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The Essential Nutrients for Healthy Aging



THE UNIVERSITY OF ARIZONA
HEALTH SCIENCES

Innovations in
Healthy Aging

Lecture SERIES

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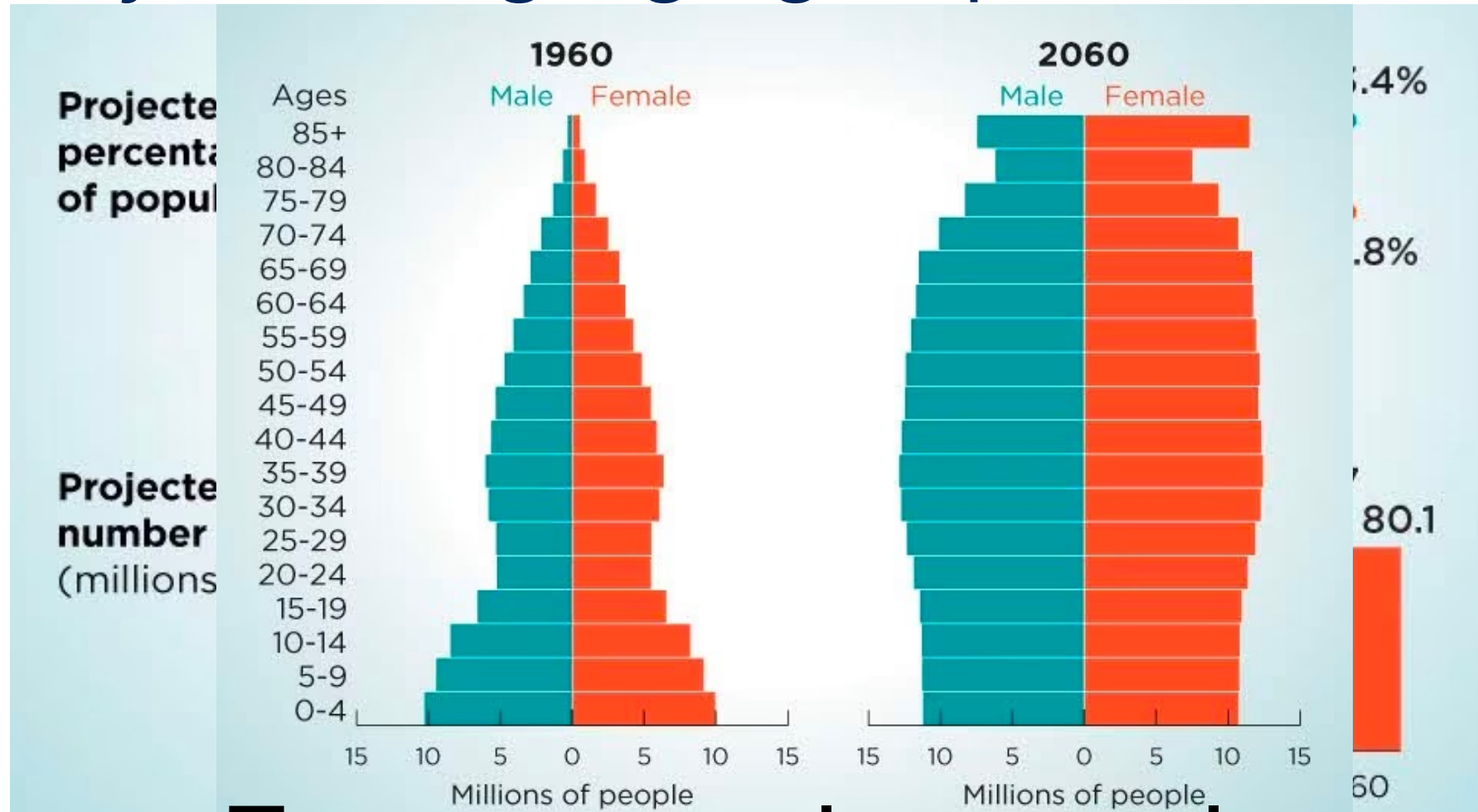
Disclaimer

- This talk is for general information purposes and is not intended to replace personalized medical or nutritional advice from your trusted medical professional. A health care provider should be consulted regarding your specific medical concerns or treatments. A registered dietitian nutritionist (RDN) can counsel and make recommendations based on your current health and medications aligned with your personal health goals.
- I have no conflicts of interest to disclose.

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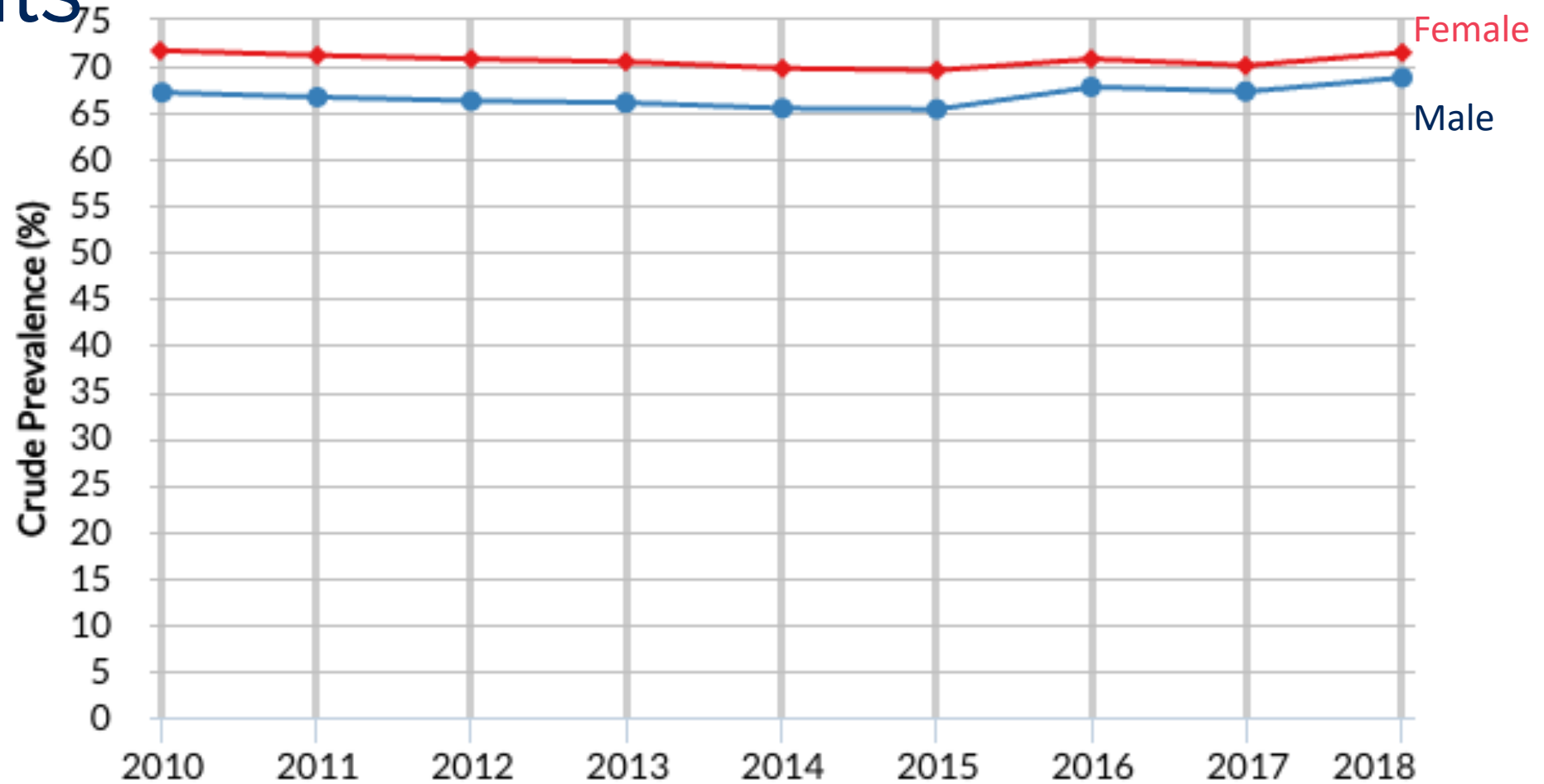
Rapidly Growing Aging Population



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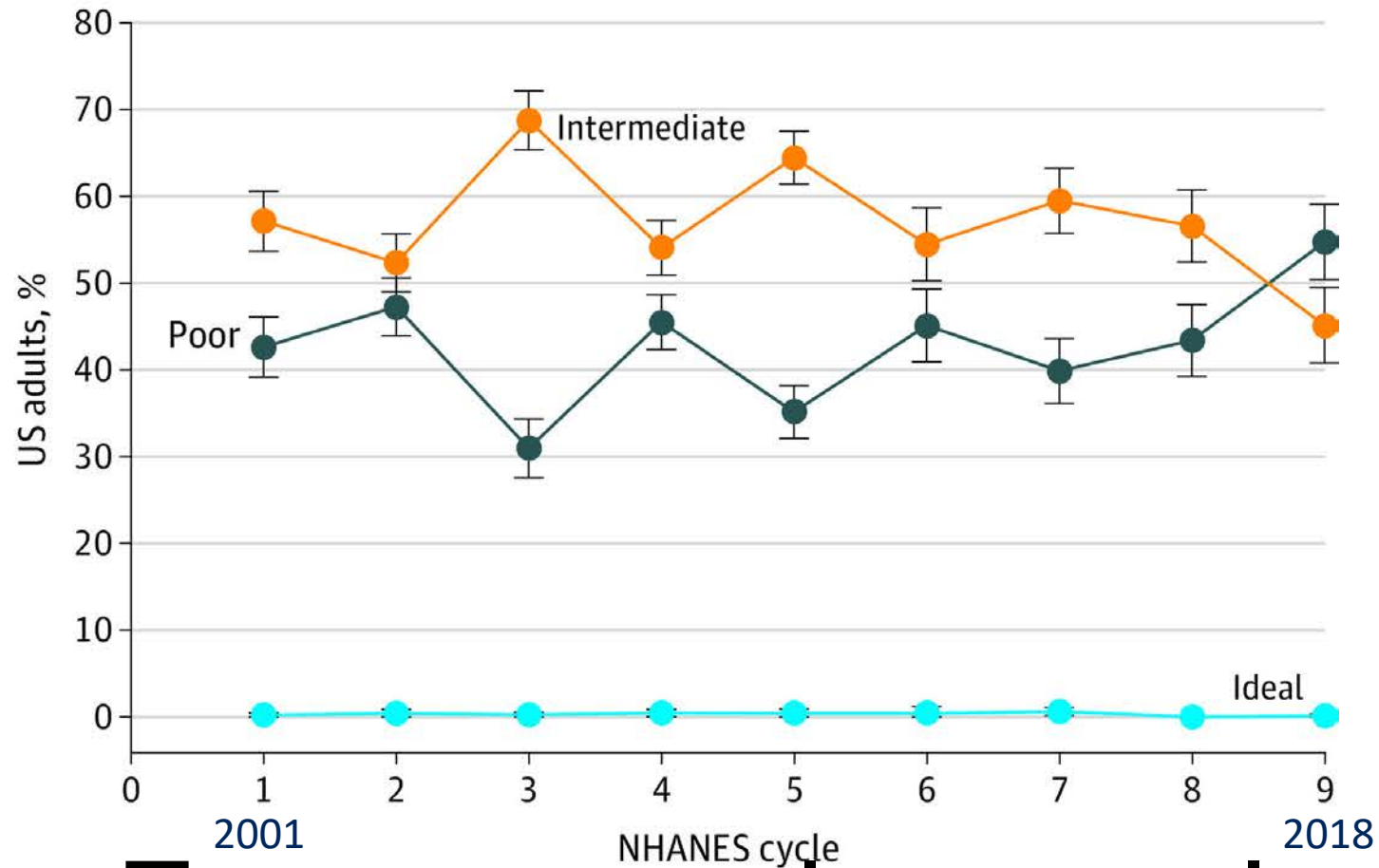
Chronic Disease Burden Among Older Adults



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Decreasing Dietary Quality Among Older American Adults



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Aging
Related
Chronic
Disease

Nutrition
Related
Chronic
Disease

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Functional Consequences of Aging

Cognitive

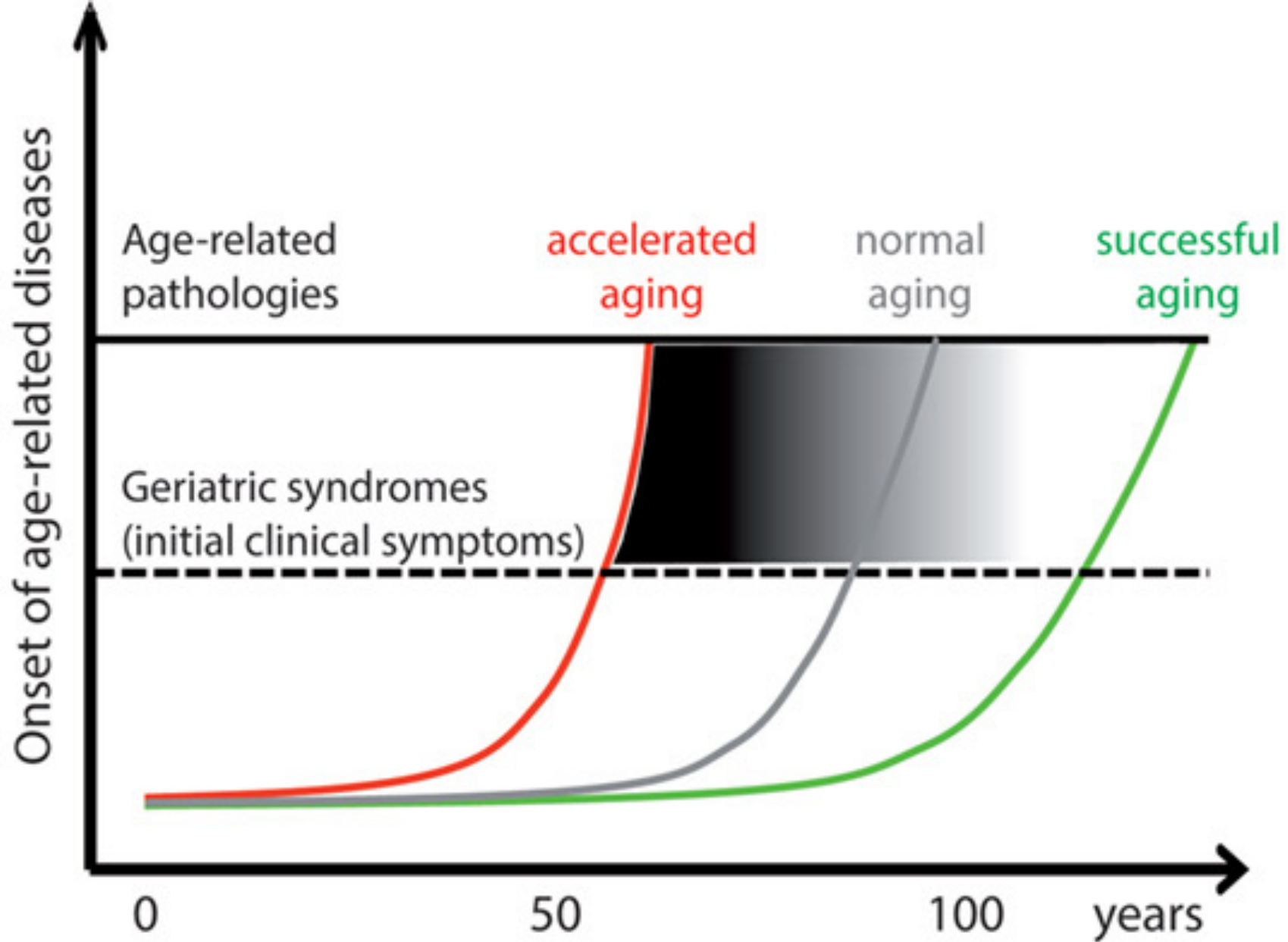
- Delayed processing speed
- Impaired memory and language
- Executive function decline

Physical

- Difficulties in daily activities
- Decreased balance and grip strength
- Mobility loss
- Frailty/sarcopenia

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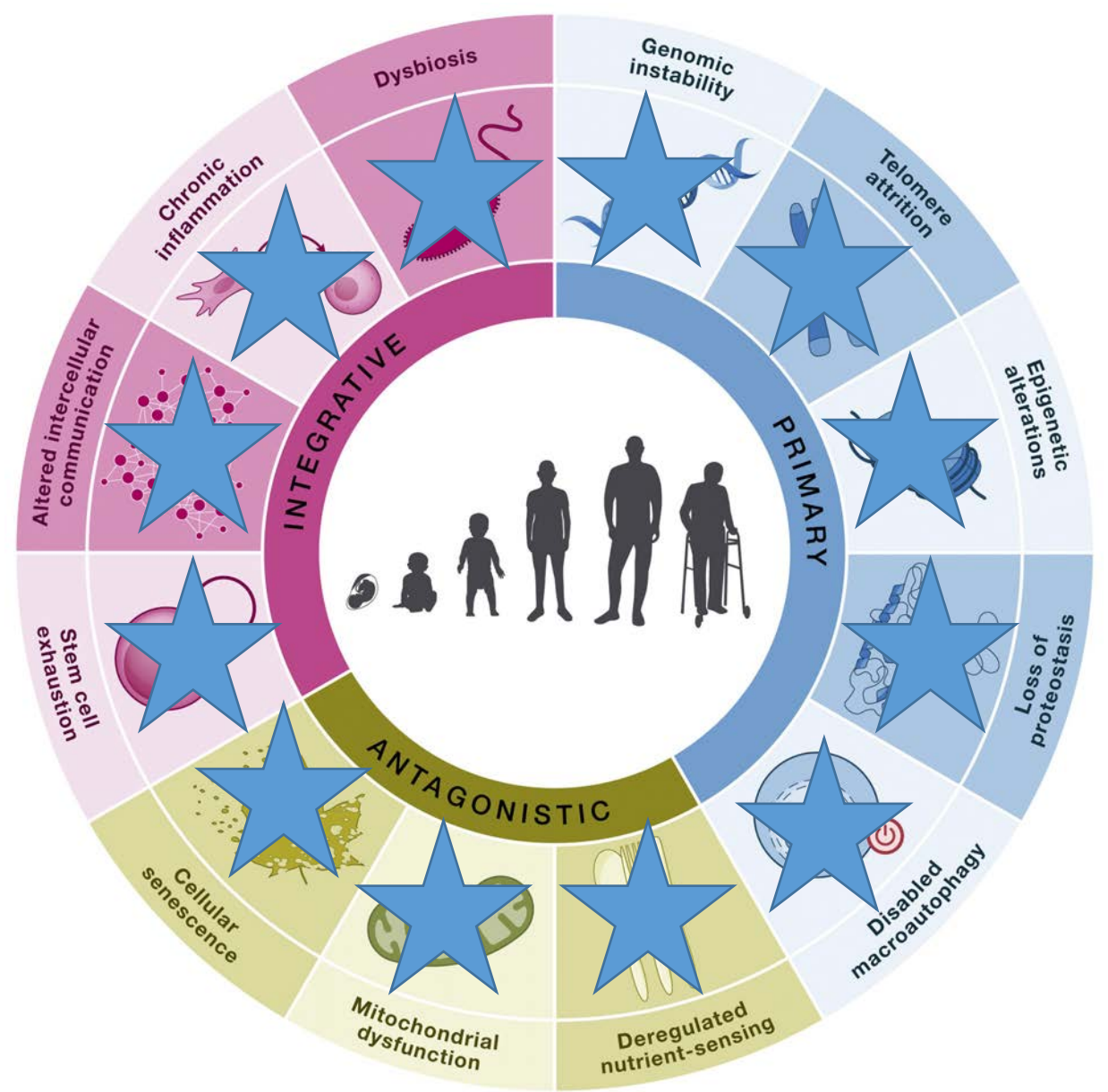




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Hallmarks of Aging



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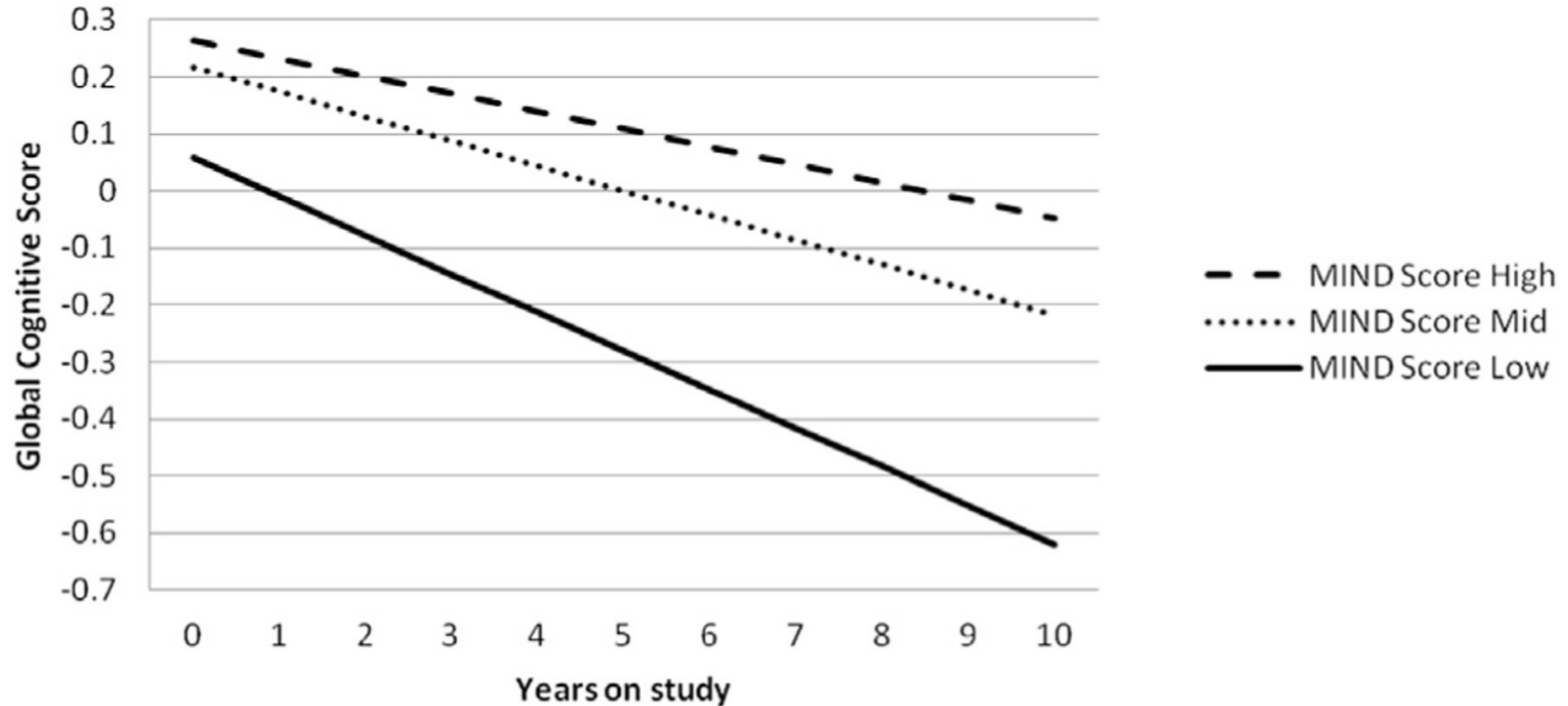




MEDITERRANEAN-DASH
INTERVENTION FOR
NEURODEGENERATIVE DELAY
(MIND) DIET

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Higher MIND diet score associated with slower decline in cognitive function



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Targets of the MIND Diet

<i>Foods to Eat</i>	<i>Recommended Serving</i>	<i>Foods to Limit</i>	<i>Serving Limitation</i>
Green leafy vegetables	½ - 1 cups / day	Red and processed meats	< 3 – 5 oz. / week
Other vegetables	½ cups / day	Butter and stick margarine	< 1 tsp / day
Nuts	5 oz. / week	Cheese (whole fat)	< 1 oz. / week
Berries	½ cups 5 times / week	Pastries, candy bars, sweets	< 4 servings / week
Beans/legumes	½ cups 3 times / week	Fried foods and fast food	< 1 meal / week
Whole grains	3 servings / day		
Fish (not fried)	3 – 5 oz. / week		
Poultry	3 – 5 oz. 2 times / week		
Extra virgin olive oil	2 tbsp / day		

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Quick Take: MIND Diet for Cognitive Decline

doi: 10.1056/NEJMdo007170

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Barnes LL., et al., N Eng J Med, (2023)

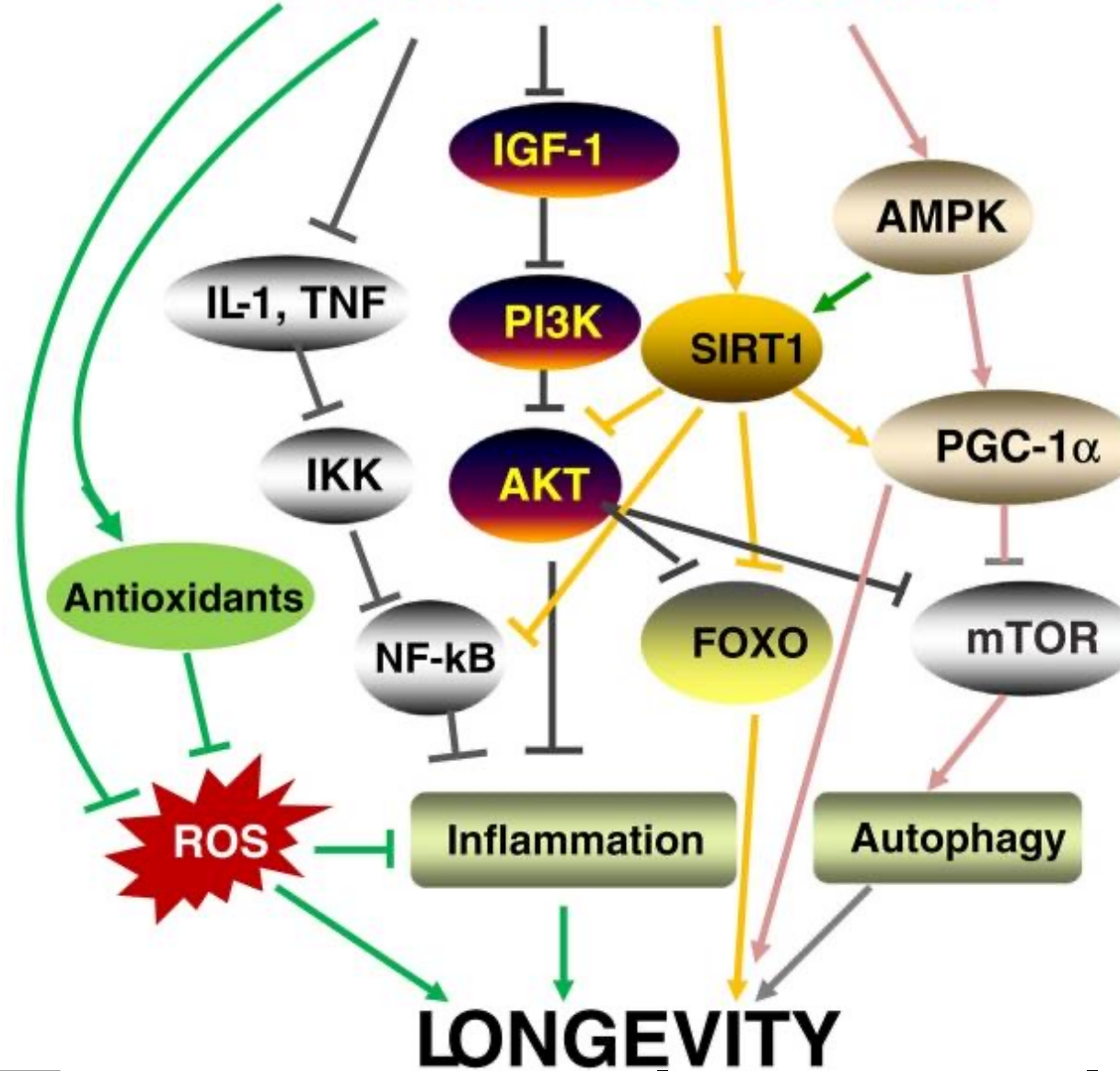
doi: 10.1056/NEJMoa2302368



ADD A VARIETY OF FRUITS AND VEGETABLES

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PHYTOCHEMICALS

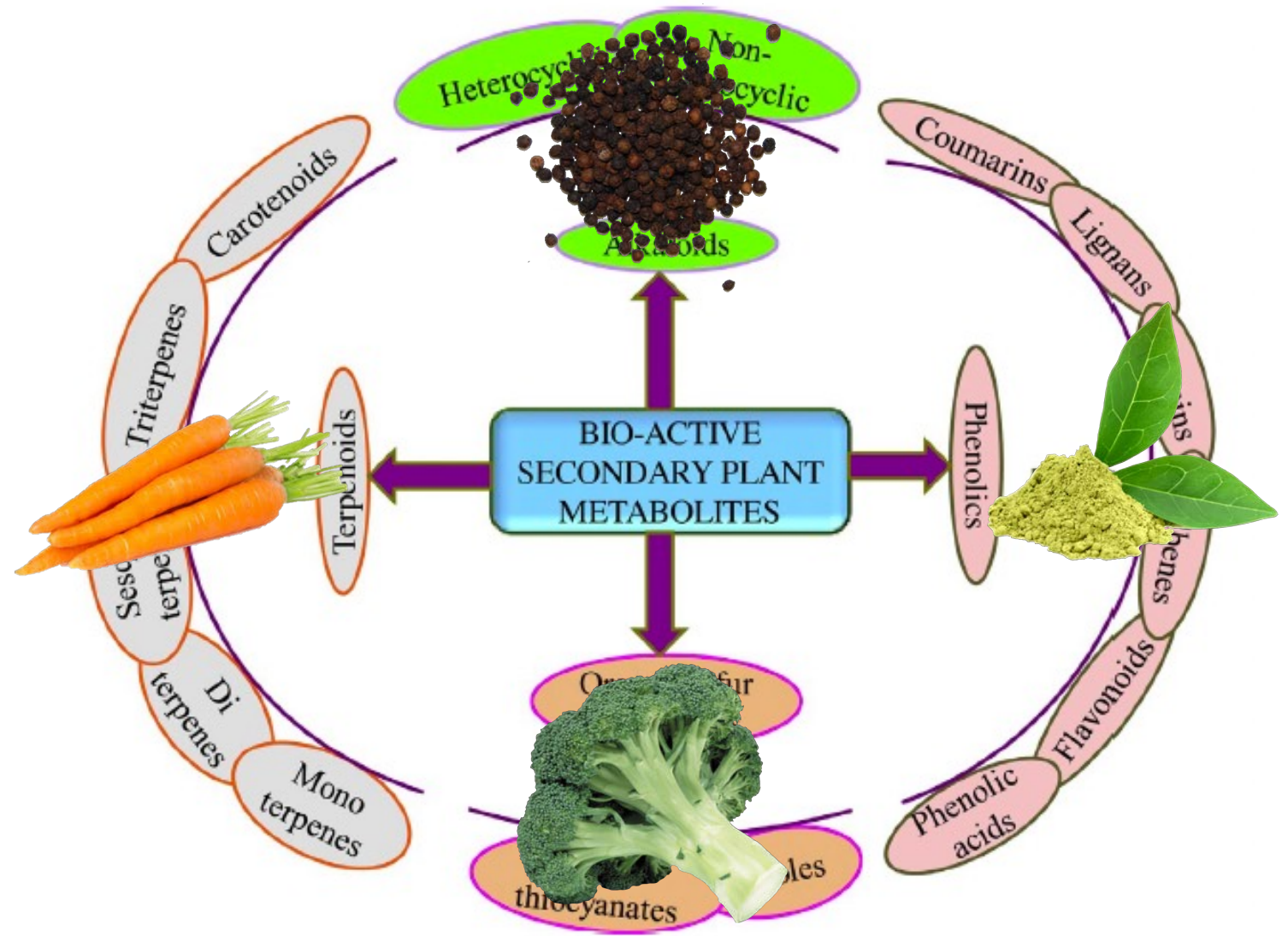


LONGEVITY

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Classes of Phyto-nutrients



Evidence of dietary supplements containing phytonutrients in humans remains limited

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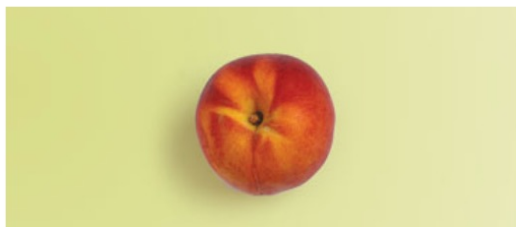


Rainbow-Hued Antioxidants

Blue & Purple	Anthocyanins/ Anthocyanidins	<i>Blackberries, Eggplant, Plums</i>
	Resveratrol	<i>Grapes, Mulberries, Lingonberries, Blueberries</i>
Green	Chlorophyll	<i>Spinach, Collard Greens, Parsley, Celery, Arugula</i>
	Isothiocyanates	<i>Broccoli, Brussels Sprouts, Boy Choy, Kale, Cabbage</i>
	Isoflavones	<i>Green Peas, Soybeans, Lima Beans, Green Lentils</i>
Orange & Yellow	Beta-carotene	<i>Carrots, Pumpkins, Sweet Potatoes, Cantaloupe</i>
	Quercetin	<i>Apples, Broccoli, Cherries, Grapes, Onion</i>
	Lutein/ Zeaxanthin	<i>Corn, Tangerines, Peppers, Papayas, Grapefruit</i>
	Hesperidin/ Limonene	<i>Lemons, Oranges, Mandarins</i>
Red	Lycopene	<i>Watermelon, Tomato, Guava, Red Bell Peppers</i>
	Anthocyanins/ Betalains	<i>Raspberries, Radishes, Beets, Dragon Fruit, Prickly Pear</i>
	Ellagic Acid	<i>Strawberries, Cranberries, Pomegranates, Cherries</i>
Tan & White	Anthoxanthins	<i>Potatoes, Mushrooms, Cauliflower, Parsnips</i>
	Allicin	<i>Garlic, Onion, Leeks, Shallots</i>

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1 small piece fruit, such as a 2-inch peach or large plum



1/4 cup dried fruit



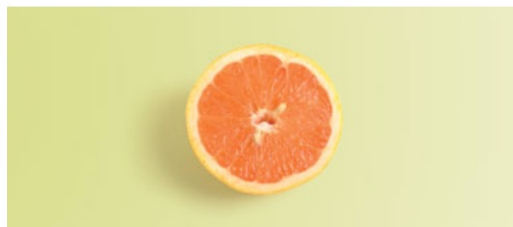
1 cup uncooked spinach



6 baby carrots



1/2 cup 100% orange juice



1/2 medium grapefruit



1/2 cup broccoli florets



1/2 large (3-inch diameter, 3-3/4 inch long) red pepper



1/8 medium cantaloupe



1/2 cup grapes



1/2 cup cooked kidney beans



1/2 cup cooked green beans

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Food Combos: Synergistic Bioavailability

Turmeric + Black Pepper	Tomato + Garlic	Olive Oil + Sweet Potato	Orange + Kale
Lemon + Green Tea	Almonds + Apples	Rosemary + Red Meats	Strawberries + Spinach
Garbanzo Bean + Beet Root	Raspberry + Chocolate	Milk + Coffee	Salmon + Broccoli

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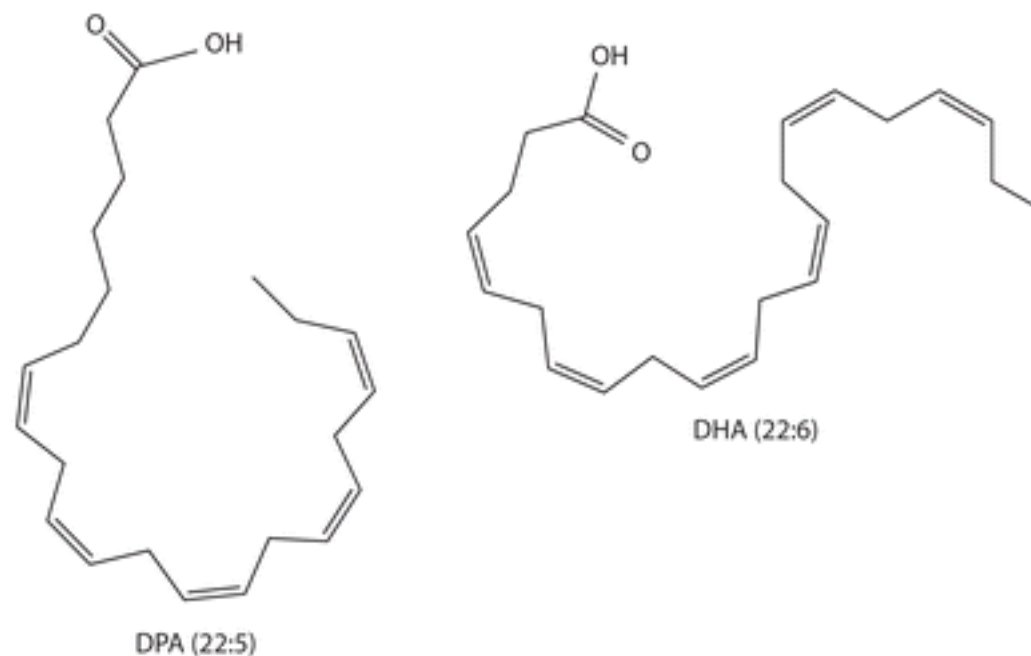
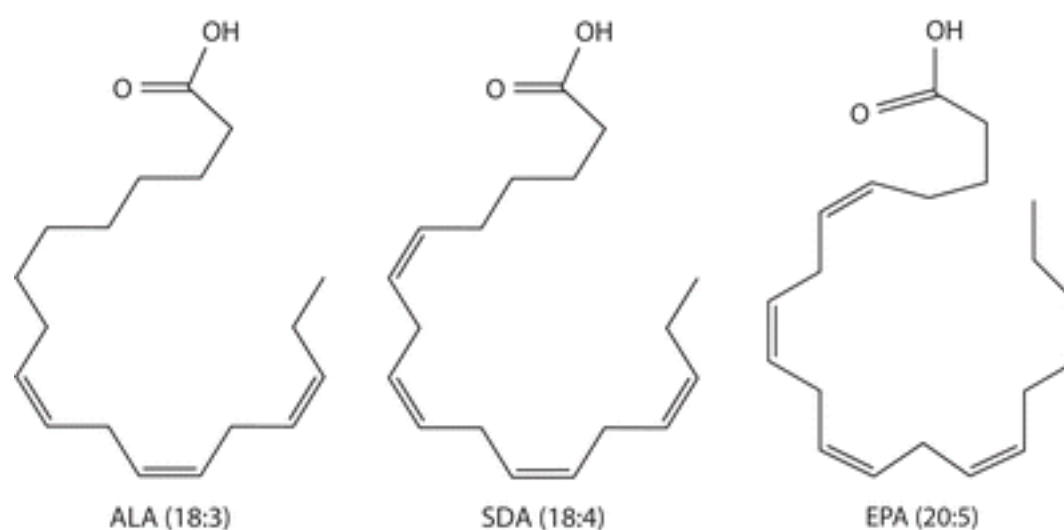




INCREASE BENEFICIAL FATS

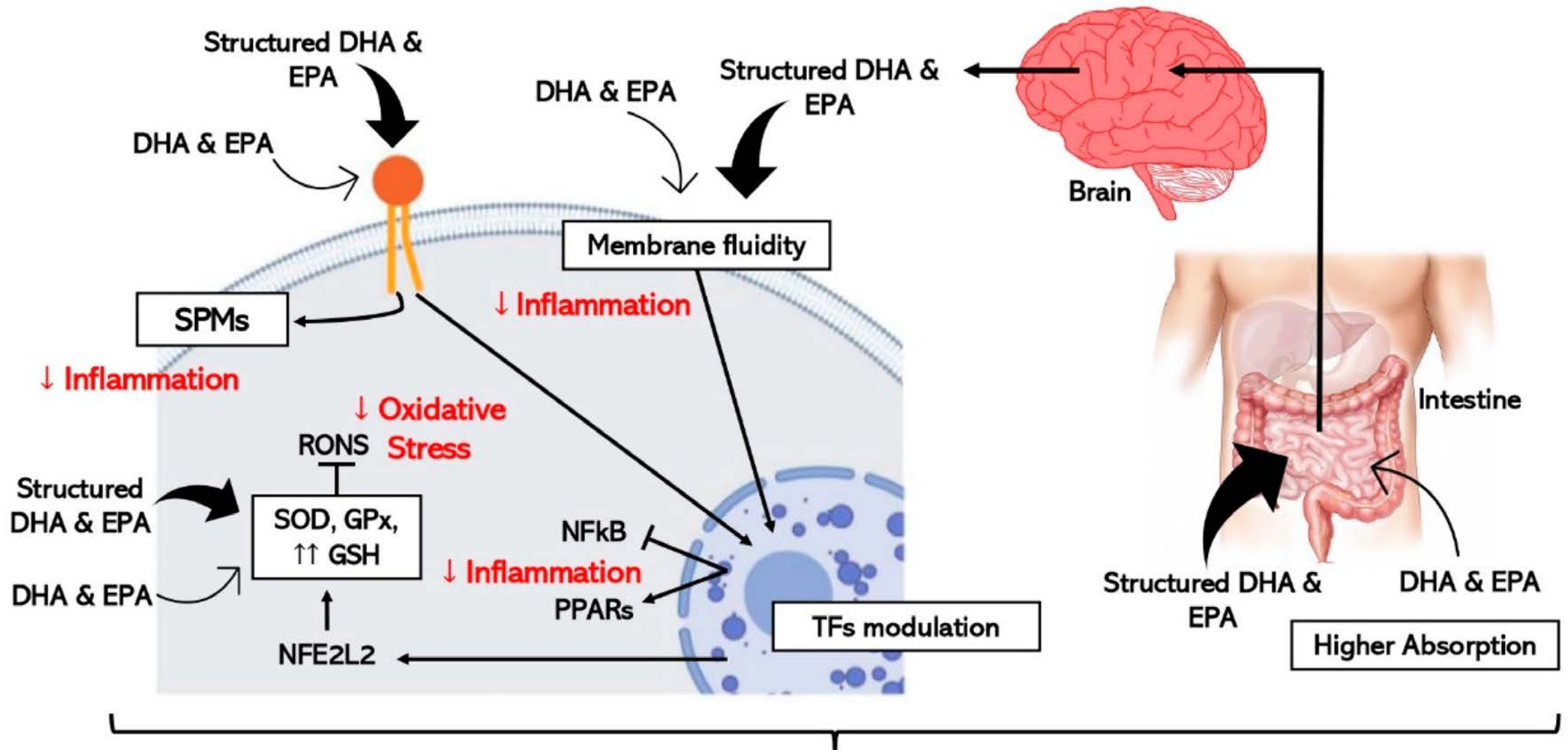
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Omega-3 Fatty Acids



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↓ Neuroinflammation
 ↑ Cognitive functions

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1/2 medium avocado has 3
teaspoons of oil



4 large ripe olives have 1/2
teaspoon of oil



1 tablespoon of peanut butter
has 2 teaspoons of oil

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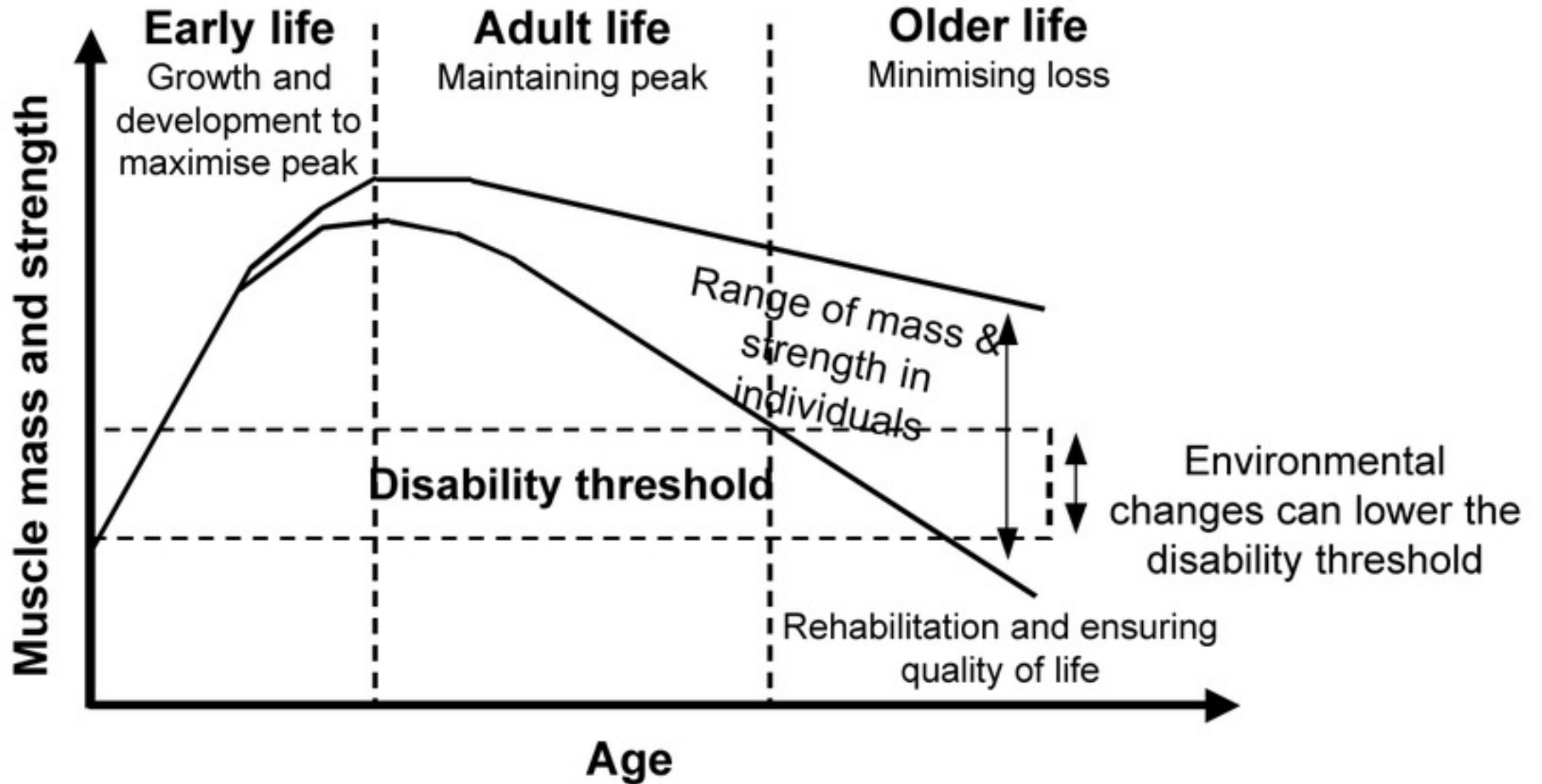
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Image source: <https://nia.nih.gov>

A top-down view of various protein-rich foods arranged on a light blue wooden surface. The items include: a bowl of white beans, a bowl of white cubed tofu, a bowl of red quinoa, a bowl of yellow quinoa, a bowl of green peas, a bowl of green edamame, a wooden tray with six brown eggs, a wooden cutting board with salmon fillets, white cheese slices, and a piece of red meat, a bowl of white yogurt, a bowl of dark lentils, and a small glass dish with yellow liquid. The text "SELECT LEAN PROTEINS" is overlaid in white, bold, sans-serif font across the center of the image.

SELECT LEAN PROTEINS

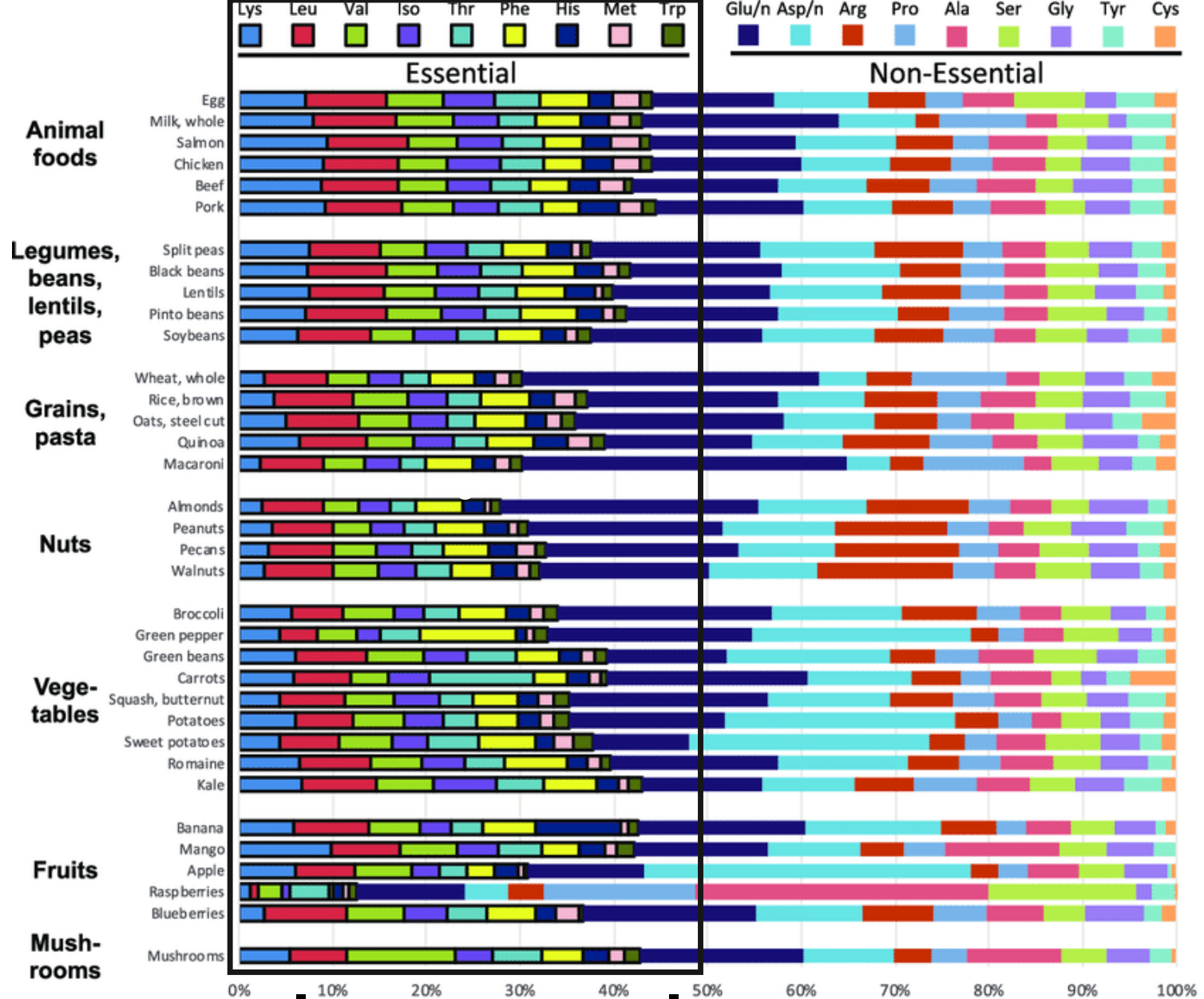
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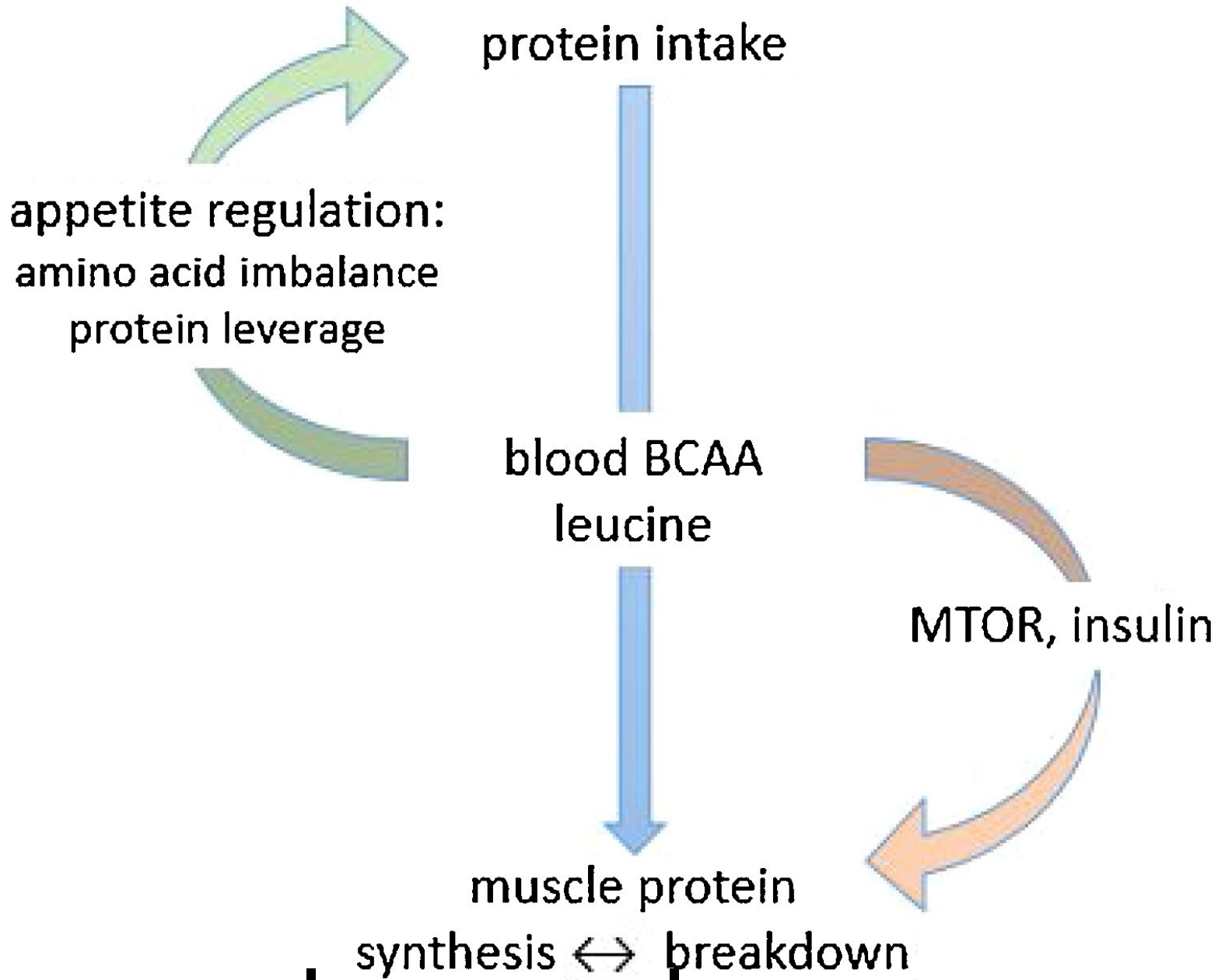
Essential Amino Acids



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BCAAs*



*Isoleucine, Leucine, Valine

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Complete Proteins

Fish	Poultry	Milk	Eggs
Quinoa	Buckwheat	Chia Seed	Hemp Seed
Soy	Brown Rice + Black Beans	Oatmeal + Peanut Butter	Garbanzo + Sesame

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1/2 ounce nuts (12 almonds, 24 pistachios, or 7 walnut halves)



1 tablespoon peanut butter



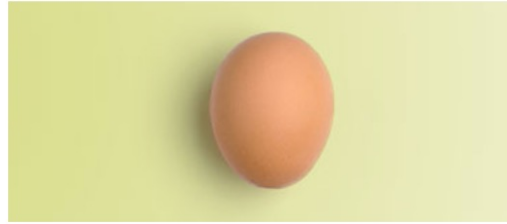
1 cup yogurt



1-1/2 ounces hard cheese, such as cheddar, mozzarella, Swiss, or Parmesan



1/4 cup tofu



1 egg



1 cup milk or calcium-fortified soy beverage



2 cups cottage cheese



2 tablespoons hummus



1/2 cup split pea, lentil, or other bean soup



1/3 cup shredded cheese



1 cup pudding made with milk

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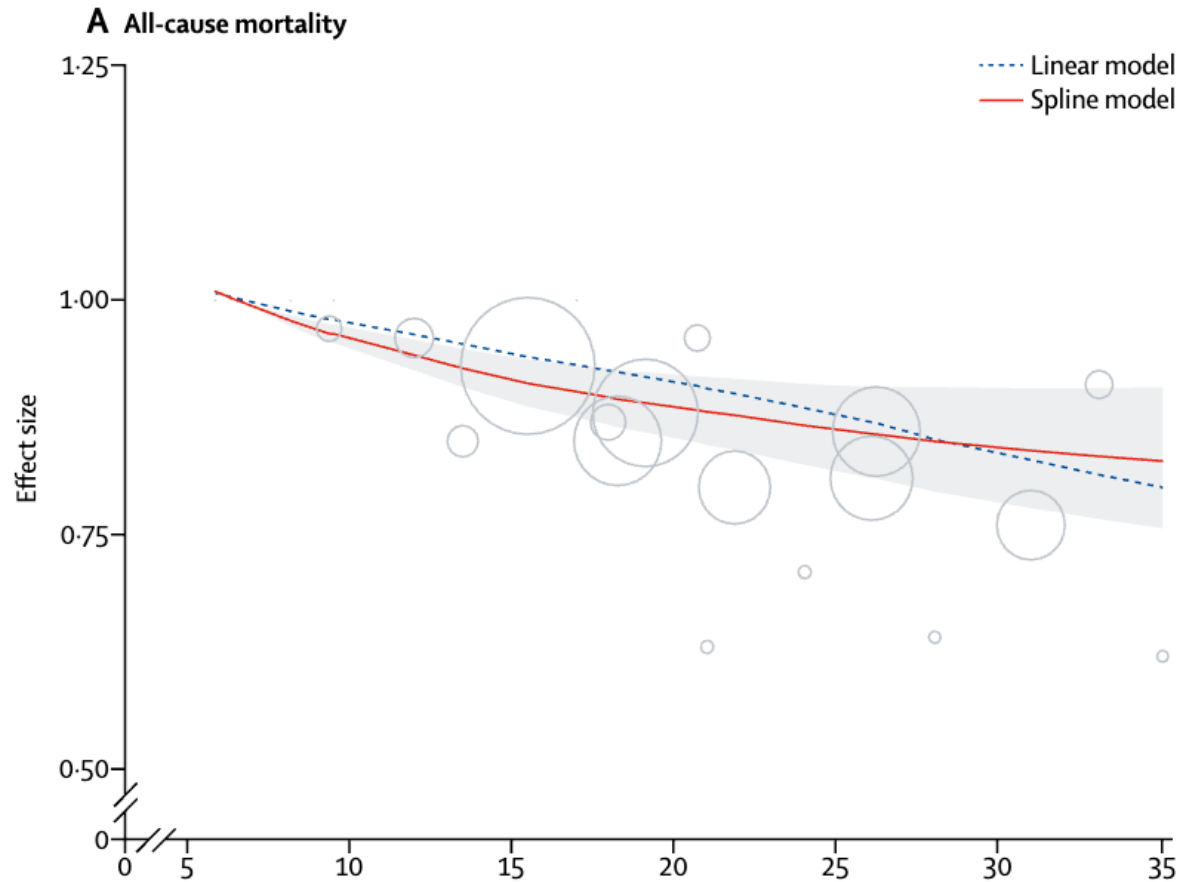
Image source: <https://nia.nih.gov>



CHOOSE WHOLE GRAINS

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Dietary Fiber



Adequate Daily Intake for Fiber		
Age	Men	Women
31-50 years	38 grams	25 grams
51-70 years	30 grams	21 grams
71+ years	30 grams	21 grams

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Individual age-related changes and the gut microbiome

Gut Microbiome

Social and societal influences on the microbiome of older people

- Human contact
- Extended family
- Visitors
- Aloneness
- Household pets
- Accommodation: home or residential care
- Life indoors

Altered nutrient intake
↓ Smell and taste
↓ Dentition

• Difficulty swallowing
• Disturbed peristalsis

Achlorhydria

↓ Digestive enzymes
↓ Mucosal immunity
↓ Colonic motility

Age-related disease affecting the microbiome

- ↑ Infections
- ↑ Antibiotic usage
- ↑ Polypharmacy
- ↑ Comorbidities

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Prebiotics & Probiotics

PREBIOTIC

- Carbohydrates which are resistant to digestion process and are fermented in the colon
- Found in foods and supplements
- Consist of both soluble and insoluble fiber types

PROBIOTIC

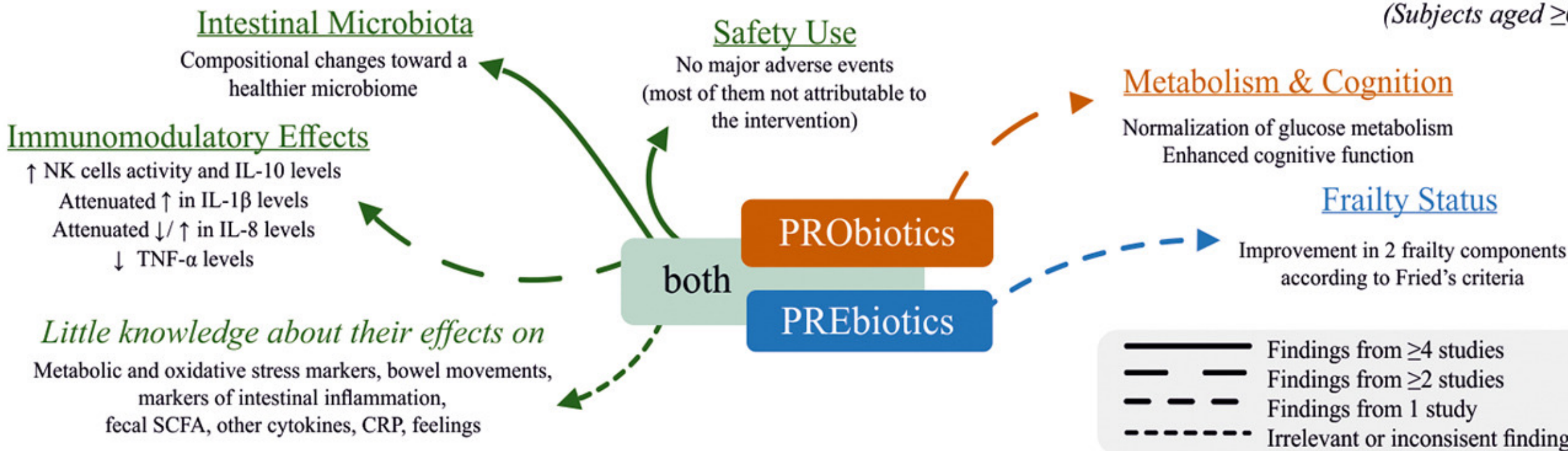
- Microorganisms (live bacteria and yeast) that ferment fibers in the colon
- Found in foods that are naturally fermented and supplements

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Impact of probiotics and prebiotics in the modulation of the aging process



Evidence of dietary supplements containing prebiotics and probiotics in humans remains limited

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1 slice bread



1 small (2-1/2-inch diameter)
muffin



1 cup breakfast cereal (flakes,
rounds, or puffed)



1/2 cup cooked cereal, rice, or
pasta



3 cups popcorn



1 small (6-inch diameter) corn or
flour tortilla

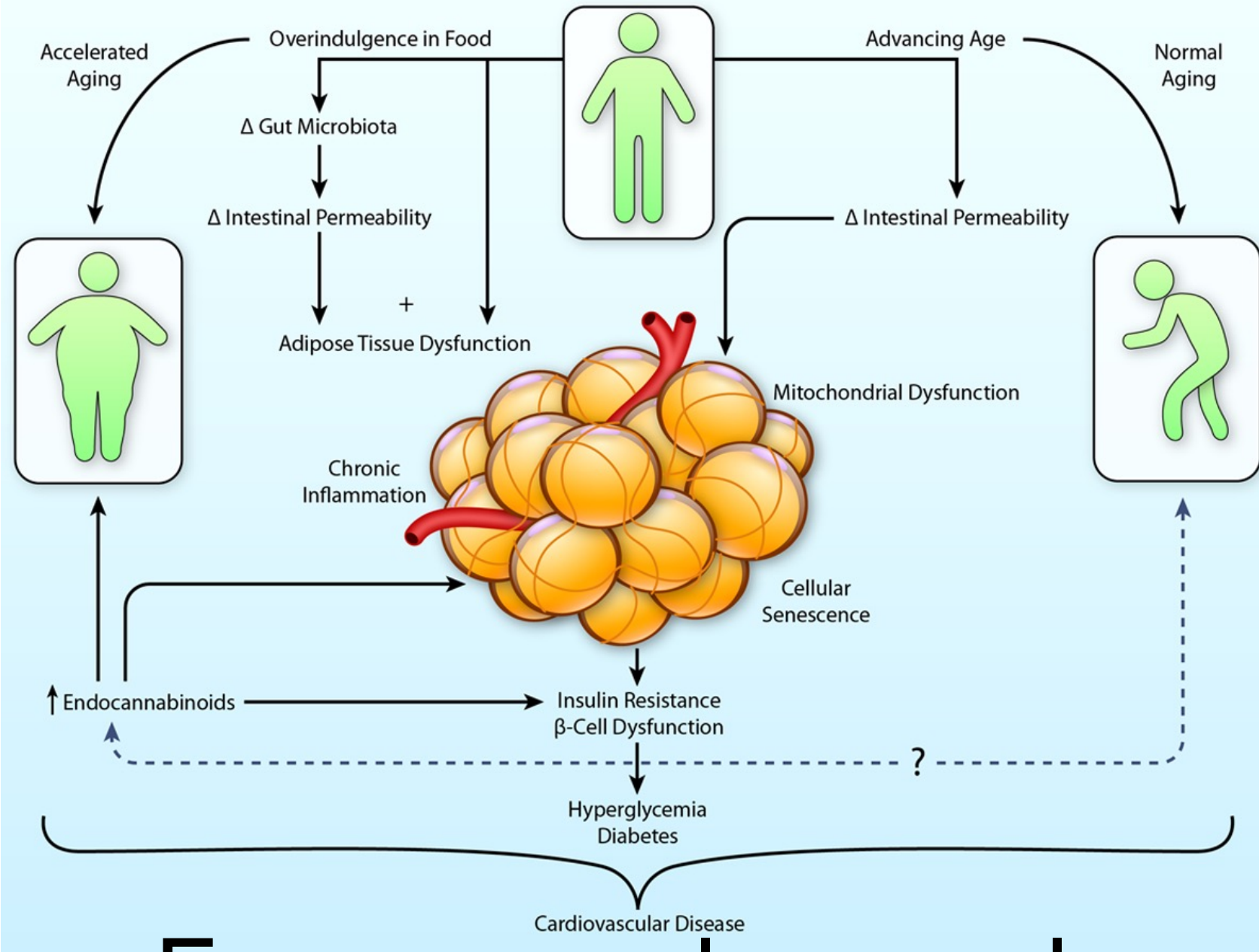
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A collection of various processed foods including cookies, gummy candies, chocolate, and cereal. The image is overlaid with a semi-transparent dark blue filter. The text "LIMIT PROCESSED FOODS" is centered in white, and "For personal use only" is at the bottom in black.

LIMIT PROCESSED FOODS

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Servings per container =
number of portions in one
package

Calories = amount of
energy contained in 1
serving, which is 2/3 cup
in this case

Total Carbohydrate
encompasses grams of
carbs from dietary fiber &
total sugar (which includes
added sugar)

Total Sugar encompasses
grams of added sugars
too. Total sugar - added
sugar = grams of natural
sugar

Nutrition Facts	
8 servings per container	
Serving size 2/3 cup (55g)	
Amount per serving	
Calories 230	
	% Daily Value*
Total Fat 8g	10%
Saturated Fat 1g	5%
Trans Fat 0g	
Cholesterol 0mg	0%
Sodium 160mg	7%
Total Carbohydrate 37g	13%
Dietary Fiber 4g	14%
Total Sugars 12g	
Includes 10g Added Sugars	20%
Protein 3g	
Vitamin D 2mcg	10%
Calcium 260mg	20%
Iron 8mg	45%
Potassium 235mg	6%

* The % Daily Value (DV) tells you how much a nutrient in a serving of food contributes to a daily diet. 2,000 calories a day is used for general nutrition advice.

Serving size = portion of food
containing quantity of
nutrients listed below

The % Daily Values are
reference amounts for
someone eating 2000
calories per day. In this
example, 8 grams of fat is
10% of the fat needed by
that person for the entire
day.

Sodium = salt. Look for
140 mg or less for a low-
sodium food. Pay attention
to % on the right for a
good estimate of how
much sodium you'll have
left for the day if you eat
this food.

Vitamins & Minerals listed are
the main nutrients of national
concern

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Image source: AZ Dietitians

A group of diverse elderly people are gathered around a dining table in a bright, modern kitchen. They are engaged in conversation and eating. The table is set with various dishes, including bread, salads, and fruits. The atmosphere is warm and social. The text "MAKE EATING A SOCIAL EVENT" is overlaid in large, white, bold letters across the center of the image.

MAKE EATING A SOCIAL EVENT

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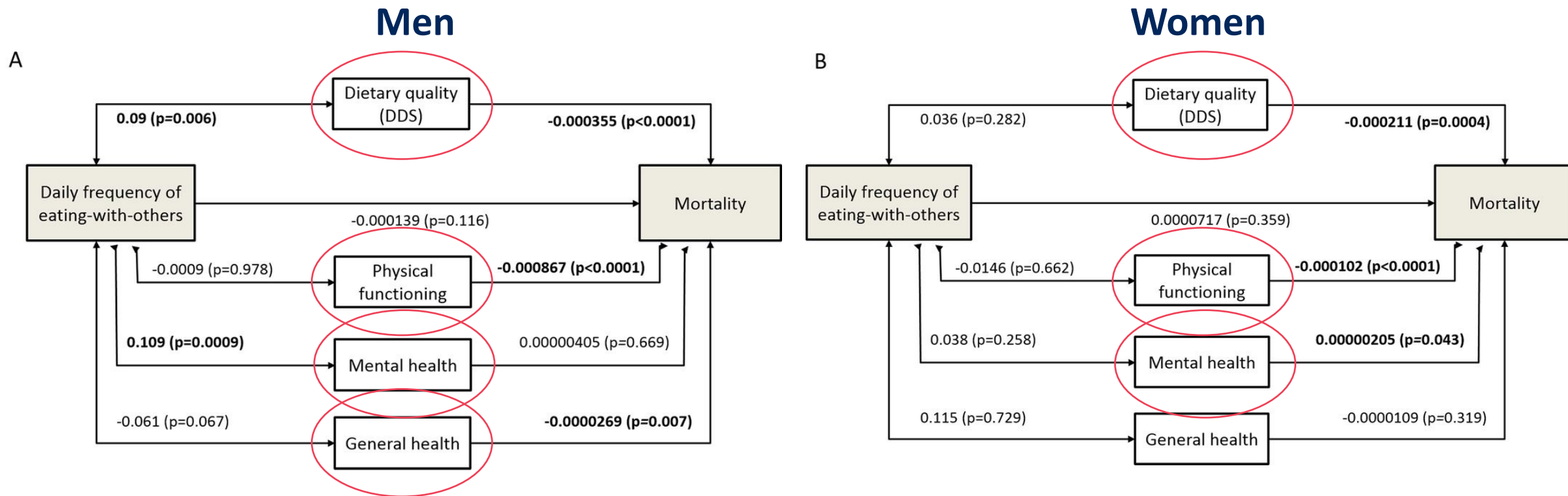
Blue Zones



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Eating With Others Promotes Longevity



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Following a Balanced Eating Pattern at Any Age

A healthy eating pattern includes:

- Foods that are high in vitamins, minerals, and phytonutrients
- A variety of fruits and vegetables—dark green, red, and orange
- Fiber from legumes, whole grains, and more
- Lean proteins and unsaturated fats
- Sharing meals with others

A healthy eating pattern limits:

- Sugar-added foods
- Highly processed foods

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”

Eat food

Not too much

“ Mostly plants

For personal use only -Michael Pollan

THANK YOU!

Let's stay connected:

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College of Nursing

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