A Stable Blood Sugar Level – A Fundamental Prerequisite for a Healthy and Long Life, and Much More

A guest contribution by Dr. med. Liutgard Baumeister-Jesch, April 21, 2026

Blood sugar levels are currently receiving widespread attention, and for good reason: a stable glucose metabolism is an essential prerequisite for healthy aging, disease prevention, and metabolic resilience. Longevity is inconceivable without consistently stable blood sugar regulation. Postprandial glucose spikes should be avoided, as should "protein glycation," which leads in the formation of AGEs (advanced glycation end products), which are highly toxic to blood vessels and neural tissue.
Factors such as vascular health, freedom from micro- and macroangiopathies (vascular changes or diseases), effective weight management, an anti-inflammatory state, physical performance particularly in sports and not least sleep quality, all directly depend on maintaining blood glucose levels that are as stable and non-elevated. In addition, blood sugar regulation also plays a role in the prevention of gestational diabetes. Increasingly, well-informed midwives are recommending micronutrients and plant-derived compounds to pregnant women in order to reduce this risk.
Orthomolecular medicine, in combination with phytotherapeutic compounds, offers significant therapeutic potential in this area.

Briefly summarized

Why is a stable blood sugar level so important for health?
Maintaining a stable blood sugar is central to vascular health, energy production, inflammation regulation, the prevention of chronic diseases, and healthy aging.

What risks arise from blood sugar fluctuations?
Pronounced fluctuations promote oxidative damage, vascular alterations, inflammation, and increase the risk of diabetes, cardiovascular disease, and neurodegenerative processes.

Which micronutrients support healthy blood sugar regulation?
Key nutrients include magnesium, vitamin C, B vitamins, selenium, coenzyme Q10, zinc, and chromium, as they support insulin sensitivity, cellular protection, and metabolic processes.

What role do plant compounds play in glucose metabolism?
Plant compounds such as bitter melon, cinnamon polyphenols, quercetin, and pine bark extract help reduce blood sugar spikes, lower oxidative stress, and improve insulin activity.

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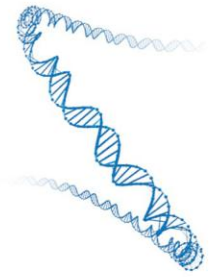

But which combination is reasonable and is efficient?

Vitamin C

Vitamin C is an antioxidant and indispensable for vascular health. It neutralizes superoxide radicals and reduces asymmetric dimethylarginine (ADMA). Moreover, long-term blood glucose markers correlate inversely with vitamin C status which is an invaluable additional advantage for a healthy metabolic profile.

Selenium and Coenzyme Q10

Selenium is an antioxidant essential for mitochondrial health. Ironically, the pancreas, the key organ responsible for blood sugar regulation, becomes depleted of this vitaminoid with age, a process that begins even before the age of 40.

Coenzyme Q10 is anti-inflammatory and therefore vasoprotective effects, among other mechanisms by downregulating NF-kB and increasing the production of Sirtuin1. It is now also recognized as being important for pancreatic protection.

Furthermore, **Q10 and selenium in combination may reduce cardiovascular risk by up to 50%,** thereby helping to mitigate the vascular damage associated with unstable blood sugar levels.

Magnesium

Magnesium deficiency contributes to insulin resistance and reduces glucose utilization.

Polyuria (pathologically increased urine excretion) and acidosis associated with diabetes exacerbate magnesium losses, while CRP levels and inflammation increase. Beyond this, magnesium exerts beneficial psychological effects, including antidepressant properties. It supports energy production and healthy vascular function, particularly in the context of vascular regulation and susceptibility to hypertension.

B Vitamins

Requirements and losses of B vitamins are increased in diabetic metabolic states. Vitamin B1 occupies a particularly important role in carbohydrate metabolism and is especially deficient in diabetes. The type 2 diabetes medication metformin additionally increases the need for vitamin B12. All B vitamins are essential for energy metabolism.

Betaine (a natural derivative of the amino acid glycine), **choline** (formerly known as vitamin B4), and myo-inositol (an important signaling molecule) support healthy homocysteine metabolism and thereby contribute to metabolic and vascular balance. Elevated **homocysteine** is, after all, an independent risk factor for cardiovascular disease and Alzheimer-type dementia.

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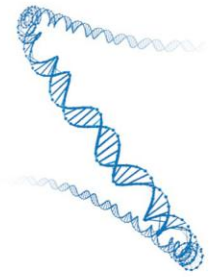

Additional Nutrients

L-arginine supports endothelial health.

Vitamin D3 improves insulin sensitivity and, together with vitamin K2, contributes to vascular integrity.

Zinc modulates insulin synthesis and efficiency, protects insulin structure against oxidative damage, and regulates insulin receptor synthesis.

Chromium activates the insulin receptor and increases its sensitivity to insulin. It has also long been recognized for its rapid effect against food cravings.

Manganese supports glucose availability as well as insulin synthesis and secretion.

Particularly Effective Plant Compounds

Bitter Melon and Cinnamon Polyphenols
These compounds support stable glucose levels and improved insulin action.

Quercetin
Quercetin contributes to protection against oxidative stress, supports NRF2-associated cytoprotective mechanisms, and also demonstrates excellent mast-cell stabilizing properties. NRF2 (Nuclear factor erythroid 2-related factor 2) is a central transcription factor that protects cells against oxidative stress and damage by activating antioxidant and detoxifying genes to maintain cellular homeostasis.

Pine Bark Extract
Pine bark extract may prevent postprandial blood sugar spikes and possesses highly effective antithrombotic and vasoprotective properties.

Counteracting Metabolic Syndrome

This creates a holistic approach through the combination of micronutrients and plant compounds that addresses key mechanisms relevant not only to longevity and athletic performance, but also to prevention and adjunctive therapy in metabolic syndrome and diabetes.

Conclusion

A stable blood sugar level is far more than merely a laboratory parameter, it is a central lever for health, performance, and healthy aging. The diverse interrelationships demonstrate that metabolism, vascular health, inflammation regulation, and energy production are closely interconnected and are profoundly influenced by glucose balance.

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A holistic approach that strategically combines micronutrients and plant-derived compounds provide crucial support in this context. Such an approach not only addresses symptoms, but also targets underlaying fundamental mechanisms such as insulin sensitivity, oxidative stress, inflammation, and mitochondrial function.

It therefore becomes clear, that anyone who takes prevention seriously and seeks to strengthen metabolic resilience cannot ignore the importance of stable blood sugar regulation. It forms the foundation for longevity, physical and cognitive performance, and ultimately for a self-determined, healthy life.

About the Author
Dr. med. Liutgard Baumeister-Jesch is a specialist in psychotherapeutic medicine and a certified micronutrient therapist. Her areas of expertise include functional medicine and, in particular, orthomolecular medicine. For more than 15 years, she has been actively engaged through lectures, seminars, publications, and interviews on the subject of hemopyrrollactamuria (HPU). In 2024, she founded the HPU Institut.

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