Food for Thought

Ruth Ann Foster, MA, RN
SBCNA, November 4, 2018
Disclaimer:
"Materials that are included in this course may include interventions and modalities that are beyond the authorized practice of mental health professionals.

As a licensed professional, you are responsible for reviewing the scope of practice, including activities that are defined in law as beyond the boundaries of practice in accordance with and in compliance with your professions standards.”

- American Psychological Association (APA)
Learning Objectives

- Describe the gut-brain axis
- List 3 widely-held nutritional beliefs
- Identify high-quality food choices that support gut function and mental health
- Evaluate personal dietary habits
- Specify dietary habits that will improve diet quality
Why?

1) Poor diet contributes more to the global disease burden than physical inactivity, smoking, and drinking combined.

2) Food choice determines the gut microbiota.


Take Home Message:

Eat Real Food*

* Fresh, whole foods
* NO industrial processing or ultra-processing
  * No refining
  * No added chemicals
  * No added sugars or salts
Outline

I. Nutrition Transition - What Are We Eating?

II. Ancestral Diets - What Did We Eat?

III. The Gut-Brain-Microbiome Axis - What Should We Eat?
I. Nutrition Transition
Industrial Revolution

Dramatic Dietary Changes:

- Food processing
- Food structure
- Dietary habits
Super Organism

Genes and cells:
10% human
>90% microorganisms
The Gut Microbiome

300 to 3,000 different species

Weight 2-3 lbs.
“Food processing is defined here as all methods and techniques used by the food, drink and associated industries to turn whole fresh foods into food products.”

Q: Are processed foods safe?

A: Yes, in fact processing foods often makes them safer. For example, heating foods helps remove harmful bacteria.

Pasteurization is a common heating process applied to milk to kill harmful organisms. Canning and freezing foods such as meats, fruits and vegetables helps them to stay fresher longer.”

https://www.foodinsight.org/
Industrial Revolution
1856

Borden’s Condensed Milk

- In 1855, dairy products were shipped in unsanitary oak barrels.
- Gail Borden used an airtight vacuum to boil off the 87% of water found in milk.
- Canned condensed milk did not spoil and could be easily transported.
1867 Synthetic Baby Food

- Formula was followed by cereals, fruits, and vegetables.
- Malted milk and chocolate were “health foods” for children.
1886
Coca Cola
1897
Campbell’s Soup

- Housewives had to be convinced to buy Campbell’s instead of making their own soup.
- They were marketed as being slightly different to homemade, but inexpensive and incredibly time-saving.
1911
Crisco

- Procter and Gamble’s flagship product.
- Crisco first accepted in Kosher kitchens.
Processed Foods

Cheese
Ham and other slated, smoked, canned meat or fish
Vegetables and fruits preserved in salt or sugar
Nuts and seeds, salted or sugared, butters and spreads
Beer and wine

Ultra-Processed Foods

Breads, rolls, crackers
Cakes, cookies, and pies
Desserts
Pizza
Breakfast cereals
Salty snacks - chips
Sweet snacks
Soft drinks, sweetened beverages, fruit drinks
French fries and other potato products
Instant and canned soups
Ready-made meals
Sauces, dressings, and gravies
Theories and Confusion

- Calorie Theory - Food Industry Distraction
- Low-fat Theory - Scientific Fraud
- Moderation Theory - Conflict of Interest
Calorie Theory

- Shifts focus away from the food industry to individual:
  - Simplistic view
  - Overlooks food processing -
    - Cooking increases energy gained
    - Metabolic costs in digestibility and immune defense

Low-fat Theory

- 1967 - *Sugar becomes the new tobacco* - Harvard University and The Sugar Research Foundation

- Demonized fat and cholesterol

- Replaced tradition fats with industrial seed oils

- Substituted sugar for fat

March 1984: Cholesterol - And Now the Bad News...

June 2014: Eat Butter. - Scientists labeled fat the enemy. Why they were wrong.

By Brian Walsh
Sugar Industry and Coronary Heart Disease Research  
A Historical Analysis of Internal Industry Documents  

Cristin E. Kearns, DDS, MBA\textsuperscript{1,2}; Laura A. Schmidt, PhD, MSW, MPH\textsuperscript{1,3,4}; Stanton A. Glantz, PhD\textsuperscript{1,5,6,7,8}  
[+] Author Affiliations  

*JAMA Intern Med.* Published online September 12, 2016. doi:10.1001/jamainternmed.2016.5394
On May 4, for the first time in its history, the people of the United States lined up inside schoolhouses to register for their first book of rationing coupons. Sugar is the first commodity for which War Ration Book One will be used. All sugar sales stopped April 27. They were resumed May 3 where registration was completed, but only to consumers armed with a war ration book. The fixed ration of half-pound a week per person is half what the sweet-toothed U. S. public normally consumes, but is almost twice as much as allotments in France and Italy. Commercial users of sugar, such as bakeries, candy and ice-cream manufacturers, received ration books April 28–29, were allotted about 70% normal requirements. The existing sugar shortage which necessitates rationing so that all on the home front may have a fair share, is due to 1) the fact that 68% of sugar used in U. S. was imported from the Philippines, Hawaii and West Indies; 2) large amounts of sugar are used in manufacture of alcohol for explosives.

Honey, maple or corn syrup and molasses are suggested for sweetening fruits. These may also be used for cooked desserts. Juice from canned fruits should be kept. It can be used as a sweetening agent in cooking, sauces and for jellied desserts. Salt, although not a sugar substitute for sugar, adds flavor to most foods, has the old effect of accentuating the sugar taste.
Sugar Rationing - First and Last
April 27, 1942 to October 31, 1947

Sugar is the first commodity for which War Ration Book will be used.

The fixed ration of half-pound (1 cup) per week per person is half what the sweet-toothed U.S. public normally consumes, but is almost twice as much as the allotment in France and Italy.

The existing sugar shortage which necessitates the ration is due to:

1) fact that 62% of U.S. sugar is imported from the Philippines, Hawaii and West Indies:

2) large amounts of sugar are used in the manufacture of alcohol for explosives - Nitroglycerin
What We Eat in America (WWEIA) Food Category analyses for the 2015 Dietary Guidelines Advisory Committee. Estimates based on day 1 dietary recalls from WWEIA, NHANES 2009-2010.
Added Sugars

Processed Foods 1.6%
Ultra-processed Foods 90%

Calories
Ultra-processed Foods 60%

Daily sugar consumption = 42.5 teaspoons per day (3/4 cup)
**A healthy breakfast: cereals, toast, fruit juice?**

<table>
<thead>
<tr>
<th>Food item</th>
<th>Serving size in g/ml</th>
<th>How does each food affect blood glucose compared with one 4g teaspoon of table sugar?</th>
</tr>
</thead>
<tbody>
<tr>
<td>Corn flakes</td>
<td>30</td>
<td>8.4</td>
</tr>
<tr>
<td>Milk</td>
<td>125</td>
<td>1</td>
</tr>
<tr>
<td>Brown toast, 1 slice</td>
<td>30</td>
<td>3</td>
</tr>
<tr>
<td>Pure Apple juice</td>
<td>200</td>
<td>8.6</td>
</tr>
</tbody>
</table>

**Total for breakfast 21 teaspoons**

Useful information for those with T2Diabetes making dietary choices

*As per calculations derived from the glycaemic index. To be found in: It's the glycaemic response to, not the carbohydrate content of food that matters in diabetes and obesity* Journal of Insulin Resistance 2016. Unwin et al
De Novo Lipogenesis

Hepatic de novo lipogenesis (DNL) is the biochemical process of synthesizing fatty acids from most commonly carbohydrate (sugar) catabolism.

In addition to glucose (sugar) which most commonly supplies carbon units for DNL, fructose is also a profoundly lipogenic substrate that can drive DNL, important when considering the increasing use of fructose in corn syrup as a sweetener.

Therefore, a high-carbohydrate (sugar) diet can prime the DNL pathway with a large substrate load and increase rates of DNL.

Sugar and Triglycerides

- Triglycerides rise when dietary carbohydrate > 55% of energy = Carbohydrate-induced hypertriglyceridemia

- Paradox - TG levels still rise with increased dietary carbohydrate consumption despite a decrease in dietary fat consumption

Moderation Theory

* Academy Nutrition and Dietetics
“It is the position of the Academy of Nutrition and Dietetics that the total diet or overall pattern of food eaten is the most important focus of healthy eating.

All foods can fit within this pattern if consumed in moderation with appropriate portion size and combined with physical activity.

In contrast to the total diet approach, classification of specific foods as good or bad is overly simplistic and can foster unhealthy eating behaviors.”

Academy of Nutrition and Dietetics
AND Sponsors – 2018

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• Campbell Soup Company
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• SPLENDA® Sweetners
• Sunsweet Growers
• The a2 Milk Company™

https://www.eatrightpro.org/about-us/advertising-and-sponsorship/meet-our-sponsors
CHICKEN STOCK, 
COOKED CHICKEN MEAT, 
CARROTS,  
CONTAINS LESS THAN 2% OF: 
WATER, 
CHICKEN FAT, 
POTATO STARCH,  
SALT,  
POTASSIUM CHLORIDE, 
HIGH FRUCTOSE CORN SYRUP, 
ONION POWDER, 
DEHYDRATED COOKED CHICKEN, 
CHICKEN FLAVOR, 
LOWER SODIUM NATURAL SEA SALT, 
DISODIUM INOSINATE, 
DISODIUM GUANYLATE, 
MILK SOLIDS,  
DEHYDRATED GARLIC,  
MODIFIED FOOD STARCH, 
SPICE EXTRACT,  
SOY PROTEIN ISOLATE, 
SODIUM PHOSPHATES,  
BEEF EXTRACT, 
ASCORBIC ACID (ADDED TO HELP RETAIN COLOR), 
CHICKEN FLAVOR (CONTAINS CHICKEN STOCK, CHICKEN POWDER, CHICKEN FAT),  
BETA CAROTENE FOR COLOR. 

Campbell’s Healthy Request Chicken Noodle Soup

COOKED ENRICHED EGG NOODLES WITH ADDED CALCIUM:  
(WHEAT FLOUR, 
CALCIUM CARBONATE*, * IN EXCESS OF STANDARD EGGS, 
EGG WHITES, 
NIACIN, 
FERROUS SULFATE, 
THIAMINE 
MONONITRATE, 
RIBOFLAVIN, 
FOLIC ACID),
The Farmer's Share

Did you know that farmers and ranchers receive only 14.8 cents of every food dollar that consumers spend? According to the USDA, off farm costs including marketing, processing, wholesaling, distribution and retailing account for more than 80 cents of every food dollar spent in the United States.

<table>
<thead>
<tr>
<th>Item</th>
<th>Retail Price</th>
<th>Farmer Price</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bacon (1 lb.)</td>
<td>$4.99</td>
<td>$0.68</td>
</tr>
<tr>
<td>Top Sirloin Steak (1 lb.)</td>
<td>$8.99</td>
<td>$2.01</td>
</tr>
<tr>
<td>Bread (2 lbs.)</td>
<td>$3.49</td>
<td>$0.12</td>
</tr>
<tr>
<td>Fresh Carrots (5 lbs.)</td>
<td>$4.40</td>
<td>$1.40</td>
</tr>
<tr>
<td>Beer (6-pack cans)</td>
<td>$8.99</td>
<td>$0.04</td>
</tr>
<tr>
<td>Cereal (18 oz. box)</td>
<td>$5.09</td>
<td>$0.05</td>
</tr>
<tr>
<td>Tomatoes (1 lb.)</td>
<td>$3.99</td>
<td>$0.40</td>
</tr>
<tr>
<td>Eggs (1 dozen)</td>
<td>$2.89</td>
<td>$2.01</td>
</tr>
<tr>
<td>Flour (King Arthur, 5 lbs.)</td>
<td>$6.09</td>
<td>$0.43</td>
</tr>
<tr>
<td>Boneless Ham (1 lb.)</td>
<td>$3.99</td>
<td>$0.68</td>
</tr>
<tr>
<td>Lettuce (1 lb.)</td>
<td>$2.79</td>
<td>$0.47</td>
</tr>
<tr>
<td>Milk (1 gallon, fat free)</td>
<td>$4.49</td>
<td>$1.34</td>
</tr>
<tr>
<td>Fresh Apples (1 lb.)</td>
<td>$2.19</td>
<td>$0.34</td>
</tr>
<tr>
<td>Fresh Potatoes (Russet, 5 lbs.)</td>
<td>$3.99</td>
<td>$0.56</td>
</tr>
<tr>
<td>Soda (2 liters)</td>
<td>$2.19</td>
<td>$0.05</td>
</tr>
</tbody>
</table>

Farmers' share derived from USDA, NASS “Agricultural Prices,” 2018. Prices based on March 2018 data.
Retail prices based on Safeway (CE) brand except where noted. *Figure according to U.S. Department of Agriculture Economic Research Service.
The New 2010 Food Guide Pyramid

9 to 11 Servings of grain = 2 cups of sugar!

MyPymid.gov
Steps to a healthier you

Academy of Nutrition and Dietetics
II. Ancestral Diets - Nutritional Wisdom
Dr. Weston A. Price
1870-1948
Children showed increasing signs of dental problems.
Cultures Studied

- Swiss
- Gaelics
- Eskimos
- North American Indians
- Melanesians
- Polynesians
- Africans
- Australian Aborigines
- Torres Straight Islanders
- Maori of New Zealand
- Peruvian Indians
A SHOCKING AND POWERFUL TESTAMENT TO THE ADVERSE EFFECTS OF MODERN PROCESSED DIETS UPON HEALTH

PUBLISHED BY
PRICE-POTTENGER NUTRITION FOUNDATION™

Nutrition and Physical Degeneration

Weston A. Price, DDS

“DR. WESTON PRICE was one of the most prominent health researchers of the 20th century. This extraordinary masterpiece of nutritional science belongs in the library of anyone who is serious about learning how to use foods to improve their health.”
— Dr. Joseph Mercola

EXPANDED EDITION WITH NEW PHOTOS AND TEXT
The Lötschental Valley, Switzerland
Traditional Diet - UnProcessed Foods

- Only 1% tooth decay
- No tooth brushes
- Every adult and child had straight teeth
- Zero cases of TB

Isolated Swiss Children
Modern Swiss Children

Industrially Processed Foods

- At least one tooth in three had decayed
- Narrow faces
- Crowded, crooked teeth
- Tuberculosis problem

Modern Swiss Children
What did they eat?
The Lötschental villagers confirmed Dr. Price’s theory on nutrition and degeneration.
The Isle of Lewis, Scotland
Isolated Scots
Smoke-filled Living Room
South Sea Islanders
90 years old
The Australian Outback
“The displacing foods of modern commerce”
Underdeveloped Middle Third of Face
Africa
Isolated Africans
African Diets
Cattle Herders, Hunters, Agriculturists

- No cavities found in the cattle herder and hunter groups
- 6% tooth decay among the agriculturists
- Agriculturists groups were shorter in height, heavier in weight, and not as robust

Masai warrior
Sacred Foods

- **Swiss** - butter from cows on spring pasture
- **Gaelics** - cod’s head stuffed with oats and chopped cod liver
- **South Sea Islanders** - organ meats of certain fish and sharks
- **Africans** - liver, raw and cooked
Traditional Diets

- Some had no plant food
- Some had few animal foods
- Some had mostly cooked foods
- Some had large amounts of raw foods
- Some had milk products; some did not
- Some had grains; some did not
- Some had fruits; some did not
Dr. Price’s Healthy Diets

- Animal foods in every diet -
  - Vitamins A and D
- Nutrient-dense foods
- No processed foods
III. The Gut-Brain-Microbiome Axis
Traditional Diets

“Epidemiological studies have reported that more traditional dietary patterns are associated with good mental health and lowered risk of depression.

Short-term intervention studies show that traditional dietary patterns can positively influence mental outlook, cognition and chronic fatigue.”

“Our findings that the human gut microbiome can rapidly switch between herbivorous and carnivorous functional profiles may reflect past selective pressures during human evolution.

Consumption of animal foods by our ancestors was likely volatile, depending on season and stochastic foraging success, with readily available plant foods offering a fallback source of calories and nutrients21.

Microbial communities that could quickly, and appropriately, shift their functional repertoire in response to diet change would have subsequently enhanced human dietary flexibility. Examples of this flexibility may persist today in the form of the wide diversity of modern human diets.”

“Remote rural areas have experienced relatively small variation over the past century, with the inhabitants having gut microbiota distinct from those of modern city dwellers.

Even in developed countries, rural–urban differences in gut microbiota exist. For example, the bacteria that metabolize fiber have decreased, whereas the bacteria that metabolize animal protein and fat have increased in city dwellers; even in people who have moved from villages to cities, the gut microbiota seems to have changed to a more urbanized microbiota.

Modernization has been changing the microbiota by various means, including diet, lifestyle, and medication.”

Dietary Changes and Dysbiosis

**Dietary structure:**
- Increased intake of refined carbohydrates - also high-fat, especially industrially-produced seed oils
- Decreased dietary fiber intake

**Dietary habits:**
- Eating out, increased snacking

Dietary Changes and Dysbiosis

- **Increased ultra-processed food consumption:**
  - Pesticide and drug residues
  - Food additives and antiseptics - sodium benzoate, potassium sorbate
  - Artificial sweeteners

- **Decreased consumption of fresh and traditionally-fermented foods**

Super Organism

Genes and cells:
10% human
>90% microorganisms
The Gut Microbiome

300 to 3,000 different species

Weight 2-3 lbs.
The Gut Microbiome
Functions of Gut Microbiota

- Nutrient digestion, absorption, and metabolism
  - Resistant starches
  - Protein decomposition (endogenous and exogenous)
- Bile acid breakdown
- Vitamin and other bioactive compound synthesis
- Immune system maturation
- Neuroendocrine system regulation
- Brain and mind development and function

Development of the Gut Microbiome
Hygiene Hysteria
The inverse relationship between (A) infectious disease incidence and (B) the rates of immune disorders suggested that a reduction in infections might be causing the human immune system to malfunction.

Psychology of the Gut-Brain

- Gut-brain can function independent of the brain
- These functions persist even in a vegetative state
- Gut-brain regulates local gut functions plus influences human behavior and cognition
Gut Microbiota and Behavioral Influences - Animal Studies

1. Pain perception and response - peripheral and visceral
2. Cognitive functions - learning and memory
3. Mood and emotion
4. Character and temperament
5. Stress management - stress response system
6. Modulates dietary choices and appetite
7. Social interaction and reproductive choices

How Microbes Talk to the Brain

1) Neural Pathway - the Vagus nerve

2) Neuroendocrine Route -
   - Neurotransmitter secretion (GABA, serotonin, catecholamines, histamine, etc.)
   - Microbial metabolites may provide signaling modulators

3) Immune Pathway

Three Pathways of Communication

Gut Microbes and Appetite

- Microbial control of the appetite-regulating hormones
- Abnormal eating habits disturb microbial ecosystem, potentially creating a loop perpetuating the disorder


A balanced and diverse gut microbiota is vital for neurodevelopment, brain function, and mental health.

Diet is an important therapeutic strategy.

- Traditional foods - fresh, whole, and minimally processed.
- Traditional fats - butter, coconut oil, lard, olive oil, ghee
- Fiber-rich foods

Reduce or eliminate sugar - especially sugar-sweetened beverages
Practice:

- Include dietary habits in client assessment
  - *Suggest healthy food choices where necessary*
- Handouts:
  - Food-based dietary guide
  - Food Diary
- *Encourage physical activity for well-being NOT weight loss*
Thank You!