QUESTIONS ABOUT LOW CALORIE SWEETENERS: HOW DID WE GET HERE AND WHAT TO DO NOW?

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LOWER ADDED SUGAR INTAKE

• Currently recommended by notable health authorities\(^1\) \(^2\)

• Increased risk of overweight with increased sugar intake\(^2\)
  • Particularly full calorie beverages\(^3\)
  • Many health complications associated with excess weight\(^1\)

• Sugar, per se, is not the issue, it is how much we consume
CAN WE RECOMMEND LOW CALORIE SWEETENERS (LCSs)?

- Yes!
  - SAFE
    - Confirmed by food safety and regulatory experts around the world
      - Intensive, thorough and robust process
      - Entirety of data reviewed by independent experts
    - Exceedingly low intakes

AND

- We need to address consumer questions!
WHAT ARE THE MOST PREVALENT QUESTIONS?

- Blood glucose/microbiota
- Cancer
- Weight gain
- Natural vs. Artificial
HOW CAN THERE STILL BE QUESTIONS?

- Myths may linger based on old research
- Sensational headlines get attention
  - Academic research
  - Scientific journals
  - Lay press
  - Social Media
- Some new studies are touting sensationalist headlines

BUT – are they justified?

Let’s take a look at the drivers behind the most prevalent questions
Suez et al. 2014, “Artificial sweeteners induce glucose intolerance by altering the gut microbiota”

- No microbiome changes are currently known as reliable biomarkers for an adverse impact on glycemic control

- Major problems in study design and analysis, e.g.:
  - Test material, doses, statistical analyses; normal variability; size; duration, etc.

- Data are inconsistent across LCSs

In contrast, MANY well-designed RCTs, and also systematic reviews and meta-analyses, show no effect of LCSs on blood glucose control
WEIGHT GAIN

Hypothesis-generating *in vitro* studies

- Early gut sweet taste receptor studies drove new hypotheses of how an LCS could cause weight gain
  - Changes in incretin secretion and glucose absorption

**Results of *in vivo* studies discredit the hypotheses**

- LCSs do not cause clinically meaningful changes in either incretins or blood glucose levels\(^8\)\(^{-11}\)

**Observational (association) studies**

- By their nature, cannot prove cause and effect\(^12\)
- Reverse causality is likely
- Reliability even more suspect when there is no known reliable MOA

**In contrast**, systematic reviews and meta-analyses of RCTs show that LCSs can help in nutritional strategies for weight loss/maintenance\(^13\)\(^14\)

*Good. Nature, 1988;332:495*
Research studies by Soffritti et al., of the Ramazzini Institute, Italy.\textsuperscript{15-17}

- Regulatory agencies have not accepted any sweetener study by this laboratory as evidence of adverse effects\textsuperscript{18-20}

Early saccharin study in rats showing urinary bladder tumors

- In 2000, results officially declared not relevant to humans\textsuperscript{21}
  - Mechanism of action not possible in humans – unique to rats
  - Finding only observed when the rat feed contained $>5\%$ sodium saccharin
    - equivalent in sweetness for us humans to $>8$ pounds of sugar/day

Collectively, both epidemiologic and direct research refutes that any approved LCS causes cancer\textsuperscript{4,18-23}
NATURAL VS. ARTIFICIAL

- Natural does not = safe
- Man-made does not = unsafe
- Safety is only known from testing
- Consumption of any food ingredient, natural or not, has a risk – it all depends on the dose!
Sensationalist headlines may not hold up to scrutiny

Safety assessment requires consideration of all the available evidence

The collective research supports that LCSs are safe AND they can have tangible benefits:

- Weight management
- Diabetes meal planning
- Dental health
HOW CAN WE HELP WITH CONSUMER QUESTIONS?

- Expert voices are needed
  - *How to counter the circus of pseudoscience*, NYT, Jan 5, 2018\(^2^4\)

- Some helpful recent resources:
  - Medscape (Oncology): Mythbusters series\(^2^5\)
  - FDA: Additional information about high intensity sweeteners\(^2^0\)
  - ADA Medical Standards of Care\(^2^6\) and UK Diabetes Nutrition Guidelines\(^2^7\)
  - *The role of low-calorie sweeteners in the prevention and management of overweight and obesity: evidence v. conjecture*. Rogers, 2018\(^2^8\)
  - *Natural vs. Synthetic*. In: Fitness Reloaded, Oct 2016\(^2^9\)
  - Other Web resources: e.g., FoodInsight.org; Calorie Control Council; International Sweetener Association; Splendaprotessional.com\(^3^0\)
References

   https://www.ncbi.nlm.nih.gov/pubmed/19704096


   https://www.ncbi.nlm.nih.gov/pubmed/?term=tucker+tan+sweeteners


