NUTRITION CONTROVERSIES

How to Handle the Tough Questions & Separate Fact From Emotion

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Disclosures

Services
• Consultation
• Counsel
• Speaking
• Writing
• Development of education materials

Clients
• Ajinomoto
• Florida Department of Citrus
• National Dairy Council/American Dairy Association Northeast
• National Cattlemen’s Beef Association
• Calorie Control Council
• Glutamate Association
• McCormick Science Institute
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<th>Topic</th>
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<td>PESTICIDES &amp; GLYPHOSATE</td>
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WHAT MOST DIETS ARE MISSING

- FRUITS
- VEGETABLES
- LOW-FAT DAIRY
- WHOLE GRAINS
2016 *Nutrition Today* Survey: Many consumers fear conventional produce

Overall preference for organic, but cost was a factor

Information about “organic” & “conventional” did not increase likelihood of buying more fruits & vegetables

Those hearing messages about pesticide residues on produce were less likely to buy ANY type of fruits and vegetables

EVALUATING SAFETY OF PESTICIDES
WHO’S IN CHARGE?

**EPA Regulates pesticides**
- Food & Insecticide Regulation Act (FIFRA)
- Food Quality Protection Act (FQPA)

**FDA & USDA**
- Sets standards for levels on & in crops
- Operates Pesticide Data Program (PDP)
ENFORCEMENT of STANDARDS: USDA’s PESTICIDE DATA PROGRAM

20 years
Rotating tests
Numerous samples: domestic & imported produce
457 pesticides, 22 environmental contaminants

Samples from distribution centers, minimum 600 samples per commodity

Sampled as consumer would eat them: wash & drain, peel if appropriate

>99.9% of commodities have consistently tested well below acceptable levels

VAST majority do not come close to limits

**SETTING THE BAR:**
**DEFINING NOAEL, ADI, & RfD**

<table>
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<tr>
<th>No Observable Adverse Effect Level (NOAEL):</th>
<th>• Maximum DAILY dose for a lifetime at which there is no biological/statistical toxic effect</th>
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<td>Acceptable Daily Intake (ADI):</td>
<td>• 100(^{th}) or 1000(^{th}) of the maximum dose at which there was no adverse effect</td>
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| Reference Dose (RfD):                      | • Context: Like ADI but focused on pesticides  
• Safety factor of 10\(^3\) or 10\(^4\) |

LEVEL OF EXPOSURE

Only 1 commodity >1% of the RfD (bell peppers at 2%)

7 foods were >0.1% of RfD

75% of foods were <0.01% of RfD

41% of foods were <0.001% of RfD

NOTE: RfD includes 1000-fold cushion of safety
GOT GLYPHOSATE?
Got Confusion.

• As seen on TV: “Used Roundup? Got cancer (any type)? You may be entitled to compensation. Call 800-555-1212 and get money!”

• “I just don’t want to be giving my kids weed killer in their oatmeal.”
GOT GLYPHOSATE?

International Agency for Research on Carcinogens (IARC 2015):

- Glyphosate classified as “probably carcinogenic to humans”

Joint Meeting on Pesticide Residues (JMPR 2016):

- “Glyphosate is unlikely to pose a carcinogenic threat to humans from exposure through diet”

So.....?
GLYPHOSATE SAFETY: GLOBAL REGULATORY BODIES WEIGH IN

(03/15) Federal Institute for Risk Assessment (Germany)

• “... a comprehensive and scientifically sound consideration of the data and arguments that led to the IARC conclusion is simply not possible . . .”

(11/15) European Food Safety Authority

• “... glyphosate is unlikely to pose a carcinogenic threat to humans. . .”
GLYPHOSATE SAFETY: GLOBAL REGULATORY BODIES WEIGH IN

(04/15) Pest Management Regulatory Authority (Canada)
- “...products containing glyphosate do not present unacceptable risks to human health when used according to the label directions...”

(12/15) Australian Pesticides & Veterinary Medicines Authority
- Concluded that “...glyphosate does not pose a cancer risk to humans...”

(09/16) EPA FIFRA Science Advisory Panel
- “...glyphosate is not likely carcinogenic to humans at doses relevant to human health risk assessment... ”
• “In glyphosate review, WHO cancer agency edited out “non-carcinogenic” findings”

• “…significant changes were made between a draft of its report and the published version. The agency won't say who made the changes or why.”

IARC classifies glyphosate in the same category as:

- The occupational exposure experienced as a barber and a fry cook.

**Risk vs: Hazard**

- EVERYTHING is a potential hazard
- Risk: the potential for a hazard to cause harm.

**Hint: Water is a hazard.**

**The dose makes the poison: AND ALSO BRINGS THE BENEFIT**
“All our food has GMOs now”

“We still don’t know what they could do to us 20 years from now.”

It’s hard to find a food that’s not a GMO.”
HOW MANY GMO CROPS ARE THERE?

- Soybeans
- Corn
- Cotton
- Canola
- Summer squash

- Sugar beets
- Papaya
- Alfalfa
- Potatoes
- Apples

www.GMOanswers.com
JUST SO THERE’S NO CONFUSION...

• GMO technology has no impact on nutrient content
• “GMO” refers only to the method of production, not to the resulting food
• Consumers should be assured:

“Non-GMO-Verified” is...
NOT A HEALTH CLAIM!

- Olive oil
- Wheat
- Oats
- Broccoli
- Salt
- Water

Source: https://www.flickr.com/photos/44126314@N07/15535539877
https://creativecommons.org/licenses/by-nd/2.0/
PUTTING SCIENCE BEFORE PHILOSOPHY ANYMORE?

>130 NOBEL PRIZE-WINNING SCIENTISTS signed a letter to Greenpeace, in FAVOR of GMO technology.

GEOGRAPHICALLY- AND SPECIALTY-DIVERSE

NONE affiliated with Monsanto

http://supportprecisionagriculture.org/nobel-laureate-gmo-letter_rjr.html
SUGAR
SUGAR
SUGAR
THE BUZZ

Sugar gets kids hyperactive

Sugar makes kids overweigh

School Meals make kids overweight!
YOU CAN’T GET OBESE BY EATING AGE-APPROPRIATE CALORIES!!!

<table>
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<tr>
<th>GRADES</th>
<th>BREAKFAST</th>
<th>LUNCH</th>
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<tr>
<td>K-5:</td>
<td>350-500 calories</td>
<td>550-650 calories</td>
</tr>
<tr>
<td>6-8:</td>
<td>400-500</td>
<td>600-700</td>
</tr>
<tr>
<td>9-12:</td>
<td>450-600</td>
<td>750-850</td>
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HOW MUCH SUGAR DO WE EAT?

Total added sugars eaten, per capita:

- 1999: 107.7 lb. (133 gm/day)
- 2007: 97.0 lb. (120 gm/day)
- 2016: 77.0 lb. (95 gm/day)

1 - ers.usda.gov, accessed 9/21/09
2 - https://www.sugar.org/diet/intake/
CHOCOLATE MILK

THE DUMBEST FIGHT IN SCHOOL
“New York City proposes ban on chocolate milk in schools. State officials are unhappy”

Dr. Keith Ayoob@DrKeithAyoob
Sep 16
“This is the DUMBEST FIGHT IN SCHOOL. W/ a measly 8 grams of added sugar & tons of nutrition it’s STILL one of the best & most nutrient rich drinks. The NYC Dept. of Ed. needs to deal w/ facts not ideology & stop using this as a distraction from their failed education policies.”
Food Sources of Added Sugars
Ages 2 Years and Older, 2015 Dietary Guidelines

Data Source: What We Eat in America (WWEIA) Food Category analyses for the 2015 Dietary Guidelines Advisory Committee
“Dietary practices should be fostered that encourage moderation rather than overconsumption, emphasizing healthful choices rather than restrictive eating patterns.”

TRANSLATION: Avoid “OCD” (Overachievement of Consumption Directives)
Empty-calorie Drinks
Where They Get Them, Where They Drink Them

Source: NCHS Data Brief No. 71, Figure 6. August 2011
Sugar, HFCS, and obesity? Evidence suggests otherwise

• IOM report (2002):
  • Higher intakes of sugar are associated with lower rates of obesity
  • “No clear and consistent association between increased intake of added sugars and BMI.”
Negative associations generally dismissed by the scientific community¹

Perception of sugar by parents and consumers continues to defy years of sound science and logic.

Some evidence that behavior is positively affected by sugar.

1 - IOM, Dietary carb, 2002
SUGAR CAN EVEN IMPROVE BEHAVIOR AND PERFORMANCE

- Decrease in activity after sucrose\(^1\) or glucose\(^2\)
- Sugar-containing snack can enhance ability to stay on task\(^3\)
- Glucose enhances long-term verbal and spatial memory\(^4\)

1 - Behar et al (1994); 2 - Saravis et al (1990)
3 - Busch et al (2002); 4 - Sunram-Lea et al (2001)
SUGAR: Bottom line

It’s not “angel food” but not “devil’s food” either.

Spend WISELY: Drive consumption of needed foods!

Quantity matters, frequency matters. TYPE of sugar doesn’t matter.

WON’T make kids hyperactive!
But the real fear is...
...sugar alternatives...
SS “OK” PER IOM REPORT ON SCHOOL MEALS

Safe for all ages

One of the most rigorously tested ingredients in the U.S. food supply

Can’t use it until high school
THE ALLEGATIONS

“Causes formaldehyde in our blood”

Brain tumors

Cancer

Glucose intolerance
WHERE WE’RE GETTING SUGAR SUBSTITUTES

% Total by Wt

Based on low calorie sweetener sales to the processed food and beverage industry.
SRI Consulting Chemical Handbook. 2007
AAP POLICY STATEMENT: Soft drinks in schools

• Each 12-oz sugared soft drink consumed daily has been associated with a 0.18-point increase in a child’s BMI and a 60% increase in risk of obesity, associations not found with "diet" (sugar-free) soft drinks. Sugar-free soft drinks constitute only 14% of the adolescent soft drink market.

American Academy of Pediatrics, 2004
AND THEN....
ASPARTAME: Some safety concerns from the Internet

“Possibility” of toxicity from *methanol*

“Possible” plasma level elevations of *phenylalanine* and aspartic acid (altering brain function!)

*Postulated* link with:

- Epilepsy
- Brain tumors
- Ailments from infertility to baldness
ASPARTAME & “The Ramazzini Study”

Largest (and worst) animal study ever done on Aspartame.

1,800 (male and female) 8 wk old rats

Very low to very high concentrations:

“Statistically significant dose-related increase in lymphomas and leukemias in females”; No significant increase in brain tumors

The Ramazzini Study: *International Response*

- **Not a single regulatory body endorsed findings**: cite large database of credible evidence showing absence of a carcinogenic effect.

- Design and execution **did not follow international protocol for animal carcinogenicity studies (or that of the National Toxicology Program)**.

- **No access allowed outside pathologists** to analyze all of the tissue samples where cancerous tumors were found (standard practice).
ASPARTAME: Absorption & Metabolism

ASPARTAME is metabolized to 3 (and ONLY 3) dietary components:

- Aspartic acid
- Phenylalanine
- Methanol

Absorption and metabolism of constituents the same whether derived from aspartame or other food products*

Methanol in Aspartame-sweetened Beverage vs. Common Foods (mg)

PHE Content of Aspartame-Sweetened Beverage Compared with Common Foods (in mg)

(Aspartame sweetened beverage (12 oz), Nonfat milk (12 oz), Chicken breast (3 oz), Boiled egg (1), Ground beef (3 oz))

(Pennington and Douglass, Bowes & Church, FOOD VALUES OF PORTIONS COMMONLY USED, 18th ed., Lippincott Williams & Wilkins, 2005)
### 2006 NIH/NCI Research Results

**Conducted** independently of any funding or ties to industry groups

Subjects included 556,990 men and women

**PROSPECTIVE study**, 5 years of follow up - 1995-2005

**RESULTS:**

- *Increasing consumption NOT ASSOCIATED with any cancer risk, including cancers reported in the Ramazzini study*
Over 500 toxicological and clinical studies conducted over 30 years confirm safety.

Regulatory authorities in more than 100 countries have approved aspartame for use:

- European Food Safety Authority (EFSA) Re-Confirms Safety of Aspartame (May 2006)
- Scientific Committee on Food (SCF) of European Commission Reconfirms Aspartame’s Clean Bill of Health-(December 2002)
- U.K. Food Standards Agency supports conclusions of SCF- (December 2002)
- French Food Safety Agency Supports Safety of Aspartame-(May 2002)
Suez, et al: Sugar Substitutes & Glucose Intolerance

**Studied:** Saccharin, Aspartame, Sucralose

“...consumption of (SS) drives the development of glucose intolerance through induction of compositional and functional alterations in the intestinal microbiota.”

https://www.nature.com/nature/journal/v514/n7521/pdf/nature13793.pdf
Suez, et al: Sugar Substitutes & Glucose intolerance

“...findings suggest that (SS) may have directly contributed to enhancing the exact epidemic (obesity) that they themselves were intended to fight.”

Widely quoted, frequently cited

https://www.nature.com/nature/journal/v514/n7521/pdf/nature13793.pdf
Suez, et al: Weaknesses/Limitations

Contradicts years of significant human clinical studies that address SS and glycemic response.

“Causative” of obesity? Saccharin is rarely used in countries with the highest incidence of obesity & diabetes.

Animal evidence of gut microbiota changes with high doses of saccharin in animals, the effect is probiotic.

http://caloriecontrol.org/council-spokesperson-berna-magnuson-reviews-nature-study-on-low-calorie-sweeteners/
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“Causative” of obesity? Saccharin is rarely used in countries with the highest incidence of obesity & diabetes.

Animal evidence of gut microbiota changes with high doses of saccharin in animals, the effect is probiotic.

Lacks a plausible mechanism!

http://caloriecontrol.org/council-spokesperson-berna-magnuson-reviews-nature-study-on-low-calorie-sweeteners/
Ramazzini Institute Sucralose Studies: NO CREDIBILITY.

“EPA has decided not to rely on data from the RI on lymphomas and leukemias in these…assessments.”

Safety of sucralose supported by ALL major international regulatory authorities

National Cancer Institute:

• “100 safety studies...showed no evidence that these sweeteners cause cancer or pose any other threat to human health.”
SAFETY:

It’s EVERYTHING...
MUST be Assessed & Vetted Across Many Subgroups
GLOBAL CONFIRMATION OF SAFETY: ALL MAJOR REGULATORY AUTHORITIES
Sugar Substitutes: Support of Major Health Authorities

American Diabetes Association
American Dental Association
AND Position Paper, “Use of Nutritive and Non-Nutritive Sweeteners”
American Medical Association Council on Scientific Affairs
American Academy of Pediatrics, Committee on Nutrition
American Cancer Society
...And ALL major international health organizations
Non-nutritive Sweeteners: Acceptable Daily Intake (ADI)

• ADI: weight of sweetener/kg bw that a person can safely consume every day over a lifetime without risk...

...divided by 100

• ADI is a conservative estimate:
  • Approximately 1/100 of maximum level that produces no adverse effects
SUCRALOSE & STEVIA: Metabolism & Absorption

**SUCRALOSE**
- 95% Excreted intact

**STEVIA**
- Broken apart by gut bacteria
- Metabolized in liver
- Metabolites excreted by kidneys
Could there be benefits?
“Reported Use of Reduced-Sugar Foods and Beverages Reflects High-Quality Diets”

“Reduced-sugar food users” consistently reported significantly higher intakes of fruit, similar or higher micronutrient intakes, lower energy intakes and lower intake of discretionary fat and added sugars.

**Do Diet Beverages Affect Dietary Consumption Patterns?**

**C.H.Oi.C.E. STUDY**
- Choose Healthy Options Consciously Everyday

**SS randomized to replace sugar-sweetened drinks for 6 months**
- Water (n=106)
- Diet beverages (n=104)

**RESULTS:**
- DB group: ↓ in most caloric drinks
- ↓ more desserts than the water group
- NO EVIDENCE DBs INCREASE PREFERENCE FOR SWEET FOODS/BEVERAGES

STEVIA – Sweet & Sustainable

To get the same sweetness as sugar cane, stevia uses:
- 1/5th of the land
- Only a fraction of the water
- Preserves rainforest land

Has few predators
- Needs less pesticide/herbicide
- Produces several crops per year

Hardy crop
- Good for smaller plots of land
- Ideal for both small, independent farms & large farms
Talking about high-emotion topics

1st priority: SOUND, SCIENCE-BASED FACTS

Use the total body of science, not “cherry-picked” studies

Distinguish “opinion” from “facts”

Always remember: FACTS first, THEN opinions
THANK YOU!
QUESTIONS?

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