



Nutrition & Health Benefits of Soy Protein

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What is Nutrition?

- The scientific study of food and nourishment, including food composition, and dietary guidelines for normal and medical health.



Why is Nutrition Important?

- The typical Western-type diet is too high in saturated fat, sodium, and sugar and too low in fruits, vegetables, whole grains, calcium, and fiber.
- *Such a diet contributes to 4 of the 6 leading causes of death, and increases the risk of numerous diseases.*



Why is Nutrition Important...

- **Almost 1 billion** people are hungry.
- 16,000 children die every day, from hunger-related causes--***one child every six seconds.***
- Hunger is the most extreme form of poverty, where individuals or families cannot afford to meet their most basic need for food.
- Chronic undernourishment and vitamin or mineral deficiencies also result in stunted growth, weakness and heightened susceptibility to illness.

Source: World Food Programme 2009

2009 Hunger Map



| Category | 1 | 2 | 3 | 4 | 5 | Insufficient data |
|----------------|---------------|----------|----------------|-----------------|-----------|-------------------|
| Undernourished | <5% | 5-9% | 10-19% | 20-34% | ≥35% | |
| Description | Extremely low | Very low | Moderately low | Moderately high | Very high | |

Sources: The State of Food Insecurity in the World 2008, Food and Agriculture Organization of the United Nations and FAO/IFPRI
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Food for Thought...

- “Much has been given us, and much will rightfully be expected from us. We have duties to others and duties to ourselves; and we can shirk neither.”

- *Theodore Roosevelt*

(1905 Presidential Inaugural Address)



Good Eating = Good Health

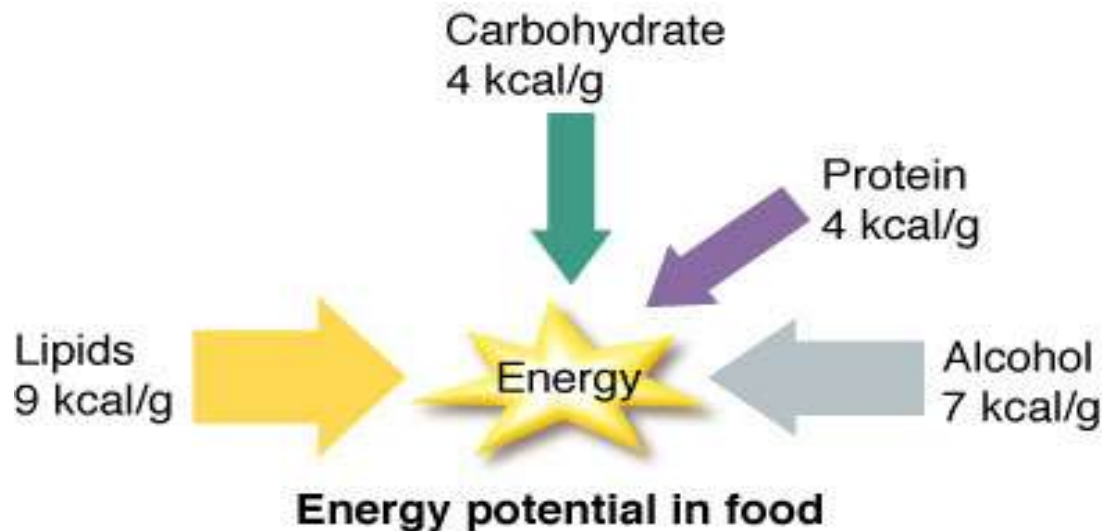
- **Food:**

- Helps us **grow & be healthy**
- Gives us **strength** to do work
- Helps us **think** and **learn** better
- Helps us **heal** when sick or hurt
- **Connects** us with others



Energy In Foods

- We get energy from the foods we eat.
- Energy measured in Kilocalories (Kcal)

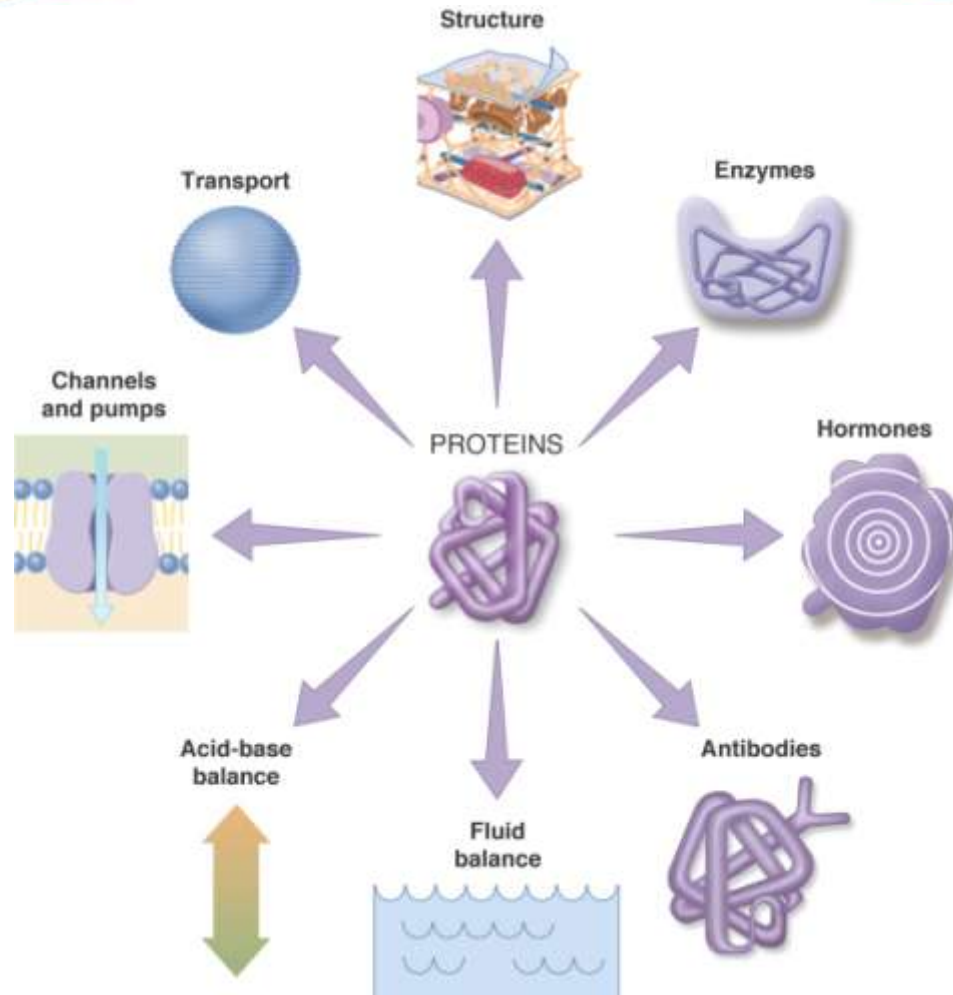


Body Building Blocks

- Protein is the building block of our bodies
- Is made up of individual amino acids
- *Essential* – must be supplied by diet
- *Non-essential* – can be made in the body



How Protein Functions



Child Protein Requirements

| Age | Protein (g/Kg body weight) | Protein DRI (g/day) |
|-------------|-------------------------------|------------------------|
| 0-6 months | 1.52 | 9.1 (RDA) |
| 7-12 months | 1.20 | 9 |
| 1-3 years | 1.05 | 11 |
| 4-8 years | 0.95 | 15 |
| 9-13 years | 0.95 | 27 males 28 females |
| 14-18 years | 0.85 | 44 males 38 females |

Source: *Food and Nutrition Board, Institute of Medicine 2002*

Adult Protein Requirements - DRI



- Males 46 g/day
- Females 38 g/day
- Pregnancy 50 g/day
- Lactation 60 g/day
- Severe physical stress, infections, burns, fevers and surgery all increase protein losses and diet must replace that lost protein

Protein Quality & Diet

- **Complete** – supply all amino acids
- **Incomplete** – low in one or more essential amino acids



Protein Deficiency

Protein-energy malnutrition (PEM)

- Kwashiorkor
- Marasmus
- Stunting
- Wasting
- Underweight
- Failure to Thrive



Vegetarian Diets

- *It is the position of the American Dietetic Association that appropriately planned vegetarian diets, **including total vegetarian or vegan diets**, are healthful, nutritionally adequate, and may provide health benefits in the prevention and treatment of certain diseases. Well-planned vegetarian diets are appropriate for individuals during all stages of the lifecycle, including pregnancy, lactation, infancy, childhood, and adolescence, and for athletes.*



J Am Diet Assoc. 2009;109:
1266-1282

The Nutritious Soybean

- Complete and inexpensive plant protein used to extend or substitute for animal proteins.
- Cultivated for many centuries
- Contains all 3 macronutrients
- Contains all essential AA
- Good quality fatty acid profile
- Rich in most minerals
- Contains all important vitamins
- Good source of complex carbohydrates
- Contains phytochemicals



Protein Quality

| Product | PDCASS Score |
|----------------|--------------------|
| Egg White | 1.00 |
| Milk (Casein) | 1.00 |
| Beef | 0.92 |
| Soybean | 0.90 – 1.00 |
| Pea | 0.73 |
| Kidney Bean | 0.68 |
| Chickpea | 0.66 |
| Oats | 0.57 |
| Peanut Meal | 0.52 |
| Lentils | 0.52 |
| Rice | 0.47 |
| Corn | 0.42 |
| Whole Wheat | 0.40 |
| Wheat Gluten | 0.25 |



Soy as a Functional Ingredient

- Fairly “taste neutral”
- Absorbs flavors
- Emulsifies
- Increases whiteness
- Improves texture
- Retains moisture
- Absorbs fat
- Improves shelf-life



Soy Consumption

- **Traditional Populations**
 - Whole soybean
 - Fermented products more common
 - Soy sauce, miso, tempeh
 - Intake of soy protein from soy in Japan and China is 8-12 grams per day (10% of total protein intake)
- **Western countries**
 - Processed Soy - Soy protein isolate, soy flour, soy oil, textured soy, second generation soy products
 - Intake of soy protein is small about 1-3 grams per day
 - **Health claim is for 25 g/day soy protein, based on clinical studies of cholesterol lowering effect**

Soy & Health

- **Heart Disease** - may reduce blood pressure and LDL cholesterol
- **Diabetes** - may help keep blood glucose in better control
- **Cancer** –may help cut risk of prostate cancer and early soy intake in youth may cut risk of breast cancer.
- **Osteoporosis** –may help prevent bone loss
- **Phytochemicals** – contains many biologically active substances that may help prevent chronic disease. These include isoflavones and plant sterols.



Soy & Health, continued...

- **Brain Power** – foods may improve cognitive function and mental abilities, especially in those with Alzheimer's
- **Weight control** – is low in calories and high in nutrition. Consumption of soy protein reduces body weight and fat mass in addition to lowering plasma cholesterol and triglycerides
- **Food Allergies** – even though soy is one of the 8 most prevalent food allergies – is only about 0.2% of population. Provides great protein and calcium alternative for those with other food allergies (milk, wheat, etc...) or lactose intolerance
- **Nourishing the World** – is economical protein, widely available and easy to adapt into differing world cultures

Soy & Infant Health

- Maternal breast milk is safest, most nutritionally adequate form of infant feeding
- Usage of soy based infant formulas (SBIF):
 - Nutritional needs and/or severe allergies not met by breast or cow's milk-based formula
 - Infants with galactosemia or severe lactase deficiency
 - Vegetarian-based alternative choice
- American Academy of Pediatrics Policy Statement 2008 confirmed safety of SBIF for most term infants

Soy Protein Solutions



- ❖ ***Adequate and good nutrition is essential for everyone***
- ❖ Soy foods are an excellent source of complete proteins
- ❖ Soy provides protein and other nutrients that have additive health benefits
- ❖ Soy products are adaptable and easy to use in meals or feeding programs
- ❖ Soy foods are highly acceptable

Thank You!



National Soybean Research Laboratory

*Research, Outreach and
Education supporting
soybean production and
nutrition*