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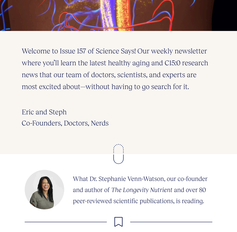
C15:0 Supports Metabolic Health: Another Study

Nov 16, 2025



Welcome to Issue 157 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

Evidence of C15:0's 360° Metabolic Support

When it comes to glucose, our metabolic health is dependent on maintaining healthy 1) insulin sensitivity and 2) pancreatic beta cell function. An impressively robust prospective cohort study was just published in *Clinical Nutrition* to evaluate associations between different dairy-derived fatty acids (including C15:0) and maintained healthy insulin sensitivity + beta cell function over a period of 9 years. Let's dive into what this study found.

I'm in. But first, what made this study so robust?

A total of 418 adults from the Prospective Metabolism Islet Cell Evaluation (PROMISE) cohort were included in this study. People with type 2 diabetes at baseline were excluded.

Each participant had 4 in-depth evaluations over a 9 year period, including fasting blood samples and oral glucose tolerance tests (OGTT) with additional blood samples and insulin measurements at 30 and 120 minutes per visit.

Specifically, the following measurements were used to assess insulin sensitivity and beta cell function throughout the study:

- Insulin sensitivity (measured as log ISI, logISSI2, and logIGI/IR)
- Fasting glucose
- Glucose at 120 minutes (logGlucose)
- Glucose area under the curve (LogGlucose AUC)

Additionally, baseline fasted serum dairy-based fatty acids were measured, including:

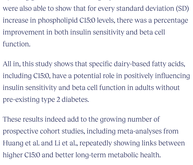
- C15:0
- Trans-16:1n9
- Trans-18:1n11
- C9 trans-11 conjugated linoleic acid (CLA)

Yehia et al. evaluated longitudinal associations between these fatty acid levels and metabolic health using covariate-adjusted generalized estimating equations with false discovery adjusted P values (that's just a fancy way of saying they applied a strong statistical model).

Got it. What did they find?

As seen in the figure below, higher phospholipid C15:0 levels were associated with:

- Healthier insulin sensitivity, as measured by ISSI2
- Healthier insulin sensitivity, as measured by IGI/IR
- Lower fasting glucose
- Lower glucose at 120 minutes in a glucose tolerance test
- Overall healthier glucose tolerance



Dairy-based fatty acids trans-16:1n9 and trans-18:1n11 were also positively associated with various measures of metabolic health.

Incremental Protection of Metabolic Health

By using generalized estimating equation models, Yehia et al. were also able to show that for every standard deviation (SD) increase in phospholipid C15:0 levels, there was a percentage improvement in both insulin sensitivity and beta cell function.

All in, this study shows that specific dairy-based fatty acids, including C15:0, have a potential role in positively influencing insulin sensitivity and beta cell function in adults without pre-existing type 2 diabetes.

These results indeed add to the growing number of prospective cohort studies, including meta-analyses from Huang et al. and Li et al., repeatedly showing links between higher C15:0 and better long-term metabolic health.

Beyond Association: Evidence of C15:0's Direct Metabolic Health Benefits

Repeated demonstration in prospective cohort studies of links between higher C15:0 and better long-term metabolic health (including long-term healthy insulin sensitivity and beta cell function in this latest study) are critical. Beyond association, however, it is important to have demonstrated mechanisms of action and efficacy that explain how C15:0 is not only associated with, but can actively support metabolic health.

Here's the good news (which is already familiar to you long-term *Science Says*! readers): peer-reviewed studies from Fu et al. and others have shown how C15:0 directly supports healthy glucose metabolism:

- C15:0 activates AMPK and AKT, which are well established mechanisms for improving glucose control and insulin sensitivity.
- C15:0 directly improved glucose uptake, insulin sensitivity, and even mimicked insulin in muscle cell systems.
- In an obese mouse model, daily C15:0 supplementation supported healthy glucose levels within 12 weeks.

The global movement is on. Have a fantastic week, everyone!

Dive deeper into the science

NERD OUT ON ALL THE C15:0 STUDIES AT DISCOVERC15.COM/RESOURCES

- Yehia et al. Longitudinal associations of serum fatty acid derived from dairy consumption with various phenotypes: The PROspective Metabolism and Islet cell Evaluation (PROMISE) cohort.
- Huang, L. et al. Circulating saturated fatty acids and long-term metabolic health: a systematic review and meta-analysis. Nutrients 11:998 (2019).
- Li et al. Saturated fatty acid biomarkers and long-term metabolic health: a meta-analysis of prospective studies. Frontiers in Nutrition 9, 963471 (2022).
- Fu, W.-C. et al. Pentadecanoic acid promotes basal and insulin-stimulated glucose uptake in C2C12 myotubes. Food Nutr Res 65:10.29219/fnr.v65.4527 (2021).
- Bishop et al. Hepatadecanoic acid is not a key mediator in protecting liver and metabolic health in mice. Nutrients 15, 2052 (2023).
- Venn-Watson, S., Lumpkin, R., Dennis, E.A. Efficacy of dietary odd-chain saturated fatty acid pentadecanoic acid parallels broad associated health benefits in humans: could it be essential? Sci Rep 10:8161 (2020).

- Nerd out on all the C15:0 science at DiscoverC15.com

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