

FOOD AS MEDICINE:

The Evidence Underlying the
Transformational Power of a Whole-
Food Plant-Based Diet

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Disclosures

- The speaker does not have a conflict of interest in this topic, other than he uses the treatment discussed to help prevent, treat, and sometimes reverse chronic disease, including his own.
- There is no commercial support for this lecture .



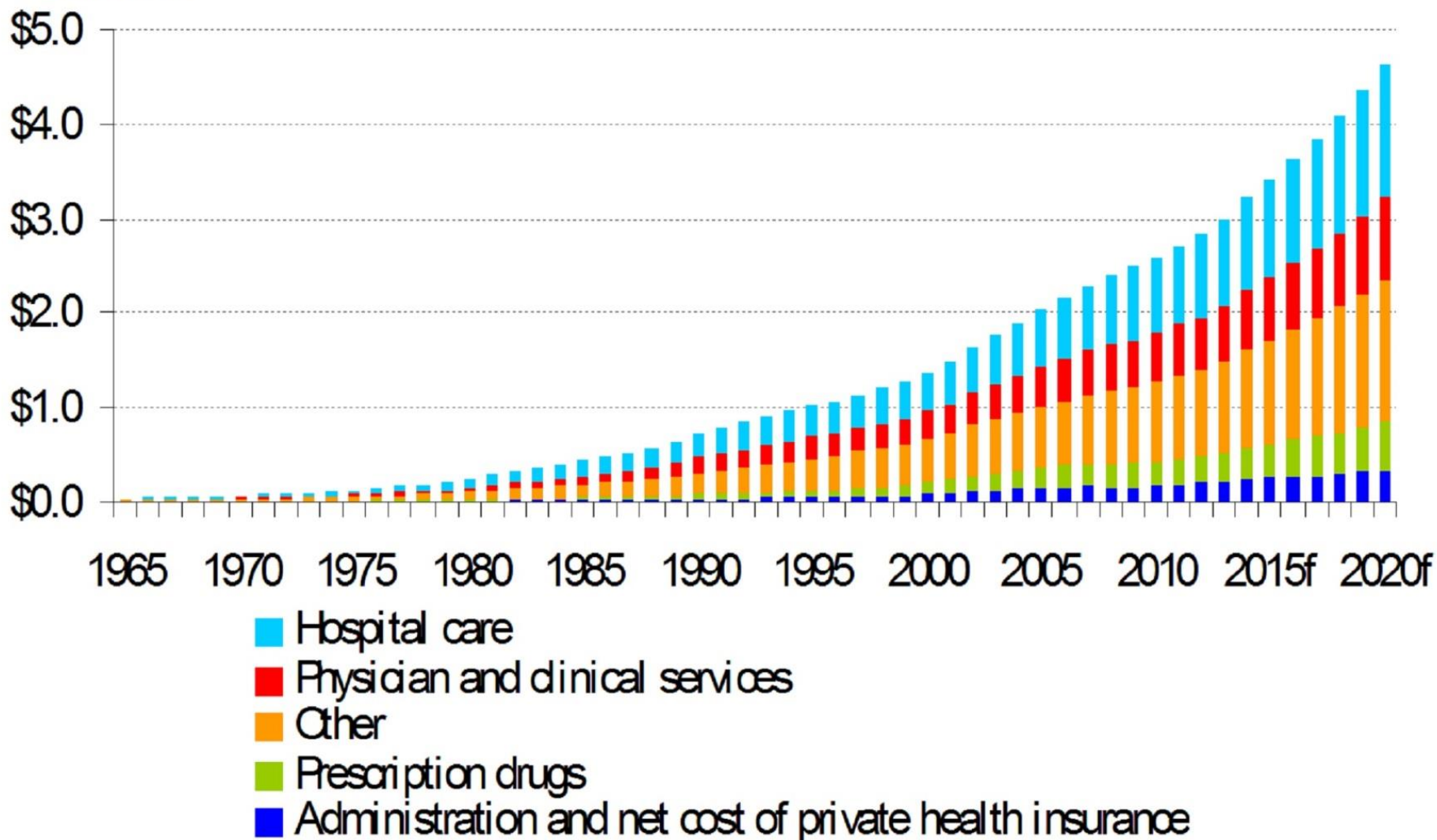
NUTRITION EDUCATION

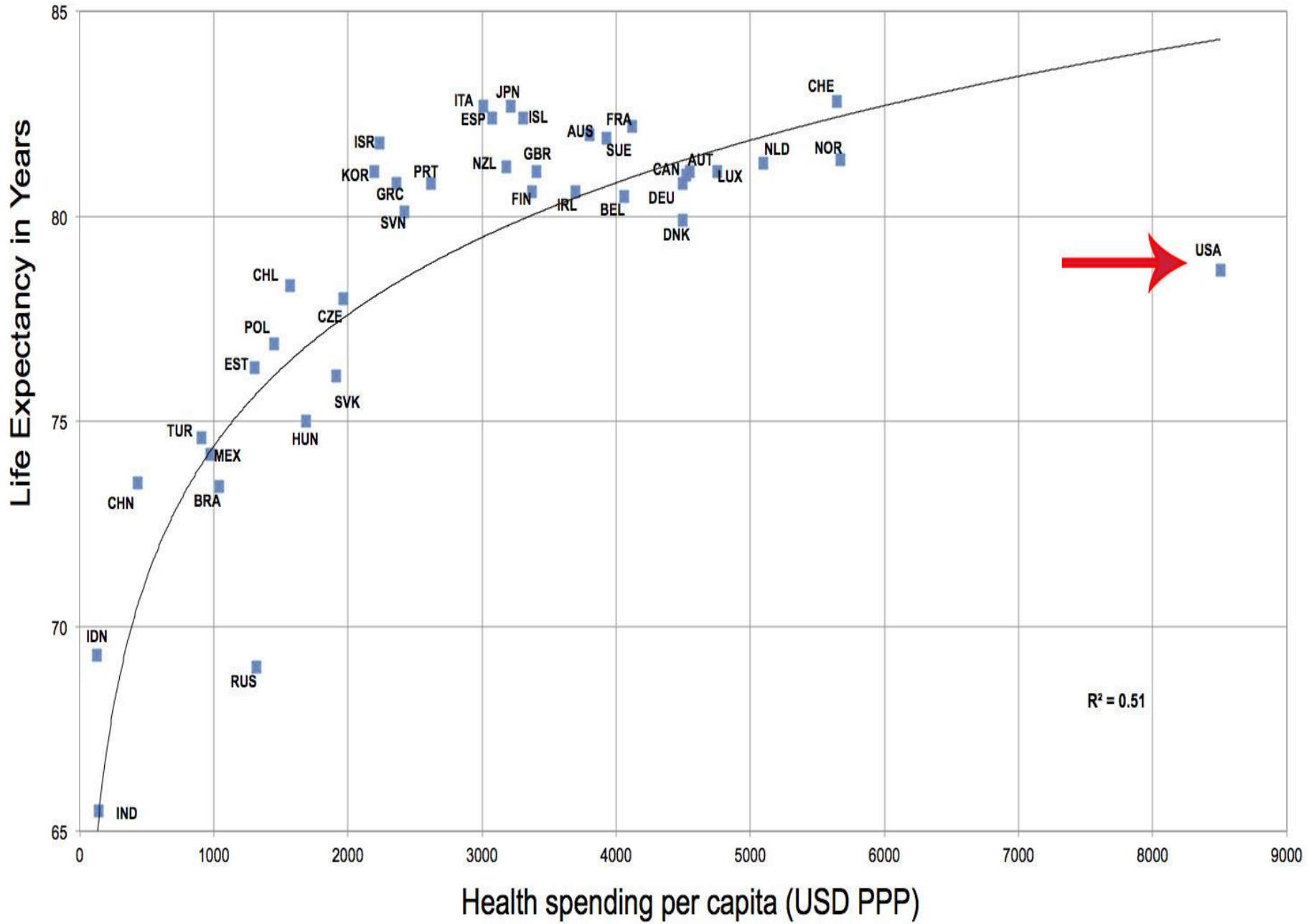
- **71% med schools fail** to provide the recommended minimum 25 hours of nutrition education
- **36%** provide **less than half** that much
- Average of **14.3 hours**

- **94 %** of physicians feel that nutrition counseling should be part of primary care visits
- **14 % feel qualified** to offer it
- **31% reported difficulty** counseling patients on a health behavior that they struggle with themselves
- Physician counseled patients in **20-25% of visits**

Annual U.S. Expenditures on Healthcare

Trillions

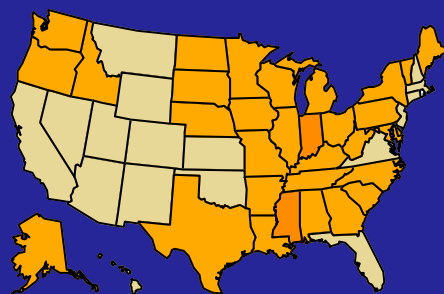




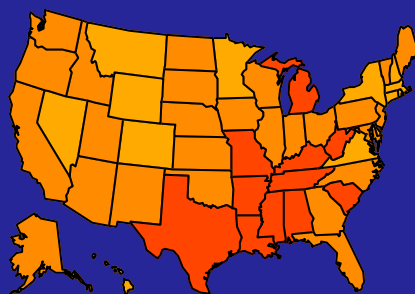
AGE-ADJUSTED PREVALENCE OF OBESITY AND DIAGNOSED TYPE 2 DIABETES AMONG US ADULTS

Obesity (BMI ≥ 30 kg/m²)

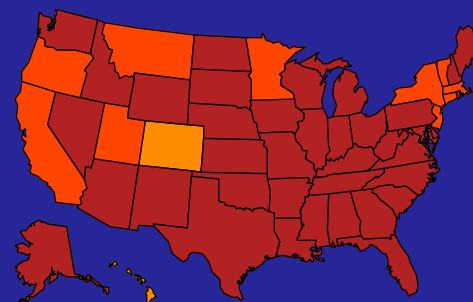
1994



2000



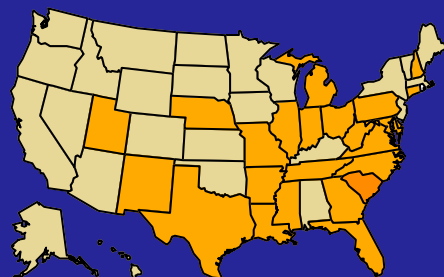
2013



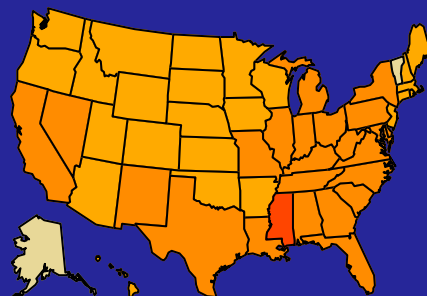
No Data
 <14.0%
 14.0%–17.9%
 18.0%–21.9%
 22.0%–25.9%
 $\geq 26.0\%$

Diabetes

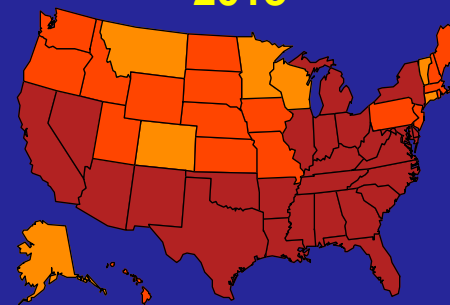
1994



2000



2013



No Data
 <4.5%
 4.5%–5.9%
 6.0%–7.4%
 7.5%–8.9%
 $\geq 9.0\%$

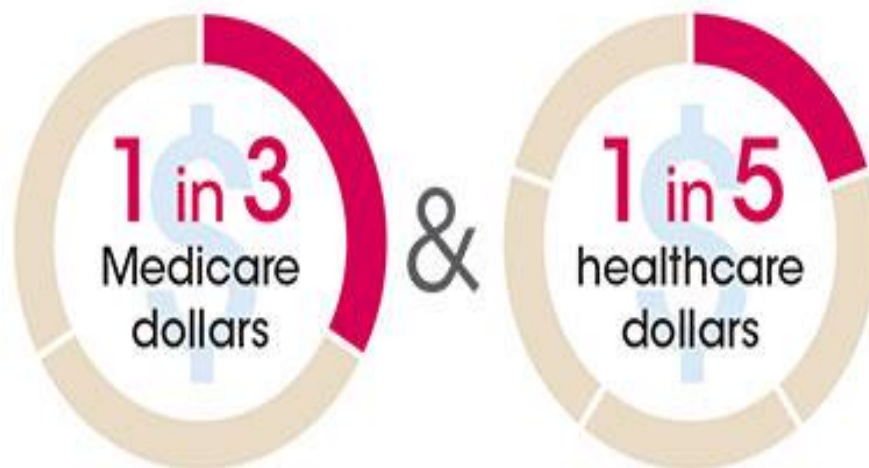


BY THE NUMBERS:

THE COST OF DIABETES

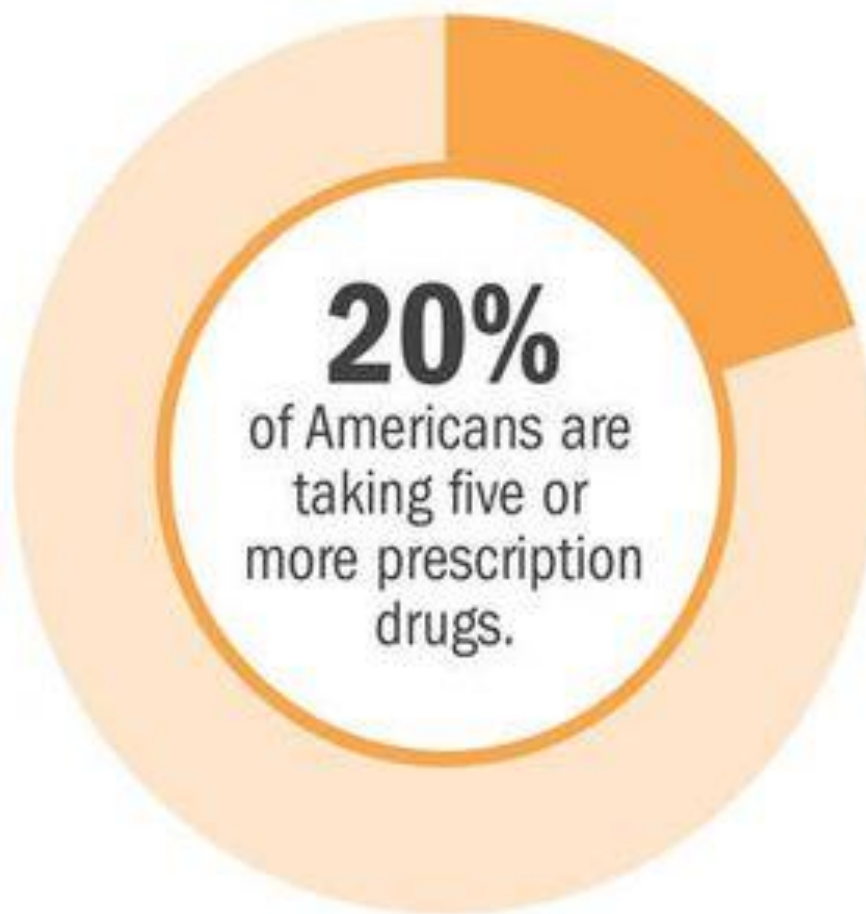
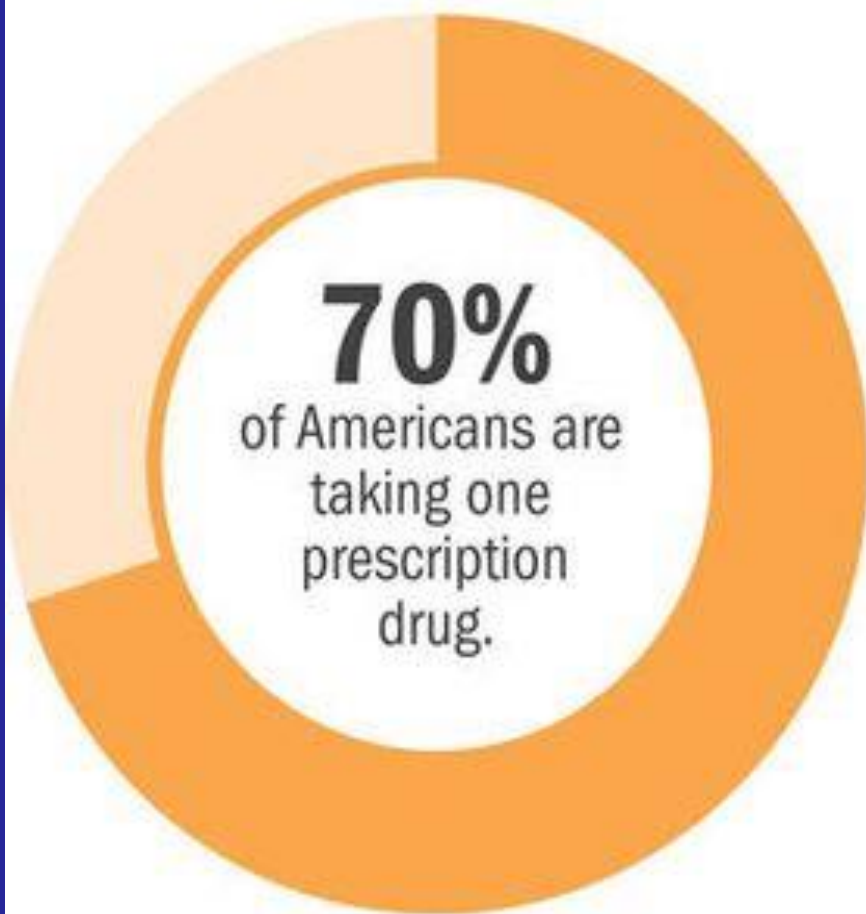
Diabetes and pre-diabetes
cost America

\$322
billion annually

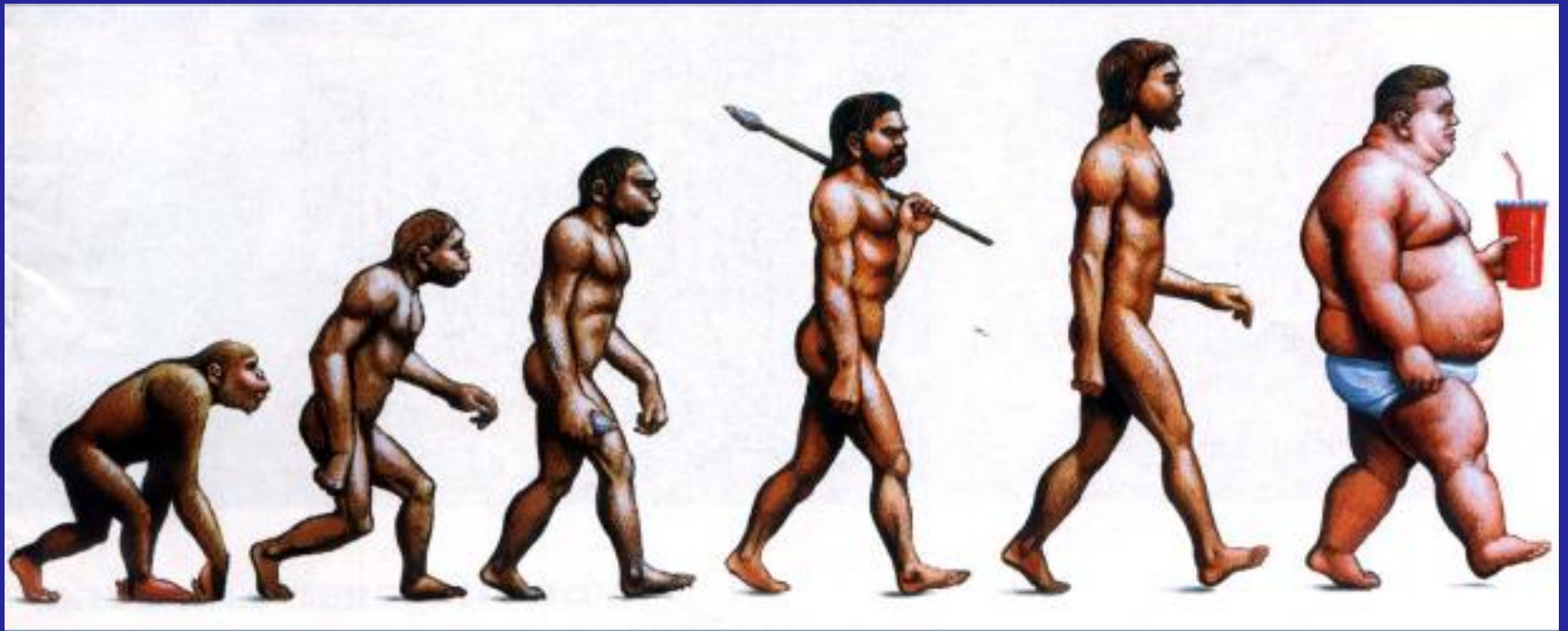


are spent caring for people living
with diabetes in the U.S.

AMERICA'S PRESCRIPTION DRUG USE

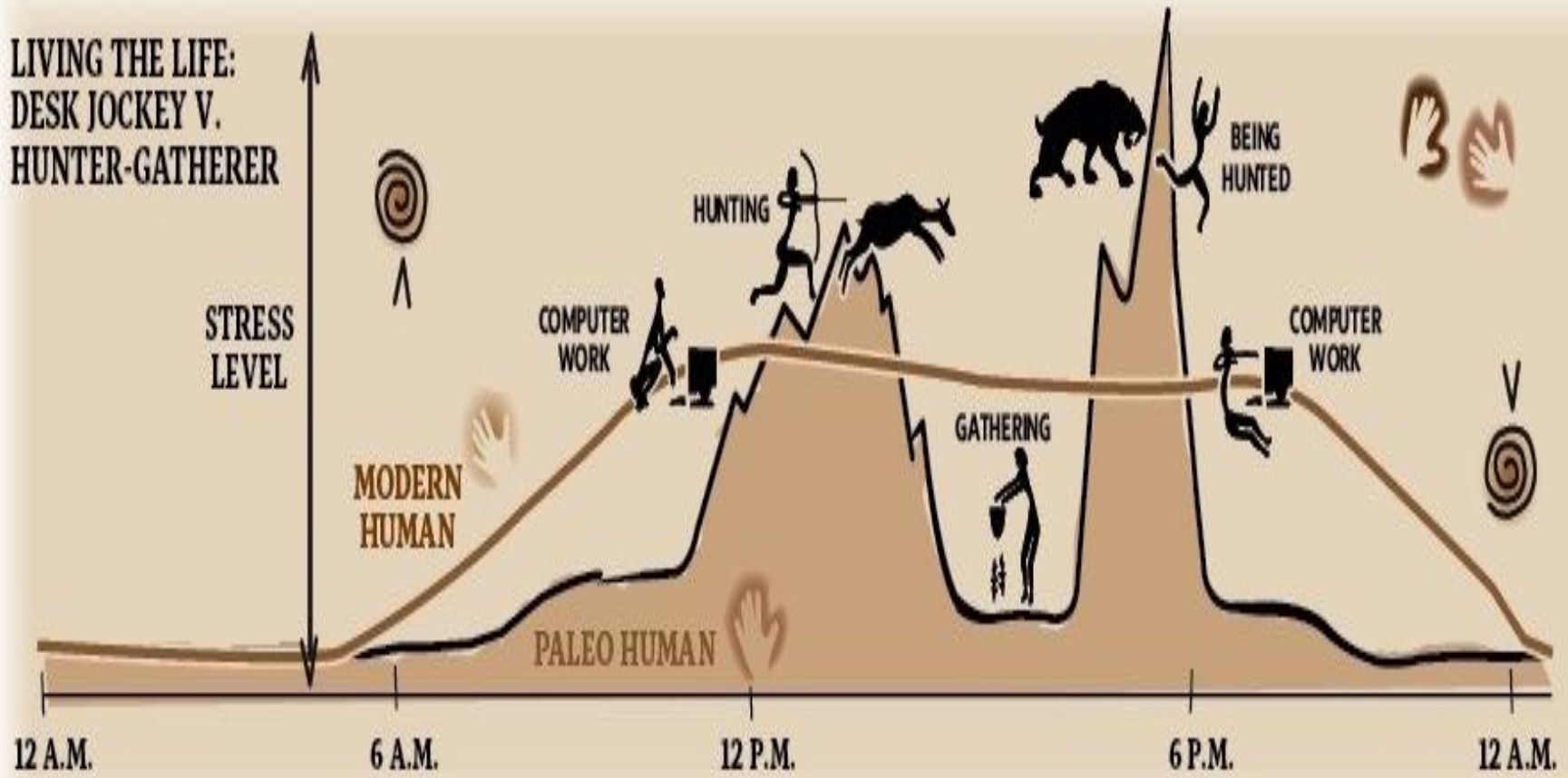


SOURCE: MAYO CLINIC STUDY



OUR EVOLUTIONARY HERITAGE

LIVING THE LIFE:
DESK JOCKEY V.
HUNTER-GATHERER



“If there is any deficiency of food or exercise,
the body will fall sick.”

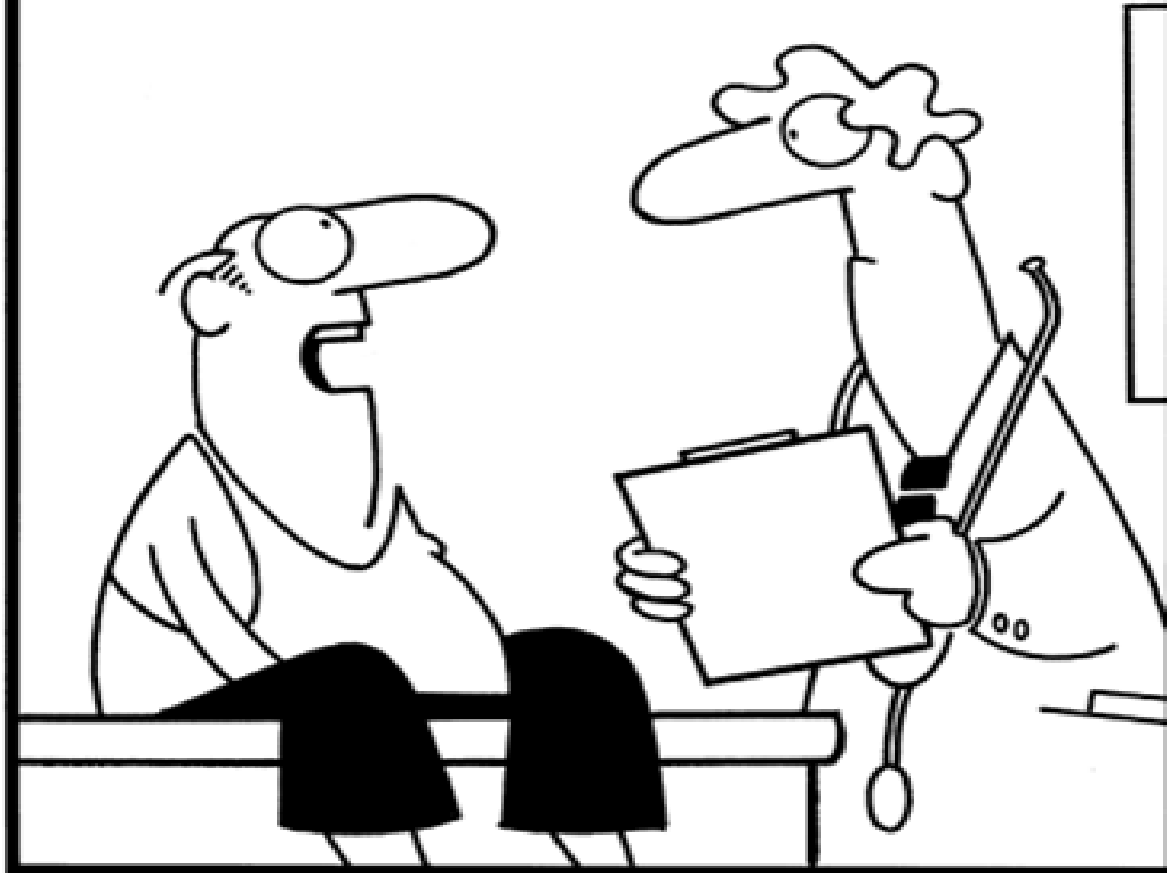
Hippocrates, 5 century BC

Healthy Lifestyle PREVENTS

- **80%** heart disease and stroke
- **80%** of type 2 diabetes
- **40%** of cancer

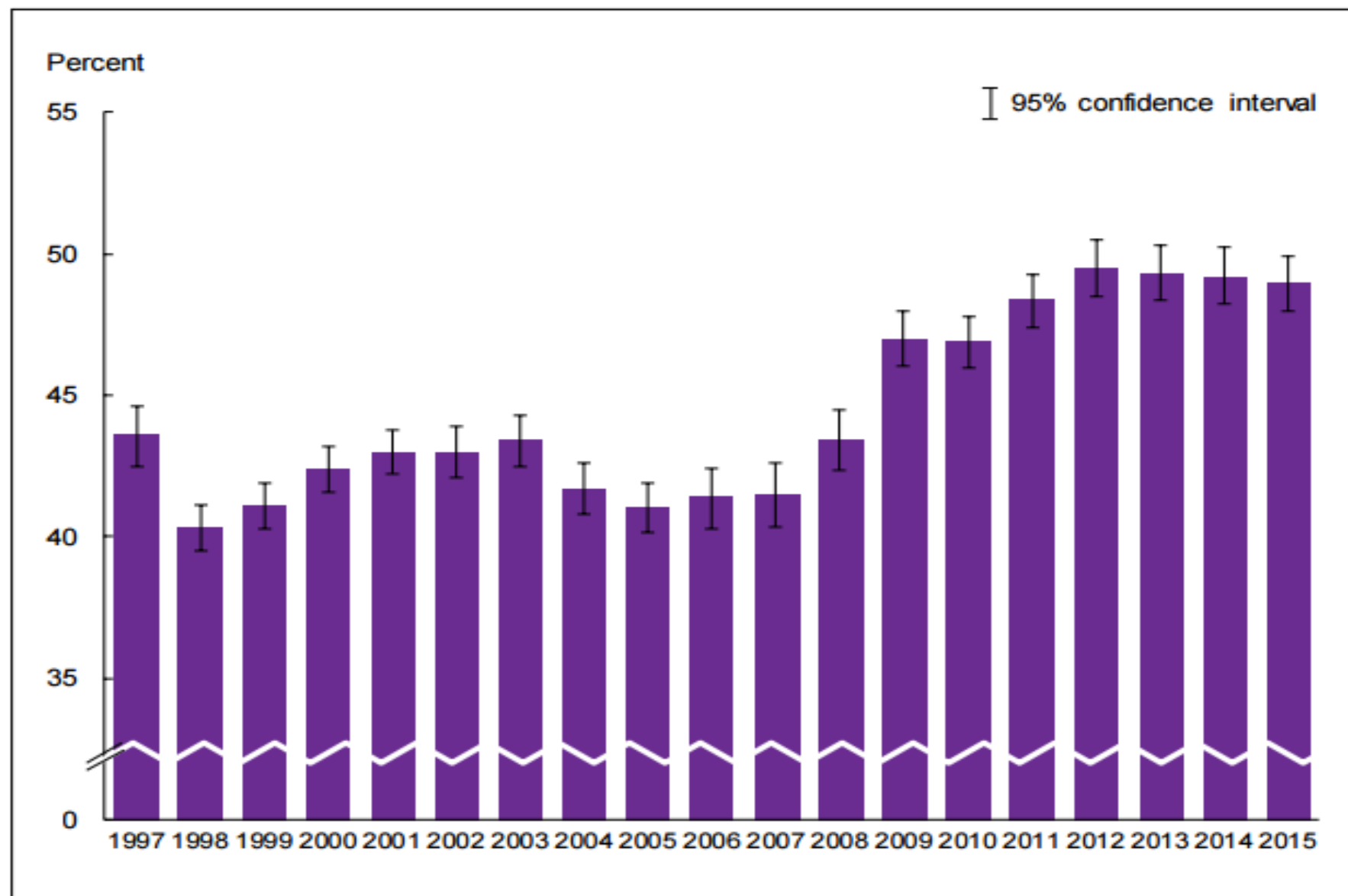
GLASBERGEN

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www.glasbergen.com



**“Stop smoking, quit drinking, eat less,
exercise more! Are you some kind
of health nut?”**

Figure 7.1. Percentage of adults aged 18 and over who met 2008 federal physical activity guidelines for aerobic activity through leisure-time aerobic activity: United States, 1997–2015

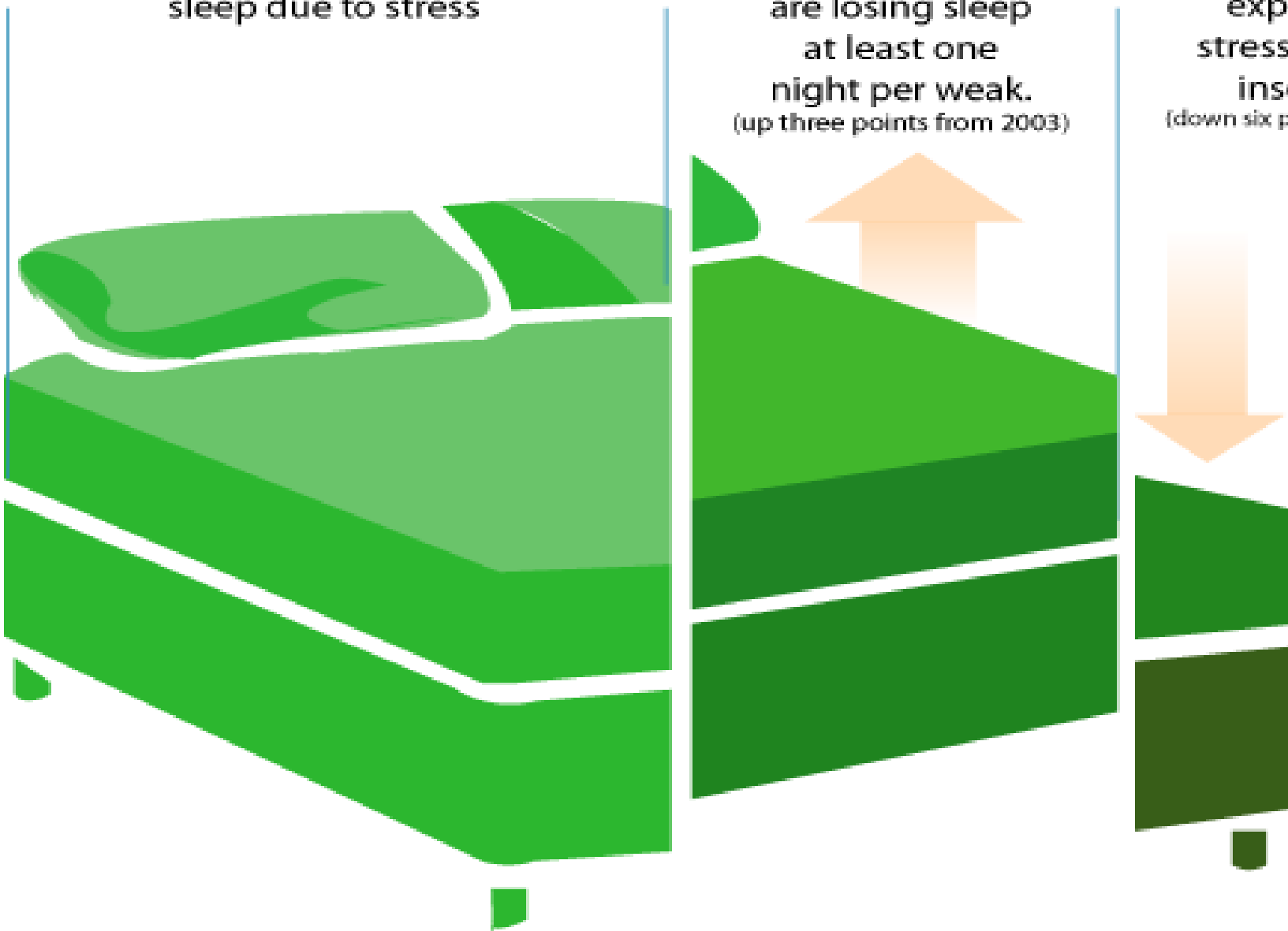


How Stressed Are We?

65% of Americans are losing sleep due to stress

32% of Americans are losing sleep at least one night per week.
(up three points from 2003)

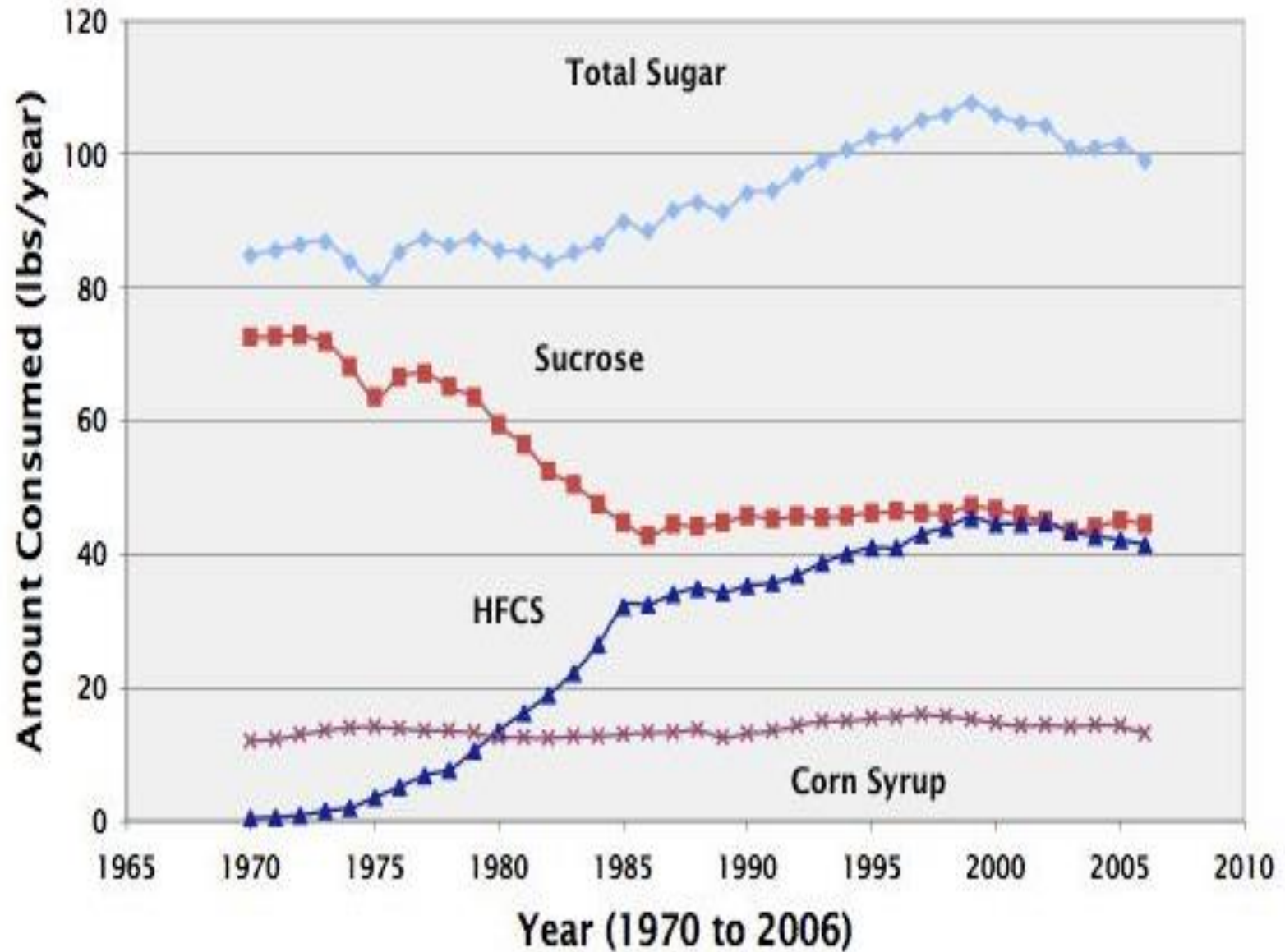
16% of Americans experience stress-induced insomnia,
(down six points from 2003)



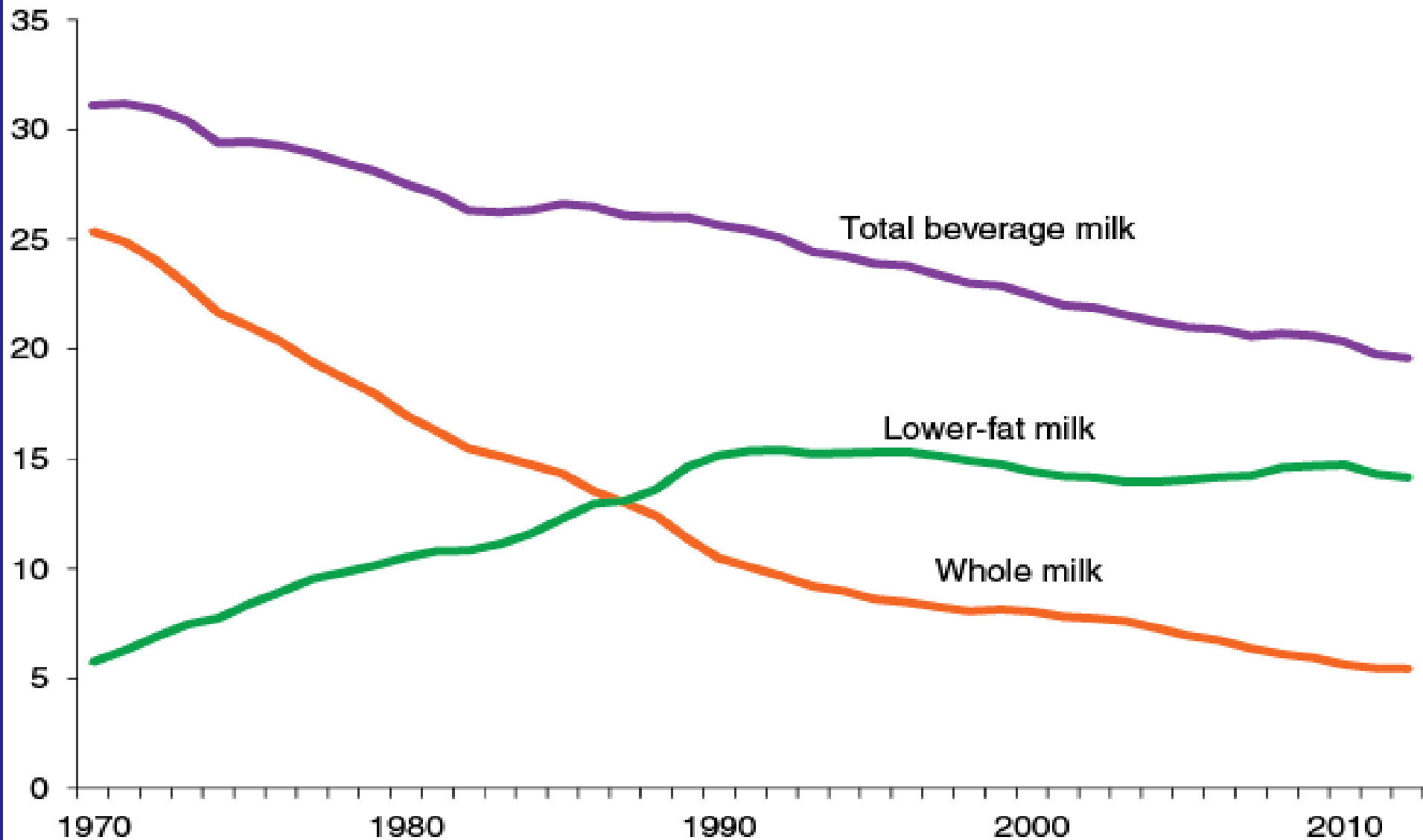
Heart attack with extra cheese, heart attack with bacon, double bypass no pickles, --hey! Where's my diabetes and large stroke?



Adjusted U.S. Per Capita Refined Sugar Consumption

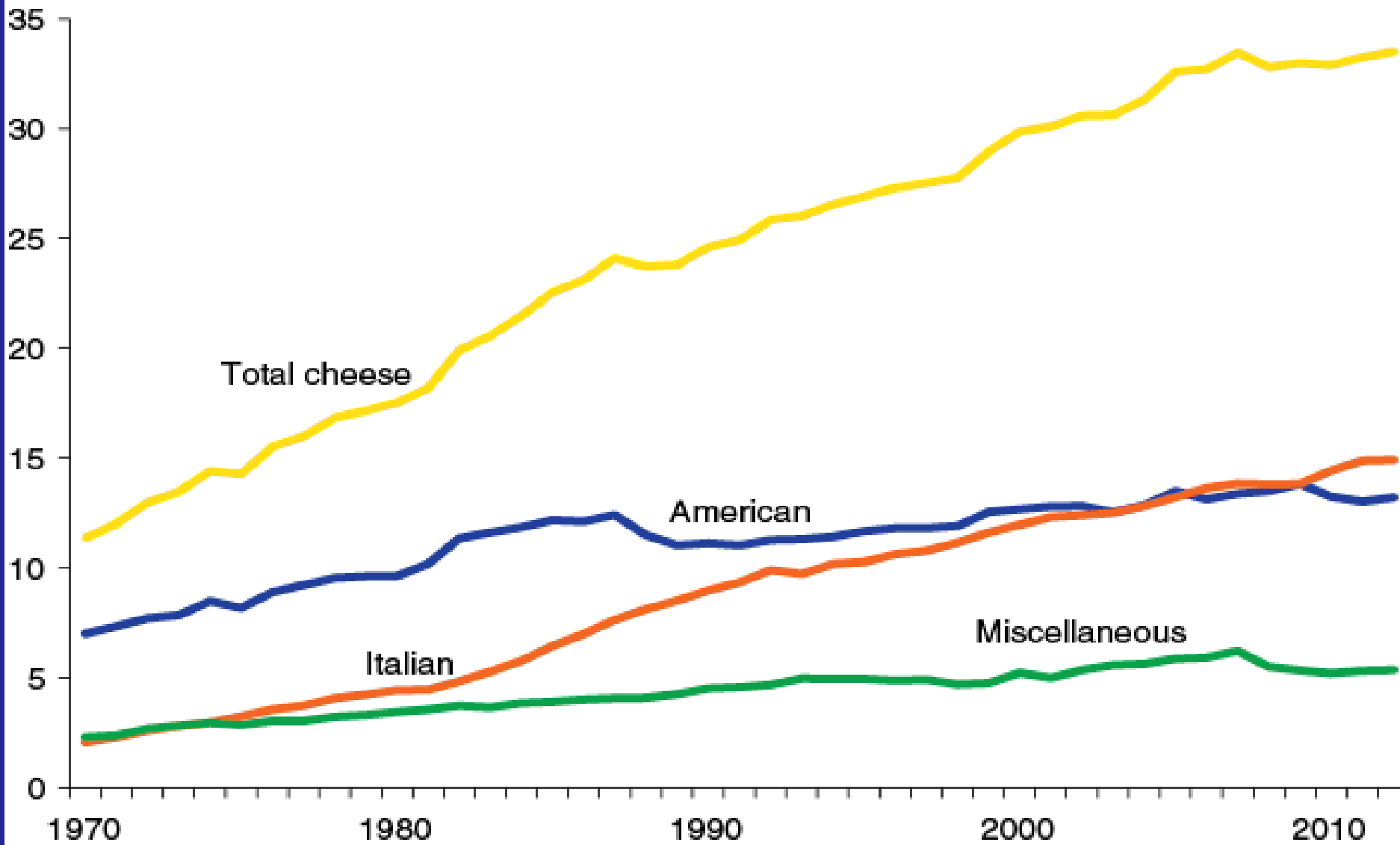


Gallons per person



Source: USDA, Economic Research Service, Food Availability (Per Capita) Data System.

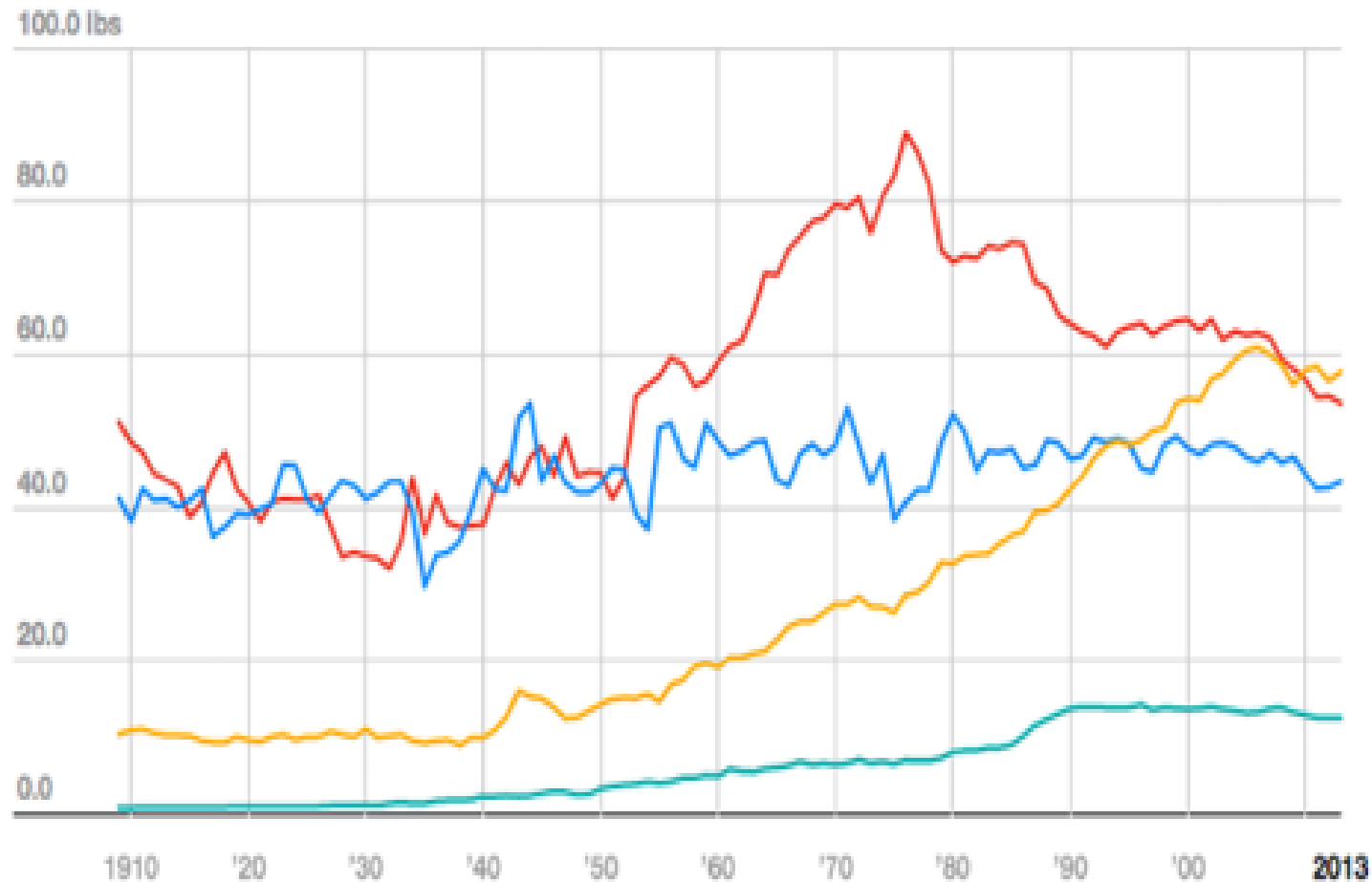
Pounds per person



Source: USDA, Economic Research Service, Food Availability (Per Capita) Data System.

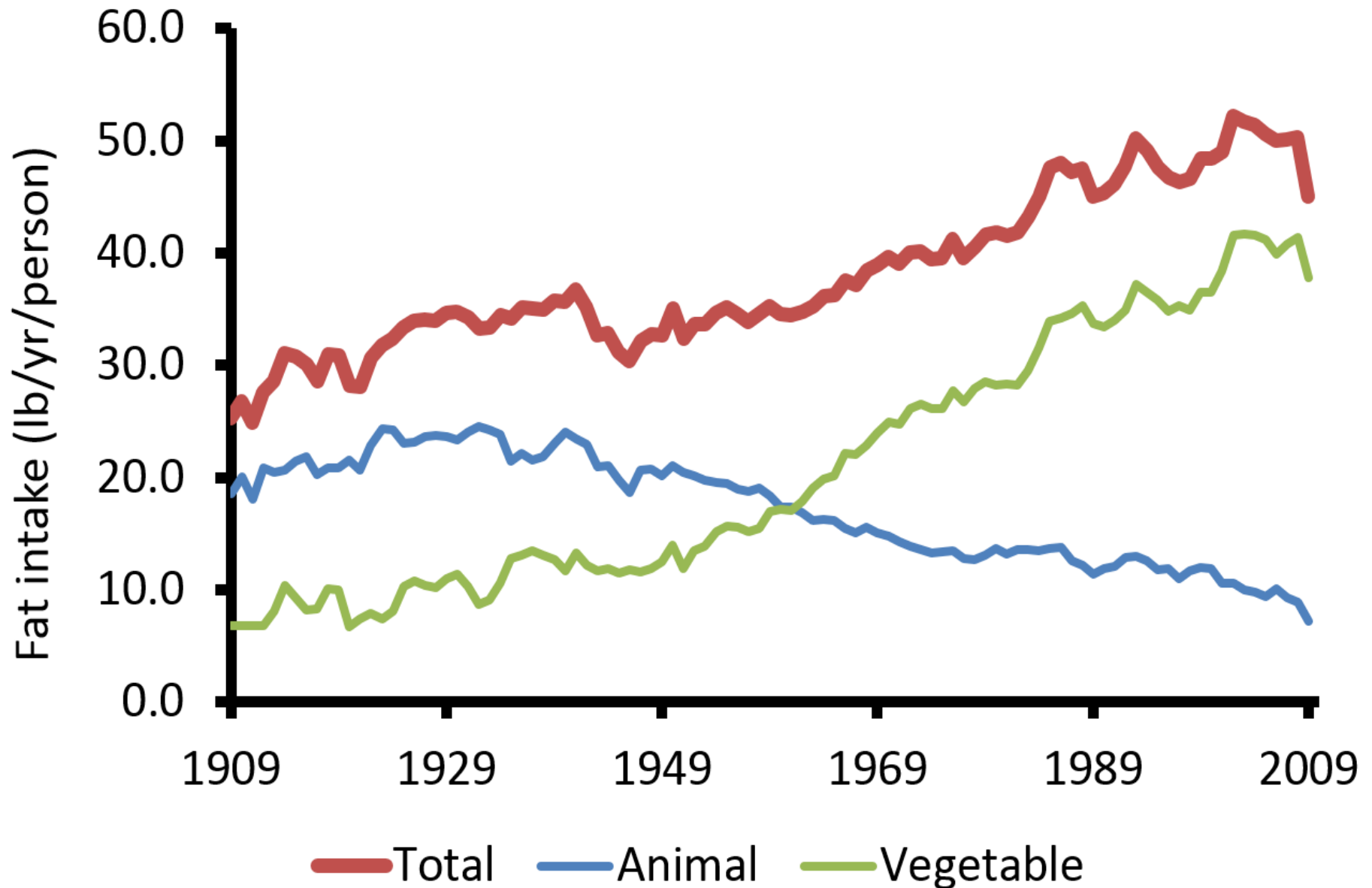
Annual U.S. meat consumption, pounds per capita

CHICKEN BEEF PORK TURKEY

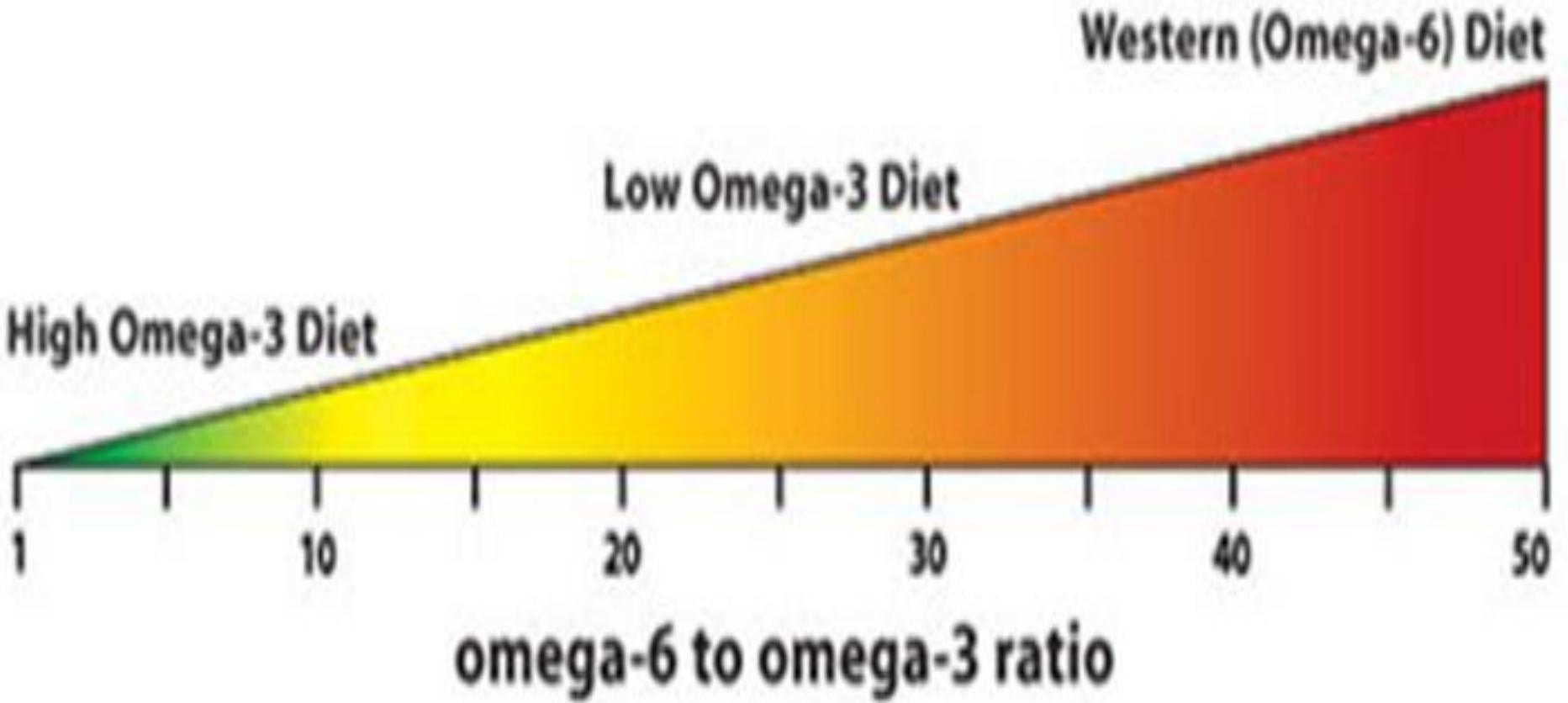


Note: The USDA uses meat available in our food supply, minus estimated loss at the retail and consumer levels, as a proxy for consumption.

US Added Fat Intake

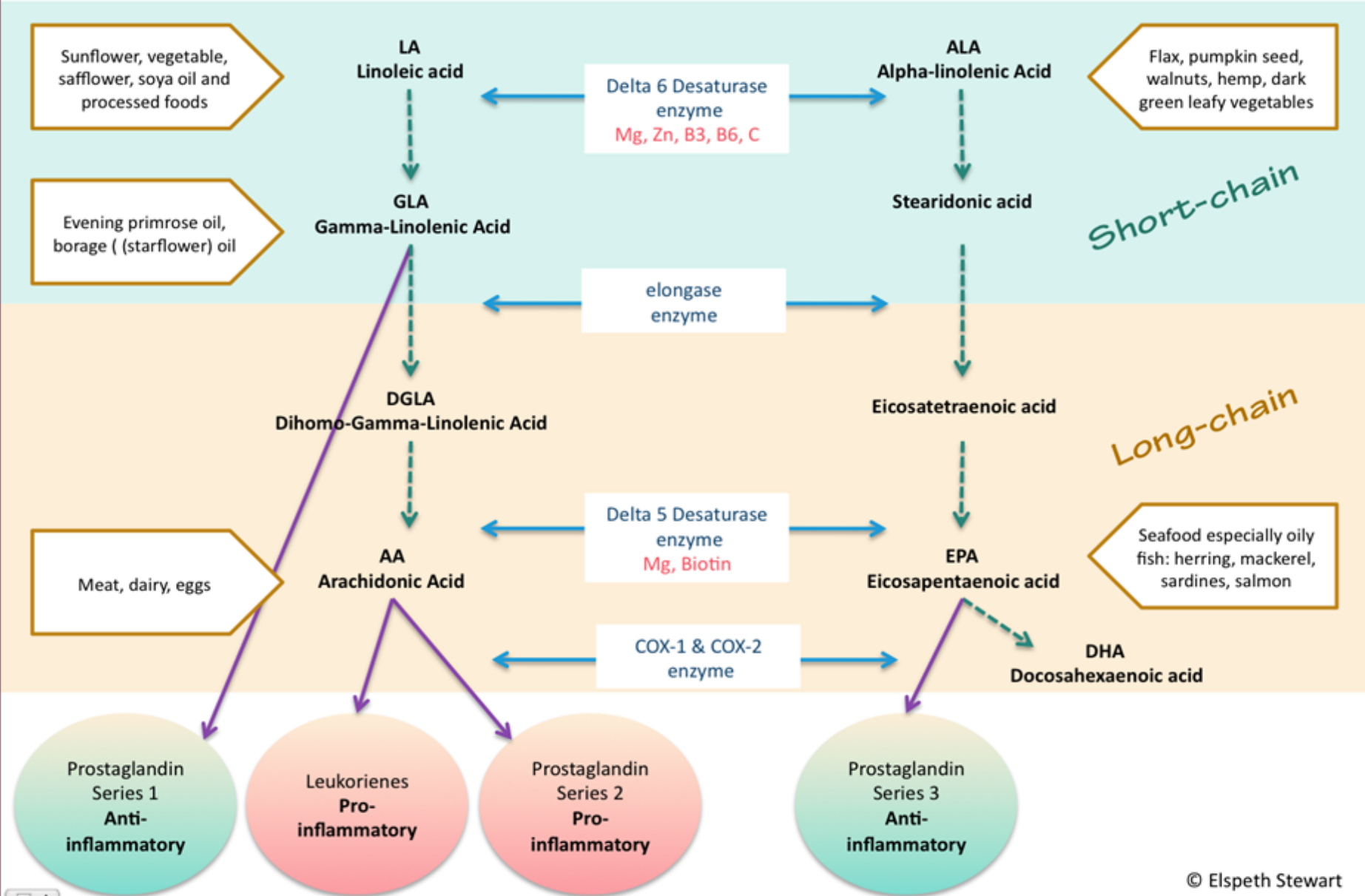


Omega 6 to Omega 3 Ratio in Different Populations



Omega 6 pathway

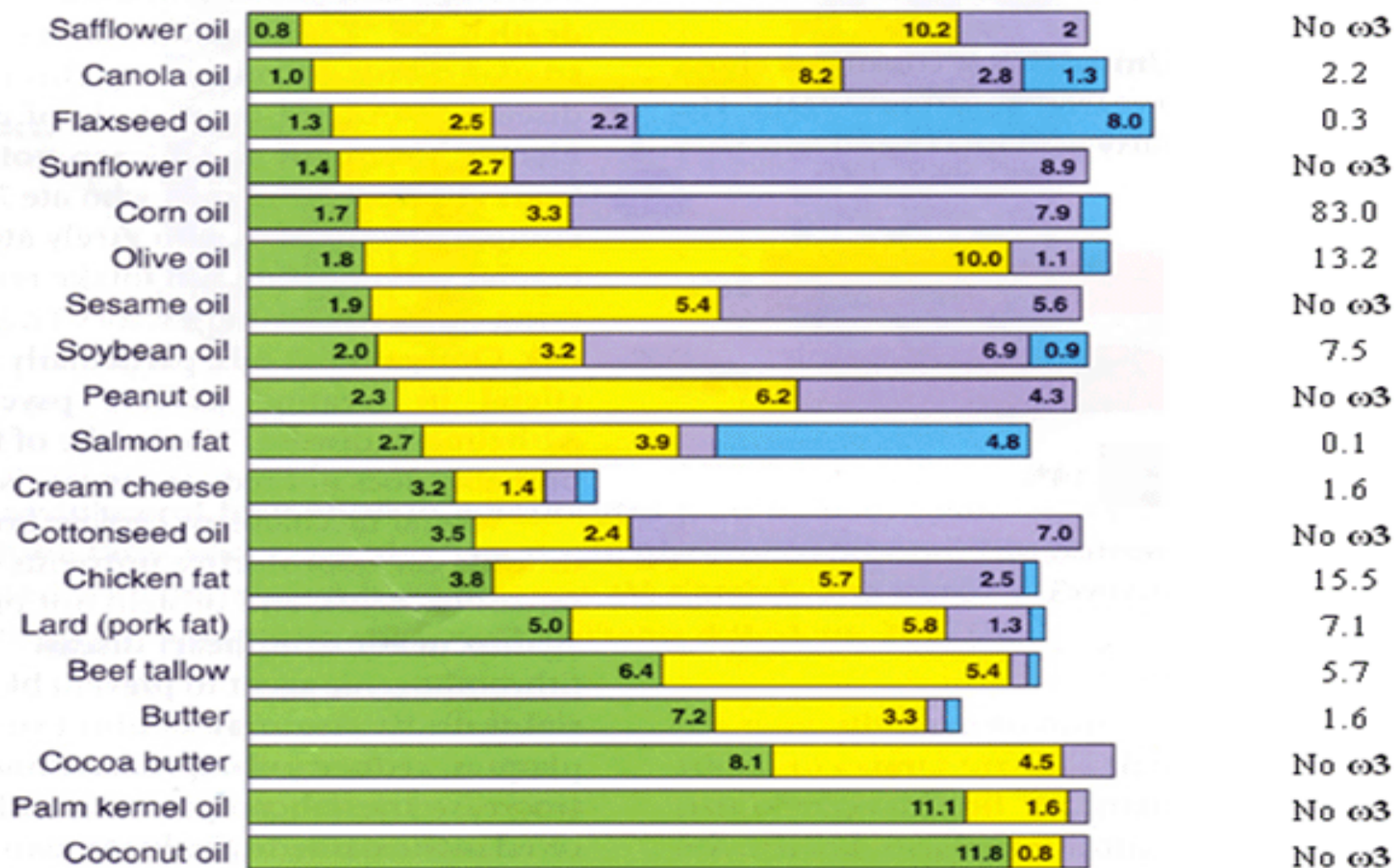
Omega 3 pathway



Fatty Acid Content (grams per tablespoon)

ω -6: ω -3 ratio

Sources of Dietary Lipid



■ Saturated ■ Monounsaturated

Polyunsaturated:
■ Omega-6 ■ Omega-3

U.S. FOOD CONSUMPTION AS A % OF CALORIES

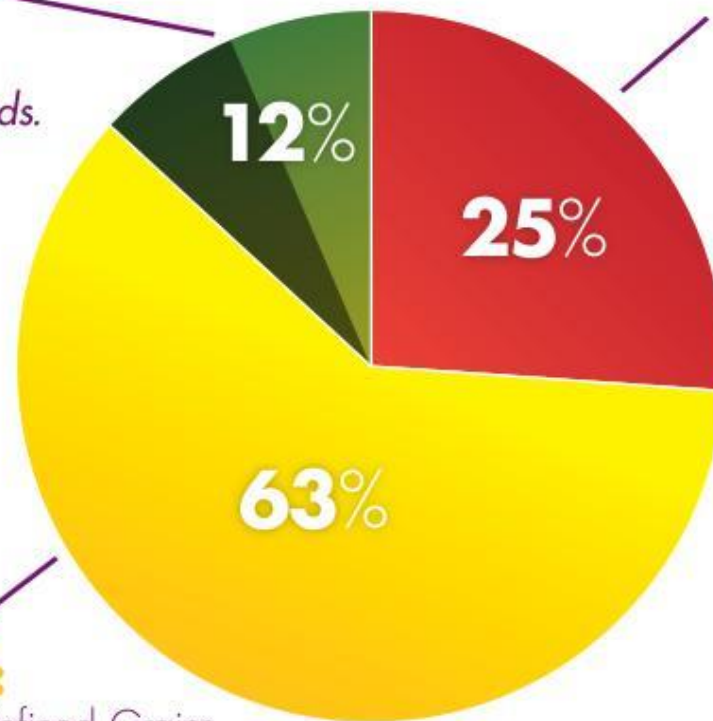
PLANT FOOD:

Vegetables, Fruits, Legumes,
Nuts & Seeds, Whole Grains
Fiber is only found in plant foods.

NOTE: Up to half of this category may be processed, for example almonds in candy bars, apples in apple pies or spinach in frozen spinach soufflé, and of course these would not be healthy choices. The focus should be on whole unprocessed vegetables, fruits, legumes, nuts and seeds and whole grains.

PROCESSED FOOD:

Added Fats & Oils, Sugars, Refined Grains



ANIMAL FOOD:

Meat, Dairy, Eggs, Fish, Seafood
Cholesterol is only found in animal foods. Animal foods are the **PRIMARY** source of saturated fat.

GUIDE TO HEALTHY EATING:

Much easier to understand than the USDA Food Pyramid, with no food industry influence.

Eat **LESS** from the animal and processed food groups and **MORE** whole foods from the plant food group.

In general, food from the animal and processed food group contribute to disease, while **WHOLE** foods from the plant group contribute to good health.

Source: USDA Economic Research Service, 2009; www.ers.usda.gov/publications/EIB333; www.ers.usda.gov/Data/FoodConsumption/FoodGuideIndex.htm#calories

New York Coalition for Healthy School Food * www.healthyschoolfood.org

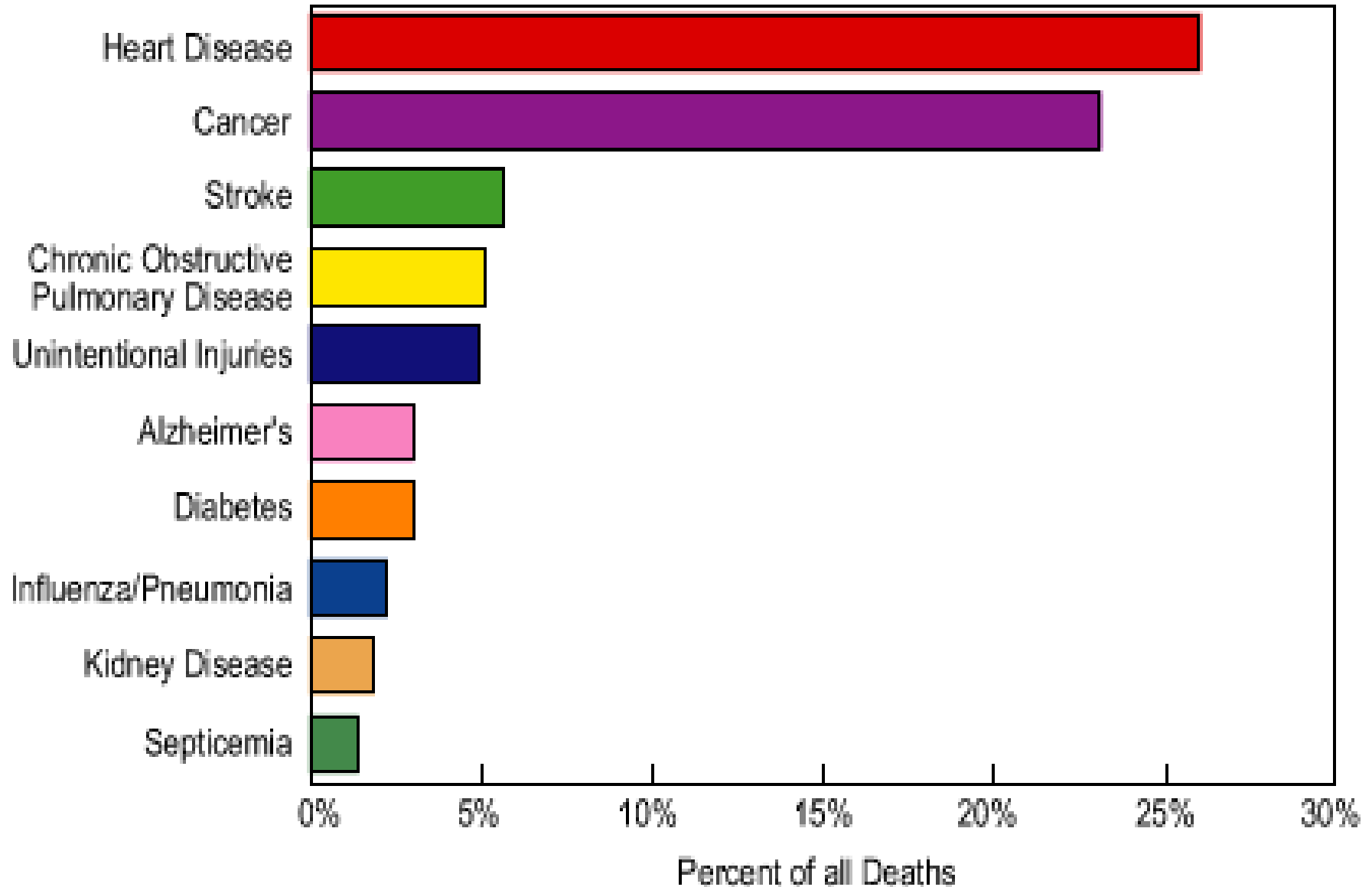
Special thanks to Joel Fuhrman, MD, author of *Disease Proof Your Child: Feeding Kids Right* * Graphics by MichelleBando.com

© 2009, New York Coalition for Healthy School Food

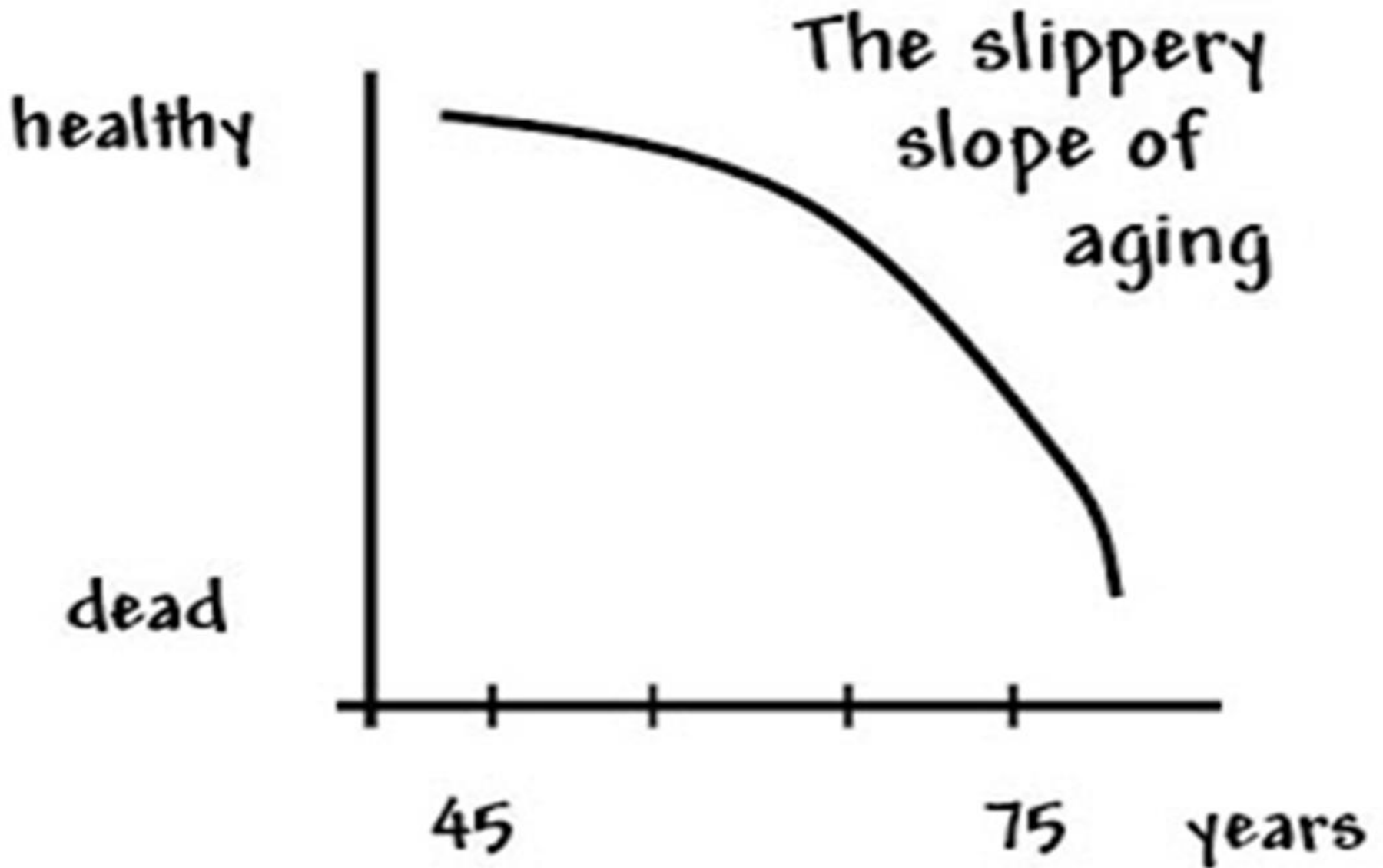
NUTRITIONAL REDUCTIONISM

- Considers macronutrients separate from food
 - “All carbs are created equal”
- Assumes calories are physiologically equal
- Leads to processed foods, food additives and supplements

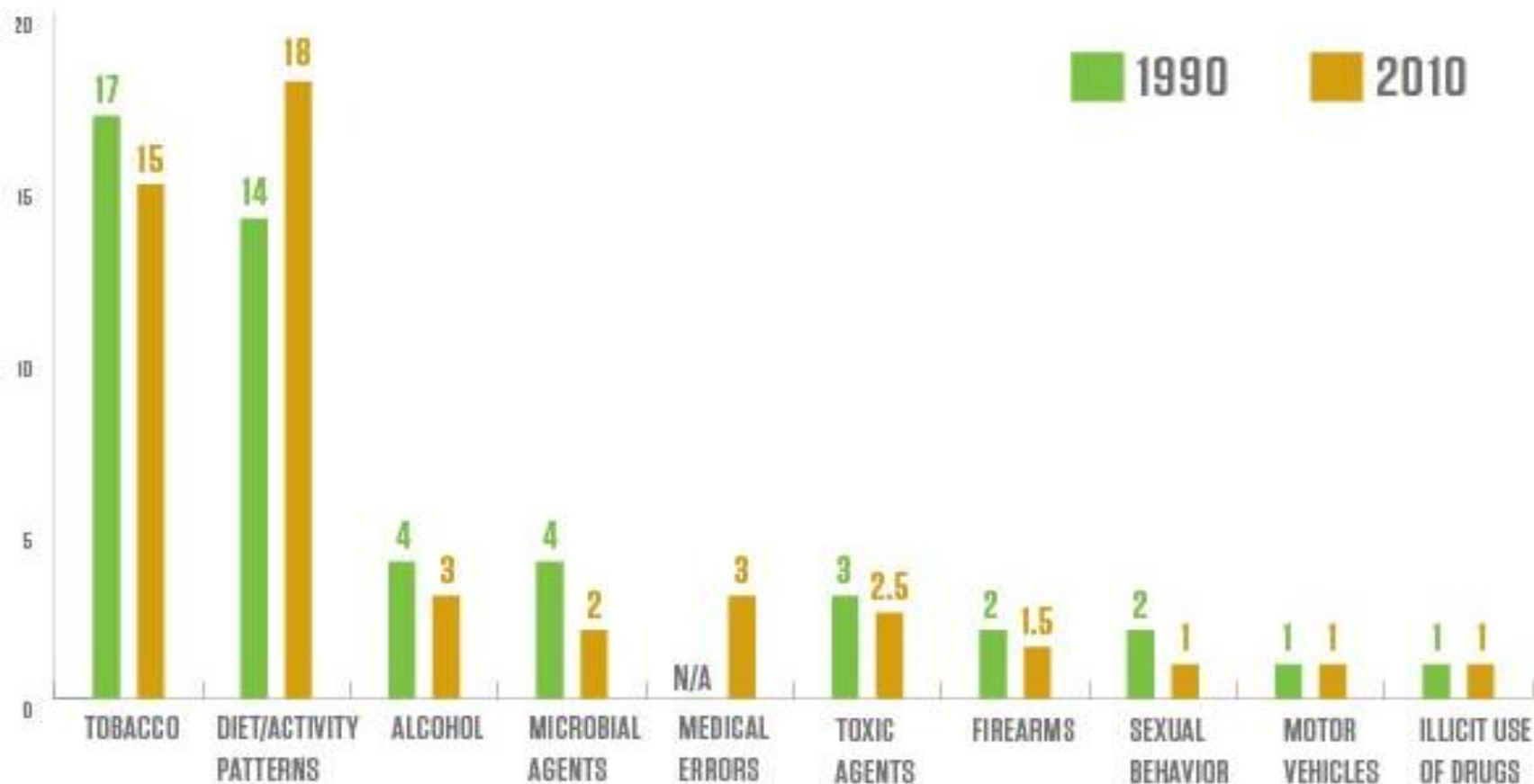
TOP TEN CAUSES OF DEATH IN THE US



SICK CARE



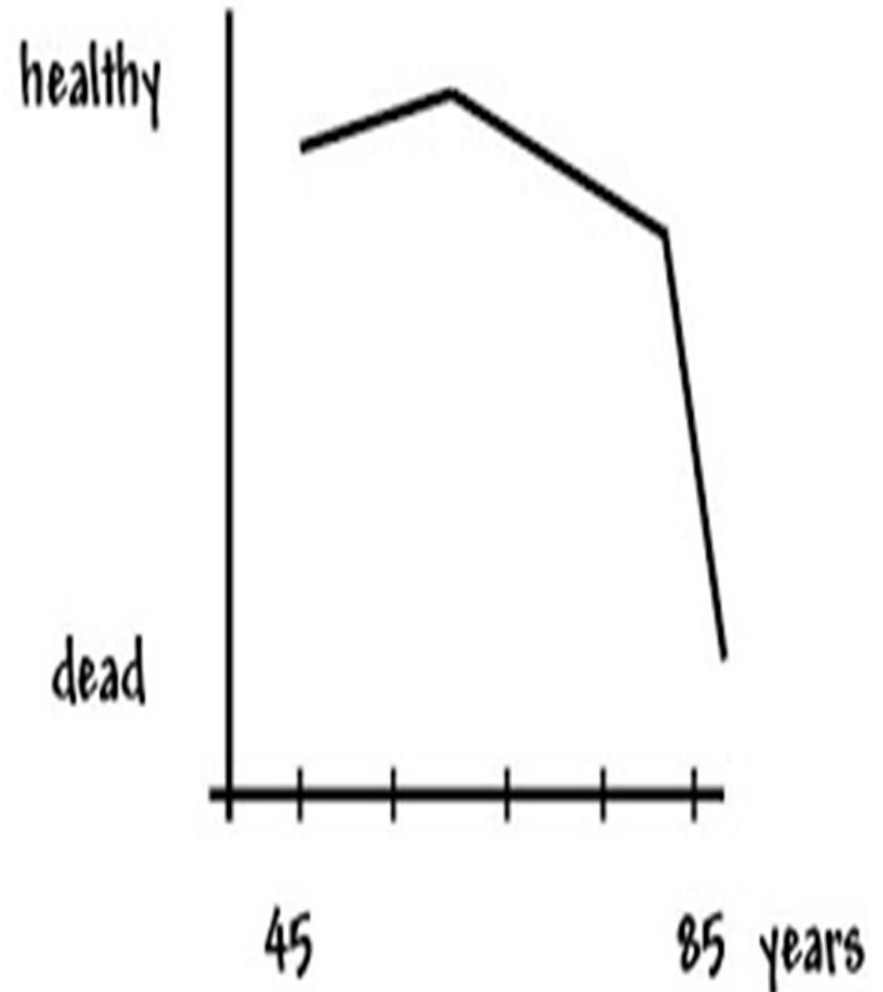
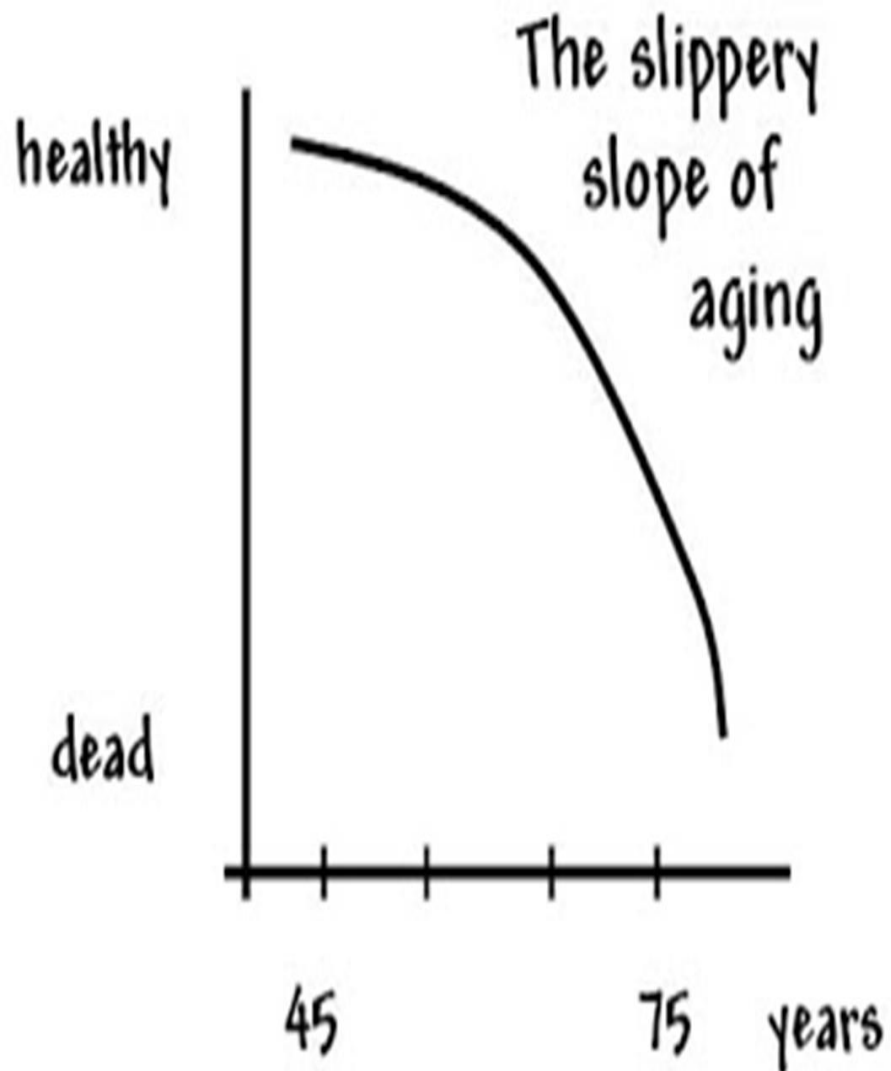
PERCENT OF EARLY DEATHS (BEFORE AGE 80) BY CAUSE, 1990 AND 2010



NOTE: Deaths due to medical errors not calculated in 1990.

SOURCE: J. Michael McGinnis, "Actual Causes of Death, 1990-2010," Workshop on Determinants of Premature Mortality, Sept. 18, 2013, National Research Council, Washington, D.C.

SICK CARE VS HEALTH CARE



**SICK
CARE**

VS

**HEALTH
CARE**



- Limit Environmental Toxins
 - Tobacco, Alcohol
 - Pesticides, Herbicides, Antibiotics residue
- Physical Wellness
 - Move around 30-45 minutes most days
- Emotional Wellness
 - Coping with stress, recovering from stress (sleep)
- Nutritional Wellness



WHOLE-FOOD PLANT-BASED DIET

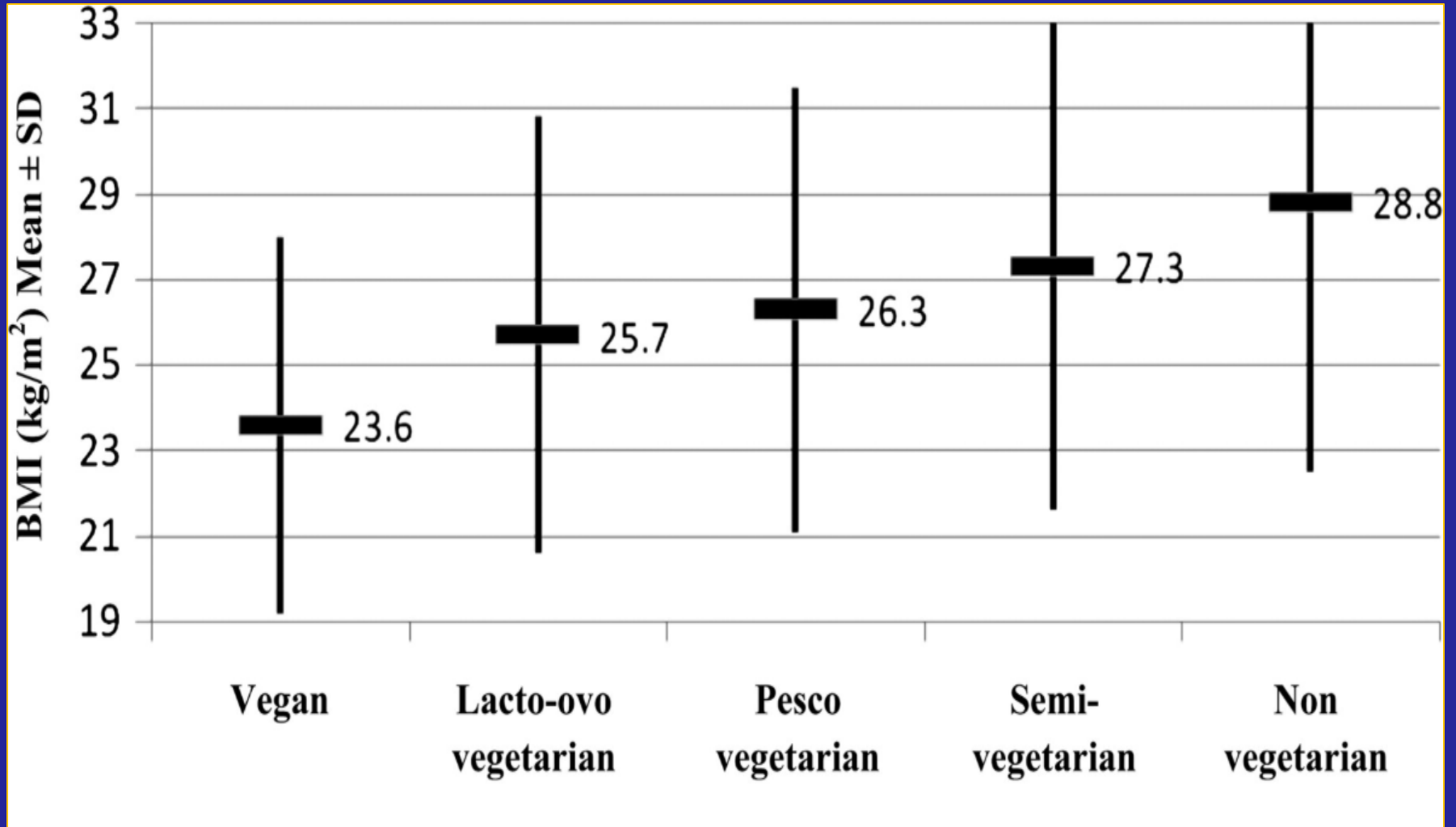
- **Vegan**

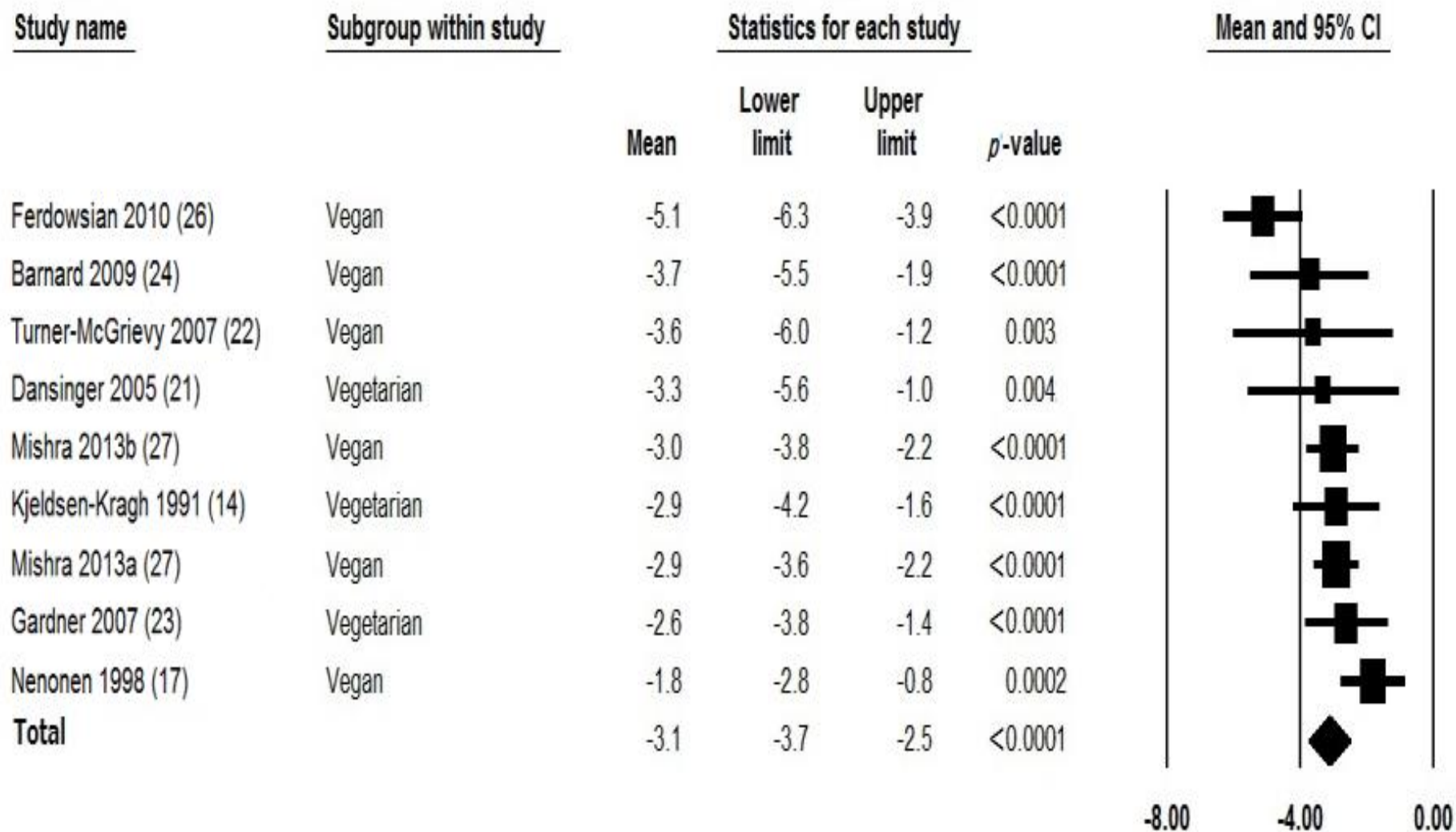
- No dairy products, eggs, or any other animal product, including clothing made from animals and products tested on animals

WHOLE-FOOD PLANT-BASED DIET

- **Whole-Food Plant-Based**
 - Based on whole, unrefined, or minimally refined plants, avoiding animal products as well as highly refined foods like bleached flour, refined sugar, and oil

WEIGHT

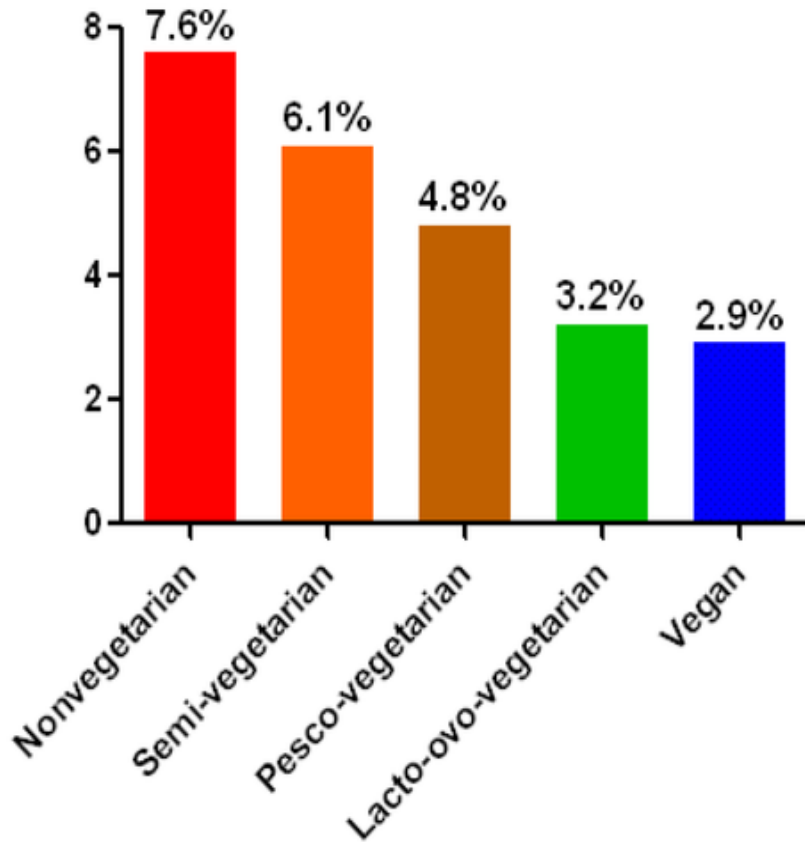




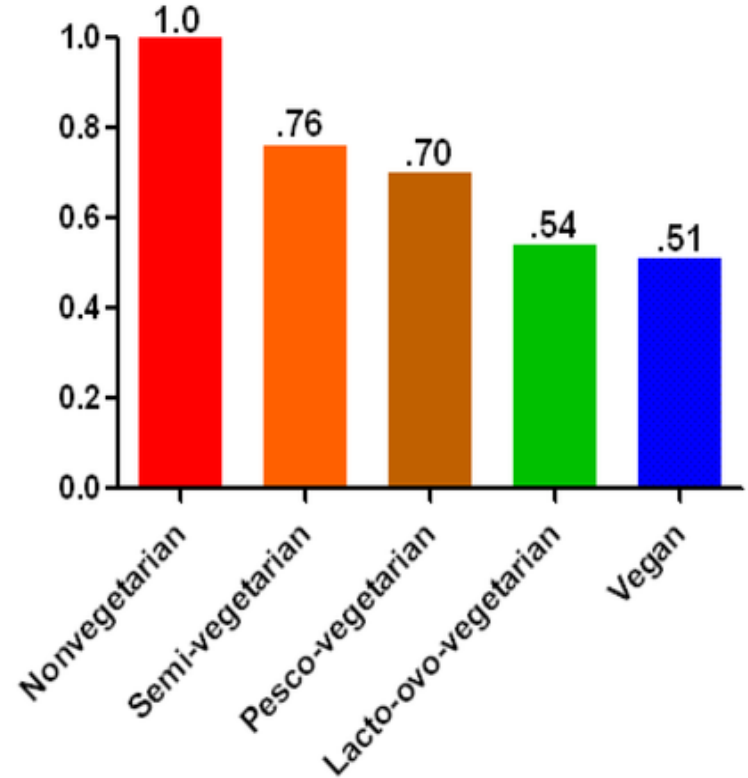
Weight loss in kg

DIABETES

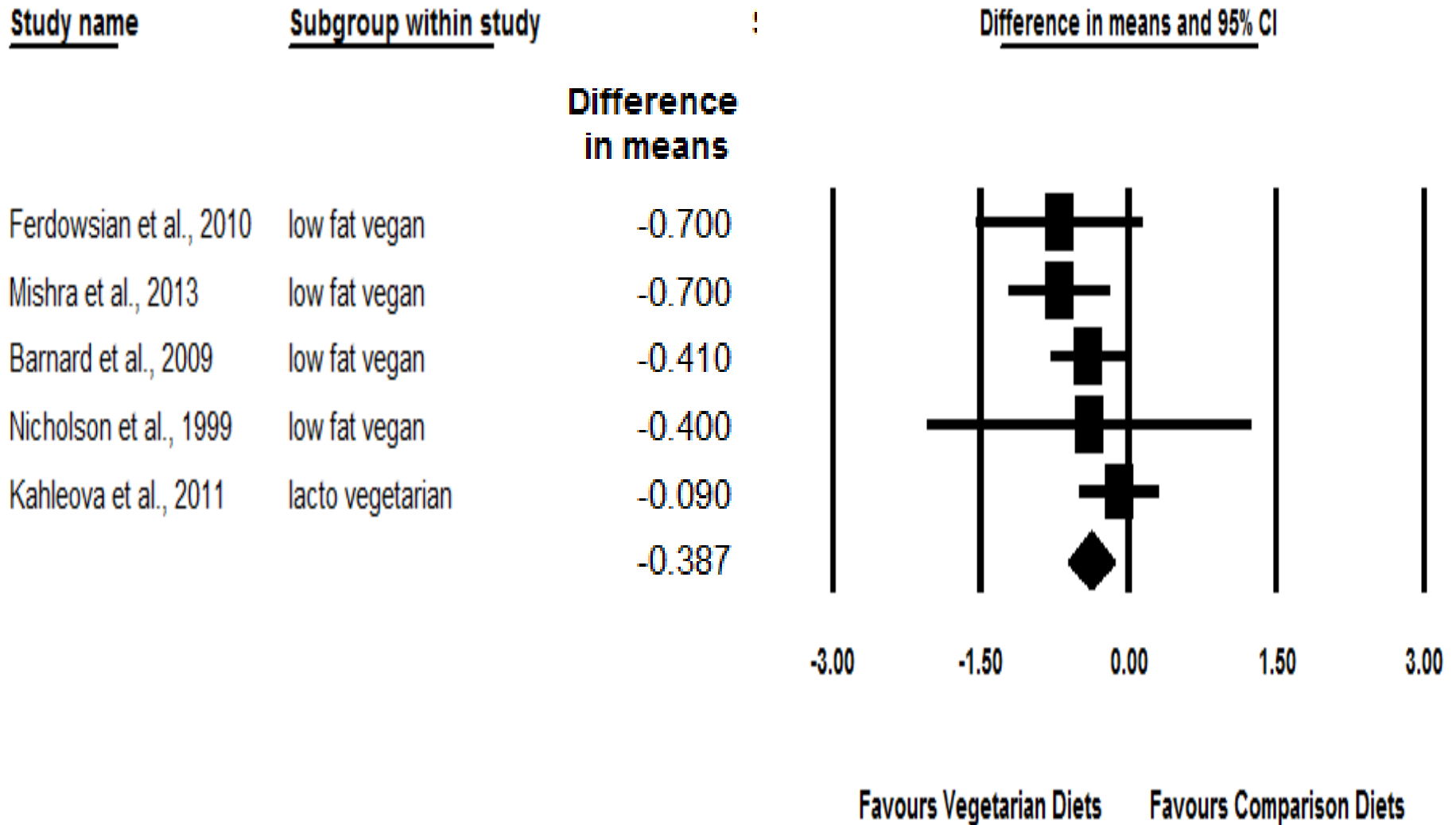
Type 2 Diabetes Prevalence



Odds Ratio* of Type 2 Diabetes

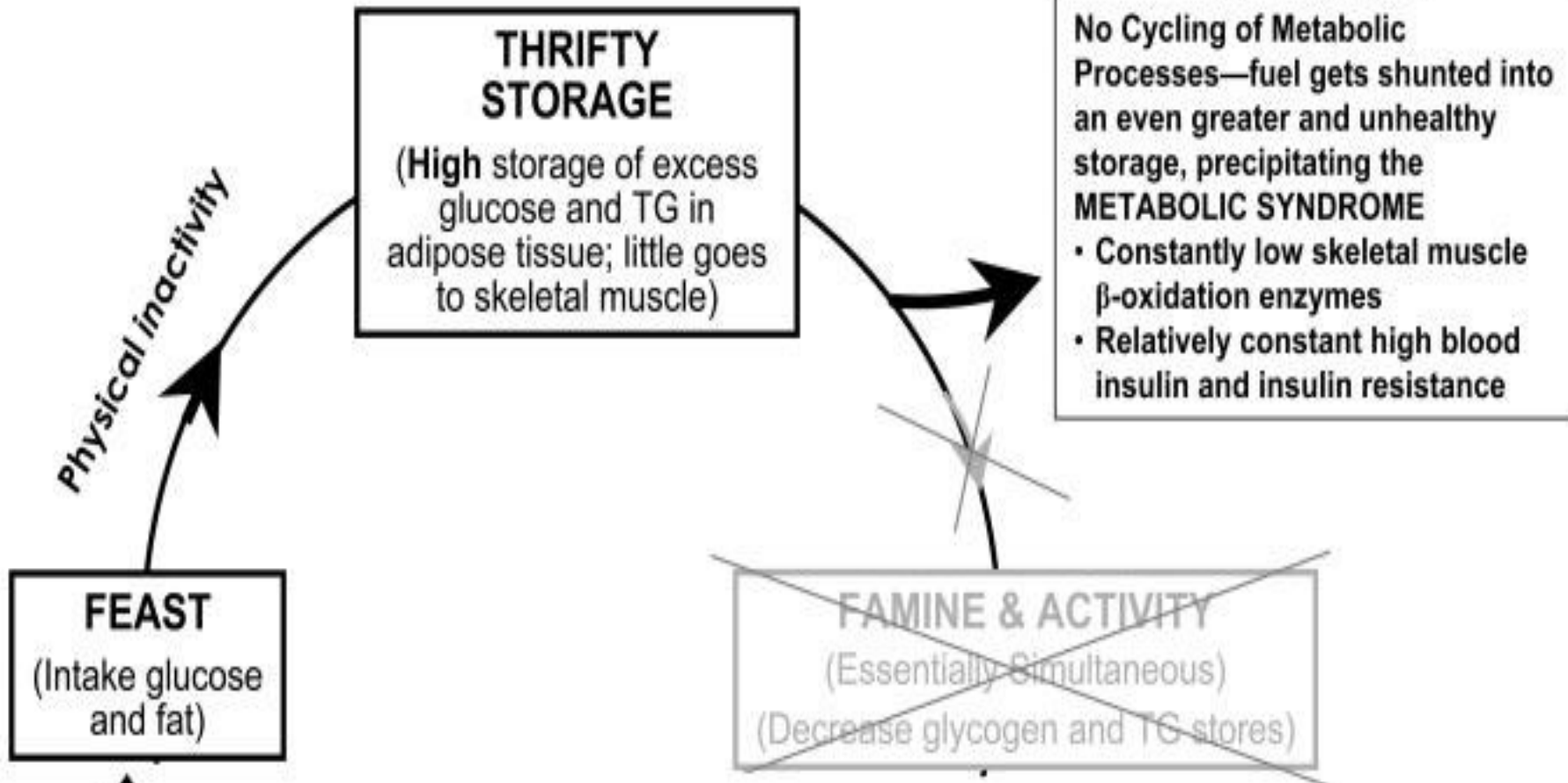


* Adjusted for BMI, age, sex, ethnicity, physical activity, and other factors

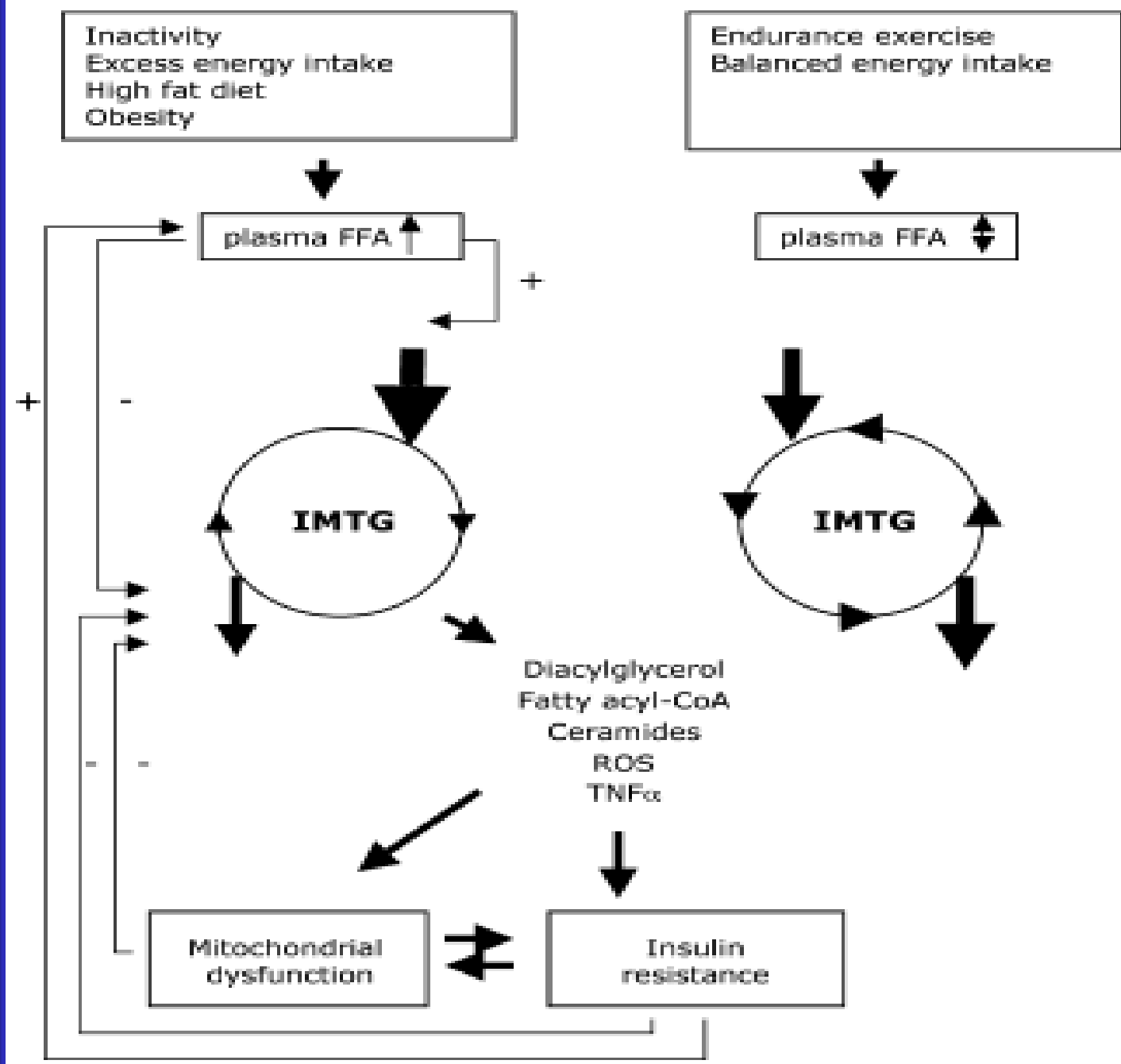


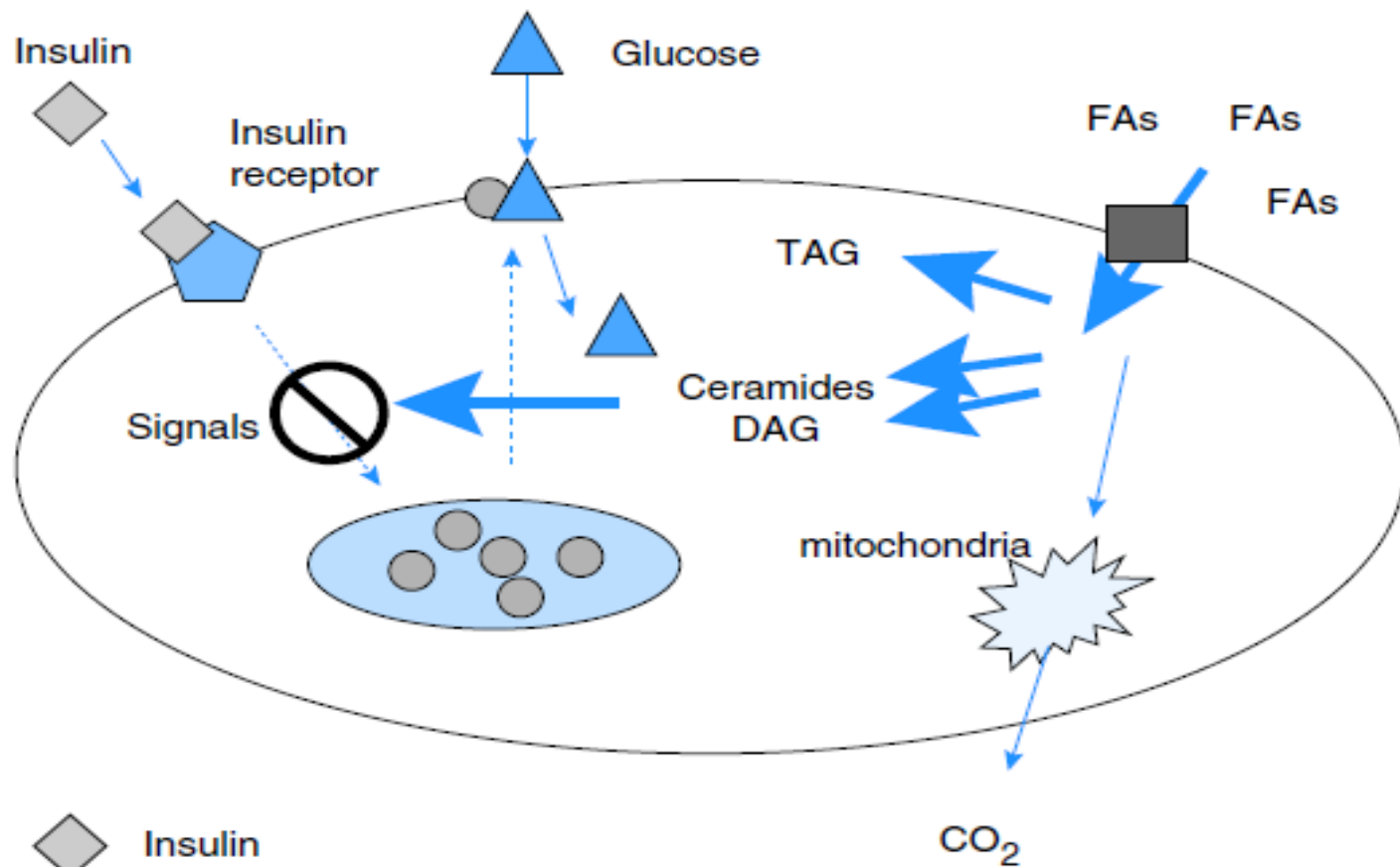
Combined effect on A1c = 0.39






STALL



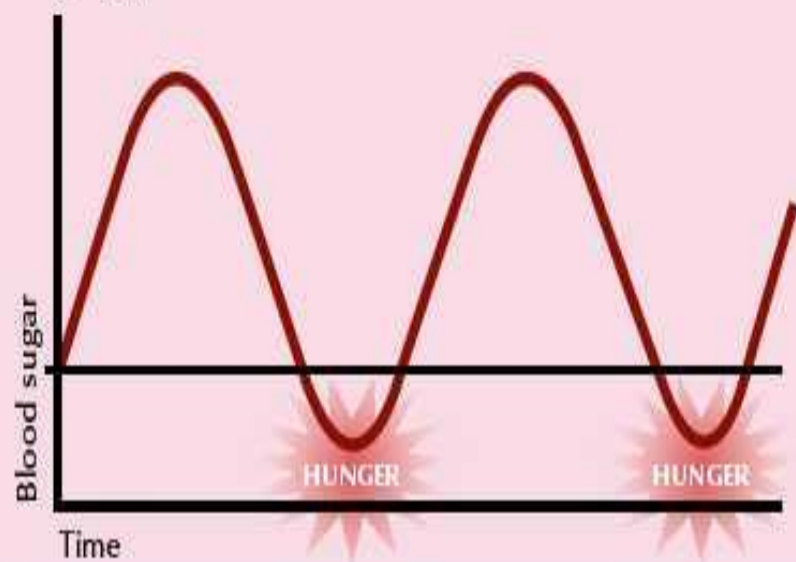
- Unlimited food supply with no exercise
- Skeletal muscle glycogen & TG stores are NOT decreased
 - Skeletal muscle GLUT4 and AMPK levels are NOT increased





-  Insulin
-  Insulin receptor
-  Glucose
-  GLUT4
-  Fat/CD36

High-glycemic chart



RELEASE ENERGY QUICKLY

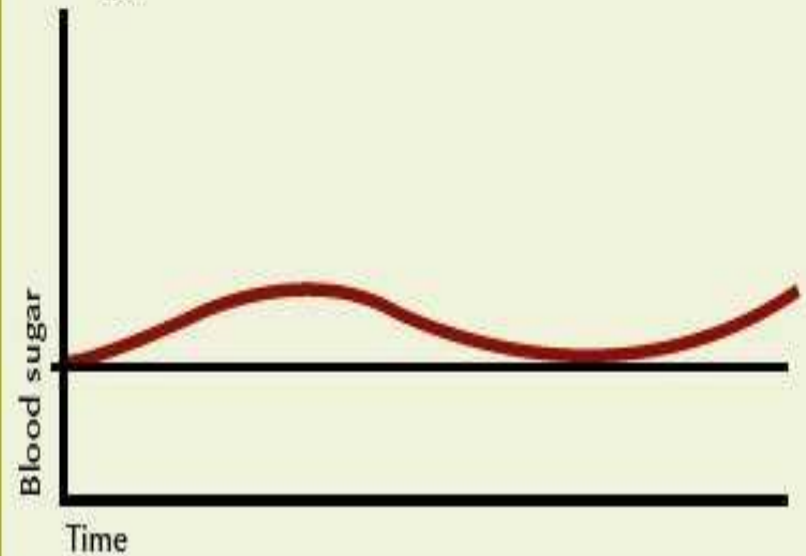


FEEL HUNGRY SOONER



EAT MORE

Low-glycemic chart



RELEASE ENERGY SLOWLY



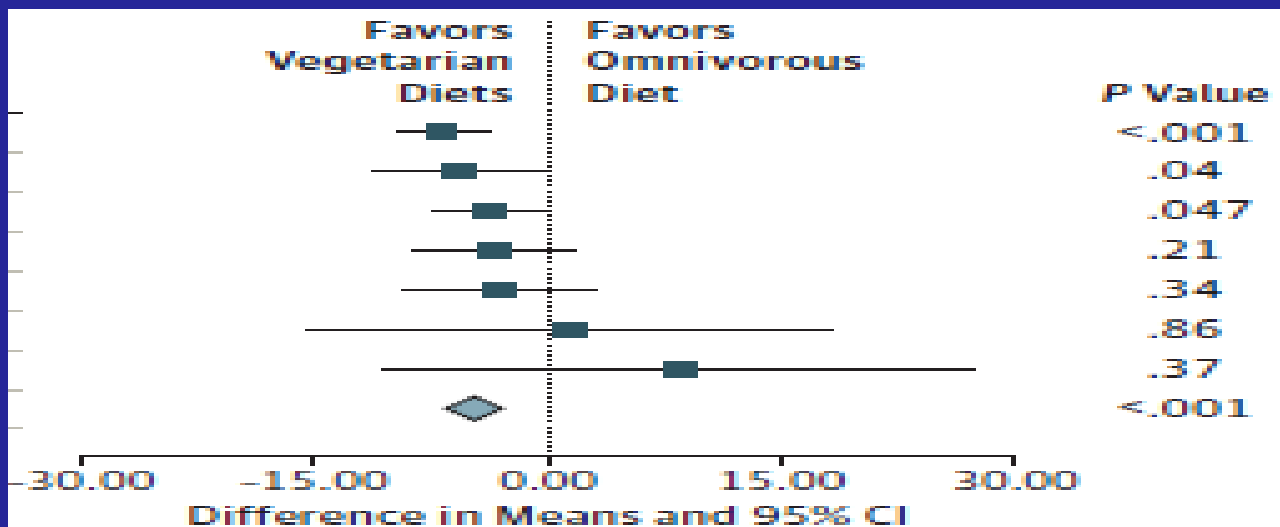
FEEL FULL LONGER



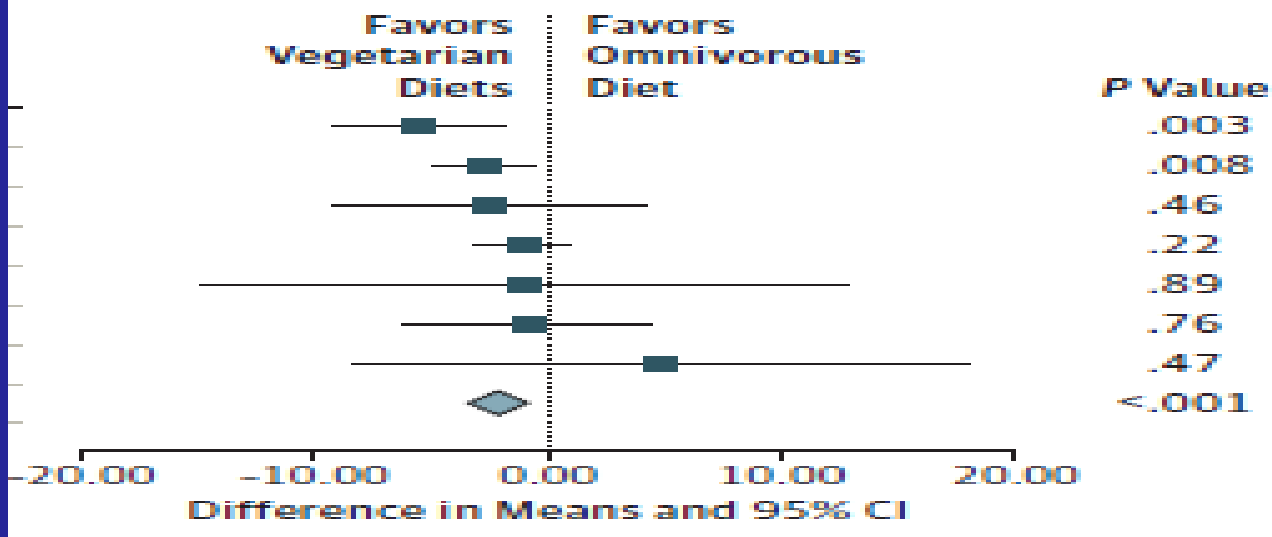
EAT LESS

BLOOD PRESSURE

Systolic

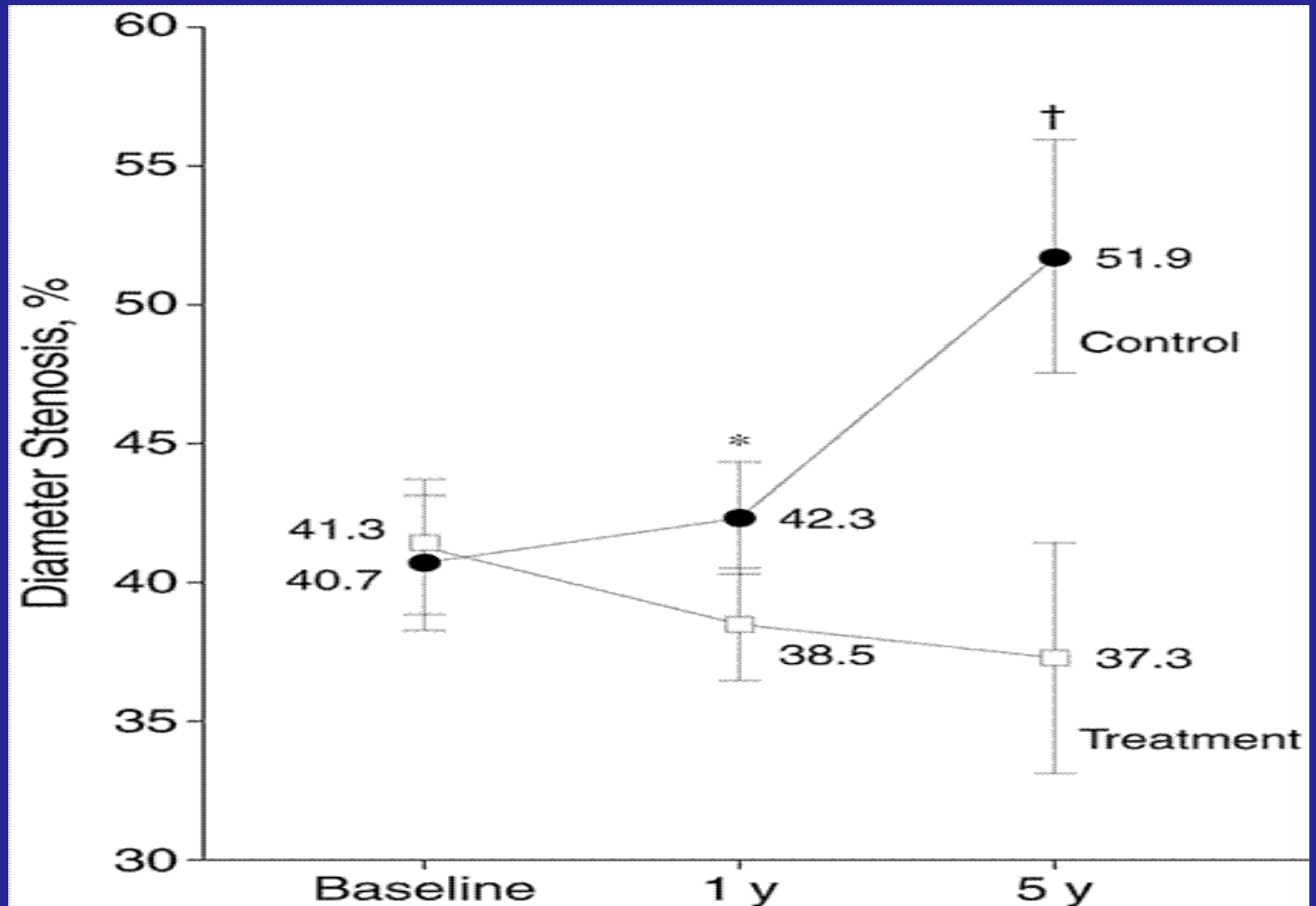


Diastolic

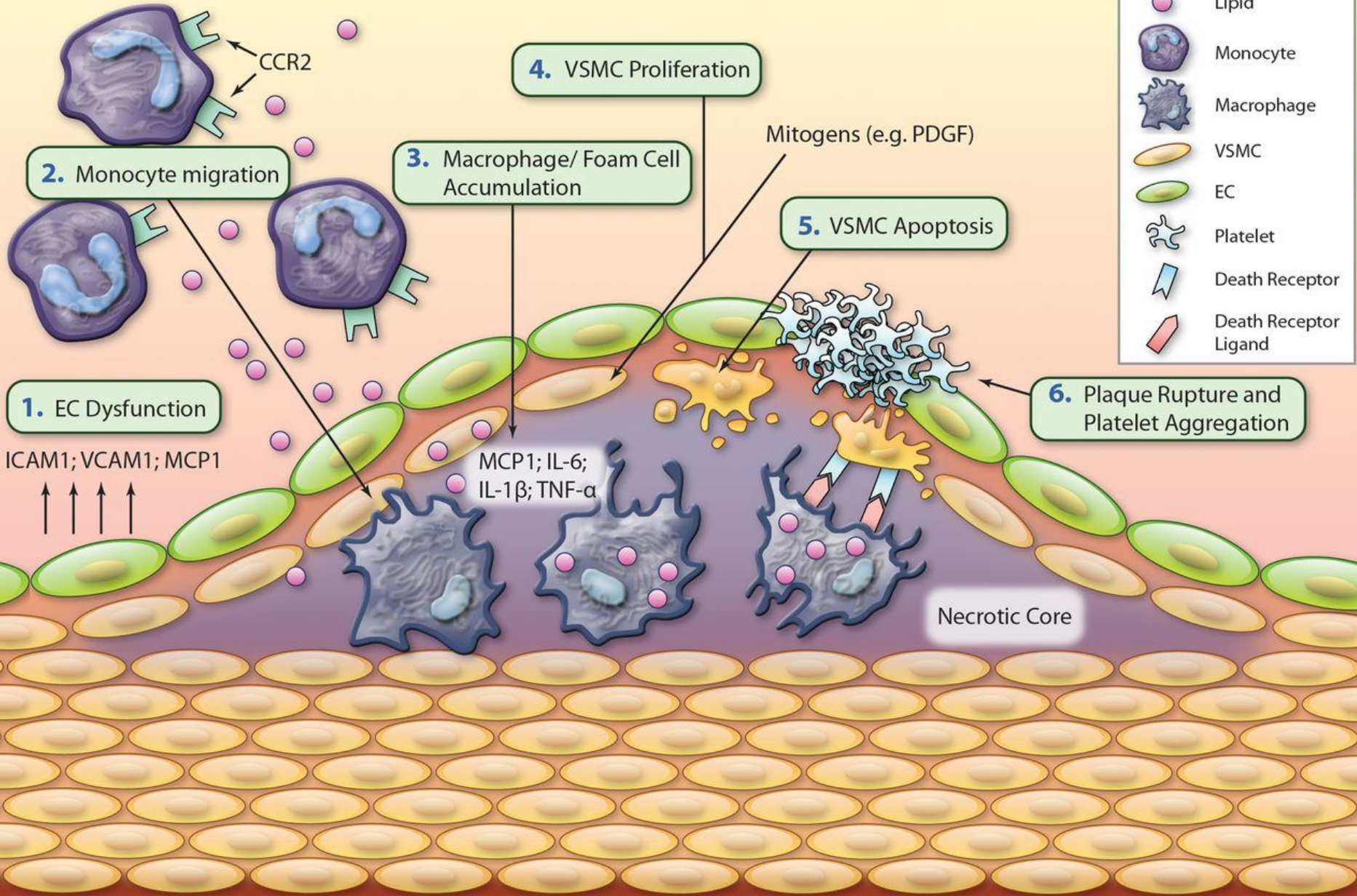




HEART DISEASE



Blood Flow →



1. EC Dysfunction
ICAM1; VCAM1; MCP1

2. Monocyte migration
CCR2

3. Macrophage/ Foam Cell Accumulation
MCP1; IL-6; IL-1β; TNF-α

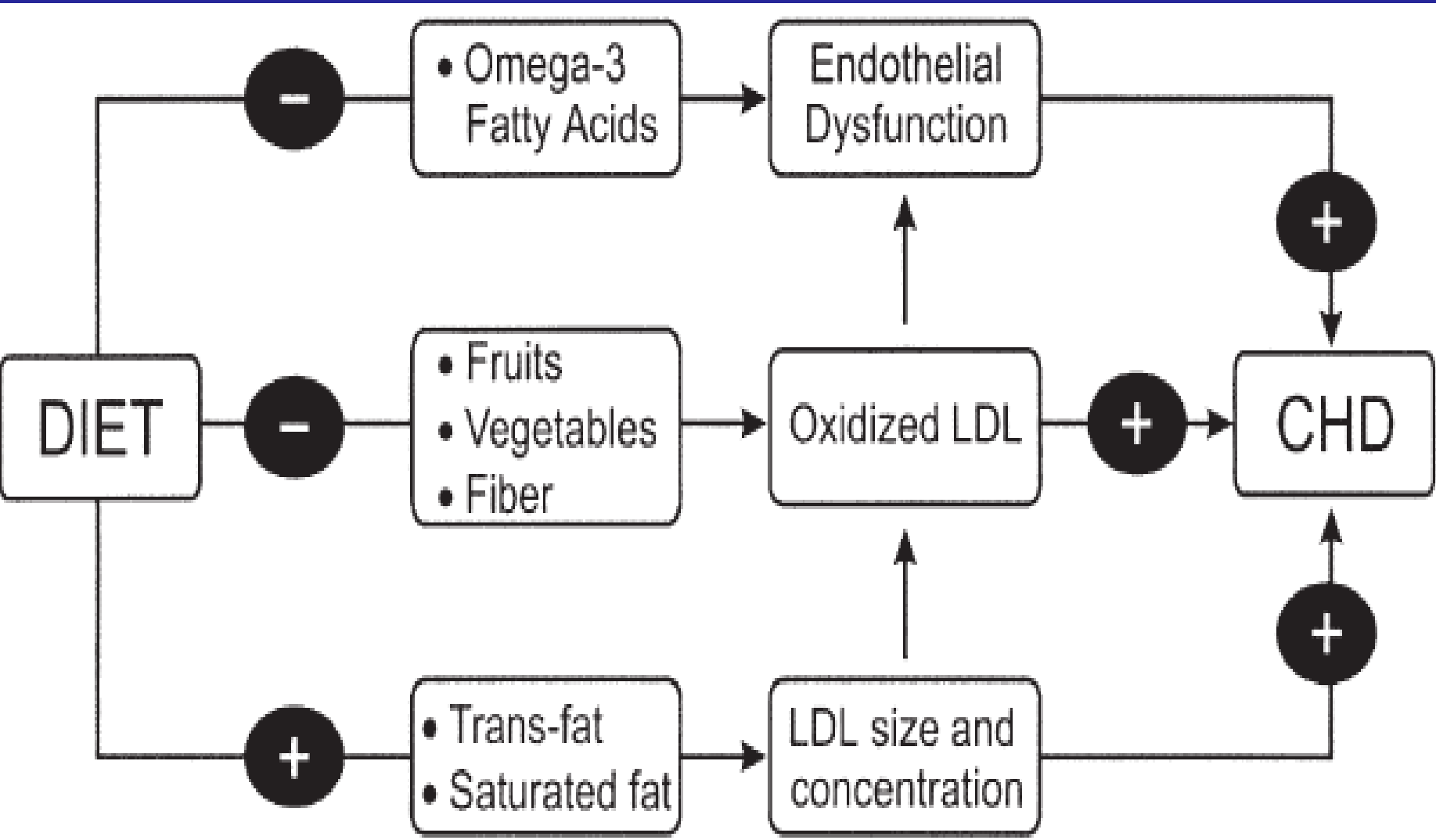
4. VSMC Proliferation
Mitogens (e.g. PDGF)

5. VSMC Apoptosis

6. Plaque Rupture and Platelet Aggregation

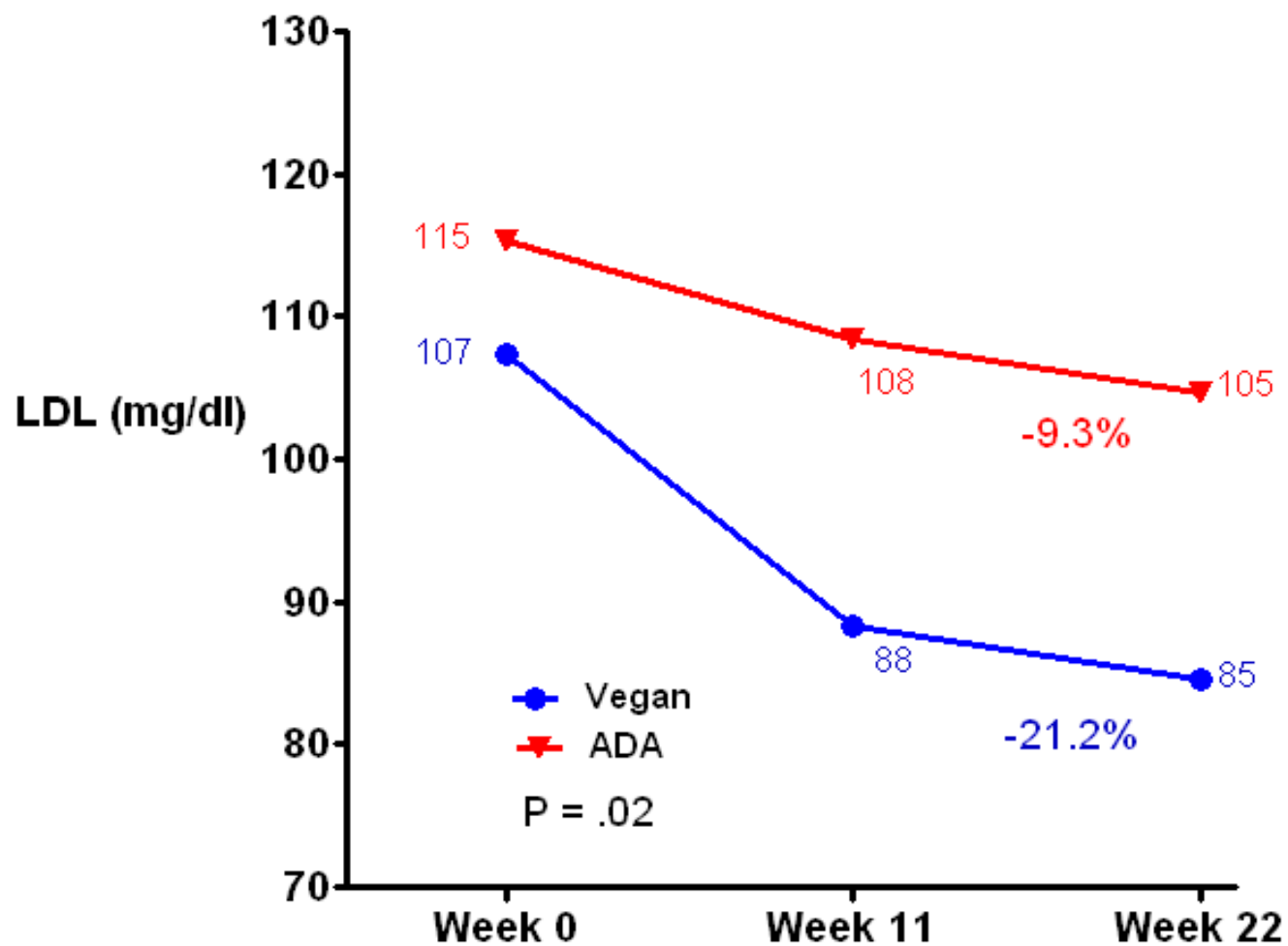
Necrotic Core

Adventitia

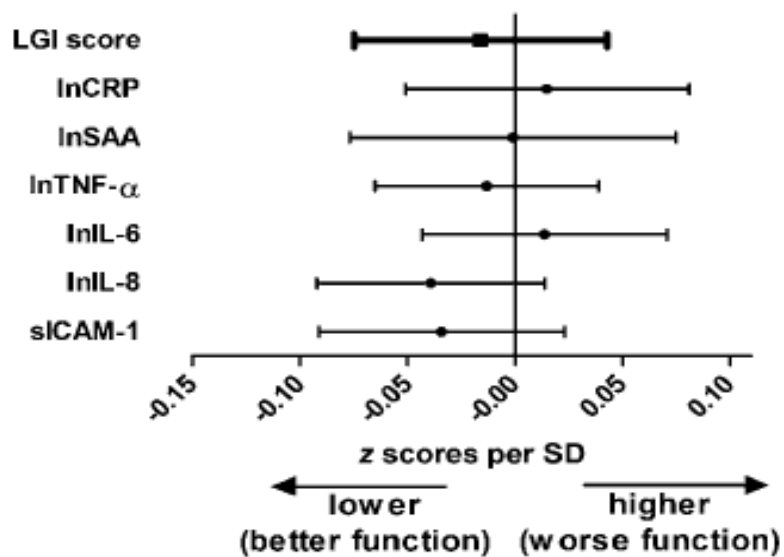
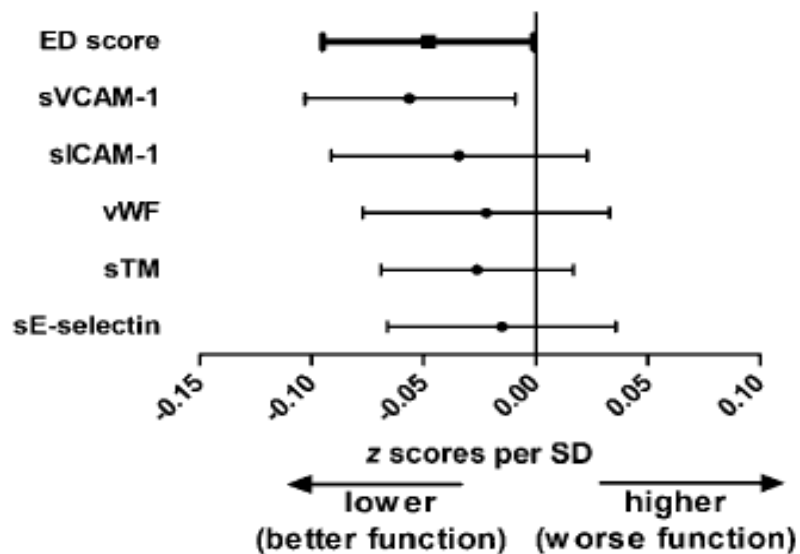


LDL Cholesterol

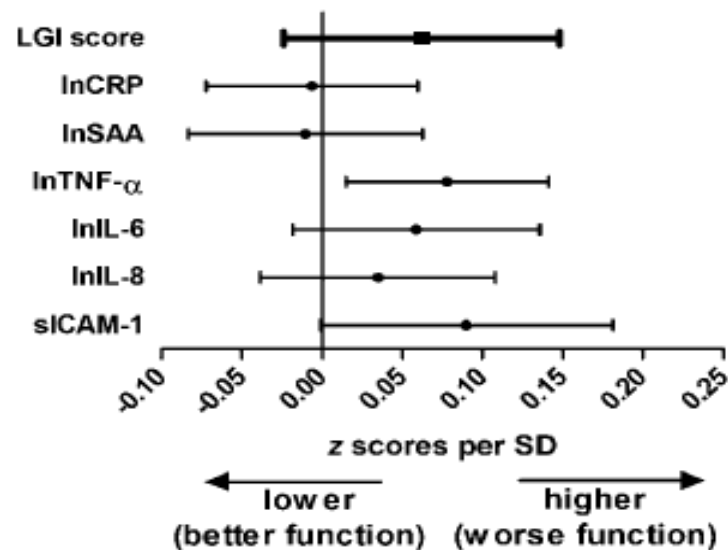
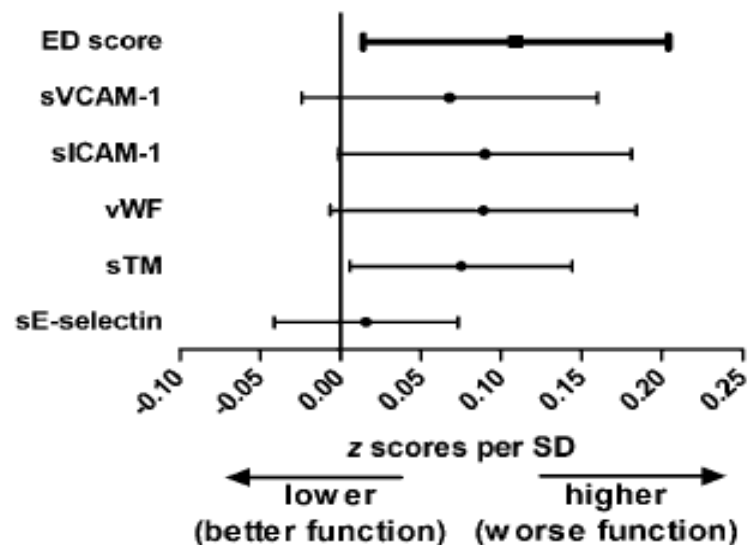
Participants with No Changes to Lipid Medications
(n = 39 vegan, 39 ADA)

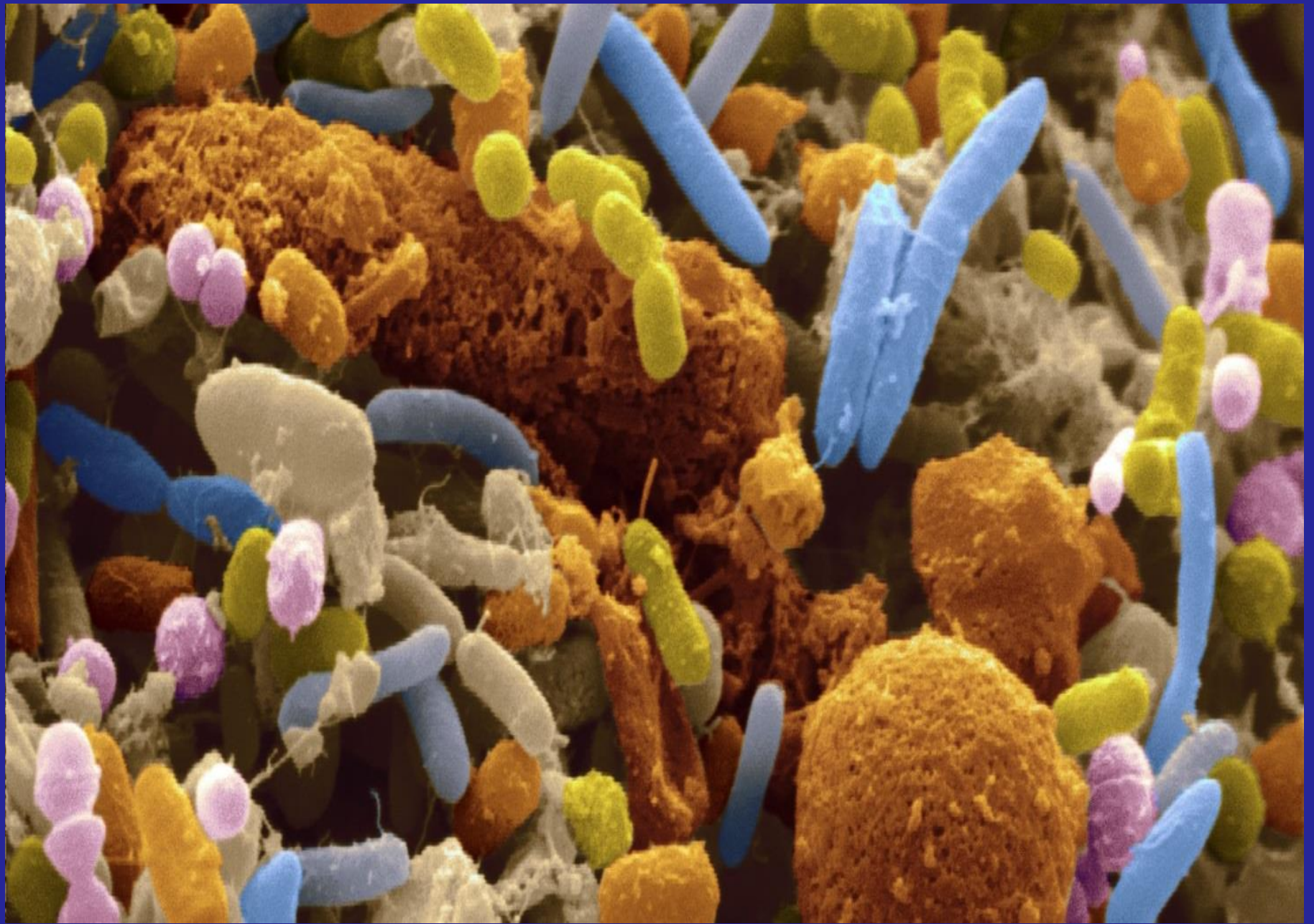


B Vegetables (raw) per 100 g/d



D High-fat dairy products per 100 g/d





Low-fat plant polysaccharide-rich diet
Probiotics

Western diet
Enteric infections
Antibiotics

Bacteroidetes/Firmicutes ratio

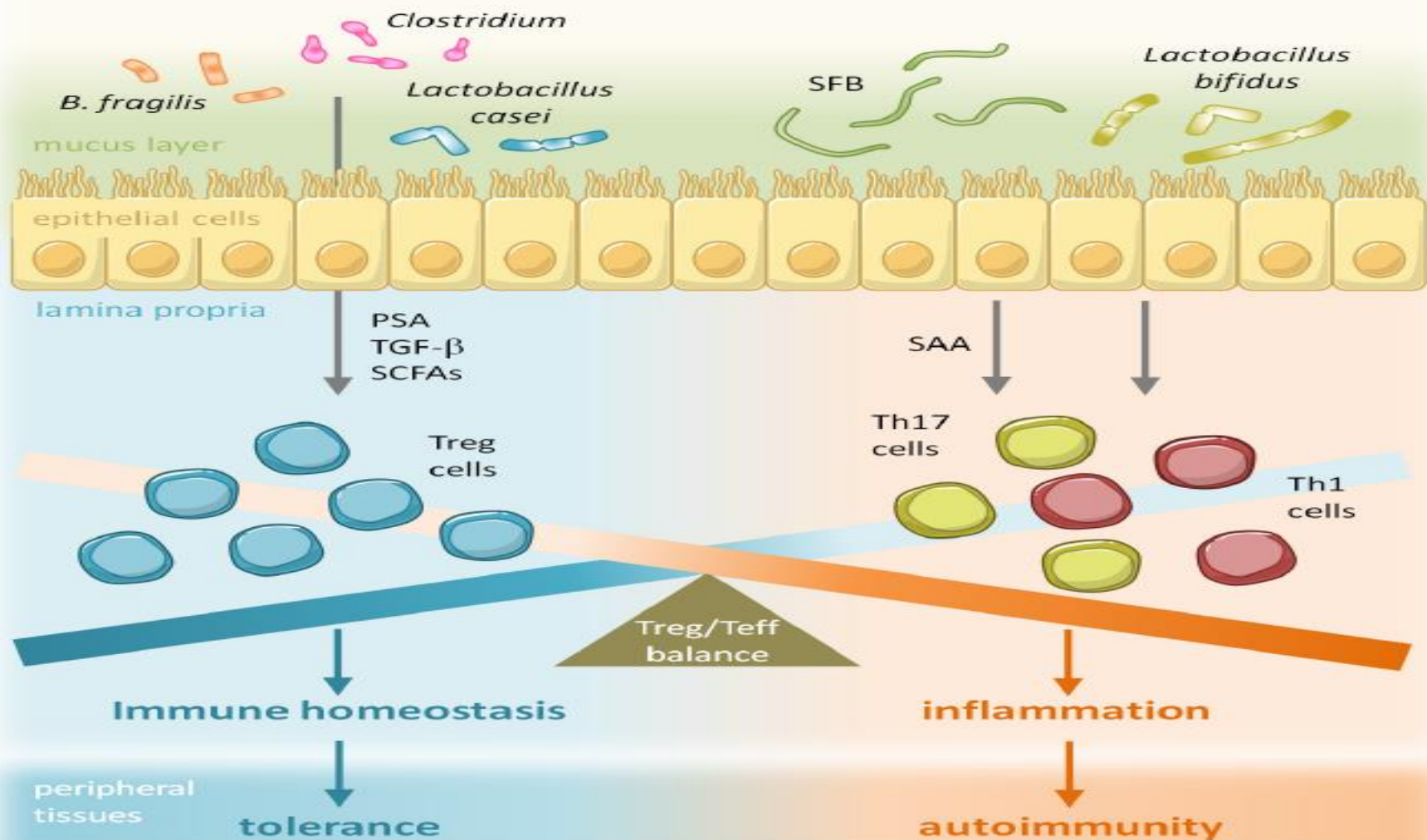
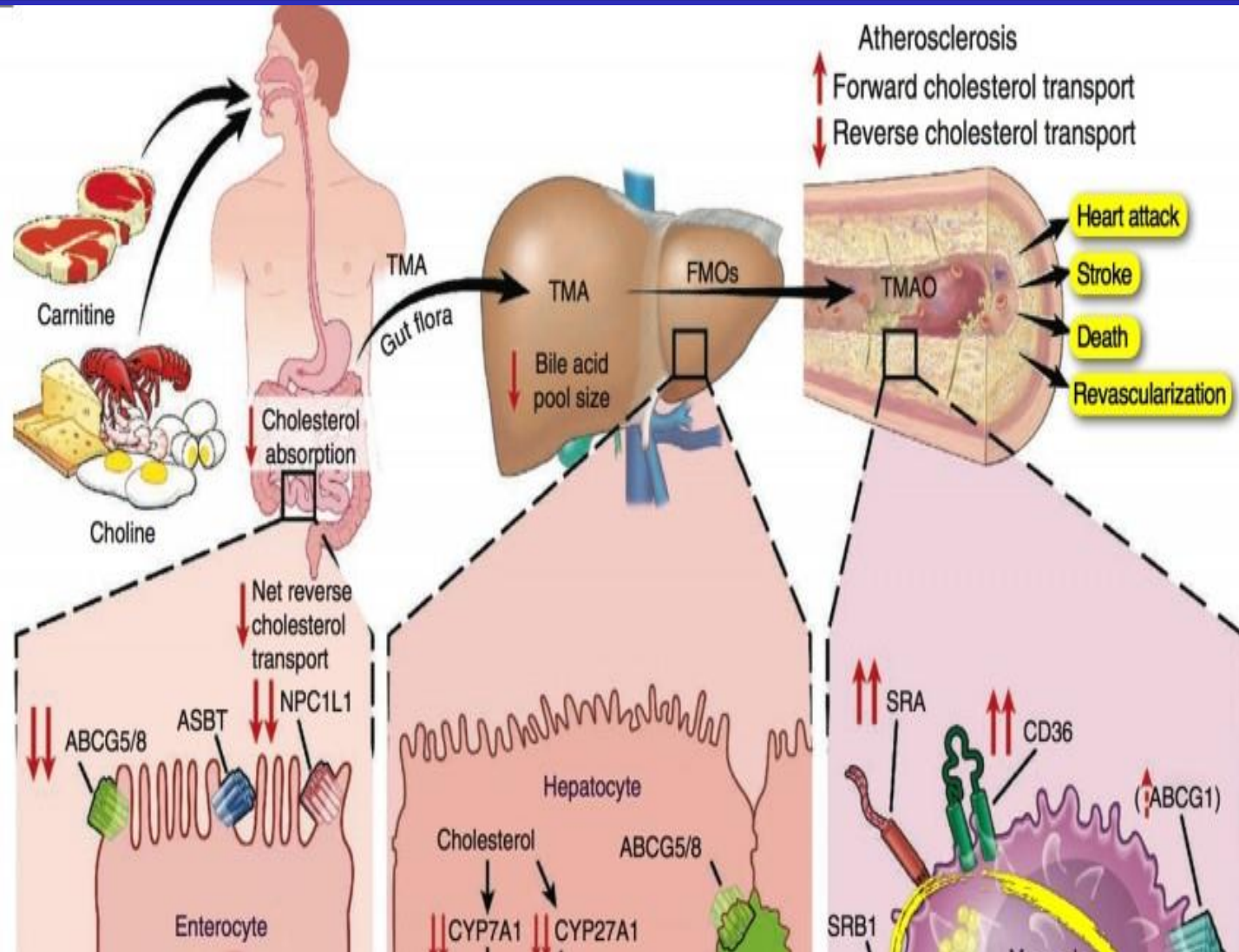
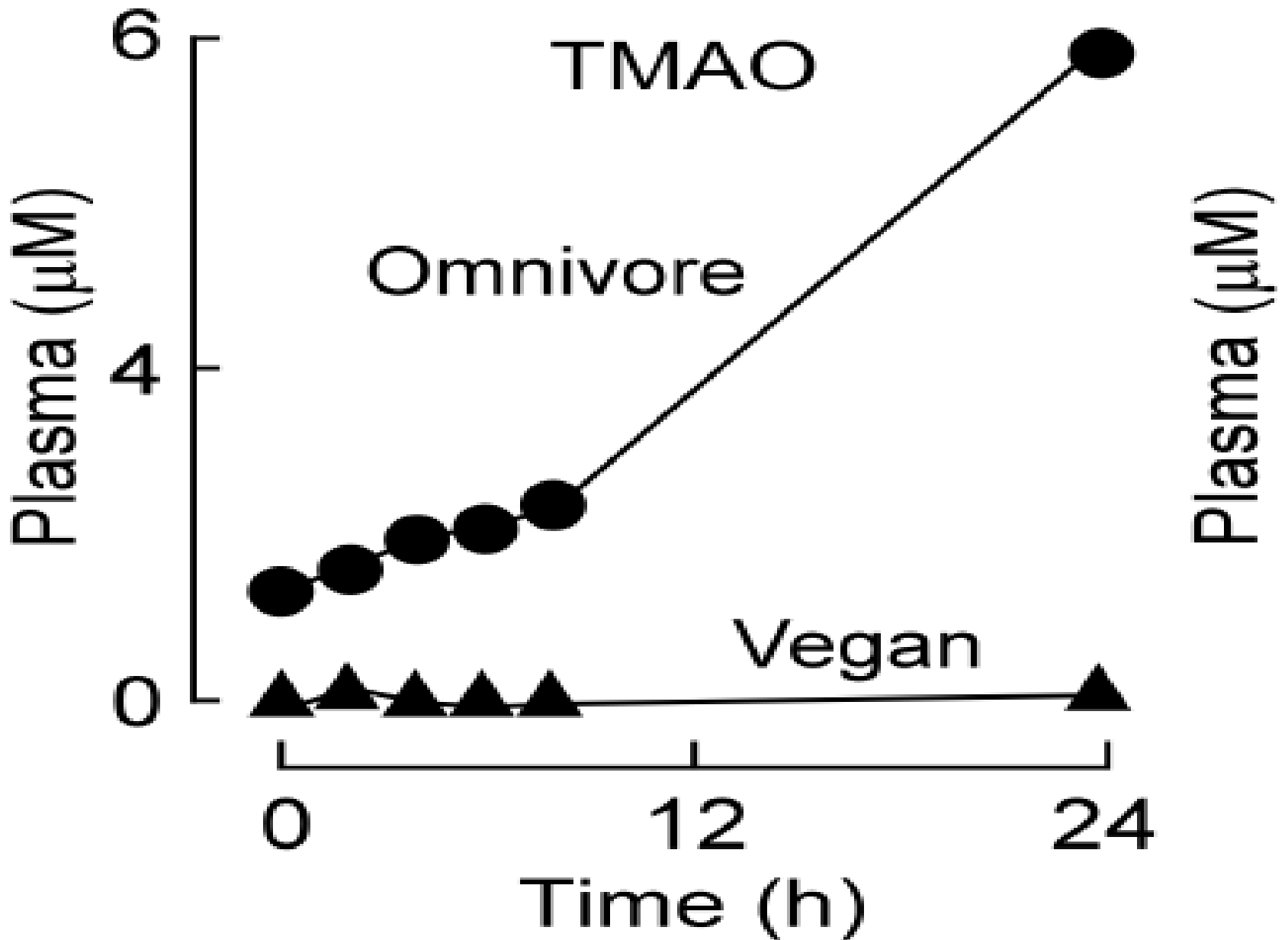


Figure 1. Environmental factors modify pathogenesis of autoimmune diabetes by altering gut microbiota composition. Several environmental factors such as diet, enteric infections and drugs (antibiotics) can affect the pathogenesis of autoimmune diseases like T1D by altering the gut microbiota and, specifically, by changing the Bacteroidetes/Firmicutes ratio thus modifying the Treg/Teff balance in the GALT and systemically.

Trimethylamine-N-oxide (TMAO)



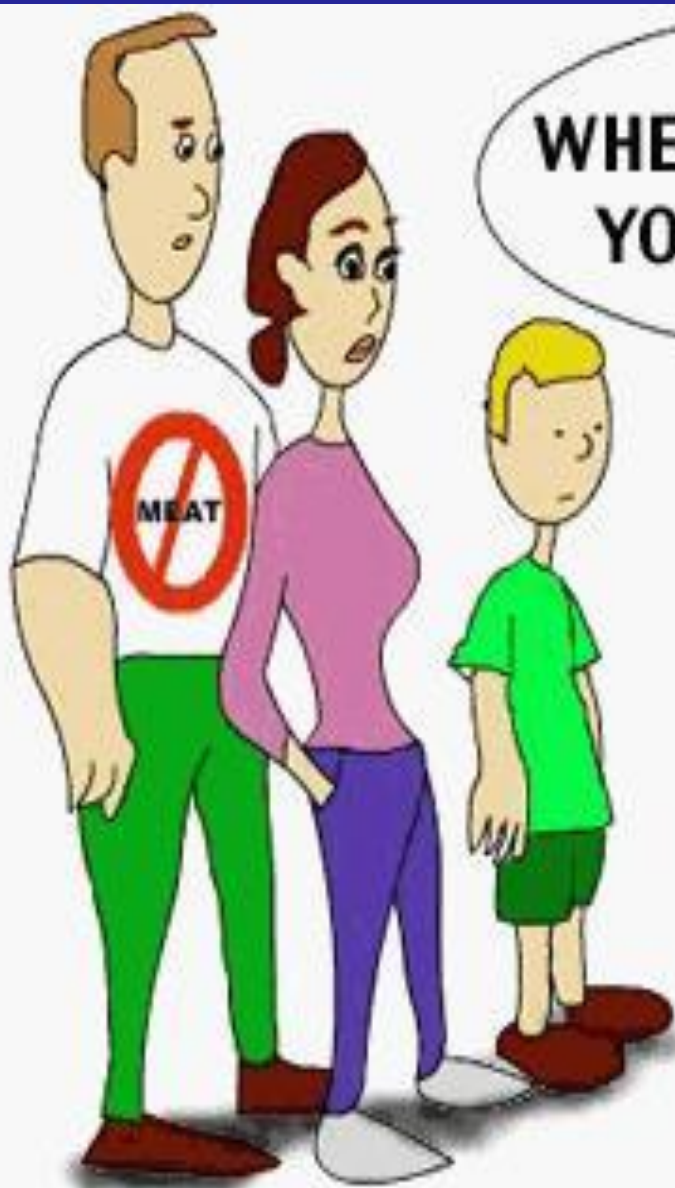


WHOLE-FOOD PLANT-BASED DIET



WHOLE-FOOD PLANT-BASED DIET

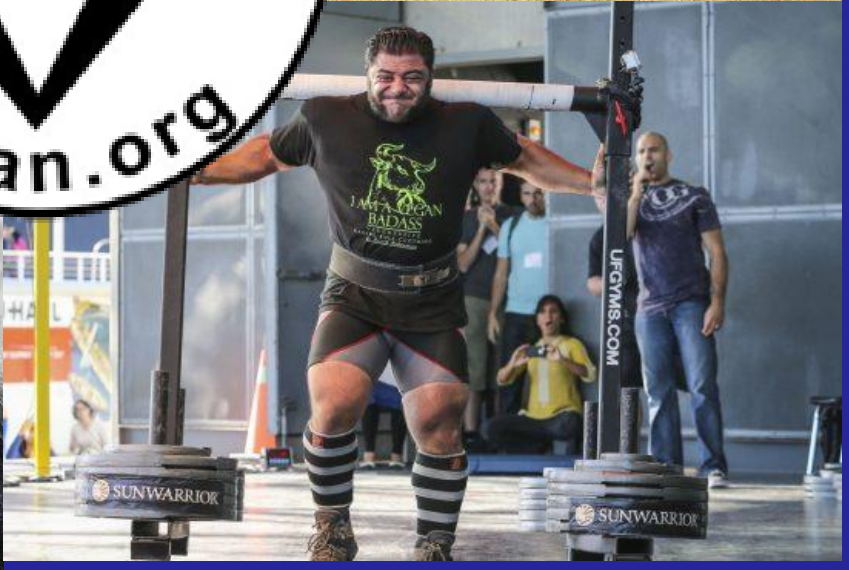
- 75-80% unprocessed carbohydrate
- 10-15% plant-based protein
- 10% fat



**WHERE DO YOU GET
YOUR PROTEIN?**



WZ



THE PROTEIN-DEFICIENCY WING OF THE HOSPITAL







400 calories
of oil




400 calories
of chicken



400 calories
of vegetables

- Vitamin B12
 - Supplements
 - Nutritional Yeast
- Calcium
 - Beans, lentils
 - Green leafy veggies

- Iron
 - Beans, lentils
 - Green leafy veggies
 - Molasses
 - Vitamin C

A white plate is centered on a light background. To the left of the plate is a silver fork, and to the right is a silver butter knife. In the center of the plate lies a single, small, two-colored pill (one end is yellow, the other is red).

**"People are fed
by the food industry,
which pays no attention to health,**

**and are treated
by the health industry,
which pays no attention to food."**

Wendell Berry

International Conference on Nutrition in Medicine



International Conference on
NUTRITION IN MEDICINE

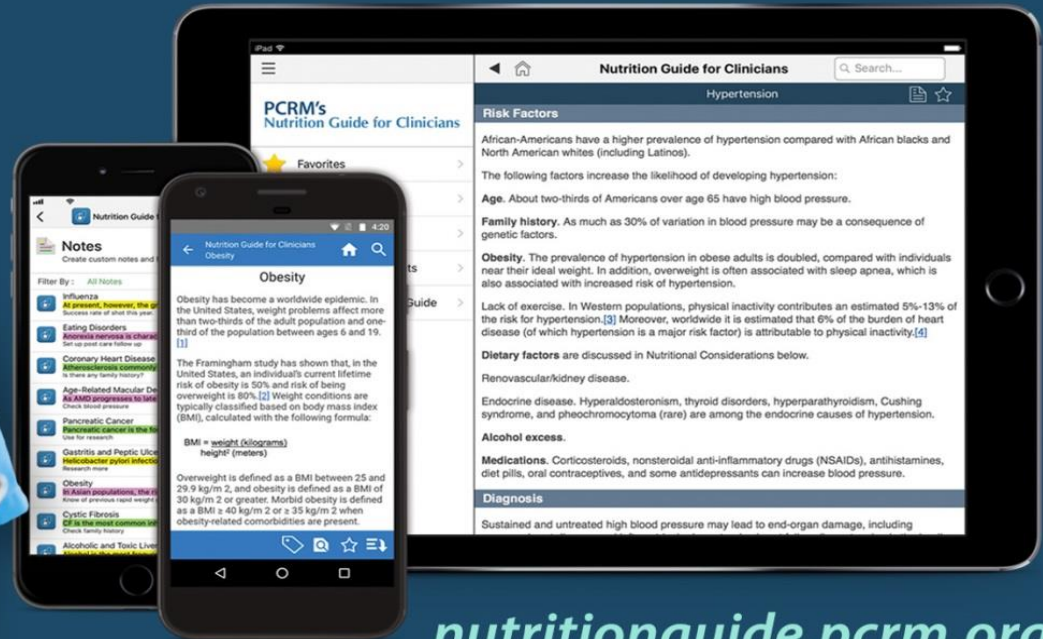
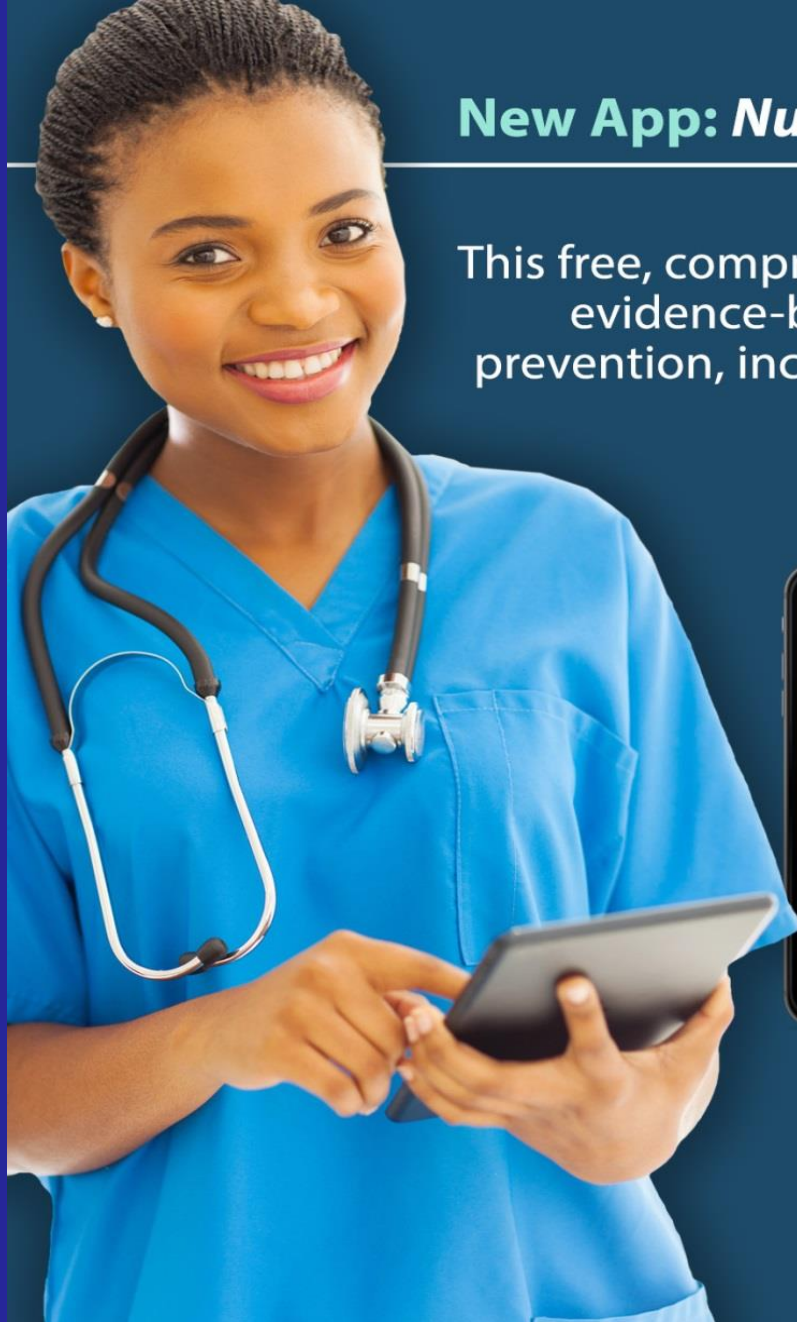
Washington, D.C. • *PCRM.org/ICNM*

August 10-11, 2018

<https://www.pcrm.org/ICNM>

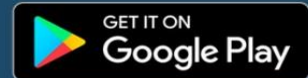
New App: Nutrition Guide for Clinicians, 3rd Edition

This free, comprehensive medical reference provides the latest evidence-based information on nutrition for disease prevention, including risk factors, diagnoses, and treatments.



nutritionguide.pcrm.org

PCRM's
Nutrition
Guide for
Clinicians



PhysiciansCommittee
for Responsible Medicine

<https://nutritionguide.pcrm.org>

QUESTIONS?

