

LINUS PAULING INSTITUTE

DIGITAL DIGEST

SUMMER/FALL 2024

A SPECIAL EDITION OF OUR TOP 10 BROCHURE! LOOK INSIDE >

TOP 10 MICRONUTRIENTS FOR AGING WELL

Background and Introduction to the *Top 10 Project*

In April 2024, the Linus Pauling Institute presented the webinar [*Aging Well: The Top 10 Micronutrients for Optimal Health*](#). During the webinar, Dr. Emily Ho presented a preview of our new *Top 10 Project*, featuring the Top 10 brochure and handouts outlining nutritional approaches to bone health, brain health, and supporting a healthy immune system.

Here, we provide an overview of this project, followed by a selection of audience questions answered by experts from the Institute. As always, the webinar video recording is available on our YouTube channel, and the *Top 10 Project* can be found [on our website](#).

What is the *Top 10 Project*?

Twenty-seven vitamins and minerals are needed to maintain good health. Fortunately, we can get most of these nutrients by consuming a variety of minimally processed foods and beverages.

Experts at the Linus Pauling Institute have identified the 10 nutrients that warrant extra attention because most people in the United States simply don't get enough of them. Paying attention to these nutrients becomes increasingly important as we age

We call these nutrients the **Top 10 Micronutrients for Aging Well** – or, simply, The Top 10: calcium, magnesium, potassium, zinc, and vitamins B₆, B₁₂, C, D, E, and K.

All of these micronutrients can be found in food. Plant-based foods like fruits, vegetables, nuts, beans, and whole grains represent some of the best sources of nutrition, but meat, fish, and dairy are also good micronutrient sources. While regularly consuming a wide variety of plants would help reduce the prevalence of many micronutrient shortfalls, it can not address all of them.

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Oregon State University
Linus Pauling Institute

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Emily Ho, PhD
Endowed Chair and Director,
Linus Pauling Institute

FROM THE DIRECTOR

In this issue, we unveil the *Top 10 Project* – a collaborative effort between the Linus Pauling Institute and the Oregon State University Extension Service.

The *Top 10 Project* was first introduced in [Aging Well: The Top 10 Micronutrients for Optimal Health](#). In that webinar, I reviewed how we selected the nutrients on the Top 10 list and moderated a Q&A with experts from the Institute.

This issue of the *LPI Digital Digest* summarizes that webinar and presents some of the best questions from the Q&A (see cover and pages 4 and 5). The full webinar recording can be found on our YouTube channel.

After the webinar, we provided all webinar registrants with a draft copy of our Top 10 brochure. As a bonus to you, the micronutrient information from the final version of the brochure is included in this issue (see pages 6 and 7).

The information from the *Top 10 Project* will come in stages. We will soon be adding information about bone health, cognitive health, and immunity. Monitor the [Top 10 Project website](#) or sign up for our emails to learn when these will be released.

In other news, the next installment of the LPI webinar series is coming very soon! Dr. Richard Bruno will present [Steeping Heart Health with Green Tea: Insights from Lab to Lifestyle](#) on August 28 at 9:30 a.m. Pacific Time (see below).

Bruno is an LPI alumnus who previously worked with Dr. Tammy Bray and Dr. Maret Traber and has expertise in vitamin E, vitamin C, metabolic syndrome, and the applications of green tea. Online registration is required to watch this webinar, and it gives you an opportunity to submit your questions about green tea for our speaker.

As with all our webinars, you can watch the recording on our YouTube channel shortly after the live event ends.

Lastly, the Linus Pauling Institute has responded to the latest controversial article about multivitamins and mortality. Long story short, there's still no reason to throw away your multivitamin supplements (see page 4).

I hope you enjoy this issue. The next issue of the *LPI Research Newsletter* will be coming this fall!

STEEPING HEART HEALTH WITH GREEN TEA:

Insights from Lab to Lifestyle

August 28th, 2024

12:30 PM Eastern / 9:30 AM Pacific

Register online at: lpi.pub/GreenTea



Oregon State University
Linus Pauling Institute



Richard S. Bruno, PhD, RD
Professor and Chair,
Human Nutrition Program
The Ohio State University



MEDITERRANEAN DIET Q&A

In February, Dr. Francesco Visioli from the University of Padua, Italy, was featured in a webinar titled [*Living Better, Longer: Healthy Compounds Found in a Mediterranean Diet*](#). In his presentation, Visioli described the basics of the Mediterranean diet: a plant-forward eating pattern with low amounts of processed foods and the use of olive oil—a common dietary component throughout the Mediterranean region.

With that in mind, Visioli focused on the benefits of olive oil and gave practical messages on how to choose a good source. The underlying message was that consuming any good-quality olive oil would be a beneficial addition for health.

During and after the webinar, more questions were asked than could be addressed at the time. Below, Visioli answers some of those questions.

Where in the Mediterranean region does the “Mediterranean diet” originate?

This diet pattern was common in southern Italy in the late 1950s, when it was first described by the American physiologist Dr. Ancel Keys. Although it used to be more widespread, this eating pattern is disappearing from many areas within the Mediterranean region.

Are there any weaknesses in the Mediterranean diet?

The most common weakness is eating too many calories, even from healthy food. Watch your caloric intake.

How much olive oil would you recommend consuming daily?

Olive oil is healthy yet high in calories, as are all fats, so use it in moderation. Pick a high-quality one that fits your budget. Replace other oils with extra virgin olive oil, but do not use it as a dietary supplement.

What does “extra virgin” mean for olive oil? Are there harmful residual solvents in these oils?

Extra virgin olive oil is made from the first cold pressing and tends to contain the most beneficial and flavorful plant compounds. It must have a free acidity lower than 0.8% and be free of flavor defects.

Solvents are illegal in processing virgin olive oil, but that is not the case for more refined olive oils.

Can the Mediterranean diet be followed by the average American?

It's easy to follow a Mediterranean diet in the United States if you center your diet on fruits, vegetables, beans, and lentils, and consume high-quality olive oil instead of other fats.

What type of bottle is best for storing olive oil?

More research is needed on this question, but the evidence suggests that metal (aluminum) is better than glass, and glass is better than plastic for keeping out light and oxygen.

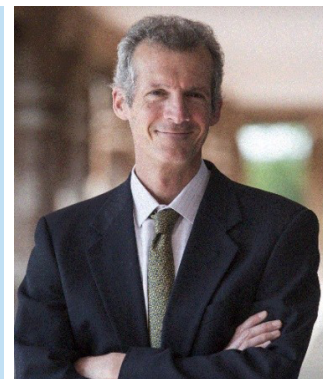
However, no matter what container you use, how you treat your oil will have the biggest impact. Storing your oil in a cool and dark environment is best for maintaining oil quality. Also, minimize its contact with air.

Olive oil is best consumed within one to two months of opening. After that point, the container material becomes less significant.

How can I find a good olive oil?

Ideally, you could taste it first. Seek olive oils with flavor and pungency. Flavors described as artichoke, tomato leaf, cut grass, buttery, floral, peppery, or tropical are signs of good quality.

If it's flavorless, it's likely more refined and not likely to have the beneficial compounds that make olive oil unique. 🌿



Francesco Visioli, PhD, is an international leader in the study of olive oil and health. His research group discovered the biological and pharmacological properties of several phenolic compounds from olive oil, including hydroxytyrosol.

The recording of this webinar featuring Visioli can be found on YouTube at:

[Ipi.pub/MedDiet2024](https://www.youtube.com/watch?v=Ipi.pub/MedDiet2024)

Continued from Cover

It is always better to get micronutrients from unprocessed or minimally processed food. Whole foods contain a variety of phytochemicals and essential macronutrients, such as fiber, essential fats, and essential amino acids, which are beneficial for health.

Conversely, ultra-processed, shelf-stable packaged foods, such as protein bars, energy drinks, and foods with a lot of preservatives and additives, should be minimized. Although these foods often have vitamins and minerals added to them, they can not provide the full range of nutritional benefits of whole foods.

Dietary supplements also have their place. Some nutrients are more bioavailable from a supplement than from food. For example, vitamin B₁₂ is better absorbed from supplement sources or fortified foods.

This is especially important as we get older because natural, age-related changes in the body can reduce the absorption, storage, and distribution of some nutrients.

These changes can be subtle and occur earlier than most people think, often starting around age 50. Thus, a goal of the *Top 10 Project* is also to highlight increased nutrient needs in older adults.

What information is available?

At the heart of this project is a brochure describing the Top 10 micronutrients for aging well, the foods that contain them, and the Institute's recommendation for a daily multivitamin. The information on vitamins and minerals from this brochure is provided on pages 6 and 7 of this issue.

Our website's *Top 10 Project* page also has an alternate version of the Top 10 brochure with more detailed information. While it is intended as a reference for healthcare and nutrition professionals, it may interest those seeking more in-depth information.

The health professional version contains the LPI recommendations for each nutrient based on sex and age. If you want to know the LPI recommendations for micronutrients beyond the Top 10 list, we suggest you view our [Micronutrients for Health](#) series for both vitamins and minerals.

As part of this project, we will soon release additional documents highlighting the connections between micronutrients and health.

The *Top 10 Project* will continue to expand in the future. Keep an eye on our [Top 10 Project webpage](#) for new documents as they become available. 🌐



Multivitamins and mortality: is there a connection?

Back in June, authors from the National Institutes of Health published [an analysis of multivitamin use and mortality risk](#) in the journal *JAMA Network Open*. Their conclusion was that multivitamin use was not generally associated with risk of death.

However, one part of their analysis showed that multivitamin use was associated with an increase in all-cause mortality at an early time point. Although this association was not seen at other time points, a flawed conclusion ("multivitamins causes you to die early") was unfortunately amplified by certain media groups.

Thankfully, this correlation is no cause for alarm.

The experts from the Linus Pauling Institute reviewed the article and provided a detailed rebuttal on our LinkedIn page. In short, the published study cannot determine cause and effect – correlation is not causation! Instead of focusing on mortality, we suggest that future studies focus on quality of life.

As always, we will continue to advocate for more informative scientific studies on multivitamins because we stand by their potential benefits for health. Read our full rebuttal at: lpi.pub/MultiStudy24 🌐

TOP 10 Q&A FOLLOW-UP

More Audience Questions Answered From Our Top 10 Webinar

How were the micronutrients on the Top 10 list selected?

Data from national surveys show what people eat in the United States. Compared to the LPI recommendations, they reveal that many adults, particularly those over 50, fall short of certain nutrient goals.

However, dietary surveys don't consider things like nutrient absorption. Specific nutrients for which absorption issues are common have also been included on the Top 10 list.

A great example is vitamin B₁₂. Although the amount of vitamin B₁₂ in the diet is not often an issue for people who eat meat, people on certain medications and adults over 50 can have trouble absorbing this vitamin from food.

So many women have low iron levels. Why is iron not listed in the Top 10?

The Institute's nutrition experts consider iron an "honorable mention" nutrient but decided not to include it in the Top 10. Most adults consume adequate amounts of iron.

Iron needs are increased for women of childbearing age due to regular blood loss through menstruation. Some women in this age group may need iron supplements to prevent anemia. In general, men and post-menopausal women do not need iron supplements and should not take them unless directed by a healthcare professional.

Are there any micronutrient combinations that should be avoided?

Interactions are not usually a problem when combining vitamins or minerals, since it happens naturally when we eat food. Typically, interactions only happen when people take very large supplemental doses.

The most common absorption issues occur with minerals. Taking a calcium supplement with food, for example, can inhibit the absorption of magnesium and iron. So, it is best to take a calcium supplement separately from meals or other mineral supplements.

A similar problem occurs with high zinc supplementation. Regular intake of more than 40 mg of zinc per day can inhibit copper absorption.

How do you know if you fall short in a particular nutrient?

The most accurate method involves analyzing your usual intake using a diet-tracking app or an online program. This is time-consuming, but it provides the most details.

It is easier to assess if your daily diet includes several servings of foods or beverages rich in the nutrient(s) of concern. This is especially important for calcium, magnesium, and potassium, as a daily multivitamin alone is often inadequate to help you meet your needs for these particular minerals.

If you think you need more of a particular vitamin or mineral, a healthcare provider can use blood tests to determine your status for many, but not all, micronutrients.

What are the best foods to eat?

As the Top 10 brochure and the Micronutrient Information Center show, many foods, such as broccoli, almonds, beans, sweet potatoes, and yogurt, are good sources of several vitamins or minerals.


It is difficult to make general food recommendations because everyone has different eating preferences. Just because a particular food is a good source of nutrients doesn't mean it is a good choice for your diet. Other factors besides nutrition, such as flavor, cost, and culture, also come into play.


































Can you recommend a brand of multivitamin?

It is against our policies to recommend a specific supplement brand. We suggest choosing any well-known multivitamin brand that contains most of the essential vitamins and minerals in moderate amounts.


When selecting any supplement, look for those that have third-party verification testing. This is when the manufacturer sends the supplement to an independent laboratory to determine if the amount of each nutrient in the dietary supplement matches the label and that the supplement is free of contaminants.


If a product is tested, a verification logo can sometimes be found on the product label. Other times this verification can be found on laboratory websites.


This is not a perfect system. This service is expensive, and only some companies can afford to send each of its products for testing. However, even if the supplement you choose has yet to be tested, selecting products from a company that submits at least some supplements for testing can provide some general assurance. 


Vitamins		How can I get more?	What else should I know?	How does it support my health?
Vitamin B ₆		Eat meat, poultry, fish, nuts, bananas, and potatoes.	You might need more vitamin B₆ if you have an inflammatory condition like rheumatoid arthritis. Talk to your doctor if you are concerned.	   50+
Vitamin B ₁₂		Eat meat, poultry, fish, eggs, and dairy, such as milk, cheese, and yogurt.	Ask your doctor to check your vitamin B₁₂ status if you take antacids, stomach acid-lowering drugs, or metformin. If you are over 50, make sure you get vitamin B₁₂ from a multivitamin, another supplement, or fortified foods.	  50+
Vitamin C		Eat berries, citrus fruit, kiwifruit, bell peppers, Brussels sprouts, and broccoli.	Don't overcook your fruit and vegetables – doing so will destroy the vitamin C in them.	      50+
Vitamin D		Eat salmon, fortified dairy products, and “vitamin D mushrooms.” Or get some midday sun on your skin.	Ask your healthcare provider to check your vitamin D blood levels to make sure you are getting enough. In the winter, there may not be enough sunlight for your skin to produce vitamin D .	     50+
Vitamin E		Eat avocados, olives, nuts, seeds, vegetable oils, and green leafy vegetables, such as kale and spinach.	Eating green leafy vegetables with fat or oil can help your body absorb more vitamin E .	   
Vitamin K		Eat kale, chard, broccoli, spinach, lettuce, parsley, and fermented foods, such as yogurt and kimchi.	If you are on the blood thinner warfarin, talk to your doctor to see how much vitamin K is right for you.	   50+
Minerals				
Calcium		Drink milk, fortified plant milks, and fortified juices. Eat cheese, yogurt, sardines, broccoli, and almonds.	Multivitamins don't have much calcium . It is best to eat foods and drink beverages high in calcium , but you can also take a calcium supplement.	  50+
Magnesium		Eat broccoli, beans, nuts, seeds, spinach, and whole grains, such as quinoa and whole-wheat bread.	Multivitamins don't have much magnesium . It is best to eat foods with magnesium , but you can also take a magnesium supplement.	   50+
Potassium		Eat potatoes, dried fruit, spinach, beans, bananas, squash, and yogurt. Drink fruit and vegetable juices.	Multivitamins do not have much potassium , and extra potassium supplements are not recommended. Stick with foods high in potassium .	  
Zinc		Eat meat, poultry, shellfish, nuts, yogurt, eggs, cheese, beans, lentils, and whole grains, such as oats and quinoa.	Soak and rinse your dried beans and grains in water before cooking to increase the amount of zinc you get from them.	  50+


Icon Legend


 Heart health


 Brain health

 Immune health

 Muscle and nerve health

 Bone health

 Wound healing

 Skin health

50+ If you are age 50 or older, you'll need more of this nutrient.

2025 Diet & Optimum Health Conference

SAVE THE DATE!

September 9 – 10, 2025

More information at lpiconference.org



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