

# *Nutritional supplements*



**Eurofins Vitamin Competence Centre**

## Nutritional supplements

Nutritional supplements are considered as supplements to an inadequate diet or supplements to prevent deficiency diseases. A nutritional supplement is a concentrated source of nutrients or other substances with a nutritional or physiological effect on the organism, for ex.



- Vitamins
- Minerals
- Active Substances from plants or animals
- Amino acid
- Fatty acid

Many people do not consume enough vitamins and minerals through their daily diet. Therefore, to maintain a healthy and active lifestyle, it is customary to consume one or more nutritional supplements.

Today there are many different products on the market which is increasing the competition between producers. Therefore, there is increasing focus on quality of individual nutritional supplements. Consumers place high demands on the product and expect the products to comply with the specifications.

The production of nutritional supplements is not only subject to the consumer monitoring. They are also controlled by the local authority in accordance to the current laws.

The European Commission has established harmonized rules to help ensure that food supplements are safe and properly labeled. The main EU legislation for food supplements is Directive 2002/46/EC when it concerns vitamins and minerals.

## Adding vitamins to nutritional supplements

According to Commission Regulation (EC) 1170/2009 Annex II it is allowed to add the following vitamins to food supplements. In the table the

<b>Vitamin A</b>	Retinol Retinol acetate Retinol palmitate Beta-carotene
<b>Vitamin D</b>	Cholecalciferol Ergocalciferol
<b>Vitamin E</b>	D-alpha-tocopherol DL-alpha-tocopherol D-alpha-tocopherol acetate DL-alpha-tocopherol acetate D-alpha-tocopherol succinate Mixed tocopherols Tocotrienol tocopherol
<b>Vitamin K</b>	Phylloquinone (phytomenadione) menaquinone
<b>Vitamin B1</b>	Thiamine hydrochloride Thiamine mononitrate Thiamine monophosphate chloride Thiamine pyrophosphate chloride
<b>Vitamin B2</b>	Riboflavin Riboflavin-5'-phosphate, sodium
<b>Niacin</b>	Nicotinic acid Niacinamide Inositol hexanicotinate (inositol hexaniacinate)
<b>Pantothenic acid</b>	Calcium-D-pantothenate Sodium-D-pantothenate Dexpantothenol Pantethine
<b>Vitamin B6</b>	Pyridoxine hydrochloride Pyridoxine-5'-phosphate Pyridoxal-5'-phosphate
<b>Folic acid</b>	Pteroylmonoglutamic acid Calcium-L-methylfolate
<b>Vitamin B12</b>	Cyanocobalamin Hydroxycobalamin 5'-deoxyadenosylcobalamin Methylcobalamin
<b>Biotin</b>	D-biotin
<b>Vitamin C</b>	L-ascorbic acid Sodium-L-ascorbate Calcium-L-ascorbate Potassium-L-ascorbate L-ascobyl-6-palmitate Magnesium L-ascorbate Zinc L-ascorbate

different forms of the vitamins that are allowed to add at present time are mentioned.

The Vitamin Competence Centre is able to help you with determination of vitamins, so for specific offers we recommend you to contact your local Eurofins laboratory.

June 2012 the European Commission launched a draft with regard to the setting of tolerances for nutrient values declared on a label. If this draft is accepted by the European Commission it means that the tolerances for vitamins and minerals in food supplements have to be set including all factors for variation (also including the measurement uncertainty).

In the draft the tolerances for supplements including measurement uncertainty for vitamins are + 50 % and – 20 % except for vitamin C (the tolerances for vitamin C is + 80 % and - 20 %).

For further details we recommend you to look at <http://www.reading.ac.uk/foodlaw/pdf/eu-12041-labelling-tolerances-draft.pdf>

The vitamin Competence Centre will be able to help you with the quality checking of your products so that you will be able to comply with the rules of the draft which is expected to be implemented. For further details please contact your local Eurofins Laboratory.

## Adding other substances than vitamins to nutritional supplements

It is allowed to add other substances than vitamins to nutritional supplements, but there are specified rules according to EF 1925/2006 for the added amount which needs to be respected. There is also national legislation based on EF 1925/2006 that tightens the rules for adding other substances than vitamins.

The Vitamin Competence Centre is able to help analyse for some of these nutrients and help you ensure that the legislation is respected.

### Amino acids

We are able to determine both total and free amino acids, so depending on what is needed we will be able to help determining the following amino acids:

The eight essential amino acids:

- Lysine, Isoleucine, Leucine, Methionine, Phenylalanine, Threonine, Tryptophane, Valine

The four amino acids which are especially essential for infants and children:

- Histidine, Tyrosine, Arginine, Cysteine/Cystine

The non-essential amino acids:

- Alanine, Asparagine, Glutamine, Glycine, Proline

We do also analyse other parameters than vitamins and amino acids. The ones that can be of interest for the analysis of nutritional supplements are

- **Taurine**

Total taurine is analysed on one of our Biochrome Amino Acid Analyzer using oxidative hydrolysis as pre-treatment. It can also be ana-

## Facts

Nutritional supplements undergo a number of safety and quality procedures, making them highly regulated. It is within the safety and quality part that we can assist you. Eurofins Vitamin Competence Centre is able to help you with knowledge and quality assurance when it comes to vitamins, amino acids and other nutrients especially used in nutritional supplements.

lysed as free taurine using an extraction with HCl.

- **Choline/Choline chloride**

Choline is analysed on our LC-MS using extraction and saponification as pre-treatment. It can also be analysed as free choline analysing directly on the extracts after dilution.

When reporting results as choline chloride a calculation factor of 1,34 is used (choline x 1,34 = choline chloride).

- **Myo inositol**

Myo-inositol is determined as free myo-inositol using isotope dilution gas chromatography with mass spectrometric detector (GC-MS).

- **Carnitine**

Carnitine is analysed on our LC-MS using extraction and saponification as pre-treatment. It can also be analysed as free carnitine analysing directly on the extracts after dilution.

- **Lutein and Zeaxanthin**

Lutein and zeaxanthin is analysed on one of our HPLC systems using an enzymatic treatment and extraction as pre-treatment.

- **Creatin/Creatinin**

Creatin/Creatinin is measured spectrophotometrically at 485 nm.

- **Ubiquinon (Coenzyme Q10)**

Coenzyme Q10 is analysed on one of our HPLC systems using extraction as pre-treatment.

Depending on the national legislation there are some countries where you need documentation of the declared level of the added substance. Furthermore you need to take samples for analytical control. This is where the Vitamin Competence Centre is able to assist and help you.

## Consider using the Eurofins Vitamin and Amino Acid Competence Centre

The Eurofins group has built a specific network, by developing competence centers all over the world, to specialize in matrices, methods and last but not least knowledge.

The Eurofins Vitamin and Amino acid Competence Centre are dedicated to analyse vitamins, some vitamin-like nutrients and amino acids. This narrow and highly specialized focus enables us to provide a "State of the art" service for our customers helping them to:

- Ensure a safe product
- Improve quality
- Reduce Cost
- Enhance branding

Concentrating all vitamin and amino acid testing at one single location enables us to provide our customers with reliable certification based on internationally recognized reference methods, with very attractive turn-around times and at competitive prices.

Eurofins is not only a laboratory service provider. Our experts offer a partnership with our customers and are pleased to advise on analytical strategies and choice of methods. Our knowledge and experience of legal regulations, product design and quality management is also of value to our customers.



The Vitamin Competence Centre is a team of highly experienced laboratory technicians and expert chemists and we are always there to help our customers.

## We provide high quality

Our quality system is based on DS EN ISO IEC 17025. We use daily control samples including use of reference materials. We participate in proficiency tests being FAPAS, BIPEA, NIST etc. We are always open to customer visits and audits. We have up-to-date equipment and very good facilities and we use semi-automatic and separate production lines.

## We have highly qualified staff

Our Business Manager and Quality Manager are highly experienced and we have very experienced chemists dedicated to ensure that the highest quality standards are being met. We have people in customer support to take care of customer contact and approximately 40 highly skilled laboratory technicians.

## We have highly competitive pricing

Our prices are very much competitive. We are always willing to make customer specific package to be able to provide you with the test you need for analysing. For any queries, questions or specific offers we recommend you to contact your local Eurofins Laboratory.

## We offer low Turn-Around Time

We can offer a low turn-around time and we can also negotiate customer specific turn-around times if needed, but it also depends on how many samples and parameters it concerns. For a specific turn-around time we recommend you to contact your local Eurofins Laboratory.

## We Use a LIMS-system

We are fully integrated on eLIMS, a LIMS system made for Eurofins. The eLIMS cooperate with Eurofins OnLine (EOL). You can get access to EOL and thereby you are able to follow the samples you send for analysis.