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How Probiotics in Fermented Dairy Help Manage Osteoporosis

Analysis by Dr. Joseph Mercola | April 24, 2026

STORY AT-A-GLANCE

- Fermented dairy like kefir helps rebuild bone by boosting osteocalcin and lowering bone breakdown markers, which results in stronger bones
- The probiotics in fermented dairy actively balance bone-building and bone-resorbing cells, helping prevent and even reverse the progression of osteoporosis
- Research shows that regular kefir consumption increased hip bone density by 5.5% in just six months, offering real gains in areas most vulnerable to life-altering fractures
- Beneficial bacteria in fermented dairy lower inflammation and oxidative stress, which are two hidden drivers of bone loss that most conventional treatments overlook
- Dairy contains C15:0, an odd-chained saturated fat that helps boost metabolic health, protects cells, and supports healthy weight — all while strengthening your bones

Osteoporosis is one of the most devastating age-related diseases, and it often goes unnoticed until it's too late. In America alone, it's estimated that 10 million people are affected by this condition.[1]

Characterized by porous, brittle bones, osteoporosis leaves you vulnerable to fractures from simple falls. Common symptoms include back pain, stooped posture, and an increased risk of breaks in the hips, spine, or wrists. Without intervention, it causes permanent disability, loss of independence, and a significantly shortened lifespan.

While common medical advice pushes for increased calcium intake, this is just one piece of the puzzle. Calcium alone, without other nutrients and bioactive compounds, will contribute very little to improving bone strength. Now, research has shown that there's one convenient solution — fermented dairy.

Fermented Dairy Actively Regulates Bone Cell Remodeling

Research published in Food Science of Animal Resources investigated how fermented dairy products and their probiotic content influence skeletal health. Specifically, researchers looked at the bone remodeling process that keeps your skeleton strong and adaptable throughout your life.[2]

- **Probiotics actively change how your body regulates bone formation —** The study shows that probiotics affect the two main types of bone cells, osteoblasts (builds new bone) and osteoclasts (breaks down old bones). When there's an imbalance between the two, the risk for bone diseases like osteoporosis increases. A healthy balance is maintained by giving your body the right nutrients and signaling molecules to favor bone building over bone loss.

  Results show that consuming fermented dairy regularly led to higher bone mineral density (BMD), better bone mineral content (BMC), and greater overall bone strength. These effects are especially notable in children during growth spurts and in aging adults who are at high risk of fractures.

- **Fermented dairy supports the function of metabolic markers tied to bone health —** According to the study, fermented dairy boosts osteocalcin and insulin-like growth factor I (IGF-I), which is a hormone that promotes the activity of osteoblasts, which is your body's bone-building cells. Essentially, when fermented dairy increases IGF-I levels, it tells your body to start building newer bones.

  At the same time, fermented dairy reduces the activity of osteoclasts by lowering inflammatory compounds like interleukin-17 (IL-17) and tumor necrosis factor alpha (TNF-α), which are known to accelerate bone breakdown. This double-action —

more building, less breakdown — is what makes fermented dairy beneficial for bones.

- **The probiotics in fermented dairy communicate with your immune system —** Specific strains like Lactobacillus and Bifidobacterium help shift your immune balance from inflammation-centric to repair-centric. By increasing the presence of immune cells that lower inflammation and promote bone resorption, the probiotics help your body tip the scale toward healing and bone regeneration.

- **Probiotics also produce short-chain fats (SCFAs) —** The study singled out the ability of probiotics to produce butyrate, which helps reinforce the gut barrier so fewer toxins and inflammatory compounds leak into the bloodstream. Less systemic inflammation means better bone protection.

  Butyrate also directly inhibits osteoclast formation and stimulates a pathway that encourages osteoblast activity and bone formation. In essence, SCFAs act like a natural defense system produced right inside your gut that also supports your bones.

- **Fermented dairy lowers parathyroid hormone (PTH) levels —** This is a noteworthy finding, as PTH is responsible for pulling calcium out of your bones when blood calcium levels drop.[3] When you eat calcium-rich fermented dairy, your body doesn't have to rob your bones to get what it needs. As a result, bone resorption markers like CTX go down — a sign that less bone is being broken down.

- **The study highlighted how fermented dairy impacts gene expression —** Specific genes involved in bone growth, like Runx2 and Bmp2, were upregulated in response to probiotic intake. Runx2 is a master switch for turning stem cells into bone-building osteoblasts. Meanwhile, Bmp2 helps trigger bone growth in both developing and mature bone tissue. Together, these genes help initiate and maintain healthy bone remodeling.

Kefir Triggers Real Bone Gains in 6 Months

In a similar study published in PLOS One, researchers tested the short-term effects of kefir on bone health in 40 adults already diagnosed with osteoporosis. For their methodology, they compared kefir with calcium bicarbonate supplementation versus taking supplements alone, measuring changes in BMD and key bone metabolism markers over a six-month period.[4]

- **Probiotics helped reverse osteoporosis —** In the kefir group, the marker for bone formation, osteocalcin, shifted dramatically. By the end of the six-month trial, people who started out with declining osteocalcin levels had reversed that trend. Their numbers rose to levels associated with active bone building.

  In addition, a biomarker for bone breakdown, β-CTX (beta C-terminal telopeptide of Type I collagen), decreased significantly. This means there was less active degradation of bone tissue. Together, these two changes reflect the influence of probiotics on the body's ability to rebuild and restrengthen bones.

- **The benefits occur within a few months —** Within the first month, β-CTX began dropping in those who took kefir. By the third month, the decline was more pronounced, especially in people who weren't in the most severe stages of bone loss. This means that kefir not only worked for advanced stages — it also worked in the early stages, when there's still time to reverse damage.

- **Kefir targets bones prone to osteoporosis —** Spine BMD didn't change much, but hip and femoral neck BMD did, which are some of the most fracture-prone bones in older adults.[5,6] After six months of kefir treatment, participants saw their hip BMD increase by 5.5%. This figure may not sound like much at first, but it goes to show how much kefir contributed to halting, and even reversing, BMD loss.

- **Thyroid function is improved —** The kefir group showed a rise in PTH after six months. For context, PTH helps regulate calcium levels in the blood and in this case of this study, higher PTH levels reflect the body's increased signaling for bone remodeling.

In contrast, the control group had lower PTH levels, which the researchers tied to lower overall bone remodeling activity.

- **Kefir is rich in health-boosting peptides —** According to the study, kefir peptides result from milk protein breakdown during fermentation. They interact with your gut, your immune system, and even your bones, enhancing calcium absorption and making sure more of it ends up in your bones.

- **Oxidative stress is suppressed by probiotics —** People with osteoporosis often experience high levels of inflammation and oxidative damage, which accelerates bone resorption. The beneficial bacteria in kefir, through both direct antioxidant activity and immune modulation, helped reduce inflammatory cytokines.

  That means less wear and tear on your bones from chronic low-grade inflammation, which is a factor that most conventional osteoporosis treatments ignore.

Ultimately, the research shows that kefir is more than a passive food you eat to fill your tummy — it also actively improves the inner workings of your bone metabolism, changing the signals your body sends about whether to build up or tear down your skeletal structure as needed. The longer those signals stay in "build" mode, the more time you buy to regain strength, stability, and resilience.

C15:0 — A Beneficial Fat Found in Dairy

C15:0, also known as pentadecanoic acid, is an odd-chain saturated fat (OCFA) largely found in dairy. It's also present in certain fish and plants. Why bring it up? Interestingly, this fat has been shown to be **an important player in maintaining your cellular health**.

You're likely familiar with well-known fats that contribute to optimal health, such as **omega-3**, but I believe C15:0 also deserves its time in the limelight. In addition to the benefits discussed above, C15:0 provides other health benefits that make fermented dairy a superfood.

- **Diabetes prevention —** A meta-analysis[7] of 33 prospective cohort studies found that people with higher C15:0 levels had a lower risk of developing Type 2 diabetes.
- **Mitochondrial health —** Research found that C15:0 helped repair mitochondrial function and lowered reactive oxygen species production in a dose-dependent u-curve.[8]
- **Weight management —** Daily supplementation of C15:0 at a dose of 5 mg per kilo of bodyweight lowered inflammation, glucose, and cholesterol levels in obese mice.[9]

The takeaway here is that aside from probiotics, fermented dairy contains other nutrients that help support your health in different ways. For this reason, I encourage you to add these to your diet more often.

5 Effective Strategies to Support Your Bone Health

As shown in the research, managing osteoporosis is attainable through the help of probiotics found in fermented dairy. It contains a collection of beneficial bacteria strains that support gene expression related to promoting stronger bones, as well as nutrients that support this process. To help you take advantage of these benefits, I recommend the following lifestyle adjustments:

1. **Add fermented dairy from grass fed sources to your diet —** If your gut is able to tolerate dairy, I highly recommend adding kefir or plain, full-fat yogurt into your rotation, ideally from 100% grass fed milk. Aside from being rich in calcium, these foods contain other nutrients that shift your bone metabolism in the right direction. As shown in the research, kefir significantly increases hip bone density in just six months and supports osteocalcin.[10]
2. **Consider taking a high-quality supplement —** If you're sensitive to dairy or can't stand the taste of kefir or yogurt, that's okay. In that case, you'd be wise to take a high-quality probiotic supplement that includes strains like Lactobacillus reuteri, L.

casei, or Bifidobacterium longum — all shown to reduce bone loss markers and improve bone density.

3. **Eat foods that feed your gut microbes —** Probiotics are important, but they only thrive if you feed them well. If your gut is already compromised, start slowly with ripe fruits, root vegetables, and fermented foods that contain prebiotics. This creates an environment where beneficial bacteria begin to thrive again and start shifting away from inflammatory processes that lead to bone loss.

4. **Bask in sunlight properly —** Sunlight is how your body makes vitamin D, and this nutrient is key for calcium absorption and proper immune function. Aim for 15 to 30 minutes of unfiltered sun on your skin every day at midday, when the sun is at its peak. If you've been on a diet high in linoleic acid (LA), get your sun exposure during early morning or late afternoon instead to avoid skin damage.

   In most regions in America, this means avoiding sunlight from 10 a.m. to 4 p.m. The reason for this is because when sunlight hits your skin, the LA in your skin is metabolized, causing DNA damage and inflammation.

   For in-depth instructions on how to safely optimize your vitamin D levels, read my article "2024 International Virtual Vitamin D Forum Unlocks the Power of Vitamin D." There, I provide additional strategies to lower your risk of skin cancer as you work towards purging your body from LA.

5. **Get regular exercise —** While a healthy diet will undoubtedly help boost skeletal health, there are other methods that optimize it further, such as exercise. As noted in the Food Science of Animal Resources Study, the impact generated by physical activity stimulates your osteocytes, thereby increasing BMD.[11]

   To get your body moving, the easiest way is to go for a walk. I generally recommend getting 10,000 steps a day for optimal health. When it comes to resistance training, the benefits max out at around 40 to 60 minutes a week. For an in-depth explanation on this topic, read my article "The Benefits of Walking — How to Get More Steps in This Summer."

Frequently Asked Questions (FAQs) About the Benefits of Probiotics for Skeletal Health

Q: What is osteoporosis and why is it dangerous?

A: Osteoporosis is a condition where bones become porous and brittle, making them more prone to fractures. It often goes unnoticed until a fracture occurs. It leads to chronic pain, loss of mobility, and even shorten lifespan if left untreated.

Q: How does fermented dairy help improve bone health?

A: Fermented dairy products like kefir and yogurt contain probiotics that regulate bone cell activity, increase bone-building cells (osteoblasts), reduce bone-resorbing cells (osteoclasts), and support bone density and strength. They also lower inflammation and boost helpful metabolic markers, such as osteocalcin and IGF-I.

Q: What scientific evidence supports the benefits of fermented dairy on skeletal health?

A: A six-month study published in PLOS One showed that kefir increased bone density in the hip by 5.5% and reversed markers of bone breakdown. Participants saw noticeable benefits in as little as one month, especially in early stages of osteoporosis.

Q: Are there other health benefits to fermented dairy besides bone strength?

A: Yes. Fermented dairy contains C15:0 (pentadecanoic acid), a rare fatty acid that supports metabolic health, mitochondrial function, diabetes prevention, and reduces inflammation, making it a complete "superfood."

Q: What are the top strategies to support bone health naturally?

A: Key strategies I recommend include:

- Eating fermented dairy like kefir or yogurt.
- Taking high-quality probiotic supplements if dairy isn't tolerated.
- Feeding your gut with prebiotic-rich foods.
- Getting proper sun exposure for optimal vitamin D levels.
- Exercising regularly, especially walking and resistance training.

Sources and References

- [1] FDA, Osteoporosis
- [2, 11] Food Sci Anim Resour 2025; 45(2):449-467
- [3] Better Health Channel, Parathyroid Glands
- [4, 10] PLoS One. 2015 Dec 10;10(12):e0144231
- [5] StatPearls, Hip Fracture Overview
- [6] StatPearls, Femoral Neck Fractures
- [7] Crit Rev Food Sci Nutr. 2021;61(16):2705-2718
- [8, 9] Sci Rep. 2020 May 18;10:8161