The Sugar Comparison  ▪ Sucrose vs. Trehalose

Lesson #20

by JC Spencer

This lesson could easily be 145 lessons but I have kept it short as a reference for your continual use.

Sucrose Warning

Here are 145 documented health warnings for sucrose. Each warning is supported with scientific evidence in the e-textbook on glycomics and brain function Expand Your Mind - Improve Your Brain available online at www.endowmentmed.org

(1) Sucrose contributes to obesity.

(2)Sucrose can cause less effective functioning of albumin and lipoproteins, which may reduce the body’s ability to handle fat and cholesterol.

(3) Sucrose can contribute to diabetes.

(4) Sucrose increases the systolic blood pressure.

(5) Sucrose can increase size of the liver (make liver cells divide).

(6) Sucrose can increase the amount of liver fat.

(7) Sucrose can suppress the immune system.

(8) Sucrose can cause hypoglycemia.

(9) Sucrose can elevate glucose and insulin responses in oral contraceptive users.

Trehalose Benefits

Health benefit headlines or titles of Trehalose science papers from major university studies. Each benefit is supported with scientific evidence in The Trehalose Handbooks - Vol 1, Vol 2, and Vol 3 available online at www.endowmentmed.org

(1) Trehalose Sugar Inhibits Fat Cell Enlargement

(2) Trehalose Sugar Inhibits Progression of Type 2 Diabetes

(3) Study identifies the effects of trehalose in preventing metabolic syndrome.

(4) Glycomic Insights from Oxford University into the Multi-functional Role of Trehalose

(5) The Sugar Trehalose Protects Cells from Electron Beam Damage

(6) Study Shows Trehalose More Stable Than Other Sugars

(7) Trehalose has Enduring Source of Energy

(8) New Research Study Explains HOW the Sugar Trehalose Inhibits Alzheimer’s

(9) Trehalose is making its way into medicine on the point of a needle
(10) Sucrose upsets mineral relationships in the body.

(11) Sucrose can cause hyperactivity, anxiety, difficulty concentrating, and crankiness in children.

(12) Sucrose can produce a significant rise in triglycerides.

(13) Sucrose contributes to the reduction in defense against bacterial infection (infectious diseases).

(14) Sucrose causes tissue elasticity loss and function. The more sucrose you eat, the more elasticity and function you lose.

(15) Sucrose reduces high density lipoproteins.

(16) Sucrose leads to chromium deficiency.

(17) Sucrose leads to cancer of the ovaries.

(18) Sucrose can increase fasting levels of glucose.

(19) Sucrose causes copper deficiency.

(20) Sucrose interferes with absorption of calcium & magnesium.

(21) Sucrose can weaken eyesight.

(22) Sucrose raises the level of neurotransmitter’s: dopamine, serotonin, and norepinephrine.

(23) Sucrose can produce an acidic digestive tract.

(24) Sucrose can cause rapid rise of adrenaline levels in children.

(25) Sucrose malabsorption is frequent in patients with functional bowel disease.

(26) Sucrose can cause premature aging.

(27) Sucrose can lead to alcoholism.

(10) Trehalose / Microarray Technology / NIH / and Texas A&M

(11) Trehalose and Enzyme used in Spine Repair Study

(12) Trehalose, Stem Cells, and Huntington’s Disease

(13) New Research: Trehalose and Neurodegenerative Diseases

(14) Trehalose as a Natural Antifreeze

(15) Trehalose may help in diabetes, triglycerides, kidney diseases, and neurodegenerative diseases

(16) Trehalose Found Instrumental in Hormonal Regulation and Gene Function in Plants

(17) Trehalose - Hot Ingredient in Cosmeceutical & Neutraceutical Market - because of it anti-aging functionality

(18) Trehalose in Certain Rice Strain Protects it from Drought

(19) Trehalose published paper abstract - Organization and mobility of water in amorphous and crystalline

(20) Trehalose Can Extend Shelf Life of Other Sugars

(21) Trehalose Improves Stress Tolerance in Organisms

(22) Trehalose Used in Cryopreservation of Human Fetal Skin for Transplantation

(23) Trehalose Proves Effective Kinetic Advantages

(24) Trehalose Poster at International Conference on Molecular Systems Biology

(25) Trehalose puts life on hold - Royal Society of Chemistry
(28) Sucrose can cause tooth decay.

(29) Sucrose intake levels that are high increases the risk of Crohn’s disease, and ulcerative colitis.

(30) Sucrose can cause changes frequently found in persons with gastric or duodenal ulcers.

(31) Sucrose can cause arthritis.

(32) Sucrose can cause or be a factor in asthma.

(33) Sucrose greatly assists the uncontrolled growth of Candida Albicans (yeast infections).

(34) Sucrose can cause gallstones.

(35) Sucrose can cause heart disease.

(36) Sucrose can cause appendicitis.

(37) Sucrose can cause multiple sclerosis.

(38) Sucrose can cause hemorrhoids.

(39) Sucrose can cause varicose veins.

(40) Sucrose can lead to periodontal disease.

(41) Sucrose can contribute to osteoporosis.

(42) Sucrose contributes to salivary acidity.

(43) Sucrose causes decrease in insulin sensitivity.

(44) Sucrose can lower the amount of vitamin E in the blood.

(45) Sucrose can decrease growth hormone.

(46) Sucrose can increase cholesterol, triglycerides, kidney diseases, and

(47) Sucrose causes drowsiness - decreases child activity.
(48) High sucrose intake increases advanced glycation end products (AGES) (sugar bound non-enzymatically to protein).

(49) Sucrose interferes with protein absorption.

(50) Sucrose causes food allergies.

(51) Sucrose can cause toxemia during pregnancy.

(52) Sucrose can contribute to eczema in children.

(53) Sucrose can cause cardiovascular disease.

(54) Sucrose can affect DNA function (alter gene expression)

(55) Sucrose can change protein structure.

(56) Sucrose can make our skin age (change collagen structure)

(57) Sucrose can cause cataracts.

(58) Sucrose can cause emphysema.

(59) Sucrose can cause atherosclerosis.

(60) Sucrose can promote LDL (elevation low density lipoproteins).

(61) High sucrose intake can impair the physiological homeostasis of many systems in the body.

(62) Sucrose lowers functionality of certain enzymes.

(63) Sucrose intake is higher in people with Parkinson’s.

(64) Sucrose can cause a permanent alteration in the way certain proteins act in the body.

(43) Trehalose paper: Using disaccharides to enhance in vitro and in vivo transgene expression mediated by a lipid-based gene delivery system.


(45) Trehalose paper: The role of cell-derived oligomers of Abeta in Alzheimer’s disease and avenues for therapeutic intervention

(46) Trehalose reduces aggregate formation and delays pathology in a transgenic mouse model of oculopharyngeal muscular dystrophy

(47) Trehalose inhibits aggregation and neurotoxicity of beta-amyloid 40 and 42

(48) Trehalose: a review of properties, history of use and human tolerance, and results of multiple safety studies

(49) Trehalose: a cryoprotectant that enhances recovery and preserves function of human pancreatic islets after long-term storage

(50) Trehalose paper: Tps1 regulates the pentose phosphate pathway, nitrogen metabolism and fungal virulence

(51) Trehalose ameliorates the cryopreservation of cord blood in a preclinical system and increases the recovery of CFUs, long-term culture-initiating cells, and nonobese diabetic-SCID repopulating cells

(52) Stabilization of membranes in human platelets freeze-dried with trehalose

(53) Multiple effects of trehalose on protein folding in vitro and in vivo

(54) Loading Human Mesenchymal Stem Cells with Trehalose by Fluid-Phase Endocytosis
Sucrose can increase kidney size and produce pathological changes in the kidney.

Sucrose can damage the pancreas.

Sucrose can increase body's fluid retention.

Sucrose is enemy #1 of the bowel movement.

Sucrose can cause myopia (nearsightedness).

Sucrose can compromise the lining of the capillaries.

Sucrose can make the tendons more brittle.

Sucrose can cause headaches, including migraine.

Sucrose plays role in pancreatic cancer in women.

Sucrose can adversely affect school children's grades and cause learning disorders.

Sucrose can cause an increase in delta, alpha, and theta brain waves.

Sucrose can cause depression.

Sucrose increases the risk of gastric cancer.

Sucrose can cause dyspepsia (indigestion).

Sucrose can increase your risk of getting gout.

Sucrose can increase the levels of glucose.

Sucrose can increase the insulin responses in humans consuming high-sugar diets compared to low sugar diets.

Trehalose paper: Lessons from nature: the role of sugars in anhydrobiosis

Intracellular trehalose improves the survival of cryopreserved mammalian cells

Gene expression pattern in HD transgenic rats and HD knock-in mice: specific effects of trehalose treatment

Purification and Characterization of a Trehalose Synthase from the Basidiomycete Grifola frondosa

Purification and characterization of trehalose phosphorylase from the commercial mushroom Agaricus bisporus

Trehalose in yeast, stress protectant rather than reserve carbohydrate

Trehalose aids Fertilization and development of frozen-thawed germinal vesicle bovine oocytes by a one-step dilution method in vitro

Extraordinary stability of enzymes dried in trehalose: simplified molecular biology

Amorphous stability and trehalose among adolescents.

Trehalose is a skin protectant now used in many leading skin care products.

Below are some of the references to sucrose and trehalose that are published in Volume 3 of the textbook, Expand Your Mind - Improve Your Brain.


Sucrose Induces Diabetes in Cat (Federal Protocol (1974;6(97)).
(82) High refined sugar diet reduces learning capacity.

(83) Sucrose can contribute to Alzheimer’s disease.

(84) Sucrose can increase platelet adhesiveness.

(85) Sucrose can cause hormonal imbalance; some hormones become underactive and others become overactive.

(86) Sucrose can lead to the formation of kidney stones.

(87) Sucrose can lead to the hypothalamus to become highly sensitive to a large variety of stimuli.

(88) Sucrose can lead to dizziness.

(89) Diets high in sugar can cause increased production of free radicals and oxidative stress.

(90) High sucrose diets of subjects with peripheral vascular disease significantly increase platelet adhesion.

(91) High-sugar diet can lead to biliary tract cancer.

(92) Sucrose feeds cancer.

(93) High-sugar consumption of pregnant adolescents is associated with a two-fold increased risk for delivering a small-for-gestational-age (SGA) infant.

(94) High-sugar consumption can lead to substantial decrease in gestation duration

(95) Sucrose slows food's travel time through the gastrointestinal tract.

(96) Sucrose increases the concentration of bile acids in stools and bacterial enzymes in the colon. This can modify bile to produce cancer-causing compounds and colon cancer.
Sucrose increases estradiol (the most potent form of naturally occurring estrogen) in men.

Sucrose combines and destroys alkaline phosphatase enzyme, which makes the process of digestion difficult.

Sucrose is a risk factor for gallbladder cancer.

Sucrose is an addictive substance.

Sucrose can be intoxicating, similar to alcohol.

Sucrose can exacerbate PMS.

Sucrose given to premature babies can affect the amount of carbon dioxide they produce.

Lower sucrose intake can increase emotional stability.

The body changes sucrose into 2 to 5 times more fat in the bloodstream than it does starch.

The rapid absorption of sucrose promotes excessive food intake in obese subjects.

Sucrose can worsen ADHD symptoms of children with attention deficit hyperactivity disorder.

Sucrose adversely affects urinary electrolyte composition.

Sucrose can slow down the ability of the adrenal glands to function.

Sucrose has potential of inducing abnormal metabolic processes in a normal healthy individual and to promote chronic degenerative diseases.

Intravenous sugar water can stop oxygen to the brain.


Some of the Selected References below were part of the list of references for trehalose regarding pH:


Sucrose increases the risk of polio.

High-sucrose intake can cause epileptic seizures.

Sucrose causes high blood pressure in obese people.

In Intensive Care Units, limiting sucrose saves lives.

Sucrose may induce cell death.

Sucrose can increase the craving for excess food.

Children in juvenile rehabilitation camps, put on a low sucrose diet, had a 44% drop in anti-social behavior.

Sucrose can lead to prostate cancer.

Sucrose dehydrates newborns.

Sucrose increases estradiol in young men. Estradiol is a sex hormone predominant present in females.

Sucrose can cause low birth weight babies.

Greater consumption of refined sugar is associated with a worse outcome of schizophrenia.

Sucrose can raise bloodstream homocysteine levels.

Sweet food items increase risk of breast cancer.

Sucrose is a risk factor in small intestine cancer.

Sucrose may cause laryngeal cancer.


Trehalose paper: Tps1 regulates the pentose phosphate pathway, nitrogen metabolism and fungal virulence


Trehalose paper: Trehalose ameliorates the cryopreservation of cord blood in a preclinical system and increases the recovery of CFUs, long-term culture-initiating cells, and nonobese diabetic-SCID repopulating cells. " X B Zhang, K Li, K H Yau, K S Tsang, T F Fok, C K Li, S M Lee and P M Yuen (2003).


Trehalose paper: Using disaccharides to enhance in vitro and in vivo transgene expression mediated by a lipid-based gene delivery system
(129) Sucrose induces salt and water retention.

(130) Sucrose may contribute to mild memory loss.

(131) Sucrose increase in 10 year-olds, causes a linear 210.

(132) A newborn exposed to sucrose results in a heightened addiction to sugar at 6 month and 2 years of age.

(133) Sucrose causes constipation.

(134) Sucrose can cause brain impairment in prediabetic and diabetic women.

(135) Sucrose can increase the risk of stomach cancer.

(136) Sucrose can cause metabolic syndrome.

(137) Sucrose ingestion by pregnant women increases neural tube defects in embryos.

(138) The higher the sucrose consumption, the more chances of getting irritable bowel syndrome (IBS).

(139) Sucrose could affect central reward systems.

(140) Sucrose can cause cancer of the rectum.

(141) Sucrose can cause endometrial cancer.

(142) Sucrose can cause renal (kidney) cell carcinoma.

(143) Sucrose can cause liver tumors.

(144) The more soft drinks, fruit juice and sugary snacks one eats, the lower the HDL (high density lipoproteins).

(145) Sucrose consumption can cause myocardial infarction.


“Several theories have been proposed as to why trehalose exerts far greater protective effects than other disaccharides like sucrose and maltose. These include suggestions that its special properties are due to a higher glass transition temperature or that it forms direct hydrogen bonds with lipids in cells, replacing similar bonds with water molecules.”


More References are available in the glycomics / brain function in The Trehalose Handbooks Vol. 1, 2, and 3 available at www.endowmentmed.org.