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Chemical Reactions in Digestion And Metabolism



Welcome to the fascinating world of digestion and metabolism, where chemical reactions orchestrate the energy and nutrients needed to keep living organisms thriving. In this reading passage, we'll explore how the body's digestive system breaks down food into essential components and how metabolism uses these components to fuel the body's activities. Get ready for a captivating journey into the chemistry of life!

The Digestive System: A Culinary Adventure

Imagine you're about to enjoy a delicious meal. From the moment you take your first bite, a symphony of chemical reactions begins in your body to transform that food into energy and nutrients.

Mouth and Salivary Glands

It all starts in your mouth, where your teeth grind food into smaller pieces, and your salivary glands release saliva. Saliva contains enzymes like amylase, which break down carbohydrates (starches) into simpler sugars.

Stomach and Gastric Juices

Next, your partially digested food enters your stomach. Here, gastric juices, which include hydrochloric acid and pepsin, play a crucial role. They create an acidic environment that helps break down proteins into amino acids and continue the digestion of carbohydrates.

Small Intestine and Enzymatic Magic

The real magic happens in your small intestine, where most nutrient absorption takes place. Your pancreas releases digestive enzymes like lipase (for fats), protease (for proteins), and amylase (for carbohydrates) to ensure every type of nutrient is broken down into its simplest form.

Absorption and Nutrient Transport

Once nutrients are broken down, they are absorbed into the bloodstream through the walls of the small intestine. From there, they are transported to cells throughout the body, providing energy and building blocks for growth and repair.



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Metabolism: The Body's Energy Manager

With nutrients in hand, metabolism takes center stage. It's the sum of all the chemical reactions happening inside your body to maintain life. Metabolism can be divided into two phases:

- **Anabolism:** These are the building-up reactions that use energy to create complex molecules. For example, anabolic reactions build muscle tissue and bone.
- **Catabolism:** These are the breaking-down reactions that release energy by breaking complex molecules into simpler ones. For instance, catabolic reactions break down carbohydrates, fats, and proteins to provide energy.

The Role of ATP

The key player in metabolism is adenosine triphosphate (ATP), a molecule that stores and transfers energy within cells. When your body needs energy, ATP releases it, powering various cellular processes.

The Importance of Balance

Maintaining a balance between anabolism and catabolism is crucial for overall health. Anabolism ensures you have the building blocks needed for growth and repair, while catabolism provides the energy required for daily activities.

Regulation by Hormones

Your body regulates metabolism through hormones. For example, insulin helps cells absorb glucose, while thyroid hormones control the rate of metabolism.

