LOUISIANA sugarcane

Sugar - More Than Just Sweet Taste!

All over the world, sugar has been an important ingredient for thousands of years.

You may not know it, but there's a lot of chemistry going on when ingredients in a recipe are put together. Sugar plays an **essential** role in the way foods look, last, and let's not forget, taste!

Sugar is made of carbon, hydrogen, and oxygen atoms. Its molecular structure ($C_{12}H_{22}O_{11}$) makes it easy to **bond** with other molecules. Sugar is also hygroscopic (absorbs moisture) this makes it an efficient natural preservative.

What are sugar's amazing powers in cooking and baking?

- Sugar grabs the available water in foods. This is important because bacteria grow in moist environments. By soaking up the water, sugar acts as a preservative which prevents the growth of the **microorganisms** that can spoil food. This is true for many products such as jams and jellies and even breakfast cereal, bread and other baked goods.
- Sugar reacts with protein in the food. The more sugar a food contains, the more brown it will become. The scientific name for this change is the Maillard reaction.
- Sugar can also brown foods through a process called caramelization. When the sugar is heated, it changes, or caramelizes. If you heat white table sugar in a pan, it will turn into a beautiful caramel sauce you can use on ice cream or fruit.
- Bread is made with baker's yeast, which feeds on sugar. When the yeast **consumes** the sugar, it releases a gas called carbon dioxide. This gas is what makes the dough rise.
- Cookies have a crumbly structure because when you beat together butter or shortening with sugar, air pockets are made, and this contributes to the **texture**. Cookies are crisp because sugar absorbs the moisture from other ingredients when baking.
- Sugar absorbs water and inhibits flour gluten development providing the proper texture in baked goods. A little sugar = dense texture like in a roll; a lot of sugar = fluffy texture like in a cake.

- Sugar helps retain moisture to extend baked goods **shelf life**.
- Sugar balances sour, bitter and spicy components in spaghetti and barbeque sauces and the dressings you put on your salad.
- Ice cream is creamy because sugar lowers its freezing point, slowing down the freezing process. This creates a smooth, creamy **consistency** that's easy to scoop.
- Vegetables have that fresh-from-the-garden taste when a little sugar is added. Sugar naturally **enhances** flavors and helps strengthen fiber and cell structure in fruits and vegetables during cooking.

For more information on baking science, go to www.homebaking.org

Continued on Back →

Glossary

- **essential** - *adj.* very important; vital
- **bond** - *v.* to stick together
- **microorganisms** - n. an organism that can be seen only through a microscope
- **consume** - *v.* to use up
- **texture** - *n.* the look or feel of something
- **shelf life** - *n.* the period of time food stays fresh
- **consistency** - *n.* the degree of how stiff, thick, or firm something is
- **enhance** - *v.* to make greater; improve
- **versatility** - *n.* the ability to do many things well

Well, we've talked about the many functions of sugar, so now let's look at the types of sugar we use most.

Granulated Sugar

Granulated sugar is the white sugar you see in the store or on your table. These sugar crystals are formed during the purification process when the molasses surrounding the sugar crystals is removed.

Brown Sugar

Brown sugar can be made two ways. Some companies stop washing the sugar while it still has some molasses on it. Other companies wash the sugar until it's white, then add molasses back into the washed sugar. You've probably seen light brown and dark brown sugar. The difference between the two is that dark brown sugar has a stronger molasses flavor. Dark brown sugar is used in gingerbread, baked beans, and other full-flavored foods. Light brown sugar is commonly used for baking.

Confectioners' Sugar

Confectioners' sugar is also known as powdered sugar. It's powdery because the sugar particles are much finer than granulated sugar crystals. A small amount of cornstarch is added to confectioners' sugar so that the particles remain separate. This fine texture is what makes frosting smooth.

Evaporated Cane Juice

Some sugar is crystallized in a single-step process, rather than using many steps. This sugar is called evaporated cane juice. It keeps more of the flavor, color, and aroma of the cane juice.

Raw or Turbinado

Raw and Turbinado sugar have been refined to a light tan color by washing in a centrifuge to remove surface molasses.

Whether it's granulated, brown, powdered sugar, or evaporated cane juice, sugar is sweet. We all know that, but now you know that sweetening foods is only one of sugar's amazing powers. Its unique **versatility** makes sugar an essential ingredient in the foods we eat. They taste better, look more pleasing, and last longer.

Here are some pretty cool activities you can do in the kitchen. Be sure to have an adult help you. Your friends and family will be impressed with all the things you know about sugar!

1. **Make Your Own Brown Sugar** -This would be a fun demonstration!

Brown Sugar Recipe

- 1 cup white, granulated sugar
- 1 tablespoon molasses
- food processor or blender

Pour the sugar into a food processor or blender. Add the molasses. Blend until the molasses coats the sugar. Ta da!

2. **Create Your Own Caramelized Sugar** - This is why our cooked foods turn that yummy, golden brown color. Mmmm...

Caramelized Sugar Recipe

- 1/2 cup sugar
- 2 tablespoons water

Cook over medium heat, stirring constantly, until mixture melts and begins to turn brown. Remove from heat and let cool.

3. **Conduct Your Own Taste Test** - Just a little bit of sugar can make a big improvement in how vegetables taste. Use this recipe to prepare some broccoli using 1 teaspoon of sugar in the water. Then, prepare a batch without sugar. Ask your friends and family to taste some broccoli from each batch and tell you their favorite. Create a graph to chart your results — how very scientific of you!

Broccoli Taste Test Recipe

- 1 cup fresh broccoli
- 1 teaspoon sugar
- 1/2 inch water in a saucepan

Place ingredients in saucepan and cover. Heat to simmer and cook 5 minutes or until tender. Drain cooked broccoli. Make a new batch without the sugar.

Now you're ready for your taste test!