Frequently asked questions

Q1. Describe in brief the role of sugar in baking?

Ans. Beyond being a sweetener and flavor enhancer, sugar (and the amount called for in standard baked goods) plays a critical role in the science of baking. Some of its most critical functions are:

a) Interacts with starch and protein during baking for the structure of products.

b) Acts as a tenderizer by absorbing water, inhibiting gluten development, and delaying starch gelatinization.

c) Incorporates air into batters and dough (creaming) for light texture and crumb.

d) Caramelizes under heat to provide cooked and baked foods with pleasing color and aroma.

e) Speeds the growth of yeast by providing nourishment.

f) Stabilizes beaten egg foams.

Q2. How is baker's sugar different from confections sugar?

Ans. Bakers Specials crystal size is fine and is used for sugaring doughnuts and cookies as well as in some commercial cakes. It produces fine crumb texture. Whereas confectioners or powdered sugar is granulated sugar ground to a smooth powder and

then sifted. It contains about 3% cornstarch to prevent caking. Confectioner's sugar is available in three grades ground to different degrees of fineness. The confectioner's sugar available in supermarkets is the finest of the three and is used in icings, confections and whipping cream. Industrial bakers use the other two types of powdered sugar.

Q3. How does sugar helps to retain color?

Ans. Sugar helps to retain the color of the fruit through its capacity to attract and hold water. Sugar absorbs water more readily than other components, such as fruit, in preserves and jellies. Thus, sugar prevents the fruit from absorbing water that would cause its color to fade through dilution.

Q4. Discuss in brief the preservation mechanism of sugar involved in foods?

Ans. There are several ways in which sugar inhibit microbial growth. The most notable is simple osmosis, or dehydration. Sugar, whether in solid or aqueous form has an effect of drawing available water from the food to the outside and inserting sugar molecules into the food interior. The result is a reduction of the water activity (a_w) , a measure of unbound, free water molecules in the food that is necessary for microbial survival and growth. The antimicrobial mechanisms include interference with a microbe's

enzyme activity and weakening the molecular structure of its DNA. Sugar may also provide an indirect form of preservation by accelerating the accumulation of antimicrobial compounds e.g, the conversion of sugar to ethanol in wine by fermentative yeasts or the conversion of sugar to organic acids in sauerkraut by lactic acid bacteria.

Q5. What are dry rubs?

Ans. A dry rub or dry marinade is a mixture of sugar (often white and brown), salt, and crushed herbs or spices that is applied to a protein's surface prior to cooking.

Q6.What quality parameters are enhanced in barbeque sauce when sugar is added?

Ans. Sugar enhances or brings out the flavors that are already in the barbecue sauce. It enhances the tomato, vinegar or lime flavors that may be present in the sauces. Additionally, sugar provides superior taste, consistency and performance over other sweeteners in barbecue sauce applications.

Q7. What are the various steps involved in the refining process of sugar?

Ans. The sugar refining process takes place in different stages. The first stage is known as affination and involves immersing the sugar crystals in concentrated syrup that softens and removes the

sticky brown coating without dissolving them. The crystals are then separated from the liquor and dissolved in water. The resulting syrup is treated either by a carbonatation or by a phosphatation process. Both involve the precipitation of a fine solid in the syrup and when this is filtered out, many of the impurities are removed at the same time. Removal of color is achieved by using either a granular activated carbon or an ion-exchange resin. The sugar syrup is concentrated by boiling and then cooled and seeded with sugar crystals, causing the sugar to crystallize out. The liquor is spun off in a centrifuge and the white crystals are dried in hot air and ready to be packaged or used.

Q8. Which international authority sets the standards for purity analysis of sugar?

Ans. The International Commission for Uniform Methods of Sugar Analysis sets standards for the measurement of the purity of refined sugar, known as ICUMSA numbers; lower numbers indicate a higher level of purity in the refined sugar. Refined sugar is widely used for industrial needs for higher quality. Refined sugar is purer (ICUMSA below 300) than raw sugar (ICUMSA over 1,500).

Q9. Why is sugar important in gelling process of jams and jellies? Ans. Sugar is essential in the gelling process of jams, preserves and jellies to obtain the desired consistency and firmness. This

gel-forming process is called gelation, where the fruit juices are enmeshed in a network of fibers. Pectin, a natural component of fruits, has the ability to form this gel only in the presence of sugar and acid. Sugar is essential because it attracts and holds water during the gelling process.

Q10. Enlist the role of sugar in different food systems.

Ans. Following are the important roles of sugar in different food systems

1. Interacts with molecules of protein or starch during baking and cooking process.

2. Acts as a tenderizer by absorbing water and inhibiting flour gluten development, as well as delaying starch gelatinization

3. Incorporates air into shortening in the creaming process.

4. Caramelizes under heat, to provide cooked and baked foods with pleasing color and aroma.

5. Serves as a whipping aid to stabilize beaten egg foams.

6. Regulates the gelling of fruit jellies and preserves.

7. Helps to prevent spoilage of jellies and preserves.

8. Improves the appearance and tenderness of canned fruits

9. Delays discoloration of the surface of frozen fresh fruits.

10. Controls the reformation of crystals through inversion (breakdown to fructose and glucose).

Q11. How does sugar help in retention of natural food colors? Ans. Sugar helps retain the color of the fruit through its capacity to attract and hold water. Sugar absorbs water more readily than other components, such as fruit, in preserves and jellies. Thus, sugar prevents the fruit from absorbing water that would cause its color to fade through dilution.

Q12. What is the role of sugar in canning of fruits?

Ans. Fruit to be canned is placed in syrup of greater sugar concentration than that of the fruit itself. The dissolved sugar in the syrup diffuses into the fruit (osmosis) and improves its flavor. In addition, sugar, upon entering the cells, also helps to minimize oxidation, and prevents the fruit's firm texture from becoming mushy.

Q13. What is water activity?

Ans water activity (aw), a measure of unbound, free water molecules in the food that is necessary for microbial survival and growth. The aw of most fresh foods is 0.99, whereas the aw necessary to inhibit growth of most bacteria is approx. 0.91

Q14. What is Turbinado sugar?

Ans. This sugar is raw sugar which has been only partially processed, removing the surface molasses. It is a blond color with a mild brown sugar flavor and is often used in tea.

Q15. Define sugar in brief?

Ans. Sugar is the generalized name for sweet, short-chain, soluble carbohydrates many of which are used in food. They are composed of carbon, hydrogen, and oxygen. There are various types of sugar derived from different sources. Simple sugars are called monosaccharides and include glucose (also known as dextrose), fructose, and galactose. The table or granulated sugar most customarily used in food is sucrose a disaccharide (C12H22O11). Other disaccharides include maltose and lactose. Sucrose is present in sufficient concentrations only in sugarcane and sugar beet