Figure 2-1.
Dietary Intakes Compared to Recommendations.
Percent of the U.S. Population Ages 1 Year & Older
Who Are Below, At, or Above Each Dietary Goal or Limit

Food Group of Dietary Component

- Vegetables
- Fruit
- Total Grains
- Dairy
- Protein Foods
- Oils
- Added Sugars
- Saturated Fat
- Sodium

Percent of Population Below Recommendation or Limit
Percent of Population Above Recommendation or Limit

NOTE: The center (0) line is the goal or limit. For most, those represented by the orange sections of the bars, shifting toward the center line will improve their eating pattern.

DATA SOURCES: What We Eat in America, NHANES 2007-2010 for average intakes by age-sex group. Healthy U.S.-Style Food Patterns, which vary based on age, sex, and activity level, for recommended intakes and limits.
Eating Patterns

• Customary way of eating
• Combinations of foods and beverages recommended for consumption
Healthy Eating Patterns

- Healthy U.S.- Style
- D.A.S.H.
- Vegetarian
- Mediterranean
CHAPTER 1

Key Elements of Healthy Eating Patterns
The Guidelines

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

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

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

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

5. Support healthy eating patterns for all. Everyone has a role in helping to create and support healthy eating patterns in multiple settings nationwide, from home to school to work to communities.
• Follow a Healthy Eating Pattern across lifespan
• Focus on variety, nutrient density and amount
• Limit Calories from added sugars and saturated fats and reduce sodium intake
• Shift to healthier food and beverage choices
• Support Health Eating Patterns for all

The Guidelines......
Healthy Eating Patterns

- Healthy U.S.- Style
- D.A.S.H.
- Vegetarian
- Mediterranean
USDA My Plate

Eat Smart To Play Hard
Use MyPlate to help you fuel up with foods from each food group.

ChooseMyPlate.gov

Keep on Moving!
You need at least 60 minutes of physical activity each day. Whether that's skateboarding, tossing a ball, or playing tag, every little bit counts!
Health Benefits of the Mediterranean Diet ... with an Arizona Twist

Melanie Hingle, Ph.D., M.P.H., R.D.
Assistant Professor
Department of Nutritional Sciences
The University of Arizona
Traditional Mediterranean Diet Dietary Pattern in olive tree-growing areas of Mediterranean Sea basin before mid-1960s
Traditional Mediterranean diet mainly plant-based dietary pattern thanks to two fruit-bearing plants:

Vitis vinifera

Olea europaea
The diet refers to a dietary profile commonly available in the early 1960s in the Mediterranean region and characterized by:

- **High consumption of vegetables, fruits and nuts, legumes, unprocessed cereals**
- **Low consumption of meat** and meat products
- **Low consumption of dairy** products (except for hard cheeses)
- **Moderate alcohol consumption with meals** (in the spirit of the Greek word ‘symposium’)
- **High intake of fats** (30-40% of total kcal), mostly unsaturated
- **Fish** consumption (as a function of distance from the sea)
The Mediterranean Diet: A Brief History

Traditional Med Diet enters the medical literature – mid-1950s

In the 1990s:
1. Recognition that high CHO may not be beneficial to HDL-c
2. New scientific approach to determining adherence to the diet pattern

In Greeks, adherence to the Med Diet was associated with greater longevity

Meta-analyses, systematic reviews, and experimental data support the preventative effects of the Med Diet

Preventative benefits observed for:
- Type 2 diabetes
- Metabolic syndrome
- Cognitive function
- Unipolar depression
- Cancer

The Mediterranean Diet: A Brief History

Ecological evidence suggested low saturated fat intake might be responsible for low incidence of CHD through lowering cholesterol

Mechanisms of Effect and Development of a Med Diet Score

Globalization of Agriculture

1960’s

1990’s

2010’s
The PREDIMED study compared the effects of two versions of the Mediterranean diet to a control low-fat diet.

Methods: N=772 older Spanish adults at high risk of CVD, assigned randomly to one of two experimental diets mimicking the Mediterranean dietary pattern - supplemented with olive oil or nuts -

Results: 30% reduction in cardiovascular events in all treatments

- Both experimental diets provided beneficial to participants
- Only the olive oil group also demonstrated a reduction in CRP (inflammation)

Take-home message: The Mediterranean diet is effective for primary prevention of CVD and the foods contributing to this effect are readily identifiable

Effects of diet on health mediated by many different pathways:

- Cholesterol and lipid fractions (LDL, HDL, triglycerides)
- Blood pressure
- Thrombotic tendency
- Insulin resistance
- Antioxidant status
- Homocysteine
- Inflammation
- Endothelial dysfunction
- Ventricular arrhythmia

Metabolic syndrome:
- Abdominal obesity
- Elevated blood pressure
- Dyslipidemia
- Impaired glucose control

“Together with regular physical activity and not smoking, our analyses suggest that over 80% of coronary heart disease, 70% of stroke, and 90% of type 2 diabetes can be avoided by healthy food choices that are consistent with the traditional Mediterranean diet.”

What components make the Mediterranean Diet so healthy?

Compared to other ‘healthy’ diets, two components unique to Mediterranean Diet Pattern are believed to contribute to health benefits:

- Abundant intake of fat (30-40% of total kcal) is allowed provided it comes from virgin olive oil, tree nuts, and fatty fish

- Moderate* intake of red wine during meals

  *One, 5-oz glass (women) per day, or two, 5-oz glasses (men)
“… the Mediterranean diet is essentially part of a lifestyle, requiring the simultaneous consideration of other non-dietary behavioral factors when assessing its effects.”

• **Wine vs. Alcohol.** It is unclear whether other types of alcohol also benefit health

• **Dairy.** High dairy intake is considered adverse in the landmark publications on Med diet and health – however, more recent epidemiological data suggest lower cardio-metabolic risk is associated with consumption of *fermented* dairy products

• **Meat and Grains.** Similar questions exist for grains (whole grains and refined grains) and meat products (unprocessed, processed, poultry need to be distinguished)

• **Generalizability.** Applicability of the health benefits of the Mediterranean diet to non-Mediterranean countries has not been established.

• **Culture.** What is the cultural ‘fit’ of the Med diet for other countries such as China, India and parts of Africa? (and for that matter, the United States?)

---

**Unanswered questions**
Mediterranean Diet

Dietary Guidelines and Impact on Health and Disease

Editors: Romagnolo, Donato F., Selmin, Ornella I. (Eds.)
"The greatest gap in life is the one between knowing and doing."
- Dick Biggs
Mediterranean Diet and Health – Nutritional Sciences Department Course

NSC 455 – Study Abroad in Verona, Italy
How to obtain the benefits of Mediterranean diet (without going here):

Or inviting this lady to your house

Antonia Polese from Verona, Italy
CHAPTER 2
Shifts Needed To Align With Healthy Eating Patterns
Mediterranean diet pyramid: a lifestyle for today guidelines for adult population

Weekly
Potatoes ≤ 3 s
White meat 2 s
Fish/seafood ≥ 2 s

Every day
Dairy 2 s (preferably low fat)
Olives/nuts/seeds 1–2 s

Every meal
Fruits 1–2 s, vegetables ≥ 2 s
Variety of colour/textures (cooked/raw)

Serving size based on frugality and local habits
Wine in moderation and respecting social beliefs
Sweets ≤ 2 s
Red meat < 2 s
Processed meat ≤ 1 s
Eggs 2–4 s
Legumes ≥ 2 s

Herbs/spices/garlic/onions
Variety of flavours
Olive oil
Bread/pasta/rice/couscous/Other cereals 1–2 s (preferably whole grain)
Water and herbal infusions

Regular physical activity
Adequate rest
Conviviality
Biodiversity and seasonality
Traditional, local and eco-friendly products
Culinary activities

2010 edition
s = Serving
## Table A4-1. Healthy Mediterranean-Style Eating Pattern: Recommended Amounts of Food From Each Food Group at 12 Calorie Levels

<table>
<thead>
<tr>
<th>Calorie Level of Pattern[a]</th>
<th>Daily Amount[b] of Food From Each Group (vegetable and protein foods subgroup amounts are per week)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>1,000</td>
</tr>
<tr>
<td>Food Group[c]</td>
<td></td>
</tr>
<tr>
<td><strong>Vegetables</strong></td>
<td></td>
</tr>
<tr>
<td>Dark-Green Vegetables</td>
<td>½</td>
</tr>
<tr>
<td>(c-eq/wk)</td>
<td>(c-eq/wk)</td>
</tr>
<tr>
<td>Red &amp; Orange Vegetables</td>
<td>2½</td>
</tr>
<tr>
<td>(c-eq/wk)</td>
<td>(c-eq/wk)</td>
</tr>
<tr>
<td>Legumes (Beans &amp; Peas)</td>
<td>½</td>
</tr>
<tr>
<td>(c-eq/wk)</td>
<td>(c-eq/wk)</td>
</tr>
<tr>
<td>Starchy Vegetables</td>
<td>2</td>
</tr>
<tr>
<td>(c-eq/wk)</td>
<td>(c-eq/wk)</td>
</tr>
<tr>
<td>Other Vegetables</td>
<td>1½</td>
</tr>
<tr>
<td>(c-eq/wk)</td>
<td>(c-eq/wk)</td>
</tr>
<tr>
<td><strong>Fruits</strong></td>
<td>1 c-eq</td>
</tr>
<tr>
<td><strong>Grains</strong></td>
<td>3 oz-eq</td>
</tr>
<tr>
<td>Whole Grains[d]</td>
<td>1½</td>
</tr>
<tr>
<td>(oz-eq/day)</td>
<td>(oz-eq/day)</td>
</tr>
<tr>
<td>Refined Grains</td>
<td>1½</td>
</tr>
<tr>
<td>(oz-eq/day)</td>
<td>(oz-eq/day)</td>
</tr>
</tbody>
</table>

[a] Recommended intake level in calories for adults aged 19 years and older.
[b] c-eq = cup-equivalent
[c] This includes all vegetables, with the exception of legumes (beans and peas).
[d] Whole grain products are defined as containing at least 16% of the total calories from whole grain ingredients.
### Table A4-1. (continued..)

**Healthy Mediterranean-Style Eating Pattern: Recommended Amounts of Food From Each Food Group at 12 Calorie Levels**

<table>
<thead>
<tr>
<th>Food Group[a]</th>
<th>1,000</th>
<th>1,200</th>
<th>1,400</th>
<th>1,600</th>
<th>1,800</th>
<th>2,000</th>
<th>2,200</th>
<th>2,400</th>
<th>2,600</th>
<th>2,800</th>
<th>3,000</th>
<th>3,200</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Calorie Level of Pattern</strong>[a]</td>
<td>Daily Amount[b] of Food From Each Group (vegetable and protein foods subgroup amounts are per week)</td>
<td>Daily Amount[b] of Food From Each Group (vegetable and protein foods subgroup amounts are per week)</td>
<td>Daily Amount[b] of Food From Each Group (vegetable and protein foods subgroup amounts are per week)</td>
<td>Daily Amount[b] of Food From Each Group (vegetable and protein foods subgroup amounts are per week)</td>
<td>Daily Amount[b] of Food From Each Group (vegetable and protein foods subgroup amounts are per week)</td>
<td>Daily Amount[b] of Food From Each Group (vegetable and protein foods subgroup amounts are per week)</td>
<td>Daily Amount[b] of Food From Each Group (vegetable and protein foods subgroup amounts are per week)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Dairy</strong>[c]</td>
<td>2 c-eq</td>
<td>2½ c-eq</td>
<td>2½ c-eq</td>
<td>2 c-eq</td>
<td>2 c-eq</td>
<td>2 c-eq</td>
<td>2 c-eq</td>
<td>2 c-eq</td>
<td>2 c-eq</td>
<td>2 c-eq</td>
<td>2 c-eq</td>
<td>2½ c-eq</td>
</tr>
<tr>
<td><strong>Protein Foods</strong></td>
<td>2 oz-eq</td>
<td>3 oz-eq</td>
<td>4 oz-eq</td>
<td>5 oz-eq</td>
<td>6 oz-eq</td>
<td>6½ oz-eq</td>
<td>7 oz-eq</td>
<td>7½ oz-eq</td>
<td>8 oz-eq</td>
<td>8 oz-eq</td>
<td>8 oz-eq</td>
<td>8 oz-eq</td>
</tr>
<tr>
<td><strong>Seafood (oz-eq/wk)</strong>[d]</td>
<td>3</td>
<td>4</td>
<td>6</td>
<td>11</td>
<td>15</td>
<td>15</td>
<td>16</td>
<td>16</td>
<td>17</td>
<td>17</td>
<td>17</td>
<td>17</td>
</tr>
<tr>
<td><strong>Meats, Poultry, Eggs (oz-eq/wk)</strong></td>
<td>10</td>
<td>14</td>
<td>19</td>
<td>23</td>
<td>23</td>
<td>26</td>
<td>28</td>
<td>31</td>
<td>31</td>
<td>33</td>
<td>33</td>
<td>33</td>
</tr>
<tr>
<td><strong>Nuts Seeds, Soy Products (oz-eq/wk)</strong></td>
<td>2</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>4</td>
<td>5</td>
<td>5</td>
<td>5</td>
<td>6</td>
<td>6</td>
<td>6</td>
<td>6</td>
</tr>
<tr>
<td><strong>Oils</strong></td>
<td>15 g</td>
<td>17 g</td>
<td>17 g</td>
<td>22 g</td>
<td>24 g</td>
<td>27 g</td>
<td>29 g</td>
<td>31 g</td>
<td>34 g</td>
<td>36 g</td>
<td>44 g</td>
<td>51 g</td>
</tr>
<tr>
<td><strong>Limit on Calories for Other Uses, Calories (% of Calories)</strong>[e]</td>
<td>150 (15%)</td>
<td>100 (8%)</td>
<td>110 (8%)</td>
<td>140 (9%)</td>
<td>160 (9%)</td>
<td>260 (13%)</td>
<td>270 (12%)</td>
<td>300 (13%)</td>
<td>330 (13%)</td>
<td>350 (13%)</td>
<td>430 (14%)</td>
<td>570 (16%)</td>
</tr>
</tbody>
</table>

---

[a, b, c, d] See Appendix 3. USDA Food Patterns: Healthy U.S.-Style Eating Pattern, notes a through d.

[e] Amounts of dairy recommended for children and adolescents are as follows, regardless of the calorie level of the Pattern: For 2 year-olds, 2 cup-eq per day; for 3 to 8 year-olds, 2½ cup-eq per day; for 9 to 18 year-olds, 3 cup-eq per day.

[f] The U.S. Food and Drug Administration (FDA) and the U.S. Environmental Protection Agency (EPA) provide joint guidance regarding seafood consumption for women who are pregnant or breastfeeding and young children. For more information, see the FDA or EPA websites www.FDA.gov/fishadvice; www.EPA.gov/fishadvice.

[g] See Appendix 3, notes e through f.
Empower People To Make Healthy Shifts

Making changes to eating patterns can be overwhelming. That's why it's important to emphasize that every food choice is an opportunity to move toward a healthy eating pattern. Small shifts in food choices—over the course of a week, a day, or even a meal—can make a big difference. Here are some ideas for realistic, small shifts that can help people adopt healthy eating patterns.

High Calorie Snacks → Nutrient-Dense Snacks

Fruit Products with Added Sugars → Fruit

Refined Grains → Whole Grains

Snacks with Added Sugars → Unsalted Snacks

Solid Fats → Oils

Beverages with Added Sugars → No-Sugar-Added Beverages
**Figure 1-2. Fatty Acid Profiles of Common Fats & Oils**

- **Saturated Fatty Acids**
- **Monounsaturated Fatty Acids**
- **Polyunsaturated Fatty Acids**

**Solid Fats**
- Coconut Oil*
- Palm Kernel Oil*
- Butter
- Beef Fat (Tallow)
- Palm Oil*
- Pork Fat (Lard)
- Chicken Fat
- Shortening**

**Oils**
- Cottonseed Oil
- Salmon Oil
- Peanut Oil
- Soybean Oil
- Sesame Oil
- Olive Oil
- Corn Oil
- Avocado Oil
- Sunflower Oil
- Safflower Oil
- Canola Oil

---

* Coconut, palm kernel, and palm oil are called oils because they come from plants. However, they are solid or semi-solid at room temperature due to their high content of short-chain saturated fatty acids. They are considered solid fats for nutritional purposes.

** Shortening may be made from partially hydrogenated vegetable oil, which contains trans fatty acids.

Where in the world can you find Mediterranean-inspired food?
Thanks to Arizona Agriculture, You Can Find the Mediterranean Diet in the Desert

By Julie Murphree, Arizona Farm Bureau: You might be surprised to learn that Arizona agriculture contributes to each area of a traditional Mediterranean diet. Indeed, our diverse agriculture in this desert state means every layer of the Mediterranean diet’s food pyramid is satisfied.
Arizona Agriculture

$17.1 billion dollar industry

20,000 farms and ranches

Dairy leading agricultural product

188,000 dairy cows

Pork: $53 million industry

8 million pounds of apples per year

2\textsuperscript{nd} in the nation in production of lemons, various lettuces, cauliflower, broccoli, spinach & cantaloupe

3\textsuperscript{rd} nationally in Pima cotton production

Yuma, AZ winter lettuce capitol

4\textsuperscript{th} largest producer of durum wheat in nation

Produces enough BEEF to feed over 4.6 million Americans

22 million pounds of pecans

Courtesy of Julie Murphree, Arizona Farm Bureau Association
Arizona Agriculture

*Trending in Arizona*: Tree nuts, wine grapes and Medjool

Courtesy of Julie Murphree, Arizona Farm Bureau Association and http://www.greenvallypecan.com/
Preparing and enjoying Mediterranean-inspired food … in Arizona
The Mediterranean Diet & Mediterranean Diet Pyramid

Sarah E. Alsing, Patrick J. Gallaway, Asuka Suzuki, and Nobuko Hongu
Mediterranean diet pyramid: a lifestyle for today guidelines for adult population

- Serving size based on frugality and local habits
  - Wine in moderation and respecting social beliefs

Weekly
- Potatoes ≤ 3 s
- Red meat ≤ 2 s
- Processed meat ≤ 1 s

White meat 2 s
- Fish/seafood ≥ 2 s
- Eggs 2–4 s
- Legumes ≥ 2 s

Every day
- Dairy 2 s (preferably low fat)
- Herbs/spices/garlic/onions (less added salt)
- Variety of flavours

Olives/nuts/seeds 1–2 s
- Olive oil

Every main meal
- Fruits 1–2 | vegetables ≥ 2 s
- Variety of colour/textures (cooked/raw)
- Bread/pasta/rice/couscous/ Other cereals 1–2 s (preferably whole grain)

Regular physical activity
- Adequate rest
- Conviviality

Biodiversity and seasonality
- Traditional, local and eco-friendly products
- Culinary activities

2010 edition
s = Serving
Now serving up delicious “edutainment”...
Arizona locations

Pima County
Maricopa County
Apache County

... with more forthcoming??
Mediterranean diet pyramid: a lifestyle for today guidelines for adult population

Weekly
- Potatoes ≤ 3 s
- White meat 2 s
- Fish/seaweed ≥ 2 s

Every day (preferably low fat)
- Dairy 2 s
- Olives/nuts/seeds 1–2 s

Every meal
- Fruits 1–2
- Vegetables ≥ 2 s
- Variety of colour/textures (cooked/raw)

Serving size based on frugality and local habits
- Red meat < 2 s
- Processed meat ≤ 1 s
- Eggs 2–4 s
- Legumes ≥ 2 s
- Herbs/spices/garlic/onions (less added salt)
- Variety of flavours
- Olive oil
- Bread/pasta/rice/couscous/other cereals 1–2 s (preferably whole grain)

Water and herbal infusions

Regular physical activity
- Adequate rest
- Conviviality

Biodiversity and seasonality
- Traditional, local and eco-friendly products
- Culinary activities

s = Serving

2010 edition
U.S. Physical Activity Guidelines

150 minutes of moderate-intensity aerobic activity every week (30 min or more most days of the week) or

75 minutes of vigorous-intensity aerobic activity and

Muscle-strengthening activities on 2 or more days a week… work all major muscle groups

10 minutes at a time is fine… It's about what works best for you, as long as you're doing physical activity at a moderate or vigorous effort for at least 10 minutes at a time.

www.cdc.gov/physicalactivity/everyone/guidelines/adults.html
“My idea of exercise is a good brisk sit.”

~ Phyllis Diller
Figure I-2.
Percentage of Adults Meeting the Physical Activity Guidelines (Aerobic & Muscle-Strengthening Recommendations)

• **WHO?** Anyone in Arizona

• **WHAT?** Join a team & record your miles as you move your way ‘across” Arizona. Teams can have up to 10 people.

• **WHEN?** The 8 week program begins on a different date in each county. Select your county to get more information.

• **WHERE?** Anywhere you can walk, run, swim, cycle, move or play.

• **WHY?** Meet new people, see new places, feel great and have fun!

---

Walk Across Arizona

[https://cals.arizona.edu/walkacrossaz/](https://cals.arizona.edu/walkacrossaz/)
Sedentary behavior is a risk factor, independent of physical activity for multiple adverse health outcomes in adults including:

- Premature death & Increased incidence of
  - cardiovascular disease
  - hypertension
  - gallstone disease
  - depression
i.e., ... Is Your Chair Killing You?

Prolonged sitting is a risk factor for premature death, independent of physical activity.
Adequate Rest

Experimental evidence suggests sleep restriction increases food intake and total energy expenditure with inconsistent effects on weight change - Effects are generally observed at <6 hours/night
Conviviality = friendliness, geniality, affability, amiability, bonhomie, joviality, liveliness, good cheer
“… the Mediterranean diet is essentially part of a lifestyle, requiring the simultaneous consideration of other non-dietary behavioral factors when assessing its effects.”

PROTECTIVE EFFECTS OF THE MEDITERRANEAN DIET ON OBESITY, DIABETES, AND CANCER

Linda Houtkooper  PhD, RDN
Cooperative Extension Specialist -Professor
Department of Nutritional Sciences
- Melanie Hingle
- Donato Romagnolo
- Ornella Selmin
- Scott Going

University of Arizona Cooperative Extension Garden Kitchen

Arizona Farm Bureau Association
- Julie Murphree

Antonia’s Kitchen, Verona, Italia
- Antonia Polese

Acknowledgments
Contact me:
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houtkoop@cals.arizona.edu
520.621.3404

Grazie!