

# America's Sweet Tooth Obsession & Its Impact on Oral & Systemic Health

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**Sucrose: 50 %Fructose / 50% Glucose**

**High Fructose Corn Syrup: 55% Fructose / 45% Glucose**

***Average Consumption of Added Sugar in U.S.:***

*~300 calories daily*

*~ 20 teaspoons daily*

*~80 grams daily*

***American Heart Association 2009 Dietary Sugar Intake & Cardiovascular Health - Added Sugar Recommendations:***

*Women 6 tsps. or 24 grams per day*

*Men 9 tsps. or 36 grams per day*

***2015 World Health Organization:***

*<10% of daily caloric intake*

*Ideally 5% or less (6 tsps.)*

***2015 – 2020 Dietary Guidelines for Americans:***

*<10% of total calories from added sugar*

***[www.fooducate.com](http://www.fooducate.com) - Make better food choices / track sugar grams daily***

***[www.coheso.com](http://www.coheso.com) - Label information on 9000+ foods***

***Daily diet sodas = 61% higher risk of vascular events according to the Northern Manhattan Study of 2500 people followed for over 9 years.***

***Journal of General Internal Medicine 2012***

**Other Names for Sugar:**

High Fructose Corn Syrup  
 Coconut Palm Sugar  
 Maple Syrup  
 Evaporated Cane Juice  
 Honey

Brown Rice Syrup  
 Agave Syrup  
 Juice Concentrates  
 Maltose/Dextrose

DRINK	SIZE	SUGAR	pH
AMP	8 oz.	31g	2.7
7-Up	12 oz.	37g	3.2
Coke	12 oz.	40.5g	2.5
Mt. Dew	12 oz.	47g	3.2
AZ Green Tea	16 oz.	50g	3.4
Langer Apple Juice	16 oz.	52g	3.2
Monster	16 oz.	54g	2.7
Nestea Gr. Peach Tea	20 oz.	57.7	2.9
Rockstar Energy	16 oz.	62g	1.5
Sobe Mango	16 oz.	70g	3.5
Tropicana Twist.	20 oz.	87.5	2.9

**\*\*\*pH of bottled water ranges from below 5.5 to 10. Not all bottled water is neutral!**

[www.sweetleaf.com](http://www.sweetleaf.com) - Stevia flavored drops

[www.cocopolo.com](http://www.cocopolo.com) - Stevia sweetened dark chocolate bars

[www.purelovechocolate.com](http://www.purelovechocolate.com) - Stevia sweetened dark chocolates

[www.lilyssweets.com](http://www.lilyssweets.com) - Stevia flavored dark chocolate bars

[www.CocoaVia.com](http://www.CocoaVia.com) - Unsweetened dark cocoa

[www.drjohns.com](http://www.drjohns.com) - Xylitol chocolate bars and assorted candies

**Low Fructose / Low GI**

Blackberry  
 Grapefruit  
 Lemon / Lime  
 Nectarine  
 Raspberry  
 Wild Strawberry

**High Fructose / High GI (Limit)**

Ripe Banana  
 Grapes  
 Dates  
 Raisins  
 Mango  
 Custard Apples

**Sugar Alcohols:**

Carbohydrates called “polyols”  
 Occur naturally in plants  
 Not completely absorbed

Lower Glycemic Index than sucrose  
 Fewer calories per gram  
 Do not promote decay (mostly)

**Sugar & Sugar Alcohol Comparison**

Ingredient	Sweetness	GI	Calories / gram
Sucrose (sugar)	100%	60	4
Malitol Syrup	75%	52	3
Malitol	75%	36	2.7
Xylitol	100%	7	2.4
Isomalt	55%	9	2
Sorbitol	60%	9	2.5
Lactitol	35%	6	2
Mannitol	60%	0	1.5
Erythritol	70%	0	0.2

**FDA Approved Sweeteners as Additives**

SACCHARIN Sweet-n-Low	ASPARTAME NutraSweet Equal	NEOTAME	SUCROLOSE Splenda	ACELSUFAME POTASSIUM
1879	1981	2002	1998	1988
300 X's sweeter	200 X's sweeter	7000 - 13,000 sweeter	600 X's sweeter	200 X's sweeter
100 countries	Greatest use worldwide	US, AK, UK	80+ countries	30+ countries
Bitter aftertaste high conc.	Most controversial sweetener	Cousin to Aspartame	Chemically- altered sucrose	Bitter aftertaste high conc.
Heat stable	Not heat stable	Heat stable	Heat stable	Heat stable
Added to Aspartame in soft drinks	Must be avoided by those with PKT	No amino acid concern for those with PKT	Tri-chlorination process	Blended with other sweeteners
Substitute & commercial	Substitute	Commercial	Substitute & commercial	Mostly commercial

## FDA GRAS Sweeteners (Generally Recognized As Safe)

ERYTHRITOL	STEVIA Truvia Purvia	ISOMALT	SORBITOL	MALTITOL/ MALTITOL	XYLITOL
Fruits, fermented foods	Natural herb Paraguay	Beets – glucose & mannitol	Stone fruits, berries	Maltose from starches	Berries, Birchwood, corn cobs
60-70%	200-300 X's sweeter	40-50%	60%	70-90%	100%
1996	2008	1990	1963	1986	1963
0.2 calories/g	Non-caloric	2.1 calories/g	2.5 calories/g	2.7 calories/g	2.4 calories/g
Heat stable	Heat stable	Heat stable	Heat stable	Heat stable	Heat stable
< 50 g/day	No daily limit	< 29 g/meal	<23 g/meal	< 100 g/day	> 50g/day
Commercial & Substitute	Commercial & Substitute	Commercial	Commercial	Commercial	Commercial & Substitute
Absorbed/not metabolized less GI distress	Bitter aftertaste high concentrations	Partially absorbed & metabolized	*Large amts. Laxative effect Caution w/ IBS	Partially absorbed & metabolized	Kinder to GI, Prevents Ear infections? Stimulates salivary flow <b>Toxic to dogs!</b>

**\*\*\*Caution regarding prolonged use of sorbitol, Isomalt, HSH found in hard candies and mints...Potentially Cariogenic!**

[www.xylitol.org](http://www.xylitol.org) - Xylitol clearing house and product guide

[www.xylimart.com](http://www.xylimart.com) - RDH based clearinghouse for Xylitol products on sale

[www.xlear.com](http://www.xlear.com) - Mints, gum, sweetener toothpaste, rinse, nose spray, etc.

[www.orahealth.com](http://www.orahealth.com) - Xylimelts discs

[www.quantumhealth.com](http://www.quantumhealth.com) OraMoist discs

[www.carifree.com](http://www.carifree.com) - products for infants & children & adults

[www.3MESPE.com](http://www.3MESPE.com) - Theramints & Theragum

[www.epicdental.com](http://www.epicdental.com) - gum, mints, toothpaste, mouth rinse, sweetener

[www.forevermints.com](http://www.forevermints.com) - long lasting Xylitol mints

### **Obesity by the Stats**

- Estimated that 3% of all new cancers may be attributable to obesity including: cancers of the colon, esophagus, kidney, gall bladder, pancreas and in women, breast cancer and cancer of the reproductive system
- US obesity doubled in adults and tripled in children in the last 3 decades
- 2/3 of population overweight with BMI: 25, or obese with BMI: 30+
- 85% of children with Type II diabetes are obese: “Diabesity”
- >60% of the global disease burden will be associated with obesity by 2020  
*Current Genomics 2008, [www.cdc.gov](http://www.cdc.gov) Accessed Nov. 17, 2016*

Kindergartner’s weight strong predictor of adolescent obesity:

Overweight 5-year-olds were four times as likely as normal-weight children to become obese by age 14.

*New England Journal of Medicine 2014*

High Sugar-Sweetened Beverage (SSB) group, i.e. > 2 SSB per day = 7% higher Visceral Adipose Tissue (VAT) and higher cortisol rates than those with low consumption of SSB in minority youth ages 14-18

*Physiological Behavior 2016*

### **CVD and Metabolic Diseases**

Excess sugar consumption influencing CVD and T2DM – Direct Pathway:

Unregulated liver uptake and metabolism of fructose

- Increased liver lipid accumulation
- Dyslipidemia (Elevated total CHD or LDL/HDL imbalance)
- Decreased insulin sensitivity (More insulin required to balance blood glucose) Insulin Resistance = gas guzzler vs. economy car
- Increased uric acid levels (Increased mortality w/ CVD due to increased endothelial dysfunction)

Excess sugar consumption influencing CVD and T2DM – Indirect Pathway:

- Weight gain
- Failure to stimulate leptin production

*Critical Reviews of Clinical Laboratory Sciences 2016*

Excess sugar consumption influencing CVD and Metabolic Diseases: Potential Pathways:

- Increased visceral fat deposition
- Increased intrahepatic fat deposition
- Increased blood triglycerides
- Increased hypertension

*Current Hypertension Reports 2016*

## **Chronically High Sugar Consumption Has Potential To Increase Risks For Systemic Conditions & Has Been Associated With:**

- Adverse effects on HDL & Triglyceride levels
- Increased BP levels
- Compromised intake of dietary vitamin & mineral intake
- Increased risk of diabetes & decreased insulin sensitivity
- Increased visceral fat mass
- Increased risk for Non-alcoholic Fatty Liver Disease (NFLD)
- Increased risk for gout
- Increased proliferation of pancreatic cancer cells

The unhealthy diet (high fructose intake, low omega-3 fatty acids) was associated with lower cognitive scores and insulin resistance. A healthier diet during middle-aged years was associated with better cognitive function later in life.

*Journal of Physiology 2012*

### **Grain Brain by David Perlmutter, MD**

#### **FACT SHEET: SUGARY DRINK SUPERSIZING AND THE OBESITY EPIDEMIC JUNE 2012**

**HARVARD SCHOOL OF PUBLIC HEALTH**

[www.hsph.harvard.edu/nutritionsource/healthy-drinks](http://www.hsph.harvard.edu/nutritionsource/healthy-drinks)

### **Remineralization Reality**

*Remineralization is the natural repair process where calcium and phosphate form a new sub-surface mineral coating, which is less soluble than the original surface, especially in the presence of fluoride.*

*Dimensions of Dental Hygiene April 2010*

#### **AMORPHOUS CALCIUM PHOSPHATE**

- Fills defects
- Increases FL<sub>2</sub> bioavailability
- Increases luster

#### **TRI-CALCIUM PHOSPHATE**

- Calcium & phosphate work synergistically with Fluoride
- Effective in neutral or acidic pH
- Enhances surface & subsurface mineralization

#### **NOVAMIN**

- Raises pH >7
- Creates layer of hydroxyapatite & reduces sensitivity
- Antimicrobial

### ***CALCIUM PHOSPHOPEPTITE & AMORPHOUS CALCIUM PHOSPHATE – RECALDENT®***

- Binds to tooth & plaque
- Remineralizes sub-surface lesions
- Potential to remove white spot lesions

### ***FLUORIDE***

- Adheres to partially demineralized crystallites
- Attracts calcium & phosphate
- Inhibits acid production
- Antimicrobial

### ***HYDROXYAPATITE***

- Natural calcium mineral
- Crystalline lattice structure
- Hardens tooth structure

### ***CHLORHEXIDINE THYMOL VARNISH***

- Hardens tooth structure
- Helps control established lesions on exposed roots

### ***ARGININE + CALCIUM CARBONATE + FLUORIDE***

- Synergistic effect to prevent caries and reduce sensitivity [www.basicbites.com](http://www.basicbites.com)  
- AlkaGen Technology to raise the pH & coat the teeth

### ***SILVER DIAMINE FLUORIDE***

- Antibacterial
- Desensitizing

### **CAMBRA Resources**

[www.cdafoundation.org/journal](http://www.cdafoundation.org/journal) - Part I October 2011 & Part II November 2011

[www.ada.org](http://www.ada.org)

[www.philipsoralhealthcare.com](http://www.philipsoralhealthcare.com) - C.A.R.E. risk assessments

[www.carifree.com](http://www.carifree.com)

### **Bacterial & Saliva Testing**

- **CRT®** Bacteria by Ivoclar Vivadent [www.ivoclarvivadent.us](http://www.ivoclarvivadent.us)  
Tests for Strep Mutans & Lactobacilli  
Culture results in 2 days
- **CariScreen** Susceptibility Testing Meter by CariFree®  
[www.carifree.com](http://www.carifree.com)  
Chairside detection of Streptococci bacterial load
- **Saliva-Check Mutans** by GC America [www.gcamerica.com](http://www.gcamerica.com)

Chairside salivary test for Strep Mutans

- **Saliva-Check** by GC America [www.gcamerica.com](http://www.gcamerica.com)  
Measures salivary production & buffering capacity  
Resting & chewing pH

### **ADA CDT Codes for Caries Risk Assessment & Documentation**

D0601 Low Risk

D0602 Moderate Risk

D0603 High Risk

All CDT codes are owned by the ADA. Current Dental Terminology© All rights reserved Used with Permission <http://www.ada.org>

### **REMINERALIZATION REALITY FOR THE MODERATE CARIES RISK PATIENT**

- Xylitol 6-10 g daily (3-5 times daily)
- OTC Fluoride toothpaste twice daily
- OTC Sodium Fluoride rinse daily
- Calcium Phosphate paste for exposed roots for sensitivity
- Sealants on pits & fissures at risk
- Every 4-6 months Fluoride varnish, or chlorhexidine thymol varnish on roots
- Assess salivary flow and pH if hyposalivation is suspected
- Every 4-6 months re-exam to evaluate risk
- Bitewings every 12-24 months
- Power toothbrush & interdental care for daily plaque removal

*Adapted from Dimensions of DH 2010 & Journal of Evidence-Based Dental Practice 2014*

### **REMINERALIZATION REALITY FOR THE HIGH CARIES RISK PATIENT** (*Modifications in italics*)

- Xylitol 6-10 g daily (3-5 times daily)
- *Chlorhexidine rinse 0.12% 10 ml daily for 1 week per month*
- *5000 ppm* Fluoride paste twice daily
- Calcium Phosphate paste *several times* per day for exposed roots or sensitivity
- Sealants on pits and fissures at risk
- Every *3-4 months* Fluoride varnish, or chlorhexidine thymol varnish on roots
- Assess salivary flow & pH if hyposalivation is suspected
- Every *3-4 months* re-exam to evaluate risk
- *Objective measurement of acidogenic bacterial load*
- Bitewings every *6-18 months*
- Power toothbrush & interdental care for daily plaque removal

*Adapted from Dimensions of DH 2010 & Journal of Evidence-Based Dental Practice 2014*



**\*\*\*All CAMBRA should include dietary modifications of fermentable carbs and reduction in amount & frequency of sugar**

“10 Ways to Treat Tooth Decay” According to Brian Novy, DDS  
[www.whollymolar.com](http://www.whollymolar.com)

[www.brushdj.com](http://www.brushdj.com) -customized music for 2-minute increments

### **Tips for Gaining Control of the Sugar Binge for Improved Health**

1. Be a label detective & decide wisely!
2. Eliminate sugary drinks!
3. Substitute sugar alcohols for sugar in foods & beverages (start slowly)
4. Count sugar grams throughout the day (Fooducate App)
5. Use Xylitol gum or mints following meals – strive for 5+
6. Reduce cravings with substitution
  - **Almonds, walnuts & cheese & substitute fresh fruit for desserts**
7. Prepare foods with fresh herbs to increase satisfaction with meals
8. Don't keep processed/sugary items at home
9. Enjoy the delectable in moderation, on occasion (3 bite rule)
10. Move more to burn more!