



Minerals for  
less Stress



**Dr. Paul Lohmann®**

**High value mineral salts**

[www.lohmann4minerals.com](http://www.lohmann4minerals.com)

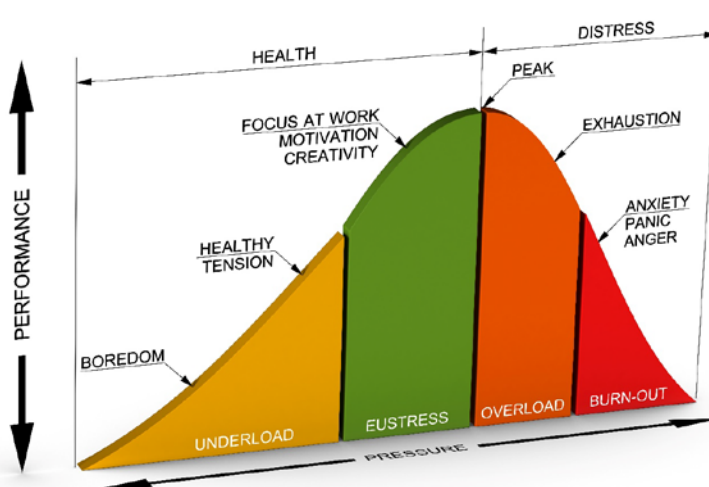
## How Mineral Salts can support the Reduction of Stress

### Definition of Stress

Stress is the term for a high form of strain. In medical and psychological context, stress is known as a physical and psychological reaction of the body to external stimuli to enable the adaptation to changed environmental conditions. This reaction can be in an adequate way and people can deal well with the changed situation. Or it can be inadequate, and lead to physical complaints commonly known as stress symptoms. In stages of life high in stress, necessary body functions are optimized for a fast supply of energy. Heart activity, blood circulation to the organs and muscles and oxygen supply to the brain increases. The immune system and the activity of the sexual and digestive organs decreases at the same time. A large number of factors play a role in the development process of stress. Stressors are, for example, lack of time, high responsibility towards work and family, noise, excessive demands, mental problems and conflicts. Negative stress is jointly responsible for the development of physical and mental complaints, including sleep disorders, high blood pressure, burnout, depressive mood, irritability, gastrointestinal complaints and tinnitus.

### Reaction to Stress

The body reacts to stress with physiological adaptation reactions. In the short term, the catecholamines adrenaline, noradrenaline and dopamine provide appropriate reactions: muscle tone and blood pressure increase, the heart beats faster, and people are more attentive and concentrated. The concentration of adrenaline and norepinephrine in the blood increases very rapidly, resulting in an increase in the organism's performance. During permanent stress, the glucocorticoid cortisol is released from the adrenal cortex into the bloodstream to provide more energy.



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### Effects of Stress on Cortisol Serum Levels

The stress hormone cortisol is necessary for the adaptation of the body to stressful situations. One of the most important functions of cortisol is the hormonal regulation of the salt and water homeostasis in the kidneys. Cortisol is a regulator in the protein and carbohydrate metabolism. Through anti-inflammatory and immunosuppressive effects, cortisol can support the stress management. It maintains or increases blood pressure. Cortisol is also involved in increasing the glucose serum level.

High cortisol concentrations in the blood due to excess stress or a permanent release of cortisol reduce food intake, promote carbohydrate degradation, lead to sleep disorders, and an increase susceptibility to infections. Memory performance is reduced as well. Strong physical or psychological stress leads to strong exhaustion. Excessively high cortisol values also lead to immunological disorders and disturbances in the electrolyte balance, as well as to inflammatory processes. In the course of time, this can lead to the development of severe diseases such as hypertension with a negative effect on kidney function, cardiovascular diseases, cardiac arrhythmia, metabolic disorders, allergies and tumors.

## Stress and Magnesium

Stress hormones stimulate cells to release more magnesium into the bloodstream in exchange for the calcium, which is needed within the cell due to the stress metabolism. This activates the kidneys and the magnesium excess is excreted in the urine. Permanent stress can lead to a magnesium deficiency that can significantly intensify stress symptoms. Magnesium deficiency can therefore become a side effect of an impending burnout.

Magnesium dampens the excitation of the nerve tracts. If there is an undersupply of magnesium due to prolonged stress, the stress resistance is decrease as well. A sufficient magnesium level can inhibit the release of adrenaline and noradrenaline and thus alleviate stress symptoms.

EFSA Health Claims:



- ◆ Magnesium contributes to a reduction of tiredness and fatigue
- ◆ Magnesium contributes to normal energy-yielding metabolism
- ◆ Magnesium contributes to normal functioning of the nervous system (neurotransmission and muscle contraction including heart muscle)
- ◆ Magnesium contributes to normal muscle function (neurotransmission and muscle contraction including heart muscle)
- ◆ Magnesium contributes to normal psychological function

## Stress and Zinc

An insufficient supply with zinc leads to a drop in activity of zinc-depending enzymes. Disturbances of the acid-base balance, increased sodium and water excretion, inadequate oxidative degradation of alcohol and disturbed protein digestion can result as well.

EFSA Health Claims:

- ◆ Zinc contributes to normal cognitive function
- ◆ Zinc contributes to the normal function of the immune system
- ◆ Zinc contributes to the protection of cells from oxidative stress
- ◆ Zinc contributes to normal acid-base metabolism



## Stress and Iron

Iron is a component of important enzyme groups in energy metabolism and plays a central role in the control of oxygen radicals and peroxides. If the body is in an iron deficiency, the supply of energy is fundamentally disturbed.

EFSA Health Claims:



- ◆ Iron contributes to normal cognitive function
- ◆ Iron contributes to normal energy-yielding metabolism
- ◆ Iron contributes to normal oxygen transport in the body
- ◆ Iron contributes to the normal function of the immune system
- ◆ Iron contributes to the reduction of tiredness and fatigue

## Stress and Calcium

If too small amounts of calcium are supplied through food, the stimuli transmission between nerve cells is regulated insufficiently. A strongly excited nervous system results in physical and mental weakness and nervous restlessness.

EFSA Health Claims:

- ◆ Calcium contributes to normal energy-yielding metabolism
- ◆ Calcium contributes to normal muscle function
- ◆ Calcium contributes to normal neurotransmission



## How to find the best Mineral Salt

The choice to the anionic part of a mineral salt is of particular importance. Beside physical and chemical properties like solubility, pH-value and taste, anions have also an influence on the bioavailability and the compatibility. Organic acids promote the absorption of certain cations, like magnesium, calcium, and iron. Citrate, malate and fumarate are part of the citric acid cycle within the human metabolic pathway and are therefore easy to digest. Mineral salts of Dr. Paul Lohmann® are especially designed for the use in food supplements. They fulfill the purity parameters for ready to use food supplements already in the raw material state. These quality parameters were decreed by the European Commission to ensure the constantly high quality and purity of food supplements. Different techniques of particle size engineering like micronization, granulation or microencapsulation is a strength of Dr. Paul Lohmann®. Tailor-made product developments and product adaptations are carried out in close collaboration with the customers.



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## Minerals by Dr. Paul Lohmann® permitted for Fortification of Food and Food Supplements according to EU Regulations

Magnesium		
Magnesium Acetate	Magnesium Potassium Citrate	Magnesium Malate*
Magnesium L-Ascorbate*	Magnesium Gluconate	Magnesium Oxide
Magnesium Bisglycinate*	Magnesium Glycerophosphate	Magnesium Phosphate
Magnesium Carbonate	Magnesium Hydroxide	Magnesium L-Pidolate*
Magnesium Chloride	Magnesium Lactate	Magnesium Sulfate
Magnesium Citrate		
Calcium		
Calcium Acetate*	Calcium Citrate Malate	Calcium Lactate PLUS
Calcium Bisglycinate*	Calcium Gluconate	Calcium Malate
Calcium Carbonate	Calcium Glycerophosphate	Calcium Phosphate
Calcium Chloride	Calcium Hydroxide	Calcium L-Pidolate*
Calcium Citrate	Calcium Lactate	
Iron		
Ferric Ammonium Citrate	Ferrous Fumarate	Ferric Sodium Pyrophosphate
Ferrous Bisglycinate	Ferrous Gluconate	Ferrous Saccharate
Ferrous Carbonate saccharated	Ferrous Lactate	Ferrous Sulfate
Ferrous Citrate	Ferrous Phosphate*	
Ferric Sodium EDTA	Ferric Pyrophosphate	
Zinc		
Zinc Acetate	Zinc Hydroxide Carbonate	Zinc Malate*
Zinc L-Ascorbate*	Zinc Citrate	Zinc Oxide
Zinc L-Hydrogen Aspartate*	Zinc Gluconate	Zinc L-Pidolate*
Zinc Bisglycinate	Zinc Lactate	Zinc Sulfate

\*only permitted for food supplements

A complete overview of all mineral salts including different hydrate forms, granulometries and qualities can be found in the Dr. Paul Lohmann® Product Catalogue: [www.lohmann4minerals.com](http://www.lohmann4minerals.com).

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## Dr. Paul Lohmann®

# Your Competent Partner for High Value Mineral Salts

With over 130 years of producing mineral salts that meet the highest quality standards, we have established ourselves as the leading global supplier to the pharmaceutical, biopharmaceutical, nutritional supplement, food and personal care industries.

### Our Expertise

- ◆ GMP and DIN EN ISO 9001:2015 certified production sites
- ◆ FSSC 22000/ISO 22000 certified
- ◆ Successfully inspected production site in Emmerthal by FDA (U.S. Food and Drug Administration) in the context of FSMA (food safety modernization act)
- ◆ Tailor-made and innovative solutions for customer requests  
Highly qualified experts in R&D lab and application technology with long-term experience and a wide variety of possibilities to develop new products and applications
- ◆ Joint product and application development together with our customers
- ◆ Own manufactured products are exclusively Made in Germany
- ◆ A wide range of more than 400 various mineral salts
- ◆ Products in compliance with the most relevant pharmacopoeias (Ph.Eur., USP, BP), food codices (FCC, E-numbers, etc.) and customer specific requirements
- ◆ Regulatory documentation (CEP, ASMF, etc.)
- ◆ REACH compliance on request
- ◆ Wide range of production equipment
- ◆ Processes according to HACCP
- ◆ Social and environmental standards (DIN EN ISO 50001, Sedex)
- ◆ High purities can be realized under certified requirements

### Modification

- ◆ Physical properties
- ◆ Chemical properties
- ◆ Packaging
- ◆ Labeling

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