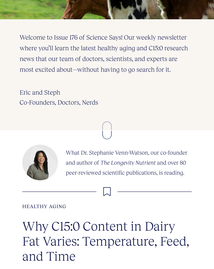
fatty15

N - 176

What Influences C15:0 Content in Milk?

April 26, 2026



Welcome to Issue 176 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

Why C15:0 Content in Dairy Fat Varies: Temperature, Feed, and Time

A new study looked at potential changes in the nutrient content of milk from black bengal goats in Thailand, based on seasonal changes in temperature. Now, while you may neither drink milk from black bengal goats nor live in Thailand, this study showed something that keeps popping up: the amount of C15:0 in full-fat milk, whether in Thailand goats or Irish cows, can vary significantly based on diet and season. Let's dive into these studies to better understand just how much a few months in a year can influence how much C15:0 we may get from dairy fat.

C15:0 from goats in Thailand...

The most recent study from Buranakarl et al. measured nutrients in colostrum from goats during either cold or hot seasons of the year. Importantly, these goats were fed the exact same diets throughout the year. The average temperature during the "cold" times was 72°F and the "hot" times was 80°F.

This was Thailand, so there were not extreme temperature differences in hot versus cold seasons. That said, upon measuring 27 fatty acid indices, this study showed that one fatty acid had the most significant difference by season (aka, a p-value < 0.05). You guessed it: C15:0. Specifically, colostrum collected during the "colder" season had less C15:0 compared to the "warmer" season (mean of 0.60 and 0.75 mg/100 g, respectively). That's **25% less** C15:0 during the colder season.

That may not seem like much, but let's move to Pariyani et al.'s study.

...to cows in Ireland.

This study also measured nutrients in colostrum, but this time from Holstein-Friesian dairy cows during spring ("cold") vs. autumn ("warm") in Wexford, Ireland. Unlike the Thailand study, these cows ate different diets during the year. Specifically, cows during the spring were primarily indoors and fed grass-silage. During the autumn, they were outdoors and ate pasture.

In Wexford, the lower temperatures in the spring average around 39°F, while the upper average autumn temperature is 62°F. Of the 944 small molecules they measured in this study, 15 complex lipids differed significantly between the two groups. Of these lipids, only one had levels that went down in the autumn vs. the spring: C15:0 (specifically, phosphatidylcholine C15:0). Here, C15:0 levels during the warmer autumn were **50% less** than the colder spring.

A little confused? So were we.

How did one study show that C15:0 content in milk is lower during a colder season, while the other showed the opposite? The answer is likely two-fold:

- First, the Thailand study controlled for diet. No matter the temperature, the goats ate the exact same feed. This allowed them to conclude that cooler temperatures resulted in 25% less C15:0 in milk.
- Second, the Ireland study purposely tested for differences based on seasonal changes in their diet. This study showed that when cows grazed outside versus being fed grass-silage diets inside, they had 50% lower C15:0 in their milk.

In summary, both changes in temperature AND diet can significantly affect the amount of C15:0 in milk.

How what cows eat (and how long they've been making milk) affects the C15:0 content in milk.

Similar to the Ireland study, other researchers have reported various reasons C15:0 content can vary significantly in milk.

For example:

- When comparing corn-silage versus grass-silage diets, Shingfield et al. concluded that cows fed grass-silage diets had significantly higher C15:0 content.
- Redoy et al. showed that cows fed a low-forage diet supplemented with isobutyrate could significantly increase C15:0 content in milk. This makes sense, since butyrate helps feed ruminal microbes that make C15:0.
- Beyond what cows are eating, Sun et al. demonstrated that C15:0 content also changed based on a cow's lactation stage. Specifically, cows that had been lactating for 22 to 100 days had significantly higher C15:0 content compared to those lactating for less than 22 days and more than 100 days.

The bottom line: Peer-reviewed studies are repeatedly showing that C15:0 content in milk can vary significantly based on season, what they're fed and supplemented, and how long they've been milkin'. All that said, full-fat dairy continues to be the world's primary dietary source of C15:0, an emerging foundational nutrient that can support healthy aging at all stages.

When a supplement is a *supplement*.

The original purpose of dietary supplements was to *supplement* nutrients that are present in the diet. By doing so, people can reliably optimize nutrient levels using both dietary sources and supplements. Importantly, pure C15:0 supplementation has been clinically proven to increase C15:0 levels (every 100 mg increases circulating C15:0 levels by about 10 uM, or 0.1% total fatty acids).

In turn, randomized clinical trials have shown that these higher C15:0 levels are associated with better protected:

- Red blood cell health
- Liver health
- Cholesterol health
- Gut microbiome health

Further, large prospective human cohort metaanalyses have repeatedly shown that the higher the C15:0 concentration, the better the associated long-term metabolic and cardiovascular health. For example, earlier this year, Schaefer et al. showed that every 0.1% increase in C15:0 levels was associated with 32% better protected long-term metabolic health.

To sum up, nutritional supplements are not intended to replace dietary sources of nutrients. By providing a reliable dose of daily C15:0, these supplements can help maintain and optimize C15:0 intake in a world where our food-based nutrients can increasingly vary.

Have a great week, everyone!

Dive deeper into the science

READ THESE STUDIES AT
DISCOVERC15.COM/RESOURCES

- Buranakarl et al. Seasonal changes in ambient temperature affected colostrum metabolomic and lipidomic profiles of black bengal goats raised in a subtropical region of Thailand.
- Pariyani et al. Metabolic profiling of bovine colostrum: unravelling the influences of diet and seasonality on functional dairy components.
- Redoy et al. Supplementation of isoacids to lactating dairy cows fed low- or high-forage diets: effects on performance, digestibility, and milk fatty acid profile.
- Sun et al. Odd- and branched-chain fatty acids in milk fat from Holstein dairy cows are influenced by physiological factors.
- Shingfield et al. Effect of forage type and proportion of concentrate in the diet on milk fatty acid composition in cows given sunflower oil and fish oil.
- Mascarenhas et al. J Clin Pharmacol 55, 854-865 (2015).
- Robinson et al. C15:0 Supplementation in Young Adults at Risk for Metabolic Syndrome: A Randomized Controlled Trial.
- Chooi et al. Effect of An Asian-Adapted Mediterranean Diet and Pentadecanoic Acid on Fatty Liver Disease: The TANGO Randomized Controlled Trial.
- Schaefer et al. Fatty acid biomarkers and protected metabolic health: a systematic review of dose-response meta-analysis of prospective observational studies. Adv Nutr 17, 100565 (2026).

An Amazon #1 Best Seller

"A groundbreaking, once-in-a-century discovery that changes how we can age for the better."

Dr. Mark Hyman
10x New York Times Bestseller

Order now

fatty15

These statements have not been evaluated by the Food and Drug Administration. This product is not intended to diagnose, treat, cure or prevent any disease.

Unsubscribe
©2026 fatty15
2907 Shelter Island Dr. Ste. 105-411 San Diego, CA 92106