Source: KBBiologyMasterIndex

1 | **Carbohydrates**

Glucose, Cellulose, Lactose, etc. etc.

Structures

- Carbs have **6 carbons.**
- Carbon chain with Hydrogen and Hydroxide
- Dissolves well in water because of the slightly positive hydrogen and the slightly negative OH

  So, if you see a hexagon carbon ring, you are probably looking at a carbohydrate

#disorganized

- Could be monomers or polymer
- Almost all monomers of sugars are of each other a isomer
- Adding different monomers creates an intricate structure called “polymers”

Sucrose — Common Sugar (Disachoride of Glucose + Fructose)

Lactose — the thing in milk (Disachoride of Glucose + Galactose)

Celloblose — The thing we can’t digest (Disachoride fo Glucose + Glucose)

- Creating a polymer (“dehydration”)
  - Take monomers
  - Remove water molecules
  - Fill the now-gaping hole with the next monomers
- Breaking a polymer (“rehydration”)
  - Take polymers
  - Add water
  - Get Glucose
  - Profit!

Hence, you get thirsty after around 45mins whenever you eat lots of sugar — ye gotta get that water to rehydrate and break down those polymers.

And now, energy?

- Enthalpy
  - To do a reaction, a system needs to break some bonds and form new bonds
  - Break all of the bonds. Breaking bonds require energy (high heat states called “transition phrase”)
  - Form new bonds
  - End up with product — either cause negative pre-post reaction potential energy difference (exothermic — release heat) or positive pre-post reaction potential energy (endothermic — take in heat)

Definition 1 · **Enthalpy Equation** $\Delta H_{rxn} = \sum \Delta H_{breaking} + \sum \Delta H_{Forming}$
"The heat difference after a reaction is equal to the heat needed to break bonds and the head used to form bonds. Both values could be negative."

- Extotheric reactions are favorable => they give out energy instead of needing it

With a positive delta H, you have an endothemic reaction. With an negative delta H, you have an extothermic reaction.

- You could add even more monosachrides up to get polysacharides (starch, fiber, glycogen)
- We get energy for lots of glucose (whose polysacharide is starch), but we can't get any from cellulose (whose polysacratide is fiber)
- We eat fiber to maintain gut health + poop goodly. Cellulose is hydrophillic, meaning that fiber makes your guts lubricated.

Polysaccharides linked together by glycosidic bonds.

So. Whichever carbohydrates you are using, you get energy from breaking its bonds.

Types of Carbs('s external structures)

Although all the

Starch

- 6 Carb Spiral that folds onto it self
- Take Glucode and daisy-chain them
- Plants use it!

Fiber

- 6 Carb chain
- Takes cellulose

Glycogen

- Used to store energy by humans
    - Bonded nature cause it not be detected as glucose + efficient
    - When bonds are cut, they become glucose

Uses of Carbs

- Mitocondria
    - Actually not strictly part of a cell!
    - Another organism (technically an organelle)
        - Could move
        - Could replicate
    - Breaks down stored carbs (glycogen) into glucose and then eventually smaller elements

- Cell tagging
    - As an authentication systems
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The Carbs Debate

- Fructose worse? Better? No difference?
- Experiments differ
    - Generally found no differences
    - Some found fructose to be a bit more obesity causing