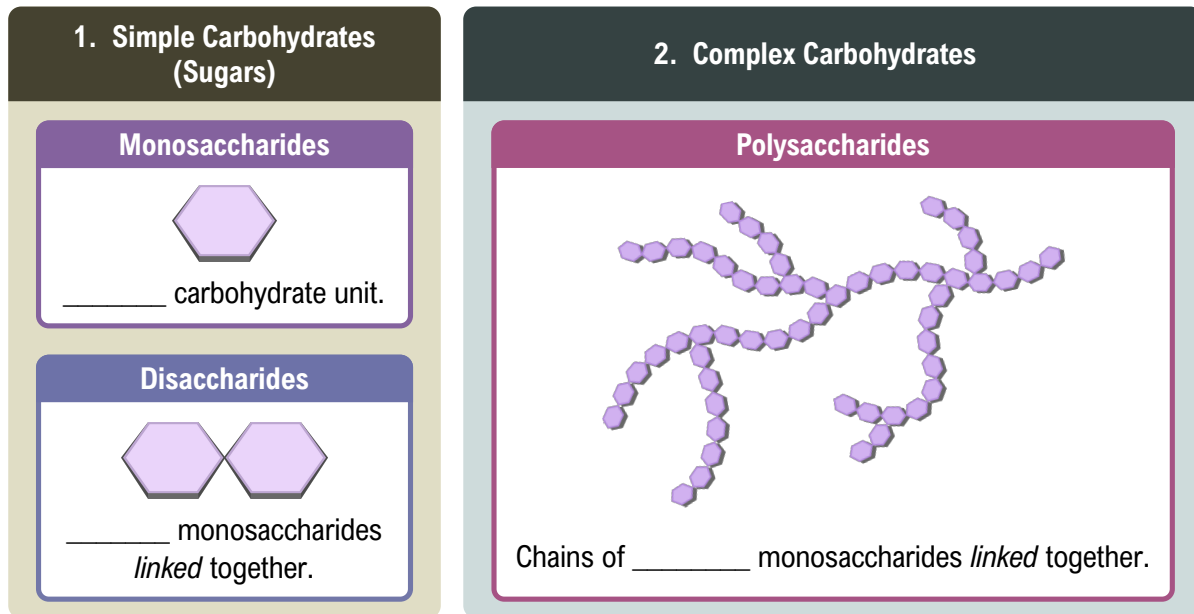


TOPIC: SIMPLE VS COMPLEX CARBOHYDRATES

Types of Carbohydrates

◆ Carbohydrates can be split broadly into ____ structural groups:



Note: To be absorbed most effectively, carbs must be digested into _____ saccharides.

EXAMPLE

The technical term for table sugar is sucrose, & it consists of two sugar units bonded together. Therefore, sucrose is a _____.

- | | |
|--------------------|--------------------------|
| a) Monosaccharide. | c) Polysaccharide. |
| b) Disaccharide. | d) Complex carbohydrate. |

PRACTICE

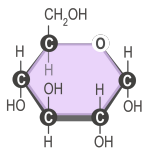
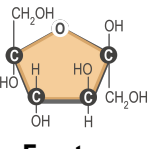
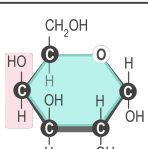
Which of the following statements correctly differentiates simple and complex carbohydrates?

- a) Simple carbohydrates consist only of monosaccharides, while complex carbohydrates consist only of polysaccharides.
- b) A disaccharide, despite being composed of two monosaccharides, is still considered a simple carbohydrate because it is structurally and functionally more similar to monosaccharides than polysaccharides.
- c) All polysaccharides are digestible forms of carbohydrates, whereas all simple carbohydrates are rapidly absorbed and used for immediate energy.
- d) Complex carbohydrates, due to their long chains, are always preferred by our body cells as an energy source.

TOPIC: SIMPLE VS COMPLEX CARBOHYDRATES

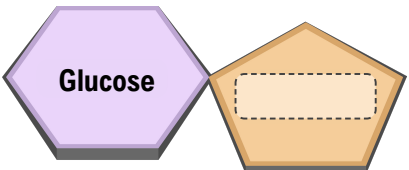

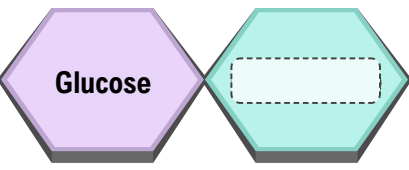

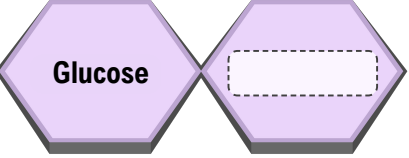

Simple Carbohydrates: Monosaccharides

◆ The 3 most common monosaccharides in our diet are _____, fructose, & galactose:

Monosaccharide	Common Sources	Role in the Body	Other Features
 <p>Glucose</p>	Fruits, honey, starch-rich foods (rice, bread etc.)	_____ energy source	Important for cellular respiration, stored as glycogen in liver & muscle
 <p>Fructose "Fruit sugar"</p>	_____, honey, candy	Energy, usually converted to glucose or fat	Sweetest carbohydrate, used to add sweetness to foods
 <p>Galactose</p>	Dairy products, some legumes	Energy, usually converted to glucose or fat	Usually consumed as part of lactose (a disaccharide)

Simple Carbohydrates: Disaccharides

◆ The 3 most common disaccharides in our diet are sucrose, lactose & maltose.

Disaccharide	Composition	Common Sources	Role in the Body	Other Features
<p>Sucrose "Table sugar"</p>		 <p>Table sugar, honey, fruit</p>	Provides quick energy	Provides sweetness in the diet
<p>Lactose "Milk Sugar"</p>		 <p>Milk, dairy products</p>	Provides energy, especially for infants	Found in mammalian milk, some people are lactose-intolerant
<p>Maltose "Malt sugar"</p>		 <p>Beer, cereals, bread, sweet potatoes</p>	Intermediate in starch digestion, provides glucose when broken down	Less sweet than sucrose

TOPIC: SIMPLE VS COMPLEX CARBOHYDRATES

EXAMPLE

A lactose intolerant person does not produce enough of the enzyme lactase. What is the role of lactase?

- a) It helps break the bond between 2 glucose molecules.
- b) It helps break the bond between a glucose molecule & a galactose molecule.
- c) It helps break the bond between glucose & fructose.
- d) It helps break down polysaccharides into disaccharides, such as lactose.

PRACTICE

Which of the following is a simple carbohydrate?

- | | |
|---------------|------------------|
| a) Lactose. | c) Fructose. |
| b) Galactose. | d) All of these. |

PRACTICE

_____ is the most important monosaccharide for humans, as red blood cells & nervous tissues rely on it for energy. When 2 of these molecules bond together they form _____, which is found in honey, sweet potatoes, beer, & grain-based foods.

- | | |
|----------------------|-----------------------|
| a) Glucose; maltose. | c) Glucose; sucrose. |
| b) Sucrose; maltose. | d) Fructose; sucrose. |

PRACTICE

Which of the following carbohydrates is a direct product of photosynthesis?

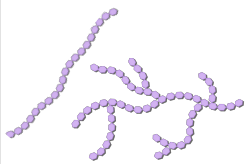

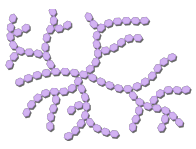
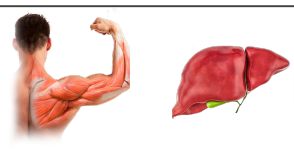
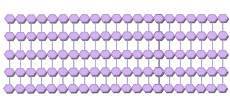

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|-----------------|-------------|----------------------|
| a) Glycogen. | c) Lactose. | e) CO ₂ . |
| b) Chlorophyll. | d) Glucose. | f) H ₂ O. |

TOPIC: SIMPLE VS COMPLEX CARBOHYDRATES

Complex Carbohydrates: Polysaccharides

◆ There are _____ different polysaccharides that you should be familiar with:

1. **Starch:** storage form of glucose in _____.
2. **Glycogen:** storage form of glucose in _____.
3. **Fiber:** a group of _____-digestible compounds with health benefits; most are plant-based polysaccharides.

Polysaccharide	Function	Common Sources	Role in the Body	Other Features
 Starch	Energy storage in <i>plants</i> .	 Potatoes, rice, wheat, corn, legumes.	Provides slow-release energy.	Amylose is _____. Amylopectin is <i>branched</i> .
 Glycogen	Energy storage in <i>animals</i> .	_____ in diet because it breaks down as soon as the animal dies.	 Glucose stored as glycogen in skeletal muscle & liver.	Highly branched structure for rapid glucose release when the body requires energy.
 Fiber	Structural components in plants.	 Fruits, vegetable, whole grains, legumes, nuts, seeds.	Promotes bowel health along with many other health benefits.	Humans cannot digest fiber because we _____ the enzymes to break them down.

EXAMPLE

Starch & fiber are both important types of carbohydrates in the human diet. However, glycogen is typically not a major part of the human diet. Which of the following answer options gives the best explanation why?

- a) Glycogen cannot be digested by the human gastrointestinal tract.
- b) Glycogen occurs naturally in certain animal tissues. However, it breaks down quickly when the animal dies.
- c) As soon as glycogen enters the digestive system, enzymes & bacteria convert it into starch.
- d) Only humans produce glycogen naturally, so there are no food sources that contain it.

PRACTICE

Why is the human digestive system able to break down starch, but not fiber?

- a) Fiber is a complex polysaccharide, whereas starch is a simple carbohydrate.
- b) The bonds between saccharides in fiber are different to the bonds between saccharides in starch.
- c) Fiber has a branched structure & starch does not, making it harder for enzymes to bind to it.
- d) Starch always has a branched structure, while fiber always consists of straight chains of saccharides.