Proteins
Proteins – an overview

• The term protein was first suggested by Berzelius to describe the complex organic nitrogenous substances found in animal and plant tissue.

• Proteins are essential nutrients for the human body. They are one of the building blocks of body tissue, and can also serve as a fuel source.
Protein a macronutrient

- Protein is a macronutrient that is essential for providing energy as well as building, maintaining and replacing muscle tissue.

- It is made of building blocks called **amino acids**. Our body needs **22** types of **essential amino acids** in order to function properly.

- It can make **13** of them, but the other **nine** must be obtained from foods to stay healthy.
Nine essential amino acids

• There are nine essential amino acids

• Which humans must obtain from their diet in order to prevent protein-energy malnutrition. They are:

1. Phenylalanine
2. Valine
3. Threonine
4. Tryptophan
5. Methionine
6. Leucine
7. Isoleucine
8. Lysine and
9. Histidine
Types of proteins

• There are two main types of protein

➢ Complete Protein – animal source

➢ Incomplete Protein – plant source - combine two incomplete protein food choices in order to get all of the essential amino acids.

There are some plant-based foods, including quinoa and soy, that are complete proteins.
Complete Proteins
Incomplete Proteins
There are many excellent sources of Vegan Protein

- Peas
- Sun Dried Tomatoes
- Nondairy Milks
- Tofu
- Tempeh
- Dark Leafy Greens
- Hemp
- Sesame
- Sunflower
- Flax
- Pumpkin
- Chia
- Edamame
- All Nuts & Nut Butters
- Seitan
- Quinoa

And so very many more!
### Protein content of some important foods

<table>
<thead>
<tr>
<th>Foods</th>
<th>Protein (g/100g)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cereals</td>
<td>6 - 14</td>
</tr>
<tr>
<td>Legumes</td>
<td>18 - 24</td>
</tr>
<tr>
<td>Soybean</td>
<td>43</td>
</tr>
<tr>
<td>Nuts and oilseeds</td>
<td>18 - 40</td>
</tr>
<tr>
<td>Oilseed meals</td>
<td>45 - 55</td>
</tr>
<tr>
<td>Egg, hen</td>
<td>12 - 13</td>
</tr>
<tr>
<td>Milk</td>
<td>3.5 - 4.0</td>
</tr>
<tr>
<td>Fish</td>
<td>18 - 20</td>
</tr>
<tr>
<td>Meat and liver</td>
<td>18 - 22</td>
</tr>
</tbody>
</table>
Functions of protein

• Body building

• Protein as an energy source

• Proteins as enzymes

• Proteins as carriers

• Proteins as biological buffers

• Proteins as lubricants

• Proteins in the immune system