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S1 00:00 Hi, this is Tim Lightfoot, the director of the Huffines Institute. To start the podcast, I'd like to take a chance to tell you about this year's rendition of the award-winning Huffines discussion. HD6 will take place on Friday, November 11th, from 1:00-4:00 pm in Annenberg Presidential Conference Center here at Texas A&M. We're thrilled to have eight world leaders in Sports Medicine and Human Performance give their big ideas, all in a language you can understand and use in your daily life. Dr. William Dexter, Dr. Russell Pate and Texas A&M legend Mr. Dat Nguyen, are just three of the eight exciting speakers here to share their thoughts on what's next in the field. We'll see you at Annenberg on November 11th. If you can't make it here, all these talks will be up on the podcast starting in January. Now, on to the podcast.

S0 00:45 Welcome to the Sports Medicine Podcast, brought to you by the Sydney & JL Huffines Institute for Sports Medicine and Human Performance in the Department of Health & Kinesiology at Texas A&M University. At the Huffines Institute, we're always working to facilitate, apply and bring you the most up-to-date coverage of the wide world that is Sports Medicine and Human Performance, all in a language you can understand and share with your friends. And now here's our host, the director of the Huffines Institute, Dr. Tim Lightfoot.

S1 01:15 Hello and welcome to the weekly podcast from the Huffines Institute for Sports Medicine and Human Performance. I am your host Tim Lightfoot, and I'm so glad that you took the time to download this and that you're listening. We are joined every week by someone who is interested in the world of Human Performance and Sports Medicine, and this week is no exception. We have with us today Dr. Susan Kleiner. Susan, welcome to the podcast today.

S2 01:39 Thank you so much, Tim, it's my pleasure to be here.

S1 01:42 We're so glad to have you. And I'm going to tell the audience a little bit about you, and then we'll just jump into this. Dr. Kleiner is a registered dietitian, she has a PhD in Nutrition from Case Western Reserve University School of Medicine, a Master's degree in Nutrition as well, a BA in Biology from Hiram College. As I said, she's a registered dietitian, a fellow of the American College of Nutrition, a certified nutrition specialist, a fellow of the International Society of Sports Nutrition. You're qualified to do what you do, aren't you?

S2 02:12 I try [chuckles].

S1 02:14 We have Dr. Kleiner on with us because she's got a lot of experience in the world of Sports Medicine. She's the owner of High Performance Nutrition. She is a nutrition consultant for the Seattle Storm of the WNBA, the Seattle Reign of the WNSL - and that's the women's soccer league. She is a consultant, has been a consultant with the Seattle Seahawks, the Seattle Mariners, the Storm, the Thunderbirds, the Supersonics when they were there in Seattle, the Cleveland Browns, the Cavaliers, the Miami Heat, and our Olympians. She's written eight books, including Power Eating, The Good Mood Diet, and several others. She's won several awards for her work. And so we just wanted to ask her to come on and talk to us about High Performance Nutrition. So again, welcome to the podcast. And we always start often with, what got you interested in nutrition? Is this something that when you were age five, you decided this was what you were going to do all your life?

S2 03:13 No way [chuckles]. I was going to be a dancer on Broadway.

S1 03:18 Excellent. Okay [chuckles].

S2 03:20 And at 16, I was a student at Martha Graham Studio in New York City. And really realized - as a girl from Cleveland, Ohio with a family that had a very small family business - that I couldn't take all the resources of the family to pursue my own dream. And so I came back home, I graduated from high school and attended Hiram College, which is a very small liberal arts college about 40 miles southeast of Cleveland. And it was the best choice that I ever made, going to this small college where I had incredible full professors teaching my introductory biology class and that sort of thing. There was quite a large emphasis on research, and in fact in those days-- and you can date me as the grandma of sports nutrition here, the godmother as one of my young colleagues says. In those days, it was really all about going to medical school. And at Hiram, their focus was if you couldn't make it in medical-- if you couldn't make it in research, you went to medical school. So that was the odd culture at this small college, and so we all did research. So today, lots of undergraduate students have that opportunity. But back in the 1970s, that was not standard to have a biological field station at an undergraduate college.

S1 05:00 Yeah, that was unusual.

S2 05:02 Yeah. And in fact, they were the only undergraduate school, [?] College, that had that in the backwoods of Ohio. And so I had a wonderful introduction to research, and in the meantime I was interested certainly in physical activity. I had left dance, and I got into dance because I was a pre-Title 9 girl. And there in Ohio, there was no organized sports for us in school at all, except in my high school, we did have field hockey. But just as an example, we had a gorgeous brand new Olympic-sized pool at my high school and on the door was written "Boys' Pool."

S1 05:53 Really.

S2 05:54 So the girls couldn't put a toe in that pool. There was nothing in the way of sports, as I said, for girls. So I loved dance and I was a modern dancer, if people are not familiar with who Martha Graham is. And so when I went to college, I was looking at that time. By then, there were more sports opportunity for girls and I just started to do everything and had a lot of fun with it, and became very interested in natural farming methods. It happened that Hiram Ohio had one of the very few leaders in the organic farming movement. And so us kids who were interested in what he was doing, he took us in and taught us his methods and gave us some [?] and let us start to grow our own produce. So we had a ball and I really enjoyed learning all of that about food and started to read everything I could, and thought I was interested in health. And again at that time, if you were interested in health, you got put on the track to go to medical school. Which if you can imagine at this school, was a secret if you wanted to go to medical school [laughter].

S1 07:16 That was not something you shared with people, in other words.

S2 07:19 No. And so I actually did everything I needed to do and started to go to my-- applied, went to my interviews and really didn't like it. Didn't like the interview questions that I was asked, nothing felt comfortable. And so I withdraw my applications, but I did have one individual who was the Dean of Admissions of Case Western Reserve University School of Medicine, the late doctor Dan Horrigan, who knew me quite well as the dad of a good friend of mine from high school. And he said, "Susan, we'd love to have you in medical school. You're not going to learn anything about what you're interested in. We teach people how to treat disease. You are interested in health, go talk to the Department of Nutrition." And I had no idea that nutrition was a whole science, I thought it was just a hobby. So that was the turning point, and that is when I saw nutrition. And then in my mind, linked nutrition and exercise of which there really wasn't much study, except in the military for army rations and that sort of thing. Understanding the needs of soldiers, which had a deep history. But as far as thinking about sports and exercise, there wasn't much in the field of nutrition. And so that was the beginning in my pivot to just finding this very exciting field that a handful of us as dietitians, pioneered in this country and connected with the pioneers around the world who were doing this research. And that was again - from where you are and how I ended up at Texas A&M speaking - was my connection to Dr. Rick Crider. And he and I came up through the ranks at the same time, he in exercise physiology and I in nutrition. And that has been just a wonderful marriage of - not between he and I, of course [chuckles] - but a field for 30 years of watching these fields really work and cooperate beautifully together.

S1 09:28 Yeah. It's interesting how a moment or some moments like that in college, can actually - as you said - make the pivot, where you move into a different area than what you anticipated.

S2 09:40 Right. Exactly. I thought you had to go to medical school. And today of course, my goodness, the options are so many. If medical school is your pass, that's wonderful. But if you really are not interested in disease [chuckles], but you're interested in health and prevention, there's so many other options.

S1 10:10 Now you worked quite a bit with high-performance athletes, I just read off a list of some of the consulting work that you've done. How, in general, would an elite athlete-- how would you say their nutrition differs from that of a regular individual who may be recreationally active, but certainly is not elite? Let's start there as a generic kind of thing [chuckles].

S2 10:31 My goal is, I wish everyone would think like an athlete and really challenge themselves physically, even if they weren't doing the volume of exercise that a professional athlete or an athlete that aspires to greater performance does. But it's really-- there's the basic foundational health and nutrition that everyone needs, and athletes need that with the same concepts but in a higher amount. Because the demands on them physically - and sometimes mentally, especially student athletes - are so much greater. And so not just calorically, but the nutrients density of their diet needs to be a high priority. Meaning that every calorie that they eat, needs to be packed with nutrients. Sort of the biggest bang for your calorie, instead the biggest bang for your buck, and then an athlete also needs to think about fueling their training. And this doesn't have to be just an elite or a professional athlete, it can be a recreational athlete. It can be anyone who's trying to get to the next level, who is really physically challenging themselves athletically. And so if you are doing more than moderate levels of exercise, then you need to fuel their training specifically to accomplish the goals of that training. And so that's a separate category from using food to nourish your body, and then using fuel to train.

S1 12:20 That's an interesting dichotomy, the difference between nourishment and training and so it's like basic nourishment is your basic diet. And then if you're going to do the training, then you have to think about that food also as a augmentation of that training?

S2 12:35 And it maybe food or because of the demands of training - typically, it's the demands of training - but also as a convenience, it may be supplements that we use as fuel. Because they may be more easily or rapidly emptied from the stomach, digested and absorbed, so that they're available for your training. And so by example, the food that we eat that we always recommend, whole foods, fruits and vegetables and grains and beans and nuts and seeds that are high in fiber and rich in the nutrition that we're looking for, to nourish our body. Of course, also dairy and protein rich foods and high performance fats. All of those take a long time to digest and empty from the stomach. And so if that's the meal that you have two hours before you train, it's likely - in some large ways - still in your stomach when you go to train. And so not only is it not fueling their training because it hasn't processed into your bloodstream yet. It's also, you're still full from training, from your meal.

S1 13:54 From your meal. Right.

S2 13:56 So it's hard to fully train. And so the goal is if you are doing high intensity training bouts and you want to extend those training bouts for as long as possible, because that's where the training effect occurs and you get the maximum benefit from each training bout, then you need to specifically fuel that training bout. Because if you go into training under fueled - which is what a lot people do all the way up to a lead athlete under fuel their training, so they feel empty enough to train - then you never maximize each training bout. You fatigue before you finish.

S1 14:49 Because you've run out of fuel.

S2 14:51 Exactly.

S1 14:52 Yeah. One of the things that you specialized in - and this makes a lot of sense - one of the things you specialized in is the difference with diet for women and girls. So in major cases, we think of generalities, we think of one nutrition guideline for everyone. But how are women and young women different in their nutritional needs and their diets, that they need when they train and perform?

S2 15:21 Well, there's two issues really, is what are the fundamental biological differences between males and females, and the other is what is the misinformation and poor messaging that gets into the heads of women and girls. And so the first piece is when you think about most male athletes, restriction is not a big part of their dietary language. They want to fuel as much as they can to build. What has been driven into the minds of young women and girls - and certainly even our master female athletes and recreational athletes - is that part of the goal of their exercise is to lose weight or have a certain body type that they desire that is less rather than more, and that is the antithesis of what the mind of an athlete should be thinking about. And so first battling the concept of using their exercise calories for weight loss is a big hurdle, and that is why typically almost every woman that I work with has to eat more. And it may not always be eating more food, that maybe the food that they're eating is meeting their basic fundamental or foundational needs, but it is not fueling their training. They are drastically underfueling their training, and it's why they either are too exhausted to do the rest of the things they need to do in their day or they are never really quite accomplishing their athletic goals. And the other is, they don't sculpt their bodies the way they think they should be sculpting them either. They just never quite get the results. One of things that we're seeing in research - and Dr. Melinda Manore in Oregon is doing a lot of writing on this and research - is the concept of going away from the idea of energy balance, where we design a diet for a woman based on how much energy is going out, and so that's how much energy needs to come in.

S2 17:52 And so if you're even doing a direct measure of energy consumption, if a woman - or a man, but it's so common in females - if they are under-fueling their body, their energy consumption is low. Because our brains and our energy systems will put a governor on the ability of our body to burn fuel, and you will not burn the optimal amount of fuel for your high-intensity exercise, the body will restrict. And so the energy that you're using and burning and the output that we're measuring is below what it could be. And so the idea then is to use a concept called energy availability, meaning that first you measure how much energy or we predict based on a well-fuelled individual how much energy you would use during your training. That's where you start, you make sure that you've got all that fuel. And then the rest that's leftover in the diet of that athlete is all that's left to fuel their fundamental resting metabolic needs, if you will, in their activities of daily living. And typically, that leftover energy is far below what we need to fully run our bodies and all our systems. And so this is why women see reproductive function diminish, immune function diminish, those systems will take a backseat to keeping our heart beating and the things-- cardiovascular system. And so we're under-fueling the body and we are robbing our basic functional health, in order to do our physical activity. And that's how women keep going despite very low energy consumption, and this is the biggest issue in female athletics today.

S1 20:08 So have you had success in treating this issue?

S2 20:10 Yes. Yes. And it's amazing. So women will think that they're doing really, really well. And actually, the-- you find this in men as well, of course, but not as co-- not as extreme and not as common. And so the-- typically, my first approach is let's just start fueling your training. Women will often be very hesitant to eat more. They're worried they're going to gain fat. And so this whole dialogue, we have a fundamental conversation about body image, marketing and media, and how do you identify yourself. Do you see yourself as an athlete? Is that the image you have of yourself, or do you see yourself as someone who needs to look good in a bathing suit but not as an athlete. So the question then - we have to get past that - then it's let's see if we start to fuel your training, and each individual is a little different. And we also look at each training bout, and some training bouts need more fuel that others, some training bouts are at a lower moderate intensity. And so those don't need quite the same kind of fuel, the same amount of fuel. Maybe they're good with their food during the day, and using nutritional sports supplementation isn't required at this time. But any time we're looking for athletic enhancement, that physical challenge of a high intensity level of exercise at 70% or more of their maximum work output, then we want to really fuel that training with carbohydrate fuel. And so as I said in some individuals, they can do that with food. I find it much more successful to use sports nutrition beverages at that time. And then it's a matter of finding the beverages that don't cause stomach upset, where we can get enough fuel in or that we need to use successive times when they're drinking throughout their training session in order to get in the fuel that they need, and then their recovery at the end. So pre, during, and post, becomes very important. And that's where I start, because that's where I can gain the greatest trust and I find the least amount of fear.

S1 22:54 Now I'm glad you brought it up, because so often carbohydrates are made to be evil in today's society - misguided society - and so it's nice to hear you talk about the need for carbohydrates. And so just if we have any of our listeners that have confusion about that, complex carbs are not a bad thing.

S2 23:12 No, no. First of all, we are not talking about an obese population that has dysfunctional energy systems. Perhaps they have been-- have some kind of insulin sensitivity issues, maybe marginally diabetic. That's not this population. That has nothing to do with this population. So number one. Number two is if you do high-intensity exercise, 70% or more of you maximal work output, as I said. The only way you do that exercise is by having carbohydrate fuel. Our physiology has not changed.

S1 24:02 Right, and that's a biochemical fact.

S2 24:03 That's a biochemical fact.

S1 24:05 Right.

S2 24:06 The thing is that if you are under fueled, and you don't have someone actually measuring your work output. Then with a low carbohydrate availability, our rate of perceived exertion, the RPE goes up. So it feels like we're doing a high-intensity workout. But if we measure your work output, your work output is low. Closer to what I would call 50 to 60% of your max. So if you are only using your own perception as your measure and you don't use carbs as fuel, you are likely mis-perceiving what your actual work output is and you are never going to reach your goals. And there is no argument about fueling high-intensity training, and every athlete that I know that talks about eating a low carbohydrate diet - if they are successful in their sport - they still fuel their high-intensity training with carbs.

S1 25:22 And as I said, that's not just anecdotal information, that's by chemical, that's-- we know that from the science side of things as well.

S2 25:32 And that's a hundred years of research, and no one has shown anything - in a good research study or any research study - above 70 to 72% on the rare individual of maximum work output, ever being fueled with anything other than carbohydrates.

S1 25:55 Yes. So eat your carbohydrates, folks. Eat your carbohydrates.

S2 25:59 Yes, but the concept of sort of managing your-- and thinking of what do I need for fuel? And that's what I like to think about is, "What do I need for my fuel for training?" And maybe if I put my simple carbohydrates that are rapidly empty from the stomach and-- or it doesn't have to be simple, it can be starch. But you want rapid stomach emptying and entry into the bloodstream where you see that good insulin response. That means that you have readily available fuel, and your brain - from the moment that hits your mouth - knows that carbohydrate has entered your body and you have greater fuel availability for your training. Under those circumstances, you figure out what are my carbohydrate needs. And you can find that research, "How many grams of carb do I burn per hour for a sport?" When I work with swimmers, I figure out how much carb they need for their sport at the level of the training they're doing that day. And that's what we fuel them with around their training, both before and during, and then just enough replenishment afterwards. Because I still want them to be able to eat most of their carbohydrates in whole food form. As I said, from fruits and vegetables, to have plenty of plant foods in their diet, and those are the nutrient dense foods that they're nourishing their bodies with. So that's why I think of these concepts of how do you nourish your body, and then what do you need to fuel your body each day for the specific bout of training that you're doing. Lower if it's a low-to-moderate intensity workout. If it's a long distance, low intensity or moderate intensity workout, you're burning mostly fat. That doesn't take a lot of carb.

S1 28:09 Right. And you know, this has been a fascinating conversation. And we could go on for hours with this, but we are running short on time. And we're going to have you come back on at some point.

S2 28:20 Fabulous.

S1 28:20 Then we'll continue the conversation. But as we do with all of our guests, we want to give you an opportunity, Susan, to give our audience a take home message. If there's one thing you want them to remember after listening to this podcast, what would that be?

S2 28:33 I have a mantra [laughter], that I want anyone that I work with to think about. And it's think about what you need to eat, not what you can't eat next. We eat so much by default in this world of fitness and performance, where we think, "I'm told I can't eat this, I can't eat this, I can't eat this," there's so much negative messaging. And I love the abundance of the world that we live in. And so our bodies, when we are trying to be fit and active and perform at our best, need the richness of an abundant diet. And so thinking about what you need to eat and not what you can't eat next, then you eat with a positive approach rather than by default.

S1 29:26 Excellent take home message. Excellent. Our regular listeners know at this point is in the podcast is when we have the podcast question of the week. So with the podcast question of the week, here is our producer, Kenneth.

S3 29:38 According to Dr. Kleiner, what causes the reproductive functions in women to decline with heavy exercise?

S1 29:45 Great podcast question, Kenneth. Be the first person, be the first listener, to send us an email with the correct answer to that question and send it to huffines@tamu.edu. And that's huffines@T-A-M-U dot E-D-U. If you're the first one to send us the answer, you'll get one of our nifty podcast t-shirts. So I want to thank all of you for - again - for listening today. Susan, in particular, I really want to thank you for taking time to be with us today.

S2 30:15 My pleasure.

S1 30:17 It's our pleasure to have you on. And I'll remind the audience that you can pick up all of Dr. Kleiner's books on Amazon.com, books like Power Eating, The Good Mood Diet, to The Power Food Nutrition Planner. Just put her name in the title bar there, and all of her books will pop up. We would encourage you to look at those, and look at all that information that's out there. And again, we want to thank you for taking the time to be with us this week. We invite you to be back with us next week, when we have another interesting person from the world of Sports Medicine and Human Performance. And until then, we hope that you are active and healthy.

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