

PRESCRIPTIONS FOR PARENTS -

MAKING SCIENTIFIC RESEARCH PRACTICAL FOR FAMILIES



NUTRITION - Sugar and Behavior

Sugar - what is it? and does it affect children's behavior?

Carbohydrates are found naturally in most foods and are found in many forms. All carbohydrates will be broken down to simple sugars, and the body handles most sugars in the same way - by releasing insulin from the pancreas. The insulin pushes the sugar from the blood stream into cells where the sugar can be used for energy. If there is too much sugar in the bloodstream, this system is overwhelmed and the sugar remains in the bloodstream where it can damage organs.

This newsletter will provide information on the different types of carbohydrates and sugars in the American diet, along with some research that implies there may be a relationship between sugar intake and behavioral changes in children.

**An excellent new resource is the website:
www.sugarscience.org.**



CARBOHYDRATES

Carbohydrates can be categorized in various ways: simple versus complex; low glycemic index versus high glycemic index; low fiber or high fiber.

Simple carbohydrates are made of one or two sugars such as glucose or fructose - they have simple chemical structures and are easily and quickly absorbed, leading to a faster rise in blood sugar.



SUGARS

Sugars are found in many food products and go by many names.

Corn syrup is a sugar that is extracted from corn as cornstarch and then broken down into glucose. The glucose is heated and results in corn syrup.



SUGAR and BEHAVIOR

There is controversy in the medical community as to whether sugar (and other dietary components, such as dyes) contributes to behavioral changes in children. Dr. Benjamin Feingold, then Chief of Allergy at Kaiser, Northern California, introduced the idea that



PRACTICAL SUGGESTIONS

Eat more fresh fruits and vegetables

Eating an orange instead of drinking 12 ounces of orange juice provides twice as much fiber and half the calories.

Eat more whole grains and beans

Complex carbohydrates have a more complicated chemical structure with 3 or more sugars and so take longer to digest. Since white bread and potatoes are considered complex carbohydrates, it does not necessarily mean that complex carbohydrates are healthy.

Glycemic index is another way of evaluating carbohydrates. The glycemic index rates foods from 0 - 100 based on how quickly and how high they raise blood sugar levels.

Foods with a **high glycemic index** like white bread are digested quickly and so raise the blood sugar rapidly. Eating foods with high glycemic indexes therefore cause high spikes in blood sugar and may lead to long term complications such as Type 2 diabetes, heart disease and obesity.

Foods with **low glycemic indexes** are broken down and digested more slowly, and so raise the blood sugar more slowly.

Many factors can affect the glycemic index, including how the foods are processed - with more refined and processed foods having a high glycemic index and higher fiber foods having a lower glycemic index.

Another measure of how carbohydrates are utilized by the body is termed the **glycemic load**. The glycemic load utilizes the glycemic index and then takes into account the amount of carbohydrate in the food.

The healthiest choices are foods with lower glycemic loads.

Low glycemic load foods:

- Bran cereals
- Apples / oranges
- Kidney beans/black beans
- Lentils
- Wheat tortillas
- Cashews / peanuts
- Carrots

Medium glycemic loads:

- Brown rice
- Oatmeal
- Whole grain breads

High glycemic loads:

Fructose corn syrup has been processed further than regular corn syrup and contains more calories than sugar. So it causes high rises in blood sugar levels - and should be **avoided**.

Fructose corn syrup is processed in the liver. Consuming large amounts has been linked with liver damage - even in young children. Read labels and avoid this ingredient.

Fructose corn syrup has even been associated with memory impairment in animal studies.

Other sweeteners which are forms of sugar include:

- brown sugar
- cane crystals
- corn sweetener
- fruit juice concentrates
- honey
- malt syrup
- maple syrup
- molasses
- sucrose

Manufacturers often list these ingredients separately so they do not have to list sugar as the first (and main) ingredient in a processed food.

The American Heart Association recommends no more than 9 teaspoons a day of sugar per day for men and 6 teaspoons per day for women. 9 teaspoons of sugar equals 150 calories which is approximately the amount found in one can of soda.

ARTIFICIAL SWEETENERS

Please also be careful

foods affected children's behavior in the 1970s, and since then there have been many medical studies attempting to evaluate this concept. Unfortunately, there are so many variables in the studies - and in children - that the topic remains controversial.

So - what do we know?

Children process sugar differently than adults

In 1995 researchers at Yale found that children respond differently to a glucose (sugar) load than adults. Normally when glucose levels in the blood fall to low levels (hypoglycemia), adrenaline is released, causing sugar levels to increase, but also causing shakiness, sweating, and altered thinking and behavior. The researchers found that children experience symptoms of hypoglycemia at higher blood glucose levels, and so seem more susceptible to dietary alterations.

Highly refined sugars and carbohydrates enter the blood stream rapidly and cause more rapid fluctuations in blood glucose levels - so should be avoided in children.

In a 1986 study researchers evaluated the behavior of preschool children after they were given a sugary drink (sucrose). They found a decrease in the children's ability to perform in structured testing as well as more inappropriate behavior during free play.

Goldman JA, Lerman, RH, et al. Behavioral effects

Choose more beans and avoid potatoes. Beans and legumes (chickpeas) not only provide fiber, but also protein.

Avoid unhealthy carbohydrates and highly refined / processed foods

These foods often also contain dyes that may adversely affect the behavior of some children.

Drink more water

Avoid sugar-sweetened beverages and juices.

BREAKFAST

If you give your child a breakfast cereal - choose one with more fiber and whole grains.

Some healthier choices include Cheerios, Kashi Go Lean and Kashi 7 whole grain, Raisin Bran, and Grape Nuts.

Add fruit, especially berries or bananas, to the cereal.

Add nuts to the cereal - good fiber as well as protein.

Try steel-cut or old-fashioned oatmeal.

Eggs, cheese, peanut butter are other sources of protein that help maintain blood sugar levels.

Find a peanut butter without added sugar.

LUNCH and DINNER

Choose yams over potatoes.

Choose wild grain rice over white rice.

Add "newer" grains such as quinoa to your menus.

Baked potato
French fries
Refined breakfast cereals

http://www.health.harvard.edu/diseases-and-conditions/glycemic_index_and_glycemic_load_for_100_foods

about the use / overuse of artificial sweeteners as new research suggests that artificial sweeteners can change the type of bacteria living in the intestines to favor those which can contribute to glucose intolerance (diabetes).

Suez J, Korem T, et al Artificial sweeteners induce glucose intolerance by altering the gut microbiota. Nature 514,181–186 (09 October 2014)

FIBER

High fiber foods do not have as much digestible carbohydrates, so are more slowly digested. This causes a more gradual and a lower rise in the blood sugar.

of sucrose on preschool children. J Abnormal Child Psych. 1986; 14:565-577.

Another study in 2007 found that a breakfast with more fiber and a lower glycemic load improved children's short term memory and attention span at school. Children having a lower glycemic load for breakfast also showed less signs of frustration.

Benton D, et al. The influence of the glycaemic load of breakfast on the behavior of children in school. Physiol Behavior 2007; 92:717-24.

Children need to eat breakfast every day - and breakfast should include foods with high fiber, low glycemic loads as well as proteins.

Offer raw vegetables with a dip, such as hummus

SNACKS

Keep fruit on hand for snacking - apples and bananas are easy to eat "on the go".

Avoid purchasing sugary snack foods - and you decrease you - and your child's - sugar intake.

www.parenting.com has ideas on how to make healthy meals and snacks more appealing to children

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