

Future of Medicine - Part Three



The second principle of the future of medicine is that it embraces an evolutionary or ancestral perspective and framework. The evolutionary biologist Theodosius Dobzhansky once said, “Nothing in biology makes sense except in the light of evolution.” What did he mean by this? All organisms are adapted to survive and thrive in a particular environment, and when that environment changes faster than the organism can adapt, mismatch occurs. This is a fundamental principle of evolutionary biology, and it applies to humans as much as it applies to any other animal or organism in nature.

For 66,000 generations, humans ate primarily meat and fish, wild fruits and vegetables, nuts and seeds, and some starchy plants. We were physically active. We didn’t sit for long periods. We lived in sync with the natural rhythms of light and dark in direct contact with nature and in close-knit tribal and social groups. Both our ancestors and contemporary hunter-gatherers who have been studied were lean, fit, and remarkably free of chronic inflammatory disease. They were also superior to us in nearly every measure of health and fitness, from body mass index to blood pressure to insulin sensitivity to oxygen consumption to vision to bone density.

You might be thinking, “So what? Why should we care about the health of our Paleo ancestors? They all died when they were 30 years old anyhow.” It’s true that our Paleo ancestors did have shorter life spans on average, but those averages don’t consider challenges that are largely absent from modern life, including high rates of infant mortality, warfare, trauma, accidents, exposure to the elements, and a complete lack of emergency medical care.

Studies have shown that when these factors were considered, contemporary hunter-gatherers and our ancestors lived life spans that were closely equivalent to our own today, but the difference is that they reached these ages without acquiring the inflammatory diseases that characterize our old age. They didn't have obesity. They didn't have heart disease. No diabetes, gout, hypertension, or most cancers. In other words, if our ancestors survived the threat of early childhood and escaped the threat of trauma, they lived long and healthy lives.

So, what happened? What transformed us from a healthy, vital people largely free of chronic disease to a sick, fat, and unhealthy people? It was a one-two punch, and agriculture was the first blow. Scientist Jared Diamond calls agriculture "the worst mistake in human history." Hunter-gatherers were virtually guaranteed a healthy diet because of the diversity and nutrient density of the foods they ate, but once humans settled down and started farming, there was a major shift in our diet. Our average carbohydrate intake shot up, and our protein intake plummeted. The quality of protein we ate also decreased.

Animal

Protein Type	Bioavailability Score
Casein	1
Egg	1
Milk (casein + whey)	1
Whey	1
Chicken (light meat)	1
Fish	0.96
Beef	0.92

Plant

Protein Type	Bioavailability Score
Soybeans	0.91*
Vegetables	0.73
Legumes (average)	0.7
Whole wheat	0.4
Wheat gluten	0.25

As you can see in the tables on these slides, animal protein is more bioavailable than other plant protein. Soybeans are close to beef, but they contain something called phytic acid, which inhibits protein absorption, and if this had been considered, they would have been even lower on the list. Notice how low whole wheat and wheat protein, or gluten, are. Notice that legumes, on average, are much lower than even some plant proteins and any animal protein.

Vitamin shortages also became common. Our new diet relied heavily on a limited set of crops such as wheat, rice, and corn, and it was lower in more nutrient-dense animal products. This led to diseases such as beriberi, pellagra, rickets, and scurvy that are caused by nutrient deficiency and were rare in hunter-gatherers but became much more common in people living in agricultural societies.

We also saw an increase in tooth decay and anemia due to iron deficiency, increases in infant mortality, and decreases in average bone density. All of these diseases, again, were rarely experienced by our hunter-gatherer ancestors.

The incredible **shrinking** human.

Upper Paleolithic



Early Agriculture



We also shrank. The average height for hunter-gatherers at the end of the Ice Age was 5 feet 9 inches for men and 5 feet 5 inches for women, and after agriculture, that decreased to 5 feet 3 inches for men and 5 feet tall for women.

The second blow was the Industrial Revolution. There is no doubt that agriculture led to an overall decline in human health, but the Industrial Revolution was really the knockout punch. It brought us to where we are today when white sugar, flour, and vegetable oil make up over 50 percent of the calories that the average American consumes on a daily basis. We're more sedentary than we've ever been before. We sit while we work and increasingly even sit while we play. We're chronically sleep deprived. A third of Americans sleep fewer than six hours per night, which is up from just 2 percent in 1965. We're working harder than ever. American men and women are working 12 to 13 hours more per week today than we were in 1968. Stress levels are off the chart for most people. We don't feel like we have enough time for rest and leisure, and even when we do go on vacation, many of us compulsively check our email and social media accounts.

Finally, many of us live and work in isolating and alienating social environments that are disconnected from the natural world we evolved in and from other people.

It may seem like this has been going on for a while, but if you think of human history as a football field, and you started walking from one end of the end zone to the other, for the first 99½ yards, humans lived as hunter-gatherers. It's only in that last half-yard of that 100-yard football field that

we developed agriculture and only in the last few inches of that last half-yard that the Industrial Revolution occurred.

The profound mismatch between our genetic heritage and the modern environment that we live in today is responsible for the epidemic of modern disease that we're suffering from, and it also explains why the Paleo diet and lifestyle have helped so many people.