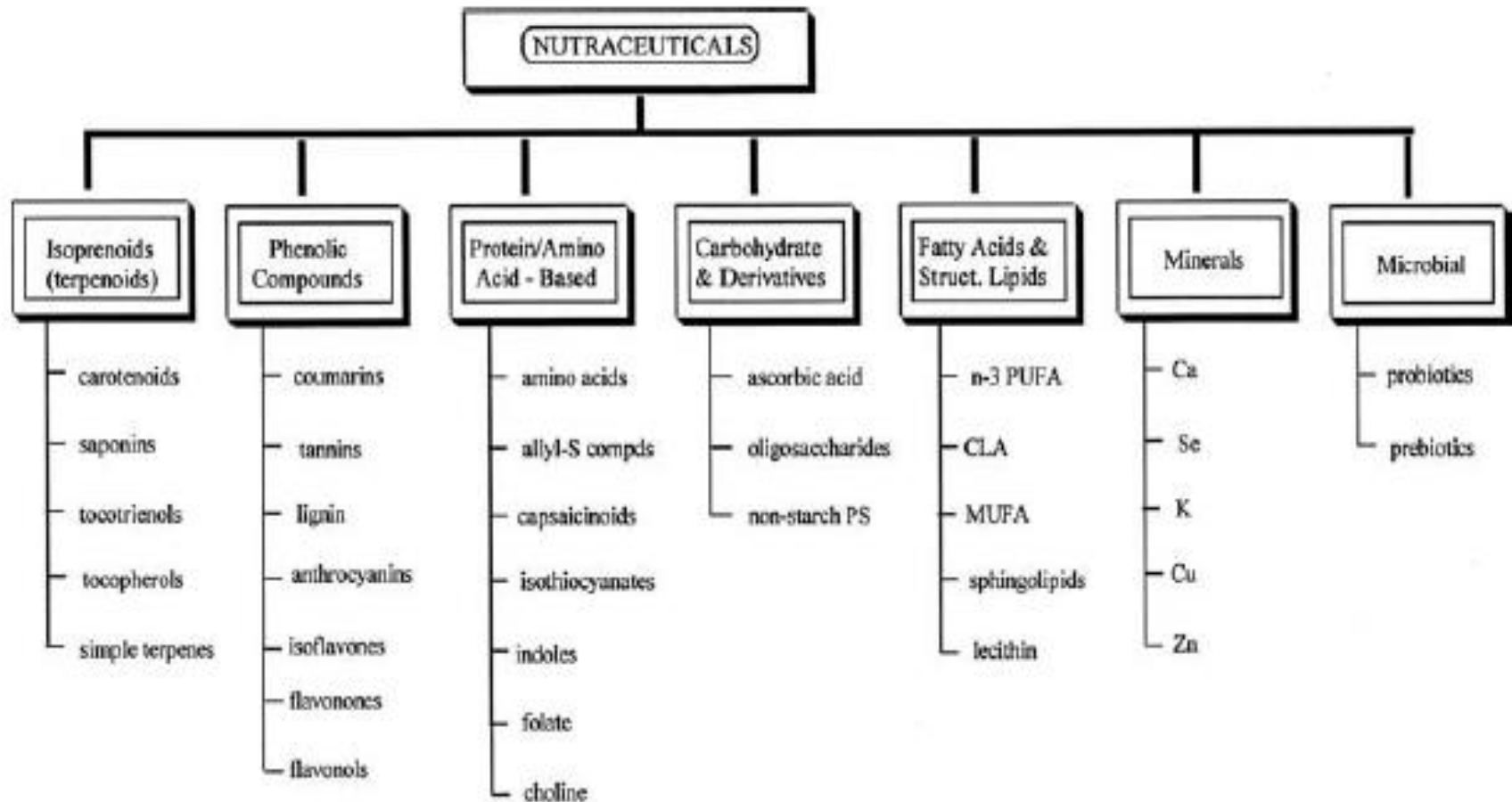


ESU 009 – Classification of nutraceuticals compounds fatty acid and amino acid based

Lecture 9



Classification Based On The Chemical Groups



Fatty acids and structural lipids

- There are several fatty acids and/or their derivatives that have piqued the interests of researchers for their functional potential.
- These include the ω -3 PUFA found in higher concentrations in plants, fish, and other marine animals
- Conjugated linoleic acid (CLA) produced by bacteria in the rumen of grazing animals such as cattle.
- The formation of CLA probably serves to help control the vitality of the released bacterial population in the rumen, whereas plants and fish use ω -3 fatty acids for their properties in membranes.

CLA Content in Foods

Food	Total CLA Content (mg/g fat)
Pasture-Raised Beef	30
Pasture-Raised Dairy	20-30
Lamb	5.6
Homogenized Milk	5.5
Buttermilk	5.4
Mozzarella Cheese	4.9
Plain Yogurt	4.8
Butter	4.7
Sour Cream	4.6
Cottage Cheese	4.5
Ground Beef	4.3
Cheddar Cheese	4.1
Ice Cream	3.6
Ground Turkey	2.5
Chicken	0.9
Pork	0.6
Egg yolk	0.6
Salmon	0.3

Source: Chin et al.

Foods Rich in Omega-3 (DHA-EPA)

	Serving	ALA	DHA	EPA	DHA+EPA	%WV*
<i>Herring</i>	4 oz	150	1252	1031	2283	65%
<i>Wild Salmon</i>	4 oz	428	1620	465	2085	60%
<i>Mackerel</i>	4 oz	128	792	570	1362	39%
<i>Trout</i>	4 oz	212	589	530	1119	32%
<i>Sardines</i>	4 oz	489	499	464	963	28%
<i>Shrimp</i>	4 oz	13	160	153	313	9%
<i>Grass-Fed Beef</i>	4 oz	800	200	100	300	9%
<i>Halibut</i>	4 oz	15	176	91	267	8%
<i>Tuna</i>	4 oz	3	223	32	255	7%
<i>Cod</i>	4 oz	1	174	4	178	5%
<i>Range-Fed Eggs</i>	2 ea-HB	36	38	4	42	1%

*% weekly value based on 3,500 mg suggestion
from American Dietetic Association*

Amino acid-based

- This group has the potential to include intact protein (i.e., soy protein), polypeptides, amino acids, and nitrogenous and sulfur amino acid derivatives.
- Today, a few amino acids are also being investigated for their nutraceutical potential.
- Among these amino acids is arginine, ornithine, taurine, and aspartic acid.

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

Thank you

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