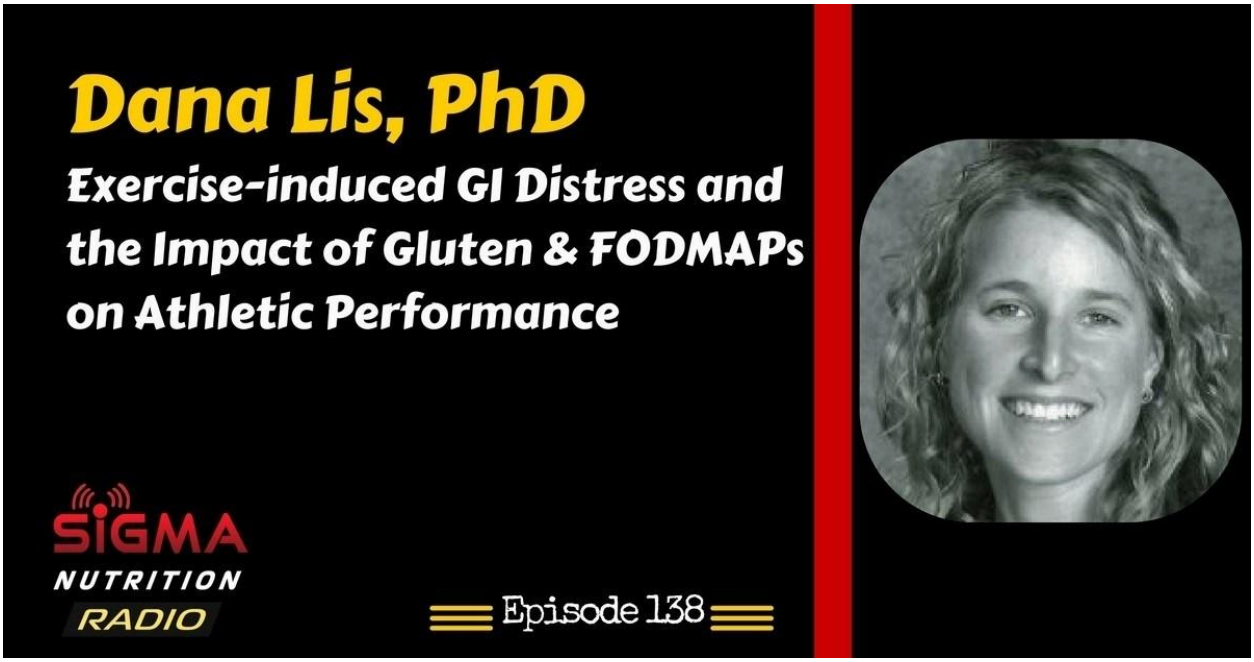

Danny Lennon: Hello and welcome to Sigma Nutrition Radio, the podcast that brings you evidence-based discussions with the world's leading researchers and practitioners in fields related to nutrition and performance. I am your host, Danny Lennon, and you are listening to Episode 138 of the podcast today.

First, I just want to start by letting you know that my good friends over at Shredded by Science have now opened the doors to the prestigious SBS Academy. From the foundations of coaching through to the most intricate details of physique and strength sports, which are taught by Eric Helms and Mike Zourdos respectively, all the way to a masterclass in setting up a personal training business, the SBS Academy covers it all. The enrollment is now open and I'd highly recommend that you just go and check out their course syllabus, and to do so you can go to shreddedbyscience.com/academy. That's shreddedbyscience.com/academy. You can check out the course syllabus, and then if you see that it's something for you, then I obviously recommend enrolling as well. I'll pop a link to that in the show notes as well for people if you want to click through and check that out.

On to today's podcast and I'm about to be joined by Dana Lis, who is a researcher who has worked with a ton of athletes in practice as well. Dana is really well-known as a sports dietitian and has a really broad experience – professional, Olympic, international level. Over the year, she's worked

with several world-class athletes achieving top performance including helping some of Canada's athletes win Olympic medals at London 2012 and Sochi 2014. And as well as that, as a 2014 registered dietitian and graduate of the renowned IOC diploma in Sports Nutrition, she is currently completing PhD research investigating the effects of gluten-free and acute low-FODMAP diets on gastrointestinal health and inflammation in endurance athletes, and that's specifically what I want to focus on on today's podcast because it's quite a novel area of research in that very narrow sense of seeing acute changes in these types of dietary approaches allow for improvements in gastrointestinal symptoms, which is obviously a big issue often in endurance athletes. And we just know that a ton of athletes are now moving towards experimenting with different types of dietary approaches. So Dana's been part of the group that has been really one of the first teams in the world to really look at this area in-depth, so really excited to ask her about some of the intricacies of the research that they've got going on.

If you want to get the show notes to this episode, that will be at SigmaNutrition.com/episode138. So if you go there, I'm going to link up to any research papers that we end up mentioning today, any other links that are kind of relevant to the show, and you'll also be able to get a transcript of this episode as well as previous episodes as well that gets delivered direct to your inbox as a PDF, and that's all for free. So you can check that out at the show notes page, so like I said, SigmaNutrition.com/episode138. And now, let's just get into the show.

Hey Dana, welcome to the show. Thanks so much for coming on.

Dana Lis: Thanks so much for having me. It's an honor.

Danny Lennon: As I said before, I'm really looking forward to discussing some of your work because it's been something I've been reading a lot recently to try and advance our own practice here. But before we get into some of the work you've been doing recently, maybe you can just give people some context to your background both through academia and then maybe on the practical side as well.

Dana Lis: Yeah, definitely. I've sort of shifted gears from more of a practitioner perspective to academia in the last few years. I came into my career as a sport dietitian a little bit late. I was sort of on the career path to be a rock guide or mountain guide for a while, then completely switched gears and went into science, and found myself working in sport nutrition

immediately after I completed my dietetic degree. So I was lucky enough to acquire full-time work in high-performance sport straight off the bat, so I've had the honor to work with some of Canada's best Olympic and professional athletes over the last few years through the Canadian Sport Institute.

And I kind of came to a point in my career where I found that my practice, my scope of practice, was a little bit limited by, A, my physiology knowledge and sport-related physiology knowledge, and just the sort of the research gap. I think if you really want to be pushing the envelope in sport nutrition, you kind of need to have that research experience as well, so one thing led to another and I found myself delving into the research end of things, in Tasmania of all places. And contrary to popular belief, Tasmania is actually not in Africa. It's in Australia. My husband took a position there, so I was offered graduate study opportunity as well. So we took that and spent about three-and-a-half years in Tasmania. Yeah, I found myself into research, and then I've absolutely been loving it. It's incredible learning and I have a fantastic supervisory team that's really let me take my research where my interest lies and where I'm passionate.

So yeah, we've been looking at the effects of gluten-free diets in athletic performance and, stemming off that, looking into FODMAPs, which we'll chat a little bit more about as well.

Danny Lennon: Yeah, and I think that's one of the things I was most keen about talking to you and why I was really interested to hear your thoughts because of the nature of that research and how it's so in line with what we need to do practically, and there's very much overlap with practical application especially when we think of those types of topics. They're so prevalent now in what athletes are probably coming to coaches and nutritionists and asking them about. So I think it works so well from that end.

So maybe if we talk about gluten and athletic performance, let's talk about the recent randomized control trial that you ran, and I think it was examining gluten-free diets in athletes. Maybe first, can you give some context as to why you wanted to carry out that study in the first place and what were you hoping to learn from the study?

Dana Lis: Yeah. Well, we were working sort of leading up to London 2012 Olympics games. Myself and the other practitioners that I regularly have dialogue with really…we all of a sudden had a slew of athletes that had swapped to a gluten-free diet and from a practitioner perspective we really

had no evidence base with which to advise whether or not a gluten-free diet was appropriate for our athletes. As a lot of things evolved, speaking with Dr. Trent Stellingwerff at ACSM in 2011 maybe, we started throwing around ideas. “Oh, we could actually look at this. We don’t really have any evidence. Let's see.” There are a lot of athletes sort of anecdotally saying, oh, they perform better, they have less GI symptoms—I mean, although they're obviously not measuring it—they're getting less inflammation, but we didn't really have any evidence base for athletes.

So that's sort of where the interest started developing our research question from, was we had all these athletes swap to a gluten-free diet and from a practitioner’s perspective we had no evidence. But I think sometimes it's interesting to consider that sometimes athletes are doing things that we don’t necessarily have evidence behind but it works for them, and then we find out later, oh, there is a reason that it works for them.

Danny Lennon: Right, yeah, that's super-interesting. And I think one of the big things that just looking at this from the outset to me was the prevalence of how many of those athletes have been reported using a gluten-free diet or at least experimenting with it, and it seemed a lot higher than what we would typically see based on how many people in the population are likely to have an issue from it. I mean, when we look at the current evidence base depending on the research study you look at, it seems that the percentage of the population maybe that might have an issue with gluten, whether that's celiac or non-celiac gluten-sensitivity or wheat allergy or whatever, is, I don't know, maybe somewhere around 5, 6% mark plus or minus a few percent depending on the study, like I say.

So based on the amount of athletes that were reporting to you that they had trialed this, why do you think athletes in particular were so likely to be switching to a gluten-free diet? Was it simply a matter that athletes maybe in general are more likely to experiment with these things or do you think there are other factors like seeing certain well-known athletes? So for example, in news people probably would have seen the likes of Novak Djokovic promoting gluten-free diets. What sort of factors do you think were driving just the sheer prevalence of or how many athletes were actually trying these types of diets?

Dana Lis: So we first had to sort of quantify the information you've just queried. We wanted to find out actually what was going on. We knew anecdotally, so we actually did a really wide-reaching questionnaire-based study. So we sent out a questionnaire worldwide. We had just under a thousand

respondents to quantify just that information, so what types of athletes are following a gluten-free diet? How much are they actually adhering to a gluten-free diet? Are they adhering to it 100% of the time? Are they just eating gluten-free two weeks before important competitions? And what were their experiences? What was the rationale?

And from that questionnaire-based study, we found that about 40% of the athletes were following a gluten-free diet at least half the time. Their reasons were they believed the gluten-free diet to reduce inflammation, to reduce GI symptoms and to improve performance. They also indicated that a gluten-free diet improved overall eating habits and conscientiousness of your dietary habits as well. So several confounding factors there. It might not necessarily be the gluten elimination in the gluten-free diet that people are "feeling better," but it could be the other dietary changes that subsequently happen. You're being more conscientious of your food choices. You're not just going to the tea room at lunch and grabbing that muffin that's sitting on the table. You're being a lot more conscientious around that. Eating more fruits and vegetables, less processed food, was also a change that was identified to happen alongside adhering to a gluten-free diet. And there's also definitely the bandwagon effect too, especially in certain endurance sport communities, so I do think that having popular sports figures promoting the benefits of a gluten-free diet also pushes athletes in that direction as well.

Danny Lennon: Yeah, I think that's actually a really important point you bring up that in a number of these athletes they probably are feeling some sort of benefit to going on a gluten-free diet but it may not necessarily be gluten per se because usually when someone makes these changes like you outlined, there's usually a number of different variables that change whether that's from the types of foods they start restricting—so if we typically think of "poor-quality" foods or heavily processed foods that we don't really want to promote too much, most of them are going to consume gluten in some way, so they're usually all gone and we end up with an athlete probably eating a diet based in whole foods. Just even the ability to just be aware of what they're consuming is worthwhile to consider. So with all that mind, once you had that kind of context for just how many of them were using it and for what reasons, how did you go about setting up the actual RCT and what were you looking to measure within that?

Dana Lis: Yeah, great. So we did set up a randomized control trial and we took recreationally competitive cyclists, so they were very fit cyclists, men and women, just to reflect more the population that was following a gluten-

free diet. And one thing I was really curious to look at was, well, we know that athletes that are undergoing strenuous training and repeated strenuous training do injure the gut, so that reduced blood flow, you're injuring the gut, and that happening on a repeated basis I was really curious to see if an athlete has regular gut injury, are they more susceptible to dietary triggers such as gluten? So that's one of the considerations we looked at with this trial.

So we had our athletes basically seven days on a gluten-free diet or gluten-containing diet. They were blinded. They didn't know which diet was which. It was randomized. We fed them a gluten-free diet on both diets. They had the same food on both diets, but then we hid the gluten in an energy bar, basically. So they had two energy bars per day and they broke those energy bars up over the course of the day to simulate the patterns, typical patterns of gluten intake. So the energy bar on the gluten-containing diet had gluten and then on the gluten-free diet had an equivalent amount of whey protein. We spent a lot of time sort of developing that bar so you couldn't really distinguish the taste or the texture. I've spent a lot of time baking. If I ever eat another quinoa-based energy bar again, it's [

Danny Lennon: [Laughs]

Dana Lis: [Laughs] I ate a lot of energy bars. [Laughs] Good thing I was pregnant during that time and didn't really worry about my weight much. [Chuckles]

Danny Lennon: Yeah. [Chuckles] It went to good use.

Dana Lis: It did. So we put them on each diet, each day of both dietary trials. They recorded their gastrointestinal symptoms daily and during exercise. We also used the daily analysis of life demands in athletes, so the DALDA questionnaire, just to assess for sexual well-being or psychological well-being because we know that does have an effect on GI symptoms or gastrointestinal symptoms. On the seventh day of each trial, the athletes came in and did a performance test. So they did basically a 45-minute steady state at 70% watt max followed by a 15-minute time trial. And we took bloods before the steady state, right before the TT and then at the end to assess basically cytokines, so inflammatory markers, and then we also looked at intestinal fatty acid binding protein, so IFABP, to look at markers of acute intestinal injury. Then, there was a 10-day washout period between the diets as well. So yeah, we looked at basically

gastrointestinal well-being, psychological well-being, and a performance marker to see if there was a beneficial or a negative effect of a gluten-free diet on athletes.

Danny Lennon: Oh, cool. And so just on the kind of hypothesis or some of the thoughts you were having before the trial, was it a case that you were maybe suspecting that rather than gluten outright causing major issues from the get-go it's just likely that in certain hard training athletes and these populations in particular where they could have, say, intestinal injury to gut tissue that they're just more susceptible then to something like gluten that could potentially in some people be a trigger?

Dana Lis: Yeah, that's one of the sort of reasons why we looked at it, is maybe the repeated gut injury is causing more susceptibility to gluten.

Danny Lennon: Cool. Okay.

Dana Lis: We didn't find that in this group but it is still only one study, so I definitely encourage more research in this area, particularly in runners as well just because the mechanical impact on the gut is more than in cycling.

Danny Lennon: Right. So with the study then itself in terms of the results and findings, not only what results did you have there but what do you think you were able to take away from that study that then we can potentially see as the next step or, number one, what conclusions can we bring from the study and then what other questions do you think it raised?

Dana Lis: So the main conclusions are we did not find a beneficial or negative effect of a gluten-free diet. So I do encourage athletes to, if they're deciding to follow a diet, a restrictive diet such as a gluten-free diet, to look at the other potential changes or consequences of unnecessary food restriction. If they don’t necessarily need to eliminate gluten, they don’t have any negative health effects or beneficial performance effects, there are some other sort of more psychosocial aspects to a gluten-free diet that can compromise an athlete’s eating. So if an athlete, for example, is traveling to Sochi, and I was in Sochi before the Olympics games in 2014, and to find a gluten-free food during sort of test events was actually quite difficult. So just considering some of those factors for athletes that are choosing unnecessary food restriction if they don’t need to restrict gluten that there could be some negative effects if they're traveling abroad, training in environments where there's not that huge food availability like we see in UK, Australia or North America. That's one of the sort of the confounding factors.

The other aspect that we were also interested, and this sort of led into the next phase of this project, was a lot of the FODMAP research coming out of Monash University is indicating that when people go on a gluten-free diet it's not necessarily the gluten that they're experiencing that's modulating sort of improved GI symptoms but it's actually the subsequent changes in certain FODMAPs, so fructans and galacto-oligosaccharides. When you cut out wheat-based products, you actually naturally decrease the intake of those specific FODMAPs, so people may actually be experiencing improving GI symptoms from those FODMAPs and not gluten itself.

Danny Lennon: Yeah, I think we've seen that in some of the athletes and just general clients that we work with who have been experiencing like IBS-like symptoms and some of them have then, say, previously tried something like a gluten-free diet to maybe some degree of success but not really clearing up major issues, but then when they tried the low-FODMAP diet it also completely eliminated the symptoms. And so there would be kind of one indicator of at least anecdotally in our case of people who are likely having an issue with FODMAPs, and then so potentially by nature if they went on a gluten-free diet they could be experiencing the benefit, like you say.

Just to take a step back for a moment, when we looked at the practical application of this, with a lot of those athletes, obviously the vast majority or I'd say at least a good percentage of them are probably self-diagnosing when it comes to deciding if they have an issue with gluten. So for maybe athletes listening who feel they could have an issue with gluten, what are the first steps maybe that we could recommend before they go and self-diagnose themselves as needing to be completely gluten-free? Is there anything that you think is a good kind of chain of events for them to go along if they suspect they may have an issue?

Dana Lis: Yes, great question. If I have an athlete that they suspect they have issue, I actually would, A, make sure that they do visit with an actual practitioner that specializes in GI issues because sometimes if you go on a gluten-free diet symptoms are masked, etc. You could actually overlook another cause. So if there's an underlying gastrointestinal issue that's sort of getting masked by going on a gluten-free diet, it's important to actually identify and diagnose that appropriately. So go through the process of working with an appropriate medical practitioner or dietetic practitioner.

The other issue that we've had up until sort of more recently is that there really is no diagnostic biomarker for a nonceliac gluten or wheat sensitivity, depending on who's writing the paper. Just recently a paper has come out of, I think it was a joint research project between some researchers in Italy and Columbia University, and they basically found—and this is a clinical population, so these are clinical patients who have gone to a gastroenterologist. So I always put that caveat in there because it's somewhat different when you're looking at rates of nonceliac wheat sensitivity in a population that's actually gone to a clinician versus the general public.

Danny Lennon: Right. Mm-hmm.

Dana Lis: But they basically compared 40 patients that met the criteria for a nonceliac wheat sensitivity, 40 celiac patients and 40 healthy controls, and actually did find specific immune markers and markers of intestinal injury in the population with nonceliac wheat sensitivity. So it is helping to point in the direction that we are moving towards having more diagnostic biomarkers for nonceliac wheat sensitivity, but up until now there hasn't been that tool.

Danny Lennon: Yeah, and I think that's what's led to such variance in trying to nail down just how prevalent an issue this is because, depending on the research study, we're seeing essentially different ways of determining what rate of nonceliac gluten sensitivity there is. So having some more objective markers will be really useful as opposed to right now it's more based on exclusion criteria.

One important aspect that I think you mentioned earlier was when we're looking at the impact or why athletes are potentially more of a risk for certain triggers to gut irritation, for example, is because we can essentially induce gastrointestinal distress through exercise itself. Can you maybe just talk a bit about maybe the prevalence and causes typically of exercise-induced gastrointestinal distress?

Dana Lis: Yeah. Se the prevalence of gastrointestinal distress or GI symptoms, I mean, the estimated prevalence or frequency rate, anywhere from 30 to 90% depending on the literature or the population group and the type of event, the longer the event tends to be correlated with more GI symptoms. So an iron man compared to a 10K run, more prevalent symptoms in a longer-duration event. Obviously, endurance-based athletes experienced GI symptoms.

The causes are sort of…there are sort of three areas of GI symptom causes. One would be physiological. So when you are undergoing strenuous training at about 70% of your VO2 max and higher for a duration of time sort of around 40 minutes or longer, you do get reduced blood flow to the gut so that blood is basically being redirected to the working muscles, so reduced blood flow causing gut injury, so leading to that link with leaky gut. And that's sort of one area we're looking at in regard to FODMAPs, but that can also be confounded with stress. So when you're going into a race feeling stressed, that affects your hormones, which do affect changes in hormones, which can affect gut motility as well, so the physiological causes being reduced blood flow and changes in the hormones related to stress affecting gut motility.

The mechanical impacts of exercise, so running for example, you're getting a lot more jostling and impact on your gut, on your lower GI's area specifically. Biking, a little more pressure on the abdomen, so cyclists tend to get more upper GI issues.

And then the last one being sort of more nutritional-related factors, so nutritional factors such as fiber and fat, protein, fructose, lactose, the osmolality of the food or fluids that you're taking in, the volume, and then the possibly residual FODMAPs in the GI tract. And nutritional definitely is very industrialized, so it does…any athletes I work with in regard to trying to identify and develop a fueling plan that reduces GI symptoms, it's definitely a process. It's not just a one-shot deal, "Here, do this, this and this and you'll be fine." It takes a while of working through different training sessions, trialing different strategies and finding out what works for that person.

Danny Lennon: So in relation to some of those potential triggers for the exercise-induced GI distress or something that may just add on as an extra stress to that, we've already talked a bit about gluten and the evaluation of that in the research, but as you had mentioned there's probably another area that we look at when it comes to FODMAPs, and some of the applications of low-FODMAP diets have been discussed some previous episodes, not so much in the context of athletes. But maybe just to refresh people's memories or to get even new listeners [00:24:37] that we're on the same page, maybe can you first explain what FODMAPs are and then how does this potentially relate to gastrointestinal issues?

Dana Lis: So FODMAPs, FODMAP is an acronym and it stands for fermentable oligo-, di-, monosaccharides, and polyols. I think, yeah, definitely the

FODMAP diet are low-FODMAP diet is a lot more prevalent in Australia because that's basically where most of the research has happened and also where there actually is a FODMAP food diet line that's been developed by Sue Shepherd. So just in terms of knowledge around low-FODMAP diets, it's been great to spend time in Australia and be exposed to that, but so FODMAPs are the group short-chain carbohydrates. They're found in a wide range of foods. They either occur naturally or additives, such as sugar, alcohols or polyols. They're poorly digested, so when they're in the upper GI tract or your small intestine, they can create an osmotic gradient that increases your luminal fluid contents, your luminal fluid volume, causing sort of to trigger diarrhea, just having a feeling of sort of more volume in that upper GI tract. And if they're not digested, they transit down to the lower GI tract, so into your colon, where they're fermented by colonic bacteria, increasing gas production, so causing those symptoms of bloating and distention, and in individuals with IBS for example where they're sort of more hypersensitive to those symptoms, causing more pain with that bloating. So that's what FODMAPs are, how they react in your GI tract.

Some foods that you would find FODMAPs and there's a huge range—and if anyone's curious into having something easy-access to check the FODMAP content, Monash University has developed a great app, a great phone app that's super-easy to use and really comprehensive and they're constantly updating it, so it's a great tool to just check FODMAP content of foods—but fructose. It's found mostly in foods, vegetables, added sugars, lactose. Obviously, we know where lactose is, but mostly cow-based dairy products. Fructans, found mostly in wheat-based products. Galectins, a little bit in legumes. And polyols, you'll find them in sort of like a lot of the sugar alcohol sweetened products, diabetic products, etc., and then they're found also naturally in some fruits such as stone fruits like nectarines.

Danny Lennon: So if we turn then our focus to those athletic populations and particularly the recent case study that you were the lead author on looking at utilizing that low-FODMAP diet to try and combat this exercise-induced gastrointestinal distress, and this is particularly interesting as there's probably no real research in this specific area at least up to this point, can you maybe delve into some of the details of that case study for us?

Dana Lis: So I had a runner that I'd worked with for a while. So he's a multi-sport athlete but his GI symptoms were definitely more prevalent during running, but they were definitely prevalent in cycling as well. So we had

tried a bunch of different dietary strategies with him and I decide…I was looking into FODMAPs and how maybe this had a place in an athletic population. It may be there's a lot going on in the GI tract with changes in gut motility. Athletes are taking on in some cases a high-fructose load. Depending on the foods they're using for fueling, they may be taking on a lot of fructose. Also, athletes may have a higher intake of lactose than the regular population because a lot of athletes rely on things like Greek yogurt, milk, etc. for high-quality protein intake.

So, with some of those factors in mind, I decided to, "Hey, I'm just going to try this approach with this athlete and see what comes out of it," and I used some of the tools that I would use in research to monitor changes with this athlete. So I put him on…I basically got him to record his habitual intake for a week, we assessed that, and then I've changed his menu. So he did a similar menu on a second seven-day period. I didn't tell him what was going on. I just kind of said, "Hey, I'm going to try this with you. I'm going get your food intake for a week and I'm going to give you a menu that's really similar but I'm just going to swap some things around." And I just kind of said, "I'm just going to swap some carbohydrates around. Let me see how it goes. I'm not sure if it's going to work." And he had no idea what FODMAPs were or anything about that, so that was a sort of a benefit from my end, was there was less sort of placebo effect there.

And he simulated his exercise, so he's a multi-sport athlete so everything's on the Garmin and they track it like crazy, so it was great, easy to get him to simulate his exercise. And he followed the menu that I made, so I basically simulated his food intake but swapped the high-FODMAP foods for low-FODMAP alternatives, and he did the same exercise, tracked his GI symptoms daily during exercise. And I also got him to record the DALDA questionnaire each day to just assess stress and stress response and, yeah, we found that his symptoms, he had quite a large change in symptoms from being relatively moderate to severe symptoms to basically nothing. Now, there was always a little bit of placebo effect but the magnitude of change I would definitely say he did have an improvement in GI symptoms. So from that, we've now developed a more…basically a randomized crossover design looking at the effects of a low-FODMAP diet in runners with persistent GI symptoms.

Danny Lennon: Awesome. And has that trial started yet or what stage are we at with that step?

Dana Lis: I'm at the final draft of writing up that paper, so hopefully it'll be out soon.

Danny Lennon: Awesome.

Dana Lis: So the design of that study was quite similar to the case study. So we had runners that self-reported persistent exercise-induced GI symptoms and we used a background gastrointestinal questionnaire to assess the level and frequency of gastrointestinal symptoms, and we quantified their background FODMAP intake with a tool that's been validated from Monash called the CNAQ or Complete Nutrition Assessment Questionnaire. So that's the only questionnaire that allows you to quantify FODMAP intake based on a food frequency questionnaire. So they had habitual higher FODMAP intakes as well as persistent exercise-associated GI symptoms.

And with similar design, all the food was made for them and the menus were simulated, so they were provided all their food, and I just changed ingredients so where I would make a quinoa salad with some vegetables I would use low-FODMAP vegetables in the low-FODMAP week and then high-FODMAP vegetables in the high-FODMAP week, and then switch up the quinoa for couscous. So the menus were very similar but obviously one was high-FODMAP, one was low-FODMAP. They did six days on each diet and then with a one-day washout and swapped over to the other diet.

Simulated exercise, and then we prescribed two strenuous running sessions, so they had an interval running session and a more threshold-pace race simulation session on day four and five of each trial. And we looked at gastrointestinal symptoms daily, gastrointestinal symptoms during exercise, and the DALDA questionnaire as well.

So yeah, we're just in the midst of writing that up. I think it'll be a good step in the right direction for finding out more about if a low-FODMAP diet does have a wider application outside of clinical realm.

Danny Lennon: Alright, and presumably you can't give us too much details on those results just yet before it's published?

Dana Lis: I want to probably give you some but, I mean, we did find that it helped in certain aspects. I think the next step I would definitely look at is doing longer training sessions to assess the effects of a potential low FODMAP intake when you're getting even more stress on the gut. Now, I think one thing that I do find interesting is that if you're looking at the gut injury that

happens to an athlete and just if you're getting…sort of you're taking on sports drinks, sometimes a higher osmotic load in the upper intestine, if you have residual FODMAPs in there, in somebody that…in a healthy athlete that doesn't have IBS but they do have the osmotic load from a sports drink, reduced blood flow, the mechanical impact, could residual FODMAPs in the gut actually augment those symptoms or increase GI symptoms? That's sort of what we're curious about, is in athletes…a healthy population hasn't been shown to benefit from a low-FODMAP diet, but athletes are still healthy but the repeated stress on the gut, could that actually be worsened with residual FODMAPs? And I wouldn't necessarily recommend athletes to jump on a high-FODMAP diet all the time if they didn't benefit from it because it is fairly restrictive and you could compromise fueling strategies as well as healthy gut bacterial populations. So I'm curious if like a short-term or acute low-FODMAP diet before key training sessions or key races could be a good strategy for athletes to implement if they did find benefit.

Danny Lennon: Right. So essentially in those cases where we know there's going to be quite a lot of stress coming from different areas, we can use that low-FODMAP diet strategically to try and just reduce one of those factors at least.

Dana Lis: Yeah, yeah, that's sort of what we're looking at, and I've been trialing it with a few professional triathletes and so far so good, and we try to minimize the time that they're actually restricting on a low-FODMAP diet.

Danny Lennon: Sure. You mentioned one of the measures you're looking at is DALDA. Can you just maybe explain that measure for people and what it exactly tells us?

Dana Lis: Yes. So the DALDA, it's a validated questionnaire. It assesses stress and stress response in athletes. So we look at factors like…it's a three-scale rating system, so it's worse than normal, normal or better than normal for 34 factors such as school – is school life worse than normal, normal or better than normal, or the recovery from training, upper respiratory illness, etc. So I think it's important to look at an athlete's overall or perceptual well-being or life stress alongside gastrointestinal symptoms, and there's a lot of work on IBS looking at patients with IBS and their personality traits or personality characteristics and finding that individuals with less, sort of not that great of coping skills, more life stress, tend to have worse GI symptoms. So there is that important gut-brain access connection that I

think as a practitioner it's important to look at that as well with your athletes that you're working with.

Danny Lennon: Mm-hmm. For sure.

Dana Lis: And I'll be blunt, I'll have some type A personality athletes that are constantly stressing, constantly worried about things and worried about every little minor GI issue, and it's important to manage those psychological symptoms as well and if you need to bring in a sport psychologist to help manage those too, to keep your mind open to that and consider that in your practice.

Danny Lennon: Yeah, for sure. I think that's a really worthwhile consideration. And so to try and pull some of this stuff together then in some sort of summary, what do you think is fair for us right now to be able to summarize or conclude on tackling GI distress in athletes, whether that's in relation to using things like low-FODMAP dieting period or something else? Is there anything that we can know right now to take away that people can maybe use in practice or at least what are the kind of key things we're maybe hinted towards that we could possibly be trying?

Dana Lis: One thing I would definitely push is definitely train the gut. I find a lot of athletes don’t necessarily train their race-day nutrition and I think that's a huge component to minimizing GI symptoms, is train the gut to take in the fuels you plan to take in on race day.

In regard to the low-FODMAP approach, I think it's still fairly new and I think theoretically there are some strong points that it could help athletes. I would advise against jumping on a low-FODMAP diet full-time for athletes. It's fairly restrictive and could cause more psychological stress than needed. But if athletes have trials, decreasing fiber, low residue, have trialed the typical strategies that we know reduce GI symptoms and they’re finding that doesn’t work, then try maybe modulating your FODMAP intake.

And the one thing about doing that is just try to identify the foods that are actual triggers. So it might be worthwhile working with a practitioner that could help you work through the specific FODMAPs that are triggers because a person may not be susceptible to all FODMAPs but it might just be one or two specific FODMAPs. So that would be the strategy that I would advise implementing at this point given our knowledge.

Danny Lennon: Perfect. And before we get to the final question, where can people learn more about some of your work? Can they find a profile on ResearchGate where they can track down your papers or anything like that?

Dana Lis: Yeah, ResearchGate would be a great place. I would love to say Twitter but I'm not a huge Twitter proponent at this point. I do have a link, but you can actually follow Dr. Trent Stellingwerff. He's one of my supervisors and he probably tweets more of our work than I do. So it's tstellingwerff or @tstellingwerff. [Laughs] Yeah, ResearchGate would probably be the best place right now.

Danny Lennon: Perfect, and for everyone listening I will link up to some individual studies that we've discussed today as well as that ResearchGate profile, and so you can check that out in the show notes to this episode. And then that brings us to the final question that we always end the podcast on and it's if you could advise people to do one thing each day that would improved their life in some aspect, what would that one thing be?

Dana Lis: One thing would just be to self-reflect on how you view and communicate your problems. I think that often we can get wrapped up in, “I've got so much work to do,” “I have a crappy car,” and I advise people to take time and sit back and ask yourself if your problem is a real problem or it's a first-world problem. I think that most of us are very fortunate and our problems on the grand scheme of things are quite trivial, so just take time to reflect on the scale of your problems and I think that really helps with just overall psychological well-being when you realize that life’s pretty good.

Danny Lennon: For sure. That bit of perspective is such a massive thing, so really glad you ended the podcast on that note. Dana, this has been really, really useful. I think people are going to take a ton of value from the information you've brought across today and I appreciate your time so much. Thank you.

Dana Lis: Great. Thank you so much for having me.

Danny Lennon: It's an absolute pleasure.

And that was Dana Lis with some really, really good information and I hope you took a ton of value from her. Remember, the show notes are going to be over at SigmaNutrition.com/episode138. And if you want to find me on social media, then either just search for Sigma Nutrition on Facebook or follow me on Instagram at dannylennon_sigmanutrition.

Also, the next couple of weeks make sure you are subscribed to the podcast. We've got a continuation of more of our mini episodes but also we've got Layne Norton coming on the show next week to discuss all sorts of things that have been going on with him and some interesting topics around performance and body composition. So that will be next week.

And finally, for anyone interested in comprehensive personalized online coaching for performance nutrition and/or strength and conditioning programming or powerlifting coaching, then check out details of the Sigma Nutrition and Performance Online Coaching program. If you just go to SigmaNutrition.com and click on the Online Coaching tab, you'll see all the details as to how some of just the way our process works, the way we try and do things, some of our coaching staff, and then some frequently asked questions. So just check that out and see if it's of interest to you, and if it all sounds good then there is an application directly on that page as well if you do want to apply to try and get onto the program.

And that brings this week's episode to a close. I hope you really enjoyed this episode and got something from it. I think this is a really interesting area of research and hopefully one that kind of more and more stuff comes out about. So I'm glad to have brought some of this to your attention for those of you either who are athletes or working with athletes.

So again, if you enjoyed the show, please continue to leave reviews on iTunes and to share the show with other people. It already makes a big difference, so thank you so much. And like I said, I'll talk to you in a mini episode later on this week, and then next week we will be having Layne Norton on the show. And that's all then. Have an awesome time.