

Why Do We Crave Sugar?

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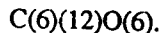
Introduction

The word sugar is confusing because there are many kinds of sugar. Sugar for many people means the beautiful white powder or lumps commonly found in restaurants or house kitchens. But other times, it means a different substance. If it is found in the blood, it is glucose (blood sugar), in fruits, it is fructose (fruit sugar), in milk, it is lactose (milk sugar), in starches and grains, it is maltose (malt sugar), and in sugarcane or sugar beets, it is sucrose (table sugar).

Scientifically, sugar is a carbohydrate. Carbohydrates are made up of the elements carbon, hydrogen, and oxygen and make up most of the organic structure of all plants, as well as existing in some quantities in animals.

Scientists divide carbohydrates into three categories.

1. The **monosaccharides** are carbohydrates that cannot be hydrolyzed (split with water) into a simpler form. Glucose, fructose, and galactose (this is the building unit of milk sugar) all belong to this group. These carbohydrates consist of one molecule, a simple carbohydrate. The chemical formula is

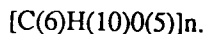


2. The **disaccharides** are the carbohydrates formed by the condensation of two monosaccharide molecules with the loss of one molecule of water. Some examples of disaccharides are: Sucrose (common table or white sugar) which is a combination of glucose and fructose. Maltose, which is a combination of two glucose molecules and a product of starches or grains, and lac-

tose, which is a combination of glucose and galactose. The chemical formula is

$$C(12)H(22)O(11).$$

3. A **polysaccharide** is the result of the condensation of many monosaccharide molecules with a corresponding loss of water molecules. The most important polysaccharides with regard to nutrition are starch and glycogen. Grains supply much starch. The chemical formula is



Glycogen is a substance consisting of long chains of glucose molecules. It is found in the largest proportion in the liver and muscle tissue. Starch is usually found in plant cells whereas glycogen, being to a certain degree soluble in water, may be dissolved in protoplasm.

Common sugar, sucrose, or cane sugar is present in the nectar of flowers, in fruits, and in the juices of various plants. The annual production of sucrose in the world, largely for food, is about 30,000,000 tons per year of which about two-thirds comes from sugarcane and one-third from sugar beets.

Glucose is the sugar of the blood and other body fluids. Blood normally contains from 60 to 90 mg of glucose in each 100 ml (which is about 1 quart of fluid measurement), but for someone in a diabetic condition more than 1000 mg of glucose may be contained

(this means ten times the normal amount of glucose).

Types of Common Sugar

Common sugar is refined from sugarcane or sugar beets. There are two types of common sugar – white or non-white. There are three kinds of non-white sugar: light brown, dark brown, and kleenraw. However, these non-white sugars are not for human consumption because they contain dirt. The varieties of brown sugar sold in stores are made by adding molasses to refined sugar. For kleenraw, 5 percent molasses is added, for light brown, 12 percent molasses, for dark brown, 13 percent molasses.

Partially refined or raw sugar is 97 percent sucrose when it leaves Hawaii and goes through a gigantic California refinery to produce refined sugar, 99.96 percent sucrose. Major sources of commercial sucrose are sugarcane and sugar beets. Minor sources are maple trees, sugar palms (especially date palms), and sorghum.

Monosaccharides

Glucose (blood sugar), also known as dextrose
Fructose (fruit sugar), also known as levulose
Galactose

Disaccharides

Sucrose (table sugar) made of glucose and fructose
Lactose (milk sugar) made of glucose and galactose
Maltose (malt sugar) made of two glucose units

Polysaccharides

Complex sugars found in whole grains, starches.

Origin of Sucrose Sugar

Sugarcane has been cultivated by man for thousands of years. Long before anyone knew how to make sugar, men were growing patches of cane to chew for its sweet juice. The original home of sugarcane was on the Pacific island of New Guinea. The native people there still grow cane in their gardens for chewing as did their ancestors. Sugarcane was transported from its New Guinea home by three great events in the world's history.

The first of these was the early migrations of peoples in the Pacific area. These migrations began about ten thousand years ago and lasted several thousand years. Among the last to migrate were the Hawaiians who came to their islands about twelve hundred years ago. Their legends tell of carrying sugarcane in their big ocean-going canoes.

Sugarcane arrived in India and China long before the Christian era. Sugar came to India about 3000 B.C. and it was called *Gaura*.

Gaura, an old Indian word for sugar, was apparently derived from the name *Gur*, an ancient monarchy in Bengal. Domestic noncentrifugal sugar, sugar that is made without centrifuging for home consumption, is now called *gur* in India and *goela* in Java. A crown made of sugarcane is described in the *Atharvaveda*, a sacred book of the Hindus, written about 800 B.C. or earlier, and the Greek general Nearchus, who accompanied Alexander the Great to India in the 4th century B.C., tells of a reed that produced honey without the aid of bees.

In China it was known as sweet bamboo. Later, writings which date back to the time of Christ tell of a sugar mill in which juice was boiled and sugar balls were made. Gradually sugarcane spread to Parsis, the country on the Persian Gulf now called Iran.

The second event that transported sugar was when the Arabs invaded Persia and the lands around the Mediterranean Sea, including Spain. The Arabs introduced sugarcane to the countries which they conquered and taught the people how to use it. Venetian merchants began buying sugar and shipping it to Europe and England along with their cargoes of silk and

spices. Because of its scarcity, sugar was expensive in Europe and in great demand. It was so precious that it was used for medicinal purposes.

The third event which was to change the world history of sugar came in the 15th century. Spanish and Portuguese adventurers sailed in their small boats westward and landed on new islands and continents. Many of these new lands were suitable for growing sugarcane. Within a few years both Spain and Portugal had sugar colonies in the West Indies, South America, and on the islands off the western coast of Africa. England, France and other European countries also founded sugar colonies in the new world.

Sugar was carried back to the mother countries on fleets of sailing ships along with gold and pearls. During this same period sugarcane was introduced to what is now the United States of America. Due to the warm climate in Florida and Louisiana, sugarcane flourished in these states. As a result of the implantation of sugarcane in new lands by these early adventurers, the leading cane-producing countries of the world today are Cuba, Brazil, the United States (three states and Puerto Rico), Australia, Mexico, and the British West Indies.

The use of the sugar beet for sugar is relatively recent. Until two hundred years ago it was used mainly for animal food. In 1747, a German chemist, Andreas Marggraf, made a tablespoon of sugar in his laboratory from beets. However, since his method of extracting sugar from the beets was expensive, it was soon forgotten. A war between England and France in 1803, however, brought about a renewed interest in beet sugar because the King of England ordered all the ports of Europe closed to British trading. This cut off the exportation of all cane sugar from the English colonies in the West Indies. As cane sugar became scarce, the price went up and demand increased. Napoleon ordered the planting of thousands of acres of sugar beets and within a few years beet sugar factories were operating in France.

A short time later, the first sugar beet factory opened in the United States, in the state of Massachusetts. The beet industry soon spread to New York,

Maine, Michigan, Illinois, Wisconsin, and Utah. In 1870, California built its first factory in the city of Watsonville and since then factories have opened in Oregon and Washington.

(*Ohsawa's note:* Since most of the sugar consumed in the world comes from sugarcane, the remainder of this article will deal with cane sugar unless otherwise noted.)

Rise in Demand for Sugar

A few thousand years ago while the Middle East and the Orient enjoyed a stable and temperate climate, Europe was just at the end of its Ice Age. The climate in Europe at that time was much colder than it is now. Because of this very cold climate (yin), Europeans were eating much yang food such as animal foods and fish, and became very yang (strong, aggressive). They were so yang that they eventually subjugated most of the world; such was their need to expand.

Gradually the climate of Europe became warmer. At this time it would have been orderly for Europeans to change their diet from an animal-food-based to a vegetable-and-grain-based diet to balance the changing of the climate. This did not happen. While the climate progressively changed, Europeans' diet did not alter very much. Animal foods do not supply enough glucose. For mental work the brain requires glucose which is acquired primarily from vegetal food with grains being the best source.

However, for the meat-eating Europeans, grains were too yang and unattractive. On an animal-food-based diet people are attracted to fruits and white sugar. When sugar was introduced into Europe the inhabitants went wild and the demand grew because sugar is very yin and tastes sweet. The sucrose in sugar is made of glucose and fructose. Glucose is the only carbohydrate that the brain can use. One who eats a lot of animal foods such as beef, chicken, pork, cheese, and fish may have an inadequate supply of glucose for brain activities. In such a condition, one craves a source of glucose. Grains are too yang (if eating an animal-food-based diet) to satisfy this craving. Therefore, yin white sugar, which is high in glucose, is a ready source of glucose.

Thus, people on a high animal food-diet would be attracted to sugar.

Something similar happened in the United States. The founders were very yang; they would have had to be to develop a new country. They also ate a great deal of animal foods, although they ate much more wild game than most people do today. Since those animal foods lacked a source of glucose, early Americans also ate grains such as corn, as the source of sugar or glucose. However, it was perhaps too yang for them. Consequently, sugar became an important food in the diet of these people when it was mass produced and affordable.

If we look at a world map, we find that although most sugar is produced in the tropics, it is consumed in the temperate zones. At first this seems to be a contradiction of macrobiotic principles and yin-yang theory.

As we look into the diet of the tropics, we find that it consists mainly of cereals (corn in particular), starchy roots, and fruit. There is relatively little consumption of animal foods. Though the natives of these areas do eat some sugarcane in its natural state, their needs for yin energy are derived from their daily diet of cereals, starchy roots, and fruit. On the other hand, the Europeans and North Americans with their unrestricted use of animal products, are attracted to sugar to create an energetic balance. It seems the sugar industry was created by Europeans for Europeans.

Front and Back of Sugar

Glucose sugar is so important to health that life would not be possible without it. If glucose were cut off from our brain for even a few minutes, the results would be tragic. We need glucose for thought processes and for energy for our trillions of body cells, especially the brain cells. Therefore, for many years, medical people have made a big mistake saying that refined white sugar, white rice, white bread, fruits or fruit juice are good foods. The sugar in these foods becomes glucose too soon and has negative consequences to the body.

Oriental wisdom says, "There is a front, there is a back." The white sugar which was originally made by black

slaves for the pleasure of the rich became a destructive weapon in the form of ice cream, chocolate, and sweetened drinks. In other words, the front character of sugar is an irresistible sweet taste. The back is slavery (the origin of sugar production), greediness (production and marketing), sickness (man craves sweet, becomes addicted to sugar, and sugar contributes to the development of illness), and unhappiness (man is arrogant and greedy when he is sick and unhappy).

People don't understand the front and back energy of sugar because they are using different definitions of the word sugar. Sugar sometimes means the beautiful white powder or lumps that makes ice cream, chocolate and sodas taste sweet, but sometimes it means a different substance that circulates in the blood. The first meaning of sugar is the product of sugarcane and sugar beets. The latter is blood glucose, the source of body cells' energy. Sugar (blood glucose) is a necessity of life. When some greedy merchants started to use the same word to mean refined sugarcane, a dangerous epidemic started.

According to *Sweet and Dangerous* by John Yudkin, M.D., "Almost every book written by people in, or associated with, the sugar industry contains a section where you are told how important sugar is because it is an essential component of the body. It is oxidized so as to give energy, it is a key material in all sorts of metabolic processes, and so on. And they imply that all this applies to sugar (sucrose). In fact, they have been talking about blood sugar (glucose). Glucose and sucrose are by no means identical. They have different chemical structures and there are important ways in which they have different effects in the body."

Raw sugar goes through many processes which remove vitamins, minerals, fiber, and other ingredients not desirable in the production of white sugar. This white sugar (sucrose) contains glucose and fructose. Therefore, it could be our body cells' energy source. However, refined sugar has had minerals and vitamins extracted which are necessary for the building up of tissues and bones and for the proper functioning of the nervous system and the purification of the blood. Without a constant renew-

al of the elements of iron and sodium the blood cannot take up sufficient oxygen and the waste products of metabolism cannot be neutralized and eliminated. The bloodstream become overloaded with waste products, causing sluggishness and general drowsiness, the symptoms of carbonic acid poisoning.

Milk contains lactose which is made up of two monosaccharides, that is to say, glucose and galactose. Therefore milk can be the source of glucose for our body. The milk of the same species is an appropriate infant food, but not for the adult of that species. The inappropriateness of regular consumption of the milk of a different species is an important health consideration, but won't be discussed here.

Starches (including whole grains) become maltose after being transformed by saliva, stomach juice, pancreatic juice, and intestinal juice. This maltose is made of two glucose molecules and contains many vitamins, proteins, and oils. Therefore, starches are the best source of blood glucose when they are eaten in moderation and chewed well so that they are completely oxidized to produce only carbon dioxide (CO₂), water, and energy.

Fruits contain fructose but not glucose. However, this fructose can be converted to glucose. Therefore, fruits can be a source of body energy. However, fruits are rich in potassium which, in excess, can cause too much excitement of the nervous system and weaken the muscles. Therefore, although fruits contain alkaline-forming minerals such as potassium, it's best to eat fruits in moderation.

Since white sugar and fruits are easily converted to glucose, they are ready to digest and taste sweet without chewing. This sweet taste appealed to people and due to merchants' greediness, manufacturers and merchants advertised that sugar makes energy and is a source of blood sugar or glucose. Increased white sugar consumption is one of the contributing factors to the development of many modern sicknesses such as chronic or sudden fatigue, constipation, anemia, protruding eyes, coronary thrombosis, low blood pressure, diabetes, hypoglycemia, tooth decay, osteoporosis, obesity, many infections, eye

troubles, skin troubles, joint troubles, liver troubles, kidney troubles, loss of appetite, impotence, frigidity, asthma, allergies, cancer, and AIDS. Furthermore, white sugar contributes not only to physical sicknesses but also psychological sicknesses such as nervousness, worry, passivity, introversion, spaciness, loss of concentration, loss of memory, and indecisiveness.

Acid-forming Capability

Why does white sugar cause so many sicknesses? Because cane/beet sugars are among the strongest acid-forming foods. They are so acid-forming due to the fact that the end products are artificially extracted and separated from alkaline-forming elements like calcium, sodium, potassium, magnesium, and iron. Due to the lack of those minerals, body fluids tend to become acidic. The result of this is the malfunction of the autonomic nervous system, hormone systems, various organs, and enzymatic functions. These will render the body unable to maintain homeo-static conditions such as maintaining constant blood sugar level and alkaline body fluids.

Why is it so important that body fluids be in an alkaline condition? When we cannot maintain an alkaline condition of body fluids, we cannot maintain healthy cells; they become sick. When cells are not healthy, organs are sick. When organs are sick, body fluids will be more acidic and cells become more sick. This continues and finally we will manifest one of many so-called sicknesses.

When we cannot maintain a constant blood sugar level, we will have a hypoglycemic condition, hyperglycemic condition and, worse yet, many psychological and emotional troubles.

Some Is Good, More Is Better

Thousands of people in this country and elsewhere are suffering from a sugar affliction called hyperinsulinism (low blood sugar). One possible origin of this malady is excessive consumption of simple carbohydrates (white sugars). Too much white sugar intake forces the pancreas to produce a huge amount of insulin to change glucose into glycogen which is then stored in the liver for later use. By eating sugary

substances we are continually aggravating our pancreas. The pancreas finally reaches a point of sensitivity that even when we do not eat much sugar the pancreas still produces too much insulin, thus lowering the glucose level of the blood. This condition is the forerunner of diabetes (high blood sugar) in which the pancreas has been overworked and can no longer produce any insulin.

Why is it important to maintain a constant blood glucose concentration, particularly since most tissues can utilize fats and proteins for energy in case glucose is lacking? The answer is that glucose is the only nutrient that can be utilized by the brain and eye retina in sufficient quantities to supply them their required energy. If we lack sufficient blood glucose in the brain, we will have mental troubles.

Approximately half of all the glucose formed by gluconeogenesis (the formation of carbohydrates from molecules which are not themselves carbohydrates, e.g., amino acids, fatty acids) during the interdigestive (time between active digestion by the stomach and intestines) period is used for metabolism in the brain. Indeed, it is important that the pancreas not secrete any insulin during this time, for otherwise the scant supplies of glucose that are available would all go into the muscles and other peripheral tissues and leave the brain without glucose.

It is also important that the blood glucose concentration not rise too high for three reasons: First, glucose exerts a large amount of osmotic pressure in the extracellular fluid (plasma and intercellular fluids) and, if the glucose concentration becomes excessively high, this can cause cellular dehydration. Secondly, an excessively high level of blood glucose concentration in the blood will be filtered out through the kidneys and lost in the urine. This is the case of diabetes mellitus. Thirdly, a high concentration of glucose in the blood vessels and urine ducts causes osmotic diuresis in the kidneys which can deplete the body fluids.

Sugar, Heart Disease, and Arteriosclerosis

Next to diabetes, the most serious disease that white sugar consumption

contributes to is heart disease. Inherent in complex starches and unrefined sugars are the B vitamins. When ingested as a complete food, these vitamins along with many others, help digest and assimilate sugars and starches. When these substances are removed from foods, the body must use its own store of vitamins to make up for the deficiency. At first the body takes these B vitamins from less important areas of the body such as the muscles. As the need for more vitamins arises, the B vitamins are taken from the liver. In the extreme, B vitamins are taken from the heart, which causes a slow weakening of this organ.

Arteriosclerosis is another major cause of death in the Western world today. Physiologist, Ancel Keys, was featured on the front page of *Time* magazine in 1961 in a story titled "Health and Diet." It explained Dr. Keys' cholesterol theory relating to coronary artery disease and arteriosclerosis. According to Dr. Keys, cholesterol is one of the major causes of death in this nation.

According to Dr. Keys, the only sure way to control blood cholesterol effectively is to reduce fat calories in the average U.S. diet by more than one-third and to take an even sharper cut in saturated fats. His dietary recommendation was to eat less fat, meat, eggs, and dairy products. To prevent heart attack, butter was to be replaced by unsaturated oil and fish was to be substituted for meat.

There is a different view explaining cholesterol deposits in the arterial walls. Other possible culprits are sugar and refined starches. "Sugar Is Public Enemy Number One," was the headline of the French medical magazine *Le Concours Medical*. It said in this magazine that high fat consumption may not be the only direct cause of arteriosclerosis. Sugar and too much refined starch are also thought to be the direct causes. This medical theory appeared in the editorial of the September 1967 issue of *Le Concours Medical*. It was written by Dr. Forest E. Kendal of Columbia University.

"This theory," said the magazine, "is of twofold importance because first of all, artery disease is ranked at the top of

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causes of death in the Western countries. Second, Dr. Kendall's theory will revolutionize our modern civilized diet."

According to the report from the World Health Organization (WHO, July 1965), half of the deaths in the world are caused by artery disease, especially hardening of the arteries, which is most often fatal. Men have a greater tendency toward being victims of this disease; the risk increases rapidly after the age of thirty-five.

Dr. Kendall expanded Dr. Keys' explanation on how cholesterol is deposited in the arterial wall. According to Dr. Kendall, it is the initial cellular damage in the arterial walls which leads to the development of arteriosclerosis. He says the arterial walls are one of the few places in our body where the cells are dependent upon diffusion of nutrients and the supply of oxygen through overlying cells. Therefore, these cells exist in a state where they are lacking oxygen. In the absence of oxygen, fat cannot be metabolized and the only source of energy available to the cell is through anaerobic glycolysis (the conversion of carbohydrates to simple sugars without oxygen). This glycolysis, according to Dr. Kendall, will function in the presence of enough insulin.

If there is an insufficient amount of insulin present, the glucose metabolism of the arterial wall cells will not function properly and this will result in the damage of the arterial wall cells. Then cholesterol deposits appear on the damaged arterial wall.

Since glucose is one of the major stimulants to insulin secretion, if we eat simple carbohydrates such as sugar, or refined starches, they are quickly digested and converted to glucose. This sudden increase of glucose in the blood would stimulate the islets of Langerhans (in the pancreas) and much insulin would be produced. Because of this quick reaction, this rate of metabolism will not continue consistently and most of the day there will be a shortage of insulin supply in the arterial wall. This will lead to the damage of the arterial wall and ultimately arteriosclerosis. To prevent arteriosclerosis one should eat

mainly whole-grain carbohydrates such as brown rice, coarsely ground grain, cornmeal, farina, and oatmeal, legumes such as beans or peas, leafy vegetables, and whole-grain pasta.

Cancer

In my opinion, sugar consumption is one of the major causes of cancer. There are two stages in the development of cancer. The first stage is initiation in which the DNA of normal cells is damaged and cell growth goes out of control. In my opinion, the cause of this DNA damage is an acidic condition of intracellular (inside the cell) fluid. Physiologically, the cause is the acidifying of the intracellular fluid from excess consumption of acid-forming foods such as sugary cakes, ice cream, sugary drinks, animal foods, fish, poultry, cheese, and eggs. Emotionally, the cause is worry, fear, sadness, stress in job or family, resentment, or anger. Weak kidneys or weak heart and/or bad circulation due to eating too much fatty foods also promotes an acidic condition of the body fluids.

Once malignant cells exist in the body, excess protein and sugar will promote their growth. This is the second stage or promotion stage of cancer. Cancer is usually diagnosed at this stage. Macrobiotic dietary suggestions may be helpful in controlling cancer in this stage. In order for cells to grow, even cancer cells, protein and sugar are required. Sugar here means glucose, sucrose, fructose, maltose, and lactose. Of these sugars, fructose is the most potent in developing cancer cells. Next is sucrose. Therefore, using macrobiotic dietary principles, it is recommended not to eat fruits, cakes, candies, ice cream, and any simple carbohydrate foods. I have seen many cancer patients who had been told by their doctor that their cancer cells were dormant. As soon as they ate fruits, their cancer started to grow again.

In addition, the macrobiotic approach to controlling cancer is to limit protein consumption to 25-30 grams per day. This is approximately the daily requirement for healthy cell renewal. If one consumes much more protein than this, the excess protein will be used as a source of development of the cancer cells. Therefore, macrobiotic dietary

recommendations for cancer are to avoid high-protein foods such as animal foods, cheese, eggs, fish, tofu, tempeh, and even beans. Some medical doctors have called such a diet a "cancer cell starving diet."

AIDS and Infectious Disease

From a macrobiotic perspective, the major causes of AIDS are high sugar consumption, a no-salt diet, and loss of sodium from excess sexual activities. These conditions weaken the body's immunity by weakening (yinnizing) the white cells. These conditions make a white cell's membrane expand (yinnize) so that an HIV virus can enter into the white cell. Once entered, the HIV virus will multiply its own cells using the DNA of a white cell. In regard to AIDS, sugar means fruit sugar, cane sugar, beet sugar, grain sugar, alcohol, honey, or molasses.

One of the main reasons people are attracted to sweets is the constant consumption of animal foods such as meat, cheese, chicken, and eggs. Those foods have plenty of fat which produces energy for the muscles, but not for the brain (which only uses glucose). Therefore, a meat eater craves foods which contain glucose. Grains are the best foods for this but grains take several hours to digest, assimilate, and convert to blood sugar. Since meat eaters need glucose immediately, they are attracted to the quick release of sugar and the strong yin energy of sugar, candy, cakes, sweet drinks, ice cream, and pies. These foods lack minerals and vitamins. In this case, fruits aren't satisfying because they need glucose for brain activity. High consumption of sugar makes them hypoglycemic and makes them crave sweet foods even more. Eating more sugary foods weakens the white cells and finally the white cells are invaded by HIV viruses. Once the HIV virus enters the white cells, a chain reaction begins and many white cells will be damaged and immunity will be weakened. Then AIDS progresses to the second stage, that is to say, infections. When one loses white cells, the body's defenses are weakened. Any microbes can invade and cause infections. Eating high-sugar and high-protein foods will promote these infections. When this stage of AIDS is

reached, infections develop very fast because there are not many white cells and the remaining ones are weak and cannot stop infections. People with AIDS die from so-called opportunistic infections, not from the HIV virus.

Sugar has a stronger effect on the development of opportunistic infections because sugar is one of the most favorable foods for feeding microbes. Unfortunately, many people with AIDS eat many sugar-rich foods.

In my opinion, the most important diet for the prevention of cancer and AIDS is abstinence from eating high sugar, high protein and/or fatty foods.

Osteoporosis

Since white sugar contains no minerals, especially no alkaline-forming minerals like calcium, sodium, potassium, magnesium and iron, it tends to turn body fluids acidic. This is particularly true for the blood. When blood becomes a little acidic, the body tries to prevent further increases in acidity by removing calcium from the bones and adding it to the bloodstream. As a result, one begins to lose calcium from bone. Over time this creates osteoporosis, a serious condition. Of course, sugar is not the only cause of osteoporosis. Any foods or drinks which cause acidity in the body fluids contribute to it also, such as: all animal foods, cheese, fish, most drugs, alcoholic drinks, any high protein foods such as tofu, tempeh and oily foods such as butter, oil, fats, and cheese. Therefore, over-eating these foods can contribute to osteoporosis. Sugar, however, is the food which contributes the most to osteoporosis.

Tooth Decay

That high consumption of white sugar contributes to dental decay is a well-known fact today. For instance, during World War II, there were great changes in the diet of many European countries. The consumption of sugar and sweets was drastically reduced. More potatoes and vegetables and less meat were consumed. Bread was made from unrefined flour rather than refined flour and in certain countries, milk was largely reserved for children. In general, these changes meant a simpler diet for most people containing less processed and highly refined foods and more vitamins

and minerals. This diet was accompanied by a steep decline of dental decay.

When the food supply returned to pre-war levels and manufacturers started food refining several years after the war, the incidence of tooth decay increased.

In many countries, it has been documented that when less sugar is available, such as during wartime, people had fewer toothaches and even fewer headaches. Many other studies have shown that the incidence of tooth decay in populations correlates to the amount of sugar consumption. Native populations, including Australian aborigines, Eskimos and Ghanaians, whose carbohydrate intake was almost exclusively unrefined starches had little tooth decay before being exposed to sugar-laden foods.

White sugar contains three substances that promote tooth decay: a gummy material called glucan which helps bacteria stick to the teeth; acids which corrode the protective enamel coating on the teeth; and stored carbohydrates which the bacteria can ferment to form acids at some later time. When fermentable food is eaten by these bacteria, acid is produced on the surfaces of the teeth, wearing away the tooth's enamel little by little, creating a cavity.

Emotions and Sugar

Another dangerous result of overeating sugar is the development of psychological and emotional problems. Sugar can cause strong emotional upset. Excessive sugar eating can also cause schizophrenic behavior because white sugar "steals" vitamins B₃ and B₆ which control sugar metabolism in the brain.

Generally speaking, sugar produces an acidic condition in our body fluids. When body fluids, especially the fluid in and around nerve cells, become acidic, our emotions become negative which creates fear, worry, sadness, resentment, depression, and anger. This in turn can lead to destructive behavior such as criminal violence, fighting, or killing. Also, negative emotions in a very yin person may cause him/her to lose hope, even creating suicidal tendencies.

If you really understand that eating white sugar can have life-threatening

results, then you will be serious about controlling the sugar-eating habit.

How to Stop Craving Refined Sugar

Too much insulin secretion is a sign of too much stimulation of the pancreas. The important thing to know here is that one cause of the over-secretion of insulin from the pancreas is overeating white sugar or refined sugar (any form of simple carbohydrate). Therefore, the first step in treating hypoglycemia is to stop eating white sugar. The second step is to strengthen the adrenal gland and the liver. Because if one's adrenal gland is strong, one can maintain normal levels of glucose in the blood plasma.

The First Step

1. Reduce animal foods, fish, cheese, eggs and fat consumption to 10 percent of total food consumption per day or eat one portion from this group of foods only one time per week. The reason for this: First, glucose is the only nutrient that can be utilized by the brain and retina in sufficient quantities to supply them with their required energy. Fats and protein cannot supply sufficient energy to the brain and retina. Second, glucose is available primarily from vegetable foods such as starches, vegetables, fruits and also milk (the lactose in milk can be converted to glucose).

2. Eat well-cooked whole grains as main foods (more than 50 percent of energy source).

3. Chew each mouthful of food so well that it tastes sweet.

4. Use squash, sweet potatoes, yams, daikon, and onion to make pies, cookies, or other dishes instead of using sugar, honey, molasses, rice syrup, or other simple carbohydrates.

5. Do not eat dried fruits or cooked fruits because they contain a higher concentration of sugar since most of the water in the fruit has been removed. Sour apples or oranges, which are not so sweet, can be eaten fresh because they contain minerals and vitamins.

6. Make it a habit to drink herbal tea, bancha tea, and grain coffee without sugar. Avoid soft drinks and coffee.

7. Learn cooking methods that create a naturally sweet taste in food.

The Second Step

Strengthen the adrenal gland so that it will secrete enough cortical hormone to change glycogen to glucose. Since the adrenal gland is part of the kidneys, strengthen the kidneys:

1. Use the right amount of salt in cooking: not too much or too little. Foods will have a sweet taste if cooked with the correct amount of salt.

2. Drink only when thirsty. This will reduce the volume of blood which passes through the kidneys every day. If the volume of blood is reduced, the work of the kidneys is reduced and the kidneys can rest. Less drinking increases the concentration of nutrients in the blood so that a small amount of blood circulates, but carries the same amount of nutrients.

3. Apply a ginger compress or castor oil pack over the kidneys.

4. Walk barefoot on the grass in the early morning when there is a dew on the grass. When there is dew, the grass temperature will be about 35°F which stimulates the kidney meridian point in the bottom of the foot, activating better kidney function.

5. Take a sauna with the temperature between 110 and 150°F and stay until sweat comes out of the body. Take a shower or bath after sweating. This will eliminate old fat and salt stored between tissues and blood capillaries and eliminate stiffness of the body muscles. Blood circulation and the function of the adrenal gland will also improve.

6. Take a salt bath. Add two to three pounds of inexpensive salt such as water softening salt to a warm bath and stay in about 30 minutes. If your heart is weak, leave the bath if you begin to feel uncomfortable.

The Third Step

Realize that overeating sugar and sugar products combined with eating animal foods could possibly be the primary cause of cancer and AIDS. Cancer cells need protein and simple sugar to grow. Without an excess of these two foods, cancer should not develop further. In my opinion, even if you have cancer cells in the body, if you don't eat sugar, the cancer cells do not multiply and eventually will die out.

However, stopping a sugar-eating habit is one of the most difficult habits

or obsessions to change. So it may take some time to change or to stop excess sugar consumption. A good rule to remember is: Never give up trying to change even if you fail once, twice, three, ten or even hundreds of times. Don't be ashamed and think that you may have a weak will. It is not the result of weak will but the result of your physical condition. As your physical condition improves, you won't be attracted to sugar.

References

- Low Blood Sugar*, Peter J. Steincrohn, M.D., New American Library.
The Chemicals We Eat, Dr. Melvin A. Benarde, McGraw-Hill Book Co.
Sugar Blues, William Dufty, Warner Communications Co.
The Poison In Your Foods, William Longood, Simon & Schuster.

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