

ESU009– Protein as functional food ingredients

Lecture 20



Amino Acids for the treatment of disease and injury

- Under physiological stress the body may increase its demand for certain amino acids to promote healing or maintain metabolic function.
- Leucine, isoleucine and valine may aid healing in multiple trauma and in burn patients.
- Glutamine appears to be important in maintaining the integrity of the gastro intestinal tract.

Influence on central nervous system

- Aspartate, glutamate phenylalanine, tyrosine and tryptophane either directly or indirectly influence CNS functions.
- Phenylalanine, tyrosine and tryptophane are transported across the blood brain barrier and are converted by neural tissue to the neurotransmitters.

Major functions of proteins

- Act as Immunostimulants
- Helps in Mineral Absorption (caseinophosphopeptides)
- Act as antihypertensive (gelatin, bovine casein, tuna muscle, zein, rice glutelin and prolamin).
- Reduces cholesterol

- Soy protein has been shown to lower total blood cholesterol by lowering LDL, the bad cholesterol.
- It does not affect the good blood cholesterol, HDL.
- Some clinical studies suggest that soy protein and its isoflavones protect bone density.
- Soy protein may have a protective effect against prostate cancer.

Therapeutic effects of some amino acids

Amino Acids	Effects
Arginine	Treatment of hypertension
Aspartic acid and asparagine	Treatment of drug addiction Management of chronic fatigue Treatment of cirrhosis
Cysteine and cystine	Treatment of acetaminophen poisoning
Glutamic acid	Relief of mental retardation and epilepsy
Glutamine	Treatment of cystinuria
Histidine	Treatment of rheumatoid arthritis

Amino acids	Effects
Lysine	Treatment and prevention of herpes simplex lesions
Methionine	Improvement of inflammatory liver disease Treatment of acetaminophen poisoning
Phenylalanine	Treatment of pain Prevention or treatment of depression Treatment of hyperactivity Treatment of attention deficit disorder, mood changes
Leucine	Treatment of muscular dystrophy

Amino acids	Effects
Threonine	Modification of amyotrophic lateral sclerosis
Tyrosine	Treatment of Parkinson's disease Attention deficit disorder Treatment of narcolepsy Treatment of depression
Tryptophane	Sleep aid Treatment of pain

Arginine rich foods

- Seafoods, meat and eggs
- Nuts
- Whole wheat
- Lentils (peas, peanut, kidney beans and sunflower seeds)
- Spinach, soyabean, pepper, onion, garlic and mushrooms
- Avacado, grapefruit, kiwi, grapes and strawberry.



Aspartic acid rich foods

- Meat, poultry and egg
- Cheese, yoghurt and butter
- Oat, barley and corn
- Cherries, plum and banana
- Soyabean
- Nuts and chickpea



Cysteine rich foods

- Poultry and egg
- Wheat, oat bran and barley
- Cheese, yoghurt etc.
- Red pepper and garlic



Glutamin rich foods

- Meat, poultry and eggs
- Dairy products
- Cabbage
- Nuts
- Beans and legumes
- Beet and spinach



Glutamic acid rich foods

- Soya protein isolate
- Eggs
- Sesame seed
- Cheese
- Fish



Histidine rich foods

- Apple
- Pomogranates, beets and carrots
- Celery, cucumber, dandelion, garlic, radish, spinach and turnip greens



Lysine rich foods

Fish, chicken, beef, lamb, milk, cheese, beans, brewer's yeast, mung bean sprouts and most fruits and vegetables.

Methionine rich foods

Eggs, sesame seeds, fish, meats and cereal grains

Phenylalanine rich foods

Milk, dairy products, meat, fish, chicken, eggs, beans, and nuts

Leucine rich foods

Cheese, soybeans, beef, chicken, pork, nuts, seeds, fish and beans

Threonine rich foods:

Beef, soy, pork, chicken, liver, cheese, shellfish, nuts, seeds, beans, and lentils

Tryptophane rich foods:

Oats, dried dates, milk, yogurt, cottage cheese, red meat, eggs, fish, poultry, sesame, chickpeas, sunflower seeds, pumpkin seeds, spirulina, bananas, and peanuts

Tyrosine rich foods:

Cheese, soya, pork and beef

Thank you

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