

# What happens to the sugar that we eat?

**Fig. 1**

## Learning Intentions

- I can explain how the body metabolizes carbohydrates and protein.
- I can explain how the body stores fuel for future use
- I can apply my understanding to new situations
- I can investigate a question through inquiry.

## Metabolism

Metabolism: refers to all chemical reactions that occur within the cells of the body.

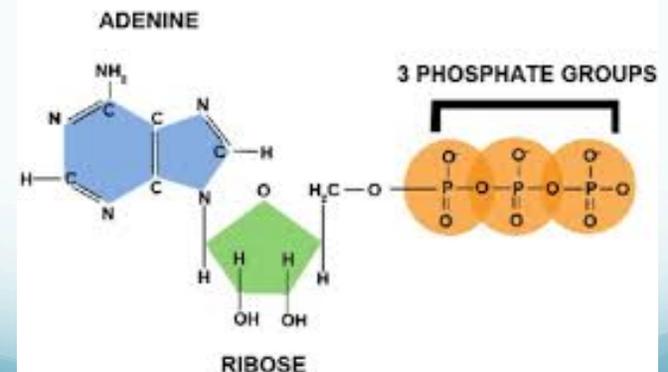
Two Major Categories:

1. Anabolic Pathways: involved in the synthesis of compounds and require energy
2. Catabolic Pathways: release energy

Healthy Adult, the rates of anabolism and catabolism should be balanced.

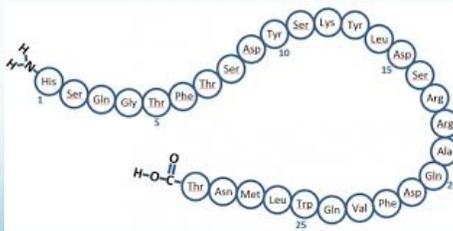
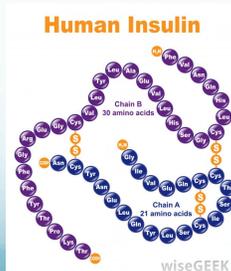
## Energy

### An ATP Molecule



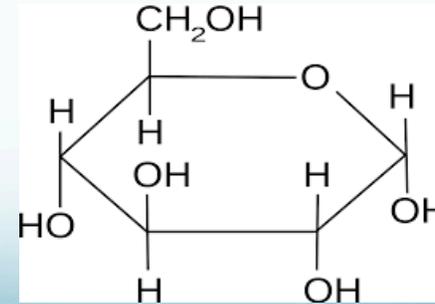
# Hormones

- Anabolic Hormones (build fuel stores)
  - Ex. insulin
- Catabolic Hormones (breakdown stores)
  - Ex. Glucagon



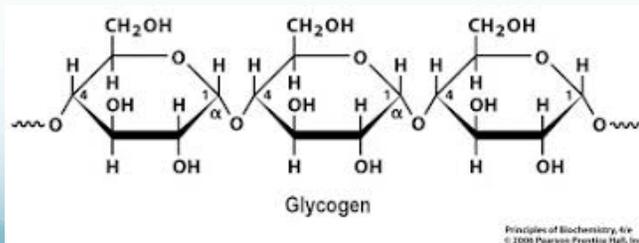
# Carbohydrates

- Glucose is metabolized by the body to produce energy. These processes are called **glycolysis** and **citric acid cycle**.



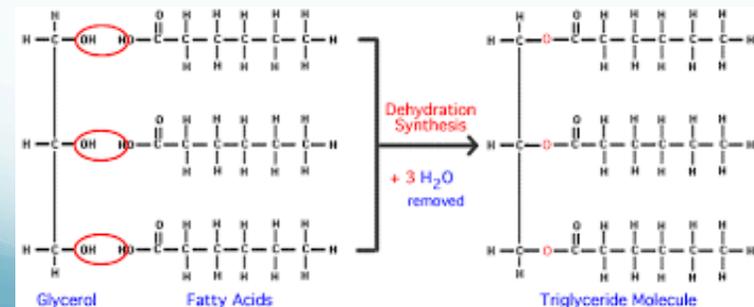
# What happens to “extra” Carbohydrates?

- Excess glucose can be stored as **glycogen** in the liver and skeletal muscle. Once these stores are “full”, additional glucose can be transformed into **fatty acids** and **glycerol** and stored as **triglycerides** in the adipose tissues.



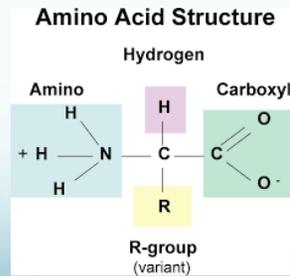
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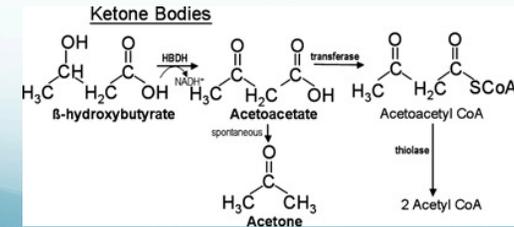
# Proteins

- **Amino Acids** are predominantly used for protein synthesis
- Excess circulating amino acids, converted to **glucose** or **fatty acids**, stored as **triglycerides**.



# What happen when we don't get enough fuel?

- During prolonged fasting, proteins are broken down to amino acids and converted to **ketones** to provide energy for the brain.
- Ketones are produced by the liver during starvation They are released into the blood and can be used for energy by other tissues, more importantly the brain.
- Ketones are the body's back up plan!



# Important Concept

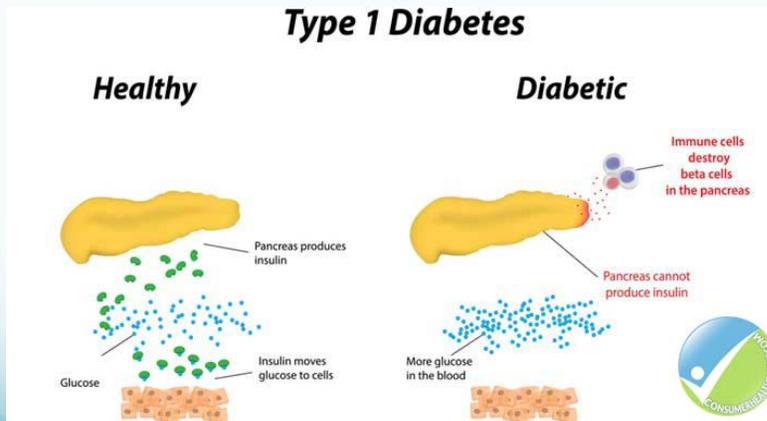
- When you eat, you use that energy immediately and store the rest for later.
- Later, when you are fasting, you use the stored energy.

# Root Words

- Glycogenesis: **Making** glycogen from glucose for storage
- Glycogenolysis: **breaking** down glycogen to use for energy

# Type 1 Diabetes

## Type 1 Diabetes



# TED x

- <https://www.youtube.com/watch?v=WlebxoTx408>

During this Tedx: please think about;

1. Why is it important to understand how food is metabolized?
2. What diseases does metabolism impact?

# Take Away Tasks

- Project: you are what you eat.
  - Due, Tuesday, October 3<sup>rd</sup>