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Macronutrients: Protein Sources in the Diet

Dr. Ritamarie Loscalzo

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What Factors Might Contribute to a Deficiency of Protein?


- ✓ Low hydrochloric acid
- ✓ Deficient pancreatic enzymes
- ✓ Poor liver function: controls amino acid metabolism
- ✓ Vitamin B6 deficiency can impair the ability of the body to manufacture non-essential amino acids
- ✓ Bacterial or viral infections and severe physical trauma use up their protein stores rapidly



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Protein Recommendations


- ✓ **RDA:** 0.36 grams per pound
- ✓ **Athletes:** 0.6 - 0.9 grams per pound
- ✓ **Paleo:** 1 gram per pound
- ✓ **Zone:** 30% of calories
- ✓ **According to Web MD**
 - Infants: about 10 grams a day
 - Teenage boys: up to 52 grams a day
 - Teenage girls: 46 grams a day
 - Adult men: 56 grams a day
 - Adult women: 46 grams a day
 - Pregnant or lactating women: 71 grams a day



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How Does Cooking Affect Protein?


- ✓ **Heating and beating** causes denaturation and coagulation
- ✓ **Denaturation** changes the shape of the protein and decreases solubility
- ✓ **Coagulation** causes protein molecules to clump together
- ✓ **Overcooking** foods destroys heat sensitive amino acids, i.e., lysine, and makes protein resistant to digestive enzymes



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When is Higher Protein Needed?


- ✓ Muscle wasting
- ✓ Weight loss
- ✓ Fatigue and weakness
- ✓ Frequent infections
- ✓ Severe edema (fluid retention)
- ✓ Slow growth and development in children
- ✓ Severe trauma
- ✓ Burns
- ✓ Competitive athletics



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Assessing Protein Status


- ✓ Assess protein intake and sufficiency
- ✓ Assess adequacy of stomach acid
- ✓ Assess pancreatic enzyme status
- ✓ Look for signs of neurotransmitter imbalance
- ✓ Assess hormone adequacy
- ✓ Look at healing and immune issues
- ✓ Clues to vitamin and mineral status
- ✓ Blood and urine tests



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Blood Assessment of Protein Status

- ✓ **Blood test indicators of low protein**
 - Protein (lo)
 - Albumin (lo)
 - Globulin (lo)
 - BUN (lo)
 - Creatinine (lo)
 - Uric Acid (lo)
- ✓ **Blood test indicators of low stomach acid**
 - Calcium (lo)
 - Iron (lo)
 - BUN (hi or lo)
 - Chloride (lo)
 - Carbon Dioxide (hi)
 - Hemoglobin (lo)
 - MCV (hi)
 - MCH (hi)
 - MCHC (hi)
 - Phosphorus (lo)
 - Protein (lo)
 - Albumin (lo)
 - Globulin (hi)



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Protein in Animal Flesh

Food	Serving Size	Cals	Amount (g)	World's Healthiest Foods Rating
Tuna	4 oz	147.4	33.06	excellent
Cod	4 oz	96.4	21.24	excellent
Chicken	4 oz	187.1	35.18	very good
Turkey	4 oz	166.7	34.17	very good
Soybeans	1 cup	297.6	28.62	very good
Salmon	4 oz	157.6	26.59	very good
Beef	4 oz	132.7	26.16	very good
Shrimp	4 oz	134.9	25.83	very good
Lamb	4 oz	350.4	25.57	very good
Scallops	4 oz	125.9	23.29	very good
Sardines	3.20 oz	188.7	22.33	very good

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Protein in Dairy and Eggs				
Food	Serving Size	Cals	Amount (g)	World's Healthiest Foods Rating
Yogurt	1 cup	149.4	8.50	good
Cheese	1 oz	114.2	7.06	good
Eggs	1 each	77.5	6.29	good
Cow's milk	4 oz	74.4	3.84	good

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Protein in Legumes				
Food	Serving Size	Cals	Amount (g)	World's Healthiest Foods Rating
Miso	4 oz	164.4	17.89	very good
Soy Sauce	4 oz	222.3	20.63	good
Lentils	1 cup	229.7	17.86	good
Dried Peas	1 cup	231.3	16.35	good
Pinto Beans	1 cup	244.5	15.41	good
Kidney Beans	1 cup	224.8	15.35	good
Black Beans	1 cup	227.0	15.24	good
Navy Beans	1 cup	254.8	14.98	good
Lima Beans	1 cup	216.2	14.66	good
Garbanzo Beans	1 cup	269.0	14.53	good


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Protein in Vegetables				
Food	Serving Size	Cals	Amount (g)	World's Healthiest Foods Rating
Spinach	1 cup	41.4	5.35	very good
Asparagus	1 cup	39.6	4.32	very good
Mustard Greens	1 cup	36.4	3.58	very good
Swiss Chard	1 cup	35.0	3.29	very good
Bok Choy	1 cup	20.4	2.65	very good
Pumpkin Seeds	0.25 cup	180.3	9.75	good
Green Peas	1 cup	115.7	7.38	good
Collard Greens	1 cup	62.7	5.15	good
Brussels Sprouts	1 cup	56.2	3.98	good
Broccoli	1 cup	54.6	3.71	good
Kale	1 cup	36.4	2.47	good
Green Beans	1 cup	43.8	2.36	good
Cauliflower	1 cup	28.5	2.28	good
Cabbage	1 cup	43.5	2.27	good
Sea Vegetables	1 TBS	10.8	1.81	good
Mushrooms, Crimini	1 cup	15.8	1.80	good
Turnip Greens	1 cup	28.8	1.64	good
Summer Squash	1 cup	36.0	1.64	good
Tomatoes	1 cup	32.4	1.58	good

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Protein in Nuts and Seeds


- ✓ **Almonds:** 15% carbs, 13% protein, 72% fat
- ✓ **Cashews:** 22% carbs, 11.5% protein, 66.5% fat
- ✓ **Walnuts:** 8.5% carbs, 8% protein, 83.5% fat
- ✓ **Pecans:** 8% carbs, 5% protein, 87% fat
- ✓ **Flax seeds:** 22% carbs, 12% protein, 66% fat
- ✓ **Pumpkin seeds:** 13% carbs, 16% protein, 71% fat
- ✓ **Sesame seeds:** 17% carbs, 11% protein, 72% fat
- ✓ **Sunflower seeds:** 17% carbs, 11.5% protein, 71.5% fat



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Protein in Nuts and Seeds


Nut/Seed (1/4 Cup; 4 tbs)	Protein (g)
Chia Seed	12
Hemp Seed	10
Flax Seed	8
Sunflower Seed	8
Salba	7.4
Almond	7
Pumpkin Seed	7
Sesame Seed	7
Pistachio	6
Walnut	5
Brazil Nut	5
Hazelnut	5
Pine Nut	4
Cashew	4



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Protein in Grains

- ✓ **Buckwheat:** 82% carbs, 12% protein, 6% fat
- ✓ **Millet:** 82% carbs, 11% protein, 7% fat
- ✓ **Oats:** 70% carbs, 15% protein, 15% fat
- ✓ **Quinoa:** 70% carbs, 15% protein, 15% fat



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Protein in Legumes

- ✓ **Split peas:** 73% carbs, 24.5% protein, 2.5% fat
- ✓ **Lentils:** 70% carbs, 27% protein, 3% fat
- ✓ **Aduki beans:** 79% carbs, 20% protein, 1% fat
- ✓ **Kidney beans:** 73% carbs, 24% protein, 3% fat



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Protein in Vegetables

- ✓ **Asparagus:** 68% carbs, 27% protein, 5% fat
- ✓ **Beets:** 86% carbs, 11% protein, 3% fat
- ✓ **Mushrooms:** 50% carbs, 37% protein, 13% fat
- ✓ **Broccoli:** 71% carbs, 20% protein, 9% fat
- ✓ **Zucchini:** 72% carbs, 18.5% protein, 9.5% fat



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