

Macronutrients again are:

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Macronutrients provide: Building Materials and Energy

Joules - ? nobody really cares

calorie – a small calorie – the amount of heat needed to raise the temperature of 1 gram (1cc) of water, one degree centigrade.

C or Kcal = 1000 small calories

Values for calories of a gram of the following substances: (Rounded to the nearest whole number)

C value of water - 0

C value of carbohydrates - 4

C value of proteins - 4

C value of lipids - 9

C value of vitamins - 0

C value of minerals - 0

C value of alcohol – 7

Empty calorie – foods such as processed food that provide little more nutritional value other than calories.

Abbreviations of note

National Academy of Science (NAS) – Organization of members of the scientific community that will work on specific projects for Uncle Sam.

Institute of Medicine (IOM) – That division of the NAS that deals with health issues.

Food and Nutrition Board (FNB) That part of the IOM that specifically deals with nutritional requirements

RDA – Stands for recommended dietary allowance and was designed by the FNB.

FDA – Food and drug administration

USRDA – United States recommended daily allowance and was designed by the FDA

Exact purpose of the RDA – Keep American citizens in WWII healthy enough to supply war materials to the rest of the world.

What was the RDA not intended for: It was never intended as a guideline for healing/treating sick people.

FNB – Make the rules

FDA – Cops that enforce the rules.

What does DRI stand for and who put them out? Stands for Daily Reference Intake and it comes from the national academy of science (NAS). This is the new version of the older RDA.

How where the DRI's calculated? Take the four pieces of information:

1. Take the old RDA
2. The estimated average daily requirement for everybody – for all age groups
3. The adequate intake – the lowest amount you can give the majority of the population without them getting sick.
4. The tolerable upper limits – the highest amount you can give without them getting sick

What does DRI stand for and replace: Daily reference intake and replaced the old RDA.

Estimated Safe and Adequate Daily Dietary Intakes (ESADDI):

Things that are plentiful in a normal diet but are required:

1. Biotin
2. Pantothenic Acid
3. Copper
4. Manganese
5. Fluoride
6. Chromium
7. Molybdenum

Nursery Rhyme for B vitamins

B1 – Thiamine (because it contains sulfur)

B2 – Riboflavin (as in ribose sugar, flavin as in yellow, it's a milk sugar that is yellow)

B3 – Niacin (nicotinic acid for everyone else in the world)

B5 – Pantothenic Acid (pan means everywhere – you find this everywhere in nature)

B6 – Pyridoxine (comes from a very flammable substance)

B7 – Biotin (life) – when they first discovered it, they thought it was the silver bullet)

B9 – Folic Acid (folium as in leaf, it was isolated from a spinach leaf)

B12 – Cobalamin (There's a molecule of cobalt in each one)

RDI – stands for Reference daily intake

DRV's – stands for Daily Recommended Values and it's for adults

Based on a 2000 calorie diet

Total Fats – should not exceed 30% of diet, 65 grams, 600 calories

Saturated Fats – no more than 10% of intake, 20 grams, 200 calories

Cholesterol – A maximum of 300 milligrams

Carbohydrates – At least 60% of diet, 300 grams, or 1200 calories

Protein – 10% of diet 50 grams, 200 calories

Fiber – at least 25 grams

Sodium – maximum of 2400 milligrams

Potassium – maximum of 3500 milligrams

DV – stands for Daily Value. A combination of the new RDI's and DRV's and are the basis of the values seen on food labels. Based on the needs of a 2000C diet (most of the time).

The new food pyramid still sucks.

Two nutritional facts that are often overlooked:

- The less calories you consume, the less essential nutrients you need. Most micronutrients are used to process incoming macronutrients. (Calories are poisonous in large numbers.)
- There is a difference between optimal or maintenance dose and therapeutic dose.
 - Optimal – what you need to keep you healthy
 - Therapeutic – using a vitamin pill as medicine. Amount of nutrition needed when it is used to cure a disease.
 - Vitamin A for vision problems or acne is taken in much larger doses than needed in normal person.
 - Need to be used cautiously. Vitamin A from an animal source, for example, will toast your liver.

Other facts that are often overlooked:

- All the above values are probably way too low

- All of the values for food are probably way to high (our soil it terrible so food isn't as good as it should be.

Metric conversions (Know the following)

1 ounce – 28 grams

1 pound - .45 kilograms

1 tablespoon

Cup - glass - 8 ounces

pint

quart = 32 ounces = 0.95 liters

gallon

Other Computations from extra sheet

Protein

Protein was the first substance – to be recognized as a vital part of living tissue.

The word protein is of Greek origin and means – of first importance

The function of protein is very similar in both the animal and plant world., it is rigid three dimensional structure that is important in the formation of biologically active chemicals.

Aobu thalf the protein in our body is tied up in enzymes.

Molecular weight of water is 18

Molecular weight of Sucrose is 342

Molecular weight of some proteins can be over a million.

The lightest protein is around 5000.

Which have been omitted from our original list of 22 and why – the baby essential amino acids.

(The CAT - Carnitene, Arginine, and the first T is Taurine)

1. Alanine
2. Arginine - B
3. Asparagine
4. Aspartic Acid
5. Carnithine -B
6. Cysteine
7. Glutamic Acid
8. Glutamine
9. Glycine
10. Histadine - E
11. Isoleucine - E
12. Leucine -E
13. Lysine - E
14. Methionine - E
15. Phenylalanine - E
16. Proline
17. Serine
18. Taurine - B

- 19. Threonine - E
- 20. Tryptophan - E
- 21. Tyrosine
- 22. Valine - E

Drop Carnitene and Taurine

Amino Acid is comprised of a “amine” group (NH₂) and a Carboxyl group making it an acid COOH and it's own particular “R” that give it it's identity

There are at least 45 amino acids, in nature.

There are 10,000 or so proteins in the human body

Peptide bond – a bond between two amino acids.

Peptide – Two amino acids chemically combined or joined together. (Most neurotransmitters)

Polypeptide – 3 and and up to 49 amino acids

Protein – 50 or more amino acids stuck together.

How big can a protein get? Most proteins of importance fall between 300 – 5000 amino acids. (there's a lot of variation on this)

Hydrolysis – water breaking. Breaking of a chemical bond by the action of an enzyme and a molecule of water. All digestion is a process of hydrolysis

Condensation reaction – Putting smaller molecules back together to a bigger molecule, with the return of a water molecule back to the environment. This applies to lipids, proteins, carbohydrates.

We do not store proteins in the same way we store fat and to a lesser extent, carbs.

Amino acid pool – Refers to the amino acids in circulation in the blood and the ones in the cells that are available for use by the body.

Our RNA/DNA is not made of AA's. They are made of Nucleic acids and protein. While we are on the subject:

Simple protein: composed entirely of amino acids

Conjugated protein: composed of amino acids that are attached to other molecules as well.

Examples of Conjugated proteins:

- Mucoproteins/Glycoproteins – a carbohydrate containing protein molecule
- Lipoprotein – cholesterol for example a combination of a lipid and protein
- Metalloprotein – hemoglobin, a protein with a metal
- Derived or(Denatured protein - heated)– a protein you have done something to to change it's shape.

Proteins like carbs and lipids contain the three basic

- Carbon
- Hydrogen
- Oxygen

Also contain 16% nitrogen (the amine group)

Can Also contain:

- P – phosphorus
- Fe – Iron
- Co – Cobalt
- S – Sulfur (a large number of the essential amino acids contain sulfur)

Nitrogen balance – if you are taking in more nitrogen than you are excreting you are building tissue, if you excrete more than you take in you have wasting of tissue. A day to day thing

Nitrogen cycle – from beginning to end.

Plants make protein from nitrates and ammonia obtained from the soil

Animals get them from plants or other animals

When an animal excretes or dies it gets returned to the soil. Thus the name nitrogen cycle.

Legumes – unique because they get nitrogen from the air by the action of bacteria that live on the roots. Their seeds are high in protein but relatively low in carbs.

Difference between a legume and a grain – legume is a bean, cereal is a grain.

Essential AA's content of Legumes and grains - Legumes are closer to animal proteins than are grain.

Complete protein – a protein that contains all of the 9 essential amino acids.

Incomplete protein – a protein that does not contain all of the 9 essential amino acids.

High-quality protein – AKA Complete Protein? - Contains 9 essential amino acids in a ratio that is equal to that found in the human body.

Low-quality protein – AKA Incomplete Protein? The amino acids are not in the ratios found in the human body.

These terms are not quite interchangeable, but most of the time they are.

The Chicken egg is the basic standard against which protein foods are gauged – the amino acid in a chicken egg is in the same proportion as in humans.

The only plant protein which is a complete protein – soybean.

Animal protein – always is a complete protein

Plant protein – with the exception of soybean, is it incomplete

Limiting Protein – The Essential AA that is used up first.

Food combining – eating two or more incomplete proteins that together will furnish all the needed essential acids.

Gelatin and the essential AA tryptophan – the only animal source protein that is incomplete. It is short tryptophan. (the acid in the rendering process destroys the tryptophan)

There are good AA's and bad AA's. A bad one is homocystein which is a product that may be produced when AA's are metabolized. What is the problem with this guy? Heart disease. It used to be that elevated levels of homocystein were the bio marker of heart disease. It was replaced by elevated levels of cholesterol. It's coming back into vogue again. (Almost every brand of vitamins has something that will lower levels of homocystein. - You can muscle test this one if you've got a vial of homocystein)

How much protein is need in the diet.

0.79 grams of protein for every kilogram of body weight which equal 0.36 grams for every pound of body weight.

This works out to about 60 grams of protein a day for the mythical 150 pound man.

The three servings from the food pyramid easily exceeds this.

Who needs more?

Infants are making new tissue rapidly

Teens are having their growth spurt and developing sexually

Pregnant and nursing women – duh!

What is the requirement in individual EAA's in an adult – see chart

How much protein is found in a gram of food – see chart

Terminology:

- Free Form AA's – supplements that contain individual molecules of AA's – true supplementation
- Protein powder – simple dehydrated protein. It may have some free form AA's but it is not worth much for supplementing individual AA's
- “L” vs “D” form of AA's - “L” levo – means left, “D” dextro stands for right. Sometimes this refers to the way it bends the light, or sometimes it is described as the twist of the AA. Only the

“L” form has any value to you. The “L” form is the only amino acids found in the body. The “D” form is not neutral, it is unhealthy.(Carcinogenic)