VIDEO_ Diet Doctor Podcast with Peter Ballerstedt (Episode 13)

Dr. Bret Scher: Welcome to the DietDoctor podcast with Dr. Bret Scher. Today I'm joined by Peter Ballerstedt. Peter is a very unique individual because he's a foot in two completely different worlds. On the one hand he has a degree in forage agronomy and ruminant feeding from the University of Kentucky.

On the other hand he has had this personal journey with health that's brought him to the low-carb ketogenic world and he's helping bridge the gap between what you can call the grass people, the ranchers, the farmers and the health side of things. And in conferences like Low-Carb Houston where we are now, he helps provide that additional perspective.

So that's why I enjoy having him on the show today to talk about this other aspect of what we're doing as we're trying to change how we eat, to change our nutrition, we also have to think about the environmental impact, the impact on animals and the whole other world. And interestingly maybe it's not as simple as we like to think. Just as I would say we should never make your healthcare simple or your health simple.

Peter has the same approach; we shouldn't make farming and ranching and raising ruminants as simple as it is. I am a big fan of grass fed, grass finished, I think it's important, I think it's healthier. Peter has a different opinion. So it's very interesting to get that type of opinion and kind of stew with it a little bit and see how it sits with us and if it makes sense.

There are some other things that may be different from what you've heard and that's what I really appreciate about his message. So I hope you enjoy this and you can incorporate what he says into your thinking process. Maybe we're not thinking about things as being so black and white but as more nuanced. So enjoy this interview with Peter Ballerstedt.

Peter Ballerstedt thank you so much for joining me on the DietDoctor podcast today.

Peter Ballerstedt: Thank you for the opportunity.

Bret: So here we are at a low-carb conference as frequently happens across the country and at these conferences there is plenty of scientists and engineers and physicians. You seem to stand out a little bit from the crowd and not just because you

wear a tie with cows on it when you give your presentation, but you represent the agriculture side and the farming side and the ranchers site and it's a very unique perspective.

And you have your degree both in forage agronomy and ruminant feeding and I think that's fascinating because it gives you such a perspective from the animal side and the agriculture and plant side. I am curious how you find that you fit into this low-carb community and what you see is your role on the low-carb message?

Peter: Primarily my role as I see it is to build bridges between the producers and the consumers. Unfortunately we have just far too big a gap between those two. And the same issues that you could see in the general population in terms of chronic illness etc. you see in the farming community.

So I want my agricultural tribe to be introduced to what I'm convinced is a life-saving message that I get to hear from all these amazing researchers and clinicians. On the other side we have access to the food that we're arguing we should eat at a lower cost than anywhere else in the world and in greater abundance, greater availability and unfortunately we really don't understand what it takes to have that happen.

And so that creates a lot of space for some misunderstanding and miscommunication to come in. So likewise I'd like my low-carb tribe to be introduced to my agricultural tribe because they do amazing things. And I think that we'll actually make more progress in getting the low carbohydrate message out to more people if we can get the kind of bridge building; so that's my primary hope.

Bret: It's great a perspective on that. And we do like to put people in organizations, in buckets, don't we? And good and bad and as not so black and white and I think is important to have someone like you to help bridge those gaps.

Peter: Thank you.

Bret: Now you came to this from a personal experience as well. In your speech you are very open about saying you were a 50-year-old obese balding diabetic and now you're just balding... I was hoping you found a cure for that one too.

Peter: No, sorry brother.

Bret: Keep working. But you reversed all this personally through a low-carb diet brought on by-- like your wife and Gary Taubes. Gary's book and then with your wife's influence. That must've been a very formative experience for you.

Peter: Absolutely and to be completely honest Nancy started on this journey in 2002 and it took me five years to join. And then of course Gary Taube's great book *Good*

Calories, Bad Calories came out the year after. So she was wise enough-- she still is wise, but she was wise enough to realize that talking to me before I was ready to listen to her talk to me about it wouldn't be helpful. That's not her way.

So her approach was, "This is what I'll eat. What would you like to eat?" And I don't know, I'm sorry, I don't know when you came into this realm, but in 2002... there were many fewer resources, and we started doing the best we could and of course all that's evolved over time. In 2007 I finally got serious and began my own journey in earnest.

And as I read Gary Taubes and Michael and Mary Dan Eades and so many others, I got angry... I got angry at what had been done to the American public in the guise of science. I got angry at what has been done to the industries that I've been trained to serve in the name of better health and protecting the environment.

When I know now manifestly those are both incorrect. And so with that anger finally... okay, we get over that and then we start trying to introduce my friends to some of these books. And I remember one colleague saying, "I couldn't get a paper published in the agronomy Journal doing what they did to get papers published in the medical journals." And I've had other--

Bret: Meaning the quality of science is so different, so much lower, so that the standards in the Agronomy Journal would say, "We cannot accept this the science because this is not proper science. Whereas for the nutrition science, that's the way it works."

Peter: Yeah, and to be fair to human nutrition they don't have the tools available to them that animal nutrition, or plant nutrition, or soil fertility has. We can get very controlled environments, if you will, to do our studies certainly in soils much more so. Plants, well you could grow them in the greenhouse, but yet at some point you want to go out to the field and mother nature still rules, but there's some things you can do there.

To make for example the site that you plant one variety from one lot of seeds on a ground that's as uniform as possible with your statistical design. So at the end you have a fair idea. Animals, again, there are issues of ethics in how you treat experimental animals and that's a good thing...

You get to humans and as I said at one meeting it's very difficult to find large groups of genetically similar human beings that you can completely control for long periods of time where you absolutely measure what goes in what comes out, their activity. And then Adele Hite spoke out from the audience and said, "And sacrifice them at the end of the study to determine body composition." It's hard to find volunteers for that kind of work.

Bret: Yeah.

Peter: So there are natural limitations and are completely understandable and it's a good thing. The bad thing is when frankly the human nutritionists act as if they are rigorous in their studies as my animal nutrition colleagues.

Bret: That's a great point, a great perspective to bring in. Having a foot in both worlds and understanding the difference in science. So from a scientific discussion to a very nonscientific discussion, you are what you eat becomes you are what you eat eats... Well actually it's you are what you eat does to metabolize what it eats... It gets a little complicated.

Peter: Right, and it's fundamentally flawed, because I think it was Jeff Volek, but I've certainly adopted it, "You're not what you eat, you are what your body does with what you eat."

Bret: Right.

Peter: And so I have a slide of cows eating hay. Well, the hay is in no way like what the cow is. And it's in some very interesting differences; one is high-fiber, the other isn't, one is low-fat, the other is high-fat, one is low-protein content and poor protein quality and of course the other isn't. And so in the case of ruminants you have this wonderful structure and capability to convert this resource that we can't utilize directly into something that we can.

And it's interesting to me that this whole "you are what you eat" never says, well yeah, we're animal tissue so maybe we should be eating animal tissue. The argument never goes there. But no, I think it's very important for us to realize that different mammals have different means of converting the resources from their environment into the nutrients that they need and then absorbing those nutrients.

Bret: You brought up the difference in proteins, animal proteins. Basically an animal eating a poor protein source of grass, cellulose, converting it, but yet we hear over and over again from the vegan community that you get all the proteins you need, readily absorbable and bioavailable and we see examples of pro athletes who are vegan who are clearly excelling on a physical level, so clearly getting enough protein.

So it seems like two messages, because on the one hand animal proteins, more bioavailable, as complete protein, vegan proteins are not, but yet some people still thrive. So how do we make sense of that difference?

Peter: There are individual differences amongst the population. Forgive me but one of the lines that I heard from an old professor was that the average human being has

one breast and one testicle, but you don't see many of them rolling around. So I'm not interested in telling anyone what they need to eat or should eat, but it's true that there's only a few plant source foods that have complete protein, that have all the amino acids that we need.

And then the question is, "Are they there in the right ratios? And it's remarkable to me that we still have large gaps in our knowledge about human requirements for protein. That being said, the simple fact is that animal source protein is of much higher value than plant source protein in part because of that biological value, but also because typically protein is assessed biometric called crude protein.

And this involves determining the percent nitrogen in any foodstuff multiplying that number by 6.25. The assumption is that all the nitrogen that was there was in protein and all of that protein was 16% nitrogen. Now you can get away with that with some foodstuffs and when you're feeding some animals. So if I'm feeding ruminants, it really isn't all that important whether the nitrogen that's in the feed that they're getting is in protein or nonprotein nitrogen, because the rumen environment will take all of that, degrade it down and build it back up into microbial protein.

So the important thing there is whether that nitrogen containing material is degradable in the rumen. Humans can't use non-protein nitrogen. So there's no such thing as an essential amino acid in a ruminant's diet, there is in humans diet. And so you can look at crude protein in equivalent amounts of cooked navy beans for example and cooked beef muscle.

And actually I believe it's like a 10th of a percent more in the beans than there is in the beef, but that's not true protein. So if you then look at the amino acid content in those two amounts what you end up with is something like 58% of the crude protein is actually true protein in the beans where it's 92% in the beef.

And then in addition to that you've got various peptides that are present in the beef that are also of use in human nutrition. And now we get into the bit that we're, you know, kind of now discovering. So those are two primary differences and unless we account for that we can be misled by the numbers.

Bret: That's a great point because when you see these graphs that are postured on social media comparing animal and plant sources approach and they are frequently only talking about crude protein but not specifying that, which always makes me wonder, "Do they know and they're being deceitful? Or they just don't know or they just don't understand?" I like to think it's the latter and they need to understand the explanation that you're giving.

Peter: I think it's always best to assume that people may be sincerely wrong. They actually believe what they're saying just as many human nutritionists have been taught certain things... Ough, there I say it, physicians... in their extensive human nutrition training have been taught certain things... and they were taught by their teachers.

And these are people-- Gary Fettke talks about generational learning, you know, the people that we respect, part of our academic lineage and it's natural for that kind of information to be difficult to overturn. I do think that there's a number of people who do know and yet maintain. But I think it's always best to operate from the position of being gracious.

Bret: And that's where the difference of science and religion of nutrition comes in and then we don't need to go down there right now but one thing I do want to address with you where I was surprised the first time I heard you speak, because I am a proponent of grass fed, grass finished, it's what I've learned is healthier and better and when I first heard your talk, I was like, "Of course, he's going to agree with that."

And I was surprised that you took a little different stands that maybe grass fed, grass finished isn't as important as it's made out to be. Now from my standpoint the research shows it has higher Omega-3s, higher CLAs, Conjugated Linoleic Acid, higher vitamin A, higher vitamin B and just seems better, feels better, the pictures are better, so of course it must be better. And you say, hold on a second, let's put this into perspective. So talk to me a little bit about that.

Peter: So just my personal perspective when I came into this realm of human nutrition I had been out of agriculture for several years. Of course all my training is in pasture-based livestock systems and grazing management and all of that kind of thing, so I started seeing things about grass fed and I was like that tripped all of my confirmation bias triggers and of course it's got to be pastured, and then I went and started looking at the articles the people were referencing to support the arguments and I became less and less convinced over time.

My position at this point is that hyperinsulinemia is the short stave in the barrel. And it's such a profound effect... I'm convinced. The strength of that signal is so large that until we've adequately accounted for that in our studies, we can't be certain about any other effect that undoubtedly is going to be there. But if we nibble at those effects before we've dealt with the biggest one, we're not likely to see it.

Bret: So is that sort of saying, "Perfect is the enemy of good"? If we're only going to have grass fed, grass finished and at the expense of not being able to get that, we're

going to shun the CAFOs, grain feds and as a result not help ourselves by changing our diet, then we're not doing ourselves any favors. Is that the summary, or--?

Peter: Yeah, let me put it this way. It strikes me that we've got into the mess that we're in by people speculating about incomplete data.

Bret: Okay.

Peter: And I doubt that we can make progress if we do exactly the same thing, though of course we'd be right when we do it. Not like those people who were wrong and ignorant and, you know, in the employ of special interests. Again this is sort of like basic human group behavior.

So when I start seeing things like that, I start saying, "Let me come back and look at this again." And so we can deconstruct the stories that are told about why one would be better than the other. And then we get to the point where I also start saying if this makes this product more expensive then how do we justify that when we have a population that is economically challenged and we know that the burden of chronic illness falls heaviest on those populations?

Also how do we leverage and expand this not just in the United States but worldwide? Because we see the same problem worldwide. So I think we need to be very circumspect in terms of some of these now and we can deal with each one, and I'd like to do that. but I'll give you an example of how this ripples out and it fascinates me.

There are long chain Omega-3 fatty acids. We got started on this road, because somebody came across what I call the Greenland paradox to follow with the Mediterranean and the French and... so one more time we find yet another population that despite eating a diet high in fat has very little heart disease. And that quote is almost word for word out of the start of the first fish oil study.

Bret: Okay, how many paradoxes does it take before is no longer a paradox?

Peter: Exactly, so their thought was it must be the fish oil. Now not coincidentally or coincidentally it launched a billion-dollar fish oil industry where one had not been before. Now fish have EPA and DHA as their long chain Omega-3 fatty acids and that became the foundation of labeling and suggestions and everything else. It turns out, ironically enough, that fish wasn't the largest source of fat in their diet. The largest source of fat in their diet was coming from marine mammals.

And mammals, including cows, contain three long chain Omega-3 fatty acids, there is a DPA. And again because we got down this track we didn't look at all three, took us a

while to find a source of it. Now there's some work suggesting it's important too. So one, that's a cautionary tale. Two, maybe all of those coming from ruminants regardless of how they are finished would be sufficient in a population that wasn't being abused by high levels of refined carbohydrates and industrial oils.

Bret: Very good point.

Peter: And we don't know. I think Amber O'Hearn says that everything we think we know about nutrition comes to us through this filter of carbohydrate-based diets. And then I am still impressed by how many people for example think that a beef animal spends its entire life in a cage, eating corn, nothing else. And so the words imply things to people, images imply things to people and I just want us to make sure that we understand what's actually going on.

Bret: And I think the image part is very important, because especially documentaries like What the Health, which was very well done as a vegan propaganda piece, not as a true documentary representing science, but one of the things that stands out the most are the images of the CAFOs, the Confined Animal Feeding Operations, the grain fed, the cages, the crowds of cows. So that's the image people have in their heads. So are you here to say that that's not the true image of what a grain fed cow is?

Peter: Yes, that's what I'm here... I am here to assure people they can go to the supermarket, certainly in the US, and I understand you have an international footprint, congratulations, that is amazing... But certainly in the United States we can go to the supermarket and, you know, nothing fancy, we can buy what we can afford and we can eat it in confidence that it's safe, it's helpful, it's nutritious.

And as Dr. Westman says, "If you eat that and not the CARBage, you will get better." And so then I am left saying, so what's the justification for saying these other things? That it must be these other things. I've had people from the audience, people I've known for a very long time, and I think a lot of them in their sphere. But they tell me, "If I'm not going to get somebody to eat a wholly organic diet, then they are better off being left on the SAD diet."

Bret: It's so scary.

Peter: It, sort of to me, says that we're dealing with belief system, no objective information here.

Bret: If all things were equal... wave a magic wand and grass fed grass finished is equally as inexpensive as grain fed, would you choose it? Would you say there is a probable value to choosing it if everything else were equal?

Peter: One, I don't think that that's a fair statement, because there's a reason that we do what we do. But that being aside, there are differences, we have no ability to assess the biological significance of those differences. If you like the taste, do it. I'm all for supporting a rancher or farmer that somebody knows personally or thinks they know personally. I'm all for that. I'm all for variety and choices within the marketplace. So I don't want to be misunderstood. What I don't think we can afford in the industry side is to set ourselves against each other. There's too few producers.

Bret: That's a good point.

Peter: Then on the consumer side, certainly within my all low-carb tribe, I want us to be aware that there is a lot of incorrect information that people pick up as they go along and they say that and that then puts their area of expertise credibility at risk certainly in the eyes of people who know more about this subject.

So, you know, the nightmare for me... or the concern for me, let's not be too dramatic... the concern for me is that I could talk to let's say Estate Beef Council audience and tell people about a low carbohydrate ketogenic diet and all the great things that come, and the value of their products as part or the majority of this kind of a lifestyle and the impact that could make in their families, the communities that they live in, the states and nation and the world.

Then they go look up, you know, low-carb ketogenic, google it and they find somebody who's talking about some of these things and they go, "They are wrong about that." Now, that's not fair... None of us can be right in everything. But it is part of the human nature. And I'd hate to have that be a barrier to this and then again if people assume that the environmental footprint of these different-- if they incorrectly assume the environmental footprints of these different management systems, then that could lead them astray as well.

Bret: Yes, so let's talk about the footprints because I think it's very important. I took a family vacation to Colorado and we're driving from Denver to Colorado Springs and you look out the window and you see these happy cows... I'm going to put my feelings on them... They are happy cows, roaming around, eating grass in the sunshine, the way a cow should be. Then took a trip to Big Bear in California and we're driving back... and you can smell the ranch before you even hit it, whereas before in Colorado you couldn't smell it.

So you smell this ranch a couple miles away, you see the crowded cows on concrete and it's a completely different feeling. You can imagine there must be a different environmental impact. So you are here to say, "Hold on, maybe it's not all that it seems"?

Peter: Yes, first of all I think the numbers... like we've got 113 million cows in the United States, something like that. And only 11 million some of them were on feed last month, which was a record. The number of animals that you would see in confinement being fed that way is a small portion of the entire beef heard.

So you have to have cows to produce calves. You have to have bulls... at some point they are using artificial insemination, total but most beef producers still have herd bulls. So then you've got the young females that are growing up to become replacement heifers. So you have to have a larger number of animals to support the crop of steers that are going to be harvested.

So that's one thing. Two is that part of the reason for those confinement operations is to limit the movement of nutrients from that source off-site. So there's lot of regulation and there's a lot of inspection and things that go on in there. Number three is when we're trying to get these animals to finished weight we do have to feed them a higher-quality diet.

Now a mama cow running out on the rangeland that you drove by in Colorado is the perfect animal to utilize that, because she doesn't have to grow much, she's typically at a mature body weight. So she needs to be maintained, she needs to support the growth of the developing calf and she needs to produce milk so indeed over time in any one cycle her feed quality needs are going to increase.

But at her lowest point she can eat some pretty poor quality forage and be very happy. You can't do that with a growing animal. You don't see that feed out in the rangeland where those calves are roaming. So those calves have to be removed and moved to a different environment...

Bret: Oh, interesting.

Peter: ...where they can then feed on that higher-quality feed. Now a lot of animals will go from the poor production pastures to better quality pastures and spend several more months on pasture. They may then go completely to finish weight on that kind of feed resource or they might then get moved again into a confined feeding operation. So at the end of the day, maybe four or six months out of that steer's life is going to be spent in that kind of situation.

So it's certainly not, you know, the lifetime spent which some people imagine. These kinds of animals are herd animals and they will naturally crowd regardless of how much space they're given, and in fact if you try to separate them then that becomes a stress to them. And then the other aspect is it's tempting to put our emotions on animals, but that's a mistake.

But that's not to say that every responsible member of the livestock industry isn't concerned about animal welfare. They very much are... in many cases these operations are multigenerational, and the animals that are on, in that herd are the product of a program that stretches back to their grandfathers.

So they've grown up with these animals, they have this tie to the land that others of us can only envy. And so they have that concern and perspective. Also you have the hard reality that if they don't care about animal welfare they hurt their own profits. And then the third is they understand that the care and treatment of the animals will be reflected in the meat.

Bret: Yes, so some statistics that I read are 11% of CAFO and grain fed cows have liver abscesses, but only 0.2% of grass fed grazing cows do. So it seems like that there would be a health difference. I don't know how significant that is, but in the use of antibiotics is different, maybe the use of hormones are different.

So there are still more things under the surface that maybe aren't as big of a deal as I would like to make them to be, but they still show a difference between the two.

Peter: One of the uses for antibiotics for example is a class of chemical that has absolutely no application in human health, and what it does is it shifts the population of microorganisms in the rumen to depress the activity of methanogenic bacteria, so those organisms that produce methane, which increases the efficiency of feed use and lower submission.

Okay so is that a good thing or bad thing? United States has about 9% of the world's beef cattle, I think it's North America, actually. So, Canada, the United States has about 9% of the world's beef cattle but produces almost 20% of the world's beef.

Bret: Oh, wow!

Peter: So that comes because of the technology that's available. So, efficiency in almost other every other aspect of human life is considered desirable thing. For some reason it's looked at with suspicion in agriculture. If we go looking for actual differences in product, there are screening and surveillance protocols in place for monitoring, for antibiotic residues, for pesticide residues, and if the animals are above, you know, if carcasses are found to be above then that doesn't go into the feed channel.

In terms of hormones from use of exogenous hormones which does tend to be more in the confinement feeding operation, but again you're talking about the vast majority of beef that's produced in the U.S. We're still at a low percentage from grass fed. We're talking about 1 nanogram difference in 3 ounces of beef. Between a an animal that

didn't get that and an animal that did, and that's at least an order of magnitude less than you get from an egg.

Bret: Oh, interesting.

Peter: Or from butter, or from other products, animal products. And then you have to become aware that there are phytoestrogenic compounds, and especially ironically enough soy is a massive source, and so these substances are present in those feeds at multiple orders of magnitude above what you could get.

Bret: You're making this much more complex; it's easier to think of it in simple terms. That's definitely getting more complex.

Peter: Would you like your physician to think about your treatment? I don't know maybe that's it didn't but.

Bret: That's one of my big messages that we shouldn't dumb this down and just make it black-and-white when it comes to your health, but when it comes to nutrition and agriculture and farming I want it black and white, I don't want this nuance. So I can see why other people want that in medicine as well.

Peter: Indeed and maybe it's because, okay if I can believe I understand it then that makes it comfortable.

Bret: Right.

Peter: And I certainly get that, but back to human beings, I think it was Ted Naiman who tells a story about one patient who despite the challenges of his life, he went and bought a used cast-iron skillet. He cooks on a butane stove. He goes to Safeway, he buys the cheap 80-20-80% lean 20% fat hamburger. He buys this, you know, the store brand eggs and that's what he eats. It's costing him $6 to $7 a day food and fuel.

And in whatever the time was, I'll say it was a year, he dumped 70 pounds of excess body weight and normalized all his panels. Okay so let's have a conversation about health food. Let's have a conversation about why that man should've been paying more than he could to eat the food to produce that effect. Now somewhere down the road of course, something but we're not there yet. We're not there yet by a long shot.

Bret: Yes, you've mentioned this before about sustainability and global impact, and we have to factor into that health impact as well, and health sustainability which I think is a great point. So, but when we talk about environment sustainability, you mentioned methane and that's a bit-- that's obviously a big topic. Everybody's worried about cow farts and cow burps and the methane emissions.

And, that's where a lot of this reporting in data gets really fuzzy as well because at one point cows were contributing more to climate change than the whole transportation sector, and then that was absolutely false because of awful data collection, comparing apples to oranges basically. So now is down about 4%, or so I think of the climate change.

But there's still this concern that it's a part of the problem, and there's a way to improve it with rotational grazing like the savory institute, and then is it, not only contributing to the environmental pollution but it can actually be in that carbon sink and take carbon out of the environment.

Do you subscribe to that as well, and say this is a great model to try and transition to so that we can no longer talk about ruminants as a contributor to fossil fuel missions but instead as a sink to improve the environment?

Peter: First of all I think the figures for the United States are the 2%, T-W-O percent of the anthropogenic greenhouse gas emissions in the US are from the beef industry. All of animal agriculture is 4, all of agriculture is 9. So in the weird world that I live in, the plant agriculture produces 5% of the greenhouse gas emissions and beef produces 2.

Bret: Seems like that's new math, but now that's just math.

Peter: Just math and meanwhile the healthcare industry is 10%.

Bret: I'm contributing more than the cow that I drove by?

Peter: Absolutely, and we'll avoid all those lines that are sitting right there in front of us. Another point is that while it is humorous to think about rocket cows with flames coming out of their back end, it's not... The methane is not from farts. It's coming from belching. The release of gases that are produced in the rumen as the microorganisms break down the feed. So there're several things you can do to lower that.

One is feed higher quality diet. So clearly 2% is 2%... it's important. If you look worldwide certainly the enteric methane emissions, which is the methane that comes from this ruminant digestion in the United States have essentially been flat. They've been trending significantly downward in the so-called developed world, while they've been trending significantly upward in the developing world.

And what we have to get our arms around is that the majority of protein in humanity's diet is not coming from animal source foods. The vast majority is coming from plant source foods. And we've already discussed that animal source of protein is superior for

human nutrition to plant source protein. In addition the majority of calories by a larger margin, the majority of calories in humanity's diet are coming from plants. And if I understand you people right, eating sugar and starch which we get from plants may not be a good thing.

Bret: May not.

Peter: And in fact consuming animal fats as part of our diet might actually be a good thing, and we've got 2 billion more people coming at us in 32 years, that's the projection. That's going to be accompanied by a requirement per the UN of increasing, doubling food production. Now we could probably make a big impact if we reduced food waste. So maybe we don't have to double food production.

Bret: And the majority of the food waste is from the plant side, not from the animal side as well.

Peter: Indeed, that's in fact an inconvenient truth to use a phrase. Also at the same time they're projecting this increase of 66% in the demand for animal protein worldwide, but that's all based on their assumption of what the proper human diet ought to be.

Bret: Right and then because of that you see publications in *Nature* recently, in *Guardian*, in the landmark UN report, that all say we need to convert more of our beef production over to a plant-based agriculture for sustainment of enough food for the world and health for the world. But that makes quite a few assumptions, doesn't it?

Peter: Right it conflates cropland with farmland or agricultural land. So the land that we can grow crops on is a small portion of the farmland in the world because relatively small percentage of the earth's surface is suitable for cultivation, about 4%. Unfortunately, that's land that we're degrading. It's also land that we're building cities and suburbs on, and so we're losing that at a frightening rate.

But we have almost a quarter of the earth's surface and I'm including the oceans in that, which is classed as rangeland, which is long-term pasture, should not be cultivated when you do think dust ball. Then we have forest land making up another significant chunk that we put it together we come up with almost a quarter.

We can raise ruminant animals in agroforestry systems. We can raise trees, grass and animals on the same ground, and we can even then do that in rotation with crops. So we can plant trees in rows and in between, in large spaces in the middle, we can then have grass growing, raise animals on that and then maybe we can come back in and

plant soybeans or corn or something else for a period of time, then go back into grass as the trees continue to grow.

This is in Brazil, this was integrated cropping livestock systems. In other areas, they call it agroforestry. But this is the kind of integration that other parts of the world are looking at and trying to practice, and for a number of reasons we've kind of gone to another direction, but I see sort of that trend bending back towards more integrated farming systems in this country.

Bret: And one of the main questions is, how scalable is that? How realistic is that? Is that something that's going to help us get out of the predicament? Or, is that just going to be a fraction of a percent? It's going to be real nice but not really have much of an impact. You have a feel for how realistic that is?

Peter: I think it's abundantly realistic. This gets to the whole idea of a ruminant revolution. We need to revolutionize our dietary advice. We need to do that because our dietary policy, and advice influences all kinds of other policy, and all kinds of other funding, and all kinds of other decisions that are made.

So we can't really make these changes in some of these column downstream parts of the system until we no longer have the message being, "We need to be eating polyunsaturated fatty acids, instead of saturated fatty acids". Well, where do we get the poof is from? We get those from plants. Well we'd better be growing more oilseed crops so that we can get those "healthier oils". You can see that rippling out.

Part of this is that a lot of what is impacting our ability to produce enough food to feed humanity appropriately really isn't agronomy, really isn't animal science. It's things to do with sociology, it's things to do with stable governments rule of law, those kinds of infrastructure issues, and all those need to be addressed.

We should be looking at that and trying to help other people become as prosperous and as flourishing as we have been allowed to become because of what our grandparents did to create the environment that we're now able to live in.

Bret: That's again a unique perspective that we don't hear as much about. So I read an article recently about goats. And they're saying goats are going to save us. Goats would be the best option to increase their usage as a food source because one, they will eat anything, and they can convert pretty much anything into a high-quality protein and in some locations goats actually are a delicacy and they're common, but here in the United States they're not. Can we have a goat revolution? Is that going to help things?

Peter: Well notice it's a ruminant revolution, as we both know ruminants rule. And I don't mean to be no bovine centric, but that's just the one that most people in the United States are used to and of course when we see that the propaganda come out... it's cows, it's not the sheep, it's not the goats. And wild ruminants release methane as well, just like termites do. Somehow we don't have a thing against termites, I wonder why that is.

Small ruminants are a critical resource in some parts of the world. They farm deer, you know, you look at the northern people in Europe and they manage their reindeer herds. So, human beings have domesticated ruminants in every biome that humans have learned how to live in. They've been a partner just like the dog's been a partner in our success. So, undoubtedly these other ruminants will play a significant part in.

And we perhaps would be better off rather than focus on the cow or the sheep or the goat to look at becoming grass farmers. And what we need to teach people how to do, is grow grass to the best of that site's ability and that's going to vary tremendously because of environmental factors.

And then how they can convert that product, which really they can't sell directly, into something that has value. So livestock, the products of livestock, both edible and byproducts, because leather is valuable for example. So, there's lot of layers to this but we need to be open to the idea that this isn't a dead-end. This isn't the enemy. The problems have been I think oversimplified.

Bret: Yes and that's really disturbing because we hear a report from the United Nations. I mean this isn't just some journal or some opinion piece, but it's a report from the United Nations that we need to reduce the amount of meat we're eating and the amount of land we're giving to grazing or raising cows, from the United Nations. That seems like almost too big to counteract in the fight against.

Peter: Well and let me just turn the table and say that there are some people who don't yet understand the value of a low carbohydrate ketogenic diet, which is completely against what the official dietary guidelines have been. My goodness, that's coming from the USDA and the Health and Human Services Department and it's supposed to be developed by people who are experts in the field, who are considering all the relevant literature... I'm being really sarcastic.

Bret: Right, but a very similar--

Peter: Absolutely, and then the other point I want people to understand is we got those dietary guidelines as a product of their time, and part of that time was this emerging environmental movement of the 60's and 70's. So one of the reasons for this

diet being advanced was because of the perception that we can't feed the world with animal products.

We have to get everybody on a plant source diet. And then if you start tracking some of the influential books and people of the time you see their influence showing up in the dietary goals. And now we're sort of coming back around because it seems, to me at least, that a lot of the dietary messages, the nutrition messages, are getting harder and harder to maintain.

So there was never any justification for cholesterol restriction in the diet, so they're kind of sort of admitting that, although they say not to eat too much. Well okay I won't, because there is no upper limit. You know saturated fat, well they're less concerned, but they're not fully convinced yet. It's still there is a restriction, but it seems that more and more it's becoming understood that natural saturated fats, we always have to say that-- at one point they included the trans fats, the artificial trans fats.

Bret: Industrial trans fats.

Peter: Yes, so that's falling away and then if you read Zoe Harcombe's excellent takedown of the red meat story. There's no "there there" either. Okay, so what's left? Well okay now we'll appeal to the environmental impact and part of what I've tried to do here, we're at low-carb Houston, was present some information to just look at the numbers.

Because there's lots of layers to this story that you could go to, but sometimes I think that's just a bridge too far for people. So let's start with the fact that when they say that livestock agriculture or cows by themselves, are, you know, more greenhouse gas emissions than transportation that's just factually incorrect based on the numbers and the numbers are always some degree of modeling right there.

Now when scientists actually put cattle into devices where there's a sleeve around their neck, so that they can enclose the atmosphere that these animals are then burping into and they can feed and then measure the methane generation, they find very different numbers. And the idea that there is such a thing as a consensus in science speaks to the weakness of that discipline because there may be some things that we think we know, but we should always be open and testing whether in fact those are so.

Bret: Right and what you compare it to, makes a big difference as well. So I read this one quote that I wanted to read, you can fill your shopping basket with lentils from Canada, mangoes from India, beans from Brazil, goji berries from China, blueberries from the United States, and Qinoa from the Andes, or you could go to your local

rancher and get a chunk of meat. Which is going to have the environmental impact, but that's not factored in to a lot of these studies and these headlines when they talk about environmental impact.

Peter: Exactly and then the point that I would make on top of that, is if you're right and the burden of chronic disease in the United States is in part because we're eating a mostly plant-based processed food diet, then how do we factor that into the conversation about environmental impact?

There are certain words that when they get used in conversation, they sort of become these feel good, you know, blankets, and we don't really have to know what we're talking about, but now we feel good. So sustainability is one of those words. And unfortunately too often it's what I call sustain a babble. If we're not talking about a societal component as well as an economic component, as well as an ecological component, then we're not having the full sort of conversation, and clearly that's got to be a very difficult exercise.

But I would point out that when we have 60% of the adult population in the US having one or more chronic diseases, when we have over half of adult Americans being diabetic or pre-diabetic, when we have 200 people a day losing some part of their body because of the standard of care for diabetes, which is the clearest case for restricted carbohydrate diets.

Yet we're hearing at meetings like this and in the literature a growing number of chronic illnesses that are plausibly linked to hyperinsulinemia, what's the impact on the families of those people? What's the impact in terms of their communities just from that perspective? And then I think to figure something like $1 billion a day close to that just for diabetes care.

Well we know that the chronic disease epidemic is bankrupting the United States. So how do you factor that in? And the interesting thing, the frustrating thing for me is when I talk to people who are sincerely engaged in this kind of an exercise when they're trying to do essentially lifecycle analysis, you know, sustainability discussions around beef in society, they have a significant number of places for health to come in, health of workers, health of consumers, health of producers.

Who's informing that part of your calculations? Is that reflecting the conventional wisdom? Where maybe, you know, 4 ounces of red meat a couple times a week would be okay, or is the room may be to make a run of your model using may be an alternative, and so these conversations need to take place as well because I think we could find a very different answer.

And so if we're right, always a useful phrase to keep in mind, if we're right that eating more animal product would produce this improvement in the health of humans not just in the United States but around the world, then how do you balance that off against some model prediction of what that's going to wreak half a century or century down the road?

Bret: I think that's a great summary and a great way to tie it all together, that we can't look at medicine and health in one bucket and environment and farming and crops in another bucket, because they're so interrelated, one influences the other and you have to factor them in together. I mean that is a great part of your message.

That's one thing I really like about, as we saw in this discussion, you have a very nuanced approach and a great way of looking at things from a wider perspective seeing how they interrelate each other. I'm glad that you're the messenger trying to bridge the gap between the disciplines, I think you're well suited for that.

Peter: Thank you very much.

Bret: So if people want to learn more about you and your message, where can they go to find out more?

Peter: You can find me on Twitter and on Instagram it's "grassbased" one word. You can find me on Facebook, I have a personal page, but then if you're more interested in just the grass based health, that's the name of the page. I have a mostly dormant blog that I keep threatening to write more for but there's some stuff there and you can also find me on YouTube.

I have a channel where I've put links to a number of videos of presentations as well as a bunch of stuff I just find interesting. So if you want to learn about Pacific Northwest geography for example I've got a number of links to some really great lectures that you can learn a lot about, something that I find interesting.

Bret: Well I have to check those out. Peter Ballerstedt, thank you for joining me today.

Peter: You're very welcome, thank you for the chance.