FOOD AS MEDICINE:
THE POWER OF PLANT-BASED NUTRITION

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OBESITY IN THE UNITED STATES

Obesity Trends* Among U.S. Adults
BRFSS, 1990, 2000, 2010
(*BMI ≥30, or about 30 lbs. overweight for 5′4″ person)

Source: Behavioral Risk Factor Surveillance System, CDC.
From autopsy of aorta and coronary arteries of young American children killed in motor accidents, over 50% of children aged 10-14 years had some evidence of early atherosclerosis.

NEARLY A THIRD OF DEATHS IN THE UNITED STATES ARE PREVENTABLE

POTENTIALLY PREVENTABLE DEATHS FROM THE FIVE LEADING CAUSES OF DEATH — UNITED STATES, 2008–2010

- Heart Disease: 91,575 deaths, 34% preventable
- Cancer: 84,443 deaths, 21% preventable
- Chronic Lower Respiratory Disease: 28,831 deaths, 39% preventable
- Stroke: 16,973 deaths, 33% preventable
- Unintentional Injuries: 36,836 deaths, 39% preventable

IN 2017, POOR DIET WAS LINKED TO:

1 IN 5 DEATHS WORLDWIDE

255 MILLION YEARS OF "HEALTHY" LIFE LOST

DEATHS PER 100,000 PEOPLE ATTRIBUTED TO DIET

- Uzbekistan: 892 (#195)
- Afghanistan: 751 (#194)
- India: 310 (#118)
- United States: 171 (#43)
- United Kingdom: 127 (#23)
- Israel: 89 (#1)

POOR DIET FOUND TO BE BIGGEST RISK FACTOR FOR MORTALITY

WHAT IS ON OUR PLATE?

THE STANDARD AMERICAN DIET

- Grains: 24%
- Added fats & oils: 23%
- Added sweetener: 15%
- Meat, eggs, nuts: 21%
- Dairy: 9%
- Fruits & vegetables: 8%
- Dairy: 9%

62% of daily calories are from processed foods.

Data source: USDA Economic Research Service 2013
Average per capita calorie consumption has increased 497 kcal/day.
Grains (mostly refined), added fats and oils, and added sugars and sweeteners account for 87% of the increase in per capita calorie consumption.

Data source: USDA Economic Research Service data as of February 2016
What should we be eating? And can we know which dietary pattern is the most health-promoting?
HOW CAN WE KNOW WHICH DIETARY PATTERN IS HEALTHIEST?

CONVERGENCE OF EVIDENCE

How do foods cause or prevent disease?

Which dietary patterns are associated with risk of disease and mortality?

What do the longest living people eat?

Which dietary components cause or prevent disease?

Basic science

Observational studies

Centenarian studies

Controlled trials
BUILDING A STRONG FOUNDATION: A basic science perspective

DIETARY PATTERN

Obesity
Dementia
Premature Death
Heart Disease
Diabetes
Cancer

Inflammation
Oxidative stress
Gut dysbiosis
Epigenetics
CONTROLLED TRIAL: PREDIMED STUDY AND CARDIOVASCULAR PREVENTION

LARGEST DIETARY INTERVENTION TRIAL ON MEDITERRANEAN DIET AND CARDIOVASCULAR DISEASE PREVENTION

- Mediterranean diet supplemented with extra virgin olive oil
- Mediterranean diet supplemented with nuts
- Control diet (advice to reduce fat)

Prevción con Dieta Mediterránea assigned 7447 participants (55 to 80 years of age, 57% women) at high cardiovascular risk, but with no cardiovascular disease to one of three diets.

CONTROLLED TRIAL
PREDIMED STUDY: PREVENTION OF DIABETES

EFFECT OF MEDITERRANEAN DIET VS LOW FAT ON INCIDENCE OF DIABETES

418 men and women without diabetes (aged 55 to 80 years) at high risk for heart disease (subgroup from the Prevención con Dieta Mediterránea cardiovascular prevention trial)

CONTROLLED TRIAL: PREDIMED STUDY
PLANT-BASED FOOD PATTERN AND MORTALITY

Fruits, vegetables, nuts, cereals, legumes, olive oil, potatoes

7216 participants, 57% women, mean age 67 followed median 4.8 years

PROGVEGETARIAN FOOD PATTERN
Score (12-60)

Plant-based food pattern associated with 41% lower mortality

Added animal fats, eggs, fish, dairy, meats

“Plant slant. Beans, including fava, black, soy, and lentils, are the cornerstone of most centenarian diets. Meat—mostly pork—is eaten on average only 5 times per month. Serving sizes are 3 to 4 oz, about the size of a deck of cards.”

PLANT-BASED DIETS AS FOUNDATION OF WELLBEING

- Inflammation
- Oxidative stress
- Gut dysbiosis
- Epigenetics

PLANT-BASED DIET

- Mood
- Creativity
- Decision-making
- Purpose
- Thinking
- Memory

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DIETARY PATTERN AND RISK OF DEPRESSION

3486 participants, 26% women, mean age 56

'Whole food' pattern
(heavy in vegetables, fruits and fish)

Highest tertile on whole food pattern had 26% lower odds of depression

5yrs

'Processed food' pattern
(heavy in sweetened desserts, fried food, processed meat, refined grains and high-fat dairy products)

High consumption of processed food associated with 42% higher risk of depression

Association between adherence to Mediterranean dietary pattern and prevalence of psychological disorders in over 3000 adults age 18-65 (mean age 37)

Decreased chance (or) among those with highest to lowest adherence:

-40% Psychological Distress
-39% Anxiety
-40% Depression

Omid Sadeghi, et al. (2019, Nutritional Neuroscience, DOI: 10.1080/1028415X.2019.1620425)
FRUITS, VEGETABLES AND EUDAEMONIA

WITHIN PERSON ASSOCIATION BETWEEN DAILY FOOD CONSUMPTION AND EUDAEMONIC WELLBEING

- Eudamonia
- Curiosity
- Creativity
- Positive affect
- Negative affect

### WHAT IS A PLANT-BASED DIETARY PATTERN?

<table>
<thead>
<tr>
<th></th>
<th>BEEF/POULTRY</th>
<th>FISH</th>
<th>DAIRY/EGGS</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>VEGAN</strong></td>
<td>NONE</td>
<td>NONE</td>
<td>NONE</td>
</tr>
<tr>
<td>Excludes all animal products</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>VEGETARIAN</strong></td>
<td>NONE</td>
<td>NONE</td>
<td>DAIRY/EGGS</td>
</tr>
<tr>
<td>Excludes animal products but can include dairy and eggs</td>
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<tr>
<td><strong>PLANT-BASED</strong></td>
<td>BEEF/POULTRY</td>
<td>FISH</td>
<td>DAIRY/EGGS</td>
</tr>
<tr>
<td>Encourages plant foods in their whole form, especially vegetables, fruits, legumes, whole grains, seeds and nuts; and limits animal products and processed foods</td>
<td>BEEF/POULTRY</td>
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</tr>
</tbody>
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Defined by what it includes rather than excludes.
NOT ALL PLANT-BASED DIETS ARE EQUAL

**PROCESSED PLANT-BASED**

- ↑ Cardiovascular disease
- ↑ Diabetes
- ↑ Obesity
- ↑ Cognitive decline
- ↑ Mortality

**WHOLE FOOD PLANT-BASED**

- ↓ Cardiovascular disease
- ↓ Diabetes
- ↓ Obesity
- ↓ Cognitive decline
- ↓ Mortality
WHAT MAKES WHOLE FOOD PLANT-BASED DIETS HEALTHY?

↓ CALORIE DENSITY

↑ NUTRIENT DENSITY

↓ GLYCEMIC LOAD

↑ FIBER

↓ SATURATED FAT & OMEGA 6:3

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GETTING FROM HERE TO THERE...
AMERICANS ARE FAILING TO MEET DIETARY GUIDELINES

PERCENT OF AMERICANS GETTING LESS THAN THE AMOUNT RECOMMENDED BY USDA

- **GRAINS**: 44% less than 6 oz.
- **FRUITS**: 75% less than 2 cups
- **VEGETABLES**: 87% less than 2 ½ cups

WHAT WE ARE NOT EATING MAY POSE A BIGGER THREAT THAN WHAT WE ARE EATING

DEATHS GLOBALLY ATTRIBUTABLE TO INDIVIDUAL DIETARY RISKS

Number of deaths globally in 2017

- Diet low in legumes: 534,767
- Diet low in fiber: 873,408
- Diet low in nuts and seeds: 2,062,522
- Diet low in fruit: 2,423,448
- Diet low in vegetables: 1,462,367
- Diet low in whole grains: 3,065,589
- Diet high in red meat: 24,834
- Diet high in processed meat: 130,349
- Diet high in sugar-sweetened beverages: 137,354
- Diet high in sodium: 3,059,953

THE PLANT-BASED ADVANTAGE

SUSTAINABILITY

HEALTHY LIVING

HEALTH CARE COST-CURVE

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SUMMARY:

• Nearly a third of deaths in the United States are preventable.

• Poor diet is the biggest risk factor for mortality globally.

• The common theme among the healthiest diets is that they are predominantly plant-based, contain whole foods, and limit processed foods.

• Not eating enough whole grains, fruits, vegetables, beans, lentils, nuts, and seeds causes more deaths and loss of quality of life than avoiding red meat, processed meats, and sugar-sweetened sodas.

• What’s good for human health is good for the health of our planet!
AN OPPORTUNITY AND CHALLENGE

Make a change...

Pass it on...

Thank you!