Time	Narration
00:00	Welcome to the **spoken tutorial** on the Importance of **protein**.
00:05	In this tutorial, we will learn about:
00:08	Benefits of **protein** for our body.
00:11	Effects of its deficiency.
00:15	Requirements at different age groups.
00:18	Food sources.
00:21	**Protein** is an essential macronutrient required by our body.
00:27	It is made up of 22 **amino acids**.
00:31	Out of 22, nine **amino acids** are essential.
00:36	These are not made by our body, hence they have to be taken through food.
00:43	Remaining 13 are made by the body.
00:47	I will briefly tell you about **Amino acids**.
00:51	**Amino acids** are organic compounds that combine to form proteins.
00:58	**Lysine**, **leucine**, **histidine**, **methionine**, **tryptophan**, are a few **amino acids**.
01:09	**Proteins** are divided into 2 types.
01:12	They are complete **proteins** and incomplete **proteins**.
01:18	The difference between them is based on the type of **amino acids** present in food.
01:27	Complete **proteins** are those which contain all the 9 essential **amino acids**.
01:34	All non-vegetarian foods are complete **proteins**.
01:39	For example: chicken,
01:41	eggs,
01:43	fish and meat.
01:46	Likewise, milk and milk products are also a source of complete **proteins**.
01:53	Incomplete **proteins** have inadequate amounts of 1 or more essential **amino acids**.
02:02	Most vegetarian foods are incomplete **proteins**.
02:06	For example: pulses,
02:09	grains, nuts
02:12	and seeds.
02:14	Among all these, soybean is one of the best vegetarian source of **protein**.
02:21	Benefits of **protein** include growth, repair and maintenance of muscle tissues.
02:30	It also controls blood sugar levels
02:33	and builds a stronger immune system.
02:37	**Protein** rich food reduces our cravings and keeps us full for a longer time.
02:43	This also helps in weight management.
02:47	Aid in digestion and breaking down of toxins are other two functions.
02:54	It also helps in carrying signals to and fro the brain.
03:00	Transporting and storage of nutrients in the body also requires **protein**.
03:06	Let us understand the signs and symptoms of **protein** deficiency now.

03:13	One of the signs of **protein** deficiency is diminished growth of the fetus.
03:20	Deficiency in children can lead to **wasting** and **stunting**.
03:26	This may result in low body weight.
03:30	In such conditions, children are at a risk of developing various infections.
03:37	Due to poor growth, a child's brain development can also get affected.
03:43	In the long term, poorly grown children are at a risk of developing diabetes.
03:51	They may also develop hypertension when they grow up.
03:56	In adults, **protein** deficiency leads to loss of muscle mass.
04:02	They may also feel tired,
04:05	weak and become prone to infections.
04:09	Wrinkling of skin and hair fall are other examples.
04:15	Various age groups have different daily requirements.
04:20	**Protein** requirements advised in this tutorial are as per the field observations.
04:28	For 0 to 12 month old babies it is 1 to 2 grams per kg body weight.
04:36	16 grams of **protein** for 1 to 3 years old children is required.
04:43	20 grams for 4 to 6 year old children.
04:48	29 grams is advised for 7 to 9 year old children.
04:55	40 grams for 10 to 12 year old children.
05:00	52 to 62 grams is suggested for adolescents.
05:06	For pregnant women, it is 78 grams.
05:11	For lactating mothers, 68 to 74 grams is advised.
05:18	For adults, **protein** requirement also depends on their physical activity.
05:25	Activity is categorized as sedentary,
05:30	moderate and heavy.
05:33	Sedentary activity includes teaching,
05:36	tailoring,
05:38	data entry
05:40	and call center jobs.
05:44	People doing desk jobs also come under sedentary activity.
05:50	Moderate activity includes agriculture labour,
05:55	househelp, mason
05:58	and driver.
06:00	Heavy activity includes stone cutter,
06:04	wood cutter,

	athlete
06:07	and mine worker.
06:10	Sedentary workers require 1 gram **protein** per kg ideal body weight.
06:18	Ideal body weight is optimum weight that is healthy for a person.
06:24	Moderate workers require 1.2 gram **protein** per kg ideal body weight.
06:32	Heavy workers require 1.5 grams **protein** per kg ideal body weight.
06:40	Let us understand this with an example.
06:44	A 55 kilograms moderate working woman's **protein** requirement would be 66 grams.
06:53	If the same woman is doing heavy work she will need 82 grams.
07:00	It is advised to include **protein** rich food in your daily diet.
07:06	Such foods should be given from 6 months of age.
07:11	Let’s take a look at the **protein** content of some of the food sources.
07:17	1 whole egg has around 7 grams of **protein**.
07:22	100 grams of boneless chicken has about 19 grams of **protein**.
07:29	Similarly, 100 grams of fish has around 20 grams **protein**.
07:36	250 millilitres of cows milk has approximately 8 grams.
07:43	Curd made of 250 millilitres of cow’s milk has nearly 8 grams.
07:51	45 grams of paneer made from cow’s milk has about 8 grams of **protein**.
07:59	20 grams of nuts and seeds have nearly 4 grams.
08:05	Approximately 11 grams of **Protein** is present in 30 grams of raw soybeans.
08:14	Nearly 5 grams of **Protein** is present in 30 grams of other raw beans.
08:22	30 grams of uncooked pulses have approximately 4 grams **protein**.
08:30	30 grams of raw milled rice has around 2 grams.
08:36	30 grams of raw foxtail millet has nearly 4 grams **protein**.
08:43	1 chapati made out of 30 grams wheat flour has 3 grams of **protein**.
08:52	Sorghum and pearl millet chapati also has around 3 grams of **protein**.
08:59	4 grams of **protein** is present in one missi roti.
09:06	Missi roti is made with equal ratio of gram flour and wheat flour.
09:13	**Protein** from non-vegetarian food is absorbed better than vegetarian food.
09:21	It is because non-vegetarian foods have complete **proteins**.
09:27	Complete **proteins** contain all the essential **amino acids**.
09:33	Thus, the quality of **protein** in the non-veg food is better than vegetarian food.
09:40	Quality of **protein** is checked by the **DIAAS** method.
09:48	**DIAAS** is **Digestible indispensable amino acid score.**
09:56	It is a ratio of digestible **amino acid** in food and the **amino acid** required.
10:05	The score is given from 0 to 1.
10:10	1 being the highest and 0 being the lowest.
10:16	Let us look at the digestibility score for a few food items.
10:22	Egg has a 1.18 digestibility score.
10:27	Whole milk has 1.32
10:31	Peas have 0.64
10:35	While chickpeas have 0.66

10:41	Cooked rice has 0.59
10:46	Wheat has 0.43
10:50	Roasted peanuts also have a score of 0.43
10:56	As discussed earlier, vegetarian sources are incomplete **proteins**.
11:02	Cereals are low in **lysine** and pulses are low in **methionine**.
11:08	Eating them together will compensate for the insufficiency of **amino acids**.
11:14	Combining cereal and pulses improves the **protein** quality.
11:20	This is called the complementary action of **proteins**.
11:25	It is recommended to eat different food groups in various combinations.
11:31	Combining of food groups helps to get different essential **amino acids**.
11:38	Combining pulses and grains with milk products improves the **protein** quality.
11:46	The missing **amino acids** in grains and pulses are compensated by milk products.
11:54	Let us look at some food items prepared with these combinations.
12:00	Millet khichdi with raita,
12:03	kadhi rice **(gram flour curd curry -Bracketed text is only for International languages)**, and paneer paratha **(cottage cheese stuffed tortilla -Bracketed text is only for International languages)** are a few examples.
12:08	Thalipeeth with curd and
12:11	kidney beans rice with curd are other examples.
12:16	Combining cereal or millet with non-veg food also improves the **protein** quality.
12:24	I will tell you some recipes that can be prepared using this combination.
12:30	They include millet chicken pulao,
12:34	egg dosa and
12:36	chicken millet roti wrap.
12:39	Egg rice,
12:41	meat stuffed paratha,
12:43	ragi ball and chicken curry are other examples.
12:49	Apart from these combinations, we can combine other food groups as well.
12:55	Curd rice,
12:57	spinach paneer curry,
12:59	coconut curd chutney are some examples.
13:04	Using paste of nuts and seeds in curries also improves the **protein** quality.
13:11	Include these food items in your daily diet for good health.
13:16	This brings us to the end of this tutorial. Thanks for joining.