Meat of the Matter

Why steaks could be in, but hot dogs are still out

John Durant really likes meat, but he does not keep much of it in his refrigerator—there is not enough room. Instead he stores his meat in a large white freezer chest in his shared Manhattan apartment. Durant, 29, opens the chest and pulls out some frozen chunks of venison wrapped in butcher paper. He digs through the ice to find a couple of cuts of grass-fed beef. He shows me lamb kidneys, pork fatback and ham hocks. As a proponent of what is known as the Paleolithic diet, Durant tries to eat the same way our evolutionary ancestors did. That means big portions of meat, usually red meat—cooked beef, pork, lamb or flesh from other mammals—almost every day.

Durant, who is currently completing a book on the Paleolithic lifestyle, is correct about at least one thing. Without meat, humanity would probably not be where it is today. Evolutionary biologists have shown that hunting game and eating cooked meat significantly altered human anatomy and likely helped us develop bigger brains. Today meat is the largest source of protein in all affluent countries except Japan. Annual global consumption of meat might reach 376 million tons by 2030.

Yet most people in industrial nations live far more sedentary lives than early humans living millions of years ago. Whereas our ancestors worked hard to gather any food at all and most likely confronted the possibility of starvation between successful kills, many of us have easy access to calorie-rich meats whenever we want. Are we in fact eating more meat than is healthy?

Twenty years ago most nutritionists would have said, "Yes," especially when it comes to fatty cuts, such as hamburger or ribs. After all, the human body readily converts the saturated fat in such meats into cholesterol in the blood, which can in turn lead to atherosclerosis—a leading cause of both heart attack and stroke. In recent years, however, some researchers have questioned whether the link between red meat and cardiovascular disease is as strong as has long been assumed.

A few studies have begun to suggest that some of the ways in which meat is processed—that is, preserved with chemicals—or cooked may be more worrying than its saturated fat content. In addition, researchers now emphasize the importance of looking at the whole diet when trying to figure out what constitutes healthy eating habits. For example, deciding to cut back on red meat while compensating for the loss with comfort foods such as pizza, white bread and ice cream will probably not help anyone. In line with these more nuanced views, many nutritionists have tempered their advice. "A shotgun approach telling people to avoid all red meats may not be the biggest bang for your buck," says Dariush Mozaffarian, an epidemiologist at Harvard University. "Not all meats are the same. We have choices." How to make those choices, however, is the subject of ongoing debate.

MAN MEETS MEAT

BEFORE DELVING into recent, sometimes contradictory, findings about how eating red meat changes our health, it is worthwhile to consider the dietary habits of our evolutionary ancestors. Although the record is by no means complete—and our ancestors' diets varied widely by geography—paleontologists have gathered enough evidence to mark a few milestones. If we travel far enough back in time, to when our predecessors first split off from the last common ancestor we share with chimpanzees, they probably ate fruits, leaves and a smattering of termites. Meat was a very rare treat. As long as three million years ago, however, our ancestors had apparently learned to slice meat off of animal bones with stone tools. At first, these early humans might have primarily scavenged the kills of other predators, stealing bits of

CHRISTOPHER GRIFFITH *Trunk Archive*

meat from a felled gazelle or chasing off smaller carnivores. Learning to cook with fire (at least 400,000 years ago) and the invention of stone spearheads (at least 200,000 years ago) dramatically improved our ancestors' chances of eating their fill.

Regularly eating meat and cooked foods changed our anatomy. Our teeth became smaller and less pointy, our colons shrank and our large intestines grew, all of which improved our ability to chew and digest soft, cooked foods. Calorie-dense meats likely enabled the tripling of our brain size as well. These and other adaptations helped our ancestors survive in a time very different from our own. The pertinent questions for today are whether the diets of our evolutionary past have any bearing on our current situation and how our modern approaches to preparing and consuming meat change our health.

RESERVATIONS ABOUT PRESERVATION

IN TRYING TO ANSWER THESE QUESTIONS, it is important to note right away that nutrition research is notoriously difficult to conduct. After all, scientists cannot ethically force some people to dine exclusively on red meat while others munch on lettuce to demonstrate the long-term health effects once and for all. But researchers have done the next best thing: surveying large groups of people about their diets.

Two studies from different teams of Harvard researchers exemplify the growing recognition that not all types of meat are equally unhealthy. This past spring Frank Hu and his colleagues concluded that eating red meat was indeed linked to a greater risk of cardiovascular disease, cancer and death from any cause. Specifically, each additional daily serving of unprocessed red meat (a serving is about the size of a deck of cards) increased the chances that someone would die by 13 percent; processed meat bumped up the death risk to 20 percent. These risks were calculated over a 22-year period for men and 28 years for women.

Translating those numbers into everyday terms requires some sophisticated math. Statistician David Spiegelhalter of the University of Cambridge used Hu's results to calculate that an adult who eats an extra serving of red meat each day would lose one year of life expectancy. Consider what that means for a healthy 40-year-old male, who can be expected to live another 36.2 years, according to FindtheData.org's analysis of the relevant Social Security data. Instead of making it just past his 76th birthday, he instead lives to 75.2 years. Nothing to shrug off—but certainly not the most deadly habit. Men and women who smoke, for example, lose an average of 13.2 and 14.5 years of life, respectively according to the Centers for Disease Control and Prevention.

Hu's study was not without limitations. It relied on self-reported surveys, which can skew the results in several ways. Equally problematic, it turns out that the participants who ate the most red meat were also more likely to smoke, drink alcohol in excess and exercise less often, making meat consumption seem unhealthier than it may truly be.

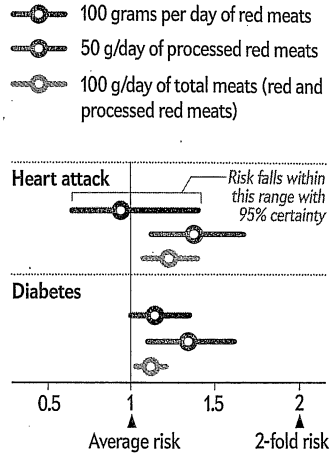
An alternative to Hu's conclusions emerged from another team at Harvard, led by Mozaffarian, who compiled and reviewed the results of 20 studies on eating meat. These 20 studies included data from more than 1.2 million people, whereas Hu's study looked at data from just over 120,000. The meta-analysis found no greater risk of death or disease tied to red meat in general; instead it singled out the dangers of processed red meat, such as bacon, salami and hot dogs. Mozaffarian and his colleagues associated each daily 50-gram serving of processed red meat with a 42 percent higher risk of heart disease and a 19 percent higher risk of diabetes.

As in Hu's study, people who eat a lot of hot dogs and cold cuts might be less healthy overall. But such strong associations from a large review are nonetheless intriguing. Why would processed red meat be so much worse than unprocessed red meat? Both have fairly similar levels of saturated and unsaturated fats. In every 50-gram serving, however, processed meats contain more calories and less cholesterol, protein and iron than red meat.

The biggest discrepancy is the level of salt and other preservatives: processed meats generally contain four times more sodium than red meats and 50 percent more preservatives, particularly chemical compounds known as nitrates and nitrites, which help to kill bacteria and give meat an appealing pink or red hue. Some processed meats also contain nitrosamines, which form nitrites when meat is cooked at high temperatures or exposed to the acidity of the human stomach. Salt has been linked to higher blood pressure in susceptible individuals. Nitrates harden arteries and trigger metabolic changes that mimic diabetes. And nitrosamines have been linked to cancer in rodents, monkeys and people. (Mozaffarian's study did not address cooking methods. Survey studies suggest that people who eat a lot of well-done, fried or barbecued meat are slightly more likely to develop colorectal or pancreatic cancer.)

Ultimately, evaluating someone's health based on meat consumption alone, while ignoring other dietary choices and personal habits, does not make sense. Although humans no longer depend on meat in the same way as our ancestors, red meat remains an important global source of protein, iron and vitamin B_{12}. The best available evidence makes a convincing case against consuming too much processed red meat and overcooked meats but not necessarily against modest amounts of red meat. That is welcome news for those of us who enjoy the occasional steak—as well as for John Durant and his meat locker. SA

The Perils of Processed Meat



META-ANALYSIS of 20 studies found that eating red meat is not associated with statistically significant higher risks of cardiovascular disease or diabetes, despite a positive trend for the latter. Processed red meat, however, did increase risk for both conditions.

GRAPHIC BY JEN CHRISTIANSEN; SOURCE: "RED AND PROCESSED MEAT CONSUMPTION AND RISK OF INCIDENT CORONARY HEART DISEASE, STROKE, AND DIABETES MELLITUS: A SYSTEMATIC REVIEW AND META-ANALYSIS," BY RENATA MICHA, SARAH K. WALLACE AND DARIUSH MOZAFFARIAN, IN *CIRCULATION*, VOL. 212, 2010

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