

Sugar vs. Your Body

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Doylestown Health

A strawberry shortcake tart sits on a light-colored wooden cutting board. The tart has a golden-brown crust, a layer of white cream, and is topped with sliced strawberries and a single blueberry in the center. Two whole strawberries are placed below the tart. Three red circular callouts are overlaid on the image: one on the left, one in the center, and one on the right.

Sugar

Sugar and
Health

Sugar and
the Body

Sugar

Sugar

- Carbohydrates composed of:
 - carbon
 - hydrogen
 - oxygen
- Is important
 - breast milk
 - signaled foods were safe to eat
 - feeds yeast for bread and beer
 - balances flavors
 - assists in caramelization
 - reduces risk of microbial growth in jams

Sugar
Chemistry

Sugar
Chemistry

Sugar
Chemistry

Sugar

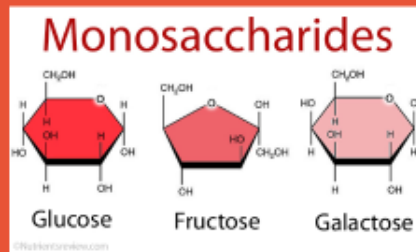
Sweet Tip #1
Many sugars end in "-ose"

Carbohydrate Chemistry

Monosaccharides - means *one*

- Simple sugar
- Glucose, fructose, galactose
- Building blocks for more complex carbs
- Occur in fruits, veggies, and milk

Monosaccharide
Foods



Foods high in monosaccharides

Fructose - Fruits

- apples, cherries, grapes, guavas, lichees, honeydew melon, watermelon, mangoes, papayas, pears, persimmons and pineapple

Glucose - found highest in fruits below and

- Dextrose, blueberries, strawberries, raspberries, papaya and cantaloupe
- Honey, agave, molasses
- Dried fruit

Galactose - hard to find without being combined to glucose to make lactose

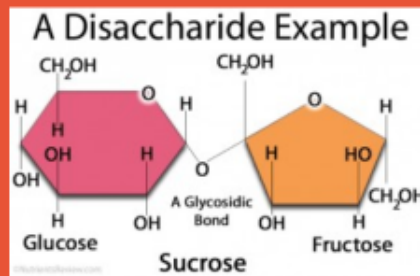
Sugar

Carbohydrate Chemistry

Disaccharides - means *two*

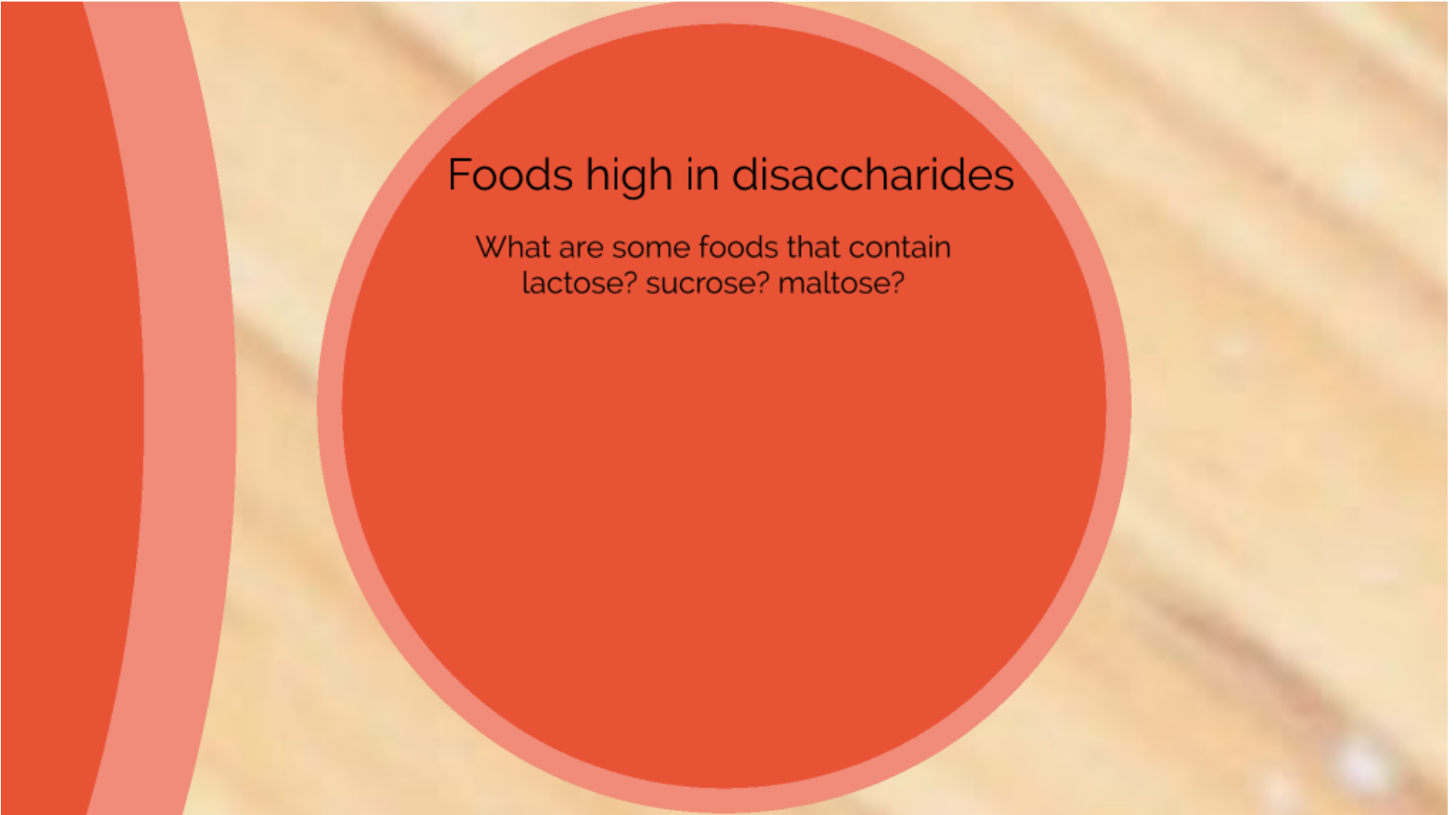
- made up of two monosaccharides joined together
- Sucrose - glucose & fructose
- Maltose - glucose & glucose
- Lactose - glucose and galactose
- Found in table sugar, beer, and dairy products

Disaccharide
Foods





Foods high in disaccharides



Foods high in disaccharides

What are some foods that contain
lactose? sucrose? maltose?



Foods high in disaccharides

Foods high in disaccharides

Lactose

- Dairy foods such as milk, cheese, yogurt, butter and ice cream, whipping cream, pudding, custard and cream soups

Sucrose

- Table sugar, fruit-flavored juices, some frozen fruit, flavored yogurts, candy, cookies, ice cream and ready-to-eat cereals

Maltose

- Malt products such as malted milkshakes and malted candies,
- Items in which starch is fermented by yeast or enzymes, such as in bread or brewed beverages

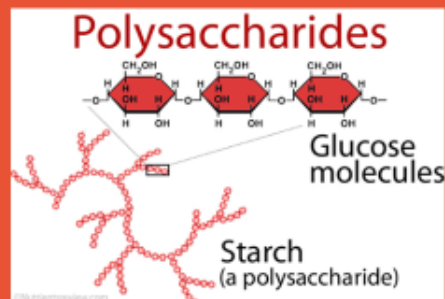
Sugar

Carbohydrate Chemistry

Polysaccharides - means *many*

- Made up of long chains of connecting monosaccharides
- Referred to as complex carbs
- Referred to as starch, glycogen, and fibers

Polysaccharide
Foods



Foods high in polysaccharides

Starch - from plants

- Cereal grains (wheat, oats, barley, corn, rice...) and their products (bread, pasta, pastries, cookies), potatoes, tapioca, yam, legumes

Cellulose - dietary fiber from plants

- Wheat, onions, chicory root, leeks, celery

Glycogen - storage form of glucose in humans in liver and muscles

- Shellfish, animal liver

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A strawberry galette sits on a wooden cutting board. The galette is a round, flat-topped tart with a golden-brown crust, topped with a layer of white cream, sliced strawberries, and a single blueberry in the center. Three red circular callouts are overlaid on the image: one on the left containing the word 'Sugar', and two at the bottom containing 'Sugar and Health' and 'Sugar and the Body'.

Sugar

Sugar and
Health

Sugar and
the Body

Sugar and Health

Most Americans consume **over 19 teaspoons** of sugar each day.



It is recommended that adults limit consumption to a **maximum of 6 teaspoons** per day.



Natural Sugars

- exist naturally in foods
 - fruits
 - vegetables

Added Sugars

- added during processing
 - grain-based desserts
 - sauces, dips
 - candies

Natural
Sugars

Added
Sugar

Sugar
Breakdown

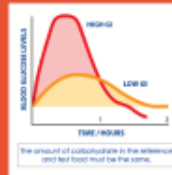
Natural Sugars

Carbohydrates = Sugar occurs naturally in:

- Fruits
- Natural sweeteners like maple syrup, honey, etc
- Vegetables
- Dairy Products

Natural sugars and your glycemic index:

- The better option for blood sugar
- Glycemic index measures how much a particular carbohydrate-containing food **increases blood-glucose levels** or how quickly **carbohydrates are turned into sugar**.
- Low glycemic index
 - Digest slower
 - Don't cause large blood sugar spikes



Sugars

Starches

Digestion of Sugars

Natural Simple Sugars

- Don't need to be further broken down during digestion
- The three main simple sugars:
 - Glucose - Honey, fruit
 - Fructose - fruits, vegetables
 - Some people have issues digesting fructose
 - Galactose - plants

Compound Sugars

- Sucrose - sugar, maple syrup
- Lactose - milk, dairy
- Maltose - malt, fruits, grains
- During digestion, the enzymes break the bonds between the sugar molecules to turn compound sugars into simple sugars.

GI Options

Low GI Options

Glycemic Index

Low GI (<55), Medium GI (56-69) and High GI (70>)

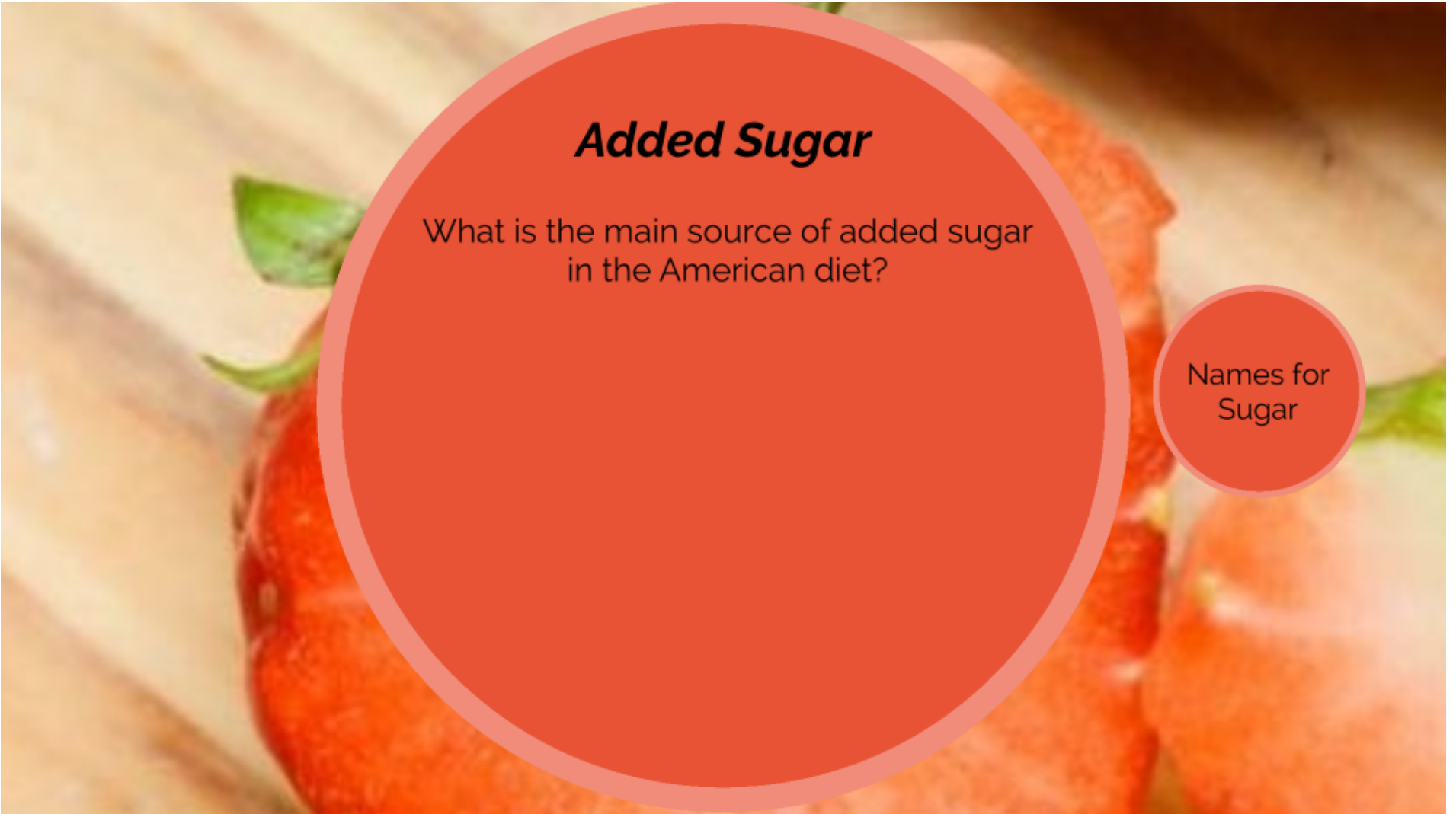
Grains / Starchs		Vegetables		Fruits		Dairy		Proteins	
Rice Bran	27	Asparagus	15	Grapefruit	25	Low-Fat Yogurt	14	Peanuts	21
Bran Cereal	42	Broccoli	15	Apple	38	Plain Yogurt	14	Beans, Dried	40
Spaghetti	42	Celery	15	Peach	42	Whole Milk	27	Lentils	41
Corn, sweet	54	Cucumber	15	Orange	44	Soy Milk	30	Kidney Beans	41
Wild Rice	57	Lettuce	15	Grape	46	Fat-Free Milk	32	Split Peas	45
Sweet Potatoes	61	Peppers	15	Banana	54	Skim Milk	32	Lima Beans	46
White Rice	64	Spinach	15	Mango	56	Chocolate Milk	35	Chickpeas	47
Cous Cous	65	Tomatoes	15	Pineapple	66	Fruit Yogurt	36	Pinto Beans	55
Whole Wheat Bread	71	Chickpeas	33	Watermelon	72	Ice Cream	61	Black-Eyed Beans	59
Muesli	80	Cooked Carrots	39						
Baked Potatoes	85								
Oatmeal	87								
Taco Shells	97								
White Bread	100								
Bagel, White	103								



Digestion of Starches

Starches

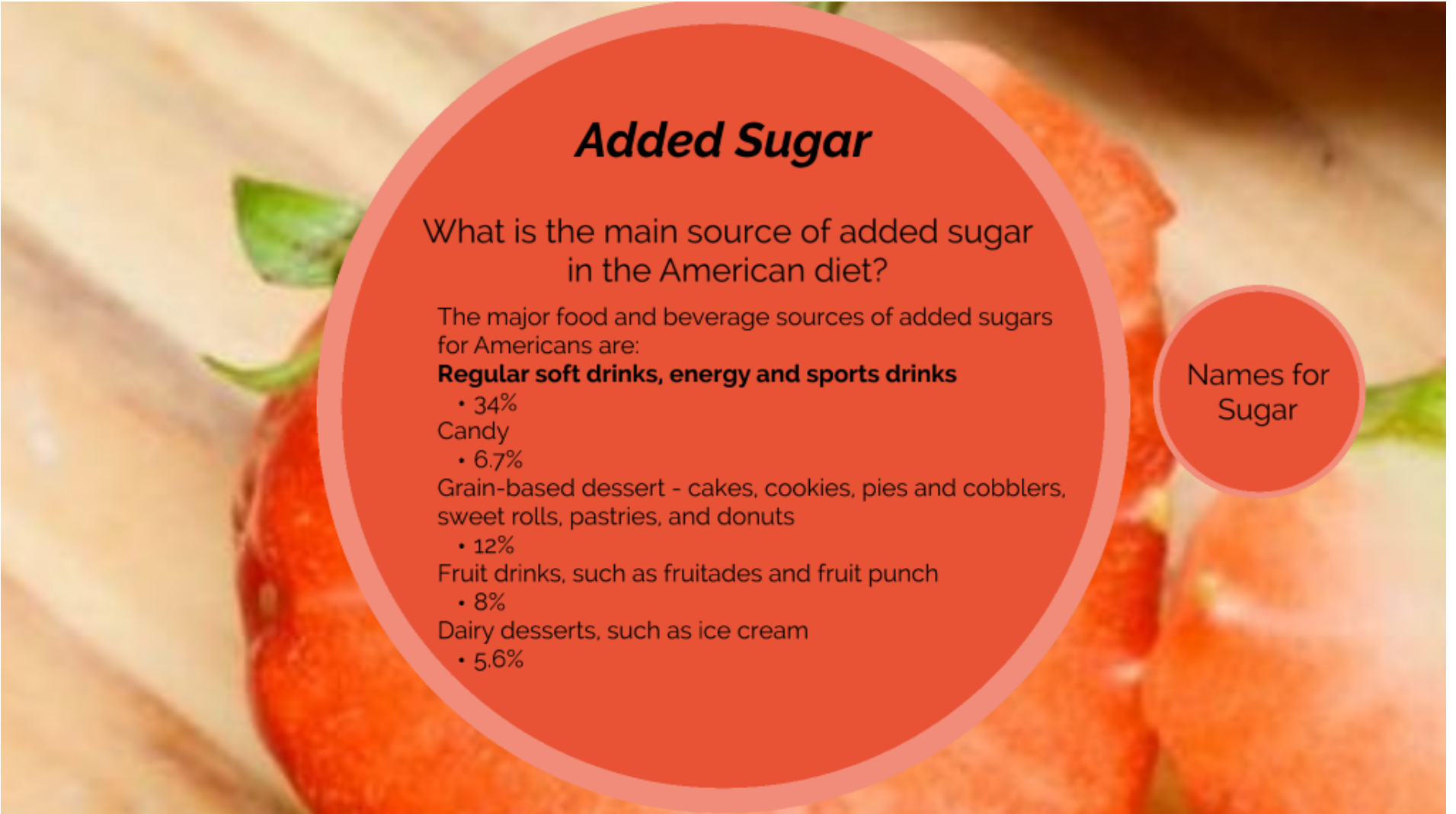
- Found in plants
- Complex carbs formed by multiple sugars
- Starches are broken down into sugars by an enzyme in your saliva and small intestine
 - glucose
 - maltotriose
 - maltose
- Further broken down into other enzymes
 - maltase
 - lactase
 - sucrase
 - isomaltase



Added Sugar

What is the main source of added sugar in the American diet?

Names for
Sugar



Added Sugar

What is the main source of added sugar in the American diet?

The major food and beverage sources of added sugars for Americans are:

Regular soft drinks, energy and sports drinks

- 34%

Candy

- 6.7%

Grain-based dessert - cakes, cookies, pies and cobblers, sweet rolls, pastries, and donuts

- 12%

Fruit drinks, such as fruitades and fruit punch

- 8%

Dairy desserts, such as ice cream

- 5.6%

Names for
Sugar

Names for added sugar

What are some names
for added sugar?

Names for added sugar

anhydrous dextrose
brown sugar
confectioner's powdered sugar
corn syrup
corn syrup solids
dextrose
fructose
high-fructose corn syrup (HFCS)
honey
invert sugar
lactose
malt syrup
maltose
maple syrup
molasses
nectars (e.g., peach nectar, pear nectar)
pancake syrup
raw sugar
sucrose
sugar
white granulated sugar

What are some names
for added sugar?

RDA for Added Sugar

Men

- 9 tsp

Women

- 6 tsp

Average adult consumes 22 tsp a day

Added sugars contribute calories, but no essential nutrients





Sugar breakdown in body

How the body metabolizes the sugar in fruit and milk differs from how it metabolizes refined sugar added to processed foods.

Breakdown of sugar:

- Mouth
- Stomach
- Primarily occurs in intestine
- Breakdown into monosaccharides to be absorbed into blood and used for energy
- *Indigestible carbohydrates can't pass through the body and are broken down other ways*

Caveat

Caveat

Both simple and complex carbohydrates are eventually broken down into glucose however:

- Simple carbohydrates are rapidly broken down
 - Insulin and blood sugar levels rise quickly
 - You don't feel full
- Complex carbohydrates are broken down slower
 - Fiber
 - Breaks down chains to shorter chains
 - Breaks down nutrients - antioxidants, minerals, vitamins, etc

The caveat:

- Once the sugar passes through the stomach and reaches the small intestine, **it doesn't matter if it came from an apple or a soft drink**
- Determinate: levels of sugar currently in blood
- Too much sugar will form as fat or glycogen

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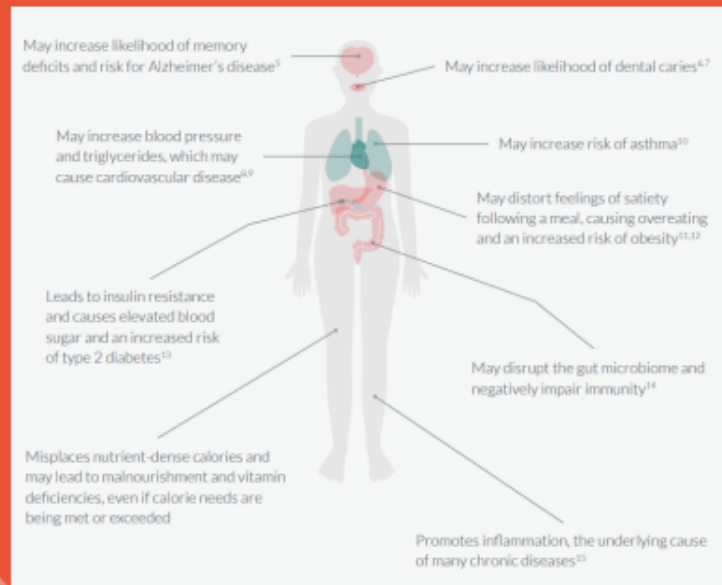
A strawberry galette sits on a wooden cutting board. It is topped with sliced strawberries, a blueberry, and a dusting of powdered sugar. Two more strawberries are placed below the galette. Three red circular callouts are overlaid on the image: one on the left, one in the center, and one on the right.

Sugar

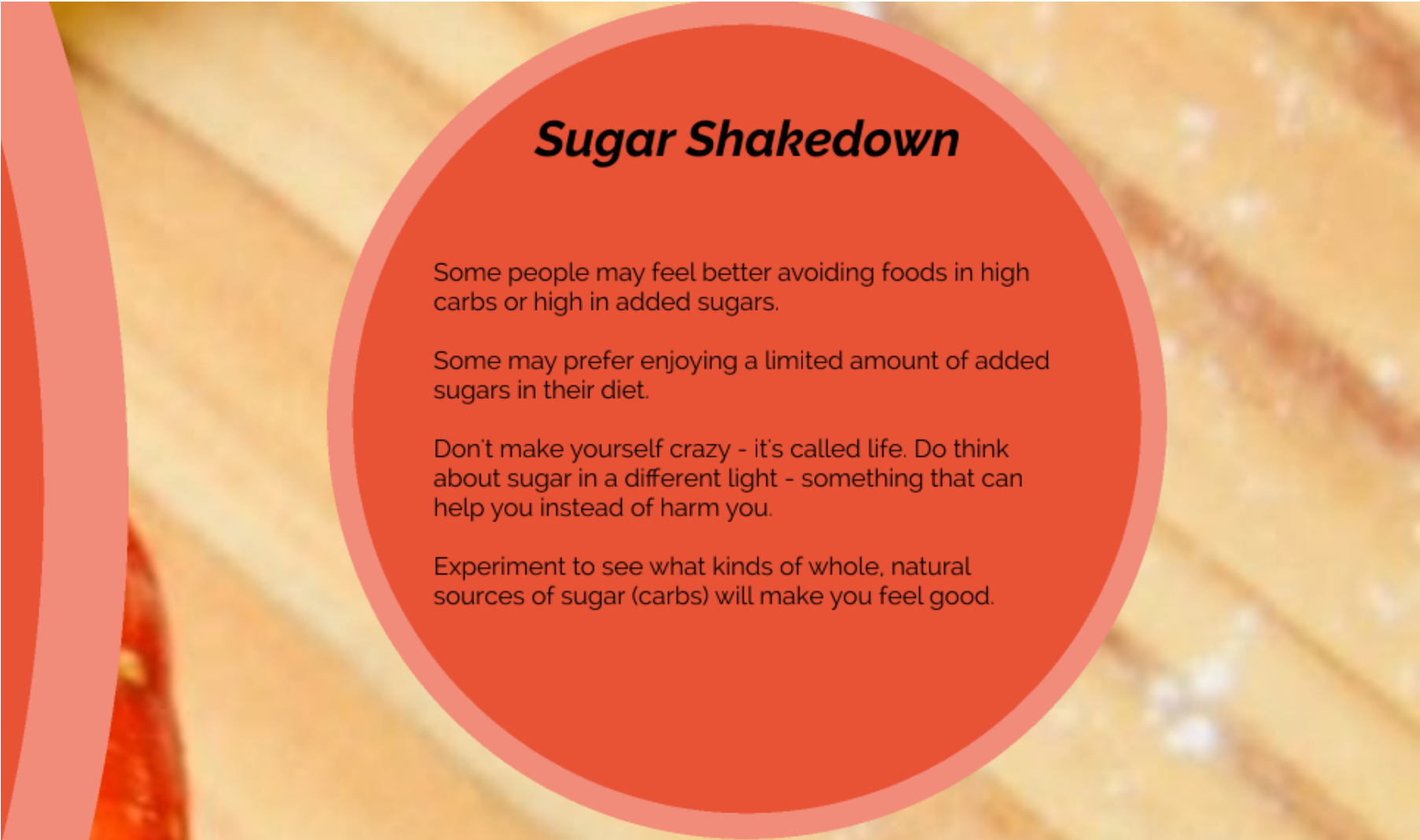
Sugar and
Health

Sugar and
the Body

Sugar and the Body



**Sugar
Shakedown**



Sugar Shakedown

Some people may feel better avoiding foods in high carbs or high in added sugars.

Some may prefer enjoying a limited amount of added sugars in their diet.

Don't make yourself crazy - it's called life. Do think about sugar in a different light - something that can help you instead of harm you.

Experiment to see what kinds of whole, natural sources of sugar (carbs) will make you feel good.

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