

# FOOD FOR THOUGHT

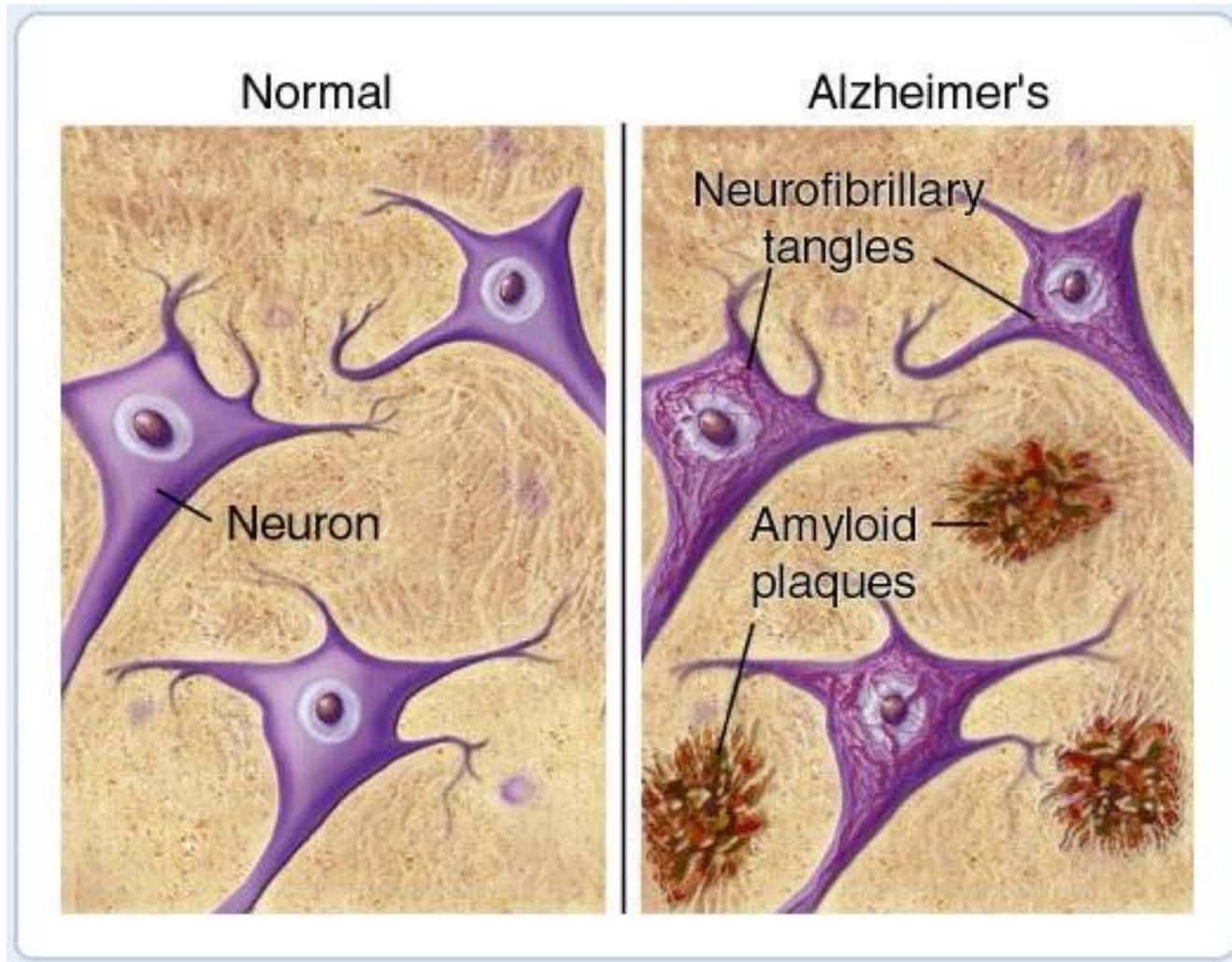
The MIND Diet

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# INTRODUCTION

- Alzheimer's disease (AD) is a neurodegenerative disease <sup>[1]</sup>
  - Nerve cells (neurons) in the brain gradually lose function
  - Plaques: disruptive protein deposits (beta-amyloid)
  - Tangles: twisted protein fibers (tau)
  - Inflammation to the brain is characteristic
- Dementia (memory loss) results

# INTRODUCTION

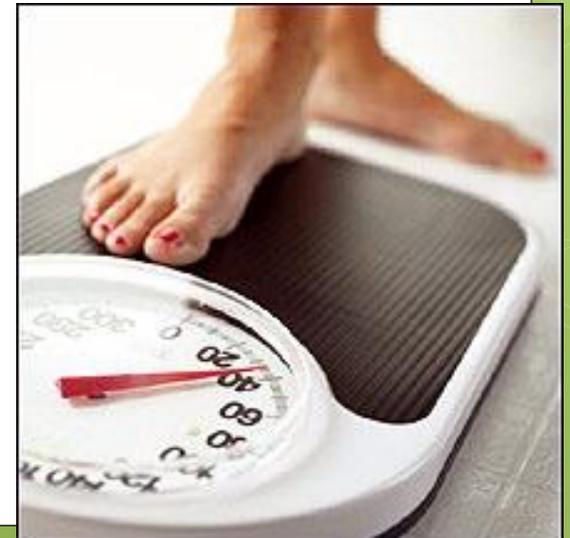


# THE MIND-BODY CONNECTION: AD RISK FACTORS [2, 3]

- Age
- Genetics
- Mid-life obesity or malnutrition
- Cardiovascular disease
  - High blood pressure, high cholesterol, stroke
- Diabetes
- Epsilon 4 allele of the apolipoprotein E gene (APOE  $\epsilon$ 4)
- Smoking
- Depression

# THE MIND-BODY CONNECTION: HEALTHY LIFESTYLE IS KEY

- Proper nutrition
- Physical activity
- Maintaining a healthy weight
- Smoking cessation



# RESEARCH: NUTRITION AND AD

- No specific “diet” for treatment
- Mediterranean-DASH diet intervention for neurodegenerative delay (MIND) designed to protect brain [6]
- Mediterranean diet has protective benefits [4, 5]
  - Intervention with Med diet resulted in:
    - 28% lower risk of Mild Cognitive Impairment (MCI)
    - 48% lower risk of MCI progressing to AD

# RESEARCH: MIND DIET [6]

- Study Population
  - 960 participants
  - 95% Caucasian, 98.5% non-Hispanic
  - 81.4 average years
  - 75% female, 25% male
- Controlled Variables
  - Age, Sex, APOEε4, Education, Physical activity, Low weight
  - Hypertension, Stroke, Myocardial Infarction, Diabetes
  - Depression, Obesity

# RESEARCH: MIND DIET KEY FINDINGS

[6]

- *Participants who adhered most closely to the MIND diet had statistically significant slower rates in cognitive decline.*
- *The difference in rates was the equivalent of being 7.5 years younger.*

# MIND DIET:

*Eat More*<sub>[6]</sub>

Diet Component	Servings and Frequency
Green leafy vegetables	6 servings per week
Other vegetables	1+ serving per day (4 is best)
Berries	2+ serving per week (6 is best)
Unsalted nuts	5 serving per week
Olive oil	Primary oil used
Whole grains	3 servings per day
Fish (not fried)	1-2 meals per week
Beans	3 meals per week
Poultry (not fried)	2 meals per week
Wine	1 glass per day (5oz.)

# MIND DIET:

## *Eat Less*<sup>[6]</sup>

Diet Component	Maximum Servings and Frequency
Butter, margarine	1 tablespoon per day
Cheese	1 serving per week
Red meat and products	4 meals per week at most
Fried foods	1 time per week
Pastries and sweets	5 servings per week

# NUTRITION MATTERS

## *What have we learned from the Mediterranean and MIND diet?*

- Increase vegetable and fruit intake
  - Variety and color
  - Focus on dark-green leafy vegetables and berries
- Choose whole grains
  - Oatmeal, whole grain bread or pastas, quinoa, brown rice



# NUTRITION MATTERS

- Include a *variety* of protein foods
  - Fish and poultry, eggs, beans, lentils, soybeans, unsalted nuts
- Choose unsaturated fats
  - Olive oil, salmon, unsalted nuts, and avocados
- Focus on fiber-rich foods
  - Whole grains, vegetables, beans, nuts, fresh fruit



# NUTRITION MATTERS

- Reduce daily sodium (salt) intake to less than 2,300 mg
  - 1,500 mg for those older than 50, with heart disease, high blood pressure, diabetes, or kidney disease
  - 1 tsp. of table salt = 2,300 mg of sodium
- Limit cholesterol to 300 mg per day
  - High fat dairy and meats, shellfish, eggs contain cholesterol



# NUTRITION MATTERS

- Limit saturated and *trans* fat
  - Saturated fats are solid at room temperature
  - *Trans* fat: partially hydrogenated oils
- Limit refined grains and added sugars
- Consume alcohol in moderation
  - Maximum of one drink per day for women
  - Max of two drinks per day for men



# What is “moderation”?

**12 fl oz of  
regular beer**

=

**8–9 fl oz of  
malt liquor**  
(shown in a  
12 oz glass)

=

**5 fl oz of  
table wine**

=

**1.5 fl oz shot of  
80-proof spirits**  
 (“hard liquor” —  
whiskey, gin, rum,  
vodka, tequila, etc.)



about 5%  
alcohol



about 7%  
alcohol



about 12%  
alcohol



about 40%  
alcohol

The percent of “pure” alcohol, expressed here as alcohol by volume (alc/vol), varies by beverage.

# QUICK FIXES

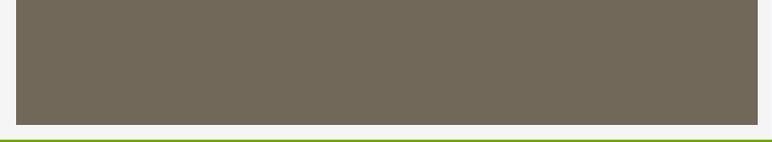
- Kale or spinach salad instead of lettuce
- Try sweet potatoes in recipes
- Brown rice or quinoa
- Mashed avocado or unsalted nut butter on toast
- Fresh berries with non-fat plain Greek yogurt



# QUICK FIXES

- Use fresh herbs and spices or Mrs. Dash
- Use 1 whole egg + 2 egg whites
- Sub whole-grain flour in recipes
- Use olive or canola oil in place of butter, margarine, or shortening





# OTHER CONSIDERATIONS: HYDRATION



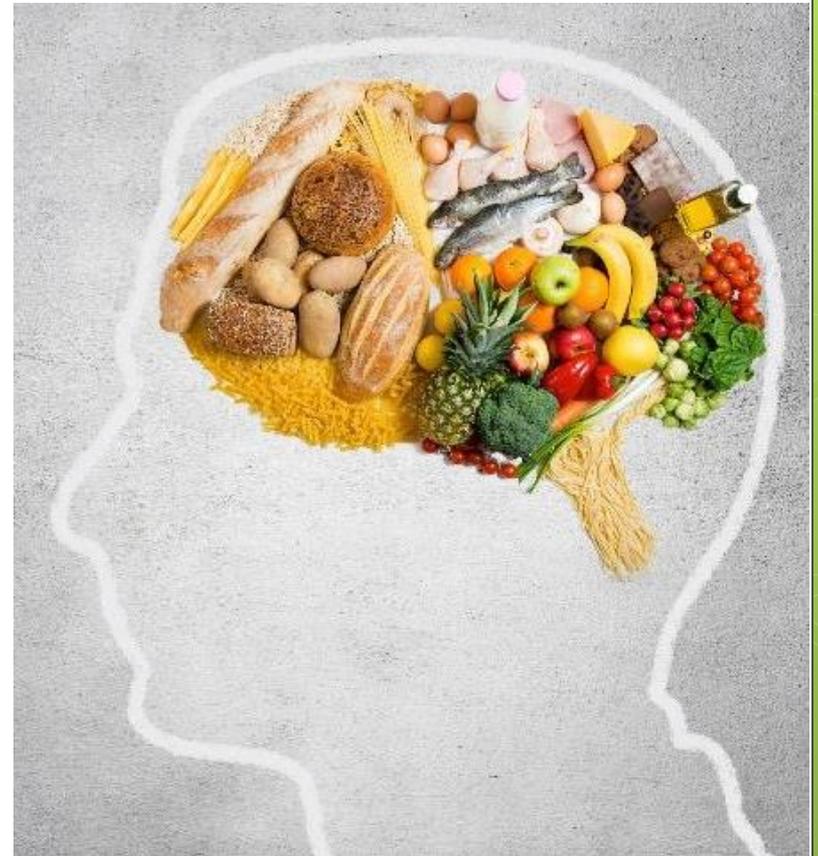
# HYDRATION [7, 8]

- Dehydration is dangerous and can contribute to cognitive decline
- Adequate fluid intake: 1.5 – 2.5 L/d (6 – 8.5 cups)
- Signs of dehydration
  - Dry mouth, thirst
  - Fatigue or dizziness
  - Dry skin
  - Constipation
  - Dark urine



# FUNCTIONAL FOODS

- Antioxidants have protective and preventive benefits for AD
  - Natural substance found in plant foods, vegetable oils, nuts, and whole grains
  - Fights damage to nerve cells caused by free radicals
  - Inhibits amyloid plaques deposition between nerve cells



# FUNCTIONAL FOODS

## *Antioxidants* [2, 9]

- Vitamin E ( $\alpha$ -tocopherol)
  - Can prevent AD-like changes in mice
  - Sources: wheat-germ, sunflower, safflower oils, leafy green vegetables and asparagus
  - Eat vitamin E and C foods together
- Supplements?
  - Alzheimer's Disease Cooperative Study Group supports the use of  $\alpha$ -tocopherol at 2,000 IU per day for treatment of AD



# FUNCTIONAL FOODS

## *Antioxidants* [2, 9]

- Vitamin C (ascorbic acid)
  - Dietary sources are abundant: bell peppers, citrus, berries, papaya, pineapple, kiwis, broccoli, and many mor
- Supplements?
  - Deficiency is very rare
  - Quality studies on vitamin C supplementation are lacking
  - Unknown if vit. C supplements are beneficial



# FUNCTIONAL FOODS

## *Antioxidants* [2, 9]

- Coenzyme Q10 (CoQ10)
  - Reduce oxidative stress by reducing amyloid plaque deposits in mice models of AD
  - Sources: fatty fish, such as salmon, tuna, and herring; poultry, peanuts, sesame seeds, pistachios, soy bean oil, canola oil [10]
- Supplements?
  - Ask your doctor
  - Recommended if taking statin (30-200 mg/d) [10]



# FUNCTIONAL FOODS

## *Antioxidants* [9, 11]

- Resveratrol
  - Decrease amyloid plaque formation in *animal studies*
  - Inhibits inflammation
  - Sources: skins of grapes, raspberries and mulberries, red wine, red grape juice
  - Currently being tested in mild to moderate AD patients
  - No current recommendations



# FUNCTIONAL FOODS

## *Antioxidants* [2, 9]

- Selenium
  - Ongoing human clinical trials
  - No current data exists
- Lipoic acid,  $\beta$ -carotene, Bioflavonoids
  - Results from clinical trials have not been sufficient to warrant changes in recommendations for practice
  - Early-stage prevention trials are needed



# ANTIOXIDANT FOODS



Fruits	Vegetables
Prunes	Kale
Raisins	Spinach
Blueberries	Brussels sprouts
Blackberries	Alfalfa sprouts
Strawberries	Broccoli
Raspberries	Beets
Plums	Red bell pepper
Oranges	Onion
Red grapes	Corn
Cherries	Eggplant

Ranked by Oxygen Radical Absorbance Capacity (ORAC), USDA database.

# FUNCTIONAL FOODS

## *B-vitamins and folate* [9]

- Vitamin B12, Vitamin B6, and folate deficiencies associated with lower cognitive function [2]
  - B12 sources: beef, fish, shellfish, dairy, fortified grains
  - B6 sources: meats, whole-grains, vegetables, nuts, and bananas
  - Folate sources: leafy vegetables, okra, asparagus, fruits, beans, yeast, mushrooms, orange juice, and tomato juice, fortified grains
- Supplement only if deficient

# FUNCTIONAL FOODS

## *Omega-3 fatty acids* [2, 9]

- Omega-3 fatty acids
- DHA and EPA are polyunsaturated fatty acids (PUFAs)
  - PUFAs decrease oxidative stress
  - Also reduce cerebrovascular disease
  - Food sources: fatty fish, flax and hemp seeds, walnuts, canola oil



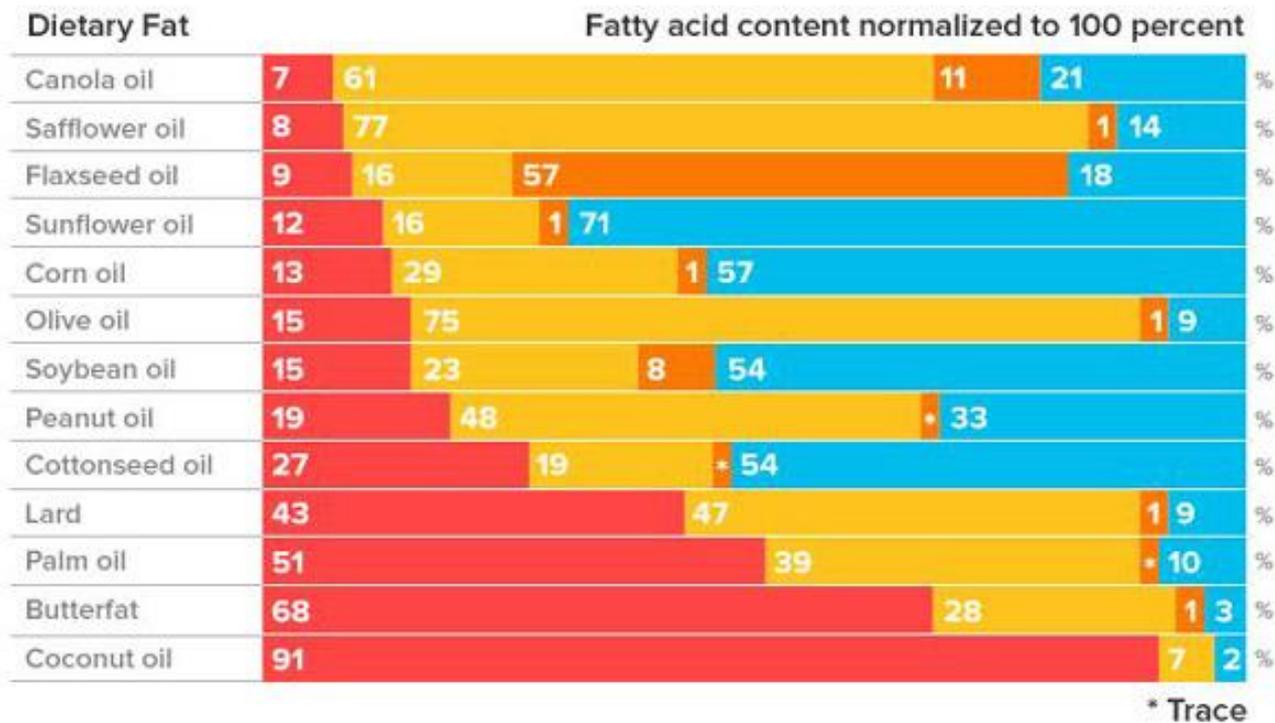
# FUNCTIONAL FOODS

## *Omega-3 fatty acids* [2, 9]

- Fish Oil supplements
  - Consult your MD
  - Clinical trials do not support omega-3 FA supplementation in treatment of AD
- Considerations
  - APOE ε4 negates benefits of omega-3
  - Optimal omega-6 FA to omega-3 FA ratio is 4:1

# FUNCTIONAL FOODS

## *Omega-3 fatty acids*



Source: POS Pilot Plant Corporation

# Coconut Oil [9, 12]

- Rich in Medium-chain triglycerides (MCT)
  - Caprylic acid supposedly restores brain function
  - Research does not currently support claims
- High in saturated fat
  - Increases AD risk
  - Increases LDL → CVD risk



# SUPPLEMENTS: Decoding the Labels



# SUPPLEMENTS: Decoding the LAbels

- Points of concern
  - May interact with medications
  - Purity and quality
  - Claims may not be backed by research
  - Actual beneficial dose not known
- Rules of thumb:
  - Let FOOD be your main source of nutrition
  - Multi-vitamin and mineral supplement to “fill in the gaps”
  - Be a conscious consumer
  - Always talk to your doctor, Pharmacist, or Registered Dietitian before taking supplements



# SUPPLEMENTS: Decoding the Labels

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# SUPPLEMENTS: Decoding the Labels

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# CONCLUSION

- Eat a well-balanced diet rich in plant-  
foods, lean proteins, and healthy fats
- Include anti-inflammatory foods
  - Antioxidants and omega-3 fats
- Maintain a healthy weight and stay  
active
- Use dietary supplements only under the  
supervision of a health care provider



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# NUTRITION MATTERS



“Let food be thy medicine and medicine be thy food”.

- Hippocrates