

Is a Powerhouse Nutrient Hiding in Plain Sight?

WE ALL HAVE a substance circulating in our blood that appears to have great importance for our long-term health outcomes and life expectancy. Unfortunately, most people have never heard about it and little attention is paid to it.

This substance, called ergothioneine (ERGO), is an amino acid with a unique structure that makes it both an antioxidant and an anti-inflammatory agent. Both properties are important to our long-term health because most chronic diseases of aging are caused by oxidative stress and/or inflammation.

ERGO attracted little attention until 2005 when a German biochemist discovered the ergothioneine transporter that is present in all mammals, including humans. It rapidly pulls ERGO out of our food and into our red blood cells that distribute it to all the tissues of the body where it accumulates in tissues that are under the most oxidative stress. This discovery indicated that ERGO could play an important role in our health, and this has encouraged more scientists to investigate ERGO.

Recently, renowned biochemist Bruce Ames hypothesized that ERGO should be considered a longevity vitamin because a shortage of it in the diet would result in cumulative negative health outcomes that can lead to premature aging. Mounting scientific evidence supports this concept. For example, ERGO content in our blood declines as we age and declines faster in people with some degenerative diseases

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This essay first appeared on IFT.org. To join an online discussion on this topic, IFT members can visit ift-connect.org/ERGO, or scan the QR code below.




of aging like Parkinson's Disease, cognitive impairment, and frailty. A recent study in Sweden involving over 3,200 people consuming a healthy diet sought to identify any blood plasma metabolites that could predict a lower risk of cardiovascular disease (CVD) and decreased mortality. Out of the 112 metabolites measured, ERGO levels were the most strongly associated with reduced mortality and CVD. The authors proposed that raising ERGO levels in blood via a diet high in ERGO may well reduce CVD and mortality.

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ERGO is made in nature exclusively by fungi and a few other microbes, so humans need to obtain it from their diet. Since mushrooms are the fruiting bodies of fungi, they are by far the leading dietary source of ERGO. Hence, it became a focus of our research at the Center for Plant and Mushroom Foods for Health at Pennsylvania State University. However, because of low mushroom consumption in the United States, we became concerned about how Americans obtain ERGO from their food. A recent study estimated how much ERGO is consumed in the United States and four European countries, and we found that Americans appear to consume the least (about 1 mg per day), while Italians consume the most (almost 5 mg per day). The data also revealed a positive association between ERGO consumption

and life expectancy and a negative association with mortality due to some chronic diseases of aging.

We hypothesized that ERGO gets into our food supply by soil-borne fungi passing it on to crops through their roots. Healthy populations of fungi in our agricultural soils would be critical in producing crops with significant levels of ERGO. Through collaborations with soil scientists, we discovered that some conventional farming practices, such as aggressive tillage (plowing) of the soil, appear to disrupt fungal networks in the soil and significantly reduce the ERGO content of crops. Elimination or reduction of tillage is the hallmark of a growing movement referred to as regenerative farming, and we believe that other regenerative practices that promote healthy fungal populations in farm soils may also increase ERGO in our food supply.

Many in the agricultural research community have come to believe that there is a connection between soil health and human health but have not identified such a connection. We believe that ERGO may well be a definitive connection. Understanding how we can increase ERGO content in the American diet could be transformative in improving our long-term health outcomes. 

The opinions expressed in Dialogue are those of the author.

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