

[00:00:00] **Dr Derek Ball:** There's an awful lot of social media out there that are making recommendations that don't appear to have any qualifications. So I can go onto Twitter and I can say I'm a nutritionist. Who's checking on what my qualifications are?

[00:00:19] **Swathi:** This time, we're diving into the fascinating, sometimes murky, world of fitness and nutrition, and learning how to tell fitness food fads from fitness food facts.

[00:00:28] **Dr Derek Ball:** A lot of the issues come from people that are things like personal trainers who have a limited qualification and a limited understanding of the underlying physiology and nutrition making recommendations, in some instances, based on what the manufacturer is telling you. And we know that, in some cases, what a manufacturer says isn't actually true, in terms of the hard science that's out there.

[00:00:57] **Tamsin:** This is Dr Derek Ball, until recently, the Head of Sports Science at Aberdeen. He's a physiologist whose career has focused on muscle metabolism and nutrition.

**Swathi:** He's really someone we ought to listen to when it comes to eating well and keeping fit.

**Tamsin:** And the big message from Derek, yes, keeping fit is important, but too many of us are being sold supplements and powders that we just don't need.

What would you say to the average gym goers? What advice would you give them, especially in relation to what you do?

[00:01:39] **Dr Derek Ball:** For the person that's going to the gym: are you going to the gym just to stay fit? And what is it that you're doing in the gym? Most people do some form of cardiovascular exercise, that might be on a treadmill or on a bicycle ergometer and some people then do some weights. And what we know is that both of those things are really important in terms of maintaining normal bodily function. And in fact, as you get older, it becomes more important to include some strength type exercise in whatever your regimen of physical activity is per week.

The reason for that is that it improves the quality of living. So, what I would say to a student coming into university is, by all means go to the gym, but what you want to try and do is have that as a lifelong activity. Commitment to maintaining physical activity. Although you're young at this point in time and you have quite

a lot of free time, as you get older and you get more responsibilities, if you have a family and you've got a full time job, trying to fit that in is a real challenge and it's worth just setting aside 15, 20 minutes a day to do some form of exercise.

The other thing that's becoming more apparent is just walking is a sufficient stimulus. So, when I'm up at the Institute of Medical Sciences, I usually park my car down by the Dental School and I walk up. And it's five minutes each way, but that ten minutes that you've done, obviously adds up per day.

[00:03:18] **Tamsin:** It's so right that people's busy lives take over, especially in times of fitting and exercise. How do you manage to fit things in?

[00:03:26] **Swathi:** So mainly for me, it's meditation. So I just take like half an hour in the morning to meditate, but I also wanted to go to ASV.

**Tamsin:** So Aberdeen Sports Village, that's a fantastic gym space, isn't it?

**Swathi:** Yeah, I don't actually go for classes maybe, but I feel like there's a lot of peer pressure to be going to gym every day or aspiring to be a specific look or specific body shape. Why do I go to gym? I know this question, so what's the intention?

[00:03:48] **Tamsin:** It can be really confusing seeing all this conflicting information online.

I run marathons, so I've had to learn quite a lot about how to train and what I need to eat to be able to perform well. But even I get a bit overwhelmed with all the different information out there nowadays.

[00:03:59] **Dr Derek Ball:** So for anybody who's interested in physical activity and exercise, the first thing that you want to pay attention to is just what your normal diet is.

So if you've got sufficient energy, around about 50 to 60 percent of your energy intake comes from carbohydrate, you've got a certain amount of protein in there, and a limited amount of saturated fats, plenty of fruit and vegetables, that is going to suffice for somebody who is going across the road, utilising the sports facilities.

For athletes that are in hard training, in a lot of instances, especially for the more endurance type events, trying to find sufficient time to consume enough

food whilst the training, at least twice a day, and then if you're a student, you've got on top of that, you're studying, trying to fit all that in as well as making sure that you've got a balanced diet is actually quite challenging.

And in some instances, maybe we should be using some supplements. But I would say that those supplements in general, you'd want those to be some form of carbohydrate rather than necessarily protein intake.

[00:05:15] **Tamsin:** So diet and exercise obviously go hand in hand and we're being fed an awful lot of misinformation or misguided information especially on social media nowadays.

What's your take on all of that?

[00:05:25] **Dr Derek Ball:** I think we have fallen into this trap that because everybody eats, everybody knows something about diet, and everybody's got an opinion about what makes a healthy diet. There's certainly, from the nutrition perspective, nutritionists and dietitians, they'll tell you that if you look at the pyramid for foodstuffs, that at the base should be a mixture of vegetables, and as you go towards the top, that should be less in terms of refined sugars.

There's certainly fats and proteins that sort of sit above that carbohydrate at the bottom. Now, when we look at social media, there's an awful lot of social media that says, for example, at the moment, that if you're going to the gym, maybe you should be going on what's called a 'keto diet'. And what is a keto diet?

So a keto diet is very low in carbohydrate and it's high in fat and protein, and there's certainly an emphasis on consuming lots of protein, because apparently that will increase your muscle mass. But that's not the case. What we know is that if you have excess amounts of protein, that will either get broken down and excreted in the urine, or it'll be broken down and utilised instead of the fat and carbohydrate that you are taking out of your diet.

So, protein is very expensive. So for a student, that's a rather expensive diet to consume. You're better off having more carbohydrate in there.

[00:07:02] **Swathi:** So I'm a bit confused. I've always thought that if you want to get fit and you want to build muscle, you need to eat a lot of proteins. Is that not true?

[00:07:10] **Tamsin:** Well, you do need to eat protein, but not nearly as much as you might think.

[00:07:13] **Dr Derek Ball:** If I was to ask you, based on your body mass, how many grams of protein do you think you need to maintain just your muscle mass as you're sitting here?

[00:07:26] **Tamsin:** What would you guess, Swathi? How many grams of protein do you think you need to eat per kilo of your body weight?

[00:07:32] **Swathi:** Is that like, I did read about it recently.

I think it was like 20 grams. No, 1. 2 grams.

[00:07:38] **Dr Derek Ball:** For an average 70 kilo male, they need 70 grams of protein. per day, and you can split that up over three meals. So, now, if I have one of these pots of yoghurt that's got a single serving of 20 grams, and I have that in the morning, I've almost reached a third of my daily intake, and then they go and have something at lunch, maybe some, a tuna sandwich, and then they have, oh, well, I need a huge pile of chicken.

And it might be that a single chicken breast is more than enough.

[00:08:14] **Swathi:** So if that's the case, what's with all these protein supplements, like powders, shakes, I see people using? Why are they so popular?

[00:08:22] **Dr Derek Ball:** They have all sorts of things on the label about how they've got this amino acid and that amino acid. We have some essential amino acids and the ones that are important for muscle mass, uh, leucine and isoleucine.

So, when people have given just these amino acids as an infusion, those amino acids stimulate maximum protein synthesis. But if I start to give them orally, I don't get the same maximum stimulation rate. And what we now start to recognise is that whole proteins are better than amino acids. So this is when people then start to look at, oh, well, is it high in whey protein?

And is that about digestibility? To some degree, that might be the case. But you're better off with a dietary source of protein rather than trying to consume a protein supplement. If you've got an adequate diet and you time it correctly, you shouldn't need to consume these protein supplements.

[00:09:22] **Tamsin:** That's incredibly interesting.

You see them all the time on social media, these people that are the gym bunnies that are putting more protein into their bodies. What, what's the effect of that?

[00:09:31] **Dr Derek Ball:** So if you consume an excess amount of protein, some of it will be what's called 'deaminated'. So the protein gets broken down to its separate amino acids, which then get absorbed.

In your gut, you don't absorb protein as a whole. It gets broken down into its constituent elements and then that's absorbed. So some of those amino acids can be further broken down and then they're excreted as urea. So essentially you end up with a rather expensive urine and then other amino acids can be used in skeletal muscle as a replacement for some of the breakdown products of fat and carbohydrate.

I don't want to go into all the complexities of biochemistry, but you can convert some of those amino acids into the same pathway to produce energy in muscle. So you're essentially swapping a very expensive protein supplement for a less expensive substrate, for example, carbohydrate or fat.

[00:10:37] **Tamsin:** So other than expensive wee, if you had your eggs for breakfast, your tuna sandwich for lunch, and some chicken for your tea, that would kind of suit most people in terms of protein intake.

[00:10:47] **Swathi:** Yeah. I think that's really funny to hear. I find it quite disappointing that we buy all this expensive stuff and it gets peed away.

[00:10:54] **Tamsin:** It's a strange addition when you've got things like the cost of living crisis and things like that going on and people are buying these because they're being told they're important.

[00:11:04] **Swathi:** Okay, so is there ever any reason to take these protein supplements or are they just totally useless?

[00:11:09] **Dr Derek Ball:** No, I think there is a place for them. Generally, it would be if you are struggling to meet the demands of training. So, if I've got an athlete that's training twice a day, some athletes train three times a day, do I have enough time to make three complete meals per day?

Sometimes, I don't. We've just had the Olympics, quite a few of the track events have had a race, then they've had a repechage to get into a semi final, to get into a final. Well, that's an awful lot of rounds to go through. I've got a huge warm

up and then once I've done my event I've got a warm down and I've got to get from where I'm staying out to the stadium, etc.

The other thing that for athletes competing at major games is that I might get drawn to give a urine sample for drug testing. That again is going to delay me in terms of my recovery process because I've got to produce this urine sample and it takes a - you know - it's not five minutes and I'm out.

There's a whole series of things that you have to go through when you actually go into drug testing. So, again, that delays your recovery element. So, for those athletes, it might mean that I need supplements.

[00:12:33] **Tamsin:** It seems from what Derek's saying, there's a big gap from the athletes to your normal, everyday gym goers and people that just want to stay healthy.

[00:12:44] **Swathi:** But for those of us who aren't high level athletes, what about us?

[00:12:45] **Dr Derek Ball:** I'd say, you know, before you go to the gym, if you had something like a tuna sandwich, That's going to put you right for doing your session in the gym.

[00:12:53] **Tamsin:** And a tuna sandwich is a lot cheaper than a tub of protein powder.

[00:12:57] **Swathi:** Something else I see a lot is those neon-coloured energy drinks. Things like Prime, Lucasate and Monster. So what about those? Do you think they help us get fitter or train harder?

[00:13:08] **Dr Derek Ball:** The short answer is no. So if this is for rehydration purposes, the majority of those energy drinks contain no electrolytes. And you might say, well, what's an electrolyte? So if I put some table salt into one of these drinks, that's added some electrolytes.

And that electrolyte is there because the presence of sodium in your intestine promotes water uptake, which is why you want the water to go into your circulation. So, having some sodium present is actually beneficial in terms of rehydration. And, a lot of the, those energy drinks contain no electrolytes whatsoever.

So what ends up happening is that you consume a drink that's low in electrolytes, that water gets into your circulation, but it's not retained, it just ends up being excreted as urine. So, you end up being dehydrated earlier, whereas if you consume a drink that's got the electrolytes in it, it's retained better in the circulation, which is where you want it.

[00:14:14] **Tamsin:** As a distance runner myself, I'm fond of a, um, diluting juice with a pinch of salt in it at the end, so that always keeps me happy.

[00:14:22] **Swathi:** But obviously a lot of people, especially young people, don't just exercise to stay fit and healthy. It's about looking good as well.

[00:14:27] **Tamsin:** And that can make people vulnerable to the kinds of misinformation that you see on social media and elsewhere. That's what Derek's been talking about.

[00:14:34] **Dr Derek Ball:** We want people to go to the gym to maintain their physical and aerobic capacity. And I think that's a great thing. If you're just doing it for the aesthetic, then that's where you then start to get all sorts of issues about body image, etc. And then they start taking really weird dietary practices.

[00:15:01] **Tamsin:** What challenges do social media influencers present to your industry, especially ones who are selling these protein-hyped products or other sort of supplements that aren't really needed?

[00:15:13] **Dr Derek Ball:** The challenge is to convince people that they don't work. A great example would be, let's say, a young male who watches TV and they see an international athlete who's got great shoulders, great chest, a six pack, they don't appear to have an ounce of fat on them and then they go onto social media and there's this social media thing that tells them that if you take my supplement, it's a fat burner and it also increases muscle mass. There's no evidence to support that. HMB is a good example.

**Swathi:** HMB?

[00:15:49] **Tamsin:** Hydroxymethylbutyrate. It's a chemical that's made when your body breaks down an amino acid called leucine. It's sold online and in health food shops as a supplement to reduce muscle damage from exercise.

[00:16:02] **Dr Derek Ball:** So, you can get HMB in a lot of these weightlifting shops that sell it with protein supplements, and it's supposed to increase muscle

mass. All the evidence suggests that it does nothing of the sort. And this fat burner story, well, what's that about? Essentially, in order to burn fat, you need to put yourself in an energy deficit.

If we look at bodybuilding, and you look at how much a bodybuilder consumes. When they're not in competition and they're trying to build mass, they'll consume somewhere in the region of about 4,000 to 5,000 calories a day. And the idea is that I get in an energy surplus, I'll put some fat on, but I'll also put some muscle on, and then as I come towards the competition, what I'll do is I'll go into an energy deficit, I'll lose some of that fat and then the last thing I do is dehydrate myself and when you look at them then, they look absolutely ripped, they are energy deficient, they're dehydrated and that, that is such a bad message to give out to young people in terms of this is the ideal body image.

[00:17:18] **Tamsin:** So we know social media is lying to us and we are a vain population, a lot of us. So this portrayed image of that being the perfect human is totally false then.

[00:17:30] **Dr Derek Ball:** Or it's attainable for a very short period of time. And the thing is that the majority of people, even if you wanted to, would really struggle to keep that body shape for, you know, 12 months of the year, for goodness knows how many years.

[00:17:48] **Tamsin:** One of my running coaches once said that you've got to, got to come away from peaking every now and again so that you, you can build back up, so is that you can't be in your optimum all the time, can you?

[00:17:58] **Dr Derek Ball:** No. If you tried to be at your optimum all the time, all that would happen is that you would overtrain and then break down and then you end up in a worse place than if you'd have just tapered off and had a taper off period and then stepped up again in terms of, training volume and intensity.

So for, for a student that's coming in, that is competing at a university level, then depending on what your sport is, there may already be in place some strength and conditioning elements to that programme with those athletes. If it's that you having to do that on your own, I would go and speak to somebody about, it.

What's the most appropriate strength and conditioning program? And we do have staff at the university that can give you that advice. From a nutrition perspective, then I would say that you would want to really think about what is it that I'm consuming on a day-to-day basis. Do I have a breakfast? Do I have a



lunch? Do I have a dinner? And what does that look like? consist of. So you want to start the day off with a good breakfast, don't skip breakfast, and then you could think about what you're having for lunch. Do you have time? And make sure that you have dinner.

[00:19:21] **Swathi:** I don't know if it's quite fascinating. It's, it's about what do you trust? Like, what's the information all around? And it's about giving it a bit of perspective to it.

[00:19:29] **Tamsin:** Yeah, I think the main theme out of this is just not to trust everything you see online. It's an excellent sales technique to say you've got a shortcut for something that everybody wants. They all want that, want it to be attainable to be that fit and healthy and look that way.

**Swathi:** It's like a quick fix, isn't it?

**Tamsin:** Yeah. Anyone can post information online without being a nutritionist and knowing exactly what they're talking about. So, how do we know who to trust? Maybe the experts do know more, but Do they know everything or does it differ person to person as well?

[00:20:06] **Swathi:** So now that we have fed your curiosity on the subjects of fitness and nutrition, what could the University of Aberdeen offer you?

[00:20:14] **Dr Derek Ball:** There's two degrees. One is Sport and Exercise Science, which is a really focused on the elements of performance, but also tied in with Biomedical Sciences. And then the other one is exercise and health science, and that is about the effects of exercise on physical health and how it can offset disease and also for the aging process. And both of those have an element of nutrition in them, both of those pathways. We run courses in third and fourth year that focus on aspects of sport nutrition and nutrition for physical activity. So those students have a good idea of what are the recommended intakes of what we call the macronutrients for both health and for performance.

[00:21:08] **Tamsin:** So we eat simply, eat enough protein, do some exercise to stop ageing, and we'll all be fine.

[00:21:13] **Dr Derek Ball:** Fingers crossed, we'll all be fine.

[00:21:15] **Tamsin:** Thank you to Dr Derek Ball for helping to clear up some of those fitness and nutrition myths and for telling us a bit about studying Sport, Exercise and Health Science at the University of Aberdeen.

[00:21:26] **Swathi:** If you want to join the Boundary Breakers, you can come to one of our open days and see our historic campus. You can also download the Our digital prospectus at [www.abdn.ac.uk](http://www.abdn.ac.uk).

[00:21:41] **Tamsin:** And to hear more from us, check out the rest of the podcast. Each episode discusses the groundbreaking research from one of Aberdeen's academics.