athletic Performance
- Vitamin E

F

- Fluoride
- Folate

General Supplement Information

- Dietary Supplements: Background Information
- Botanical Dietary Supplements: Background Information
- Vitamin and Mineral Fact Sheets
- Botanical Supplement Fact Sheets
- Frequently Asked Questions
- Dietary Supplements: What You Need to Know
- ODS Videos
- Información en español

Supplements for Specific Purposes

- Coronavirus and "alternative" treatments
- NIH COVID-19 Treatment Guidelines on Vitamin C
- NIH COVID-19 Treatment Guidelines on Vitamin D
- NIH COVID-19 Treatment Guidelines on Zinc Supplementation
- Exercise and Athletic Performance
- Primary Mitochondrial Disorders
- Weight Loss

NIH National Institutes of Health
Office of Dietary Supplements

Strengthening Knowledge and Understanding of Dietary Supplements

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COVID-19 is an emerging, rapidly evolving situation.

Get the latest public health information from CDC: https://www.coronavirus.gov
Get the latest research information from NIH: https://www.nih.gov/coronavirus | en español: https://salud.nih.gov/covid-19

combat COVID. hhs.gov

Health Information

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Home › Making Decisions › Dietary Supplement Fact Sheets › Biotin › Biotin - Health Professional

Biotin

Fact Sheet for Health Professionals

Biotin

- Consumer
- Datos en español
- ▶ Health Professional
- Other Resources

- Introduction
- Recommended Intakes
- Sources of Biotin
- Biotin Intakes and Status
- Biotin Deficiency
- Groups at Risk of Biotin Inadequacy
- Biotin and Health
- Health Risks from Excessive Biotin
- Interactions with Laboratory Tests
- Interactions with Medications
- Biotin and Healthful Diets
- References
- Disclaimer

This is a fact sheet intended for health professionals. For a reader-friendly overview of Biotin, see our consumer fact sheet on Biotin.

Have a question? Ask ODS
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Introduction

Biotin, a B vitamin, is an essential nutrient that is naturally present in some foods and available as a dietary supplement. This water-soluble vitamin is a cofactor for five carboxylases (propionyl-CoA carboxylase, pyruvate carboxylase, methylcrotonyl-CoA carboxylase [MCC], acetyl-CoA carboxylase 1, and acetyl-CoA carboxylase 2) that catalyze critical steps in the metabolism of fatty acids, glucose, and amino acids [1-5]. Biotin also plays key roles in histone modifications, gene regulation (by modifying the activity of transcription factors), and cell signaling [3].

Most biotin in foods is bound to protein, although some dietary biotin is in the free form [1,3,4,6]. Gastrointestinal proteases and peptidases break down the protein-bound forms of ingested biotin into biocytin and biotin-oligopeptides, which undergo further processing by biotinidase, an enzyme, in the intestinal lumen to release free biotin [6]. The free biotin is then absorbed in the small intestine, and most biotin is stored in the liver [1,3,6].

A limited number of reliable indicators of biotin status is available [7]. In healthy adults, the concentration of biotin is 133–329 pmol/L in serum and 18–127 nmol/24 hours in urine [2]. Abnormally low urinary excretion of biotin is an indicator of biotin deficiency, as is abnormally high excretion of 3-hydroxyisovaleric acid (higher than 3.3 mmol/mol creatinine) or 3-hydroxyisovalerylcarnitine (higher than 0.06 mmol/mol creatinine) resulting from reduced activity of MCC [2,7,8]. The most reliable individual markers of biotin status, including deficiency and sufficiency, are biotinylated MCC and propionyl-CoA carboxylase in white blood cells [7]. Oral administration of large doses of biotin increases serum concentrations of biotin and its metabolites [1,9]. However, serum concentrations of biotin and its catabolites are not good indicators of marginal biotin deficiency because they do not decrease sufficiently in people with marginal biotin deficiency for these changes to be detectable with existing tests [3,10].

Recommended Intakes

Intake recommendations for biotin and other nutrients are provided in the Dietary Reference Intakes (DRIs) developed by the Food and Nutrition Board (FNB) at the National Academies of Sciences, Engineering, and Medicine [1]. DRI is the general term for a set of reference values used for planning and assessing nutrient intakes of healthy people. These values, which vary by age and sex, include:

- Recommended Dietary Allowance (RDA): Average daily level of intake sufficient to meet the nutrient requirements of nearly all (97%–98%) healthy individuals; often used to plan nutritionally adequate diets for individuals.
- Adequate Intake (AI): Intake at this level is assumed to ensure nutritional adequacy; established when evidence is insufficient to develop an RDA.
- Estimated Average Requirement (EAR): Average daily level of intake estimated to meet the requirements of 50% of healthy individuals; usually used to assess the nutrient intakes of groups of people and to plan nutritionally adequate diets for them; can also be used to assess the nutrient intakes of individuals.
- Tolerable Upper Intake Level (UL): Maximum daily intake unlikely to cause adverse health effects.

NIH Dietary Supplement Fact Sheets

https://ods.od.nih.gov/factsheets/list-VitaminsMinerals/

Studies do not support that long-term use of multivitamin/mineral supplements or individual supplements decrease the risk of death

Studies Examining Multivitamin/Mineral Supplements

- Of eight observational studies that examined the effect of long-term multivitamin/mineral (MVM) supplements on mortality, six studies found no effect of MVM use, whereas two studies observed an increased risk of death in those taking MVM supplements.
- In a recent randomized clinical trial, approximately 10 years of MVM administration caused no decrease in deaths from cardiovascular disease or cancer. MVM supplements did not affect the occurrence of CVD, although there was a slight decrease in the occurrence of all cancers.
- An earlier randomized clinical trial found no decrease in mortality following the administration of an MVM supplement to a poorly nourished population for six years, nor was there any affect on mortality 20 years later.
- Analysis of data pooled from 78 clinical trials involving nearly 300,000 participants found no benefit of antioxidant vitamins and minerals on the risk of death; however, consuming supplements of beta-carotene and vitamin E were found to increase the risk of death.
- The analysis of pooled data from 21 studies that had administered supplements containing three or more vitamins and minerals to more than 90,000 participants found no effect on mortality risk.

Multivitamins in the prevention of cancer and cardiovascular disease: The COSMOS randomized clinical trial

- American Journal of Clinical Nutrition 3/2022
  - https://academic.oup.com/ajcn/advance-article/doi/10.1093/ajcn/nqac056/6548187?login=true
  - Randomized, double-blind, placebo-controlled, two-by-two factorial trial of a daily MVM and cocoa extract for prevention of cancer and cardiovascular disease (CVD) among 21,442 U.S. adults (12,666 women aged ≥ 65 years and 8776 men aged ≥ 60 years) free of major CVD and recently diagnosed cancer.
- A daily MVM supplement, compared with placebo, did not significantly reduce the incidence of total cancer among older men and women.
- MVM did not significantly affect CVD outcome or all-cause mortality
- Future studies are needed to determine the effects of MVMs on other aging-related outcomes among older adults.

Multivitamins, but Not Cocoa, Tied to Slowed Brain Aging

- 11/2021 https://www.medscape.com/viewarticle/962772
  - Taking a daily multivitamin for 3 years is associated with a 60% slowing of cognitive aging, with the effects especially pronounced in patients with cardiovascular (CVD) disease, new research suggests.
  - In addition to testing the effect of a daily multivitamin on cognition the COSMOS-Mind study also examined the effect of cocoa flavanols, but showed no beneficial effect.
  - The findings "may have important public health implications, particularly for brain health, given the accessibility of multivitamins and minerals, and their low cost and safety," said study investigator Laura D. Baker, PhD, professor, Gerontology and Geriatric Medicine, Wake Forest School of Medicine, Winston-Salem, North Carolina.
- *COcoa Supplement and Multivitamin Outcomes Study*
  - https://cosmostrial.org/
  - The COcoa Supplement and Multivitamin Outcomes Study (COSMOS) at Brigham and Women's Hospital – an affiliate of Harvard Medical School (Boston, MA) – and the Fred Hutchinson Cancer Research Center (Seattle, WA) is a clinical trial that randomized 21,442 men and women across the United States. The study has investigated whether taking daily cocoa extract supplements containing 500 mg/day cocoa flavanols or a common multivitamin reduces the risk for developing heart disease, stroke, cancer, and other important health outcomes.

If you are in a category that might benefit from taking a supplement, follow these tips

Tips for Choosing a Multivitamin Supplement

- **Read the label carefully**. Examine which nutrients are included and the amounts contained within each serving. In general, choose a supplement that provides 100% of the Daily Value (DV) for most of the vitamins and minerals in that supplement. Some nutrients, such as calcium and magnesium, are rarely included at 100% because the pill would be too large to swallow.
- **Look for quality products.** The initials USP stand for U.S. Pharmacopeial Convention, and NSF stands for NSF International; both are reputable organizations that test dietary supplements for quality.
- **Look for the expiration date.** Select products that will have a long shelf life.
- **Consider formulas for men, women, and age groups.** Choose a multivitamin designed for your age and sex so that the nutrients included will be right for you.
- **Don't overdo it.** Avoid multivitamins that exceed 100% of daily recommended values.

SPECIAL CAVEATS

- **Beware of interactions.** Taking a combination of supplements together with medications could produce adverse effects. For example, Coumadin (a prescription drug), ginkgo biloba (an herbal supplement), aspirin (an OTC drug), and vitamin E (a vitamin supplement) can each thin the blood, and taking any of these products together can increase the potential for internal bleeding. The herbal supplement St. John's wort may also reduce the effectiveness of prescription drugs for heart disease, depression, seizures, certain cancers, and oral contraceptives.
- **Some supplements may interfere with surgeries.** Before elective surgery, you may be asked to stop taking vitamins, minerals, or herbal supplements to avoid potentially dangerous supplement/drug interactions—such as changes in heart rate, blood pressure, and increased bleeding—that could adversely affect the outcome of your surgery.

Centrum Womens "regular"

Supplement Facts

Serving Size 1 Tablet

Amount Per Serving	% DV
Vitamin A 1,050 mcg (29% as Beta-Carotene)	117%
Vitamin C 75 mg	83%
Vitamin D_3 25 mcg (1,000 IU)	125%
Vitamin E 15.8 mg	105%
Vitamin K 50 mcg	42%
Thiamin 1.1 mg	92%
Riboflavin 1.1 mg	85%
Niacin 14 mg	88%
Vitamin B_6 2 mg	118%
Folate 667 mcg DFE (400 mcg Folic Acid)	167%
Vitamin B_{12} 6 mcg	250%
Biotin 40 mcg	133%
Pantothenic Acid 15 mg	300%
Calcium 200 mg	15%
Iron 18 mg	100%
Phosphorus 20 mg	2%
Iodine 150 mcg	100%
Magnesium 100 mg	24%
Zinc 8 mg	73%
Selenium 18 mcg	33%
Copper 0.5 mg	56%
Manganese 1.8 mg	78%
Chromium 32 mcg	91%
Molybdenum 50 mcg	111%
Chloride 72 mg	3%
Potassium 80 mg	2%

%DV=% Daily Value

SILVER®

Women 50+

What's different?

More B6 and B12

Slightly more vitamin C

Slightly more calcium

More zinc

Less iron

More manganese and chromium

Supplement Facts

Serving Size 1 Tablet

Amount Per Serving	% Daily Value
Vitamin A 1,050 mcg (43% as Beta-Carotene)	117%
Vitamin C 100 mg	111%
Vitamin D_3 25 mcg (1,000 IU)	125%
Vitamin E 15.8 mg	105%
Vitamin K 50 mcg	42%
Thiamin 1.1 mg	92%
Riboflavin 1.1 mg	85%
Niacin 14 mg	88%
Vitamin B_6 5 mg	294%
Folate 667 mcg DFE (400 mcg Folic Acid)	167%
Vitamin B_{12} 50 mcg	2,083%
Biotin 30 mcg	100%
Pantothenic Acid 5 mg	100%
Calcium 300 mg	23%
Iron 8 mg	44%
Phosphorus 20 mg	2%
Iodine 150 mcg	100%
Magnesium 100 mg	24%
Zinc 15 mg	136%
Selenium 22 mcg	40%
Copper 0.5 mg	56%
Manganese 2.3 mg	100%
Chromium 52 mcg	149%
Molybdenum 50 mcg	111%
Chloride 72 mg	3%
Potassium 80 mg	2%
Lutein 300 mcg	*

*Daily Value not established.

Centrum Men's – "regular"

Supplement Facts
Serving Size 1 Tablet

Amount Per Serving	% DV
Vitamin A 1,050 mcg (29% as Beta-Carotene)	117%
Vitamin C 90 mg	100%
Vitamin D_3 25 mcg (1,000 IU)	125%
Vitamin E 20.3 mg	135%
Vitamin K 60 mcg	50%
Thiamin 1.2 mg	100%
Riboflavin 1.3 mg	100%
Niacin 16 mg	100%
Vitamin B_6 2 mg	118%
Folate 333 mcg DFE (200 mcg Folic Acid)	83%
Vitamin B_{12} 6 mcg	250%
Biotin 40 mcg	133%
Pantothenic Acid 15 mg	300%
Calcium 210 mg	16%
Iron 8 mg	44%
Phosphorus 20 mg	2%
Iodine 150 mcg	100%
Magnesium 100 mg	24%
Zinc 11 mg	100%
Selenium 100 mcg	182%
Copper 0.9 mg	100%
Manganese 2.3 mg	100%
Chromium 35 mcg	100%
Molybdenum 50 mcg	111%
Chloride 72 mg	3%
Potassium 80 mg	2%
Lycopene 600 mcg	*

*Daily Value (DV) not established.

What's different?

More vitamin C and E
More B vitamins including B6 and B12
No iron in 50+
More zinc
Less selenium and copper
More manganese and chromium

SILVER®

Men 50+

Supplement Facts
Serving Size 1 Tablet

Amount Per Serving	% DV
Vitamin A 1,050 mcg (29% as Beta-Carotene)	117%
Vitamin C 120 mg	133%
Vitamin D_3 25 mcg (1,000 IU)	125%
Vitamin E 27 mg	180%
Vitamin K 60 mcg	50%
Thiamin 1.5 mg	125%
Riboflavin 1.7 mg	131%
Niacin 20 mg	125%
Vitamin B_6 6 mg	353%
Folate 500 mcg DFE (300 mcg Folic Acid)	125%
Vitamin B_{12} 100 mcg	4,167%
Biotin 30 mcg	100%
Pantothenic Acid 10 mg	200%
Calcium 210 mg	16%
Phosphorus 20 mg	2%
Iodine 150 mcg	100%
Magnesium 75 mg	18%
Zinc 15 mg	136%
Selenium 21 mcg	38%
Copper 0.5 mg	56%
Manganese 4 mg	174%
Chromium 60 mcg	171%
Molybdenum 50 mcg	111%
Chloride 72 mg	3%
Potassium 80 mg	2%
Lutein 300 mcg	*
Lycopene 600 mcg	*

* Daily Value (DV) not established.

"High potency" supplements appear to pose the highest risk

- Significantly in excess of the Daily Values for one or more nutrients/ingredients
- Sometimes in excess of the "UL" (Tolerable Upper Intake Level), above which there are documented adverse effects
- No current law prohibits excessive supplement potency, except for potassium
- Potential adverse effects
  - Fatigue, diarrhea, hair loss
  - Kidney stones, liver damage, nerve damage, birth defects
- Taking high levels for a prolonged time can be toxic
  - Fat-soluble vitamins (A and D)
- Can result in nutrient–nutrient imbalances/interactions
  - High doses of some nutrients may reduce absorption and utilization of other nutrients
    - Copper can interfere with the absorption of zinc
    - Iron can interfere with calcium absorption

Botanical or herbal supplements are derived from plants

- Usually consist of dried preparations of flowers, leaves, roots, bark, and/or seeds
- Less potent form of crude drugs, but can still have drug-like effects
  - Do not undergo stringent approval process like drugs
- Examples: echinacea, ginseng, ginkgo, St. John's wort

Mario Tama/Getty Images

Possible adverse effects and benefits associated with the use of herbal supplements

Potentially Effective Botanical Supplements and Possible Adverse Effects

	Supplement	Possible Benefits	Adverse Effects
	Senna	Laxative	Liver failure with excessively high doses
	Licorice root	Protection against liver damage, anti-ulcer effects	Hypertension
	Hawthorn	Cardiovascular benefits	None
	Ginger	Reduction of nausea and vomiting	None
	Garlic	Reduction of hypertension and cardiovascular benefits	Decreased clotting
	Black cohosh	Relief of menopausal symptoms	Possible liver injury with long-term use
	Holy basil	Anti-inflammatory, anticarcinogenic effects	None
	Fenugreek	Lower blood glucose and improved insulin sensitivity	Diarrhea, low blood glucose
	St. John's wort	Treatment of mild to moderate depression	Hypertension
	French maritime pine bark (Pycnogenol)	Antioxidant, decreased hypertension, improved cardiovascular function	May cause mild dizziness, nausea, headache

A recent study found that bottles labeled as St. John's wort from two manufacturers contained none of the medicinal herb; one contained only rice powder, and the other contained senna.

Drug Interaction Checkers…

- NIH Dietary Supplement Fact Sheets (Health Professional) see Interactions with Medications for individual supplements
  - https://ods.od.nih.gov/factsheets/list-VitaminsMinerals/
- Drug Interactions Checker
  - https://reference.medscape.com/drug-interactionchecker
- Herb Drug Interactions
  - https://www.nccih.nih.gov/health/providers/digest/herb-drug-interactions
  - https://www.nccih.nih.gov/health/know-science/how-medications-supplements-interact
- Common Herbal Dietary Supplement–Drug Interactions
  - https://www.aafp.org/afp/2017/0715/p101.html
- Natural Medicine Database
  - https://healthy.kaiserpermanente.org/health-wellness/natural-medicines

My Dietary Supplement and Medicine Record

https://ods.od.nih.gov/pubs/DietarySupplementandMedicineRecord.pdf

My Dietary Supplement and Medicine Record

Name _____ Date _____

Enter all of the Dietary Supplements, Prescription Drugs, and Over-the-Counter Medicines that You Take.

What I'm Using Dietary supplement, prescription drug or over-the-counter medicine (product name and active ingredients)	**What It Looks Like** Color, shape, size, markings, etc.	**How Much** Dose	**How to Use and When**	**Start/Stop Dates**	**Why I'm Using**	**Who Told Me to Use and How to Contact**
EXAMPLE: Calcium – Calcium Carbonate	*White oval tablet*	*500 mg*	*Take orally, 1 time a day with food*	*9/15/18 to present*	*Bone health*	*Dr. S. Smith (800) 555-1212*

National Institutes of Health
Office of Dietary Supplements

For more information from the NIH Office of Dietary Supplements, visit our website at: https://ods.od.nih.gov or email us at ods@nih.gov

My Dietary Supplement and Medicine Record

https://ods.od.nih.gov/pubs/DietarySupplementandMedicineRecord.pdf

Allergic Reactions or Other Problems I've Had with Any Dietary Supplement, Medicine, Food, Skin Product, etc.

Additional Notes

Questions I Should Ask About Dietary Supplements or Medicines

- Are there any special directions for using this product?
- Should I avoid any other dietary supplements, medicines, or treatments while using this product?
- Should I avoid any foods, beverages, other substances, or activities while using this product?
- What are the possible side effects from this product? Is there anything I should watch for? What should I do if I get a side effect?
- What should I do if I miss a dose?

Tips for Using My Dietary Supplement and Medicine Record

- **Fill in this record with any dietary supplements, prescription drugs, or over-the-counter medicines you take.** Note: Dietary supplements include vitamins, minerals, herbs and botanicals, amino acids, enzymes, and many other products.
- **Print and share this record** with your doctors, pharmacists, or other health professionals at all your visits.


POISON


BEER


Is Caffeine
BAD FOR YOU?
YURIELKAIM

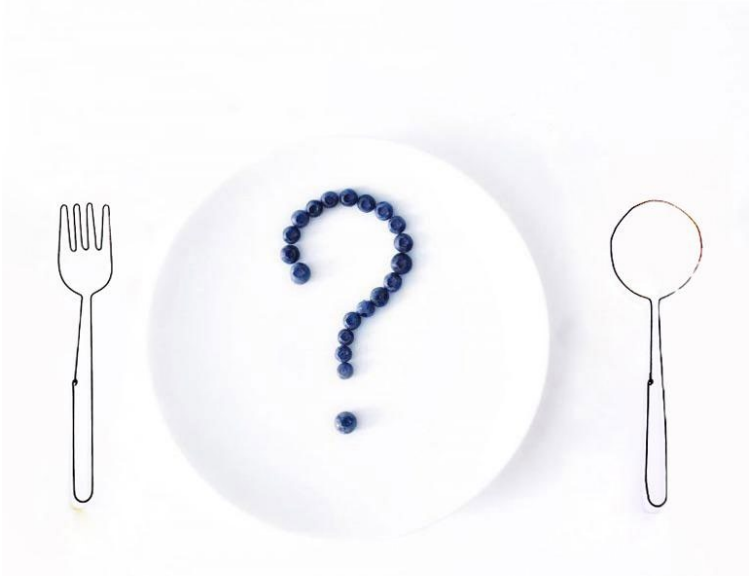

CORONAVIRUS


9 FOODS
THAT MAKE
YOU FAT
Apples
Donuts
Nuts
Nut Butters
Salads
Saucy Wings
Avocado
French Fries
Pizza


GOOD
CARBS
VS.
BAD
CARBS

Where do you get your nutrition information?

- Health Professionals
- Internet search
- Online websites
- News service
- Educators and classes
- Social media
- Friends and family
- Coaches and trainers
- Magazines and books
- Television and movies



Intermittent Fasting “isn’t a magic diet trick after all”

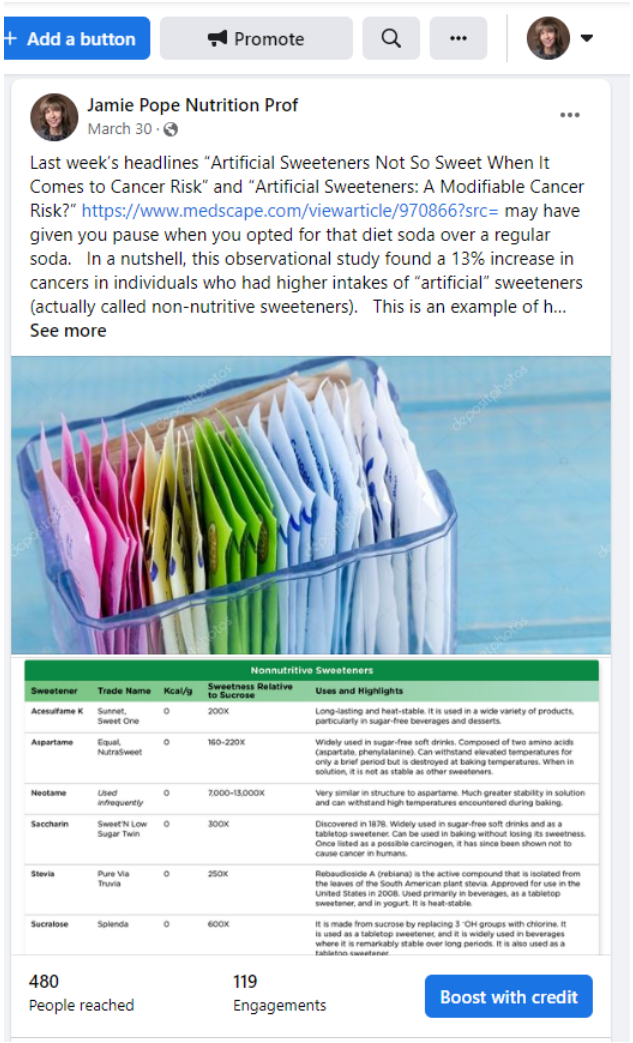
- https://www.sciencealert.com/here-s-what-that-controversial-new-study-on-intermittent-fasting-really-shows
  - “As we have seen many times previously, this study confirms there is no one best diet for weight loss. It also shows small decreases in the window of time you're eating probably won't make a difference to weight loss.”

Time Restricted Eating….

- April 21, 2022, New England Journal of Medicine
- ***Calorie Restriction with or without Time-Restricted Eating in Weight Loss***
  - https://pubmed.ncbi.nlm.nih.gov/35443107/
- Conclusions: Among patients with obesity, a regimen of time-restricted eating was not more beneficial with regard to reduction in body weight, body fat, or metabolic risk factors than daily calorie restriction

Examples of nutrition in the news….

- Jamie Pope Nutrition Prof educational Facebook page
  - https://www.facebook.com/jamiepopenutrition



Sources for credible nutrition information

- Academy of Nutrition and Dietetics https://www.eatright.org/
- Position Papers of the Academy of Nutrition and Dietetics https://www.jandonline.org/content/positionPapers
- Nutrition.gov https://www.nutrition.gov/
- Dietary Guidelines for Americans https://health.gov/dietaryguidelines/
- National Institutes of Health https://www.nih.gov/
- U.S. National Library of Medicine Medline Plus https://medlineplus.gov/
- Harvard School of Public Health https://www.hsph.harvard.edu
- Health organizations (AHA, ADA, ACS)

Scientific literature data base

- PubMed https://pubmed.ncbi.nlm.nih.gov/
- National Institutes of Health Office of Dietary Supplements https://ods.od.nih.gov/factsheets/list-VitaminsMinerals/

Nutrition news sources

- Nutrition and Dietetics Smart Brief https://www2.smartbrief.com/signupSystem/subscribe.action?pageSequence=1&briefName=eatrightpro&campaign=in_brief_signup_link&utm_source=brief
- Medical News Today Diet/Nutrition https://www.medicalnewstoday.com/categories/nutrition-diet
- Science Daily https://www.sciencedaily.com/news/top/health/
- EurekAlert! Science News https://www.eurekalert.org/bysubject/medicine.php
- International Food and Information Council https://foodinsight.org/your-covid-19-resource-for-food-safety-and-nutrition/

Credible sources of nutrition information

Government and Private Agencies/Credentialed Expert Advice

Source	Examples
Nonprofit, Professional Health Organizations	• American Heart Association • American Cancer Society • Academy of Nutrition and Dietetics • American Diabetic Association • American Institute for Cancer Research
Scientific Organizations	• National Academy of Science • American College of Sports Medicine • The Obesity Society • Institute of Medicine (under National Academy of Science)
Government Publications: Nutrition, Diet, and Health Reports	• National Institutes of Health • Surgeon General • Food and Drug Administration • Centers for Disease Control and Prevention • United States Department of Agriculture (USDA) Food and Nutrition Information Center • USDA Center for Nutrition Policy and Promotion • NIH: National Center for Complementary and Alternative Medicine
Registered Dietitians	• Hospitals • Public Health Departments • Extension Service
Other Nonprofit Organizations	• Sense about Science • HealthWatch-UK

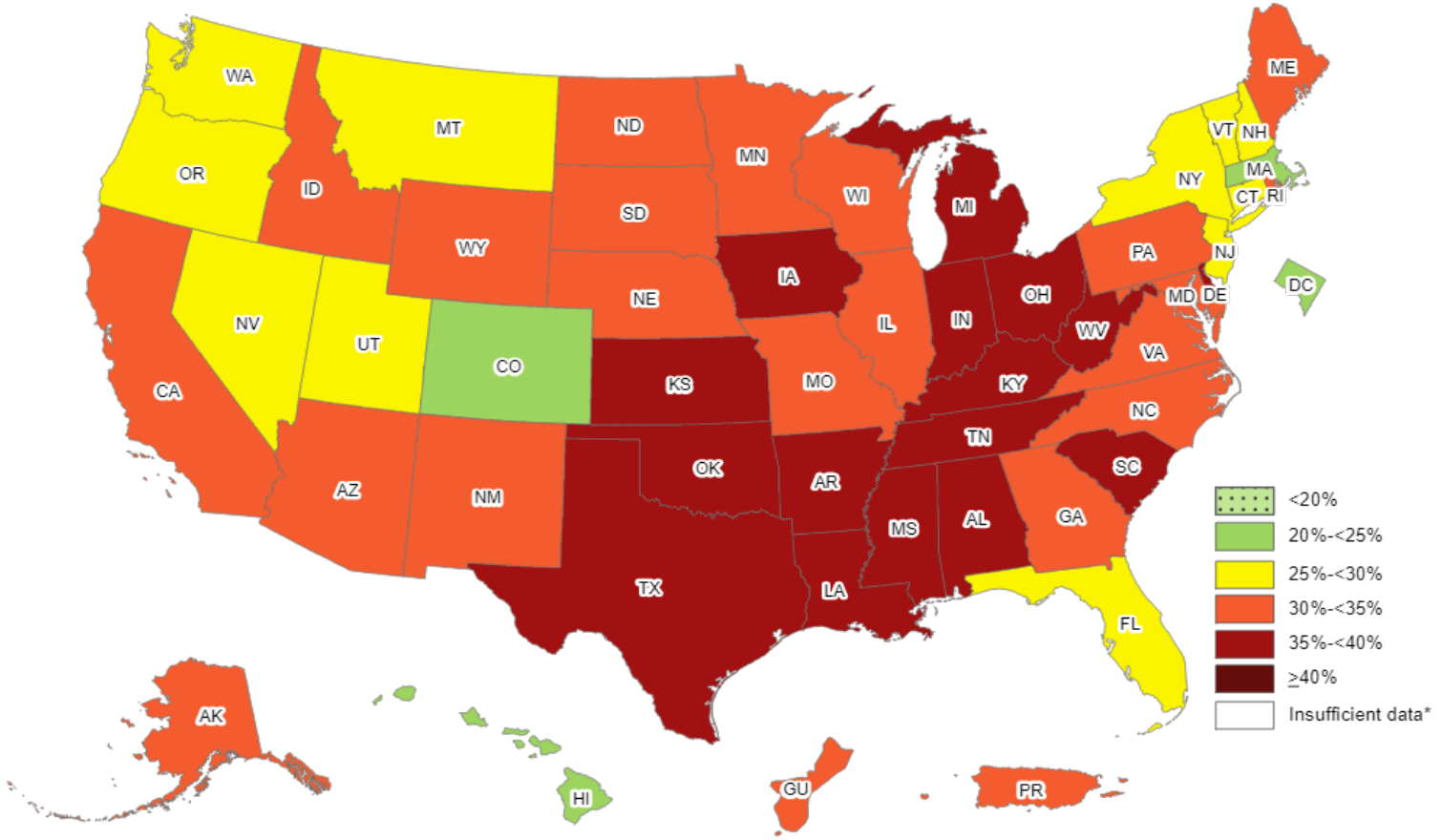
When searching the Internet for reliable information, you can limit your search to university and government websites by entering site.edu or site.gov, respectively.

Publications

Source	Examples
Scientific, Peer-reviewed Journals	• *Obesity* • *American Journal of Physiology: Endocrinology and Metabolism* • *Diabetes Care* • *American Journal of Clinical Nutrition* • *Annual Review of Nutrition* • *Journal of the Academy of Nutrition and Dietetics* • *Journal of Nutrition* • *British Journal of Nutrition* • *Journal of the American College of Nutrition* • *Journal of the American Medical Association* • *European Journal of Nutrition* • *Diabetes* • *Lancet* • *New England Journal of Medicine* • *Journal of the American Medical Association* • *Journal of Clinical Investigation* • *Nature* • *Science* • *Public Health Nutrition* • *International Journal of Sports Nutrition and Exercise Metabolism* • *Medicine & Science in Sports & Exercise*
Other *(Although not peer-reviewed, these publications rely on the expertise of the faculty within each of these universities for their content.)*	• *Tufts Health and Nutrition Letter* • *Harvard Health Letter* • *Berkeley Wellness Letter*

Prevalence of Self-Reported Obesity Among U.S. Adults by State and Territory, BRFSS, 2020

https://www.cdc.gov/obesity/index.html



U.S. News and World Reports "Best Diets"

https://health.usnews.com/best-diet

- **Best Diets Rankings** A panel of 27 nationally recognized experts in diet, nutrition, obesity, food psychology, diabetes and heart disease reviewed our profiles, added their own fact-finding and rated each diet in seven categories:
- How easy it is to follow.
- Its ability to produce short-term weight loss.
- Its ability to produce long-term weight loss.
- Its nutritional completeness.
- Its safety.
- Its potential for preventing and managing diabetes.
- Its potential for preventing and managing heart disease.

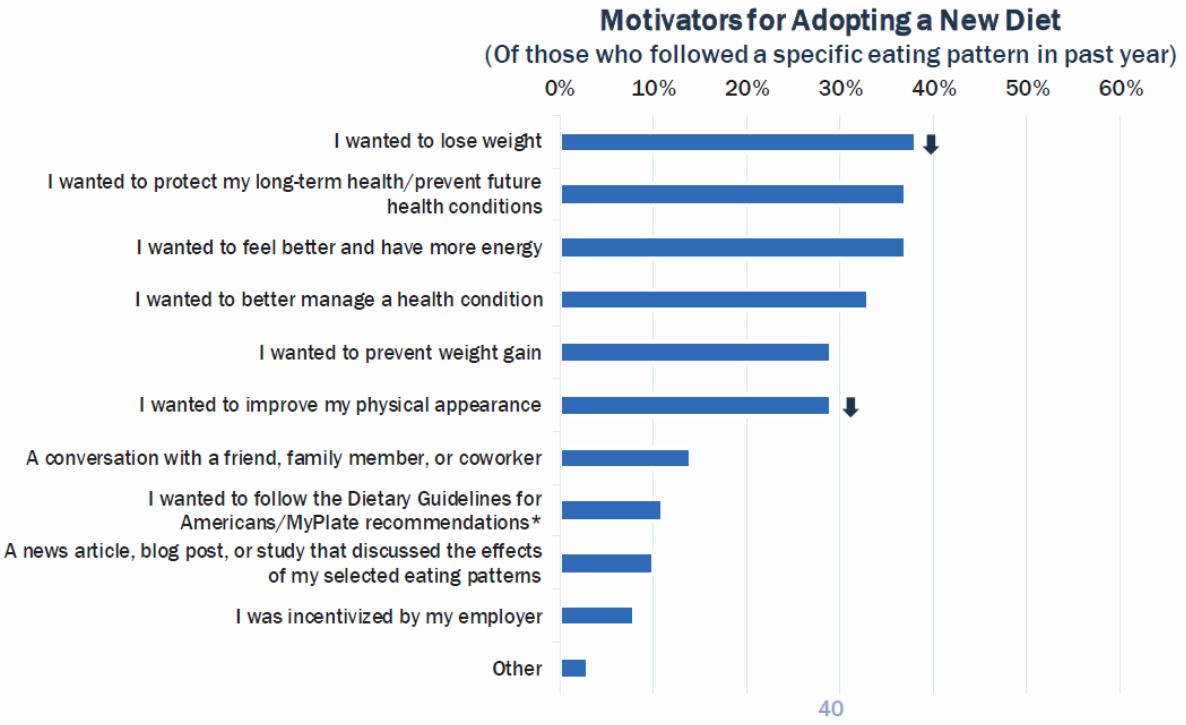
- **Best Diets Overall**
  - #1 Mediterranean Diet
  - #2 DASH Diet (tie)
  - #2 The Flexitarian Diet (tie)
  - #4 MIND Diet
  - #5 Mayo Clinic Diet (tie)
  - #5 TLC Diet (Therapeutic Lifestyle Changes) (tie)
  - #5 Volumetrics Diet (tie)
  - #5 WW (Weight Watchers) Diet (tie)

IFIC 2021 Food and Health Survey

https://foodinsight.org/2021-food-health-survey/

Fewer Americans dieted in 2020 in order to lose weight, although it still ranks #1

Women and older consumers are more likely to have started a diet in order to protect their long-term health



Women are more likely than men to have tried a diet due to wanting to lose weight, wanting to protect their long-term health, and wanting to improve their physical appearance

61% of people ages 65+ tried a diet due to wanting to protect their long-term health/prevent future health conditions (vs. 30% ages 18-49)

20% of parents with children under 18 tried a diet because they wanted to follow the Dietary Guidelines/MyPlate recommendations (vs. 6% of those without children <18)

(REVISED TREND) Q29. Which of the following motivated you to make an effort to adopt a new eating pattern/diet? Select all that apply. (Of those who tried a diet, n=390)
**New addition in 2021*

ACC/AHA Guidelines for the management of overweight and obesity in adults

- Critical Questions (CQ) posed:
  - In overweight or obese adults, *what is the comparative efficacy/effectiveness of diets of differing forms and structures or other dietary weight loss strategies in achieving and maintaining weight loss?*
  - During weight loss or maintenance after weight loss, what are the *comparative health benefits or harms* of the aforementioned diets and dietary strategies?

Executive summary: Guidelines (2013) for the management of overweight and obesity in adults: a report of the American College of Cardiology/American Heart Association Task Force on Practice Guidelines and the Obesity Society published by the Obesity Society and American College of Cardiology/American Heart Association Task Force on Practice Guidelines. Based on a systematic review from the Obesity Expert Panel, 2013. *Obesity*, 2014 Jul;22 Suppl 2:S5-39
https://pubmed.ncbi.nlm.nih.gov/24222017/

ACC/AHA Guidelines for the management of overweight and obesity in adults

Evidence Statement (ES1): *To achieve weight loss, an energy deficit is required*

- Techniques for reducing energy intake:
  - *Specification of energy intake target less than that required for energy balance*
    - Usually 1,200 – 1,500 kcal/day for women/1,500 – 1,800 for men
      - Adjusted for individual body weight and activity level
  - *Estimation of individual energy requirements* according to expert guidelines and prescription of an energy deficit of 500-750 kcal/day or 30% energy deficit diet
  - *Ad libitum approaches*, in which a formal energy deficit target is not prescribed, but lower calorie intake achieved by restriction of particular food groups or provision of prescribed foods

ACC/AHA Guidelines for the management of overweight and obesity in adults

ES2: *A variety of dietary approaches can produce weight loss in overweight and obese adults*

- Higher-protein
- Low-calorie
- Low-carbohydrate
- Low-fat vegan style
- Low-fat (20% cal)
- Low-glycemic load
- Lower-fat (<30% cal)
- Macronutrient-targeted
- Mediterranean-style
- Moderate-protein (12% cal)
- AHA-style Step 1 diet

Dietary modifications and increased physical activity are generally recommended to help people achieve and maintain a healthier body

- Most “diets” result in reduced calorie intake
  - Studies show little variation in terms of weight loss
  - Some approaches more nutritionally sound and conducive to keeping weight off
- Losing and maintaining of 5% to 10% of initial body weight represents clinical success for most patients
  - Reduces risk of chronic disease and all-cause mortality

Treatment of Obesity in Primary Care

https://pubmed.ncbi.nlm.nih.gov/29156186/

- The studies reviewed demonstrate that the interventions most likely to produce clinically important weight loss are those that provide high-intensity counseling.
- Given the behavioral and biological challenges involved in maintenance of weight loss, PCPs should be open to the idea of using medications and surgery to treat obesity. To the extent that PCPs themselves are open to these therapies, they will truly be treating obesity in the same way they treat other chronic medical illnesses.
- Whether or not a PCP becomes an expert in the treatment of obesity, she or he should show respect and empathy in discussing the topic with patients.
- Positive reinforcement of success with patients is very important, including redefining success (5%–10% loss of initial body weight), encouraging efforts at maintenance of weight loss, and refocusing on improvement in weight-related conditions, not body mass index alone.
- The physicians who will have the greatest success in managing obesity will be those individuals who are most adept at engaging patients in behavioral treatment, providing patient-centered counseling, and using biological tools when necessary to produce long-term weight loss.

Talking to your patients about weight

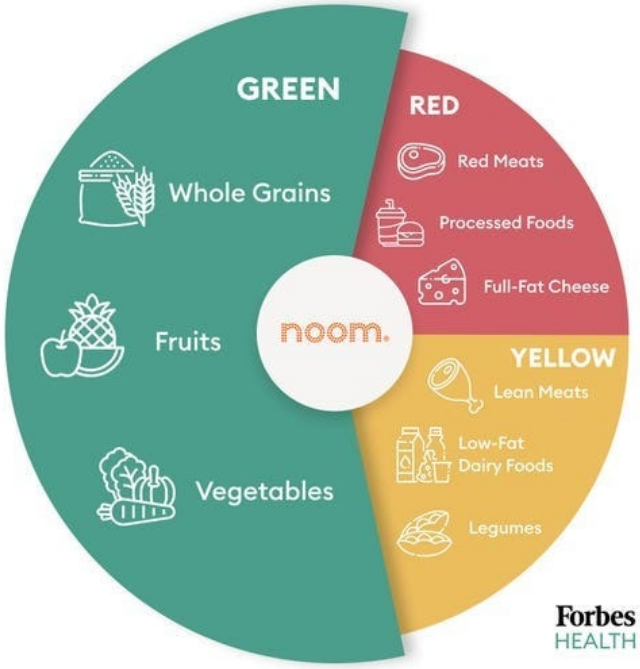
- Patients prefer the terms "weight" and "BMI" when talking about obesity, and dislike the terms "fatness," "excess fat," and "obesity."
- Be sensitive to cultural differences about weight, favorite foods, social norms and practices, etc.
- For example, patients who think they are at a normal weight within their culture might respond better to suggestions for maintaining, rather than losing, weight
- Ask about eating patterns in a nonjudgmental way
  - "I'd like to learn more about your eating habits. What kinds of foods and beverages do you eat and drink on a typical day?"
  - "What does 'healthy eating' mean to you?"
  - "Do you eat only when you're hungry, or do you eat for other reasons as well, such as feeling stressed or bored?"
  - "When is the amount of food and beverages you eat and drink likely to change (for example, when you eat out or at work or family celebrations)?"
  - "How do you think keeping a journal will help you track how much you eat, drink, and exercise?"
- Questions about physical activity might include:
  - "When would be the best time of day or evening for you to be active?"
  - "What kinds of activities do you enjoy? Do you like walking? Seated aerobics? Do you prefer activities you can do alone, with someone else, or in a group?"
  - "How much time do you spend sitting each day? Would you like to try to work some physical activity into your daily routine?"

Communicating About Weight in Dietetics Practice: Recommendations for Reduction of Weight Bias and Stigma

- https://jandonline.org/article/S2212-2672(21)00063-0/fulltext
- Weight bias reflects negative societal attitudes based on body weight and may include judgments about a person's body shape or size if that size is not in concordance with societal expectations.
- People-first language (ie, the use of the phrase "person with obesity") has gained support among the academic community and is endorsed by many professional organizations, including the Academy of Nutrition and Dietetics, and has shown promise as a way to decrease weight stigma.
- A recent systematic review on language used to discuss obesity indicated that words such as weight or unhealthy weight were the most accepted by a range of different groups when discussing weight, whereas the words obese and fat were least preferred

NOOM

- **Self-Reported Nutritional Factors Are Associated with Weight Loss at 18 Months in a Self-Managed Commercial Program with Food Categorization System: Observational Study**
  - https://pubmed.ncbi.nlm.nih.gov/34065277/
  - Individuals with greater weight loss reported consuming higher proportions of low-energy-dense foods and lower proportions of high-energy-dense foods than individuals with less weight loss at 4 months and 18 months (all ps < 0.02). Individuals with greater weight loss had higher fruit and vegetable intake (p = 0.03), dietary quality (p = 0.02), nutrition knowledge (p < 0.001), and healthier food choice (p = 0.003) at 18 months. Only nutrition knowledge and food choice were associated with weight loss at 18 months
  - https://www.forbes.com/health/body/noom-diet-review/



Very low carbohydrate diets

- When deprived of dietary carbohydrates (usually below 50g/day), the liver becomes the sole provider of glucose – glucose preferred energy source for most cells in the body, including the brain
- Without sufficient dietary CHO and depleted glycogen CHO stores the liver generates ketone bodies for energy instead of glucose
- During metabolic stress, ketones serve as an alternative energy source to maintain normal brain cell metabolism
- Blood glucose maintained by breakdown of certain amino acids and fatty acids to glucose (by products – ketones)
- The ketogenic diet advocates moderate amounts of protein, very low amounts of carbohydrate (often < 20 g/day) and high amounts of fat (as much as 90% calories from fat)
  - the diet's goal is to eliminate the carbohydrate reservoir stored in muscles for energy and to force the body to use fat stores instead, through a process called ketosis – intended to decrease hunger and satisfy appetite longer
  - In short-term may aid in weight loss, long-term adherence to this high-fat, low-carbohydrate plan may be detrimental to heart health and emotional well-being, as imposing severe food restrictions may create a stronger desire for so-called "forbidden" foods.
  - Side effects can include headache, fatigue, constipation, elevated lipid levels and bad breath

“CICO” Diet – Calories In Calories Out

- Perspectives…
  - https://www.healthline.com/nutrition/cico-diet
  - https://www.today.com/health/what-cico-diet-all-about-calories-calories-out-diet-t191457
  - https://www.menshealth.com/nutrition/a28493677/what-is-cico-diet/


Gluten Free
Dairy Free
Soy Free
MONO DIET
Clean eating
BLOOD GROUP DIET
Vegan
I QUIT SUGAR!
Organic
Paleo?
Metabolism boosting
High Protein
Fat burning
low carb
Juice detox
INTERMITTANT FASTING


Nutrition Facts
?