

## CAS 30 BRAVE MINUTES PODCAST: The Science of Dieting

NARRATOR AND EDITOR RICHARD GAY: This is 30 Brave Minutes, a podcast of the College of Arts and Sciences at the University of North Carolina at Pembroke. In 30 Brave Minutes we'll give you something interesting to think about. Joining the Dean of the College of Arts and Sciences Jeff Frederick are Jeff Kushner from the Department of biology and Misty Stone from the Department of Nursing. The topic for today is the Science of Dieting. Get ready for 30 Brave Minutes.

FREDERICK: Adkins, South Beach, Ketogenic, Paleo, Mediterranean... sound familiar? They're all diets. All heavily marketed and all designed to feed the fundamental premise that people want to be leaner. We are marketed constantly on being leaner, stronger, and becoming consumers of a 70 billion dollar diet products industry. One estimate places the number of Americans who diet each year at about 45 million, with as many as 70% of Americans falling under the heading of overweight or obese. The Robert Wood Johnson Foundation predicts that by 2030, 13 states could have adult obesity rates above 60%, 39 could have rates greater than 50%, and the national rate could be above 44%. I won't tell you where North Carolina and the rest of the south fits on that obesity spectrum, but suffice it to say our passion for barbecue and fried everything doesn't always prove helpful or healthy. Americans are five percent of the world's population and 13% of the world's overweight or obese. Something needs to change. Studies suggest that 8 in 10 Americans under the age of 36 admit they could be healthier. Even the words overweight and obese are loaded. In the 1990s an international obesity task force changed the baseline metric for defining overweight from a body mass index rate of 27 to 25.

As the Guardian newspaper recounts "Overnight millions of people around the globe would shift from the normal to the overweight category." We want desperately for the diets we begin to be successful, but the most common outcome is that we don't lose much weight, or if we do, we quickly gain it back. This somehow leads to another New Year's resolution, which often comes apart just in time for Valentine's Day or Easter candy. There are many paradoxes and contradictions inherent in the concept of dieting. Breakfast is often noted as the most important meal of the day, yet Americans are more likely to skip breakfast than any other meal. For a time, physicians suggested taking up smoking as a preferred option to snacking. "Reach for a Lucky Strike instead of a sweet," if you will, so the early 20th century ad campaign advised. Our diet posture too often seems to focus on deprivation. These are foods you can't eat, making them considerably more appealing and creating a sense that we should feel bad if we give in and eat them. Dieting then becomes a slow slog toward feeling bad about yourself, rather than an extended voyage toward becoming healthier, happier, and in balance. Diabetes, heart disease, hormonal imbalance, maintenance medications, resistance to exercise, and a host of complications make a deprivation-based plan all the more challenging to execute. In the end what works is a matter of science and practical application. How do we get healthy and stay healthy? Why do some diets work for a time and then not so much? Why do some diets work for some people and yet not for others? The topic for today: The Science of Dieting. And joining me are biologist Dr. Jeffrey Kushner and nurse educator Misty Stone. Welcome.

Why is losing weight so hard? Why do people have such limited success on these popular diets?

STONE: Well, I can one, agree that yes, losing weight can be hard, but it can be even harder if we don't do it the correct way. For instance, you see your friend. Your friend has followed this specific diet and had wonderful results, lost all of this weight in a very short time period. So why can't I do that? A lot of times we forget about our own body's genetics and not just our body's genetics, but also the environment that we surround ourselves in. And as Americans, or, I'll speak for myself as an American I want to do something and I want to see quick results and that's not always how it is, especially when it comes to losing weight. But we have to remember genetics. We also have to remember when we are dieting or when persons diet, that diet has neurological changes that happen in the body. It also has hormonal changes that happen in the body. One of those changes is with the hormone dopamine. Dopamine is one of our addictive hormones, whether we are addicted to sports or addicted to drugs or addicted to food. So that comes into play, too, when someone is dieting. And that hormone is increasing and it makes the body and the person want more. You see those cookies and the person who's maybe not dieting can skip those cookies, but the person that is dieting because of these hormonal and these neurological changes is even more tempting.

FREDERICK: It looks twice as good.

STONE: I've got to have those cookies and I've got to have more. I've got to have two of them. The other change that happens is with the hormone leptin. Leptin is our safety hormone, so that, too, goes into play whenever someone is dieting and the body takes more food at that point. The body wants more of it to feel full or to become full. So the irony is that someone who has been dieting for some time those changes happen that make it hard for them to continue or to succeed. You know, usually when you first start a diet you lose weight. I say wait five, six-ish pounds, or seven pounds go pretty quickly, but what people don't realize is that it's really not weight. It's more so water and so they're like, oh, you know, this is great. I can do this. I'm losing weight when it's really, again, not the weight. So then what happens is Weeks Later, months later, they're going, "Man, you know, it's been two months and I've only lost a pound what in the world?" and it just becomes harder and harder to follow that diet, so now that I have suppressed my eating habits per se I now think, "well, this diet isn't working anymore. And I go back to those old habits and you know what happens.

FREDERICK: Every time you try something new you change that balance you were describing.

STONE: Yes! You change your balance and then once you say, okay, you know what? I'm just going to have one cookie. I'm just going to cheat this one meal.

FREDERICK: It might be the size of this table, but only one...

STONE: Yes. So yes, losing weight can be hard. Again, environmental factors as well as genetics.

KUSHNER: Well, and it's interesting that you mentioned the term balance because overall the body strives towards homeostasis which is balance. Every time you try to change your weight, you're changing the body's balance. You're fighting it physiologically. Another reason that people have such limited success on diets is they're boring. You know, the best diet for an

individual is one that you will stick. You don't have to call it Atkins. You don't have to call it South Beach, but if you will stick with it, it'll work for you.

STONE: More of a lifestyle change, I would say, versus a diet.

KUSHNER: Right. And what I like is you are mentioning genetics. I think there's a big genetic component. But more than that, the term nutrigenomics will be becoming more popular. Everybody's genes are different and basically, there's going to come a time when you will have your whole genome on a magnetic strip on the back of your health care card. And so, you know, the four of us here if we all went on the exact same diet one might be successful, one might be unsuccessful, and two might just stay where they are. That's because all four of our genomes are different.

FREDERICK: So the genetics help to determine the balance and the balance that you have determines what diets will work perhaps a little bit better.

KUSHNER: Right. So what would work for you might be a low-carb diet. Maybe for me, a low fat diet would work best. There's no way to know unless you get your genome.

FREDERICK: So we need our genomes before we figure out what's next.

STONE: I'm not promoting this, but for Christmas me and my husband and my daughter we did the 23andMe. And it came back. The results finally came back. And for my husband, you know it looks at your genes and it looks at weight or body mass and weight. It tells him on his that he is going to be a medium build and so he's like, "Yes! I don't have to do this diet no more! So, you made me think of this.

KUSHNER: I've done 23andMe also.

FREDERICK: So having the information though, you know, increasingly in the 21st century is going to be critical to making the right decision, right? Yeah. So it seems that it's easy to put weight back on and people talk about yo-yoing. Is that just that you get to a certain number or you get to a certain pants size or dress size and then you decide okay, I don't have to deprive myself and then it pops back on or is it more complicated scientifically than that?

KUSHNER: Well, let me use an example that I use with my students. Let's say that we have a 200 pound individual who is about 20%, well, let's take a male and 20% body fat. This person decides to go on a diet. So over six months they lose, say, twenty pounds. That's 10% of their body weight. What they've lost not only is a little bit of fat but also some muscle. Now they get tired of this diet that they're on and so they start eating again. If, when they started this, they were maintaining their weight at 2,000 calories a day, by going back to 2,000 calories a day, not only are they going to get back to their 200 pounds, but they're going to go above 200 pounds because in gaining back the weight that you've lost you are not gaining back the muscle that you've lost. Muscle is metabolic tissue. The more muscle mass you have the faster your metabolism would be and the more calories you can take in on a daily basis.

FREDERICK: And muscle weighs more than fat, but it also burns calories faster.

KUSHNER: And that's something that bothers people. So if I started a diet and exercise program and say that I was lifting weights to exercise. Even if I'm taking in less calories, I'm going to start out increasing my weight because I'm increasing my muscle mass and that's a very good point.

FREDERICK: So the number might not be the most important thing to look at. It might be: How do I feel? What's my energy level? How are my clothes fitting? Things like that?

STONE: More so, I would think, more so measuring. Like measuring arm circumference, thigh circumference, waist circumference. We can really get obsessed with scales and the numbers that come from the scales and it can be very heartbreaking when you have, or you feel like you have done really good with your eating habits for two months and you get on the scale and it says instead of 149 now it says 150 and you're going, oh my gosh,

FREDERICK: What in the world!

STONE: But you know, it is funny, too, that you said something about fat and muscle weighing more. I read something the other day and maybe you can tell me if you've seen something on this. But I read the other day where people say this all the time, but when they really looked at it, it was only like, the muscle was only really weighing like a kilogram more in comparison to the fat but I mean, I don't know what's behind that, but...

FREDERICK: The long and short of it though, is maybe stay off the scale, or get on it a little less frequently, because you might make decisions based on what that number says that day, which is not really reflective of getting back to that balance.

KUSHNER: And on a day-to-day basis your weight will probably change but on a week or monthly basis, it will probably level out.

NARRATOR AND EDITOR RICHARD GAY: We'll return to our program in just a moment. The faculty and staff of the College of Arts and Sciences are changing lives through education. Our award winning faculty inspire students to achieve their goals. To learn more about our departments and accredited programs as well as our student and faculty achievements explore our website. Additional news and events may be found by following us on Facebook at UNCP College of Arts and Sciences. Remember you can subscribe to 30 Brave Minutes on Podbean and iTunes. You can also join us in changing lives by donating to the College of Arts and Sciences. Click the "Give to UNCP" button on our website. Thanks for listening and now back to Dean Frederick and his guests.

FREDERICK: So you guys, talk a bit about metabolism. Are there ways to increase your metabolism?

KUSHNER: Increase muscle mass.

FREDERICK: So even those people who were on a more cardio-centric exercise regimen should work in a couple push-ups now and again?

KUSHNER: Yes, they should. Resistance exercise is extremely important and the interesting thing that people don't realize, is that lifting weights, for example, burns energy without oxygen. It's very inefficient. Doing aerobic exercise is very efficient. So, somebody that's lifting weights is burning more calories per minute than somebody that's running even a seven-minute mile.

FREDERICK: Fascinating. So you can increase your metabolism? Is it related at all to genetics? Could you be genetically predisposed to have a slower metabolism?

KUSHNER: I believe very much that your genetics has a lot to do with it and you look and especially, you know, here we've got a campus full of, you know, approximately 20 year olds. You can look and some kids can eat a lot and not gain weight and some eat very little and gain a lot of weight. I'm not suggesting that half of them are hypothyroid and half are hyperthyroid. I think, you know, their thyroid is probably normal, but again, talking about the thyroid, when you lose weight, your thyroid is smart enough to decrease your metabolic rate. And then when you start eating again, if you don't regain muscle your metabolic rate stays low and so you can't eat the same number of calories that you did before you started dieting.

FREDERICK: So your body will compensate. So if you start reducing your body will say well, let's slow that process down and if you start increasing, your body might not be able to respond to keep you in that month-long balance you suggested.

KUSHNER: Right. And she mentioned Leptin. So when you have adequate adipose tissue in the body, you have a high level of leptin and a lower level of a stomach hormone called ghrelin. Ghrelin stimulates the urge to eat, Leptin shuts off the urge to eat. Well, as you lose body fat, you lose the leptin, the switch to turn off eating and you increase Ghrelin, you increase the switch to eating and so you are constantly battling your hormones in attempting to lose weight.

FREDERICK: And you don't even know that there's this battle going on and it's right inside you. You're just trying to get into that new pair of pants that you're trying to buy. Alright, so let's talk about nutrition, though, from maybe a different perspective here. How do our nutritional needs change so when we're young we need certain foods in certain amounts and then, over time maybe that changes. Talk about that.

STONE: Okay. So the US Department of Health and Human Services actually have a very detailed breakdown of, if you're female or if your male, if you're this age-range male, if you are this age-range female. It even has it broken down if you're male this age with a sedentary lifestyle or female this age, sedentary lifestyle. Now those numbers I don't remember. I'm awful with numbers, but they do have a very specific breakdown for, like I said, male versus male, sedentary versus non sedentary and then it also has a breakdown for children. What I have always followed or thought highly of, is however many calories I'm taking in is what I need to try to burn off, because if not, then that's when you're going to start seeing the weight gain or the adipose tissue start building up, but what do you think?

KUSHNER: Well, I'm glad you mentioned calories in versus calories out because there was a study done and the paper published from this study is entitled "A calorie is not a calorie," and depending on where you get your calories from... Typically, carbs and proteins are considered 4 calories per gram and fats nine calories per gram but protein calories are not the same as carb or fat calories. And so, depending on what you eat, you may be able to take in more or less calories on a daily basis and even maintain or gain or lose weight.

FREDERICK: I have three boys and my oldest was kind of the first person to do this and then the younger two have done a variation of it. My wife was out of town, so one of them came home after ball practice. The oldest one at the time, Logan and he went into the cabinet - and I think he did this because he knew Mom was not there and he got out of a brand new box of cereal and this gigantic bowl and he sat in the full gallon of whole milk and set it down and commenced to the process of destroying an entire box of cereal in a single sitting, knowing full well that dinner was coming later. And he was as just as lean as could be. Those needs for how much we can consume and more to Misty's point, how much we are burning and getting rid of with our active lifestyle... it changes over time doesn't it?

KUSHNER AND STONE: yes.

FREDERICK? One of the most amazing things I've ever seen. So nutrition is full of all kinds of things, right? Proteins and fats and vitamins and minerals and carbohydrates and water and fiber... How do we know how much of which we need and how do you balance that against things that you want to eat or that you're predisposed to like the taste of?

KUSHNER: Well, one thing that I tell people when they ask me questions like that, is just eat real food, you know. If it comes from nature, it's good for you and it will have everything you need. If it comes from a factory think twice about eating it. You don't have to worry about all the individual components of any food. If it's natural, it's good for you, even sugar. There are many people that are concerned about sugar and there are many researches that believe sugar is the root of all evil because of what it does to insulin, but you know you can take in the sugar of a cookie or the equivalent amount of sugar in fruit. The sugar in fruit comes with fiber which is going to prevent a large spike in insulin. The sugar in a cookie is not going to prevent a large spike.

FREDERICK: So, the banana is, in fact, better than the cookie even though I would say that the cookie is better.

KUSHNER: (laughing) yes, and about a month ago, there was a very interesting story circulating on the internet, "why chocolate chip cookies are addictive." And there's a lot of science there, but it, you know, it made me laugh because everything it said was exactly true and even, you know, you mentioned dopamine... the combination, so chocolate, sugar, and I forget the cooking term for what happens when butter and sugar melt together.

FREDERICK: The word you're looking for is awesome!

KUSHNER: Okay, the awesomeness of melting all that stuff together elevates your brain dopamine levels and it's just... you can't stop at one.

STONE: And the more we eat of whatever that substance is, the more our body wants and the body wants more and more and more. I thought, too, it just makes sense. If you eat something that's natural like the banana versus the cookie. Yes, they both have sugar, but the body can take care of that natural, that banana sugar much quicker and more efficient than the sugar that's in that cookie. When you mention fats, I also think about when we say fats usually the general person or the layman think: "Fats. Fats are bad, fats," but they really don't understand there's good fats. There's healthy fats and then there's the non-healthy fats and again, the protein. Where are we getting our protein? Is it from the processed meats we're eating or is it from the can of processed beans that we're eating? Like, where are we getting that? But I totally agree that a variety of natural foods is what we should be eating.

KUSHNER: An old friend of ours said, "Everything in moderation."

STONE: Yes.

FREDERICK: So some people resist some of those natural foods we are supposed to eat. I'm particularly good at resisting broccoli. A lifetime of resisting it successfully, and then other folks compensate for that by taking vitamins or supplements. What's the science on that?

KUSHNER: I tell my students don't take water soluble vitamins in a pill. It's all going to end up in your urine.

STONE: Right. Yes.

KUSHNER: But if you eat real food you get exactly what you need. You should not need to take anything in a pill.

FREDERICK: So all the more reason to have a specific grocery list when you go to the store because there are certain things that you really should be making sure that get in your cart in order to avoid trying to compensate.

KUSHNER: Yes, like green vegetables.

STONE: Yes, fill your buggy up with green vegetables. A lot of times people don't realize that vitamins are sold over the counter, which we know. You can even get Flintstone vitamins for kids. But you can actually take too much of vitamins, especially the fat soluble vitamins because the body holds onto the fat-soluble. The water-soluble, not so much because the body is going to get rid of the excess but people really don't realize that and they think well, it's over the counter, it's just a vitamin. Let me load up on vitamins. They are good for me. They're going to keep me from getting sick and that's not really the case and I agree.

KUSHNER: And I know a case where this guy went to the hospital because he was orange. And he lived on carrots and carrot juice. Carrots full of vitamin A, a fat soluble vitamin. Every fat cell in his body was full of vitamin A.

FREDERICK: Wow. So there's three things that I tend to see in the news over and over again as either being, you know, really good for you or a new study comes out and says, it's really bad. Most commonly they seem to be coffee, which I don't know how to live without. Broccoli, I can live without forever, coffee, not so much, chocolate, and wine. So, sometimes you hear these are all good for you. And sometimes you hear not and I know you guys earlier said, you know, moderation, but what would you advise on coffee, chocolate, and wine?

KUSHNER: Well, you know, if you look at the components: so dark chocolate is supposedly better than light chocolate. Wine, red wine is supposedly better than white wine, and let's take wine for instance. There's a chemical in wine called Resveratrol and in the wine Resveratrol is beneficial to your health. You can get a pill of Resveratrol. It's not going to be beneficial to your health. The components of dark chocolate and even caffeine. You can get caffeine in a pill or an energy drink which is a lot different than getting caffeine in coffee. And you know, you look at all the extras in the natural food and that has a difference in the effect of any of these components.

STONE: Yeah, I agree. I love chocolate, though, but when I have it I tend to stay to the dark chocolate. No, I mean I don't have anything to add that's very, very well said.

FREDERICK: So park in the last spot in the parking lot, walk all the way into the grocery store, get dark chocolate, eat a small amount of it, and then walk all the way back to the parking spot all the way at the end. We've mostly focused today on talking about things that you should do, healthy foods that you should eat, you know, an amount of exercise, you know, building some muscle in order to keep your metabolism going, but are there some things we shouldn't do? I mean, deprivation is not really a good way, but are there some specific foods you should eat rarely or maybe only for that special occasion?

STONE: I would say stay away from processed foods, if at all possible.

KUSHNER: Yes.

STONE: Um, and it's not, I mean, I don't think people really realize the effects that it has. I mean, it's it can inflame the body, inflame the joints, it can do damage to the spinal cord. So, my takeaway from this would be, if at all possible, and it's so hard because it's where you know, we live busy lifestyles and you know, it's just quick and easy to grab that processed turkey meat or those processed chicken nuggets and go with it, but if you have the time to prepare, try to stay away from the processed.

KUSHNER: I totally agree. And another thing to consider is that the microbiome. Your gut has more bacteria, like, at least ten times more bacterial cells than your entire body has. Your gut bacteria talk to your brain. If you eat to feed the bacteria well, the good ones last, and the bad ones go away. If you eat things that encourage the bad bacteria to overgrow the good bacteria your health is going to suffer.

FREDERICK: So talk a little bit about that. How do you know what good bacteria is that you have? What bad bacteria? How do you get more of the kind that I you want to have a how do you get less of the kind you don't want to have?

KUSHNER: Again, less added sugar, less processed and refined grains, less processed meats. All of these things encourage the bad bacteria. So, if you eat complex carbohydrates, which prevent a sharp rise in glucose levels, if you eat natural meats instead of processed meats, you're going to encourage the growth of the good bacteria in the gut.

FREDERICK: I keep giving you both opportunities to tell me that I should never eat broccoli and confirm all of my suspicions. You have refused to do that.

KUSHNER: If you'd rather eat spinach than broccoli, go right ahead.

FREDERICK: My apologies to the broccoli lobby if you're listening today. We talked earlier about maybe not getting on that scale all the time. What are some signs that you maybe should look for other than the scale, in terms of when some dietary changes or some nutritional modification needs to occur?

STONE: I would say if you are starting to outgrow your clothes, that's one sign. And it may not even be just weight. Food can affect, like we talked about earlier, our neuro. It can affect our mood. Am I tired all the time versus, if I take out or start limiting some things from my diet, how does that make me feel mood-wise? How does that make my energy level? So I would say just knowing your body. We know our bodies better than anybody knows them. So just knowing your body and paying attention to what's going on.

FREDERICK: Energy level, tiredness, ability to get to sleep. Try not to have that gigantic Diet Coke right before you're trying to go to sleep at night.

KUSHNER: And also starting the day. You mentioned breakfast being the most important meal. I look at breakfast as the time that you break your fast. And fasting for 8 to 12 hours at least puts you in a state of ketosis, which is another good thing to do. But, if you start out with a protein and fat breakfast as opposed to this bowl of cereal that your son ate...

FREDERICK: A box of cereal.

KUSHNER: Okay. You're going to be in much better shape. Let's say that you eat eggs, you know, you have scrambled eggs, protein and fat, no carbohydrates. You're not going to get hungry till lunchtime, but you have a bowl of cereal, you have Frosted Flakes and you're going to be reaching for a Snickers at 10 o'clock in the morning, which isn't going to help you get through to lunch anyway. So it's a lot of timing, you know, what you eat and when you eat it. If you want a snack, have it after you've eaten things that are going to prevent a sharp rise in glucose and insulin.

FREDERICK: Okay, final question. What is one tip that you would think would be universal and good advice for everybody, no matter their balance, their genetics, other than the "don't eat

processed foods" and "try to eat whole and healthy things." What one final piece of advice would you give to people who have struggled with weight for some time and maybe it's affecting how they feel about themselves?

KUSHNER: Well, one thing that I would say is don't try to fight your genetics and physiology. Some people are not meant to be thin and a hundred pounds. Some people are meant to be a lot heavier than that. If you try to fight that you're going to lose the battle.

FREDERICK: Enjoy who you are.

KUSHNER: Yes.

STONE: I would say for that person just to educate their self. What are the good foods that I should eat? What are the good fats or the healthy fats versus the non-healthy? And even, a lot of times like when we use oils when we're cooking like canola oil versus vegetable oil versus avocado versus coconut. Just become educated on what it is that you are putting in your body. Even if you decide well, I'm going to drink the unsweetened coconut milk. Okay, that's great, but look and actually take the time to read those ingredients and see what I am actually putting in my body?

KUSHNER: Yes. There are probably over 20 different terms for sugar. Check out the ingredient list.

STONE: Yes.

FREDERICK: Misty Stone, Jeff Kushner, thanks for being here today and for a great discussion on the science of diets. We've all learned something today. Thank you for being here.

KUSHNER AND STONE: Thank you.

FREDERICK: Catch us next time on 30 Brave minutes.

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