**C15:0 (pentadecanoic acid)** is an odd-chain saturated fatty acid (15 carbon atoms) found in small amounts in certain foods, especially full-fat dairy and ruminant-derived fats. Unlike most dietary saturated fats, it has been shown in recent research to have active biological roles beyond just energy storage, leading some scientists to propose it might be a conditionally essential nutrient (similar in concept to omega-3s) because humans don't make much of it on their own. MDPI It makes up only a tiny fraction (<1%) of total circulating fatty acids in humans but is measurable in blood and red blood cell membranes. SpringerLink

**Food Sources of C15:0**

C15:0 comes from diet — it's not produced in large amounts by the body. Major natural sources include:

**Dairy products**

- Butter/heavy cream: ~50–60 mg per tbsp
- Full-fat cheeses: ~70–130 mg per ounce
- Full-fat yogurt: ~70–100 mg per serving

(Values are approximate) THE MALONE INSTITUTE

**Ruminant meats**

- Grass-fed beef/lamb: ~80–130 mg per 4 oz (higher in grass-fed vs grain-fed) KETO-MOJO

**Fish**

- Sardines/mackerel/salmon: smaller amounts (~10–65 mg per 4 oz) KETO-MOJO

**Plants & oils**

- Very low amounts; e.g., coconut oil has trace levels. KETO-MOJO

Overall, whole-fat dairy and grass-fed animal fats are the richest typical dietary contributors. THE MALONE INSTITUTE

**C15:0 and Red Blood Cell Levels**

- Red blood cell (RBC) membrane levels of C15:0 are used in research as a biomarker of dietary intake — when people eat more C15:0-rich foods, erythrocyte levels rise. PubMed
- In controlled feeding studies, increased dairy intake did increase RBC C15:0, showing diet can change these levels. PubMed
- Lab and animal data suggest higher RBC C15:0 is associated with greater membrane stability, healthier hemoglobin, and reduced markers of cell fragility — though this area is still emerging science. MDPI

In dolphin models, increasing dietary odd-chain fats boosted RBC membrane C15:0 from ~0.17% to 0.58% of total fatty acids and corresponded with improved red cell stability and reduced anemia — implying C15:0 levels below ~0.2% might be suboptimal for cell health. PMC

**What the Research Says: "Adequate" Levels & Health Associations**

✔ Circulating Concentration Targets (Humans)

Human pharmacokinetic modeling suggests:

- Baseline average C15:0 circulation ~ 25 μM.
- Dose-response studies show ~ 200 mg oral C15:0 yields ~ 20 μM circulating concentrations, which are within ranges where anti-inflammatory and cell-protective effects have been seen in vitro. PMC

So 20–30 μM circulating C15:0 — roughly equivalent to several hundred milligrams/day — has been proposed in the research as a putative adequate range linked with physiological activity, though definitive clinical targets are not yet established. PMC

✔ **Associations with Health Outcomes**

Epidemiological and mechanistic research finds links between higher C15:0 levels and:

- Lower risk of cardiometabolic disease (e.g., heart disease, hypertension) SpringerLink
- Lower inflammation and better lipid/glucose profiles in animal and cell studies MDPI
- Greater hemoglobin and red blood cell stability in models of aging and fragility MDPI

**However:**

- Most of the causal evidence comes from experimental models (animals, cell systems), not large randomized human trials.
- Some findings are associative, and more research is needed before C15:0 is universally recognized as essential by medical authorities. Nature

**Dietary Intake & Supplementation**

**Typical Intake**

Modern intake of C15:0 from diet varies widely by culture and eating patterns. Some older estimates suggest average intakes around ~200 mg/day in certain populations with traditional diets, but this isn't widespread today. PMC

**Supplementation**

There are supplements containing purified C15:0 (e.g., microalgae-derived) designed to help raise circulating levels — typical suggested doses in early studies and products are in the ~100–200 mg/day range, aiming to reach the ~20–30 μM circulatory window connected to health outcomes in research. Metabolic 360

Note: Supplements are not FDA-approved for disease prevention or treatment and should be discussed with a clinician, especially if you have health conditions or are on lipid/glucose-modifying medications.

**Key Takeaways**

➡ **What C15:0 does**

- Small amount dietary fatty acid with metabolic and cell membrane effects seen in models. MDPI
- May be linked with healthier inflammation, lipids, glucose, and RBC stability. SpringerLink

➡ **Sources**

- Best from full-fat dairy and grass-fed ruminant fats; lesser amounts in fish and trace amounts in some plant oils. THE MALONE INSTITUTE

➡ **Red blood cell relevance**

- RBC C15:0 levels rise with intake and may reflect membrane incorporation and potential functional effects. PubMed

➡ **Adequate levels**

- Proposed adequate circulating range: ~20–30 µM, achievable with roughly 200 mg/day intake, but definitive human guidelines are not yet established. PMC

**Core Reviews & Mechanistic Papers**

https://www.mdpi.com/2072-6643/15/21/4607
https://pmc.ncbi.nlm.nih.gov/articles/PMC7235264/
https://lipidworld.biomedcentral.com/articles/10.1186/s12944-025-02640-4
https://www.nature.com/articles/srep44845

**Red Blood Cell / Biomarker Studies**

https://pubmed.ncbi.nlm.nih.gov/31421524/
https://pmc.ncbi.nlm.nih.gov/articles/PMC11279173/

**Dietary Sources & Translational Summaries**

https://maloneinstitute.org/blog/well-being-c150-or-pentadecanoic-acid
https://keto-mojo.com/article/c15-fatty-acid-health-benefits/

**Population / Metabolic Context**

https://metabolic360.org/2025/10/29/the-surprising-health-benefits-of-c150-and-c170-why-odd-chain-saturated-fats-matter/

**Acknowledgment and Educational Notice**
Portions of the background research, organization, and drafting support for this Library article were assisted by ChatGPT (OpenAI), an AI-based language model, which helped summarize and structure publicly available scientific information for educational purposes. Final content selection, interpretation, contextual framing, and responsibility for accuracy remain solely with the author.

This material is provided for general educational and informational purposes only and is not intended as medical advice, diagnosis, or treatment.