

Salt Restriction Promotes Stress by Elevating Cortisol

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STORY AT-A-GLANCE

- › Low-salt diets are often recommended as a tool to avoid certain chronic diseases and protect health, but salt restriction, particularly unprocessed, natural salt, often backfires
- › If you don't consume enough salt, it may lead to elevated cortisol levels in your blood
- › Cortisol, a stress hormone, plays a vital role in your health but can lead to severe health issues like muscle breakdown, inflammation and impaired immune function when chronically elevated
- › In a study involving data from 181 countries, higher salt intake was linked to longer healthy life expectancy and lower overall death rates
- › For optimal health, pay attention to the type of salt you eat and balance it properly with potassium; it's generally recommended that you consume five times more potassium than sodium

Sodium is an essential nutrient for human health. It's crucial for maintaining fluid balance, transmitting nerve impulses and contracting muscles. Sodium is naturally present in many foods, including vegetables, dairy products, meat and seafood. It's also added to processed foods in the form of salt, a compound made up of sodium and chloride ions.

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Cortisol, a stress hormone, plays a vital role in your health but can lead to severe health issues like muscle breakdown, inflammation and impaired immune function when chronically elevated, which is why keeping your levels in check is so important — and why salt restriction can cause far more harm than good.

Low-Sodium Diet Increases Cortisol

Research published in the journal *Steroids* found that following a low-sodium diet decreased cortisol levels in urine.¹ Meanwhile, another study found that increased dietary sodium intake increases cortisol excretion in urine, while total cortisol levels in the blood measured in the morning were slightly lower when participants consumed more salt.² ZeroHedge reported:³

“A study published in Clinical Endocrinology in 2020⁴ showed that an increase in salt consumption leads to a rise in cortisol levels in your urine and lower cortisol levels in your bloodstream. What does this potentially mean?

Restricting your sodium intake may lead to higher levels of circulating cortisol.”

As noted Georgi Dinkov's blog, which is inspired by the work of the late Ray Peat, “Once again, what we are told by medicine is healthy (e.g. salt restriction) turns out to be anything but.”⁵

“There is now evidence that salt restriction may not only be contributing to the stress response (HPA [hypothalamic-pituitary-adrenal] axis) but severe sodium restriction (as advocated by most doctors for people with blood pressure, diabetes, CVD [cardiovascular disease], CKD [chronic kidney disease], etc.) may be able to trigger the stress response ‘de-novo’ — i.e., in the absence of any stressful external/internal stimuli. How does salt restriction achieve that ‘feat’? Simple — by elevating cortisol levels.”

Another 2020 study, published in The Journal of Clinical Investigation Insight, revealed that on a high-salt diet, there was an increased excretion of glucocorticoids, which include cortisol. This suggests that a high-salt intake triggers your body to release more cortisol and other stress-related hormones, which are then excreted in higher amounts in urine.⁶

In another example, a study published in The Journal of Clinical Endocrinology and Metabolism in 2003 found, “In healthy subjects, dietary salt loading increases and sodium restriction decreases urinary free cortisol excretion” and “changes in cortisol metabolite excretion after salt loading were accompanied by a decrease in plasma cortisol concentration.”^{7,8} To Extract Knowledge from Matter explains:⁹

“Now, the study found that restricting salt intake decreased urinary cortisol excretion and this is what led to increase in the blood cortisol concentrations.

However, I am not convinced this is the whole story considering the fact that salt restriction is known to increase adrenaline release (a known stimulator of ACTH [Adrenocorticotrophic hormone] and thus cortisol), and such it is likely that the elevation of blood cortisol was due to sodium restriction both increasing cortisol synthesis/release from adrenals and decreasing cortisol excretion.”

The Problem with Elevated Cortisol

Many people think of cortisol simply as a stress hormone, but that is not its primary role in your body. Cortisol serves as your body’s protective mechanism to keep your glucose levels from dropping dangerously low, preventing you from going into a hypoglycemic coma and dying.¹⁰

However, its mechanism of action contributes to its long-term consequences and makes elevated cortisol levels undesirable. It is also one of the factors that made me radically revise my recommendations about [low-carb diets](#).

In a previous [interview about cortisol](#) and its association with carbohydrates and glucose, Georgi Dinkov, who is an expert on Peat’s work, an author and pioneer in

nutrition, bioenergetic medicine, environmental factors and regenerative processes, commented:

"I think there's hardly a chronic condition where you don't see cortisol implicated, and usually, in the majority of cases, it is elevated cortisol, not low cortisol. In fact, the only situation in which low cortisol becomes problematic is probably Addison's disease, which is adrenal failure. And that's very rare.

Studies as far back as the 1950s and '60s demonstrated that you can produce every single phenotype of aging if you inject cortisol, or at least create a state of relative glucocorticoid excess in the animal. So, you can do it either by injecting synthetic or natural glucocorticoids, or you can do it by reducing the levels of the natural anti-cortisol steroids in the body."

Elevated cortisol has harmful catabolic effects, meaning, muscles can get wasted away slowly over time. It's also damaging to brain tissue and contributes to brain atrophy seen in dementia and depression.¹¹ Elevated cortisol also accelerates aging,¹² a fact not widely recognized in the longevity community and uses up stored fat in a process called lipolysis. This process increases reductive stress and your body's ability to create cellular energy.

While this may sound like a great thing, the problem is that it doesn't get rid of the harmful visceral fat found around your internal organs that causes inflammation. So, ultimately, chronic excess cortisol is going to cause inflammation and impair your immune function, while breaking down your body tissues.

Maintaining health as you age requires building healthy tissues, but chronically high cortisol levels hinder this process. Moreover, cortisol even stimulates the release of neurotransmitters that trigger food cravings,¹³ increasing the risk of unhealthy eating habits. For help with elevated cortisol, read my [key strategies to reduce your cortisol levels](#).

More Reasons Why Low-Salt Advice Backfires

Your body strives to maintain an optimal level of sodium regardless of your intake, signifying its importance to health and vitality. Your body uses magnesium and calcium levels to control your sodium level. As your intake declines your body begins to pull sodium from your bone, and at the same time pulls out magnesium and calcium.

James DiNicolantonio, Pharm.D., author of “The Salt Fix,” who is also the coauthor of my book, “Superfuel: Ketogenic Keys to Unlock the Secrets of Good Fats, Bad Fats, and Great Health,” explains that the rise in high blood pressure, obesity and diabetes that began in the early 1900s parallels a reduction in salt intake, and low-salt diets are likely implicated in chronic disease like osteoporosis.¹⁴

“There is a large fraction of body sodium deposited in the bone, suggesting that bone might serve as a sodium reservoir, which is mobilized during homeostatic stress. Salt also has a crucial role in maintaining positive magnesium and calcium balance.

If a reduction in serum sodium occurs, the bone may be stripped of sodium (as well as magnesium and calcium) to maintain normal serum sodium levels. Indeed, a low-salt diet has been shown to lead to negative calcium and magnesium balance, which could result in osteoporosis. Thus, a low-salt diet may cause osteoporosis by stripping the bones of sodium, calcium, and magnesium.”

Further, according to DiNicolantonio, reducing your salt intake may, indeed, lower your blood pressure, but it can also worsen your total cholesterol to high-density lipoprotein (HDL) ratio, a better heart disease predictor than low-density lipoprotein (LDL). Triglycerides and insulin levels also increase, ultimately raising your heart disease risk despite better blood pressure readings.

Low-Salt Intake Causes Heart Problems, While Higher Salt Intake Increases Longevity

Additionally, salt deficiency can lead to insulin resistance because your body raises insulin levels to preserve salt, as higher insulin helps your kidneys retain more salt. Insulin resistance, in turn, is a hallmark of heart disease and most chronic diseases. DiNicolantonio and colleagues explained in the American Journal of Medicine:¹⁵

“There is evidence that a low-sodium diet may lead to a worse cardiovascular prognosis in patients with cardiometabolic risk and established cardiovascular disease.

Low-sodium diets may adversely affect insulin resistance, serum lipids, and neurohormonal pathways, leading to increases in the incidence of new cardiometabolic disease, the severity of existing cardiometabolic disease, and greater cardiovascular and all-cause mortality.

Although a high sodium intake also may be deleterious, there is good reason to believe that sodium intake is regulated within such a tight physiologic range that there is little risk to leaving sodium intake to inherent biology as opposed to likely futile attempts at conscious control.”

It’s also revealing that a New England Journal of Medicine study found those with the lowest risk for heart problems or death from any cause were consuming three to six grams of sodium a day¹⁶ — far more than U.S. daily recommended limits.

In another revealing study, researchers analyzed data from 181 countries on average salt consumption and compared it to healthy life expectancy at birth and age 60.¹⁷ Higher salt intake was linked to longer healthy life expectancy and lower overall death rates. According to the researchers:¹⁸

“Our observation of sodium intake correlating positively with life expectancy and inversely with all-cause mortality worldwide and in high-income countries argues against dietary sodium intake being a culprit of curtailing life span or a risk factor for premature death.”

The Importance of the Sodium to Potassium Ratio

The type of salt matters when it comes to its role in your health, and so does its relationship with potassium, a naturally occurring mineral your body uses as an electrolyte. It's generally recommended that you consume five times more potassium than sodium, but most Americans get the opposite ratio, eating two times more sodium than potassium.

If you eat a lot of processed foods, which contain processed table salt, your sodium to potassium ratio is likely out of balance. While conventional health care practitioners may suggest you remedy this by limiting salt intake, focusing on increasing potassium is key. Research shows an association between higher potassium intake and lower blood pressure, regardless of sodium intake.¹⁹

Even the American Heart Association explains, “Foods with potassium can help control blood pressure by blunting the effects of sodium. The more potassium you eat, the more sodium you process out of the body.”²⁰ Examples of potassium-rich foods include:²¹

Spinach	Broccoli	Beet greens
Oranges	Coconut water	Tomatoes
Yogurt	Winter squash	Cantaloupe

In addition to increasing your potassium intake, it’s possible to improve your sodium to potassium ratio just by switching the type of salt you eat – from table salt to natural varieties such as pink Himalayan. In the U.S., the majority of salt that’s consumed comes from processed foods. This processed salt contains 97.5% sodium chloride, with about 39% sodium.

Natural salt, however, is higher in potassium than processed salt. Compared to iodized white table salt, which contains 151.68 milligrams per kilogram (mg/kg) of potassium, pink Himalayan salt contains 2,085.71 mg/kg.²² If you're unsure how much sodium or potassium you’re consuming, use a food tracking app such as [Cronometer](#), which allows you to enter the foods you eat and calculate your sodium to potassium ratio automatically.

How Much Salt Is Ideal?

Your body has a built-in “salt thermostat” that lets you know how much you need by regulating your craving for salt. It’s a good idea to listen to your body and, if you’re craving salt, consume more. If you sweat profusely, either through exercise or sauna use, for example, or drink caffeinated beverages, you automatically will need more salt than usual.

A number of medical conditions can also increase sodium loss or prevent your body from absorbing salt well. This includes inflammatory bowel diseases, sleep apnea, adrenal deficiency, bariatric surgery, kidney diseases, hypothyroidism and celiac disease. So, if you have any of these, you may need a bit more salt in your diet to compensate.

That said, DiNicolantonio recommends eating about 3,500 mg of sodium daily,²³ which is far more than the American Heart Association’s recommended maximum limit of 2,300 mg a day, and their “ideal limit” of less than 1,500 mg a day.²⁴

If you’re not sure whether you’re eating the right amount of salt for your body, you can also get a fasting chemistry profile that shows your serum sodium. As a general rule, your ideal sodium level is 139, with an optimal range of 136 to 142. If it is much lower, you probably need to eat more natural salt. If it’s higher, you’ll likely want to restrict your processed salt intake.

There are also some salt-sensitive subpopulations that may need to limit their salt intake to 2,300 mg per day. This includes those with:

- Endocrine disorders
- High aldosterone levels
- Cushing’s syndrome
- Elevated cortisol
- Liddle syndrome, a rare condition affecting about 1 in 1 million individuals, causing them to retain too much salt. If treated with amiloride, salt intake probably does not

need to be restricted

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