



Episode 14 Transcript

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The Ins And Outs Of Ketogenic Dieting For Athletes: Part 1

Dr. Krissy Kendall: Welcome to *The Bodybuilding.com Podcast*. So check it out, I am flying solo today, so I'm going to take you back to an interview I did with two great guys, Steve Hertzler and Jason Wittrock, where we discuss everything there is to know about keto.

I'm your host Krissy Kendall. I am the science editor here at Bodybuilding.com, and with me today I have Jason Wittrock. He is a personal trainer as well as an EAS Myoplex athlete and a Bodybuilding.com spokesmodel. And then I also have [Dr. Steve Hertzler](#) who is the chief science officer for EAS Sport Nutrition, as well as a member of the [EAS Academy Advisory Panel](#). Thank you both for being here, we're thrilled to have you. And today's topic is basically going to cover all different aspects of the ketogenic diet, including: What is the ketogenic diet? Who uses it or who might benefit from it? And then how to incorporate it into your everyday lifestyle. So, I would say before we even get started diving into this, Dr. Hertzler if you want to talk a little bit about what is the ketogenic diet? And if you were to explain it to one of your patients that came in to talk to you, how would you explain it to them?

Dr. Steve Hertzler: Yeah, essentially the ketogenic diet is a very high fat diet that is moderate in protein and very low in carbohydrate. And the diet has been used therapeutically in different populations, in the epilepsy population, in children, that's one of the areas where it got a large amount of exposure. But it's sort of moved into the fitness and bodybuilding world now and a lot individuals are attempting to reduce their carbohydrate and increase their fat intake via this diet. Typically this diet is around 75% of its calories from fat, 20% of its calories from protein, and about 5% of its calories from carbohydrate.

Jason Wittrock: You know, I think the reason it's becoming more popular is because people are starting to realize that carbohydrates might be the culprit for why people get fat. And insulin resistance is a very real thing, so it kind of turned people's attention to having a high fat diet.

Krissy: And the purpose to switch onto this diet or to consume such high fat, low carb would be?

Steve: Essentially what you're trying to do is stop your body from burning carbohydrate as its main fuel source and switch the body's metabolism to metabolizing fat as its primary energy source. When you're metabolizing fat, primarily in the absence of carbohydrates, your body will generate compounds called ketones that circulate in the blood and then they can be used as energy sources for the brain and for the muscle tissue. And it's not quite as high in protein than some of the typical low-carb diets out there. We have to keep the protein under control because too much protein can actually interfere with the productions of those ketones as well.

Krissy: And you mention ketones, so for the newbie out there, what are ketones and why are they important in this diet or in this type of lifestyle?

Steve: Ketones, when your body kicks over into heavy duty fat metabolism, when you're not metabolizing carbohydrate, you're using fat for energy. And when you really start using fat for energy, you actually produce in your body three substances, acetone, acetoacetate and beta-hydroxybutyrate and those three substances are called the ketone bodies. And when those circulate in the body those can be a source of energy for your brain and other tissues to use for fuel. And you start to use those for fuel instead of carbohydrate during your exercise.

Krissy: And Jason, you had briefly mentioned insulin resistance and I think we can kind of tie into ketones and your body using that for fuel versus what we typically consider carbs or glucose.

Jason: Yeah, so when you're running on glucose you eat a carbohydrate rich meal and that protein also does convert into glucose, so that is why it's a moderate protein diet. But when you eat carbohydrates they cause a significant impact on your blood sugar levels. As a response, your body secretes a hormone called insulin. So, insulin is this hormone that is responsible for taking glucose and storing it inside muscle cells or fat cells. It's literally called the fat storage hormone. The other thing that insulin does is since it's trying to get glucose inside the fat cell, it prevents fat from leaving the fat cell. So since the ketogenic diet is very, very low carb you're able to control low insulin levels, which allows fat to actually leave the cells. And like the doctor said, as soon as fat leaves the cell, it goes to your liver, gets metabolized there and turns it into ketones. So that's the most important thing about the carbohydrate restriction, is simply controlling the insulin and blood sugar levels to allow yourself to burn fat. Your body wants to burn fat but it can't because you're constantly spiking your blood sugar and constantly spiking insulin. And where insulin resistance comes into play is over time when you continuously spike your blood sugar and your insulin levels by eating carb after carb after carb, eventually your body becomes more resistant to that insulin. So the fat cell starts to say, hey we can't take anymore glucose. This is enough, we can't do it, so it resists the effect of insulin. As a response your body says, well we gotta get this glucose out so it shuttles out even more insulin. So now even if you just eat a small amount of carbohydrates, your body's forced to secrete a ton of insulin. And like I said, if insulin is in your bloodstream it has a locking mechanism on the fat cell and you simply will not burn fat. So insulin resistance leads to diabetes, where eventually the time has run out, your pancreas just gives up and now you have type two diabetes. The ketogenic diet kind of reverses that entire mechanism and says, let's not run on carbohydrates then. Let's run on fats because fats do not cause a significant increase in blood sugar and insulin levels.

Krissy: And you bring up a great point. We will definitely talk about the ketogenic diet for athletes or those who are resistance trained, but its application is not just for one population. Type two diabetics is what you just mentioned. You also mentioned seizures, so maybe talk a little bit about maybe who else could benefit. It may not always be used as weight loss, it may not always be used again for an

athletic population.

Jason: They're doing a lot of research. This ketogenic diet is coming to the forefront and thank heavens for it, because they're starting to use the diet actually in cancer research, because cancer survives on glucose. So I expect a lot of promising things to come out of it for that. Parkinson's disease, it's being used in clinical studies right now to see what the effects are on that. Something that hits home for me, my grandmother suffered from Alzheimer's disease, so they have actually used an application of a ketogenic diet to see if it's able to help explain why people get Alzheimer's in the first place and can this diet cure it? I want low carb forever, I found out ... Well I first started off as a wrestler and I started counting calories. And I said well, all you have to do to lose weight is under eat and over exercise. So I did that forever, I got exhausted from it. When I got in the fitness industry I started doing the same approach and it just didn't work. I went to find more answers, I did a lot of research on Bodybuilding.com as a matter of fact and found out that insulin is what drives fat accumulation. So I went low carb forever, and it was absolutely ... It was miserable, I had low energy, all this stuff. Then I took a different approach and started carb cycling. Then I had the opportunity to work with children who suffer from mental illness. And I was brought in as a lead personal trainer, and these kids all suffered from bipolar, schizophrenia, cutters, many of them had tried to commit suicide, you name it these kids have it, right? And so I went in there, and the thing about it was all these kids were taking a medication, right? And this medication made their triglycerides go up, their risk for cardiovascular disease went up, their weight went up, it sky rocketed. It went up 30, 40 pounds in a matter of a week. So I was brought in to help train these individuals to help try and save their life, because ultimately they end up dying the time they're 40, simply from this medication that has such a major effect. When I got there they told me they were gonna use a ketogenic diet approach and that metabolic syndrome could be cured by having a ketogenic diet. And I didn't know what that was and I thought they were crazy to be honest with you, having the high fat. But it was very, very, very effective for all of these children. They lost weight, the cholesterol went down, the good cholesterol went up, triglycerides went down, waist adiposity went down, their overall sense of well-being and energy went up, the whole thing was extremely successful. I was sold, I did it all myself and haven't turned back since. So it really can be used to save lives. Multiple applications.

Krissy: Yeah, multiple applications for ... very interesting. So I guess that's a good lead in to actually how to do or to set up a ketogenic diet. And I think we start from the groundworks, and how do you figure out the percentage of carbs, fats, proteins, and if you could, maybe talk a little bit about some of the common mistakes you guys come across when people are starting the ketogenic diet and whether that's, as you mentioned before, too high of protein or not monitoring their carbs close enough, so I guess yeah, how do you set it up? If I want to start keto tomorrow what do I need to do?

Steve: The most important thing is making sure you understand what the macronutrient ratios are on a true ketogenic diet. Again, it's different than a low carbohydrate diet that a lot of people are familiar with. This is a diet that has about 75% of its calories from fat, about 20% of its calories from protein, and about 5% of its calories from carbohydrate. So basically you have to get an estimate of what your caloric needs are on a daily basis. There are a lot of different formulas to do that, you can go see a dietician, you can get your metabolic rate checked and all those kinds of things to try to determine what your overall calorie levels are, and then you do a little bit of math and you come out with that. And using that ratio and that will give you the grams of fat, carbohydrate and protein that you need to target each day.

Krissy: And are there any specific sources? Because I know some people think, 75% fat? How can that be good for you?

Jason: Yeah, so the hardest part of this diet when you first start out is just getting over the fat phobia, as I like to call it. Because you've been ingrained your entire life with this low-fat craze, that fat is what makes you fat. But as we discussed, insulin resistance and carbohydrates are actually what makes you fat. But none the less, people were taught to fear fat, they think butter is the devil, eating fatty meats is also the devil. So the first thing you have to get over that fear of eating fat is gonna make you fat. So when it comes to have 75% of your calories from fat, these are things coming from saturated fats, which have actually been proven to give you the most amount of energy. So you have butter, you have coconut oil, eggs, bacon, sausage in the morning. I know, everybody when you say bacon they're like, what?

Krissy: Lights up.

Jason: Yeah, I personally don't eat a ton of bacon. But yes you can eat bacon on this diet. And you're using oils, olive oil, fatty fish, salmon especially is good for the omegas. I eat nuts and seeds, pumpkin seeds, sunflower seeds, you can use cream cheese, sour cream, regular cheese, it's just training yourself to go after the fat is the hardest part. And you can only get 20% of your calories from protein. And the other thing people will end up doing is they say, they go to the grocery store and they say, I have to have 75% fat, 20% protein and they end up selecting ground turkey, or turkey bacon. That's a big mistake because you'll quickly find out that your protein numbers are way up there but your fat is down there. And what ends up happening is your body converts that protein into glucose, it'll keep you out of ketosis and mess with your energy levels. When it comes to 5% carbohydrates I think it's important to note that it is net carbohydrates. So you are taking out fiber from that calculation. Green leafy vegetables are huge on this diet, taking a fiber supplement is also important. When I was low carb for a very, very, very long time, years, I would spend every single day just thinking in my head, I gotta avoid carbs, I gotta avoid carbs, I gotta avoid carbs. And they're everywhere, and it could be mentally exhausting. On the ketogenic diet you're not eating carbs. You need to focus on getting enough fat. You need to wake up every day and you need to say, where's the fat coming from and how can I reach my fat macronutrient goal, instead of saying, I gotta avoid the carbs because you'll get caught up pretty quick, so ...

Steve: I think one of the points of confusion that a lot of people have on ketogenic diets, and I know Dr. Jacob Wilson talks a lot about this too, is that a lot of times the confusion about ketogenic diets happens because many people are afraid of high fat, high carbohydrate diets at the same time. And while this amount of fat might seem high, if you think about it, a person on 2400 calories a day is eating 200 grams of fat on this diet. But the thing is, that is their primary energy source on this diet. It's one thing to be eating 300 grams of carbohydrate and 200 grams of fat, that's bad news. But this is a little bit different take on it, and so that's one of the things that people kind of have to understand.

Krissy: And would you say, at least getting started, that it's pretty important that you're tracking? Or is this one of the diets where you can get on the right path with just estimating?

Jason: No, you must track. And this is from personal experience and experience working with a lot of clients. It's very hard to track using MyFitnessPal and things on every single day. It just really is, it's not realistic, but it's very important, especially when you start off on this diet to use something like MyFitnessPal to track your macronutrients. Because like I said before, if you're not getting enough

fat, your energy levels are gonna be down. Are you getting too much protein? Well how are your carbs? You need to be able to see, to manage what you're doing, at least for the first few weeks while you're trying to get keto-adapted, and also by tracking during that keto adaptation phase, it gives you a way to troubleshoot problems. Hey, I feel like crap, my energy levels are down, well you can take a look and see, was your fat number there? Were you way under on fat? Did you go too high on protein? And then you can take the training wheels off, after you kind of ... You'll have your go-to meals that you'll use. You'll track and every day you'll find yourself eating the same things, you'll start to know what you need to be eating to hit those numbers, then you can take the training wheels off. But I also suggest, if for some reason, you find yourself hitting a plateau, you go straight back to tracking. That's the way I approach it.

Krissy: You had mentioned 'keto-adapted.'

Jason: Yes.

Krissy: That's a word we hear, ketosis and then obviously the ketogenic diet and ketones. A lot of names that sound very, very similar but they all have their own respective definition. So take me through the process of if I just started a ketogenic diet today, what can I expect in the next few days and the next couple weeks, and then when and what does it mean to be keto-adapted?

Steve: Yeah, I can take you through a little bit of that. The one thing people don't understand is that there's a difference between being in ketosis and being keto-adapted, and the difference is that if you go on a very high-fat, very low-carbohydrate diet, for a short period of time, you will end up with ketones in the blood, you'll meet the definition of being in ketosis, but your body hasn't fully adapted to using that ketones for fuel yet. There are enzymes that are present in your brain cells and in your muscle cells and everything and it takes a while for those enzymes to kick in and there's adaptations that go on with those enzymes. You actually see the activities of those enzymes that metabolize ketones go up. So while you might get into ketosis after three, four days on a high fat diet like this, you may not be fully keto-adapted for weeks or even months. It takes a little while to really, truly adapt to this way of eating and get your body metabolism to change over to using fat for fuel.

Jason: And from experience, myself, and from dealing with a lot of people that I've helped with the ketogenic diet, the first few days I would say, the first two weeks, kind of considered hell week. You have to face it and you have to understand you've been running on carbohydrates your entire life, glucose is your primary source of energy. And when you take that glucose away your body will fight you back for it. Carbohydrates hit the same part of your brain as narcotics and other drugs called the reward center. So when all the sudden you pull that stuff away, your body and your brain is saying, it's give me this stuff back. I kind of liken it to checking yourself into rehab, essentially. And it really does kind of feel like that, your energy levels for the first few days will go down. But physiologically your goal is burn off the stored carbohydrates in your body. Once that happens, your body will switch over and start burning fat and produce ketones for you. It depends on the individual how quickly they can overcome what's called the keto flu, the dreaded keto flu, it's not the actual flu, you just get certain symptoms that are similar to the flu. All of a sudden you'll come out of that slump and your body's just gonna say, fine okay we give up we don't care about the carbs anymore. We're gonna start using this fat as energy. And you'll notice immediate benefits from it and then you're off to the races there.

Steve: Yeah, there's some changes that go on with fluid balance as well during the first couple weeks of a keto diet, where you have some more losses of fluid and electrolytes than your body is

used to on a higher carbohydrate diet. Some people think that might be part of the reason why, other than the low carbohydrate, obviously, and the low glycogen levels in the muscle, which is stored carbohydrate in the muscle. Beyond that you also can see some problems with electrolyte imbalances and things like that. So it's been suggested by Dr. Volek and other individuals who do a lot of research on the ketogenic diet, make sure you're keeping your sodium intake where it needs to be, your potassium intake where it needs to be on this diet and that might help to ease some of those keto flu type of symptoms.

Jason: Yeah, that's very, very, very important. The sodium is another one of those things though where everybody's like, well if I eat too much sodium I'm gonna get fat, it's gonna cause bloating. Not the case on a ketogenic diet, you're suppressing the hormone insulin, and that's allowing you mobilize fat. But the problem is insulin's also the hormone that tells your kidneys to store sodium. So you must replace that sodium your kidneys are just flushing out sodium at rapid amounts, especially when you're working out. So sodium in my opinion is absolutely critical. When a client calls up and says hey, I'm feeling like crap, the very first thing I do is say, how is your sodium intake level? I'll suggest drinking a cup of chicken broth, make sure you salt your food, don't be afraid to put salt on your food, eat salty snacks. The other one is potassium, which is also very, very, very important as well. Things like avocados are perfect for that. And then magnesium is the third essential electrolyte on this diet. You can go to Bodybuilding.com and you buy magnesium supplements there and that will help you cover your electrolytes. But most people when they fail on a ketogenic diet, when they just say, hey I'm gonna do this and they haven't done much research. They'll get the eating part down for the most part, but then the electrolytes is the hidden killer here. When those go down, you start getting the headaches, the dizziness, the lethargy and you will quit. And you didn't even know that all you had to do was add some salt to your food.

Steve: Even using salmon as one of your protein sources during a ketogenic diet, number one it's got great healthy fats and it's a good source of protein, but also it's a fairly reasonable source of potassium. Putting that with your leafy greens, your avocado, things like that. That is one way to try to get potassium. Potassium can be a little difficult to get on this diet because you're not getting a lot of dairy products, you're not drinking orange juice, you're not eating bananas. All the kinds of things ... Or baked potatoes, a lot of the things that people typically associate with potassium. But there are ways to do that, even using some lite salt once in a while, which is a potassium chloride type of product as a way to get a little extra potassium in there on this diet, so you make sure you don't tank on electrolytes and the fluids and stuff.

Krissy: And so from going, starting ... Feel a little crappy for a few weeks and then you get into keto adaptation, or yeah, and then become keto-adapted ... Other than just how you feel ... I know that there are sticks that you can pee on, there's ... Do you guys recommend doing that? Do you recommend just going off of how you feel? Or how do you know or be able to track your progress thought the adaptation or getting to the adaption part of the keto diet.

Jason: I use the keto, the urinalysis test that you can buy at your local grocery store and pharmacy. They are the least accurate of all the way to measure, but, you know I ... And it can also fluctuate depending on water intake, timing of the day, things like that. I used them kind of just as a way ... If that stick turns any shade of red, I'm good. And I don't obsess over it, I don't do ketones drip test every single day, I just kind of use it as a guide. It's kind of an assurance thing. It's if that thing turns red I know I'm doing something right. I don't care how dark it is, how light it is, things like that. But I'll let the doctor explain the other methods that are ...

Steve: Yeah, there are a couple methods that are out there as well. One of the primary circulating ketone bodies is betahydroxybutyrate, or BHB. So the Abbott company actually has a monitor to measure betahydroxybutyrate concentration in the blood, so it's a finger stick, like just like testing your blood sugar. It's kind of expensive on a per strip basis especially. It's probably the gold standard as far as monitoring your levels of ketones. Typically on a ketogenic diet, to be considered in ketosis your blood ketone level, or BHB level has to be at least .5 millimoles per liter, which is what the machine will tell you, how many millimoles per liter you are. .5 to around three is what we could consider that nutritional ketosis type of range, kind of that target level that you're shooting for. There's also breath monitoring as well that monitors acetone. And that one, they've done some studies showing some correlations with the blood monitoring. So that might be an option as well, I would say still probably the blood monitoring is the gold standard, if you're really, really trying to stay in that strict ketosis range.

Krissy: So during this process, again going back to starting the diet, maybe experiencing crappy days, how or would you train differently during this time? Did you train any differently? And how did you push through? Because I think that's another reason people quit this early on. And again, maybe it's because they aren't using the correct supplements with it, sodium, potassium, magnesium, or maybe they're just going in too hard and not realizing that their body might need more time to adapt.

Jason: Yeah, I'm trying to think back when I first started this diet. I definitely remember, your strength falls off in the very beginning. It's very common. A lot of people, they get alarmed by that. They freak out and they think, "my strength's gonna go down? Oh, this diet's not for me." Your strength will come back as you become more adapted. Your body is going through so many changes in the beginning of this, so incorporating rest days into your training is something that I feel is very, very, very important. Also research has shown that things like high intensity interval training, and my personal favorite is tabata, will get the glycogen down very, very, very fast which will bring you closer to actually switching over and producing ketones and getting into ketosis. I incorporated a lot of supersets, trisets, and just kind of keep the intensity up. I also make sure that I pair ... Before I did this diet, I was the typical bodybuilder, one muscle group at a time, one muscle group a day type of guy. But now I make sure I pair muscle groups together. I've even done some full-body workouts, upper body/lower body split, really it's up to you. But the high intensity interval training in the tabata, in my opinion, is something that's very important in the beginning and make sure you rest. Your body is going through so many changes. If you don't give yourself enough time to rest, your body's just gonna hate you for it. That's been my experience with it.

Krissy: And did you take anything before, during, after your workouts? Or did you supplement differently once you started on a keto diet?

Jason Wittrock: I had to kind of avoid the flavored BCAAs for the first two weeks, just to make sure that I wasn't sending mixed signals to my brain, that hey, you're gonna get a little bit of glucose here and there. You can buy unflavored BCAAs of course. But creatine in my opinion was absolutely critical, the production of ATP, there's so many benefits to creatine and adding that in was a huge help, the creatine monohydrates. I backed off protein for the first two weeks, whey protein supplements, because like I said before if you get too much protein, your body will convert it into glucose. But that was kind of the basic supplement that I was taking.

Dr. Steve Hertzler: I think some other supplements that might be helpful is, when you're on a ketogenic diet you're always risking losing muscle mass because it is a moderate protein diet and it's not as high in carbohydrate, carbohydrate is great for everything that some people fear about it, it is

a great protein-sparing nutrient. So you do have the issue of potentially turning too much protein into glucose and degrading some of that muscle protein that you worked so hard to build. So some supplements that might be helpful ... There's been some interesting research on HMB, especially in an animal model they actually did some animal studies simulating military training and caloric restriction. So they actually taught rats how to exercise like soldiers, okay? And they put them on a calorically restricted type of diet, kind of similar to what your body would go through in a ketogenic type of state. And using some HMB in there helped to ward off that protein degradation. And there are lots of studies in humans showing that HMB is very good for helping to reduce protein degradation. There's also some interesting work on phosphatidyl serine and potential anti-cortisol effects of phosphatidyl serine that might be helpful to minimize that protein breakdown and try to help you hold on to that hard-earned muscle tissue.

Krissy Kendall, Ph.D.: That's it for today's episode. In part two, we'll dive a little bit deeper and see what happens with you become fully keto-adapted. See you next time.



KETOGENIC DIET: YOUR COMPLETE MEAL PLAN AND SUPPLEMENT GUIDE

Jumping into the ketogenic diet without a rock-solid plan will set you up for failure. Use this approach, crafted by researchers and athletes who have done the work and made the switch already!