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A Critical Analysis of the Paleolithic Diet

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Abstract

One recent diet receiving public attention is known as the Paleolithic diet, which essentially prescribes that we need to regain our connection with the eating patterns of the Paleolithic era, roughly between 2.6 million and 10,000 years ago. The logic behind the Paleo diet states that since this period our eating habits have developed so rapidly that our bodies haven't been able to keep up evolutionarily. In other words, humans are biologically designed to eat a certain way and the disparity between this and the way modern humans eat happens at the expense of our health. Though this sounds logical, it makes several assumptions that aren't necessarily true. It assumes that human genetics haven't changed significantly since Paleolithic times, that humans didn't eat certain foods before the agricultural revolution, and that hunter-gatherer diets can be reduced down to one category. For these among other reasons the Paleo diet has some fundamental flaws.

1. Introduction

As much as the human race claims that it has transcended the animal world we still remain in touch with some of our primal vestiges. The need to consume food belies our animal nature. And yet, humans have reframed the struggle for sustenance into a vastly complex science of figuring out the exact combination of calories and nutrients necessary to achieve 'perfect health.' In this way, nutrition science seeks to optimize health and is a uniquely human endeavor. A problem arose, however, when we lost touch with eating as a biological drive. Now people no longer know what they need to eat for their health instinctively and so they rely on the advice of dietitians, which may not always necessarily be accurate.

One of the more recent diets to gain recognition is known as the Paleolithic (Paleo) diet, which essentially prescribes that we need to regain our connection with the eating patterns of the past. Specifically, this diet focuses on the very distant past, about 10,000 or so years ago during the Paleolithic era. The logic behind the Paleo diet states that since this period our eating habits have developed so rapidly that our bodies haven't been able to keep up evolutionarily[1]. In other words, humans are biologically designed to eat a certain way and the disparity between this and the way modern humans eat happens at the expense of our health. While the science behind the Paleo diet seems to make some very compelling points it is a diet that ultimately fails upon scrutiny.

2. Analysis

According to its official website, the Paleolithic diet is centered around eating modern foods that reflect the patterns exhibited by our ancestors, the hunter-gatherers. Though it is often called the Hunter-Gatherer diet, the Paleo diet doesn't prescribe foraging for food but rather trying to emulate the eating habits of those who had no choice but to forage. The diet calls for high protein, potassium, fiber, plant nutrient, and fat consumption coupled with lower sodium and carbohydrate intake[2]. However, the specific guidelines make things more complicated. While on the

Paleo diet one is encouraged to eat natural meats, seafood, fresh produce, eggs, nuts, seeds, and certain oils. Cereal grains, legumes, dairy, refined sugar, potatoes, processed foods, and salt are frowned upon[3]. The idea is that the foods under the 'Don't Eat' category were not available to or eaten by Paleolithic humans and so are at odds with our genetic predispositions while the permitted foods were widely consumed. Some of the 'Don't Eat' items might reasonably raise a few eyebrows and a few of them beg a very detailed scientific confirmation. For example, if humans have been eating grains and legumes for millennia without suffering the rampant 'diseases of civilization,' how is it that these foods are at odds with our genetics? Perhaps they are not.

Dr. Loren Cordain, founder of the Paleo movement, along with his team of researchers and scientists determined that 10,000 years ago about the time of the agricultural revolution, our eating habits and our biology diverged. Indeed, the development of agriculture had a massive impact on the human diet, but Dr. Cordain's finding is not strictly true. If he is correct then that would mean that the human genome has not gone through any significant or substantial changes since the Paleolithic era. In reality, the situation is more complex than that. For example, it is true that humans were not adapted to drinking milk beyond infancy, and certainly not from other animals. There is plenty of research to suggest that lactose tolerance developed during the last 7000 years in the European continent, and interestingly enough one of the studies cited on the official Paleo diet website readily admits this[4]. According to the study about 80% of humans are unable to process lactose proteins, a substantial number, but what about the other 1/5th of the population? The gene for lactose tolerance, mostly found in people of European descent, did not exist before 7000 years ago meaning that the mutation appeared and flourished long after the advent of agriculture. In other words the human genome *has* changed since Paleolithic times and in major ways. The same study that mentioned the (relatively) recent incidence of lactose tolerance also describes that evidence that the grinding and processing of grains has been dated to as far back as 40,000 years ago, long before the close of the Paleolithic period. Grains were likely a part of at least some hunter-gatherers' diets if tools for making grains more edible existed so long ago. The study then points out that about 1 in 133 people suffer from Celiac disease, or the inability to digest the gluten found in some grains, implying that this statistic confirms that humans aren't meant to eat grains. If this was the case it would make sense that more than a mere 0.75% of people would have Celiac disease while the other 99.25% have an adaptive tolerance. The relatively low presence of Celiac and the prevalence of lactose tolerance expose the contradiction in claiming that humans can't or haven't changed along with their diet; simply put, humans have indeed physiologically adapted to relatively recent foods.

In addition to the development of enzymes to break down new foods the Paleo diet also fails to recognize the ability of our gut microbiomes to adapt and diversify very quickly. The massively complex ecosystem of bacteria inside our bodies is responsible for many of our digestive processes and there is evidence to suggest that it is capable of responding to shifting diets. For example, many humans in Japan have gut bacteria adapted to breaking down seaweed, a food that gained popularity in the region after the agricultural revolution[5]. In this sense, ideal diet is not a question of what *humans* are adapted to because people and gut microbes are in a symbiotic relationship in which the bacteria do the legwork to make up for humans' genetic shortcomings. The importance of gut microbe diversity applies on an individual level as well in that all people have unique intestinal ecosystems. Even if they were in the same tribe two individuals would be suited to different particular foods[6]. While it is difficult to ascertain the characteristics of paleolithic humans' intestinal bacteria, it is highly probable that they are significantly different from those of today's humans[7].

Paleo diet science also makes various assumptions about the diets of Paleolithic humans that may not be true. For instance, it implies that there was one universal ancestral diet. In reality hunter-gatherers consumed only what their immediate environment allowed, meaning that every tribe or community probably ate in a way that was different even from neighboring tribes. When one envisions the massive biodiversity of the Earth it is not hard to imagine that the early humans of the Arctic North had a diet entirely unrelated to the diet of the tribes of sub-Saharan Africa. And in fact they did; a research article posted on the Paleo diet website explains the nutritional composition of hunter-gatherers' diets in different areas of the world. A table provided in the article showed just how drastic the differences could be. While the Nunamiut of Alaska's diet is comprised of an amazing 99% animal food, the African Gwi get only 26% of their calories from animals[8]. Other percentages on the chart reflect the diverse range of diets for different hunter-gatherer societies around the world. This table shows the hunter-gatherer diet was highly variable. Humans are best described as dietary generalists, meaning that what they eat is largely dependent on the local environment. Paleolithic humans obviously would have chosen their meals based on what was available to them. Additionally, pre-agricultural tribes had to make decisions based on what had the best overall ratios of nutritional value, abundance, and effort required to retrieve the food[9]. In other words, even tribes in similar areas would eat differently based on their particular conditions.

Furthermore, what little knowledge there is about Paleolithic eating patterns is determined through very limited and precarious archaeology as the organic remains of food are often so degraded they are difficult to analyze[10].

Research on ancient diets is conducted primarily by examining teeth, animal bones, stone tools, and the composition of human remains. However, these methods are limited. For example, it is possible to study deposition of animal bones to determine how early humans may have eaten but it is difficult to say whether it reflects patterns or just isolated incidents[11]. The dietary plant composition is even harder to determine as plants do not leave behind durable bones and do not require as much processing with stone tools.

Proponents of the Paleo diet argue that the risk of chronic disease can be minimized by following a hunter-gatherer's dietary pattern[12]. In other words, diseases of modern civilization such as cancer, chronic heart disease, and obesity are caused by eating a diet at odds with our genetic heritage. If this were true it would mean two things: that these diseases would be rare if present at all in hunter gatherers and that they occur primarily as a result of eating a non-Paleo diet. However, there seems to be sufficient research to contradict these statements. One study that examined atherosclerosis in ancient mummies showed that damaged and clogged arteries were found in numerous preserved bodies around the world including Unangan hunter-gatherers both male and female ranging in age from 4-51 years, showing that humans eating forager diets are not as immune to heart disease as the Paleo diet suggests[13]. Furthermore, there are many communities in the world, many of them rural and almost all post-agricultural, that have extremely low rates of these diseases consuming grains, legumes, dairy, and other foods condemned by the Paleo diet. Okinawa, a region in Japan, is one such community which boasts unusually high rates of healthy individuals. It has one of the highest life expectancies *and* health expectancies in the world, and a large number of its people live to be over 100[14]. An ongoing study started in 1975 known as the 'Okinawa Centenarian Study' collects data from Okinawan elders, primarily those who survived to more than 100 years of age, to track general health and the appearance of various chronic diseases. To this day the study finds that Okinawans have very low rates of heart disease and cancer compared to the rest of the world. The typical diet in the area includes various grains, legumes, and some dairy along with relatively low protein intake, all of which defy Paleo diet recommendations. This is one example from a long list of cultural diets that have been shown to benefit cardiovascular health. Another excellent example would be the Mediterranean diet, which has been shown to significantly reduce the risk of cardiovascular disease while allowing grains, legumes, alcohol, and dairy as well as limiting meat intake[15]. When compared directly to the Paleo diet the Mediterranean diet is at least equally effective at preventing certain lifestyle-related diseases including sporadic colorectal adenomas[16].

Though there are a number of flaws in Paleo diet science, and though there are many other diets that are similarly effective and less restrictive, it is important to point out that the Paleo diet is not an unhealthy one, generally speaking. Evidence shows that even in a relatively short timespan the Paleo diet can help with weight loss, high blood pressure, and triglyceride levels[17] as well as cardiovascular risk factors[18]. Many of the risk factors for type 2 diabetes, including high blood glucose levels and lipid profiles[19] can be controlled on a Paleo diet about as effectively as on a diabetes recommended diet[20]. While the science is not perfect, the Paleo diet is potentially very effective at promoting and maintaining good health.

3. Conclusion

The Paleo diet concept that makes the strongest point--that humans are designed to eat a certain way for optimal health--is also an area where it falls short. Paleo diet scientists jump to the conclusion that our digestive tracts are frozen in time, unchanging after having reached evolutionary stability. Paleo diet proponents draw a direct connection between the agricultural revolution and the diseases of civilization even though there are many post-agrarian societies that enjoy excellent health. When one examines the facts, Paleo diet claims seem less convincing. Humans are highly adaptable animals and so their diet is based on their immediate environment more than anything else. The ability to eat new foods can be adapted in a relatively short timespan, and even foods that humans can't digest might be accommodated by intestinal bacteria. The downfall of Paleo diet logic is that it attempts to prescribe a certain lifestyle for every individual based on a period in time that relatively little is known about. The current state of archaeology makes research on eating patterns from over 10,000 years ago a precarious science. What little *is* known about this time period is highly varied and contested, so it is entirely possible that some Paleo diet assertions are based on misinterpreted archaeological findings. Even if Paleo diet science was entirely factual, there are still many other contemporary dietary patterns that grant comparable health benefits while making fewer restrictions. Still, the Paleo diet is not to be completely discounted. It has been shown to prevent numerous disease risk factors, including cardiovascular disease and diabetes, and is overall not necessarily a poor diet to follow. As research continues it is possible that the Paleo diet will come to be a highly recommended diet for general health, but for the time being it falls short due to inadequate scientific backing.

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