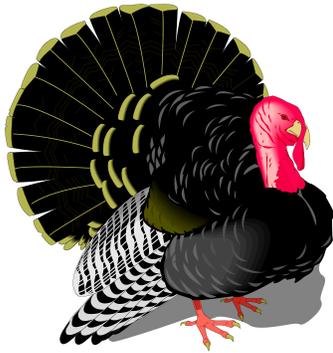


Chapter 4

Protein

Proteins are Complex Structures



Protein is the group name to designate the principal **nitrogen constituents of the protoplasm of all plant and animal tissues**. Proteins are **necessary for tissue syntheses and regulation** of certain bodily functions.



However, to say that proteins are more important than other nutrients is not appropriate. An **inadequate dietary supply or interference of any nutrient** in the body can have serious consequence

Proteins are **complex structures** made up of **amino acids**. The type of amino acids vary with each protein. However, **nitrogen is always present**. **Carbohydrates and fats** do not contain nitrogen.

Availability Of Protein

The American diet, generally, is well supplied with **animal (meat) proteins** and amino acids are in generous quantity. But, many conditions can **alter the amounts and availability** of individual amino acids. **Illness, stress, extreme cooking procedure**, etc. all affect foods **before** they are eaten. On average, the American is a good eater of proteins. However, this does not take into account the **very young** -- who may not be able to eat enough protein or, -- **senior citizens** who may not be able to purchase enough protein because of costs.

“But Can I Afford It?”

All foods provide different **amounts, types and combinations** of amino acids.



An **everyday** diet of **meat, milk and eggs** provides a high yield of **essential amino acids**. But, is this really practical? Can most individuals afford meat, milk and eggs everyday? How many simply don't like eating meat, milk and eggs every day? Meat is one of the the **most expensive** single items in the food store.

Other Sources of Protein

In cereals, millets and similar grains, **Lysine** and **Threonine** are the "**limiting**" amino acids. This means they exist in **smaller** quantities and **not** in **proper balance**. **Corn** is *deficient* in **Tryptophan**. **Legume** products are *deficient* in **sulfur amino acids** and **Tryptophan**. **Nuts** and **oil seeds** as well as **soybean proteins** are *poor* in **Methionine**. **Sunflower** seeds *lack* **Lysine**.

Peanut proteins (supposed to be one of the most complete foods) are *deficient* in **Lysine**, **Methionine** and **Threonine**. **Green peas** are a *poor* source of **Methionine**. **Green leafy vegetables** are a *good source* of proteins except for **Methionine**.

The "Official" View

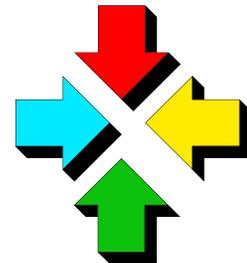
Experts like to say, "*It doesn't really matter.*" They claim that when you eat a balanced diet of everything -- you'll probably get enough amino acids somewhere in that diet. But, the authorities are talking about the **average sedentary individual** -- not a person embarking on an exercise program with **personal individual habits, pocketbooks, likes** and **dislikes**. It is reasonable to suggest that individuals may have **amino acid deficiencies** that are difficult to identify.



Limiting Amino Acids

The term "**essential**" refers to a specific nutrient that the body is not capable of producing, but does require. If the essential nutrient is not supplied through diet or supplementation, a **deficiency** for that particular **nutrient** may occur.

As with **protein synthesis**, if one amino acid is supplied in a smaller amount than necessary (i.e., incomplete proteins or low-quality protein), then, the total amount of protein which can be synthesized from other amino acids will be **limited**. When this occurs, body protein-synthesis is restricted. If one essential amino acid is completely absent, however, the other amino acids **can not be utilized** and are therefore, **wasted** by the body.



It's All or Nothing

The human works on the "all or nothing" principal in protein synthesis. Only **complete proteins**, as opposed to **partial proteins**, can be utilized.

The same situation can occur when an **essential amino acid** is destroyed as the result of heating protein to extreme temperatures. In this case, all of the other amino acids in the protein become **limited**. This is referred to as the "**limiting factor**" of a protein. For example, cooking egg whites may result in a limited protein.

"What if I'm a Vegetarian?"

For years, researchers concluded that **vegetarians** could easily become protein deficient unless each meal provided a **balance** of **amino acids**. Current studies continue to indicate that the body must receive sufficient amounts of the **essential amino acids** in order to sustain life.



It is now known that protein requirements in vegetarian diets can safely be obtained through a combination of **complimentary plant proteins** that work synergistically to produce the **necessary amino acid balance**.

There is much confusion and discussion throughout the research world about supplements of protein and amino acids.

The final judge, however, is **you**. When you gain the results you wish from a protein or amino acid supplement -- no amount of authoritative research writing is going to change your mind.