Debunking The Paleo Diet by Christina Warinner Transcript

In this TEDxOU talk, Christina Warinner, an achaeological geneticist, here debunks the Paleo diet fads…below you can find the full transcript of the talk…

MP3 Audio:

http://wp74.hostgator.com/~wadgv40ab6we/wp-content/uploads/2014/06/MP3-Debunking-the-paleo-diet-by-Christina-Warinner-@-TEDxOU.mp3

Right click to download the MP3 audio:
Download Audio

Thank you, it's a pleasure to be here. I'm an archaeological scientist and I study the health and dietary histories of ancient peoples using bone biochemistry and ancient DNA.

I'm here because I want to talk to you about the Paleo Diet. It's one of America's fastest growing diet fads. The main idea behind it is that the key to longevity and optimal health is to abandon our modern agricultural diets, which make us ill, and move far back in time to our Palaeolithic ancestors, more than 10,000 years ago, and eat like them.

Now, I'm really interested in this idea because it purports to put archaeology in action, to take information we know about the past and use it in the present to help us today.

Now, this idea was really started in the 1970s with this book, "The Stone Age Diet." It's diversified since then into several variants, including the Paleo Diet, the Primal Blueprint, the New Evolution Diet, and NeanderThin, and most of the language of these diets makes references to anthropology, nutrition science, and evolutionary medicine.

The diet does seem primarily targeted at men, so if you look at advertisements and descriptions, they have virile, cavemen-like images, things like "live primal," lots of red meat. And basically, the idea behind it can be broken down into four parts.

One is that our agricultural diets today make us chronically ill, that they are out of sync with our biology.

And two, that we need to abandon these agricultural diets that started during the agricultural period, and move back in time to the Palaeolithic and eat more like our ancestors over 10,000 years ago.

Third, that we know what these diets were like, and what they were like was they had a lot of meat, they were mainly meat based. That was supplemented with vegetables and fruits and some nuts and oils, but it definitely did not contain grains or legumes or dairy.

And fourth, that if we emulate this ancient diet, it will improve our health and make us live longer.

So what I want to talk to you about today is that this version of the Paleo Diet that's promoted in popular books, on TV, on self-help websites and in the overwhelming majority of press has no basis in archaeological reality. So, thank you!

(Laughter)

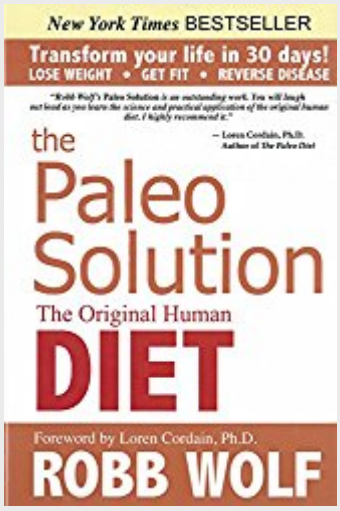
No, I'm not going to end there; I will explain. So what I want to do as an archaeologist is go through this, do a bit of myth-busting of some of these foundational archaeological concepts upon which it's based, and then I want to talk to you about what we really do know from the archaeological record and from scientific studies about what Palaeolithic people did eat.

Myth #1: Humans are evolved to eat meat

So, myth one is that humans are evolved to eat meat and that Palaeolithic peoples consumed large quantities of meat. Humans have no known anatomical, physiological, or genetic adaptations to meat consumption. Quite the opposite, we have many adaptations to plant consumption.

Take, for example, vitamin C. Carnivores can make their own vitamin C, because vitamin C is found in plants. If you don't eat plants, you need to make it yourself. We can't make it, we have to consume it from plants. We have a longer digestive tract than carnivores. That's because our food needs to stay in our bodies longer, so we have more time to digest plant matter.

We need more surface area, we need more microbes. We have generalist dentition, so we have big molars that are there to shred fibrous plant tissue. We do not have carnassials, which are the specialized teeth that carnivores have to shred meat, and we do actually have some genetic mutations in some populations that are adaptive to animal consumption, but it's to milk, not meat, and these arose in certain populations during agricultural periods primarily in Europe and Africa.



I call this “The Meat Myth.” The idea behind it is that we should eat all this red meat, but that’s just really not true. The meats on this plate of meat here are from fattened cattle, these are domestic animals. Anything a Palaeolithic person would have eaten would have probably been very lean, probably small, and they wouldn’t really have eaten that much meat. Of course there’s also bone marrow and organs, these would have been very important.

We see evidence of harvesting of bone marrow in faunal assembles where you see characteristic cutting open of the bones, like you see here, for marrow extraction. Now sure, people did eat meat, and especially in the Arctic and areas with long periods where plants were not available, they would have eaten a lot of meat. But people that lived in more temperate or tropical regions would have had a very large plant portion of their diet.

So where does this Meat Myth come from? There’s really two places, and one is the inherent bias in the archaeological record. Bone is 80% mineral by weight, it’s going to preserve better and longer over thousands of years than delicate plant remains.

But the other issue comes from some early bone biochemistry studies that were performed on Neanderthals and early people. This bone biochemistry study is based on something called *nitrogen stable isotope analysis*. It’s complicated, but I’m going to try and break it down.

The basic idea is that you are what you eat, and so we – there’s nitrogen-15 and nitrogen-14, heavy and light versions of nitrogen – and we consume this nitrogen in our food. But there’s one important difference, and that is, with each step that you go up the trophic hierarchy, the amount of the heavier isotope increases.

So if you measure the amount of heavy isotope in the bone, you can infer where that individual was on a food chain. This is an example of a generalized isotopic model. I’ve plotted where plants generally fall, and above them are the herbivores, and then above them, the carnivores.

But one of the problems is that not all ecosystems conform to this model. There’s a lot of regional variability, so if you don’t understand the region, you can come to erroneous conclusions. I’ll give you some examples.

We can take East Africa. If we measure animals and ancient humans in East Africa, we see some very strange patterns. First of all, how can a human be higher than a lion? Lions only eat other animals. And then, how is this herbivore above a lion? Well, it turns out that the food that you eat is not the only contributor to these isotopic values and that aridity can also have an impact.

So what we're likely seeing here is differences in water access. So let's move out of the savannah and move into the tropical areas. Let's look at the ancient Maya. Again, we see something anomalous. We see the ancient Maya lining up with jaguars. Now, we know the ancient Maya had a diet heavily reliant on corn.

So what's happening here? We don't exactly know, but we think this may have to do with the way they performed agriculture and how they fertilized their crops.

Now let's go to the **Pleistocene**. We see some really interesting patterns here too. We see reindeer plotting very low, in the range of plants. We see wolves plotting normally where you would see herbivores, and we see mammoths spanning all three levels, at once plants, herbivores and carnivores.

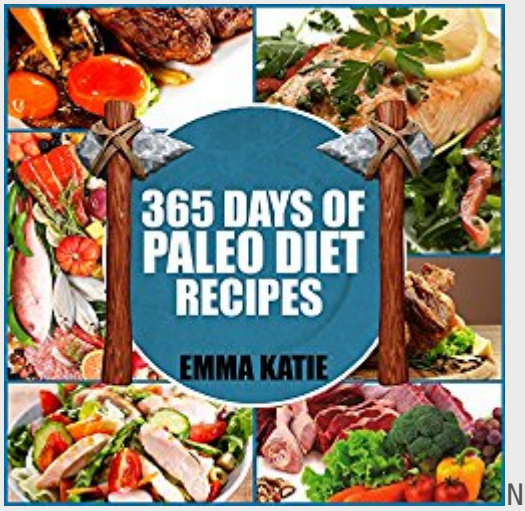
So what we think is happening here is that in very cold climates, animals eat unusual things and in this case what we think is happening is these mammoths are eating lichens and bark and that's giving them very strange values. So if we now go to humans, ancient humans, Palaeolithic humans, and Neanderthals, we see that they plot in the same isotopic space as wolves and hyenas.

Now that's true, but as I've shown, if you don't have good control over the regional isotopic ecology, you can come to an erroneous conclusion, and I think it's premature to say this is very strong evidence of meat consumption, given how very little we really know about the Palaeolithic ecosystems.

Myth #2: Palaeolithic peoples did not eat whole grains or legumes

So, myth two is that Palaeolithic peoples did not eat whole grains or legumes. Now, we have stone tool evidence from at least 30,000 years ago – that's 20,000 years before the invention of agriculture – of people using stone tools that look like mortars and pestles to grind up seeds and grain.

More recently we've been developing techniques where we can actually measure this thing called "dental calculus." It's very interesting: it's fossilized dental plaque. We can go in the individual mouths of people, pull out that plaque and recover microfossils of plants and other remains. My team is working on developing methods to extract DNA and proteins, and other research groups are focusing on these microfossils like starch grains, pollen and phytoliths.



Now, we're still in early days here, but even with the limited research we have, we can say that there is an abundance of plant remains inside the dental calculus of Paleolithic peoples. And these things include grains, including barley. We're finding barley inside Neanderthal teeth, or inside the plaque. We also have legumes and tubers.

Myth #3: Paleo Diet foods were eaten by Palaeolithic ancestors

So, myth three is that Paleo Diet foods, in the fad diet, are what our Palaeolithic ancestors ate. That's just not true.

Every single food that's pictured in these advertisements are all domesticated foods, products of farming, of agriculture. They're from the Neolithic transition.

Let's give an example – bananas. Bananas are the ultimate farmer's food. They can't reproduce in the wild anymore. We've bred out their ability to make seeds. So every banana you've ever eaten is a genetic clone of every other banana, grown from cuttings. They're definitely a farmer's food. If you were to eat a wild banana, it is so full of seeds that I bet many people in this room wouldn't even recognize it as edible.

Let's take salads, that seems like a really great Paleo Diet food. Except that we've radically changed the ingredients to suit our needs. So, wild lettuces contain a great deal of latex, which is indigestible and irritates our gastrointestinal system. It's bitter, the leaves are tough. We've domesticated them to be softer, to produce bigger leaves, to remove the latex and the bitterness, remove the spines that grow on the leaves and stems of wild varieties, make them tastier for us.

The tomato that's shown here lacks the tomatine and solanine toxins that are present in its wild relatives, which are all members of the poisonous nightshade family. If we look at oil, it's true that olive oil is the only natural vegetable oil that can be harvested without synthetic chemicals. Except, it still requires at least rudimentary presses to remove it, something that no Palaeolithic person would have ever built. This is a farmer's food.

This is a model diet I found on a website. It looks like a delicious and

nutritious breakfast, but a Palaeolithic person wouldn’t have had access to it.

First of all, the blueberries are from New England, the avocados from Mexico, and the eggs, from China. This would have never appeared on any Palaeolithic plate.

And last, we have this problem of size. Domestic blueberries are twice the size of wild blueberries. We’ve already talked about bananas; you look at avocados. A wild avocado has maybe a couple millimeters of fruit on it, and the same goes for wild olives. And of course chickens, chickens are prolific producers. They lay eggs almost every single day. They’re predictable, large and abundant.

If you’re trying to collect wild eggs, they don’t lay year round, and they’re not as easy to find, they’re typically small. But maybe you’re not convinced, so I’m going to give just a couple more examples.

This, you may all recognize as broccoli. Broccoli did not even exist in the Palaeolithic period. What you see on the left is wild broccoli – looks quite different. Now, wild broccoli is also: wild cabbage, wild cauliflower, wild kale, wild kohlrabi and wild Brussels sprouts, they’re all the same species. The only difference is they’re different cultivars. We’ve selectively bred the same species to produce the kind of food that we like best. These are human inventions.

Broccoli, I think, is an interesting example because it’s this weird thing. What even is broccoli? It’s such a strange looking vegetable. In case you don’t know, it’s flowers, the flower of the plant. We’ve changed this wild plant into something that produces so many dense flowers. It produces this odd, stalk-like thing, but it is flowers.

If you don’t believe me, buy some broccoli at your grocery store, put it in a vase, like I did on the right, and it will bloom. It makes a lovely, lovely bouquet.

So let’s talk about carrots next. You all recognize the carrots on the right, but wild carrot is what’s on the left. It contains falcarindiol and other things that are natural pesticides. They’re bitter in flavor and they taste really bad, and we’ve bred them out and we’ve also expanded them, made them much bigger, much sweeter, and much more full of vitamins, because that’s what we want.

Many of you may not know this, but almonds and apricots are extremely closely related species of prune. The main difference is that we’ve bred out the cyanide in almonds, so that we can eat the seed, and we have selected for bigger, thicker fruits in apricots, because that’s what we want to eat from that particular species. They’re very closely related and, like carrots and broccoli, they are essentially human inventions.

So let’s talk about some real Paleo diets.

First of all, I need to clarify that there is no one Paleo diet. There are many, many Paleo diets. People, when they spread out across the world, colonized the continents, they ate local foods, and of course they were extremely variable. So when we speak about Palaeolithic diets, it’s very important to speak of them in the plural.

Let’s take a closer look at one in particular; we’re going to go 7,000 years back in time to Oaxaca, Mexico, and right now you’re looking at the view outside of the Guilá Naquitz rock shelter, one of the earliest sites in Mexico. This is a photograph that I took in December, and people would have been living here at this time, and what you are essentially seeing right now is dinner. And this is a far cry from anything that you would find on the Paleo Diet and anything you would find in your modern supermarket. But, there was plenty of food here for people to eat on a seasonal basis.

So, September was high time at Guilá Naquitz. This is when a lot of people would have come in and occupied these rock shelters, and they would have eaten the local resources. And if you notice, this includes a lot of fruit, legumes, agaves, that’s what we make tequila from today. Various nuts and beans and squashes and wild game, predominantly rabbits.

But by the time April came around, there was very little edible food in this region so they would have moved on to other places where food was more abundant. So if we take a step back and say, “Well, what can we really learn about the Palaeolithic diets around the world?” There are some general observations we can make.

One is that they are regionally variable. People in the Arctic have and will eat something different than people in the tropics. They have different resources. So people who live in places with no plants tend to eat more animals, and people who live in places where there are plants tend to eat more plants. They’re going to be seasonally variable, because plants seed and fruit at different times, herds migrate and fish spawn on a seasonal cycle.

As these things happen, people have to move from resource patch to resource patch, which means that there is periodic high mobility, sometimes over long distances. Once again, it depends on the region.

Food packets were generally small. If you go around collecting wild broccoli, you’ll have to collect an awful lot of it to be the equivalent of its domesticated variety. The foods that you would have collected would have been generally tough, woody and fibrous. You would eat meat, but you would also eat the marrow and the organs of the animals you collect, and they’d generally be very lean.

Finally, the plants you’d eat would still contain a lot of toxins at various levels, and phytochemicals, some of which actually have very good health

benefits. But it’s almost impossible for us now to eat this sort of diet.

Three billion people cannot eat like foragers on this planet, we are too big. So, can we take lessons from these Palaeolithic diets that we still can apply to our lives today?

Lessons to learn

And the answer is, ‘yes.’ I think there’s three main lessons we can learn: First, there’s no one correct diet, but diversity is the key. So, depending on where you live, you can eat very different things, but you need diversity. We lack the ability to synthesize many nutrients that we require for life, nutrients and vitamins, and we are required to get them from our foods. Eating a diet that’s rich in species, has high species diversity is very important.

Now unfortunately in American diets today, the trend is going in the opposite direction. If you go and you take a processed food off a grocery store’s shelf, it doesn’t matter if it’s cake batter, mayonnaise or coffee creamer, increasingly there is only three species in almost everything we eat. We have corn, soy and wheat. That’s opposite direction we need to be going.

Second, we evolve to eat fresh foods, in season, when they are ripe. That’s when they have their highest nutritional content. But, of course, we have to also talk about food storage and preservatives, because in large urban societies, you can’t always eat everything fresh; food spoils. Some foods preserve naturally well; these include things like seeds and nuts, and that’s why traditionally they’ve been so important to agricultural populations.

But we can preserve them in other ways, through salting, through sugar, vinegar. We can pickle them, we can smoke them, we can dry them, we can add artificial preservatives.

What I find very interesting about this is that these all work in the same way. They work by inhibiting bacterial growth. But we have to keep in mind that our gastrointestinal systems are also full of bacteria, good bacteria that do many good things for you: they digest your food, regulate your immune system, promote mucosal function.

If you eat foods full of preservatives, how does that affect your microbiome, your good bacteria within you? And the answer is, ‘We really don’t know.’ And it’s something we’re only starting to investigate.

And third, we evolved to eat whole foods in their complete package, with their fiber and their roughage and everything. It turns out this is really important, that your foods are not just the sum of the calories and the vitamins. But even the parts you can’t digest are very important. The fiber that you eat regulates the speed at which the food travels through your gut. It modulates metabolism, it slows down the release of sugars, it has all sorts of functions, it feeds the good bacteria that live in your gut.

And increasingly we're seeing that low fiber diets are associated with microbial communities that cause things like obesity and diabetes. What's unfortunate also in the globalized system of processed foods is that we're losing these connections, we're losing the whole food, and we're eating reconstituted, concentrated foods, and we don't get the benefits of having, for example, the fiber and pectin in the fruit juice because it's been filtered out. We're losing all of this balance.

And, as an example of how this thing gets so out of balance, we can eat so many more calories, so much more food in a very small package without realizing it, and that short-circuits our abilities to know when we're full and when we've had enough.

So I have a question, and my question is, I was wondering, does anyone here know, if you take a soda, let's say a 34 ounce soda, which is increasingly becoming the normal size, like this one, and you drink it – imagine that you're back in the Palaeolithic period, and you want to consume the equivalent amount of sugar. How much sugar cane – if you stumbled upon a sugar cane field, how much would you have to eat, how many feet of sugar cane do you think you'd have to eat?

I brought some sugar cane. How many feet of sugar cane do you think you'd have to consume to reach that level? Any ideas? One… how many sticks do you think you'd have to eat? They're pretty big. Not quite 40 feet. You'd have to eat 8.5 feet of sugar cane to reach that level. That's an awful lot of sugar.

There is no physical way that a Palaeolithic person could have possibly eaten that much sugar cane, even if they really wanted to, and now you can consume it in about 20 minutes. So, by decoupling the whole food from the nutrients inside of it, we trick our bodies and we can override the mechanisms that we've evolved to signal fullness and satiation.

These are the three main lessons I think we can learn from real Palaeolithic diets:

There's no one correct diet, but dietary diversity is key, that we need to eat fresh foods when possible and that we need to eat whole foods.

So, anthropology and evolutionary medicine have a lot to teach us about ourselves and new technologies are opening up new windows into the past. But we still have a lot to learn from our Palaeolithic and our Neolithic ancestors.

Thank you.