



Collagen, Explained: For Athletes, Aging, and Everyone in Between with Dr. Dana Lis (ep – 61)

[00:00:01] **Dr Ginger Hultin** What if there was a way to make your joints more resilient, your recovery more efficient, and your skin just a little bit glowier all at once? For years, collagen has been touted as a magic bullet in the wellness world, but how much of it is real science and how much is just hype? I'm Ginger Hultin, and in this episode of The Good Clean Nutrition podcast, I'm sitting down with one of the world's leading experts in performance nutrition, Dr. Dana Lis. From Olympic athletes to the Golden State Warriors, she's worked at the highest level of sport to understand what really moves the needle in injury prevention, muscle recovery, and the role collagen plays in it all. Today we'll explore what collagen is, how it works in the body, and what the latest research actually says about supplementation. Whether you're an athlete, a healthcare professional, or just collagen curious, this conversation is packed with insights to help you cut through the noise and understand what's worth your time and money. So Dr. Dana Lis, welcome to the podcast. I'm really excited about this conversation. And I just wanted to start by having you quickly introduce yourself.

[00:01:09] **Dr Dana Lis** Yeah, well, thank you so much for having me. This, yeah, this is a topic in an area that's, yeah, close to my heart, close to research. But I've been in the performance or sport nutrition world for about 18, 17, 18 years now, and worked all across the world. I've worked in Canadian Olympic sport for several years, and then jumped over to Australia for a bit to do my PhD and just, yeah I get more kind of training and expertise in the physiology space. Because, I think, when you're working in sport with elite athletes, you really need the deep dive physiology knowledge. It's like nutritional physiology, basically, is what we're doing to really optimize, optimize performance at that level. And worked across, yeah, Olympic sport, worked across world tour cycling, so with men's and women's teams in Europe, flying back and forth, a lot of air miles. And then I live in Lake Tahoe area, California now, and I work in the NBA. So I work with the Golden State Warriors.

[00:02:07] **Dr Ginger Hultin** I love that. It's so fun to talk to someone that's really launched leadership that we need in that area. So thank you for all that



you've done and thanks for cheering your expertise today. I love that you have done research in this space because you and I have both been practitioners for a long time, and I'm interested to get your take. I would say 10 years ago, nobody was talking about collagen. It's exploded in popularity, like, no one like on social media. I'm sure you are sure you were. But all of a sudden, everyone's talking about it, taking it, questions about it. And so how long do you think it's been like popular?

[00:02:45] **Dr Dana Lis** I would say since about 2016, maybe no, sorry, 2014. And I would say the big jump came from, in our space as practitioners from one publication out of Keith Baar was the lead author, I think he was lead author was it was Greg, one of them anyways, lead author that first like gelatin study, where they had like a small number of subjects, and they measured a marker of collagen synthesis in the body, which is P1NP. And it was a small number, but the findings were really unique, and kind of the way the stats were done, it looked really, really quite impactful. So I'd say that's where in our space, we, everyone jumped on that. And it was, and I think also too, it was a new thing. Like I felt at that point, our, our field in terms of new science was getting a bit bored. Like we were like the last big kind of new thing we had was, was beta-alanine, and so it was new, like, way that as practitioners, we were like, oh, we can help athletes with injury. We can, you know, help with connective tissue and help with force rate of force development and adapting to that explosive performance type training. So I think we just got really excited.

[00:03:51] **Dr Ginger Hultin** Totally. It's in everything. Well, I want to get your molecular information about what is collagen in the first place, and then what role does it play in the body?

[00:04:01] **Dr Dana Lis** So collagen is basically in our body, we have about 27 different types of collagen-based tissue. And what's common about these tissues is the structure of amino acids is very similar. Regardless if it's your skin connective tissue or your bone or your tendons or ligaments, the amino acid makeup is essentially like the protein strands of the sort of more primary structure is really, really high in glycine, but overall it's like the most, the highest sort of type of tissue in our, in our body. And there are tons of different types of connective tissue, but it's something that from an athlete perspective, historically we thought that there wasn't a lot of blood flow to our cartilage or to our ligaments and tendons. So really trying to find ways to optimize adaptation



and optimize return, like injury recovery, essentially, was where sort of some of the rationale around, hey, let's look at sources of collagen. And so when we take collagen as a supplement, so separating from kind of what it is in our body, but we're trying to get those building blocks from a supplement and put them into our body to maybe hopefully improve some of the connective tissues adaptations we're looking at. Different companies will have different sources of collagen supplements. So some will be bovine. Some will be marine-based. But basically you're taking byproduct of animal, but, and then it's processed through sort of a heat denaturation process, chemical process into like basically broken down into single amino acids and dipeptides. So really highly digestible, highly bioavailable sources of these amino acids. You get these powders, take them, and see what happens.

[00:05:56] **Dr Ginger Hultin** Yeah. I mean, I have patients taking them in a different way than yourself. I have people doing it for skin, hair, that kind of stuff. And I'm interested in your eyes. You mentioned athletes. Who else benefits? Aging adults, people with joint issues? Who is this for?

[00:06:12] **Dr Dana Lis** There's definitely like a solid area of research supporting the use of collagen supplementation in older populations with osteoarthritis, osteoporosis, in the recovery process of like total knee replacements. So looking at, hey, when do we, when is our connective tissue, when do we start to have problems? Like when do start to break down, why? And what can we do nutritionally to help reduce or slow that? But I would say that taking collagen for, whether it's like a joint, health, connective tissue, sort of joint focus, you still need to load. You still need exercise. It's not gonna be like you can take it and then magically your bone gets better. You still to do the rehab or be active and load that joint to stimulate collagen turnover and stimulate the formation of those collagen cross-links. So you have the collagen tissue, but that tissue is made up of those collagen sort of fibers essentially, the triple helix of protein strands joined together with these cross- links. So that's what gives it like the strength in a way. So when we adapt, we don't only make connective tissue, but we also improve the cross-linking. So break and make new cross-links. So that also helps with just like the integrity. I kind of think about it as a hair elastic where you have an old stretchy hair elastic that you've used for ages. It's your favorite hair elastic, but it really doesn't hold your hair up anymore. Whereas then you get a pack of fresh new elastics. And I kind, that's how I kind of think of some of the like tendon and ligament



collagen-based tissue is like, we're trying to keep it, like, fresh and springy, so it, it holds your hair, holds your body up and generates force.

[00:08:06] **Dr Ginger Hultin** That's such an awesome example. It really, it really speaks to me. It really makes sense. And I was writing an article the other day about pre-habilitation. So getting people ready for surgeries and things like that. So I think about collagen whenever we need the healing process. And there was some interesting stuff out there about dosing extra protein and maybe collagen to help with the healing processes later. So there seems to be a lot of uses, and I would say good research and emerging research it sounds like.

[00:08:36] **Dr Dana Lis** And it's also risk versus benefit. There's not really a lot risk.

[00:08:40] **Dr Ginger Hultin** But, you know, you and I talked about how collagen is everywhere. If you go to the store, there's literally like shelves full of it. I think that this is not just like a passing trend. I really think this is here to stay. And I'm interested to hear if you believe the same. And then if you think we're under utilizing it, like should be using it more.

[00:08:59] **Dr Dana Lis** I'm surprised how long it has stayed around honestly. I kind of thought it was going to be like kind of the gluten-free trend, where we'd have a few years of everyone's selling collagen products, and then the few high quality products would stay around, but it just still seems to continue to grow. And the market just keeps expanding and still being somewhat lucrative. And I so I think it will continue to stay around. There's still a lot of interest in the research space. Which tells me that it will continue to grow because we'll learn more. And I would say underutilizing, maybe I just, there's only so many supplements people can take. And I try to get people to like, I guess whenever they're like, oh, if I take all these supplements, like that's, first of all, adds up to your bank account really fast. But it's like, how long are you gonna take 40 supplements a day? Not very long. So I really try to get people to like work through. And when I work through with athletes too, we don't just take every supplement all year round. We really, we periodize. And I try to encourage people to even write down, what are your priorities right now? What are your health priorities? And what are the top three or five, or whatever it is that you think you can manage supplements for this period of time that you would think would be beneficial, rather than I have cupboards of supplements that I



periodically just garbage bag. So I think really let's try to be in a way priority based like we do with athletes is figuring out what are your priorities, what nutrition strategies and supplements underpin those priorities for this X amount of time.

[00:10:32] **Dr Ginger Hultin** As far as like where collagen has come in the past five or ten years, are there any like misconceptions that are that are floating around out there that we should bust today?

[00:10:43] **Dr Dana Lis** There's definitely some marketing that is very strongly opinionated around if you are trying to improve or return to play or your rehab from ACL reconstruction, you should take this X amount of this type of collagen. So, like, type three and type one or whatever, or if it's skin, you should take this type and this type of collagen, they're all like labeled with essentially Roman numerals. But I haven't really found any literature supporting the benefit of, like, type two or three collagen for a certain condition over hydrolyzed collagen peptide. And when I think about like the processing of collagen and I think about the structure, the only rationale I can think why one type of specific type of collagen may be indicated for a specific condition would be that there's some bioactive compounds in that product from the extraction process that somehow, it somehow benefits or somehow makes it more, more active or beneficial. And I, but there, I haven't come across any literature that has really any good literature that hasn't shown this. I try to think through it like kind of methodically, because if we are waiting for a review or a meta-analysis to come out, you're going to be waiting a long time, and then you're gonna be really behind the times as a practitioner. So I really try to understand the mechanisms to then form sort of an evidence-influenced opinion for my clients or for my patients. So if I look at like processing a collagen and what comes out on the other end, single amino acids and dipeptides, and they're pretty similar in the amount of these amino acids as well, regardless of what tissue it's been extracted from.

[00:12:35] **Dr Ginger Hultin** That is really interesting, because I get confused when I'm like looking at the literature or hearing people talk about, it has to be type one, two, what have you. And I think people get really in the weeds about that. But what I'm hearing from you is that is not maybe where we should put our biggest focus.



[00:12:48] **Dr Dana Lis** Yeah, I think just like a high quality product and the same product of collagen, like the same thing essentially that you get in that canister has six different names. Sometimes you'll have collagen peptides, hydrolyzed collagen, and it's just different names for the same things too. So sometimes people will also get in the weeds of being like, oh, you have to take collagen peptide. That's the only thing that works or that works the best, but it's processed the same. So just, yeah, not trying to get yourself too caught up in that. And then there's the gelatin piece too, which was sort of where some of this collagen products came essentially from gelatin, and like years ago, NFL teams were taking jello shots for what we use collagen for now, for a bit we used, yeah, we used gelatin and jello and stuff, but now we have actually decent tasting.

[00:13:38] **Dr Ginger Hultin** I actually want to jump a little bit more into exercise, because you mentioned something really interesting that was like so many supplements. You don't just take collagen and everything's fine, like you need to also do the work. So I'm interested in taking collagen and exercise and how they work together.

[00:13:55] **Dr Dana Lis** So I'd say there's sort of two ways to do it. Two things we're looking at with connective tissue adaptation when it comes to loading or exercise. One is if you have that hair elastic that's super springy and fresh and generates force really well, or holds your hair up really well, what are you using collagen for? Is it to improve your rate of force development and some of those basically related performance measures? So there's that sort of piece, which is like the are you looking for the performance? Are you're looking to optimize the tissue that is helpful with explosive power-based performance, jumping, sprinting? Or is your priority more around like just connective tissue integrity, health, maintenance? And that would be sort of like your, we might call like a prehab program. And that will be more of focusing on isometrics, longer holds, like a wall squat. So what you're doing there is you're changing, we'll put loading the tissue in a way where it's getting loaded and you're breaking off, you're braking those cross-links and then with the right nutrition, forcing your body to make more better cross-lengths. So having sort of more, what we hope is like more sort of tissue integrity. Those would be sort of the two rationales and like exercise related scenarios. And kind of how I separate them out because it is confusing.



[00:15:21] **Dr Ginger Hultin** You did mention muscle though, and I know that there are studies that suggest that collagen might help with muscle mass. Is that true and can you walk me through that?

[00:15:30] **Dr Dana Lis** So well the muscle itself, the muscle tissue itself is not going to really benefit from collagen alone. I mean, maybe it benefits if you have a really low-protein diet, but it's the extracellular matrix of the muscle that, so Luc van Loon's lab in the Netherlands, they've done a string of studies measuring changes in the extracellular matrix. So muscle tissue, itself, no, but that's not really what we're looking for in a way. That's not the reason I would use collagen, but there's definitely been some misinformation in that space.

[00:16:04] **Dr Ginger Hultin** One of my favorite ways to get collagen is actually in smoothies. What's so great about collagen powders, especially Orgain's Wild Caught Marine Collagen, is that they dissolve easily and can be mixed into just about anything. One of my favorite smoothies is my wild blueberry oatmeal smoothie. It includes whipped ricotta, which gives it an amazing creamy texture plus extra calcium. And wild blueberries boosts the antioxidants in this delicious drink. The recipe is in the description below. After everything we've covered so far, are you curious to try collagen without altering the taste of your favorite foods? Orgain's grass-fed collagen peptides deliver 20 grams of collagen peptide in a smooth, easy-to-mix powder. Since it's flavorless, you can get creative and mix it into your coffee, a smoothie, or even a soup recipe. With products ranging from marine collagen to collagen plus plant protein, Orgain can make it easy to add collagen to your routine. Visit orgain.com to get started. I do see people coming to me more, I guess I see people with, I have joint issues, I have arthritis, maybe I have osteoporosis. And you mentioned before that that could be helpful. So maybe there's more use there.

[00:17:18] **Dr Dana Lis** Yeah, I would definitely say more use in the joint and bone, like your bone, surprisingly, is collagen-based tissue. It's never just like a X plus Y equals improvement. There's always so many confounding factors if you have somebody who's started to address joint pain or osteoarthritis or osteoporosis, and they're also, okay, I'm gonna do this with my nutrition. I'm going to start doing this exercise and this mobility and going to PT. So it's usually like a few factors that are involved. And there's never just like a magic supplement that's gonna fix everything.



[00:17:55] **Dr Ginger Hultin** Right, right, right. And I do think that that's one of the myths or misconceptions that people do get confused about. And osteoporosis, I mean, that's a complex disease that develops over time, and you're not just going to take collagen and, hey, it's way better, but maybe it's part of the story or maybe we need to be thinking about it more as preventative before we get into full-blown osteoporosis.

[00:18:16] **Dr Dana Lis** If I really look at preventative, I'm looking at your teenage years and making sure that you're optimizing your bone development during that time, but also trying to reduce the breakdown of bone that happens with age. And we just get, as much as I hate to say it, I am way more sedentary than I used to be. I'm way less active. And do less structured training and loading just because of like how busy life is with kids and stuff. And it doesn't have to be like you go to the gym, and you have this complex lifting program. You can take five minutes and 10 minutes and do step ups or do some weighted step ups. It doesn't have to be like a huge complex program. It can be just integrating those movements and a little bit of loading into, into your lifestyle. Stu Phillips is a researcher at a McMaster. He's probably top three protein and protein and protein like muscle maintenance and longevity type researcher I'd say in the world. And one of the things he says that always resonates with me is that maintaining muscle mass is like the one factor linked to health span or longevity. So I, yeah, like when I look at life span more, I'll use health span. Cause if I'm like super unhealthy, I don't really want to live a long, long time if I am bedridden and not able to do what I love. But like health span, being mobile and being able to do what you love is maintaining, maintaining lean mass. And as we age too, the signaling of our body too, in terms of adapting and making protein or making muscle protein or turning over muscle protein and building, muscle as we age that signaling slows down, so we actually need to eat more protein as we get older. And if we look at maybe look at your grandparents what do they tend to eat more of it's a lot of times it's not protein, toast, cookies, so it just really is to help educate on that with the aging population as well.

[00:20:22] **Dr Ginger Hultin** Right, I mean, we see people fall into this situation where their muscle mass is declining, they're not as active, fat mass either stays the same or increases and that's called sarcopenia. So then you have more fat mass, less muscle mass, it's harder to move through the world, and then



you're more sedentary and that this really negative cycle that holds people back from living a healthy life.

[00:20:43] **Dr Dana Lis** And then you get intimidated too of what you think you need to do to put on muscle. And I think you don't need to necessarily go to the gym and hire a personal trainer. There's, there's a lot you can do kind of at home.

[00:20:55] **Dr Ginger Hultin** Right. I always ask my patients, well, okay, there's all these barriers. What can you do? Like with every, with what you've got in front of you, what can you do? And I will point out proudly that I did weighted step-ups this morning, Dr. Lis. So I'm already showing your advice.

[00:21:09] **Dr Dana Lis** Ah, excellent.

[00:21:12] **Dr Ginger Hultin** Yes, yes, I do. I'm really following the research about how important it is to maintain your muscle mass and that how that affects your bone mass as you age. So I'm really glad that you touched on that. And even if taking collagen doesn't affect your muscle mass, it helps your bones and connective tissue, and that can help support maintaining your muscle mass.

[00:21:30] **Dr Dana Lis** Yeah, and like muscle quality with the extracellular matrix PCM.

[00:21:35] **Dr Ginger Hultin** Right, right, right. You mentioned something that is very interesting and important, which is the lack of completeness regarding collagen. So there's a, I struggle with this being a plant-based provider because it's like, there's this messaging when you're eating protein in your day. Like it doesn't have to be perfect. Your body can put it together, but I think that might be a little different when we're talking about collagen versus like whey protein. And can you talk me through the incomplete protein part of this conversation?

[00:22:04] **Dr Dana Lis** Yeah, like you don't, collagen is fairly limited in the range of amino acids it has in the supplement itself. So I wouldn't say I would use it as a protein source. I would use it as a collagen source. Sure, it can add on to increasing your lysine intake, but it's not gonna, if you just only have mostly collagen, and then maybe a little bit of lentils or beans, you're still gonna probably struggle to meet your quality protein needs in your, you might hit total



protein, but getting enough of the essential amino acids, you'll probably struggle. But I do, I just think people like just need to be aware, I guess, that collagen is not going to be in one hit wonder protein source. It's I would use it in a more targeted manner.

[00:22:52] **Dr Ginger Hultin** Yeah, it has amino acids in it, but it's not like a protein supplement. It is very specifically a collagen supplement.

[00:22:59] **Dr Dana Lis** Yeah Exactly.

[00:23:00] **Dr Ginger Hultin** Interesting. Dietitians like to be food first, right? We say that a lot. When you're working with athletes or people with cancer like a lot of times you need very targeted supplementation. Can you get collagen from the diet? And how do you know when you need to supplement?

[00:23:15] **Dr Dana Lis** Yeah, there's Rebecca Alcock ran a couple of different studies, and basically measuring the amino acid composition of a bunch of different commercial based collagen sources or supplements. And so just like basic like straight up product analysis. So she looked her research that she looked at bone broth, it was like it was a casein they're looking at a couple of other like whey protein alternatives just to look at the amino acid composition. Collagen peptides, gelatin, like a baking gelatin, they use Knox. And what that, the series of research she looked at there really found that compared to a collagen peptide or a hydrolyzed collagen, the amino acids that were in a bone broth product or a, mostly the bone broth, I probably would say was the most surprising, they were really low actually. So I think a lot of people will have use a bone broth as a source of collagen. But I don't know if you'll get what we think is sort of the effective or lowest effective dose, I'd say it depends on how much you're drinking, taking depends on, how you're making it depends, on how much you, you need, whether you're like, maybe don't need 20 grams, three times a day for a rehab. And you just need maybe five or 10 grams a day. So I, I think that does factor in, but I'd say if you're really looking for like, highest efficacy, highest dose of amino acids, you're probably looking at like a collagen supplement.

[00:24:46] **Dr Ginger Hultin** Yeah. Yeah. And about gelatin, like you mentioned gelatin, do you get it that way?



[00:24:51] **Dr Dana Lis** Yeah, you can totally, and it's fairly bioavailable as well. Just functionality wise, even putting it in a smoothie, like you gotta drink that smoothie fast or it starts gelling. Tastes gross. So I remember like when this first got hot too, we were like, there was like, Jell-O recipes circulating. So you go to the bakery aisle and you buy your little packs of like old school Knox gelatin that your like, your great-grandmother would have had. And you're like, oh yeah, I'm like being super innovative, I was making gummies. I had all these like silicone trays with like penguin shapes and like. I'm making gelatin stuff, and but then when I like start calculating how much jello or gelatin whatever creation you're making even if you add like your own sort of high antioxidant juice to it you really need to you really need to eat a lot of jello, you need like a whole tray to get 20 grams in. So yeah you can use that but if you're just looking for like ease functionality Just a straight up collagen powder is probably your best bet.

[00:25:53] **Dr Ginger Hultin** We've come a long way. We've come a long way. There's so much more to talk about, and I wanna keep diving into the research here, but based on what we've talked about so far, Dr. Lis, what are the main reasons that our listeners should consider implementing collagen into their diets?

[00:26:07] **Dr Dana Lis** Sort of a, like in a, you mentioned like sort of a prophylactic or preventative. I would say that in, as we sort of, as we get older and as we age, and I hate to be in that category, but I am, like injuries just, I get injured more. Like I get more and more easily. So I would as we aged, some of our tissue integrity just starts kind of just depleting. So what can we do with, from exercise perspective? And then also a nutritional perspective to, in a way, help slow that help reduce or having more severe injuries. So as like a preventative piece, there are several scenarios that I would recommend collagen. So if you're in a sport that you're more prone to ACL injury, soccer, skiing, basketball, that might be something you integrate into your your program with a tendon loading protocol and there's also the link with females in terms of the effects of estrogen on on connective tissue. So we know that when we our body's getting ready to give birth, estrogen levels go through the roof so that we can stretch. So if you're more lax though, there are higher risk of injury, higher risk injury and basically rupturing or tearing connective tissue, ligaments, tendons. So that also sort of happens during our monthly cycle where during the luteal phase, that's when estrogen is the highest and there's some



evidence that's when more females, more female athletes may actually injure rupture ACLs. So I'd say that's sort of a scenario. So yeah, pre-post-surgery would be another scenario. And then, yeah, aging population, osteoarthritis, osteoporosis, sort of joint pain. If you have some cartilage damage, but again, still like still needing to move and load.

[00:28:03] **Dr Ginger Hultin** What I loved most about that conversation with Dr. Lees was how clearly she connected the dots between molecular research and everyday health decisions. Whether you're prepping for surgery, ramping up your training, or just want to support healthy aging, collagen can be a part of that equation. Up next, we're diving even deeper. In part two, we'll talk about how to use collagen strategically, what to buy, how much to take and weather timing really matters. Trust me, you don't want to miss it.

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