



MARCH 2023 | NEWS METHOD

Determination of Amino acids



Amino acids are organic compounds that contain mostly carbon, hydrogen, oxygen, and nitrogen atoms. They also have amine ($-NH_2$) and carboxyl ($-COOH$) functional groups with side chains that differentiate one amino acid from another.

Proteins are chains of amino acids. Each protein has its own sequence of amino acids. The sequence confers the protein different shapes and different functions in human body.

In addition to their essential role in protein formation, amino acids are important to biosynthesis, neurotransmitter transport, and other biochemical processes.

Neutron proposal

In view of the above Neutron performs the analysis of amino acids with different techniques (see **Table 1**):

The analysis of total amino acids is recommended in matrices such as cereals, meat, milk and feed. The analytical process consists in hydrolysing the sample to break down proteins into the amino acids. In this way, all the amino acids present in the sample are detected and an estimation of the protein content provided.

The analysis of free amino acids is recommended for the quantification of those that have been added as free in the sample (for example in food supplements) or to detect the amino acids naturally present in free form and not involved in the building of proteins.

| Analytes | Analytical Technique | LQ* |
|--|----------------------|-----------------|
| AMINO ACIDS 1 (after Acid Hydrolysis) | | (g/100g) |
| Aspartic Acid | HPLC-DAD | 0,025 |
| Glutamic Acid | HPLC-DAD | 0,025 |
| Alanine | HPLC-DAD | 0,025 |
| Arginine | HPLC-DAD | 0,025 |
| Phenylalanine | HPLC-DAD | 0,025 |
| Glycine | HPLC-DAD | 0,025 |
| Hydroxyproline | HPLC-DAD | 0,025 |
| Isoleucine | HPLC-DAD | 0,025 |
| Histidine | HPLC-DAD | 0,025 |
| Leucine | HPLC-DAD | 0,025 |
| Lysine | HPLC-DAD | 0,025 |
| Proline | HPLC-DAD | 0,025 |
| Serine | HPLC-DAD | 0,025 |
| Tyrosine | HPLC-DAD | 0,025 |
| Threonine | HPLC-DAD | 0,025 |
| Valine | HPLC-DAD | 0,025 |
| Collagen (hydroxyproline x 8) | HPLC-DAD | 0,025 |

| Analytes | Analytical Technique | LQ* |
|--------------------------------------|----------------------|-----------------|
| AMINO ACIDS group 2 | | (g/100g) |
| Cysteine and Cystine | HPLC-DAD/FLR | 0,025 |
| Methionine | HPLC-DAD/FLR | 0,025 |
| AMINO ACIDS group 3 | | (g/100g) |
| Tryptophane | HPLC-FLR | 0,025 |
| FREE AMINO ACIDS | | (g/100g) |
| Aspartic Acid (free) | HPLC-DAD | 0,025 |
| Glutamic Acid (free) | HPLC-DAD | 0,025 |
| Alanine (free) | HPLC-DAD | 0,025 |
| Arginine (free) | HPLC-DAD | 0,025 |
| Asparagine | HPLC-DAD | 0,025 |
| Cysteine and Cystine (sum) | HPLC-DAD | 0,025 |
| Phenylalanine (free) | HPLC-DAD | 0,025 |
| GABA | HPLC-DAD | 0,025 |
| Glycine (free) | HPLC-DAD | 0,025 |
| Glutamine (free) | HPLC-DAD | 0,025 |
| Hydroxyproline (free) | HPLC-DAD | 0,025 |
| Isoleucine (free) | HPLC-DAD | 0,025 |
| Histidine (free) | HPLC-DAD | 0,025 |
| Leucine (free) | HPLC-DAD | 0,025 |
| Lysine (free) | HPLC-DAD | 0,025 |
| Methionine (free) | HPLC-DAD | 0,025 |
| Ornithine | HPLC-DAD | 0,025 |
| Proline (free) | HPLC-DAD | 0,025 |
| Serine (free) | HPLC-DAD | 0,025 |
| Tyrosine (free) | HPLC-DAD | 0,025 |
| Threonine (free) | HPLC-DAD | 0,025 |
| Tryptophane (free) | HPLC-DAD | 0,025 |
| Valine (free) | HPLC-DAD | 0,025 |
| Beta-Alanine (free) | HPLC-DAD | 0,025 |
| Citrulline (free) | HPLC-DAD | 0,025 |
| TAURINE | | (g/100g) |
| Taurine (on milk powder) | HPLC-DAD | 0,005 |
| Taurine (on liquid milk) | HPLC-DAD | 0,001 |
| Taurine (all other matrices) | HPLC-DAD | 0,005-0,1 |
| TOTAL AMINO ACIDS Low Limit** | | (g/100g) |
| Phenylalanine Total (low limit) | LC-MS | 0,01 |
| Tyrosine total (low limit) | LC-MS | 0,01 |
| Methionine total (low limit) | LC-MS | 0,01 |
| Valine total (low limit) | LC-MS | 0,01 |
| Isoleucine total (low limit) | LC-MS | 0,01 |
| Leucine total (low limit) | LC-MS | 0,01 |

| Analytes | Analytical Technique | LQ* |
|---|----------------------|-----------------|
| FREE AMINO ACIDS Low Limit** | | (g/100g) |
| Phenylalanine (free) (low limit) | LC-MS | 0,01 |
| Tyrosine (free) (low limit) | LC-MS | 0,01 |
| Threonine (free) (low limit) | LC-MS | 0,01 |
| Methionine (free) (low limit) | LC-MS | 0,01 |
| Valine (free) (low limit) | LC-MS | 0,01 |
| Isoleucine (free) (low limit) | LC-MS | 0,01 |
| Leucine (free) (low limit) | LC-MS | 0,01 |
| Tryptophane (free) (low limit) | LC-MS | 0,01 |
| TITLE AMINO ACIDS (analytes with content > 25 g/100g) | | |
| Aspartic Acid (title) | HPLC-DAD | / |
| Glutamic Acid (title) | HPLC-DAD | / |
| Alanine (title) | HPLC-DAD | / |
| Arginine (title) | HPLC-DAD | / |
| Asparagine (title) | HPLC-DAD | / |
| Cysteine and Cystine (sum) (title) | HPLC-DAD/FLR | / |
| Cystine (title) | HPLC-DAD | / |
| Phenylalanine (title) | HPLC-DAD | / |
| GABA (title) | HPLC-DAD | / |
| Glycine (title) | HPLC-DAD | / |
| Glutamine (title) | HPLC-DAD | / |
| Hydroxyproline (title) | HPLC-DAD | / |
| Isoleucine (title) | HPLC-DAD | / |
| Histidine (title) | HPLC-DAD | / |
| Leucine (title) | HPLC-DAD | / |
| Lysine (title) | HPLC-DAD | / |
| Methionine (title) | HPLC-DAD | / |
| Ornithine (title) | HPLC-DAD | / |
| Proline (title) | HPLC-DAD | / |
| Serine (title) | HPLC-DAD | / |
| Taurine (title) | HPLC-DAD | / |
| Tyrosine (title) | HPLC-DAD | / |
| Threonine (title) | HPLC-DAD | / |
| Tryptophane (title) | HPLC-DAD/FLR | / |
| Valine (title) | HPLC-DAD | / |
| Beta-alanine (title) | HPLC-DAD | / |
| N-Acetyl-L-Tyrosine (title) | HPLC-DAD | / |
| Citrulline (title) | HPLC-DAD | / |
| N-ACETYL-L-TYROSINE | | (g/100g) |
| N-Acetyl-L-Tyrosine | HPLC-DAD | 1 |

* LQs are indicative and may vary by matrix.

** Low limit analyses are carried out to detect traces of a different amino acid when the sample is a raw material composed by a specific amino acid or by a premix of high content amino acids.

Contact us for more information: www.neotron.it