The Real Deal About Calcium and Your Bones

A science-based, holistic approach to optimal bone nutrition

Leesa Klich, MSc, RHN

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THE REAL DEAL ABOUT CALCIUM AND YOUR BONES

Science-based, holistic approach to optimal bone nutrition

By Leesa Klich, MSc, R.H.N.

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About the Author

Leesa Klich, MSc, R.H.N. is a health writer and science-based holistic nutritionist. Leesa earned her Master's degree in Biomedical Toxicology and Nutrition, and after a short time in food R&D, Leesa enjoyed a 12-year career in drug/supplement safety. While Leesa thoroughly enjoyed her time in pharmacovigilance (fancy word for drug safety), several things in her life started pointing toward some of the benefits of a more holistic approach to health. After moving across Canada and graduating as a Registered Holistic Nutritionist, Leesa is blending her extensive experience in health science with her education in holistic nutrition. Leesa likes to say that she lives "at the intersection of science and holistic health, and it's very interesting here."

Learn more by checking out Leesa's website, or downloading some of her free science-based health resources when you sign up for her newsletter.

You can also find Leesa on Facebook, Instagram, Pinterest, Twitter, YouTube and Periscope (as @NutritionInteraction).

Leesa's other book:

Marijuana's Potential for Chronic Pain: What does science know so far?

(which you can also download for free when you subscribe to her newsletter)

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INTRODUCTION

Thank you SO much for your interest in calcium and bone nutrition!

Hi, I'm Leesa, a 43-year-old science-based holistic nutritionist at risk of osteoporosis. I'm on a mission to incorporate as many food, supplement and lifestyle upgrades for my own bones, starting now. And, why on earth should I just do it for myself?

My "WHY"

I have a long list of reasons why bone health is so very important to me now. My daughter broke her elbow falling out of our tree two summers ago which initially sparked my interest. I want to get enough calcium because I want to maximize my bone strength and density before I'm hit with a large loss during menopause. Osteoporosis is in my family (my grandmother & aunt). I am also smaller-boned, not that active, and absolutely fascinated by the science and physiology of bones. In fact, I wrote a whole blog post about why I love bones here.

If you want to know the WHAT and the WHY behind bone nutrition and calcium, then feel free to read this short ebook cover to cover. It won't take you an hour and it's packed with useful information. I also use science to tackle the controversies surrounding dairy (Chapter 3) and calcium supplements (Chapter 5).

If you want to skip to HOW to get enough calcium – head straight to Chapter 6 to find out how much you need and how to get it from foods first. That's really what you need to do on a day-to-day basis to ensure you're getting the minimum amount of calcium to avoid deficiency and insufficiency.

Why write this book?

Random stats aside (e.g. fractures from osteoporosis are more common than heart attack, stroke and breast cancer ***combined;*** the projected cost of osteoporotic fractures in the next two decades is estimated to be $474 billion dollars in the USA, etc.) the real reason I created this book because ***I'm making bone health a priority for me now.***

I also know there is a lot of conflicting information out there. (Did I say a lot? I meant A LOT!). Too much misinformation is floating around that is leading people to:

- Mistrust good information (via sensational headlines, misrepresentation of study results, etc.);
- Leading people to think that a calcium supplement or drug is the only thing they can or need to do for their bones;
- Focus on tiny details (i.e. amount of oxalates in sweet potatoes, etc.), instead of having an overall approach to bone health.

I'm not going to tell you to believe me and only me, but I'll be straight up with my position, research, education, and knowledge so you see where I'm coming from.

Leesa's position (or should I say “bias”?)

As a science-based holistic nutritionist, I bring out the best of both science and holistic health. The science behind what we know and don't know about foods, supplements, lifestyle factors and bone health. AND the holistic perspective that we need to consider all of these interconnected areas for optimal health in general.

I have a very strong scientific background (Master of Science in Biomedical Toxicology and Nutrition - MSc), and I also have a lot of respect for the holistic approach, and I'm a Registered Holistic Nutritionist (R.H.N.).

By “holistic approach” I mean the acknowledgement that every person is unique, that there is wisdom in nature, and that there are interconnections between nutrition (foods and supplements) and lifestyle (exercise, sleep, stress, etc.).

As a scientist, I will absolutely NOT jump to conclusions from minimal or new “groundbreaking” studies nor will I recommend things that we really just don't know much about. I will also NOT market or try to sell you on “too good to be true” health outcomes that are one-in-a-million “long shots” to make money from you.

As a holistic nutritionist, I fully recognize that everyone is unique and what works for one person may not work for everyone. I also do NOT look at a person as a “walking ball of biochemistry” - I recognize the many complex interactions between a person's nutritional status, physiology and the connections between them and exercise, sleep, stress, etc.

I do, however, disagree with some of the "medical" approaches that tell people to just take a drug or supplement, and "eat better and exercise". In my opinion, this is putting a band-aid on the situation and doesn't help most people improve their health as they would like to. It's certainly not very educational or empowering!

On the holistic side, I also disagree with some of the dismissal of basic medical knowledge, and distractions from the main focus by trying to create controversy, and making tiny details waaaaay more important than they really are. (You'd do SO much better to have a glass of protein-rich vitamin D and calcium fortified milk (300 mg Ca); than to worry about whether oxalates reduce your absorption of the 20 mg of calcium in 1/2 of a sweet potato).

I guess I like to think I have a unique perspective, and bring out the absolute best from both medical science and holistic nutrition. I totally believe in building a foundation of health by starting with the things that will give the most "bang for your buck".

My bottom line is that I look at the science behind holistic nutrition advice, and use that as the basis for all of my recommendations.

I do not discount holistic approaches that seem to have low risk and have not been scientifically tested, but I do discount holistic approaches that have been tested and have failed repeatedly.

I am not a “whistleblower” for either the medical or the holistic health

communities. I just bring out the best from both of them and truly believe that these “bests” are going to help way more people achieve health, rather than bickering between who is right. In fact, you can read a bit more about my health philosophy and why I don't really fit in.

So, this book is based on scientific research (you can look at the references at the end), and will go over bone nutrition, with a focus on calcium, from both a science-based ***and*** holistic point of view.

What's in this ebook?

Chapter 1 is a quick primer on the fact that ***way too many people don't get enough calcium***, how your body regulates calcium stores, and some of the risk factors for osteoporosis.

Chapter 2 will talk about what constitutes a “bone healthy diet”. I talk a bit about other essential bone nutrients and give a list of some recommended foods for optimal bone health (and overall health).

Chapter 3 is all about dairy. Yes, I'm tackling that controversy head-on; using science of course! I think there will be lots of interesting information for you there, but my final conclusion may be very predictable.

Chapter 4 is all about the fact that high-protein meals increase the amount of calcium excreted in the urine. Yes, it's true. But, (and I mean BUT) this doesn't necessarily need to concern you. And I'm busting wide-open the reasons why:

1) Your bones NEED protein, and

2) Alkalinizing your urine is a waste of time, energy, and focus.

Chapter 5 is “scientific supplement sanity”. If you've heard the controversy in the news about calcium supplements and atherosclerosis lately, let me give you a scientific remedy for the fear-mongering sensationalized headlines scaring people for no reason except to get attention, clicks, and viewers/readers.

P.S. With 12-years experience in drug and supplement safety, this topic is near and dear to my heart. I'm so happy to contribute a dose of scientific sanity where things have gotten a bit insane.

Chapter 6 is probably the most important one. Feel free to skip right over to it if you don't have the hour to read this short book cover to cover. In it, I show you how to get enough calcium from foods first. And by getting it from foods first, you're getting a whole lot more nutrition than just calcium!

<u>The bottom line</u>

Using nutrient-dense minimally-processed foods as your main source of nutrition is awesome not only for your bones, but for your overall health and wellness.

I always recommend eating/drinking as much nutrition as possible first, and then only make up the shortfall with supplements.

So, while this book focuses on calcium, it is just the start of a complete bone-healthy (and health-healthy) diet.

If you want to get straight to the HOW much calcium do I need and HOW to get it from foods first – just skip right to Chapter 6.

I hope you're as excited about this as I am!

CHAPTER 1: Calcium and Your Bones

Of course calcium is just one of many nutrients needed for bone health. So you may be wondering:

Why focus this book on calcium?

Bone nutrition certainly doesn't begin and end with calcium! Calcium, however, is arguably the most important nutrient for bone health. Calcium is the most abundant mineral in the body, and no less than 99% of it is stored in your bones.

That makes it very important to bone health, and overall health & wellness.

The funny thing with calcium, is that it is easily obtained from foods, however, is one of the top 3 nutrients that many developed countries simply do not get enough of!

We in North America are seriously (and surprisingly) insufficient in calcium intake!

Recent studies have also shown that calcium obtained from foods is safer than relying wholly on supplements.

The thing is that ***if you focus on getting your calcium from foods first (as opposed to relying on supplements alone), you will almost definitely be getting all of your essential bone nutrients.***

What's calcium needed for?

Since calcium is needed for blood clotting, nerve conduction, and muscle contractions (not just your arms & legs, but your heart and gastrointestinal tract muscles too), ***the body will always regulate the calcium in the blood first and foremost; even if that means other tissues (like bones) are negatively affected.***

Here is a **great video** that explains how the body regulates the calcium in the bones & blood via “homeostasis” (keeping a healthy balance). It shows how the body lowers the blood calcium when it's too high, and how it increases the levels when it's too low.

Don't get me wrong here, the bones are in a constant state of remodeling which is a homeostatic balance between removing old bone (known as “resorption”), and creating new bone in its place (called “formation” or “deposition”).

This process of bone break down and rebuilding is perfectly normal, and necessary for strong healthy bones.

The issue is not with the remodeling process; the issue is when this process is out of balance and tips more toward resorption, and away from formation.

So, when the blood calcium is ***too low***, parathyroid hormone (PTH) is released by the parathyroid glands at the front of the neck. PTH activates osteoclasts which are the cells that degrade bone as part of the natural bone remodeling process. When the osteoclasts sense more PTH, they do more work to degrade

bone (via “resorption”), thereby removing calcium from the bones and putting it into the blood.

The kidneys have two roles in increasing blood calcium levels. First they activate vitamin D (to increase calcium absorption from food). Second, they tell the kidneys to re-absorb calcium so it isn't flushed out in the urine.

On the other hand, when blood calcium levels are ***too high***, the thyroid gland produces the hormone calcitonin which slows down the osteoclasts from breaking down bone, as well as slows the kidneys from re-absorbing a lot of calcium.

This results in more calcium getting flushed out in the urine, and leads to lowering the amount of calcium in the blood until it's the right level.

If these systems of gastrointestinal nutrient absorption, hormones and kidneys are all working perfectly in balance, then you'll have the perfect amount of calcium in your blood for essential processes (blood clotting, nerve transmission, muscle movement, etc.), and you'll retain enough calcium in your bones to ensure they're healthy and strong.

Are you at risk for osteoporosis? I am!

Our bones are pretty pliable as infants and children, and as we grow they harden with calcium deposits. So, the remodeling balance for the first 29 years or so of our lives is tipped toward “formation” or “deposition”.

After that, and depending on many factors including the ones listed below, our bone density will either stay relatively stable or slowly drop. The average woman's bone density drops about 0.5% per year starting from age 40. That is, until menopause when the withdrawals (“resorption”) really kick in.

There are about 125 factors that increase risk of osteoporosis and bone fractures.

They range from “non-modifiable” factors like:

- family history of osteoporosis,
- advancing age (including menopause), and
- gender.

To nutritional factors that reduce absorption of key bone-healthy nutrients like:

- celiac disease,
- eating disorders,
- poor diet, or
- vitamin D insufficiency.

- Osteoporosis can also be associated with use of certain medications like:
- antacids,
- hormonal medications* (i.e. for breast cancer treatment, thyroid hormone replacement, etc.), or
- glucocorticoids (e.g. Prednisone).

As well as many “modifiable” lifestyle factors like:

- lack of weight-bearing exercise,

- drinking 2 or more alcoholic drinks per day, or
- smoking.

***Note:** When it comes to birth control pills, there have been several studies looking for effects on bone density. Overall, there has not been shown to be a strong link either way. There may be a small link with injected “depo” (progestin only). If you have any concerns, you can bring this review to discuss with your doctor.

Whether you're higher risk for osteoporosis or not, ***it's always a good idea to keep bone health in mind*** way before you anticipate results from your first bone density scan.

Calcium in pregnancy and breastfeeding

Interestingly, our daily calcium needs don't “officially” increase during pregnancy and breastfeeding. But since this is a time of extra demands on our bodies, our nutritional status is even more critical when we're pregnant or breastfeeding.

Key Takeaways about calcium and your bones:

- Calcium is just one essential nutrient for optimal bone nutrition and overall health & wellness, but your body makes a lot of effort to make sure you have enough for essential (non-bone) processes by tightly regulating the blood levels of calcium. If they're off, there is no hesitation to remove calcium from the bones to ensure that the blood levels are high enough.
- There are over 125 risk factors for osteoporosis, and prevention is a long-

term strategy that we need to think about way before menopause.

- Proper nutrition is one risk factor for osteoporosis that we have control over, and will benefit more than just our bones.
- If you get enough calcium from foods first, you will be getting the safest forms of calcium (versus supplements, but we'll talk about that in Chapter 5). You will also likely be getting much of the other bone-healthy nutrients from minimally-processed foods.

Next up...Chapter 2: What is a Bone-Healthy Diet?

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As a nutritionist, I find this to be an absolutely fascinating question!

And, even though calcium is the most important nutrient for bone health; it is absolutely not the only thing to consider.

If you can get most of your daily calcium from nutrient-dense minimally processed foods, you're most likely going to be getting all of the nutrition your bones (and the rest of your body) needs.

Bone-Healthy Diet Characteristic #1: Enough calcium

Of course, getting enough calcium is a critical first step, and that's where this book comes in. It's the first step, and I want to help make it as easy as possible for you.

Bone-Healthy Diet Characteristic #2: Enough vitamin D

Did you know that if your blood level of vitamin D is optimal, you're likely to have a higher bone density in your hip; and if you take vitamin D supplements you have a reduced risk of falling and fracturing your hip?

Yes, you read that right, people (especially elderly people) who take vitamin D seem to fall less frequently!

Vitamin D is the fat-soluble “sunshine” vitamin, that acts more like a hormone

than a typical vitamin.

It has several roles in the body, one of which is to increase absorption of calcium from the gut.

Vitamin D is the #1 nutrient that we in areas like North America, the UK and several parts of Europe simply do not get enough of (and yes, calcium is #3). This is partly because many people are (wisely) protecting our skin from the sun's cancer-causing ultraviolet rays. But also because vitamin D is simply not readily available from most foods. It occurs in small amounts in organ meats and some fish (including cod liver oil), and sunshine-exposed mushrooms, but not much else.

Many experts suggest that vitamin D supplements should be taken by most people.

However, as with many nutrients, and all fat-soluble vitamins, more is not always better. If you think you need more than the amount on your supplement's label, ask your doctor about getting a blood test to be sure you're not going to get too much of a good thing.

Bone-Healthy Diet Characteristic #3: Enough protein

Your bones are made of a framework or scaffold of collagen which is a protein. In fact, about 20-30% of your bone mass is pure protein. Without this scaffold, there is nowhere for the calcium and other minerals to be laid onto.

We'll talk a bit more about protein in Chapter 4.

Bone-Healthy Diet Characteristic #4: Enough magnesium

After learning the most common nutrient insufficiency is vitamin D, and #3 was calcium, did you wonder what #2 is?

It's magnesium. (Do you see a bone nutrition deficiency problem here?).

Magnesium is an essential mineral, and similarly to calcium, it's also necessary for proper nerve conduction, muscle contraction, and bone health.

Here's a little **article I wrote** about the importance of magnesium for good health.

Magnesium is found in many green plants because it is the central part of the chlorophyll molecule.

Bone-Healthy Diet Characteristic #5: Enough potassium/less sodium

North Americans tend to consume too much sodium, and not enough potassium. We all know that sodium is the main mineral in salt (table salt, kosher salt, Himalayan salt...all salts). Potassium is abundant in many vegetables, and most people just aren't getting enough.

Bone-Healthy Diet Characteristic #6: Vitamin K

Vitamin K is a not-so-well-known fat-soluble vitamin that is known to help re-mineralize bone. High vitamin K levels is associated with reduced risk of all types of fractures.

Another interesting thing about vitamin K is that when it's low, calcium seems to build up in the arteries ("arterial calcification"). When vitamin K is increased, that arterial "calcification" seems to reduce. This is particularly important since several studies have shown a correlation between taking higher-dose calcium supplements and increased arterial calcification. Don't worry, we'll talk a bit more about this in Chapter 5 on calcium supplements. It seems that vitamin K can help with this.

Bone-Healthy Diet Characteristic #7: Other minerals (phosphorus, manganese, zinc, boron, etc.)

There are a lot of minerals your bones need and use. This includes phosphorus, manganese, zinc, boron, among others.

My goal with this short ebook is to help you get enough calcium from foods first; however, my master plan is actually to help you get enough of all of those other critical minerals that are needed in much smaller amounts.

How can I do this if I focus on calcium?

By using real, whole, minimally processed, nutrient-dense foods to help you get that calcium.

And guess what else is in those foods?

Yes, lots of other nutrients!

So, what should I eat?

Regardless of what eating style you prefer, be it vegetarian, paleo, or whatever, there are certain fundamental “rules” of nutrition that apply to everyone (the science is pretty solid here):

- Eat minimally processed foods, fewer “ready-to-eat”, pre-made, packaged foods; and instead focus more on real, whole, nutrient-dense foods.
- Eat a lot of fruits and vegetables. Very few people eat even 5 servings per day, and this has huge health benefits for so many diseases. In terms of fruits and vegetables, there is no doubt that they are a necessary part of any healthy diet. Fruits and vegetables are rich in not only vitamins and minerals, but also phytonutrients, fiber, and antioxidants. People who eat an abundance and variety of fruits and vegetables are at decreased risk for several chronic diseases (e.g. heart disease, cancer, etc.), including osteoporosis.
- Eat enough protein, ensuring you get all of the essential amino acids. And please don't be afraid of protein for bone health (if you're concerned, or just interested, check out Chapter 4).
- Eat healthy fats. Olive oil probably tops the list of health benefits, but you can also have moderate amounts of healthy saturated fats such as coconut oil. And don't forget the healthy fats in avocados, egg yolks, nuts and seeds.

As you can imagine from what we've already seen, a bone-healthy diet would consist of not only calcium-rich foods, but also foods rich in protein, and other vitamins and minerals.

Calcium rich foods are listed in detail in the Food Calcium Chart in Appendix 1.

- Dark green leafy veggies (e.g. kale, chard, etc.) and Brussels sprouts contain magnesium, vitamin K, and other vitamins and minerals. Don't forget to eat them with some healthy fat so you can absorb that bone-healthy fat-soluble vitamin K.
- Nuts and seeds contain minerals such as potassium and calcium. Almonds and sesame seeds are particularly high in calcium.
- Seafood contains potassium and omega-3 fatty acids. And if you eat some of the bones (e.g. as in canned salmon) you are also getting a rich source of calcium and other bone minerals.
- Several fermented foods such as natto and some cheeses contain vitamin K.
- If you can tolerate dairy, that is a great source of calcium, especially fermented dairy like yogurt. We'll dive into the dairy controversy a bit more in Chapter 3.
- Do you like prunes? One study showed that adding 10 dried plums per day was very beneficial for bone health. They seem to help increase bone mineral density by inhibiting resorption. But don't just go ahead and start eating 10 prunes a day. They're high in sugar, and have a laxative effect. So increase gradually, and consider them a replacement for your regular dessert.

For a bunch of recipe ideas and inspiration, I invite you to follow my Pinterest account, and join my facebook group.

Key Takeaways about a bone-healthy diet:

- There are several key nutrients that your bones need; including calcium, vitamin D, protein, magnesium, potassium, vitamin K, etc.
- A bone-healthy diet includes minimally-processed foods, lots of fruit & veggies, enough quality protein, and healthy fats.
- A “bone-healthy” diet is actually simply a “healthy” diet, and some added prunes for good measure.

Next up...Chapter 3: Dairy: Good for Bones or Not? (You May Not be Surprised)

CHAPTER 3: Dairy: Good for Bones or Not? (You May Not be Surprised)

Dairy is controversial!

It seems that most people either love it (or, at least love cheese), or completely avoid it. Many adults are lactose-intolerant, and many have seen reduced health concerns after removing at least some dairy products from their diets.

Fun fact: Fermentation of dairy products (i.e. to make cheese or yogurt, etc.) removes some of the lactose, so many fermented dairy products are easier for people to digest, rather than drinking the milk itself.

I'm not going to tell you you need your dairy, because “dairy” is NOT essential to a bone-healthy diet. However, it has been estimated that 70% of the (already insufficient) dietary calcium intake of Americans is from dairy products, so it already plays a huge role in many people's calcium intake.

Yes, there is more calcium per serving in dairy than most other foods.

Yes, the calcium phosphate molecule in dairy is more easily absorbed than the calcium oxalate in plants. In fact, at least one study has shown that you absorb 96% of the calcium from milk, yogurt and cheese!

Yes, milk is often fortified with vitamin D to help increase absorption of calcium.

But all of this together does not mean that you absolutely need dairy.

You don't.

But you can!

In fact, when you look at the science of dairy's impact on our bones (I'm not talking about one “groundbreaking” new study that the media and some online health “gurus” love to sensationalize, but what is called “the totality of the evidence”) you'll see that the evidence is mixed.

Some studies show that people who drink more milk have higher bone mineral density (BMD), but there isn't consistent evidence on whether or not that translates into more or fewer fractures.

And fracture reduction is really what we're aiming for.

In this 2016 ***review*** ***of several studies on milk and risk of fractures, the evidence of dairy's effect was neutral.***

Yup, neutral!

And it wasn't just neutral when it came to fractures. It was also neutral when it came to heart disease, stroke, and type 2 diabetes.

So dairy was not associated as being protective, nor worsening of any of these conditions. The effects were "neutral".

Here is the summary table from that article:

Oh, and this wasn't the only study that looked at a bunch of research and came up with this conclusion.

Here is another study that reviewed 7 studies and a total of over 195,000 women and had the same conclusion:

> "...There was no overall association between milk intake and hip fracture risk in women..."

Dairy for children and adolescents

There does seem to be an association between a higher milk intake in children and adolescents, and a reduced risk of osteoporosis and bone fractures in older age.

One thought as to why is that children who drink more milk are not drinking as much soda pop. So, it may be possible that the reduced risk of hip fracture was actually due to an overall more nutritious foods, rather than the milk in an of itself.

What's my bottom line with dairy?

> ***As far as I'm concerned, dairy is something that you can take or leave when it comes to bone health.***

Here are a few things to consider if you're thinking about starting or stopping your dairy intake:

1. “Dairy” is not an essential nutrient.
2. If you react to it, avoid it.
3. If you have eliminated it from your diet, and feel better for any reason whatsoever, then there is no need to re-introduce it if you don't want to.
4. Be aware of “replacements”. One hypothesis about milk being helpful to bones is that it can be a healthier replacement for sugar-sweetened beverages like soda pop. So, if you're cutting it out, make sure you don't replace it with nutrient-poor sugary drinks.
5. Dairy is a good source of protein (including all essential amino acids), absorbable calcium (in the form of calcium phosphate), and vitamin D, if fortified (in some countries, milk often has added D3, but it's not added to other dairy products like yogurt and cheese). So, as long as you're getting these essential nutrients elsewhere, I see no issues. And beware of milk

substitutes (e.g. nut milks, etc.) - they rarely have the same nutrition as dairy milk. BUT, I did find an almond milk in Costco that is fortified and has almost the same nutrition as dairy milk (but not as much protein), so check your labels!

As long as people are getting the protein, calcium, vitamin D, etc. elsewhere every day, no need to have dairy. But, as we know, calcium is the third most common nutrient that we in North America don't get enough of (vitamin D3 is #1, and magnesium is #2 – do you see a bone nutrition issue here?).

But, you know what this also means?

That having a glass or two of milk a day won't guarantee fracture-resistant

bones!

There is way more to bone and nutrition health than dairy!

Key Takeaways about dairy and your bones:

- Dairy may be associated with slightly higher bone density, but has not been shown to be particularly helpful in preventing, nor increasing, risk of fractures. The overall evidence is neutral.
- Dairy is the main source of calcium in most people's diets, but it isn't necessary if you are intolerant to it.
- Make sure you replace it with equally nutritious foods and drinks.

Next up...Chapter 4: High Protein and Urinary Calcium

CHAPTER 4: High Protein and Urinary Calcium

Yes, it's true that eating higher protein meals causes our body to excrete more calcium in the urine (hypercalciuria). It's been shown in many studies for the past hundred years.

After this observation, the question then was, “Where the heck did this higher-than-normal urinary calcium come from?”. And that was a great question!

Of course, one of the main hypotheses at the time, was that the calcium came from the body's main storage of calcium, namely bone. Since our bones store 99% of the body's calcium on a protein matrix, that's a logical place where this calciuria may very well be coming from.

This was the hypothesis, and it went on to consider whether there might be a link with the acidic ash that results from the metabolism of proteins versus other foods.

This hypothesis got many, many people on board with the idea that excess meat consumption contributes to loss of bone density. (By the way, there are still a lot of people why try to sell an “alkaline” diet to prevent or reverse osteoporosis...I don't think they've looked at much research done in the past 10 years).

But wait!

How can we test if this hypothesis is true? How can we figure out what the

actual cause of the hypercalciuria was? Where ***exactly*** did that urinary calcium come from?

We can test this by using radio-labeled calcium!

So, back in 2004 a study was published that solved this mystery using safe levels of non-harmful radiation.

Scientists took a group of women and for 10 days they were on either a moderate or a high protein diet, ingesting 600 mg of calcium per day. Then they had them eat a meal where the calcium was radioactive so they could measure (via the radiation) where that calcium from the meal actually went.

Guess what?

The urine was radioactive!

In fact, most of the increased calcium in the urine was radioactive. Yup, it came from the meal, NOT the bones!

What does radioactive urinary calcium mean?

Well, this is when we learned that ***eating calcium with protein actually increases the body's absorption of calcium***, from the normal level of about 19%, up to 26%.

Here's exactly what they say:

> "The high-protein diet caused a significant reduction in the fraction of urinary calcium of bone origin..."

You heard that right, ***reduction*** in the amount of urinary calcium from the bones!

So, by eating higher amounts of protein with a calcium-containing meal, you can help your intestines absorb more of that calcium from the meal!

How does the calcium get into the urine?

Of course, your kidneys are always doing their job to regulate your blood so it's always just about perfect – its pH, electrolytes, mineral concentrations, etc. So, when you have enough calcium in your blood at the moment (because you just absorbed a whole whack of it from your high protein meal), your kidneys filter some of that excess calcium out into the urine so as to maintain perfect blood levels of calcium.

So, what we actually learned was that ***protein helps us to absorb more calcium from our meals***!

Yes! Similarly to vitamin D (which we all know is critical for increasing absorption of calcium), protein also increases our absorption of calcium.

In case you're wondering, other studies have also shown that high protein diets do not negatively affect bone health.

Not to mention that study after study shows that high protein diets are associated with higher bone mineral density and lower fracture risk! Especially when those people are eating adequate amounts of calcium.

In fact, in one large study, the people who ingested the most protein and at least 800 mg/day of calcium had an 85% reduced risk of fracture compared with those who ate the lowest amount of protein!

There are several thoughts as to why higher protein diets are actually better for your bones, such as whether it's only due to increased calcium absorption, or perhaps also due to increased muscle mass, or suppressing parathyroid hormone, or other reasons. It's not quite clear exactly all the reasons why.

Some studies have suggested that higher protein diets are good for bone health, but mostly when adequate calcium is also ingested.

Once again, calcium is critical for your bones.

The bottom line is that your bones need the calcium, and the protein (and a bunch of other vitamins and minerals too). Don't skimp out on any of these the vital nutrients!

Key Takeaways:

- High protein intake helps your body to absorb more calcium from your foods.
- Research within the last 10 years shows that higher protein diets seem to

be beneficial to bone health, particularly when enough calcium is consumed.

Next up...Chapter 5: Calcium Supplements: Have You Heard the Controversy?

CHAPTER 5: Calcium Supplements: Have You Heard the Controversy?

You may very well be taking a calcium supplement, either within your multivitamin, or separately.

You've probably been told that they're good for your bone health.

You may have also heard the recent controversies over the “heart health” concerns with taking too much calcium via supplements.

Of course, you should always aim to get your nutrients from foods first. That is NOT always possible, and in fact, ***it is very common to not get enough nutrients on a daily basis***! And as mentioned earlier, calcium is the third most common deficiency in North America (behind vitamin D & magnesium - all are important for bone health).

Calcium supplements and bone health

First of all, getting your daily amount of calcium from food first is recommended by just about everyone. Chapter 6 is dedicated to reviewing several ways that you can track your calcium intake from foods. I've looked at several apps, as well as created a food calcium chart and tracker in Appendix 1.

Ideally, you won't need to take much of a calcium supplement because you're getting most or all of your calcium from food first.

If you do need to take a calcium supplement, then know that supplementing with

calcium has been shown to ***modestly*** reduce risk of fractures. The result is much better when combined with vitamin D supplements. And since vitamin D is not widely available in most foods, many experts recommend that as a supplement when you're not enjoying the summer sun on a regular basis.

Calcium supplements and heart health

If you've heard the headlines that calcium supplements are linked with heart disease, please let me summarize the science for you.

Yes, calcium supplements (and not calcium from foods) seems to be associated with increased risk of “calcification of the arteries”. This isn't great. You don't want your arteries to become hardened with minerals, you want them to remain soft and pliable.

Yes, increased calcification of arteries seems to be associated with higher risk of heart disease and heart attack.

But (and a big BUT) when you put these two together, and actually directly look at the risks of people who take calcium supplements and the risk of heart attacks (skipping the middle step of “calcification of the arteries”), there seems to be no correlation.

Nope. None.

Since the media fiasco, several reputable health and osteoporosis associations have gone on record to say that calcium supplements can be taken safely. See:

- National Osteoporosis Foundation and American Society for Preventive Cardiology Position Statement
- Medscape's video - Calcium Supplements and the Heart: Clearing Up the Confusion

The bottom line here is that you should:
- Get your calcium from food first (1,000 - 1,200 mg calcium per day) – See Chapter 6;
- Make up the difference with supplements;
- Don't go over 2,000- 2,500 mg calcium per day.

How to choose a calcium supplement

Before you go out to choose a calcium supplement there are a few things to consider.

First and foremost, if your doctor has told you to take a certain one, don't change without consulting them first. And this goes especially if you're taking other supplements and/or medications. Calcium can interact with several of them, so be sure to clear it with your doctor first.

If you have the “OK” from your doctor, then let me give you a bunch of tips to choose a good calcium supplement:

Calcium Supplement Tip #1: Safety of calcium

Calcium supplements are generally safe, and do not seem to cause issues for most people. There could be concerns if you take it with certain medications or other supplements, or if you take too much.

They are also generally safe for most pregnant and/or breastfeeding women.

Calcium supplements can be taken long-term, so if they're serving you well, you can take them regularly (even daily) well into older adulthood.

Please follow the label directions for use.

Pro Tip: Check the listing of all the medicinal and non-medicinal ingredients on your calcium supplement. Some may contain allergenic artificial colours, or even loads of sugar (if they're chewable), so you should consider all of the ingredients before purchasing any supplement.

Calcium Supplement Tip #2: Form of calcium

There are so many types of calcium that you can get. Did you know that the active ingredient in some very popular antacids is calcium carbonate?

Calcium carbonate is the most common form of calcium in supplements, but you can also find supplements that contain calcium citrate.

Calcium citrate is a recommended source of calcium if you have any gastrointestinal upset from taking calcium carbonate. It is easier to absorb, and doesn't need to be taken with foods to reduce stomach upset like calcium

carbonate does.

Hot Tip: When you look at your supplement labels, you should be comparing mgs of “elemental” calcium. The carbonate molecule weighs less than the citrate molecule, so 40% of the calcium carbonate is the calcium, but only 21% of the calcium citrate molecule is calcium.

Calcium Supplement Tip #3: Format

In general, I recommend supplements in the form of powders, liquids or capsules.

The reason is, that hard-pressed tablets can be difficult to absorb. They're compressed so tightly into a “rock like” format, and they have been known to “go right through you” undigested.

Also, when it comes to calcium specifically, many of the chewable forms come packed with a bunch of sugar as well as artificial colours and flavours (check the ingredients).

Calcium Supplement Tip #4: Dosage

I mentioned before, and I'll say it again: ***the best place to get your calcium is from foods first.***

In this case, you really may not need much of a supplement. If you track your calcium intake as I teach you in Chapter 6, then you may not need one at all, or

you may just need a lower dosage to bring your total up to 1,000 or 1,200 mg/day.

Also, please don't waste your money on ones with 1,000 mg of elemental calcium. Your body has trouble absorbing more than 500 mg at a time. So, ideally, you should eat calcium throughout the day, and only take a small amount of supplemental calcium in the evening (if necessary).

And, because you can't absorb more than 500 mg at a time, don't take your calcium supplement with milk or a calcium-fortified juice. Take it with water.

Finally, unless directed by your doctor, never take more than 2,000 mg of supplemental elemental calcium per day.

Key Takeaways:

- Unless directed by your doctor, calcium supplements should only be taken if you cannot meet your minimum daily calcium intake from foods.
- On the supplement labels look for “elemental” calcium, other medicinal and non-medicinal ingredients, stay away from hard-pressed tablets or caplets, don't take it with a high-calcium meal or drink, and don't take more than necessary.

Next up...Chapter 6: How Much Calcium?

CHAPTER 6: How Much Calcium?

Yes, I'll show you how to get enough calcium, but first, you need to know how much you're aiming for.

How much calcium do you need?

Recommended daily Calcium intake for adults		
	Institute of Medicine (North America)	National Health and Medical Council of Australia
Women		
19 – 50 years old	1,000 mg	1,000 mg
51 – 70 years old	1,200 mg	1,300 mg
71+ years old	1,200 mg	1,300 mg
Men		
19 – 50 years old	1,000 mg	1,000 mg
51 – 70 years old	1,000 mg	1,000 mg
71+ years old	1,200 mg	1,300 mg

What can affect the absorption of calcium

In Appendix #1, I included the Food Calcium Chart & Tracker that you can fill out online, or print to track your own calcium intake. That's if you like to do things more manually.

If you're all about the apps, then...there's an app for that!

I've also spent a bunch of time trying, testing and reviewing four popular fitness/nutrition tracker apps. Here is a **link to that article where I list the pros and cons of four popular apps**.

Spoiler Alert: MyFitnessPal was the runner up; and my favourite one was HealthWatch360. You can **download it for free right here**.

Tips for tracking your calcium intake

When tracking your calcium intake, I always recommend referring to the product labels first. If there is no product label, then you can use a tracker/app, or the chart I created for you in Appendix #1.

BUT, the product labels don't measure calcium in mg! They measure it in %DV.

To get the %DV, they use an average of 1,000 mg/day. So, if you are an "average" adult, then you are supposed to add up everything throughout the day to add to a total of 100% which is 1,000 mg.

So:

%DV	mg calcium	%DV	mg calcium
15%	150 mg	6%	60 mg
10%	100 mg	3%	30 mg

Unless you're a woman over 50, or man over 70; or if your healthcare professional has recommended more than 1,000 mg of calcium per day. In this case ***you need more than 100%***! You may need 120% or 130% to meet your

need for 1,200 or 1,300 mg per day.

How can I track my calcium?

Option #1: The Food Calcium Chart and Tracker Approach

In Appendix #1 I've included a handy food calcium chart & tracker that you can complete by hand or on your PC. You can use it to estimate the calcium you're getting from your foods on a daily basis (using the food labels first, and the chart second).

If a food you eat isn't listed, you can search it online at the USDA's Nutrition Database here:
https://ndb.nal.usda.gov/ndb/search/list

Or, you can use MyFitnessPal or HealthWatch360 (my personal favourite) to look up the nutrition in your food (they even have barcode scanners!). See more on these nutrition tracker apps in this post.

Option #2: The "All In" Online Food Tracker Approach

You can use a handy free website or smartphone app to enter in everything you eat and get a tally of the amount of calcium you're getting (and other vitamins and minerals, fats, carbs, proteins and calories too).

If you already have a favourite online nutrition tracker then by all means use it.

Or, here is that link again **to that article where I list the pros and cons of four popular apps**.

How to Start: Eat normally, and track your calcium intake for a couple of days

We need to start where we are. You may be surprised at how much (or little) calcium you get from foods in a regular day.

I was!

On days when I didn't have milk, I didn't meet my calcium intake.

Of course, you absolutely ***don't need to drink milk*** to get enough calcium (see Chapter 3). If you don't, you just need to be a bit more conscientious.

Pro Tip: What I like to do, is to save some "caloric" room throughout the day for a calcium-rich evening snack. My "go-to" snack lately is about 1/3 cup of plain unsweetened (non-Greek*) yogurt, with about 2 heaping tablespoons of this delicious chia cereal. I mix them together in a small bowl & wait a few minutes for the chia to absorb the liquid from the yogurt. The consistency will get pretty thick and pudding-like, and there will still be a bit of crunch left.

***Pro Tip:** I find that adding chia to Greek yogurt just makes it way too thick. Feel free to try this for yourself, you may like the consistency more than I do.

This seriously keeps me full all night, into the next morning.

Super-simple. Two ingredients. About 250-350 mg of calcium.

Pro Tip: To reduce sugar intake: I use either sweetened yogurt or sweetened chia cereal; not both. It looks like this:

1) Plain, unsweetened (non-Greek) yogurt & add Q'ia chia cereal (**like this one** - sometimes available at Costco), or

2) Sweetened (non-Greek) yogurt & add plain chia seeds (**like this one**).
(Note: These are Canadian affiliate links)

Now how do I increase my calcium intake?

In a word: “swap”.

Unless you are underweight or have a reason to eat more food than you normally do, you want to use this as an opportunity to get more calcium without getting more calories (more “calcium”, not “calories”). This is why we're “swapping” instead of adding.

Of course, if you need to eat more food, then just add in a calcium rich food.

If you're already getting 1,200 mg of calcium every day from foods, then you're doing fabulously, and I'd love to cheer you on to continue this!

If not, the do some higher-calcium swaps and at the end of the day use a supplement with enough calcium to bump you up to where you need to be.

Simple!

Key Takeaways:

- See if you need to reach for a calcium intake of 1,000 mg per day or more.
- Decide whether manually charting your calcium intake is better for you, or if you'd rather use your PC or an app.
- Start with where you are by tracking what you normally eat in a day, and look specifically for the calcium levels.
- If you need to increase your calcium intake, then start swapping out some of your food for ones that are richer in calcium. Then only supplement enough at the end of the day to make up the difference.

Next up...REFERENCES.

But you're probably going to want to see page 59 for Appendix #1: The Food Calcium Chart and Tracker

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Calcium chart and tracker

Do you know how much calcium you're eating and drinking?

Did you know it's the third most common deficiency in North America; behind vitamin D & magnesium?

Here's a handy “calcium in food” chart to help you keep track to make sure you're getting at least 1,000 mg each day.

Of course, people have evolved to meet their nutrient needs from food, and even though science shows we actually don't get “all the nutrition we need from food” (and calcium intake is consistently too low), we should make food our first priority for nutrition.

And don't forget, by taking in calcium from whole foods, you will get the added benefit of taking in other essential nutrients as well!

Colour codes:

Fortified foods (added calcium)	Dairy
Seafood	Fruits, Vegetables & sea vegetables (including dried)
Legumes & legume products	Nuts & seeds
Herbs & Spices	Sweeteners

Food	Calcium (mg)	Serving Size	Notes
Tofu, raw, firm, with calcium	861	½ cup (126 g)	
Salmon, Sockeye, canned, drained with bones	441	½ can (184 g)	
Sardines, canned with bones	351	3.75 oz can (92 g)	
Ricotta, part skim	335	½ cup (123 g)	
Orange juice, calcium fortified	349	1 cup (229 g)	
Milk, 1%	305	1 cup (244 g)	
Soymilk, unsweetened, fortified	301	1 cup (243 g)	
Milk, fat-free, skim	299	1 cup (245 g)	
Milk, 2%	293	1 cup (244 g)	
Ricotta, whole milk	257	½ cup (124 g)	
Swiss cheese	252	1 oz (28 g)	

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Mozzarella, part skim	222	1 oz (28 g)	
Stinging nettle, blanched	215	½ cup (44 g)	When eaten (not tea).
Provolone	214	1 oz (28 g)	
Yogurt, plain, low-fat	207	2 oz (113 g)	
Cheddar	201	1 oz (28 g)	
Rhubarb, frozen, cooked	174	½ cup (120 g)	
Beans, French, raw	171	½ cup (92 g)	
Chia seeds	179	1 oz (28 g)	
Yogurt, fruit, low-fat	156	2 oz (113 g)	
Mozzarella, whole milk	143	1 oz (28 g)	
Feta	140	1 oz (28 g)	
Yogurt, plain, whole milk	137	2 oz (113 g)	
Collards, boiled	134	½ cup (95 g)	
Soybeans, green, boiled	130	½ cup (90 g)	
Spinach, boiled	122	½ cup (90 g)	
Figs, dried	121	½ cup (75 g)	
Yogurt, Greek, plain, low-fat	115	100 g	
Yogurt, Greek, plain, whole milk	100	100 g	
Sesame seeds	88	1 tblsp (9 g)	
Lobster, cooked	82	3 oz (85 g)	
Beans, white, cooked	81	½ cup (90 g)	
Cabbage, Chinese (bok choy)	79	½ cup (85 g)	
Crab, blue, cooked	77	3 oz (85 g)	
Almonds, whole	76	1 oz (28 g)	About 23 nuts.
Trout, rainbow	73	3 oz (85 g)	
Cottage cheese, 1%	69	½ cup (113 g)	
Bass, freshwater	65	3 oz (85 g)	
Tahini (sesame paste)	64	1 tblsp (15 g)	
Navy beans, cooked	63	½ cup (91 g)	
Broccoli, boiled	62	1 cup (156 g)	
Soymilk, unsweetened, unfortified	61	1 cup (243 g)	
Orange, raw, navel	60	2.75” fruit (140 g)	

Shrimp, cooked	60	3 oz (85 g)	
Parsnips, boiled	58	1 cup (156 g)	
Brussel Sprouts, boiled	56	1 cup (156 g)	
Beans, snap, green, boiled	55	1 cup (125 g)	
Crab, Alaska king, cooked	50	3 oz (85 g)	
Kale, boiled	47	½ cup (65 g)	
Anchovies, canned	46	5 fish (20 g)	
Broccoli, raw	43	1 cup (91 g)	
Parmesan, grated	43	1 tblsp (5 g)	
Molasses	41	1 tblsp (20 g)	
Prunes, dried	37	½ cup (87 g)	
Cabbage, boiled, shredded	36	½ cup (75 g)	
Sage, ground	33	1 tblsp (2 g)	
Squash, zucchini, boiled	32	1 cup (180 g)	
Spinach, raw	30	1 cup (30 g)	
Ocean perch, Atlantic, cooked	29	3 oz (85 g)	
Orange juice, raw	27	1 cup (248 g)	
Kale, raw	24	1 cup (16 g)	
Clementine, raw	22	1 fruit (74 g)	
Sauerkraut, canned	21	½ cup (71 g)	
Hemp seeds	21	3 tblsp (30 g)	
Strawberries, raw, whole	12	½ cup (72 g)	
Cucumber, raw, with peel, sliced	8	½ cup (52 g)	
Leeks, cooked	8	¼ cup (26 g)	
Seaweed, spirulina, dry	8	1 tblsp (7 g)	
Halibut, cooked	8	3 oz (85 g)	
Blueberries, frozen, unsweetened	6	½ cup (77 g)	
Garlic, raw	5	1 clove (3 g)	
Rosemary, fresh	5	1 tblsp (1.7 g)	
Parsley, fresh	5	1 tblsp (3.8 g)	

NOTE: These reported calcium amounts are general numbers and there is often variation

between foods, preparation methods, etc.; so please check the Nutrition Facts label on your particular products which may differ from this chart.

Also, double-check serving sizes. I included the direct links for each item, you can hop on the site and adjust the serving size to match how much you actually ate to see how much calcium (and other nutrients) are in it.

Track my calcium

Date:

	Which calcium-containing foods & drinks	How much food/drink?	How much calcium?
Upon waking			
Breakfast			
Snack			
Lunch			
Snack			
Dinner			
Snack			
Total Calcium for the day			

Hi! I'm the Leesa behind leesaklich.com

As a health writer and science-based holistic nutritionist at risk of osteoporosis, I am committed to helping women get abundant nutrients for optimal bone health. Food first. Supplements second.

For me, I have a lot of reasons why bone health is one of my top priorities now. Not only am I a "small-boned" woman over the age of 40, but osteoporosis is in my family. In fact, I was there when my aunt crushed her L1 (and went on to be diagnosed with osteoporosis); as well as when my grandmother slipped off her chair and broke her hip (many years after her diagnosis).

You can read about the reasons why optimal bone health is near and dear to my heart in this post.

If you want to know about how I blend my scientific background with holistic health, and why I don't really fit in, click here.

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Did this resource help you? Do you know other people who could benefit from it? If you'd like to spread the word (and I'd SO appreciate that!), send them directly to my home page where they can sign-up to instantly download a free copy for themselves!

Thanks so much!

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