Using sugar substitutes in cooking and baking

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It may surprise you that sugar substitutes have been around since the late 1870's. That's when Saccharin, which is over three hundred times sweeter than table sugar (i.e., sucrose), was discovered. One hundred and fifty years later, a lot has happened and high-intensity sweeteners have become a huge business.

In 1976, almost one hundred years after Saccharin came onto the scene, Sucralose was discovered. It is about six hundred times sweeter than the sucrose from which it is produced. Sucralose is probably better known to most people under its registered tradename "Splenda". It is now the market leader among the sugar substitutes available to consumers.

In the process used to make Sucralose, three chlorine atoms are attached to the sucrose molecules. This essentially fools our bodies which no longer see the new molecule as a carbohydrate. Our bodies see the Sucralose as being non-digestible.

Sucralose would be far too sweet to use in its pure form, so it needs to have a bulking agent to increase its volume. We won't go into all that technical stuff here. However, there are some interesting features about Sucralose that change its behaviour quite significantly from table sugar. The "Splenda" website is an excellent source of information in this regard (www.splenda.com/cooking-baking/granulated).

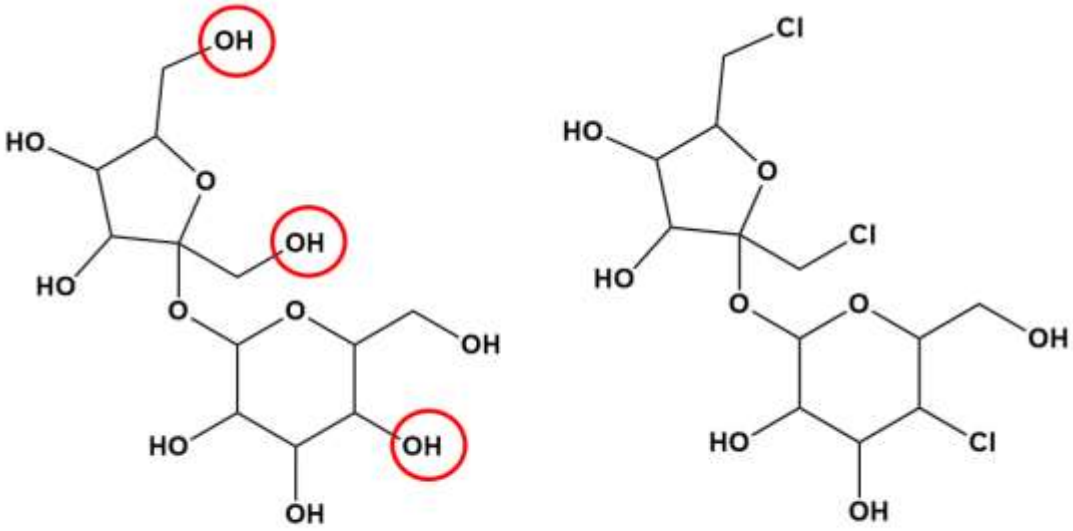
Those of you who have baked with "Splenda" may have noticed that there is not the distinct browning that you would expect to see with sugar. That's because sugar caramelizes at baking temperatures and "Splenda" does not. An apparent remedy to this is a light coating of cooking spray on the surface of the dough or batter just before putting your baking in the oven.

To me, one of the most significant differences between Splenda and sugar is observed when making jams or jellies. The substitution of three of the oxygen-hydrogen groups (we call them hydroxyl groups) with chlorine atoms change the manner in which the new molecules behave in the presence of water. Sucrose has the ability to grab water molecules and hold them quite strongly. When you make jams, you add a bit of acid in the form of lemon juice or vinegar plus pectin to the mixture. As it cools, a tight network is set up that forms a gel. Because the water is tied up in this network, it is difficult for microorganisms to grow and we have a preservative effect created by the sugar and pectin.

When using "Splenda" for jams and jellies, there is no longer any water binding capability provided by the sweetener. If you did not take any corrective action, you

would end up with runny jam that would not gel. The easy fix for this is to use a pectin preparation designed for low-sugar or no-sugar recipes. Even though the jam you get in this manner will have gelled, you need to take extra precautions since there will not be the preservative effects that sugar provides. By following the recommended procedures for making sugarless jams, you should be able to avoid any potential problems.

Just as a final note, when using any of the available sugar substitutes or high-intensity sweeteners, be sure to consult the manufacturer's instructions that are available on the package or on-line.



Sucrose Sucralose

The three "OH" groups that are circled on the sucrose molecule on the left are replaced with chlorine atoms (Cl) to produce the Sucralose molecule on the right.