

The Mediterranean Diet

Steven Lalevich, RD



What is a Mediterranean Diet?

- Based on traditional diets of cultures around the Mediterranean Sea
- May lower risk of heart disease, obesity and other chronic diseases
- Associated with enhanced longevity and healthy aging
- Key characteristics:
 - Whole plant foods
 - Olive oil
 - Seafood
 - Wine





<http://fineartamerica.com/featured/map-of-mediterranean-sea-jennifer-thermes.html>



LIVE YOUR BEST YOU.

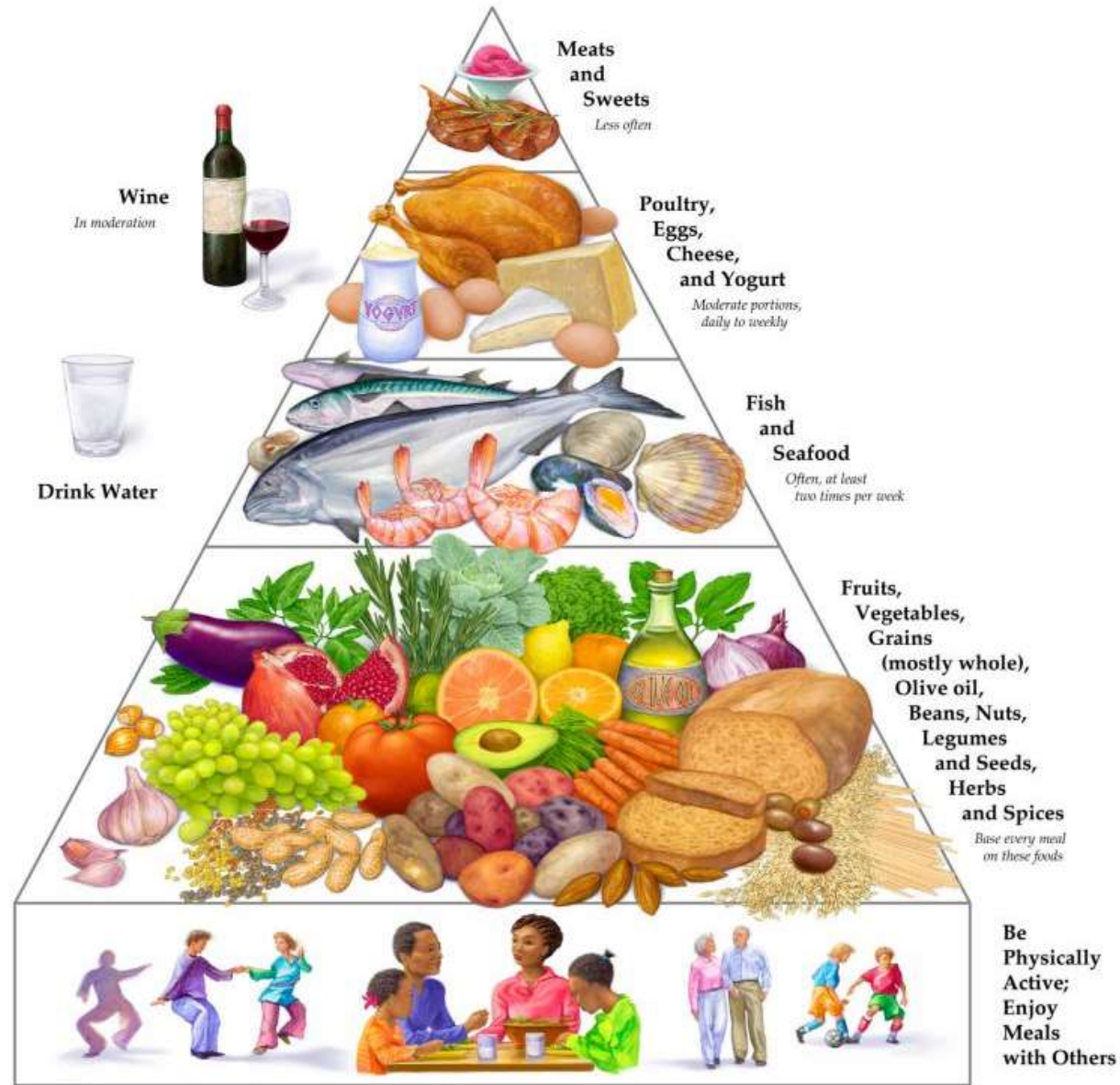


Illustration by George Middleton

© 2009 Oldways Preservation and Exchange Trust

www.oldwayspt.org

healthy
IU

LIVE YOUR BEST YOU.

Whole Plant Foods

- Base of the pyramid
- Includes
 - Vegetables
 - Fruits
 - Whole grains
 - Beans and legumes
 - Nuts and seeds
 - Herbs and spices



healthy
IU

LIVE YOUR BEST YOU.

Fruits & Vegetables



- Choose a variety of colors for most nutritional benefit
 - **Red:** Beets, Red cabbage, Cherries, Cranberries, Red grapes, Red peppers, Pomegranates, Strawberries, Tomatoes, Watermelon
 - **Green:** Green beans, Broccoli, Brussels sprouts, Lettuce, Kale, Collard greens, Spinach, Green grapes, Honeydew, Kiwi
 - **Orange/Yellow:** Apricots, Squash, Cantaloupe, Mangoes, Oranges, Peaches, Pineapple, Pumpkin, Corn, Sweet potatoes
 - **Blue/Purple:** Blackberries, Blueberries, Eggplant, Figs, Plums, Purple grapes
 - **White:** Cauliflower, Garlic, Onions, Mushrooms, Potatoes



Simple ways to eat more fruits and vegetables

- Fruits
 - Eat fruit for dessert instead of sweets
 - Add fresh, frozen, or dried fruit to hot cereal
 - Add frozen fruit to a smoothie
- Vegetables
 - Make vegetables the focus of lunch and dinner – fill half your plate with vegetables
 - Have a salad for lunch – add protein to make a balanced meal
 - Wash and cut vegetables in batches so you always have some on hand
 - Add a handful of leafy greens to a smoothie



healthy
IU

LIVE YOUR BEST YOU.

Whole Grains

- Whole grains include nutrient-rich germ and bran
 - Fiber
 - Vitamins & Minerals
 - Phytonutrients
- For each serving of whole grains consumed per day:
 - 5% lower overall mortality
 - 9% lower cardiovascular disease mortality
- Choosing whole grains in place of refined grains is associated with lower risk of:
 - Diabetes (21-30% lower)
 - Heart disease (25-28% lower)
 - Stroke (30-36% lower)



Simple ways to eat more whole grains

- Choose whole grain versions of foods you eat regularly
 - Whole wheat pasta
 - Brown rice
 - Whole grain cereals
 - Whole grain bread
- Check the first ingredient and look for the word “whole”
 - Whole wheat flour
 - Whole oats



Beans & Legumes

- Inexpensive, versatile, and nutritious
 - Protein
 - Fiber
 - Vitamins and minerals
- May help to reduce
 - Blood sugar
 - LDL cholesterol
 - Triglycerides
 - Blood pressure



Simple ways to eat more beans and legumes

- Add beans to a salad
- Add beans to pasta dishes
- Add whole beans or mashed beans to a wrap
- Dip vegetables in hummus
- Use quick-cooking dry beans, such as lentils
- Use canned beans to easily add protein to any meal



healthy
IU

LIVE YOUR BEST YOU.

Nuts & Seeds

- Nutrients:
 - Unsaturated fats
 - Fiber
 - Vitamin E
 - Protein
- Despite being high in calories, nut intake is associated with lower BMI



Nuts & Mortality

- Nut intake associated with lower risk of death from all causes:
 - Once per week: 11% lower
 - 2-4 times per week: 13% lower
 - 5-6 times per week: 15% lower
 - 7 or more times per week: 20% lower



healthy
IU

LIVE YOUR BEST YOU.

Simple ways to eat more nuts and seeds

- A handful of nuts or seeds makes a healthy snack
- Combine with dried fruit to make trail mix
- Add nut butter (peanut, almond, etc.) to:
 - Whole grain bread
 - Oatmeal
 - Smoothie



Olive Oil

- Nutrients
 - Monounsaturated fat
 - Polyphenols
- Types of Olive oil
 - Extra virgin: superior taste, lower acidity
 - Virgin: good taste, moderate acidity
 - Refined (light/pure): less flavor, less acidity, less polyphenols, more heat-stable



healthy
IU

LIVE YOUR BEST YOU.

Health Effects of Olive Oil

- As part of a Mediterranean diet, olive oil may help to:
 - Lower triglycerides
 - Reduce abdominal obesity
 - Reduce elevated glucose
- Polyphenols in olive oils may:
 - Improve blood pressure
 - Decrease inflammation
 - Improve antioxidant function



Simple ways to eat more olive oil

- Make your own salad dressings and sauces with olive oil
 - Olive oil and vinegar
 - Sofrito sauce: tomatoes, onions, olive oil, and herbs/spices
- Use olive oil in cooking
 - Refined for high-heat cooking
 - Extra virgin or virgin for low-to-moderate heat cooking
- Use olive oil in place of butter:
 - Bread/toast
 - Cooked vegetables
 - Popcorn



Fish & Seafood

- Nutrients
 - Omega-3 fats
 - Protein
 - B vitamins
 - Important minerals: selenium, zinc, iodine
- Fatty fish are particularly high in omega-3 fats
 - Salmon
 - Sardines
 - Tuna
 - Mackerel



**Fish
and
Seafood**

*Often, at least
two times per week*

healthy
IU

LIVE YOUR BEST YOU.

Benefits of omega-3 fats

- Omega-3s are an essential fat, but Americans don't eat enough
- Important for multiple health functions
 - Brain: memory, cognition, mood
 - Heart: may reduce risk of cardiovascular disease
 - Inflammation: may lower systemic inflammation
- In order to get enough omega-3s
 - Eat seafood at least twice per week
 - or
 - Consider taking fish oil supplement



healthy
IU

LIVE YOUR BEST YOU.

Seafood intake and heart disease risk

- Nurses' Health Study (84,688 female nurses, from 1980 to 1994)

Fish Intake	Risk Reduction
Less than once a month	--
1-3 times per month	21%
Once per week	29%
2-4 times per week	31%
5 or more times per week	34%



Omega-3 fats

- Plant-based ALA
 - Alpha-linolenic acid (ALA)
 - Flaxseeds, walnuts, canola oil
 - Not readily converted to active form
- DHA/EPA
 - Docosahexaenoic acid (DHA)/Eicosapentaenoic acid (EPA)
 - Best source is seafood
 - WHO recommendations: 300 to 500 mg DHA/EPA per day



Amount of omega-3s in seafood

Seafood	Omega-3 content (3 oz portion)
Light tuna, canned	200 to 500 mg
Albacore tuna, canned	500 to 1,000 mg
Wild salmon	500 to 1,000 mg
Sardines	500 to 1,000 mg
Trout	500 to 1,000 mg
Pollock	200 to 500 mg
Shrimp	Less than 200 mg
Cod	Less than 200 mg

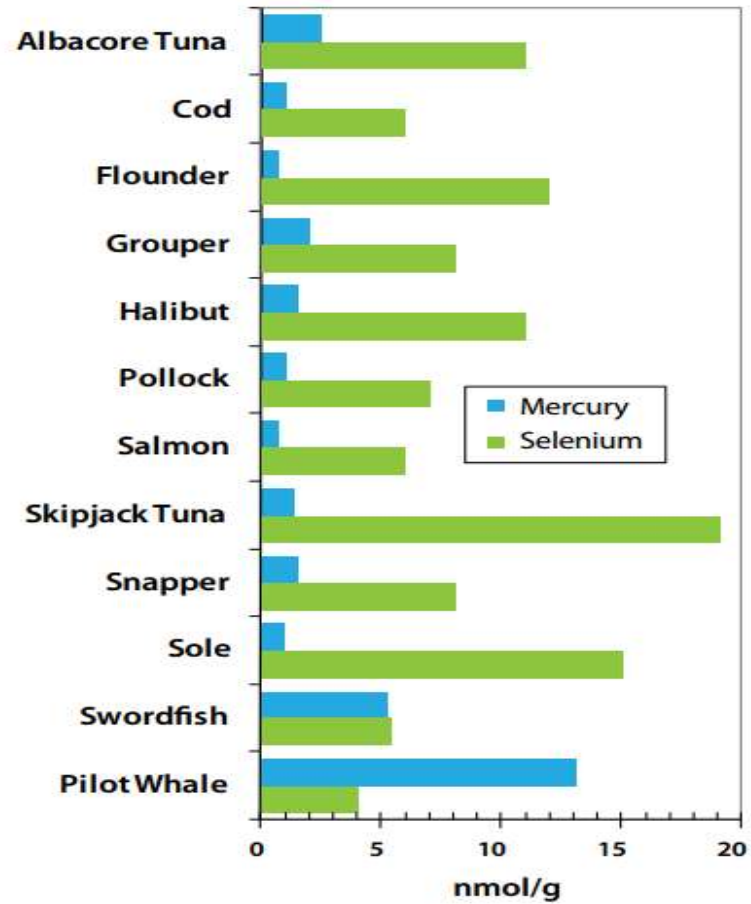


Seafood and mercury

- General guidelines for choosing fish with less mercury:
 - Choose smaller fish over larger fish
 - Choose wild-caught over farm-raised
- Fish with highest mercury content:
 - Swordfish
 - King Mackerel
 - Tilefish
 - Shark
- Risk of mercury toxicity from seafood may be overstated
 - Only one study has demonstrated toxicity from seafood intake (pilot whale)
 - Mercury binds with selenium in seafood and is excreted



Selenium and Mercury Content of Seafood



<http://www.undeerc.org/fish/pdfs/Selenium-Mercury.pdf>



LIVE YOUR BEST YOU.

Monterey Bay Aquarium® Seafood Watch®

The Monterey Bay Aquarium Seafood Watch program creates science-based recommendations that help consumers and businesses make ocean-friendly seafood choices. Carry this guide with you and share it with others to help spread the word.

BEST CHOICES

Arctic Char (farmed)
Bass: Striped (US hook & line, farmed)
Cattfish (US)
Clams, Mussels & Oysters
Cod: Pacific (US hook & line)
Perch: Yellow (Lake Erie wild, US farmed)
Rockfish (US)
Salmon (AK)
Sardines: Pacific (Canada & US)
Scallops (farmed)
Seaweed (farmed)
Shrimp (AK wild, US farmed)
Tilapia (Ecuador & US)
Trout: Rainbow (US farmed)
Tuna: Albacore/White canned (Canada & US troll, pole)
Tuna: Skipjack/Light canned (FAD free, US troll, pole)
Tuna: Yellowfin (US troll, pole)
Whitefish: Lake (Lake Michigan trap net)
Whitefish: Lake (Lakes Huron & Superior)

GOOD ALTERNATIVES

Basa/Pangasius/Swai
Cod: Pacific (US Trawl)
Crab: Blue & King (US)
Grouper: Black & Red (US)
Halibut (US Pacific gillnet & trawl)
Lobster (Bahamas & US)
Mahi Mahi (Ecuador & US)
Salmon (CA, OR & WA wild)
Scallops (wild)
Shrimp (Canada & US wild, Ecuador farmed)
Snapper (US)
Squid (US)
Swordfish (US)
Tilapia (China & Taiwan)
Trout: Lake (Lakes Huron & Superior)
Tuna: Albacore/White canned (US longline)
Tuna: Skipjack/Light canned (imported troll, pole and US longline)
Tuna: Yellowfin (imported troll, pole and US longline)
Whitefish: Lake (Lake Erie)
Whitefish: Lake (Lake Michigan gillnet)

AVOID

Cod: Pacific (Japan & Russia)
Crab: Canned (imported)
Crab: Red King (Russia)
Lobster: Spiny (Belize, Brazil, Honduras & Nicaragua)
Mahi Mahi (imported)
Orange Roughy
Salmon: Atlantic (farmed)
Sardines: Atlantic (Medit. Sea)
Sharks
Shrimp (imported)
Squid (imported)
Swordfish (imported)
Trout: Lake (Lake Michigan)
Tuna: Albacore/White canned (except Canada & US troll, pole and US longline)
Tuna: Bluefin
Tuna: Skipjack/Light canned (imported longline and purse seine)
Tuna: Yellowfin (except troll, pole and US longline)

Start with “Best Choices” then check the other columns—your favorite seafood could be in more than one.

Best Choices

Buy first, they’re well managed and caught or farmed in ways that cause little harm to habitats or other wildlife.

Good Alternatives

Buy, but be aware there are concerns with how they’re caught or farmed.

Avoid

Take a pass on these for now, they’re overfished or caught or farmed in ways that harm other marine life or the environment.

Visit us online or download our app for a **full list** of our recommendations.

Omega-6 to Omega-3 ratio

- Ratio may help to guide intake recommendations
 - Omega-6 and omega-3 fats compete within the body
 - Excessive omega-6 intake may cause conditional omega-3 deficiency
- Omega-6 sources
 - Vegetable oils (corn, soybean, safflower, etc.)
 - Nuts
 - Meat
- American diet contains 14-25 times more omega-6 than omega-3
- Optimal omega-6:omega-3 ratio is around 2:1 to 4:1



Omega ratio in Mediterranean diet

- High omega-3 intake
 - Daily intake of fish and seafood (DHA/EPA)
- Low omega-6 intake
 - Olive oil (monounsaturated fat) in place of vegetable oils (omega-6 fat)
 - Low intake of processed foods containing vegetable oils



Simple ways to eat more seafood

- Pack shelf-stable options (canned/pouched) for lunch:
 - Add to a salad
 - Add to a sandwich
- Rinse pre-cooked frozen shrimp and add to:
 - Salad
 - Pasta
 - Rice
- Add seafood to eggs or egg salad
- Use avocado, Greek yogurt, or olive oil in tuna salad recipes



healthy
IU

LIVE YOUR BEST YOU.

Wine

- Moderate alcohol intake:
 - Raises HDL (good) cholesterol
 - “Thins” the blood – may prevent blood clots
 - May decrease risk of heart disease
 - Associated with 30 to 35% lower heart attack risk
 - All types of alcohol show similar risk reduction
- Moderation is the key:
 - Women: No more than one drink per day
 - Men: No more than two drinks per day
- Non-drinkers: Not enough evidence to recommend starting



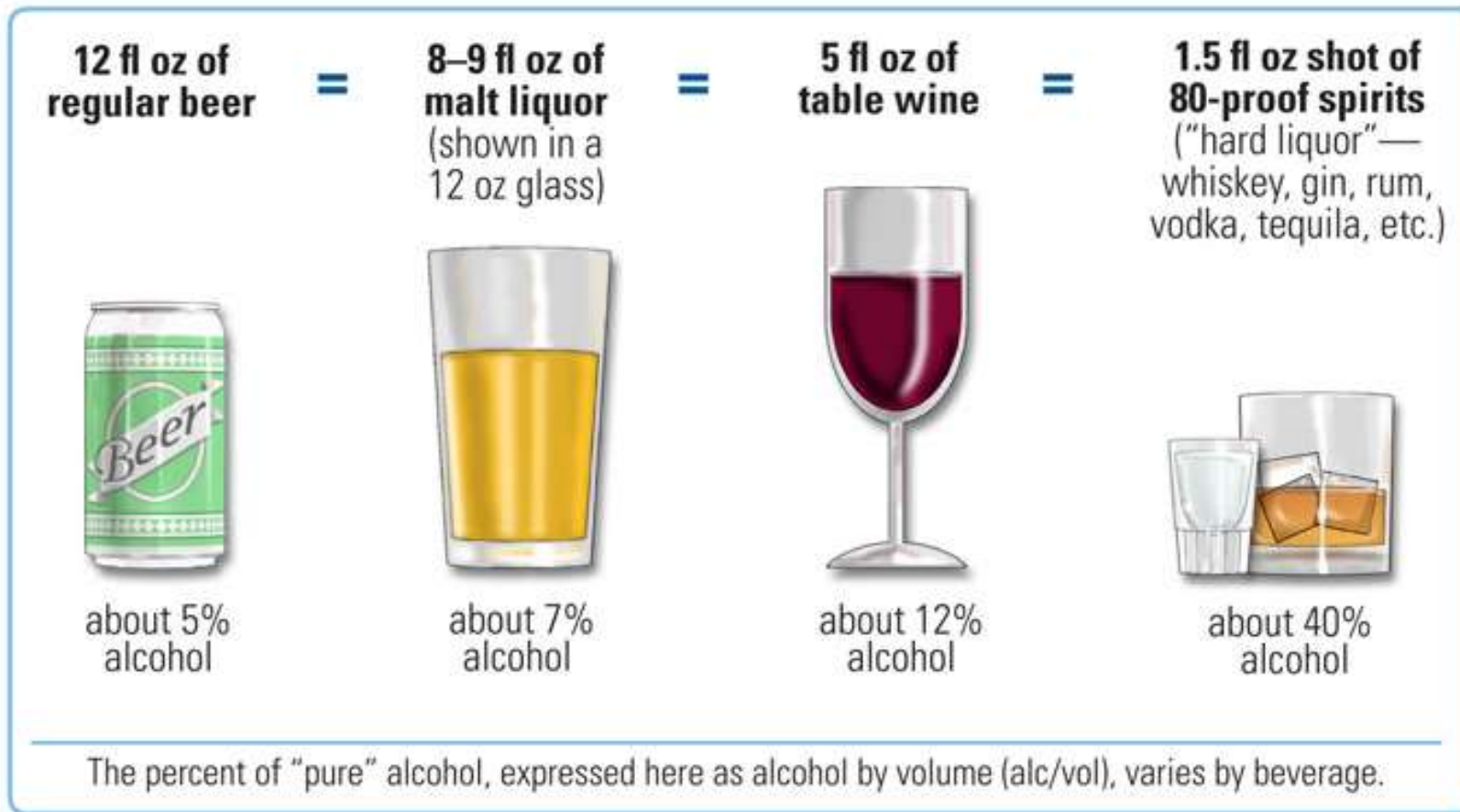
Risks of alcohol

- Heavy drinking increases risk of:
 - Heart disease
 - Liver disease
 - Mental illness
- Even moderate drinking may increase risk of certain types of cancer, including breast cancer.
- Alcohol consumption may interfere with sleep
 - Easier to fall asleep, but quality of sleep impaired
 - Tip: Finish drinking at least a few hours before bedtime



LIVE YOUR BEST YOU.

What is a drink?



<http://www.niaaa.nih.gov/alcohol-health/overview-alcohol-consumption/standard-drink>



LIVE YOUR BEST YOU.

Mediterranean Diet Research Findings

- Reduced risk of:
 - Cardiovascular disease
 - Cancer
 - Parkinson's disease
 - Alzheimer's disease
 - Type 2 Diabetes
- Lower:
 - Blood pressure
 - Blood sugar
 - Triglycerides



Mediterranean Diet & Cardiovascular Events

- Cardiovascular events include:
 - Heart attack
 - Stroke
- Mediterranean diet vs. Low-fat diet
 - Med. diet subjects had 30% greater risk reduction than low-fat diet subjects



Mediterranean Diet Study Parameters

- Olive oil: at least $\frac{1}{4}$ cup per day
- Vegetables: at least 2 servings per day
- Fruits: at least 3 servings per day
- Wine: at least 7 glasses per week
- Seafood: at least 3 servings per week
- Nuts: at least 3 servings per week
- Legumes: at least 3 servings per week



Mediterranean Diet Study Parameters

- Red meat: less than 1 serving per day
- Butter, margarine, cream: less than 1 serving per day
- Sugary beverages: less than 1 serving per day
- Sweets: less than 3 servings per week



Longevity

- Telomeres
 - Protective caps on ends of chromosomes
 - Shortening of telomeres correlates to cell aging
- Mediterranean Diet
 - Greater adherence to Mediterranean diet = longer telomeres
 - Not just one component of diet, but diet as a whole



Healthy Aging

- Living to 70+ years without major health problems
- A healthy diet improves odds of healthy aging:
 - Dietary Guidelines for Americans: 34% improved odds
 - Mediterranean Diet: 46% improved odds



Why is a Mediterranean diet so healthy?

- Anti-inflammatory compounds
 - Seafood
 - Olive oil
 - Whole plant foods
- Benefits of moderate alcohol
- Fatty acid profile
 - High omega-3
 - Low omega-6
 - Monounsaturated fats
- Macronutrient ratios
 - Higher fat
 - Lower carbohydrate
- Lack of highly processed foods



What about a Mediterranean lifestyle?



**Be
Physically
Active;
Enjoy
Meals
with Others**

healthy
IU

LIVE YOUR BEST YOU.

A Mediterranean Lifestyle

- More physical activity as part of daily life
 - Walking
 - Riding bicycles
- Greater sense of community
 - Strong relationships with family and friends
 - Eating as social occasion
- More time spent outdoors
 - Fresh air
 - Sunshine (vitamin D)
- Slower pace to life
 - Less stress
 - More enjoyment



<http://www.smithsmagazine.co.uk/2015/03/19/the-happy-mediterranean-lifestyle-and-diet/>

healthy
IU

LIVE YOUR BEST YOU.

Additional Resources

- Oldways
 - <http://oldwayspt.org/>
- Monterey Bay Aquarium Seafood Watch
 - <http://www.seafoodwatch.org/>



References

- Babio N, Toledo E, Estruch R, et al. Mediterranean diets and metabolic syndrome status in the PREDIMED randomized trial. *CMAJ*. 2014;186(17):E649-E657.
- Bao Y, Han J, Hu FB, et al. Association of nut consumption with total and cause-specific mortality. *N Engl J Med*. 2013;369(21):2001-11.
- Crous-bou M, Fung TT, Prescott J, et al. Mediterranean diet and telomere length in Nurses' Health Study: population based cohort study. *BMJ*. 2014;349:g6674.
- Energy and Environmental Research Center. Selenium and mercury: Fishing for answers. 2011. <http://www.undeerc.org/fish/pdfs/Selenium-Mercury.pdf>
- Estruch R, Ros E, Salas-salvadó J, et al. Primary Prevention of Cardiovascular Disease with a Mediterranean Diet Supplemented with Extra-Virgin Olive Oil or Nuts. *N Engl J Med*. 2018;378(25):e34. Jenkins DJ, Kendall CW, Augustin LS, et al.
- Effect of legumes as part of a low glycemic index diet on glycemic control and cardiovascular risk factors in type 2 diabetes mellitus: a randomized controlled trial. *Arch Intern Med*. 2012;172(21):1653-60.



LIVE YOUR BEST YOU.

References

- Moreno-luna R, Muñoz-hernandez R, Miranda ML, et al. Olive oil polyphenols decrease blood pressure and improve endothelial function in young women with mild hypertension. *Am J Hypertens.* 2012;25(12):1299-304.
- Oldways. <http://oldwayspt.org/>.
- Samieri C, Sun Q, Townsend MK, et al. The association between dietary patterns at midlife and health in aging: an observational study. *Ann Intern Med.* 2013;159(9):584-91.
- Schwingshackl L, Missbach B, König J, Hoffmann G. Adherence to a Mediterranean diet and risk of diabetes: a systematic review and meta-analysis. *Public Health Nutr.* 2014;:1-8.
- Seafood Health Facts. Omega-3 content of frequently consumed seafood products. http://seafoodhealthfacts.org/seafood_nutrition/practitioners/omega3_content.php.
- Wu H, Flint AJ, Qi Q, et al. Association Between Dietary Whole Grain Intake and Risk of Mortality: Two Large Prospective Studies in US Men and Women. *JAMA Intern Med.* 2015;
- University of Maryland Medical Center. Omega-6 fatty acids. <http://umm.edu/health/medical/altmed/supplement/omega6-fatty-acids>



Questions?

For additional questions, or to schedule a one-on-one nutrition counseling appointment, email: askanrd@indiana.edu

