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What are Macros?

What are macronutrients and what are their functions?

"Macro" is another term for macronutrients, which include three key nutrients (carbohydrates, proteins, and fats). They are found in foods and beverages and help to provide energy and are involved in building & repairing tissues.[1]

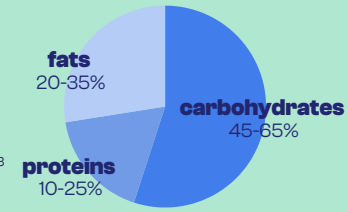
Why are they called macros or macronutrients?

Macronutrients get their name because we need these particular nutrients in large (macro) gram amounts.[1]

Energy (Calories) Provided by Macronutrients[2]

CARBOHYDRATES - 4 calories per gram
PROTEIN - 4 calories per gram
FAT - 9 calories per gram

The National Academy of Science's Acceptable Macronutrient Distribution Range (AMDR)[3]



CARBOHYDRATES

COMPOSITION

Composed of units of glucose (sugar) in structures with varying levels of complexity.
- includes simple sugar, starch, & fiber [4,5]

TYPES

Structure complexity determines how quickly they are digested and the speed at which we obtain energy from them (in the form of glucose released into the blood)
- **SIMPLE carbohydrates** - quick acceleration (& decline) of glucose (energy) into the body
- **COMPLEX carbohydrates** - slower, steady release of glucose (energy) over time) [4,5]

FUNCTIONS

- Provides energy
  - Broken down to glucose - primary source of fuel for the body
- Spares protein & fat
  - Carbohydrates used as fuel first before protein and fat (sparing them for other functions)
- Regulates metabolism
  - Breakdown of fat and cholesterol for use
  - Complex carbohydrates help control blood glucose levels & insulin release.
- Promotes digestive health
  - Dietary fiber adds bulk to the stool & promotes GI tract motility & bowl movement regularity. [4,5]

FOOD SOURCES

breads, pastas, vegetables, and fruits[5]

PROTEINS

COMPOSITION

Composed of chains of amino acids in various sequences
- Specific sequence determines protein function

20 amino acids
- 9 essential amino acids (must come from diet)
- 11 non-essential amino acids (can be made in the body) [6]

TYPES

Sources vary in quality depending on the ease of digestibility and whether they provide all the essential amino acids needed in the correct ratio.
- **LOWER Quality Protein** - Considered "incomplete" proteins because they lack one or more of the essential amino acids needed
- **HIGHER Quality Protein** - Considered "complete" proteins because they contain all the essential amino acids (and are usually easier to digest & absorb) [7,8]

FUNCTIONS

- Major functional and structural component of all cells in the body
- Act as building blocks to:
  - Build & repair muscles & tissues
  - Create enzymes & other facilitators that promote normal body functions [9]

FOOD SOURCES

animal sources (meat, eggs, & milk) or plant sources (soy, nuts, legumes) [9]

FATS

COMPOSITION

Consist of chains of fatty acids bound together by glycerol
- Type of fat is determined by length of fatty acid chain and level of saturation.[10]

TYPES

UNSATURATED fat (mono- and poly-unsaturated)
- Liquid at room temperature
- Positive health impacts (lowers LDL (bad) & raises HDL (good) cholesterol)

SATURATED fat
- Solid at room temperature
- Negative health impacts (raises LDL & total cholesterol) [10,11]

FUNCTIONS

- Insulates body to keep warm
- Allows absorption of fat-soluble vitamins (A, D, E, K)
- Promotes healthy skin and hair
- Major energy (calorie) source
- Provides essential fatty acids (ALA, EPA, & DHA)
  - Can't be produced in the body so must be provided by food [11]

FOOD SOURCES

fatty meats / fishes, nuts / seeds, oil, dairy / butter [10]

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