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# Reduce Your Risk of Cognitive Decline as You Age

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# Reduce Your Risk of Cognitive Decline as You Age



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# Today's Presenters



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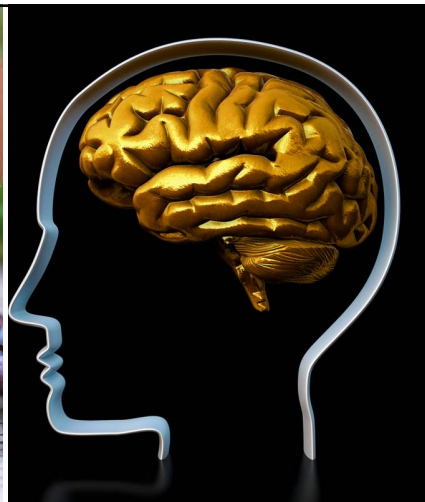


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**REDUCE YOUR RISK OF  
COGNITIVE DECLINE AS YOU AGE**

**TEXAS A&M  
AGRI LIFE  
EXTENSION**

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## IN THIS SESSION

- Trends in aging
- Cognitive changes as we age
  - What's normal and what's not
- What we can do to promote brain health (cognition) as we age
  - Diet (Jenna Anding)
  - Self care (Andy Crocker)



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## Aging & Brain Function

- Aging may be generally characterized by
  - Slowing of cognitive performance (-)
  - Decrease in mental flexibility (-)
  - Independence in ADL and IADL (+)
  - Retention of verbal abilities and vocabulary (+)
- ADLs and IADLs
  - Inability to perform IADLs typically precedes inability to perform basic ADLs
  - Inability to manage finances may be one of the earlier IADL changes suggestive of dementia

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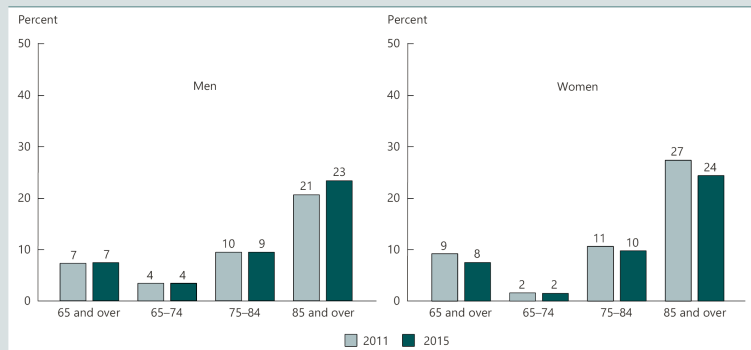


# Dementia

- General term for a variety of neurodegenerative conditions that cause progressive cognitive and behavioral impairments
- Type of dementia and symptoms depend on which regions of the brain are damaged
- Dementia is not part of the normal aging process
- Some symptoms are potentially caused by treatable conditions

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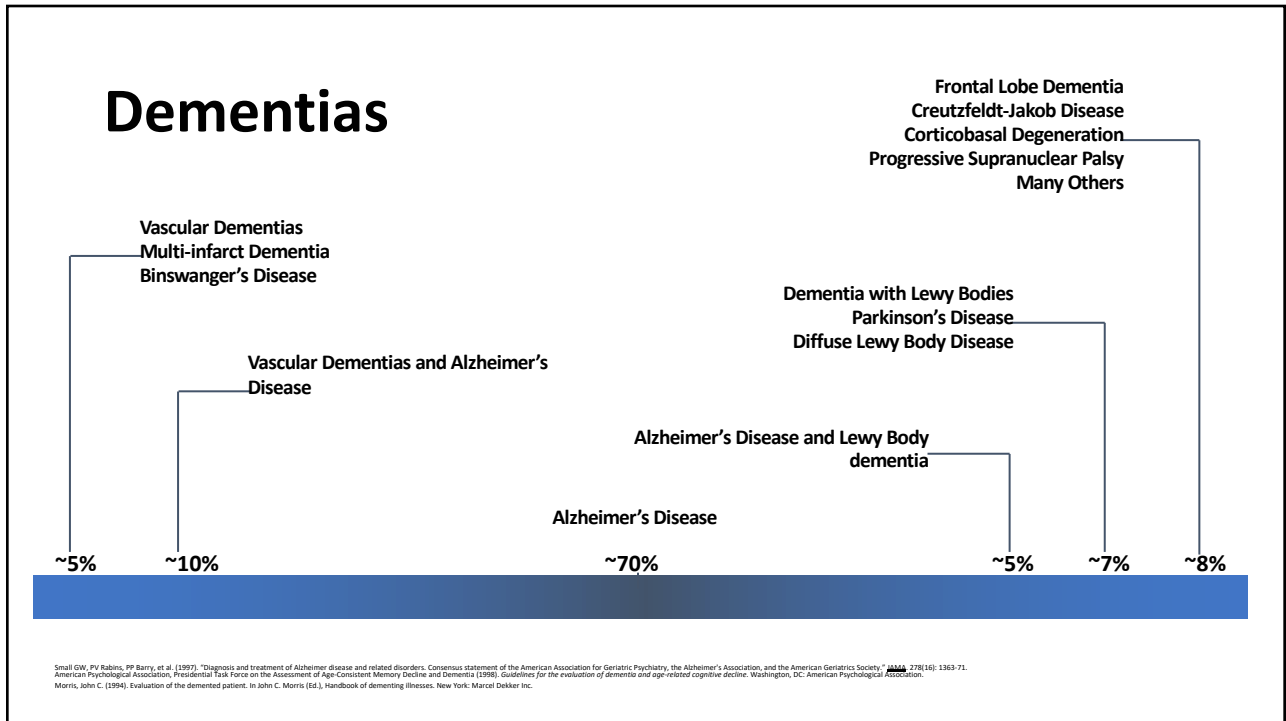
Percentage of the non-nursing home population age 65 and over with dementia, by age group and sex, 2011 and 2015



NOTE: The estimate of dementia includes Alzheimer's disease and other related dementias such as frontotemporal, Lewy body, mixed, and vascular dementia. Dementia status in the National Health and Aging Trends Study (NHATS) was determined using three types of information: (1) a report (by the respondent or proxy) that a doctor told the sample person that he or she had dementia or Alzheimer's disease; (2) a score indicating probable dementia on a screening instrument administered to proxy respondents during the interview; and (3) cognitive tests that evaluate memory, orientation, and executive function administered to the respondent during the interview. To minimize potential learning bias and to be classified as having dementia, participants must meet criteria for dementia in two subsequent NHATS rounds, or meet dementia criteria in one round followed by death or loss to follow up in the next round, as described in Freedman, Kaspar, Spillman, and Plassman (2018).<sup>18</sup> Data from 2011 have been revised with the two-round dementia criteria and differ from Indicator 20: Dementia in Older Americans 2016. Reference population: These data refer to Medicare beneficiaries not living in nursing homes. SOURCE: Office of the Assistant Secretary for Planning and Evaluation, National Health and Aging Trends Study.


Older Americans Key Indicators of Wellbeing (2020) - Dementia

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## Aging vs MCI vs Dementia




**Aging**

Body and brain may gradually slow but intelligence remains relatively stable.



**MCI**

Notable problems with memory or other core brain functions but not sufficient to interfere with daily life.



**Dementia**

Range of neurodegenerative brain disorders causing severe enough mental decline to interfere with daily life.

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## Risk Factors for MCI & AD That We Can Address

### May Increase Risk


- Traumatic brain injury
- Chronic disease
- History of depression
- Smoking
- Sleep disturbances
- Excessive alcohol consumption
- Social isolation

### May Decrease Risk

- Years of formal education
- Physical activity
- Cognitive training
- **Healthy diet**

Source: Baumgart et al., Alzheimer's & Dementia, June 2015; Livingston, G. et al. (2020). Dementia prevention, intervention, and care: 2020 report of the *Lancet* Commission.

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**LET'S CHAT ABOUT IT: HOW WOULD YOU  
DESCRIBE A TYPICAL AMERICAN DIET?**

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## WHAT COMPONENTS OF A HEALTHY DIET MIGHT HELP PREVENT DEMENTIA?

- **Antioxidants**
  - Vitamins C & E
  - Beta carotene
  - Selenium and Zinc
- **Phytonutrients**
- **Healthy fats**
- **B-vitamins**
  - B<sub>12</sub>
  - Folic acid



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## ANTIOXIDANTS

- Protect against free radicals; reduce inflammation in the body.
- May be **associated** with a reduced risk for Alzheimer's disease.
- A 2021 systematic review of published research found an overall positive impact of antioxidant-rich plant foods on *cognition*.
- A meta-analysis of 52 studies found that patients with Alzheimer's disease had lower blood levels of beta-carotene, lycopene, lutein, Vitamins A, C, and E compared to individuals without the disease.
- Choose vegetables and fruits (red, orange, dark green), citrus fruits, berries, whole grains, nuts, seeds, and vegetable oils as part of a healthy diet.



Source: Coley, Vauris, and Andrieu. *Clini Geriatr Medicine*, 2015; Baroni, L. et al, *Antioxidants*, 2021; Mullan K., et al., *J Alzheimers Disease*, 2018

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## POLYPHENOLS



- A class of phytonutrient; Strong antioxidant and anti-inflammatory
- Berries, citrus, colorful vegetables, tea (green), certain spices, nuts, and, cocoa, **red wine**.
  - Cocoa flavanols **may** help improve cognitive function in older adults
  - Blueberries have been shown to improve performance on some cognitive tests but not others
  - Consuming strawberries more than 1x a week was **associated** with a 32% reduced risk of Alzheimer's (2015).
  - A 2021 study of older adults found that consuming 24 grams of freeze-dried strawberries a day for 90 days led to improved cognition.
  - Excessive alcohol consumption may increase risk for dementia.

Sources: Gomez-Pinilla and Nguyen. *Nutritional Neuroscience*, 2015; Coley, Vaur, and Andrieu. *Clini Geriatr Medicine*, 2015; Travica et al. *Brain, Behavior, and Immunity*, 2019; Langballe et al. *European Journal of Epidemiology*, 2015; Alonso-Alonso, M. *American Journal of Clinical Nutrition*, 2015; Agarwal, P. et al. *Strawberry Consumption Associated with Reduced Alzheimer's Dementia Risk*. Nutrition 2019 conference, Baltimore, MD.; Paloma K, et al. *Plant Foods for Human Nutrition*, 2020; Miller MG et al. *British Journal of Nutrition*, 2021

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## HEALTHY FATS

- Diets rich in omega-3 fatty acids are beneficial for health
  - ↓ inflammation
  - ↓ risk for heart disease and autoimmune diseases
- Omega-3 fatty acids have been linked with improved brain health and the slowing down of cognitive decline
  - Has not been shown to be a treatment for Alzheimer's disease; not sure if they prevent cognitive decline
- High fat diets that consist of omega-6 fats, saturated fats, and trans fats **have been associated** with poor cognitive function and possibly an increased risk for Alzheimer's disease.
- Food vs. Supplement debate (omega-3) continues



Sources: Burckhardt et al., *Cochrane Database Syst Rev.*, 2016; Andrieu et al., *Lancet Neurol*, 2017; Watanabe and Tatsuno, *Expert Review of Clinical Pharmacology*, 2017

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## B-VITAMINS (FOLATE, B<sub>6</sub>, & B<sub>12</sub>)



- Homocysteine – a type of amino acid found in the blood.
- High homocysteine levels in the blood are **linked** with increased risk for heart disease as well as cognitive decline.
  - B-vitamins (B<sub>6</sub>, B<sub>12</sub>, and folate) can help lower homocysteine levels in the blood
  - B<sub>6</sub> include chickpeas, potatoes, bananas, and fortified cereals
  - B<sub>12</sub> include beef, fish, clams, and fortified cereals
  - Folate include liver, spinach, peas, fortified cereals, asparagus, and Brussels sprouts
  - Supplements may reduce homocysteine levels but have not been proven effective in preventing or delaying the onset of dementia.


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## GROWING LINK BETWEEN GUT MICROBIOME & BRAIN HEALTH

- Definition of a *healthy gut microbiome* is loosely defined in terms of numbers of bacteria as well as diversity (how many different types of bacteria).
  - “beneficial” vs “pathogenic” bacteria
- Foods that **promote a healthy gut microbiome** = fruits, vegetables, fermented foods, plant-based proteins, polyphenols, mono- and unsaturated fats
- Foods that have a **negative impact on gut microbiome** = foods high in saturated fat, animal protein, highly refined carbohydrates, processed meats, foods high in added simple sugars
- Stay tuned!

Source: Berding K., et al. *Adv Nutrition*, 2021

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## WHAT AM I SUPPOSED TO EAT?

Diet Options:

- DASH
- Mediterranean
- MIND

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## Dietary Approaches to Stop Hypertension Diet

Originally designed to promote healthy blood pressure

- 8 to 10 servings of fruits and vegetables **per day\***
- 2 to 3 servings of low-fat dairy
- Healthy fats
- 6 to 8 servings of grains per day
- 2300 mg sodium (from food and added)
- 3-6 servings of nuts and seeds per week
- No more than 5 servings of sweets/week



**\* Based on a 2,000 calorie diet**

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## BENEFITS OF THE DASH DIET



- Has been shown to reduce systolic and diastolic blood pressure
  - Recommended by the AHA for the non-pharmacological mgmt. of hypertension
- Linked with lower total and LDL-cholesterol levels and overall reduction in heart disease risk by as much as 20%
- Improvements in insulin sensitivity and inflammation
- Possible neuroprotective benefits; associated with a reduced risk of cognitive decline in some studies but not others
  - Impact on blood pressure and reduced risk of vascular dementia

Sources: Siervo et al., *British Journal of Nutrition*, 2015; Salehi-Abargouei et al., *Nutrition*, 2013; Juraschek et al., *J Am College Cardiology*, 2017; Samadi M et al., *Neurological Sciences*, 2019; van den Brink et al., *Advances in Nutrition*, 2019; Daniel GD, et al. *Clinical Nutrition ESPEN*, December 2021; Hosseinpour-Niazi S. et al., *Nutr Metab (Lond)*, 2022.

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## MEDITERRANEAN DIET

- No single Mediterranean diet but they all share similar characteristics.
- Benefits of the diet first reported ~40 years ago.

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## CHARACTERISTICS OF A MEDITERRANEAN DIET

- Base meals around on fruits, vegetables, grains (whole), olive oil, nuts, legumes, seeds, herbs and spices (not salt).
  - Goal is 7 to 10 servings of vegetables and fruits a day
- Fish and seafood at least 2 times a week.
- Consume poultry, eggs, and low/no-fat cheese and yogurt in moderate amounts.
- Olive oil is used instead of butter or margarine.
- Sweets, sugar sweetened drinks, and processed meats and other highly processed foods are eaten less often.
- Wine in moderation (if at all).



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## BENEFITS OF THE MEDITERRANEAN DIET

- **May reduce** the risk of diabetes, heart disease and inflammation.
- **Associated** with a reduced risk of memory problems and dementia.
- Has been shown to slow the rate of cognitive decline in some populations but not others.
- Fish and fruit were found to be **associated** with a reduced risk of dementia in a UK study of adults 55 years of age and older (studied for 10-14 years).
- A 2022 systematic review of 28 studies found that following a Mediterranean diet may reduce the risk of mild cognitive impairment and Alzheimer's disease.

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## BENEFITS OF THE MEDITERRANEAN DIET

- A higher adherence of the Mediterranean diet was related to better memory in a group of 512 adults in Germany with varying levels of cognitive health.
- A 2021 meta-analysis of studies of older adults (60+) found that high adherence to a Mediterranean diet was associated to reduced risk of cognitive decline in older adults **without dementia**.
- In a study of 612 adults across 5 European countries, adherence to a Mediterranean diet was **associated** with changes in the gut microbiome and was positively associated with indicators of reduced frailty and improved cognitive function.

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## Mediterranean-Dash Intervention for Neurodegenerative Delay - MIND Diet

- Combination of the DASH and Mediterranean diets .
- Emphasis on whole grains, leafy vegetables, nuts and berries.
- Early research (2015) found that individuals who follow this style of eating could reduce their risk of Alzheimer's by as much as 35%.
  - Ongoing research and clinical trials.
- Linked with a **reduced** risk for depression.



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## WHAT IS IN THE MIND DIET?

### PER DAY

- $\geq 3$  servings of whole grains
- 1 serving of dark leafy greens (salad)
- $\geq 1$  serving of "other" vegetables
- 2 tablespoon extra virgin olive oil
- < 1 tablespoon butter/margarine
- 1 glass of wine/alcohol (optional)

### PER WEEK

- 5 ½-cup servings of berries
- $\geq 1$  serving of fish (at least one)
- $\geq 2$  or more servings of poultry
- 3 servings of beans (1/2 cup = serving)
- 5 servings of nuts (1 ounce = serving)
- Up to 3 servings of red meat per week
- Up to 2 ounces of cheese per week
- No more than 4 servings of sweets
- $\leq 1$  serving of fried/fast food



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## BENEFITS OF THE MIND DIET

- Early research found that individuals who follow this style of eating could reduce their risk of Alzheimer's by as much as 35%.
- 2021 systematic review of 13 different studies found that following the MIND diet was positively *associated* with aspects of cognitive function in older adults.
- MIND, DASH, and Mediterranean diets have been *linked* with a **reduced** risk for depression in some studies but not others.
- A 2023 study did not find any differences (cognition and brain MRIs) between those who followed the MIND diet compared to those who followed a control diet with a mild caloric restriction.

Sources: Morris et al. *Alzheimer's & Dementia*, 2015; Kheirouri S. and Alizadeh S. *Critical Reviews in Food Science and Nutrition*, 2021; Adjibade et al. *J Neurol*, 2019; van den Brink et al., *Adv Nutr*, 2019; Berendsen et al., *J Nutr Health Aging*, 2018; Salari-Moqaddam et al. *J Affect Disord*, 2019; Cherian L. et al. *Journal of Gerontology*, 2021; Fresan U. et al. *European Journal of Nutrition*, 2019. Barnes et al., *New England Journal of Medicine*, October 2023.

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## Limitations To The Research On Diet & Cognition

- How dietary intake was measured and how often (longitudinal studies)
- How cognitive function was assessed (memory, processing, language, global cognition and more)
- Ages of the subjects in the studies; comorbidities; cognitive function; location of the study
- Race/ethnic differences



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## Feeding Your Brain – Where Do I Start?

- Increase vegetable and fruit intake.
  - Dark red, orange and green veggies
  - Include berries (goal of **at least five times** a week)
- Choose healthy fats over saturated and trans fats.
- Choose highly processed/refined carbohydrates less often.
- Progress, not perfection.
- Don't wait until you are "older" to start.

**The secret to getting ahead is  
getting started.**

*~Mark Twain*

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## Can Dietary Supplements Stop Cognitive Decline?



- \$>3 billion dollars are spent each year globally
- Includes vitamins, minerals, herbs, and other substances
- No real evidence that they improve brain health or prevent cognitive decline
- Not regulated in the same manner as prescription medications
- Dietary supplements can interfere with prescription medications
- Dietary supplements may include excessive doses of vitamins or minerals.
- Be aware of claims that a supplement is “clinically proven”
- If it sounds too good to be true, it probably is. Save your money!

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**LET'S TALK ABOUT SELF-CARE.**

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## COGNITIVE RESERVE

- Cognitive reserve can act as a moderator between pathology and clinical outcome
- No exact “recipe” for helping create cognitive reserve
  - Physical activity
  - Educational and mentally stimulating activities

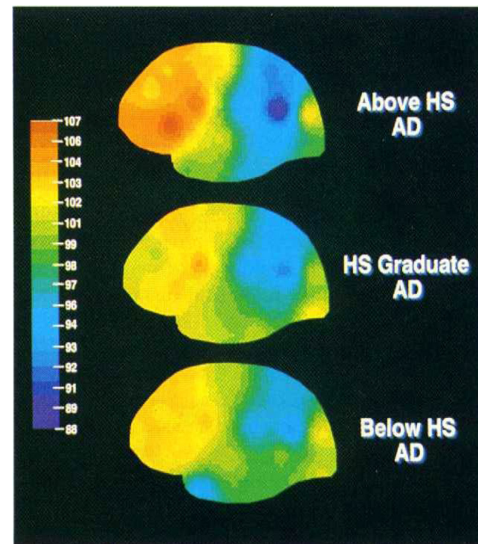


Image: Stern, Y. (2012). Cognitive reserve in ageing and Alzheimer's disease. *The Lancet Neurology*, 11(11): 1006-1012.

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## Isolation & Loneliness

### Connectedness may help...

- Promote longer life
- Boost mood
- Provide a sense of purpose



### Loneliness may increase risk for...

- Stress/Anxiety
- High blood pressure
- Obesity
- Depression
- Cognitive decline
- and on and on and on



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## Cognitive Training

- Cognitive training has been shown to improve cognitive abilities in older adults
  - Memory
  - Reasoning
  - Speed of processing
- Group training improved scoring on cognitive skills testing
  - Higher ratings of self-efficacy
  - Less anxiety
  - Problem-solving with a peer group can be motivating



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**MEMORY**

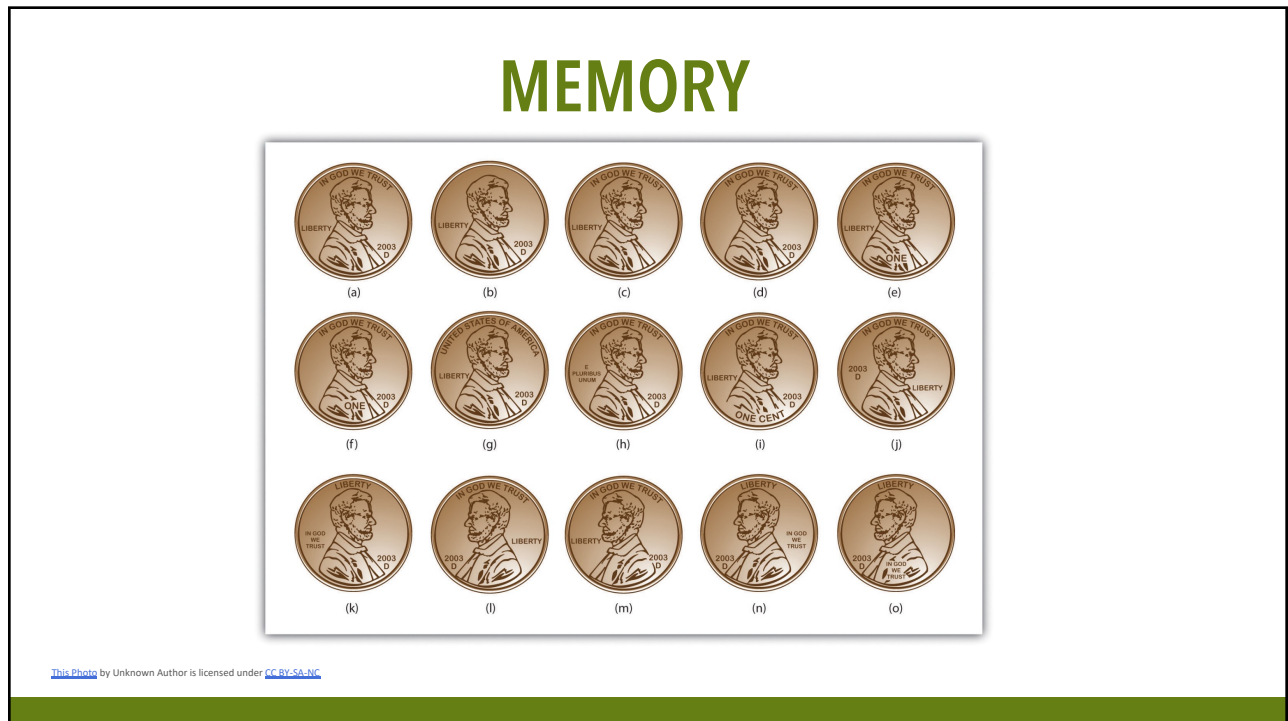
 A collection of 20 black and white icons arranged in a grid-like pattern. The icons include: a domino, a candy cane, a person riding a bicycle, a sitting cat, a football, an apple, a bell, a potted plant with flowers, a truck, a birthday cake with candles, a drum with drumsticks, an ice cream cone, a butterfly, a dog, an airplane, an alarm clock, a duck, a coffee cup with steam, and a circle containing the number 10.
 

Images: Microsoft Word Icons

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## REASONING



 $36$


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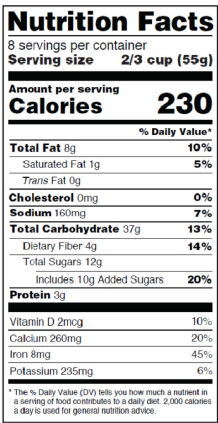

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Images: Microsoft Word Icons

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## REASONING

Finish the series: a c e g i...



- To reduce the % daily value of sodium by half, how much of the product should be consumed?
- How many grams of product are in 3.5 servings?

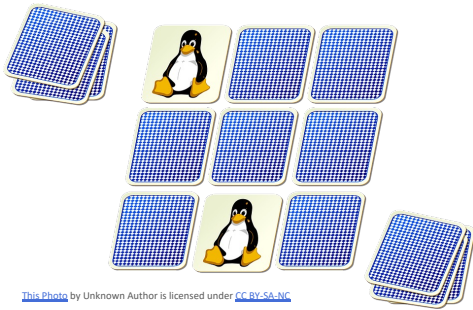
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			4	1	9		5
				8			7
						7	9

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## PROCESSING



- $2 + 7 + 10 + 3 + 6 + 4$ 
  - Now do it while reciting the months of the year aloud
- Towel Sorting and Shell Game
  - <https://education.nationalgeographic.org/resource/age-and-processing-speed/>

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## KEY TAKEAWAYS

- Not all memory issues are dementia.
- Alzheimer's disease is the most common but not the only type of dementia.
- Start incorporating MIND diet components in place of less healthy foods.
- Adopt physical activity into your everyday routine.
  - Aerobic, strength, and flexibility are all important
- Think about other healthy habits: sleep, alcohol consumption, smoking, etc.
- If you have a chronic disease like diabetes and hypertension, work to get it under control.
- Don't be isolated – have a social group to interact with.
- Keeping your brain active throughout the lifespan is beneficial for cognitive function.

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What Questions Would  
You Like To Ask?

TEXAS A&M  
AGRI LIFE  
EXTENSION

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