

Eat Meat? Evidence of Harm to People and Planet, and a Sustainable Food Secure Opportunity

Introduction

In October 2019, just about the time this book is going to press a series of articles were published in the *Annals of Internal Medicine* by a new group of investigators who systematically examined the evidence that red meat and processed meats were harmful to human health. They were reacting in part to the 2015-2020 Dietary Guidelines for Americans which recommended just one serving of red or processed meat each week. The World Health Organization issued an advisory in 2015 labeling red meat as “probably carcinogenic” and processed meat as “carcinogenic”. The main conclusion of these articles contradicted the 2015 advisory that the evidence for harm is not zero but is less than some might expect. Given the relatively large quantity of meat consumed by the average person in Western cultures like the U.S., we interpret the preponderance of scientific evidence from the most qualified sources to demonstrate that it is critically important for most people to reduce meat consumption from current levels.

If you are considering how much and what kind of meat to consume, how do you know what is acceptable? Reports continue to issue on all sides of the question about what quantity of meat consumption is or is not healthy. Some people advocate veganism or vegetarianism, others promote eating lots of meat to provide quality proteins and vitamins. “New” reports seem to issue weekly seeking to “settle” the debate on meat consumption but serve only to stir more debate. Chapter 1 points readers to scientific reports which should be considered more strongly by describing a basic understanding of the types of scientific studies. From tissue cultures to large population and synthesis studies, each type offers strengths and weaknesses. We believe it is critical for a person who really wants to understand dietary recommendations to understand how nutritional research is conducted. There are inherent strengths and limitations in any type of study, and some should carry more weight than others. When many reports by qualified researchers arrive at similar conclusions over time, that preponderance of evidence should be valued heavily.

The aggregate of multiple synthesis reports over many years provides compelling evidence that suggests the consumption of a little meat – mostly poultry and fish, minimal red and very little processed meat - is not necessarily harmful to human health. It is certainly not necessary to eat meat to maintain health in most situations. The most compelling argument against meat consumption is the effect of meat production on environmental health. The use of monoculture agriculture to produce livestock feed drives soil erosion, soil quality decline, biodiversity loss, species extinctions, deforestation and greenhouse gas emissions from livestock, especially ruminants through methane release, but livestock waste and carbon release from soil does produce a lot of nitrous and carbon dioxide.

This book is divided into three sections. Chapters 2 through 6 focus on the impact of food consumed on human health. Chapters 7 through 9 present impacts of meat production on environmental health with a view to an alternative food production system fully capable of feeding a growing global human population. The final Chapters, 10 and 11, invite consumers to a healthier diet by providing rationales for why consuming less meat is ethical and financially expedient for individuals, populations of taxpayers, and is critical to protecting remnant biodiversity that will be required to maintain an inherently sustainable agroecological food production systems and protect food security.

Chapter 2 considers disease in general; our goal is to place the impact of meat consumption on health and chronic disease in perspective with the variety of problematic chronic diseases. Some dietary

zealots would have us to think that all chronic disease is related to meat consumption. In truth, disease develops because of a host of genetic and environmental factors. Infections, addictions, autoimmune disease, injury, social connectedness, and aging all impact our health.

The effect of meat consumption on human health is complex. The scientific evidence that meat is harmful is detailed in Chapter 3. Heavier meat consumption is associated with weight gain and higher incidence of diabetes; diabetes also diminishes health and increases risk of chronic disease. The health benefits of reduced meat consumption are greatly influenced by what replaces meat calories in the diet. A proper dietary pattern which includes generous portions of vegetable and fruits, whole grains, severely limited refined carbohydrates, and limited processed foods - diets similar that described by T. Colin Campbell in rural China and by Denis Burkitt in Uganda in middle of the last century - are associated with large reductions in many of the chronic diseases prevalent in the developed world.

Chapter 4 is an important bridge between the evidence about meat consumption and disease, and a broader perspective on how dietary science has evolved over the last century. Nutritional science and hence dietary recommendations before the turn of the 21st century placed greater emphasis on the composition of foods than dietary patterns. Hence, the American Heart Association dietary guidelines limited cholesterol and saturated fats. Focus was placed on recommending minimal dietary allowances to minimize exposure to less healthful nutrients while obtaining adequate quantities of essential vitamins and minerals. The dream of nutrition in the 1990's was that increased consumption of certain vitamins would result in protection from chronic diseases. Nutritional science can be partially excused for its emphasis on dietary components since this resulted in some of its earliest achievements: the use of vitamin C to prevent Scurvy and vitamin D to prevent Rickets but the failure of vitamin supplements to improve health and prevent disease must also be documented. Chapter 4 is designed to create some skepticism regarding the food industry and the prescription drug industry. Ultra-processed foods such as those with trans-fats have likely caused chronic disease. Drugs can be effective in preventing chronic disease but are not an effective substitute for a healthy diet and lifestyle.

With the understanding of what evidence to value and how meat contributes to chronic disease, ideal diets as recommended by nutritional experts are presented and assessed in Chapters 5 and 6. Twenty-first century dietary recommendations emphasize dietary patterns, the Mediterranean and DASH diets, rather than individual dietary components. Switching to these dietary patterns should reduce chronic disease and encourage weight loss. People will choose to change their diet and lifestyles only when they completely understand this issue and possess authentic information about what constitutes a sustainable and healthful diet. Reduction in red meat consumption is one of many components of a healthy diet and lifestyle. It is important to think about this issue and understand the science that has led to these recommendations. In this regard, we want this book to provide cognitive behavioral therapy for those wanting to consume a diet ideal for their health and good for the environment.

Chapters 7 and 8 detail impacts on environmental health, positive and negative, from producing livestock for meat. While the negative impacts of meat consumption on human health, although significant, might be somewhat less than many expect, impacts of meat production on environmental health in the current industrialized monoculture system are decidedly worrisome. Huge chunks of the Earth's terrestrial surface are devoted to food production so small local impacts have large global effects. Large land areas of the U.S., South America, and Europe are planted to corn and soybean each year, most of which is used for animal feed or fuel. While agricultural systems utilized extensive multi-crop rotations of grains, vegetables, fruits and livestock in the past, intensive systems today are decidedly simple affairs of corn and soybean rotations or continuous corn by grain producers, or egg, or chicken,

or beef, or pork producers. Farmers must excel in producing one crop and leverage larger farm size to stay financially solvent with an incredibly low profit margin or get out of farming altogether. It should not be too surprising then that intensive monocultures over large land areas is decimating biodiversity by virtue of habitat loss. Soil lost, nutrients, and pesticides applied to crops end up in fresh water and coastal areas where they do their bidding intended originally for crop fields.

The confined animal feeding operations (CAFOs) described in Chapter 8 improve human labor and feed conversion efficiencies over free range systems, but there are costs to consider as well. It requires less feed to produce meat, eggs or milk in a CAFO, so if we as society intend to continue to eat the quantities of these foods we do, less agricultural land will be required to produce the feed required by animals in CAFOs. On the other hand, the greenhouse gas (GHG) footprint of livestock, especially the methane from ruminants, is easily among the largest drivers of global climate change (GCC). Indirect sources of GHGs are just as onerous, burning forests to make way for livestock production releases carbon dioxide, as soil tillage in feed production fields from soil organic matter, or the Haber Bosch process to produce nitrogen fertilizer. The point is that we should eat less meat to reduce emissions. And if we do follow dietary patterns that promote human health, the much smaller quantity of meat required by the public may be produced in sustainable agroecological systems that do not require CAFOs.

That many ecologists seem to focus intensely on the protection and restoration of forests and prairies risks obfuscating the largest global cause for loss of global ecological health – agriculture! Chapter 9 is devoted to describing what mainstream sustainable agriculture is and makes the case that while this movement of some fifty years does generally promote improved environmental health, the rate of change is too slow and is inherently unsustainable overall because this system is predicated on intensive industrialized monoculture feed production systems. The engagement of ecologists in food production will be requisite to inform the practices of agroecology. Agroecological systems that model principles of natural ecosystems proven to be sustainable for millennia (think forests and prairies) offer tremendous potential to protect the integrity of the global ecosystem. A common concern about converting the current monoculture system to agroecosystems is lack of presumed capacity to feed a growing global human population. First, evidence is available that indicates polycultures produce more food per unit of land area than most monocultures. Second, to intensify current systems will only increase the rate of environmental decline and future food production capacity. Monocultures of corn and soybean in Western culture are devoted to the production of feed grains in intensive industrialized systems motivated to produce meat calories with maximum labor efficiency. Labor use efficiency is favored in deference to low efficiency of fertilizer, water, soil, and light. Agroecosystems will ‘cost’ more labor while enhancing virtually all other efficiencies and environmental health. A successful trajectory toward future food security is improvement of the global ecosystem by featuring polycultures in food production, like polycultures are features of healthy natural ecosystems.

Chapter 10 provides a principled basis and Chapter 11 concludes with pragmatic reasons for consuming less meat. While government will need to be involved in motivating change in diet and food production systems, heavy handed law or executive order about what to and not to eat have not worked well in the past nor are likely to in the future. Rather, fact-based policies that promote accurately informed individual autonomy of food choice, distributive justice to ensure that all people have reasonable access to healthful foods, and protection of future food production capacity by improving ecosystem function. Eliminating crop subsidies on feed grains and potentially transferring those subsidies to fruits and vegetables would have a significant impact on meat and produce costs in directions consistent with ideal diet. Pragmatically, we are paying for poorer food and lifestyle choices already in the form of externalized costs, largely taxes and healthcare. If we can promote a culture with less diet-induced chronic disease, healthcare costs should decline, and life expectancy improve.

Consuming less meat promotes human and environmental health. The preponderance of evidence generated by scientific experts in health and nutrition over decades demonstrates that people who limit red meat consumption and instead consume eight or more servings of fruits and vegetables daily, while limiting salt and sugar intake, are more likely to experience greater longevity and quality of life. To achieve these health goals, it will be necessary to limit red meat and move toward an ideal dietary pattern heavy in fruits and vegetables and an aerobically active lifestyle. Reduced meat consumption implies less meat will need to be produced, a potential boon to environmental health. Adoption of highly integrated agroecological systems oriented to produce a variety of fruits, vegetables, and mostly poultry or fish should be modeled after the principles of demonstrably sustainable natural ecosystems. These systems will probably require greater investment of human labor but could produce large improvements in light, water, nutrient, and energy use efficiencies per calorie of quality food produced. Polyculture agroecosystems provide the capacity to feed a growing global human population in the decades to come while simultaneously restoring local and biospheric environmental health.