Mostly Plants

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Eat food. Mostly plants. Not too much.

—Michael Pollan\textsuperscript{1} The Omnivore’s Dilemma

There is a growing convergence of scientific evidence that an optimal diet is mostly plant based, consisting pre-
dominantly of fruits, vegetables, whole grains, legumes, and
soy products. A healthful diet is also low in refined carbo-
hydrates, saturated fat, and trans fats and high in complex
carbohydrates with adequate omega-3 fatty acids.\textsuperscript{2}

In this issue, Kottler et al\textsuperscript{3} review studies indicating that
a plant-based diet combined with nuts, soy, and/or fiber
reduces low-density lipoprotein (LDL) cholesterol by an
average of 25\% to 30\%. This is comparable to what can be
achieved with statin drugs but without the costs and poten-
tial side effects. Last year, almost $20 billion was spent on
statin drugs in the United States. At a time when health care
reform is at center stage, the potential cost savings of re-
ducing the need for statin drugs by changing diet and life-
style is of great interest.

When most patients are diagnosed with hypercholester-
olemia, they are usually advised to follow the dietary guide-
lines of the American Heart Association or the National
Cholesterol Education Program. However, these moderate
changes in diet usually result in only modest reductions in
LDL cholesterol levels,\textsuperscript{4} at which point lipid-lowering drugs
are usually prescribed. Most patients are not given the
option of making more intensive changes in diet and life-
style such as a plant-based diet, because of the belief that
they will not follow them.\textsuperscript{5}

This belief often becomes self-fulfilling. “Mr. Jones,
your LDL cholesterol level is elevated. I know you wouldn’t
follow a plant-based diet or even a modified plant-based
diet, and why would you want to when I can give you a
statin drug and that will do it?” So the patient takes the
drug, does not change his diet, and the doctor says, “See, I knew
he couldn’t change his diet.”

The idea that taking a pill is easy and that most patients
will adhere whereas changing diet and lifestyle is difficult if
not impossible is not supported by most studies. In fact,
research shows that up to 60\% of patients prescribed lipid-
lowering drugs are not taking them only 6 months after
initiating treatment.\textsuperscript{6} Why? Because patients are asked to
take a pill that does not make them feel better in the hope of
preventing something frightening, such as a myocardial
infarction or stroke, which most people do not want to think
about, so they usually do not.

However, when people make comprehensive lifestyle
changes, including a plant-based diet (or a modified plant-
based diet), they often feel so much better, so quickly, that
it reframes the reason for making these changes from fear of
dying, which usually is not sustainable, to joy of living,
which often is.

Evidence suggests that a plant-based diet is beneficial for
preventing and treating a variety of chronic diseases. In
addition to the effects of a plant-based diet on hypercholes-
terolemia, these include coronary artery disease, diabetes,
hypertension, obesity, prostate cancer, breast cancer, and
other conditions. In other words, it is not 1 diet for heart
disease, another for diabetes, and another for hypercholes-
terolemia. A reason that these conditions are often associ-
ated is that they often share common diet and lifestyle
origins.

The National Institutes of Health and AARP study of
500,000 subjects reported that the consumption of red meat
was significantly associated with increases in total mortal-
ity, cardiovascular mortality, and cancer mortality.\textsuperscript{7} Mea-
sures of cardiovascular disease such as flow-mediated va-
sodilation as well as LDL cholesterol and inflammation
worsened on a typical Atkins diet but improved significantly
on a low-fat, whole-foods, plant-based diet.\textsuperscript{8}

What we include in our diet is as important as what we
exclude. Plant-based foods contain =100,000 disease-pre-
venting nutrients, such as phytochemicals, bioflavonoids,
carotenoids, retinols, isoflavones, genistein, lycopene, poly-
phenols, sulforaphanes, and so on.\textsuperscript{9} They are also low in
disease-promoting constituents such as saturated fats, trans
fatty acids, dietary cholesterol, and sugar.

For example, blueberries contain phytochemicals called
anthocyanins that may improve memory. Tomatoes are rich
in lycopene, an antioxidant that may help reduce the risk for
coronary artery disease, breast cancer, lung cancer, and
prostate cancer. Ginger contains a compound called gin-

erol that may lower blood pressure and increase circula-
tion. Pomegranates are rich in phytochemicals that may help
prevent prostate cancer by reducing deoxyribonucleic acid
damage and may increase myocardial perfusion in those
with ischemic heart disease.\textsuperscript{10} Kale contains luting, an
antioxidant that protects against macular degeneration.

Studies are showing that although isolated vitamins may
not be beneficial, plant-based foods that contain these vita-
mins often are protective. For example, \(\beta\)-carotene supple-
ments were found to increase the risk for lung cancer in
smokers, whereas foods such as carrots that are rich in
\(\beta\)-carotene were found to lower the risk.\textsuperscript{11}

In our studies, my colleagues and I at the nonprofit
Preventive Medicine Research Institute, in collaboration
with other institutions, found that a plant-based diet (along
with moderate exercise, such as walking 30 minutes/day,
stress management techniques such as meditation and yoga,
and increased social support) was able to stop or reverse the
progression of even severe coronary artery disease as mea-
sured by exercise thallium scintigraphy,\textsuperscript{12} radionuclide ven-
triculography,\textsuperscript{13} cardiac positron emission tomography,\textsuperscript{14}

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and quantitative coronary arteriography.\textsuperscript{15} There was even more improvement after 5 years than after 1 year, and there was a direct correlation between the degree of change in diet and lifestyle and the degree of improvement in percentage diameter stenosis. Also, we found 2.5 times fewer cardiac events.\textsuperscript{16} We conducted a randomized controlled trial indicating that the progression of early-stage prostate cancer was slowed, stopped, or reversed in patients who followed a plant-based diet and lifestyle intervention.\textsuperscript{17}

We are gaining a greater understanding of some of the genetic mechanisms by which these diet and lifestyle changes are beneficial. For example, we found that this intervention caused beneficial changes in gene expression in >500 genes in only 3 months, upregulating disease-preventing genes and downregulating oncogenes that promote breast cancer and prostate cancer and also downregulating genes that promote inflammation and oxidative stress, which often contribute to the cause and progression of coronary artery disease.\textsuperscript{18} We also found that these lifestyle changes increased telomerase, the enzyme that lengthens telomeres, the ends of our chromosomes that affect longevity.\textsuperscript{19} Even drugs have not been shown to do this.

Also, what’s good for you is also good for our planet. Animal agribusiness generates more greenhouse gases than all transportation combined.\textsuperscript{20} The livestock sector generates more greenhouse gas emissions as measured in carbon dioxide equivalent than transportation (18% vs 13.5%). Also, it accounts for 9% of the carbon dioxide derived from human-related activities. It generates 65% of the human-related nitrous oxide, which has 296 times the global warming potential of carbon dioxide. It is also responsible for 37% of all the human-induced methane, which is 23 times more warming than carbon dioxide. Nitrous oxide and methane mostly come from manure, and 56 billion “food animals” produce a lot of manure each day. Also, livestock now use 30% of the earth’s entire land surface, mostly for permanent pasture but also including 33% of global arable land to produce feed for them. As forests are cleared to create new pastures, it is a major driver of deforestation: some 70% of forests in the Amazon have been turned over to grazing.

Finally, eating lower on the food chain is a more efficient way to produce protein. It takes significantly more resources to produce meat-based protein than plant-based protein. As the earth’s population continues to increase and resources decrease, choosing to eat more plant-based foods frees up more resources to help feed others. Knowing that the food choices we make each day not only help ourselves and our family but also our planet often brings a sense of meaning; for many people, this is a powerful motivator.

Many people tend to think of breakthroughs in medicine as new drugs, lasers, or high-tech surgical procedures. They often have a hard time believing that the simple choices that we make in our lifestyles—what we eat, how we respond to stress, whether or not we smoke cigarettes, how much exercise we get, and the quality of our relationships and social support—can be as powerful as drugs and surgery, but they often are. Sometimes, even better.


5. Ornish D. Statins and the soul of medicine. \textit{Am J Cardiol} 2002;89:1286–1290.


