

AGEs (Advanced Glycation End products) and a Healthy Heart

The American diet is saturated with sugar. It's not just in traditionally sweetened snacks such as candies, cookies, cakes and pies either. Food manufacturers put sugar in ketchup, mayonnaise, and hot dog and hamburger buns. Pharmaceutical manufacturers place sugar in some medications too.

Not only does sugar contribute to excess weight and obesity, but to diseases such as Alzheimer's and heart disease. It does this through a process called glycation. No wonder a healthy heart is rare these days.

Glycation, or the Maillard reaction, results when a sugar and a protein molecule combine. It is this process which causes bread and pastries to turn brown when baked. Sugar (sucrose, fructose, lactose, etc.) mixes with certain amino acids in the grain proteins of flour.

In your body, glycation happens when blood sugar (glucose) combines with the amino acids tryptophan, lysine, and arginine. This reactive process creates byproducts known as AGEs (advanced glycation end products.) AGEs causes the body's cells to, well, age.

Researchers now think that AGEs accumulate in the body and take up permanent residence. AGEs form rapidly when the body has low levels of antioxidants and when the kidneys are weak, or not working properly.

Diabetics are especially vulnerable to AGEs. Large numbers are created when glucose levels are high.

Think about the 'runny' part of a raw egg. It is almost completely protein. When heated, the 'runny' portion changes through a chemical reaction from liquid to a solid, rubbery white substance. This is substantially what happens inside the body during glycation.

Since protein is located throughout the body, it can all be affected. When the protein in blood vessels undergo glycation, the arteries become less flexible, and lead to hypertension (high blood pressure), the formation of plaque, stroke, heart attack, and heart disease. A healthy heart is next to impossible to achieve in this environment.

What can you do to prevent the damage caused by AGEs? The very first thing to do is avoid refined products containing sugar (sucrose, dextrose, fructose, maltose, lactose, high fructose corn syrup.) At the very least, make sure that of one these ingredients is not listed first, second, third, or fourth on the ingredients label. **AVOID HIGH FRUCTOSE CORN SYRUP ENTIRELY!** Besides foods, high fructose corn syrup is in most sodas and fruit juices and drinks.

Instead of using table sugar to sweeten beverages and baked goods, use stevia. Increase the amount of fruits and vegetables in your diet.

The results of a study of the phenol contents of common herbs and spices were published in the Journal of Medicinal Foods. The study showed that the phenol content of herbs and spices prevented glycation and the creation of AGEs (advanced glycation end products.) AGEs are strongly responsible for premature aging and heart disease.

The top ten herbs and spices containing high phenolic levels are:

- ground cloves
- ground cinnamon
- ground Jamaican allspice
- apple pie spice (mixture)
- ground oregano
- pumpkin pie spice
- marjoram
- sage
- thyme
- gourmet Italian spice

'Glycation' is a process by which sugar such as glucose, fructose, etc., bonds with proteins and form AGEs. These AGEs produce inflammation which triggers an immune response from the body.

One such immune response is macrophages. Macrophages are scavengers that contain special receptors called RAGEs for attracting AGEs. RAGEs bind to AGEs and eliminates them from the body.

AGEs accumulate in the body and slowly breaks it down. They cause the formation of scar tissue known as plaque in the arteries.