

Say Good-bye to Sugar!

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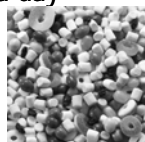
Why Do We Crave Sugar?

- Sweet is the first taste humans prefer from birth - hardwired
- Large amount of lactose in breast milk makes it taste so sweet: breast milk contains roughly twice as much lactose as cow's milk



What's wrong with sugar?

- Between 1970 and 2005 American's intake of added sugars – cane and beet sugar, high-fructose corn syrup, dextrose and other sweeteners – jumped 20%
- We now consume 22 – 30 tsp a day
- 350-475 EMPTY calories!



What's wrong with sugar?

- During same time proportion of Americans who were overweight/obese increased from about 1/2 to 2/3



What's wrong with sugar?

- A growing body of research suggests that added sugars or sugar-sweetened beverages boost the risk of disease: cardiovascular disease, high blood pressure, inflammation and type 2 diabetes
- American Heart Association urges Americans to slash their sugar intake to no more than 100 calories a day of added sugar for women and 150 for men

What are *added* sugars?

- Added sugars include:
 - High fructose corn syrup – HFCS
 - Sucrose, brown sugar
 - Honey, HFCS, Molasses
 - Agave nectar
 - Raw sugar, fruit juice concentrate
 - All other sweeteners with calories



Added/Natural Sugars

- Added sugars are sugars/syrups included in foods during processing or preparation as well as those consumers add
- Different from naturally occurring sugars
- A healthy, well-balanced diet contains naturally occurring sugars fructose, sucrose and lactose from fruit, milk, grains, vegetables



Sugar sweetened beverages

- 20% more added sugars since 1970 come mostly from beverages!
- In 1965 Americans got an average of 12% of calories from beverages
- In 2001, 21%!
- Soft drinks are the #1 source of added sugars in diet



Sugar sweetened beverages

- Double whammy – sugary liquids may make us fatter because they don't curb our appetite for more food
- People given liquid calories before a meal don't compensate by eating less at the meal or later in the same way they do for calories from solid food



Sugar sweetened beverages

- Research at Purdue University: researchers gave 15 people 450 calories of sugars each day from a liquid or a solid
- After 1 month people eating solid food compensated by eating less other food so they gained no weight
- On beverages – they actually ate more food than before. Gained weight.

Sugar sweetened beverages

- Recent study that lasted 1 ½ years: people who cut back on liquid calories lost more weight than those who cut the same number of solid calories
- Soft drinks, other sugar sweetened beverages: sports drinks, energy drinks, sweetened coffee, tea



Sugar sweetened beverages

- Harvard researchers tracked more than 88,000 women for 24 years
- Regardless of weight – those who drank at least 2 sugar-sweetened beverages a day had a 20% HIGHER risk of heart disease than those who drank LESS than 1 sugar-sweetened beverage a month



Sugar sweetened beverages

- High triglycerides raise risk of heart disease and metabolic syndrome
- Fructose (high fructose corn syrup) raises triglycerides
- When you consume a lot of fructose, the liver converts some of the fructose to fat
- Fat gets sent into the bloodstream resulting in higher levels of triglycerides

Is High Fructose Corn Syrup MORE Damaging than Sucrose?

- High Fructose Corn Syrup: 55% fructose, 45% glucose
- Sucrose: 50% fructose, 50% glucose
- Important to pay attention to ALL added sugars



High fructose corn syrup

- HFCS (high fructose corn syrup) was invented in 1966 in Japan and introduced to American market in 1975
- Food/beverage manufacturers began switching from sucrose (table sugar) to HFCS because it was cheaper to make. Some are now switching back
- HFCS also 20 times sweeter than table sugar

HFCS

- In most all types of processed foods
- HFCS in US diet increased 10,673% between 1970 and 2005 according to USDA
- Processed foods account for more than 90% of the money Americans spend on meals
- Added sugars in ketchup, BBQ sauce, baked beans, bread, salad dressings, etc.



HFCS

- Soda now made with HFCS
- One soda a day in the diet adds up to 15 pounds of added fat per year
- 150 calories x 365 days per year = 54,750 empty calories
- 54,750 divided by 3,500 (calories in 1 pound) = 15 pounds per year

Diabetes

- Researchers tracked 91,000 women for 8 years
- Those who drank at least 1 sugar sweetened soft drink a day had an 83% higher risk of type 2 diabetes than those who drank less than 1 per month
- Very rapidly raises blood sugar levels

Increases visceral fat

- Studies show the more fructose consumed the more gain in deep abdominal – or visceral – fat
- Visceral fat linked to higher risk of heart disease and diabetes
- Fructose drinkers had a drop in insulin sensitivity – raises insulin resistance

May promote overeating

- Leptin – hormone made by fat cells
- Tells your brain that you've consumed enough calories
- Researchers fed rats a 60% fructose diet for 6 months – animals became resistant to leptin
- Over time a high-fructose diet blocks the leptin signal in the brain. Result – keep eating even when enough calories have been consumed
- People can also become resistant to leptin

Not just HFCS

- Many studies on animals and humans suggest that consuming pure fructose may not satisfy hunger same way pure glucose does
- BOTH fructose and glucose trigger reactions in body that lead to feeling full
- Glucose does this more efficiently

Not just HFCS

- When glucose is consumed – pancreas releases insulin
- Insulin causes an increase in leptin – hormone tell brain we've eaten enough
- Fructose does not stimulate insulin secretion and the consequent increase in leptin which reduces appetite
- Glucose also blunts effects of ghrelin – the “hunger hormone” that makes us want to eat more
- Pure fructose doesn't activate these same “fullness” cues – result: eat more

Not just HFCS

- But HFCS isn't just pure fructose – ½ fructose, ½ glucose
- 100% pure fructose foods don't exist outside the lab (neither do 100% pure glucose foods)
- HFCS and table sugar seem to affect body similarly

Food & Mood

- Scientists at the Massachusetts Institute of Technology (MIT) found that sugar and carbohydrates boosted a powerful brain chemical called “*serotonin*”
- They linked serotonin and other neurotransmitters to our mood, energy levels and craving for highly processed foods

Is Sugar Addictive?

- Serotonin regulates impulse control and appetite, elevates mood, self-esteem, feelings of optimism and induces calm feelings and sleep
- Researchers at the University of Michigan have linked the desire for sugar and fat to **endorphins** – naturally occurring substances in the brain that produce pleasurable feelings and also act as painkillers

Is Sugar Addictive?

- We have enough scientific evidence now to tell us that we can train ourselves to crave sugar
- to build tolerance to it
- to experience withdrawal when we stop ingesting a lot of refined sugar
- These are the hallmarks of addiction:
- Craving, tolerance and withdrawal

Is Sugar Addictive?

- Dr. Serge Ahmed, of Bordeaux, France, has been working with rats and giving them the choice between cocaine and sugar. Guess what wins, time and again? That's right, sugar. The sweet taste of sugar is more rewarding than the high of cocaine.

Is Sugar Addictive?

- Sugar, like drugs of abuse, produces dopamine in the brain. The body's own happy, feel good, chemical



Is Sugar Addictive?

- Once you stop sugar for a period of time, your brains will begin to produce dopamine on their own
- This takes some time, however
- Once many people go cold turkey – eventually stop craving sugar all the time

Can supplements help?

- Ayurvedic herb gurmar – *Gymnema sylvestre* – the sugar destroyer
- Some studies show it can slow the absorption of sugar into the blood stream and the conversion of sugar into fat
- May help curb appetite for sweets
- 150-250 mg twice daily before meals
- Diabetics – may lower blood sugar

Can supplements help?

- Chromium - an essential trace element
- Plays an important role in insulin's regulation of blood glucose and it acts as a cofactor for a number of enzymes involved in energy production
- Studies in humans have used doses of 200-1,000 micrograms of chromium per day -GTF chromium best
- More research needed

What about Sugar Substitutes?

- According to recent survey – 7 out of 10 adults say they want to reduce or avoid added sugars
- Marketing research shows that in recent years sales of caloric sweeteners like sugar have been declining
- Sales of sugar substitutes have skyrocketed increasing by 50% from 2000-2006



What about Sugar Substitutes?

- Saccharin first artificial sweetener
- Safety testing in 1958 showed it caused cancer in animals
- 1977 FDA proposed to ban it
- Public outcry kept it on the market with a health warning
- 2000 National Toxicology Program concluded it did not increase cancer risk and Congress revoked the rule requiring the disclaimer

What about Sugar Substitutes?

- Many still feel skeptical of artificial sweeteners
- FDA food- additive approval process: ingredient's manufacturer is responsible for demonstrating its safety
- Some feel it is biased and too lax

What about Sugar Substitutes?

- Center for Science in the Public Interest – CSPI – a Washington, DC consumer watchdog group advises consumers to avoid saccharin, Ace-K and aspartame



Sucralose (Splenda)

- Heat stable
- Can be used for baking
- Made by combining sucrose (table sugar) with 3 chlorine molecules
- Body doesn't digest or derive calories from it
- 600 x sweeter than sugar
- Some note metallic aftertaste

Aspartame (NutraSweet, Equal)

- Made by combining 2 amino acids – phenylalanine and aspartic acid – with a methyl ester that becomes methanol, a by-product of carbohydrate fermentation
- 180 x sweeter than sugar
- People with phenylketonuria (PKU) cannot break down phenylalanine – must avoid
- Some note a bitter aftertaste

Saccharin (Sweet'N Low, Sweet Twin)

- A compound containing sulfur and nitrogen that provides no calories – body cannot break it down
- Sweetness factor: 300 x sugar
- Some note bitter aftertaste



Xylitol

- Heat stable – can be used for baking
- Chemically classified as a sugar alcohol
- Naturally occurring food compound
- GRAS – “Generally Recognized As Safe” by FDA
- Exempt from approval process mandatory for artificial substitutes regulated as food additives
- Same sweetness as sugar

Xylitol

- Body absorbs xylitol but not fully
- Provides 2 calories per serving rather than sugar's 4 calories
- Can cause digestive problems for some people
- Diabetes use caution – count ½ of the sugar alcohol grams as carbs
- Can also help reduce cavities – sugarless gum
- Very toxic to dogs

Erythritol (ZSweet, Sun Crystals)

- Heat-stable, can be used for baking
- Naturally found in melons and pears
- Sugar alcohol
- Body fully absorbs erythritol (unlike xylitol) but can't break it down
- Provides virtually no calories – no glycemic response
- Sweetness factor: 60-80 % as sweet as sugar

Erythritol

- Less likely to cause gastric distress than xylitol
- Sun Crystals: erythritol combined with sugar – 4 calories per tsp compared to sugar with 16 calories per tsp
- Registers a slight glycemic response

Stevia (Truvia, PureVia, SweetLeaf)

- Heat-stable can be used for baking
- Long history of use in South America
- Extract of the Stevia rebaudiana plant
- Does not raise blood sugar
- Sweetness factor – 200-300 times as sweet as sugar
- Until Dec 2008 stevia and its derivatives could be sold in US only as a dietary supplement

Stevia

- 2008 FDA affirmed a highly purified form of the stevia plant – Rebaudioside A (AKA Rebiana or RebA) as a GRAS ingredient
- Reb A sold as Truvia and PureVia
- Sales of stevia close to \$100 million for year ending 2009
- FDA did not change previous ruling on whole-leaf stevia or other stevia extracts
- Must be sold as dietary supplements

Agave

- Syrup made from same Mexican plant that gives us tequila
- Not calorie free – roughly same number of calories and carbs per serving as honey
- Similar to honey – thinner consistency
- In recipes typically requires less agave than sugar. 1 cup sugar to $\frac{3}{4}$ cup agave
- Makes baked products moist –muffins, cakes, cupcakes, etc
- Avoid if you want a crisp outcome



The Bottom Line

- 100 calories (6 $\frac{1}{2}$ teaspoons or 25 grams) a day of added sugars for women
- 150 calories (9 $\frac{1}{2}$ teaspoons or 38 grams) a day of added sugars for men
- Don't DRINK sugar-sweetened beverages
- Limit fruit juice to 1 or less per day
- Limit ALL added sugars – high fructose corn syrup, corn syrup, cane or beet sugar, brown rice syrup, agave, honey, etc

The Bottom Line

- Drink smarter
- Ditch the soda and other sweetened beverages and treat yourself to fruit flavored seltzer water
- Add cucumbers, mint, lemon or watermelon to a pitcher of water
- Add just a splash of 100% juice to H₂O
- Drink ice/hot tea – regular and herbal

The Bottom Line

- OK to get naturally occurring sugars in fruit, milk and plain yogurt
- If food contains little or no milk or fruit – the “sugars” number on the package's nutrition Facts panel will tell you how much added sugars are in each serving



The Bottom Line

- Be sure to eat your sugar with fiber . . . as in a piece of fruit
- When Mother Nature made fructose, she packaged it with the antidote – fiber
- Exercise – sugars are concentrated energy. Burn the energy through exercise
- Exercise reduces stress, lowers cortisol which decreases appetite

The Bottom Line

- With ANY sugar the poison is in the dose
- Enjoy small amounts of sweetened foods
- By enjoying an “occasional” indulgence rather than trying to totally abstain often leads to greater success in making healthy changes
- Those who try to totally abstain – can lead to binge

The Bottom Line

- A major trigger for sugar craving is low blood sugar
- Eat at regular times during the day
- Eat protein, fiber (whole grains, legumes, fruit) and healthy fat with meals
- Don't go too low in carbohydrates
- Don't eat refined carbs – white bread, most breakfast cereal, cookies, etc.

The Bottom Line

- Eat carbs with fat and protein – slows the rise of blood sugar. Toast with peanut butter, apple with nuts, etc
- Grab some gum – research shows that chewing gum can reduce food cravings
- Slow down – think ahead about meals and snack and have healthy foods on hand
- Go easy on yourself – it's hard to change human behavior but it CAN be done

■ Let's Get Cooking!

