Short answer type questions:

1. what are sugars?

Ans: Sometimes called "caloric sweeteners," sugars are carbohydrates naturally present in or added to foods. Sugars contribute between 3 and 4 calories per gram (simple sugars have 4 calories per gram while some polyols and polysaccharides can have lower caloric content). Two other terms are often associated with sugars i.e., "added" and "naturally occurring" sugars. "Naturally occurring sugars" is a term that refers to the sugars in food or beverages coming from the ingredients themselves. Such ingredients inherently containing sugars are fruit, vegetables, and milk. "Added sugars" refer to sugars added to foods in manufacturing, cooking, or at the table. Examples of added sugars include sucrose, corn syrup, high-fructose corn syrup, honey, and molasses. Both types of sugars are digested and metabolized in the same way in the body and can be part of a balanced diet that includes a variety of foods.

2. How are carbohydrates and sugars used by the body?

Ans: Once ingested, most carbohydrates and complex sugars are broken down into the simple sugar glucose. Glucose is the primary fuel utilized by the brain and working muscles. To protect the brain from a potential fuel shortage, the body tries to maintain a constant glucose level in the blood. Excess dietary glucose can be stored in the liver and muscle cells in units called glycogen. When the level of glucose in the blood starts to drop, glycogen can be converted to glucose to maintain blood glucose levels.

3. How sugars are related to diabetes?

Ans: There are two types of diabetes, i.e., type I and type II. In

type I diabetes, the pancreas fails to produce the hormone insulin. Insulin is required by the body for energy utilization both by muscles and other cells. Type II diabetes results when the body is unable to respond properly to the insulin produced by the pancreas. Type II diabetes is the most common. Individuals who are overweight or obese may be more at risk for developing type II diabetes. Consumption of sugars and carbohydrates does not cause either type of diabetes. However, people with diabetes need to be especially careful about the carbohydrates that they consume, usually by counting grams of carbohydrate.

4. Are the caloric sweeteners used in food safe?

Ans: The FDA has examined numerous sugars including glucose, dextrose, fructose, sucrose, high fructose corn syrup, lactose, and maltose and determined that they are 'generally recognized as safe' (GRAS). According to the FDA, sugars for use in foods have a proven track record of safety based either on a history of use or on published scientific evidence, and need not be further approved by the FDA prior to being used in food products.

5. what role does the sugar and carbohydrates play in foods?

Ans: Sugars and carbohydrates play a very important role in foods. These commonly act as a sweetener and also caramelize under heat. In bakery these enhance the growth of yeast for breads and baked goods and act as tenderizer in baking. These play a role as a preservative to prevent spoilage and control the gelling process when making fruit preserves. Their addition increases the smoothness of ice creams and frozen desserts. The sweetening ability of sugar can encourage people to eat nutrient-rich foods that would otherwise probably not be consumed for examples a sprinkle of sugar added to oatmeal or grapefruit or adding sugar to cranberries in the juice

making process.

6. What are carbohydrate and sugar consumption recommendations?

Ans: The Institute of Medicine recommends that adults and children consume at least 130 grams of total carbohydrate per day based on the average minimum amount of glucose utilized by the brain. The Dietary Reference Intakes (DRI) for carbohydrates and sugars recommends a maximum intake level of 25 percent or less of energy from added sugars. The new Dietary Guidelines for Americans emphasize that it is necessary to include nutrient dense foods within an individual's caloric needs. After all basic nutrition needs are met with these nutrient dense foods any calories "left over" for the day are considered "discretionary." These so-called discretionary calories may be used in any way an individual chooses. This might be to add more butter or oil for cooking or to add some sugars to their foods. Depending upon your activity level and basic metabolic needs you will have different amounts of discretionary calories available to you while still maintaining a healthy body weight. The new dietary guidelines suggest that consumers choose and prepare foods and beverages with only those added sugars or caloric sweeteners that fit into the individual's discretionary calorie allowance.

7. What are the common sources of fructose?

Ans: Fructose, or fruit sugar, is a simple monosaccharide found in many foods and fruits. It is one of the three important dietary monosaccharides, along with glucose and galactose. It is part of the chemical structure of sucrose, or table sugar. Some common sources of fructose are cola or lemon lime juice, ginger ale, raisins, fruits like apple and pear, molasses etc. In addition to limiting added sugars, those with triglycerides outside the normal range should limit fructose consumption to 50-100 grams per day, because fructose raises triglycerides.

8. Do sugars cause high triglycerides?

Ans: Added sugars intake does appear to be connected with increased triglyceride levels, a known risk factor for developing heart disease. Eating added sugars often means a person is consuming less fiber. This is important because increasing fiber in the diet is associated with decreasing energy intake (calories), which can result in weight loss. For those who are at a greater than ideal body weight, weight loss is an important therapy for lowering triglycerides. Fructose is metabolized differently than other sugars such as glucose. Because it may raise triglycerides, its use should be limited if levels are outside the normal range.

9. What is lactose intolerance?

Ans: Lactose intolerance is a clinical syndrome generally seen in children above 6 years of age in which the milk protein i.e. lactose is only partially digested, or is not hydrolyzed at all. If there is a deficiency of lactase, some lactose remains in the lumen of the small intestine which tends to draw fluid into the lumen by osmosis. This fluid produces abdominal distention and cramps. From the small intestine, the lactose passes into the large intestine (colon) where it undergoes anaerobic bacterial fermentation to lactic acid and other short-chain acids. The increase in the concentration of molecules due to the same increases the osmolality resulting in still greater retention of fluid. In addition, the acidic products of fermentation lower the pH and irritate the lining of the colon, leading to an increased movement of the contents. The gaseous products of fermentation also cause bloating and cramping.

10. What are the different ways to overcome the lactase deficiency in body?

Ans: There are two ways to overcome the effects of lactase deficiency. One is to remove the lactose by fermentation for example by producing yogurt and buttermilk products. Another is to produce reduced-lactose milk by adding lactase to it. However, both products of hydrolysis,

D-glucose and D-galactose, are sweeter than lactose, and at about 80% hydrolysis, the taste change becomes too evident. Therefore, most reduced-lactose, milk has the lactose reduced as close as possible to the 70% government-mandated limit for a claim.