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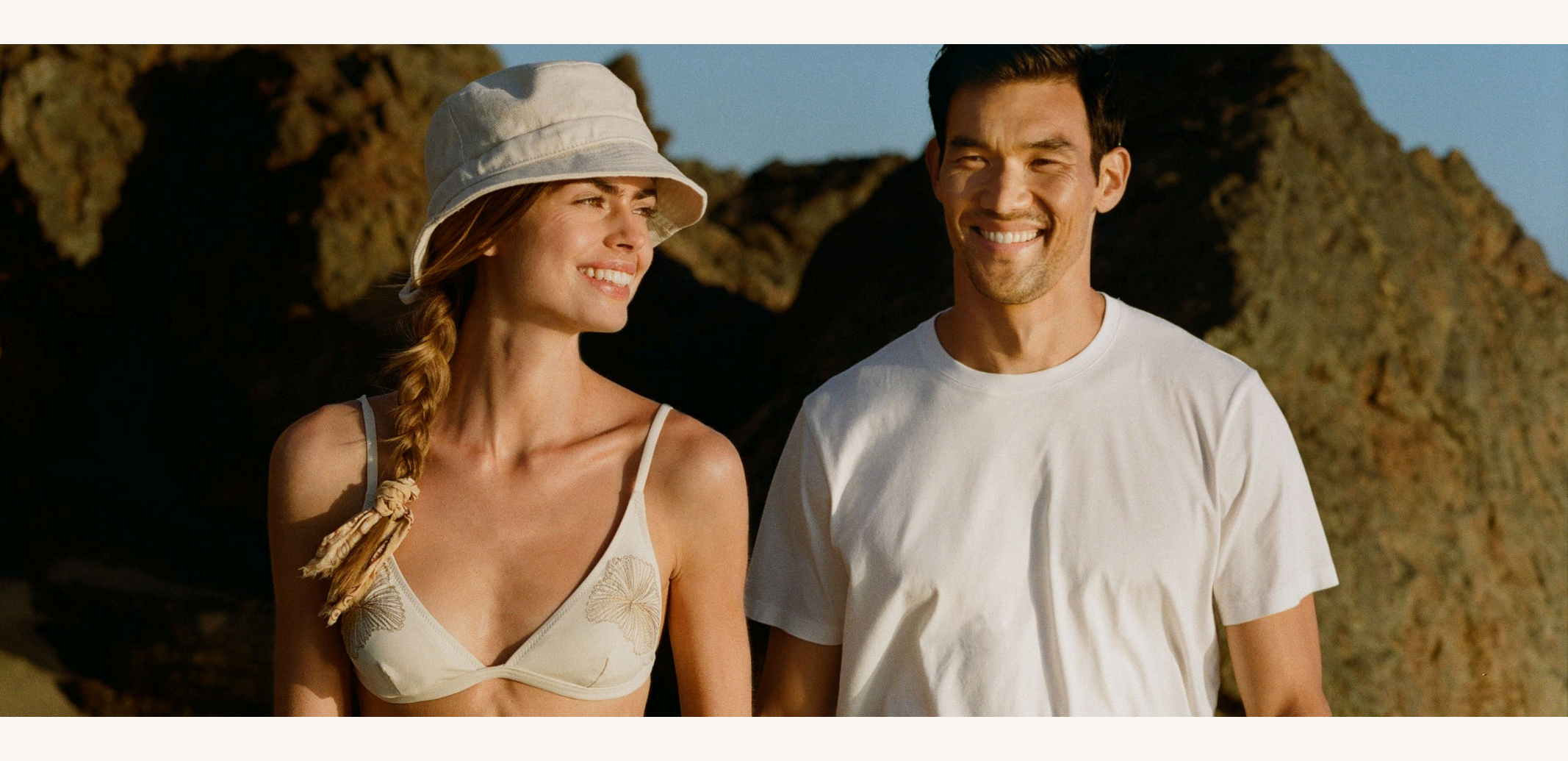
C15:0 Science Round-Up Series: Population Studies

September 14, 2025



Welcome to Issue 148 of Science Says! Our weekly newsletter where you'll learn the latest healthy aging and C15:0 research news that our team of doctors, scientists, and experts are most excited about—without having to go search for it.

Eric and Steph
Co-Founders, Doctors, Nerds

What Dr. Stephanie Venn-Watson, our co-founder and author of *The Longevity Nutrient* and over 80 peer-reviewed scientific publications, is reading.

HEALTHY AGING

A Preponderance of Evidence Across Populations

It's back to school time, so we thought, what better time to do a Round-Up Series on what makes C15:0, well, so science-backed? In this series, we will cover the following six key topics on C15:0:

- **Mechanisms of Action:** How C15:0 works
- **Optimal Effective Levels & Daily Intake:** C15:0 bioavailability and amounts needed to achieve active levels
- **Cell-Based Efficacy:** What C15:0 does at the cellular level
- **In Vivo Efficacy:** What C15:0 does at the whole-body level
- **Epidemiological Studies:** People who have higher levels of C15:0 have healthier ________ (we'll fill in the blanks)
- **Clinical Trials:** Randomized controlled clinical trials with C15:0

What makes the science behind C15:0 so robust is its consistency across all six topics above - including 100+ studies across numerous independent research teams throughout the world. We'll also share how C15:0 study outcomes - from its mechanisms of action to clinical trials - are intricately interlinked.

Last week, we covered seven peer-reviewed publications on ***controlled clinical trials, which support C15:0's role in promoting our liver, red blood cell, vascular, skin, and mood health.*** This week, we summarize the evidence of similar C15:0 health benefits when we look across populations.

Tens of thousands of people tracked for decades.

There are a slew of studies where people's C15:0 levels and their health have been tracked over time. These are also called prospective cohort studies. And there have been so many of these studies, that there are now meta-analyses (aka studies of studies) that lead to the following conclusions:

People with higher C15:0 levels have better long-term health, especially:

- Heart health
- Metabolic health

Additionally, studies have shown that people with higher C15:0 levels also have better:

- Liver health
- Red blood cell health
- Mood health

... and even a **younger biological age**. Below are highlighted findings in each of these areas.

Let's get to the heart of C15:0.

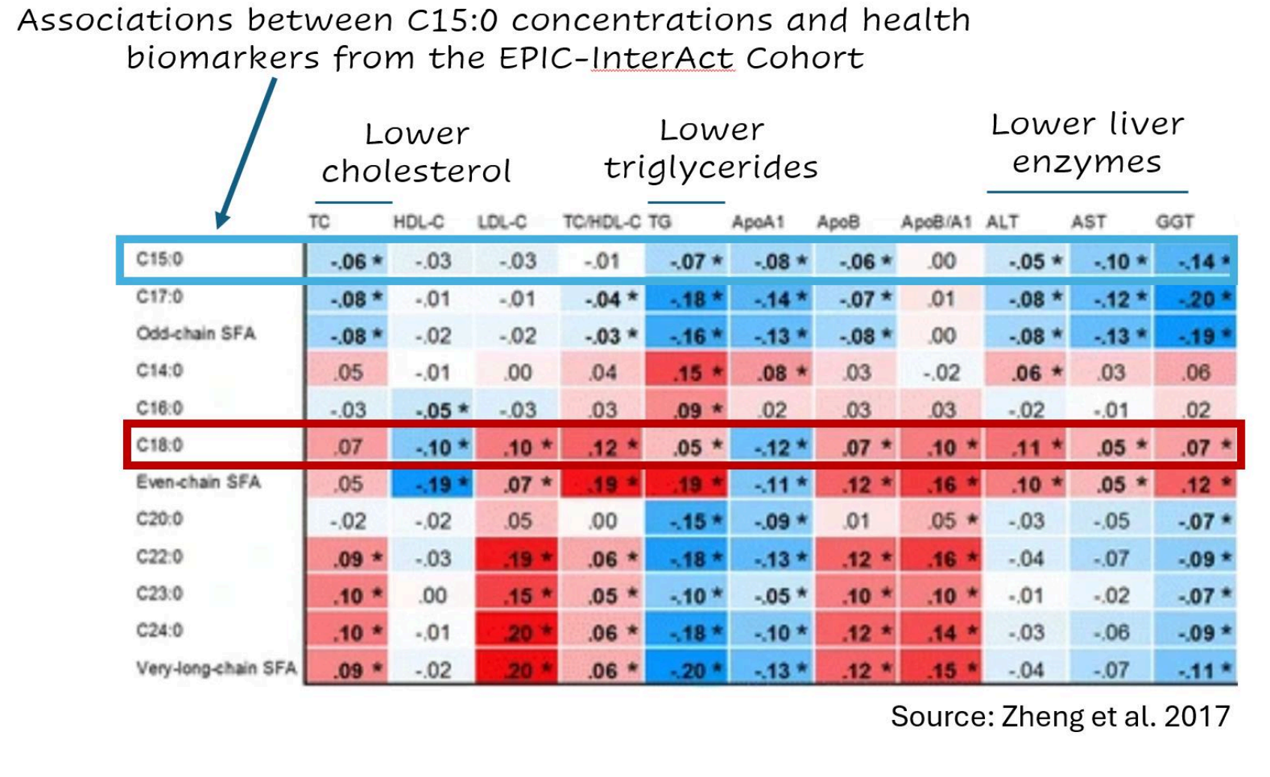
In their meta-analysis including 14 prospective cohort studies following 26,772 people, Li et al. found that people with higher C15:0 levels are 17% more likely to keep their long-term heart health.

This aligns with the Arghavani et al. crossover clinical trial we shared last week, where raised dietary and circulating C15:0 levels were linked to improved vascular function.

Similarly, other population-based studies have shown that higher C15:0 levels are linked to:

- Lower cholesterol, triglyceride, and liver enzyme levels, as shown by Zheng et al. (see below).
- Healthy blood pressure, shown by Chen et al. and Huang et al. in both adults and children.

Importantly, these studies showed the opposite was for even-chain saturated fatty acids, like C16:0 and C18:0, where higher levels were consistently associated with poorer biomarkers of heart health (see below).



Associations between C15:0 concentrations and health biomarkers from the EPIC-InterAct Cohort

	Lower cholesterol				Lower triglycerides				Lower liver enzymes		
	TC	HDL-C	LDL-C	TC/HDL-C	TG	ApoA1	ApoB	ApoB/A1	ALT	AST	GGT
C15:0	-.06 *	-.03	-.03	-.01	-.07 *	-.08 *	-.06 *	.00	-.05 *	-.10 *	-.14 *
C17:0	-.08 *	-.01	-.01	-.04 *	-.18 *	-.14 *	-.07 *	.01	-.08 *	-.12 *	-.20 *
Odd-chain SFA	-.08 *	-.02	-.02	-.03 *	-.16 *	-.13 *	-.08 *	.00	-.08 *	-.13 *	-.19 *
C14:0	.05	-.01	.00	.04	.15 *	.08 *	.03	-.02	.06 *	.03	.06
C16:0	-.03	-.05 *	-.03	.03	.09 *	.02	.03	.03	-.02	-.01	.02
C18:0	.07	-.10 *	.10 *	.12 *	.05 *	-.12 *	.07 *	.10 *	.11 *	.05 *	.07 *
Even-chain SFA	.05	-.19 *	.07 *	.19 *	.19 *	-.11 *	.12 *	.16 *	.10 *	.05 *	.12 *
C20:0	-.02	-.02	.05	.00	-.15 *	-.09 *	.01	.05 *	-.03	-.05	-.07 *
C22:0	.09 *	-.03	.19 *	.06 *	-.18 *	-.13 *	.12 *	.16 *	-.04	-.07	-.09 *
C23:0	.10 *	.00	.15 *	.05 *	-.10 *	-.05 *	.10 *	.10 *	-.01	-.02	-.07 *
C24:0	.10 *	-.01	.20 *	.06 *	-.18 *	-.10 *	.12 *	.14 *	-.03	-.06	-.09 *
Very-long-chain SFA	.09 *	-.02	.20 *	.06 *	-.20 *	-.13 *	.12 *	.15 *	-.04	-.07	-.11 *

Source: Zheng et al. 2017

Higher C15:0 = healthier metabolism.

In their meta-analysis including 22 prospective cohort studies following 166,745 people, Li et al. showed that people with higher C15:0 levels are 24% more likely to keep their long-term metabolic health. Specifically, related to healthy glucose metabolism.

This massive study-of-studies showed that for every 50% increase in the percentage of circulating C15:0, long-term metabolic health was protected by 8%.

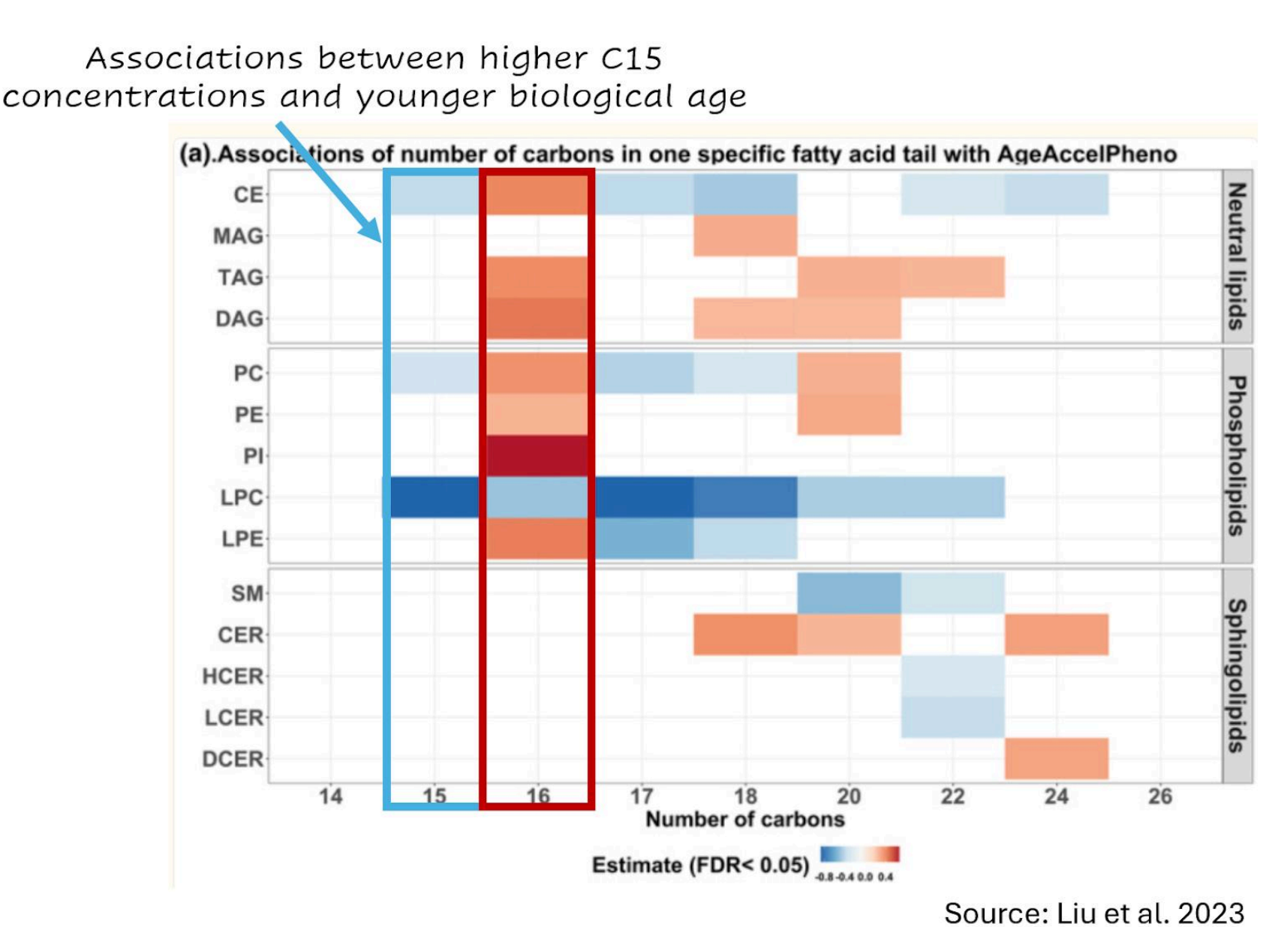
Translation: If a person has a C15:0 level of 0.2% and increases it to 0.4% of total fatty acids, that person's odds of protecting their long-term metabolic health would go up 16%. Not bad for a single nutrient. Again, these studies showed the opposite was for C16:0, where higher C16:0 levels were consistently associated with poorer metabolic health.

Higher C15:0 = better health on many fronts, including a younger biological age.

In addition to meta-analyses on heart and metabolic health, population-based studies have shown that people with higher C15:0 have better long-term:

- Liver health, including studies with adults and children from Kratz et al. and Sawh et al., respectively.
- Red blood cell health, including stronger cells and lower oxidative stress in a study by Sobeleva et al.
- Mood health, where both Brydges et al. showed that people with higher C15:0 had calmer moods.

Given all the above, it is not surprising that Liu et al. found that people with higher C15:0 in their lipids had a younger biological age than their chronological age, using both gold standard measurements (aka AgeAccelPheno and Age AccelGrim). And yet again, while higher levels of C15:0 were associated with a younger biological age, higher C16:0 was associated with an older biological age (see below).



Associations between higher C15 concentrations and younger biological age

Source: Liu et al. 2023

In Summary

In summary, population studies have shown that people with higher C15:0 levels have better long-term:

- Heart health
- Metabolic health
- Liver health
- Red blood cell health
- Mood health

Beyond association, these benefits align with many of the clinical trials we shared last week.

Importantly, these epidemiological and clinical trial results also fit well with the 100+ peer-reviewed studies also demonstrating C15:0's:

- Dose-dependent mechanisms of action
- Cell-based efficacy studies
- In vivo efficacy studies

Each of which we'll cover as part of this C15:0 *Science Says!* Series as we continue to make our way down our list of evidence. Next week, we will go all-in on in vivo efficacy studies that repeatedly show that C15:0 supplementation directly promotes cardiometabolic, liver, and red blood cell health. Ah, it's all coming together to explain just how C15:0 supports longevity.

In the meantime, have a fantastic week, everyone!

Dive deeper into the science

READ THESE STUDIES AT
DISCOVERC15.COM/RESOURCES

- Li et al. (2022) Frontiers in Nutrition 9, 963471.
- Arghavani et al. (2025) Nutr Metab, Cardiovasc Dis 35,104112.
- Zheng et al. (2017) BMC Med 15, 203.
- Chen et al. (2025) Lipids Health Dis 24, 219.
- Huang et al. (2025) Clin Nutr 46, 30-36.
- Kratz et al. (2014) Am J Clin Nutr 99:1385-1396.
- Sawh et al. (2021) J Pediatr Gastroenterol Nutr 72:e90-e96.
- Soboleva et al. (1994) Bull Exp Biol Med 117, 600-602.
- Brydges et al. (2022) Brain Behav Immun 102, 42-52.
- Liu et al. (2023) Aging Cell 22, e13934.

CLINICAL TRIALS

- Stallings et al. (2013) Int J Clin Pharmacol Ther 51, 263-273.
- Mascarenhas et al. (2015) J Clin Pharmacol 55, 854-865.
- Robinson et al.(2024) J Nutr 154, 2763-2771.
- Chooi et al. (2024) Am J Clin Nutr 119, 788-799.
- Salamanca-Sanabria et al. (2025) Front Nutr 12, In Press.
- Arghavani et al. (2025) Nutr Metab, Cardiovasc Dis 35,104112.
- Kaneko et al. (2023) Med Cons New-Remed 60, 459-470.
- Nerd out on all the C15:0 science at DiscoverC15.com

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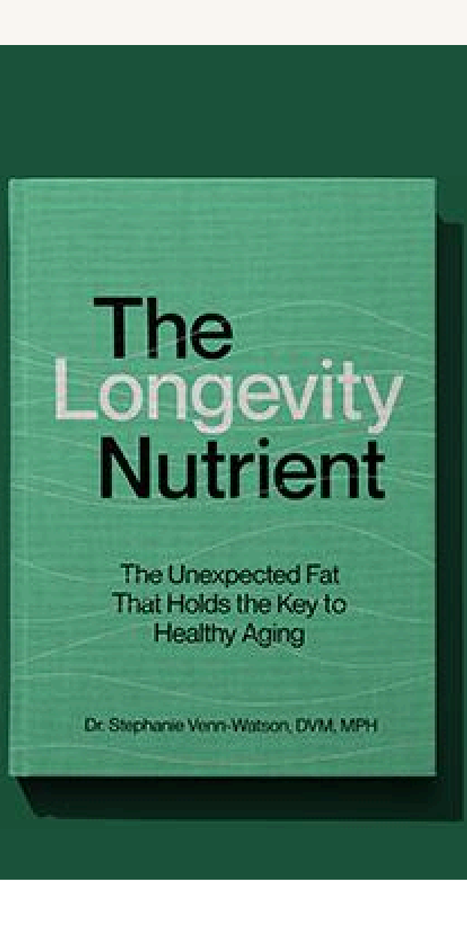

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