

# Red Meat in Moderation: Better for you, Better for the Environment

Don't forget to add some green veggies to those summer barbecues!

July 30, 2026 By Fred Hutch News Service and Diane Mapes

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## Key Takeaways:

- **Moderation matters:** Red meat isn't inherently "bad," but Americans eat far more than recommended.
- **Higher consumption leads to more risk:** Red meat is linked to colorectal cancer, cardiovascular disease and higher overall mortality.
- **Cancer risk:** High intake of red meat is associated with ~30% increased colorectal cancer risk, rising to ~40% for processed meat.
- **Processed meat poses greatest concern:** WHO classifies processed red meat as carcinogenic and unprocessed red meat as a possible carcinogen.
- **What can you do?** Cut back on red meat consumption for better health and to protect the environment.

Hot dogs and hamburgers are a Fourth of July tradition, as American as apple pie and, alas, high rates of [colorectal cancer](#).

The U.S. has among the highest rates of colorectal cancer, or CRC, in the world, and early-onset CRCs, i.e., diagnoses in people under the age of 50, are rising rapidly. Has our lifelong relationship with red meat finally gone south?

Yes and no, says Fred Hutch Cancer Center's [Kalyan Banda, MD](#), a medical oncologist and [glycobiologist](#) who recently coauthored a new interdisciplinary review published in *Science* that argues red meat, once an essential component of human evolution, has become a significant threat to human health and our planet's sustainability.

First, a fact check: Humans haven't *had* a lifelong relationship with red meat, Banda said. The paper, "Red Meat in Human Evolution, Health and Disease: From a Blessing to a Curse?," traces animal-food consumption back millions of years, showing that early hominins were not the single-minded meat-eaters of popular imagination. But they weren't vegetarians either.

Animal tissue became a regular part of the diet around two million years ago, marking a genuine evolutionary turning point that helped make humans human. What our ancestors prized most, though, was fat, marrow and nutrient-dense organs from a wide range of wild animals, eaten alongside varied plant foods. Modern red meat — in particular, mass-produced muscle from a handful of domesticated species — is a recent invention that only superficially resembles what shaped our biology.

But this misinterpretation of human history has driven us to accept — even embrace — meat as the mainstay of our meals. The revamped U.S. dietary guidelines even include a thick rib-eye steak at the top of the food pyramid. As the authors said in their paper, "The nature, scale, and context of red meat consumption today differ drastically from those of our evolutionary past."

And that's a big problem for our health, said Banda, who treats [gynecological cancers](#).

"Excess of anything is a bad thing and that includes red meat," he said. "The amount of red meat we consume today is quite a lot and it has a clear association with medical problems like cardiovascular disease, stroke and what's called 'all-cause mortality'. The higher consumption of red meat that we have, the higher mortality rates humans have. And there is a clear association with cancers, too. The World Health Organization actually ranks processed red meat as a carcinogen and unprocessed red meat as a possible carcinogen."

### Should we move past meat?

Banda is not anti-meat at all. Growing up in India he didn't eat much of it, mainly because it wasn't really around. But many other delicious foods were (one of his favorites is eggplant).

"Growing up, it was rarely available and was like a special treat," he said. "Here, I could have red meat with every meal. My red meat consumption went up dramatically when I moved here."

But not so much that it's become a health risk. Moderation, he said, is the key.

"It's easy to demonize something," he said. "What we're saying is red meat was an extremely important evolutionary adaptation that really did contribute to humans becoming humans. But at this point, the amount we consume is quite a bit and it has associations with bad health outcomes. Does it mean we should cut out all red meat? It's hard for humans to do extreme things. So I say everything in moderation."

It's also important to think about how much we eat, he said, and what form we're eating, because the form meat comes in also matters.

“Processed red meat has a higher association with worsening health outcomes,” he said.

What does that mean for people who believe hot dogs and hamburgers are essential for a successful Fourth of July?

“They should go ahead and grill hamburgers and hot dogs,” he said. “But that’s not the only thing they should grill. They can also have white meat, like chicken, which doesn’t have the same degree of association with bad health outcomes. I would say a little less of the hamburgers and hot dogs, a little more of the vegetables and white meat.”

## How does red meat affect our health?

Banda and his co-authors (Juston Jaco, PhD, Ajit Varki, MD, and Pascal Gagneux, MS, PhD) relied on a mountain of research for their paper, including work done by Fred Hutch Public Health Science (PHS) Division researchers [Johanna Lampe, PhD, RD](#), [Marian Neuhouser, PhD, RD](#) and professor emeritus [Ross Prentice, PhD](#).

In 2022, the researchers published a large meta-analysis in the [Journal of Nutrition and Nutritional Epidemiology](#) seeking to clarify the role that red and processed meat play in chronic disease risk in the diets of post-menopausal women (they used a Women’s Health Initiative cohort for their research).

In 2015, WHO’s cancer agency classified processed meat as “carcinogenic to humans” and unprocessed red meat as “probably carcinogenic to humans,” also reporting that “every 50-gram portion of processed meat [that’s about one hot dog] eaten daily increases the risk of colorectal cancer by 18%.” A few years later, however, other studies pooh poohed that finding. Fred Hutch public health researchers tried to glean the actual truth.

What did they find?

“Our results indicate that it’s a good idea for U.S. populations, most directly for postmenopausal women, to avoid a dietary pattern that is high in meat content especially if that pattern ... includes high intakes of saturated fat, total calories and sodium,” Prentice said of the work.

More recently, Fred Hutch’s [Ulrike \(Riki\) Peters, PhD, MPH](#), a molecular and genetic epidemiologist, provided additional insights into the risks people face with red meat consumption.

In a [study published in 2024](#), she and colleagues pooled participants from 27 studies to analyze genetic data from around 30,000 colorectal cancer patients and approximately 39,000 healthy control participants. In addition to diet, the researchers looked at age, amount of food intake, weight and other factors. Results showed that older adults, those who were obese, those who ate more calories every day, and those who ate more red meat were all at greater risk for developing CRC.

“Participants with the highest intake of red meat had a 30% increased risk of colorectal cancer and

those with the highest intake of processed meat had a 40% increased risk,” said Peters, who holds the Fred Hutch 40th Anniversary Endowed Chair.

But, she added, “due to genetic variability, a subset of the population faces an even higher risk of colorectal cancer if they eat red or processed meat.”

Peters, with biostatistician [Li Hsu, PhD](#), went on to create an easy risk assessment tool people can use to evaluate their own personal risk for CRC. The [MyGeneRisk Colon](#) online app is free and can be paired with DNA results from consumer genomics companies to give a more detailed picture of colorectal risk.

## How does meat production affect the environment?

Unfortunately, the heavy consumption of red meat can be harmful in other ways. Banda found the cost to the environment even more worrisome than the risk to human health.

“Going over the environmental impact of red meat was personally shocking to me,” he said. “The amount of energy, water and farmland resources you have to invest to get one pound of steak is enormous. It shocked me more than the other data.”

What is that impact? The paper points to these findings:

- Nearly 40% of the world’s grain goes to livestock feed rather than food for humans.
- Intensive rearing practices have degraded terrestrial and aquatic ecosystems, depleted water resources and exacerbated a warming climate.
- Production and consumption of meat is linked to climate change with three major greenhouse gases propelling significant atmospheric alterations, contributing to 80% of today’s gross warming.
- Waste generated by extensive feeding operations is a major contributor to environmental pollution, seeping into groundwater and/or contaminating watersheds.

“In short, global red meat production and consumption poses immediate threats to the Earth’s biosphere and its inhabitants, yet the full extent of its impact remains largely unknown,” the authors wrote.

## Do we all have to stop eating meat?

Banda said he and his co-authors are absolutely *not* telling people to “go meatless.”

Rather, he wants people to consider their choices and weigh them against their health and that of

the planet. Meat is part of our culture, our customs, even our favorite childhood memories, he acknowledged.

But it is increasingly a big part of our health woes.

“The highest risk that’s been shown is always colorectal cancer,” he said, noting CRC is one of the fastest rising cancers in young people now in the U.S. “And we haven’t even talked about diabetes and stroke and heart attacks and atherosclerosis and hypertension and all of these other ‘diseases of civilization.’ They’re all linked in one way or another to our lifestyle.”

What does he want people to keep in mind for the coming Fourth of July holiday and all those days after?

“As a physician, I would say that the amount of meat we’re eating is probably a little too much,” he said. “As a Western society, we consume a lot of red meat and a lot of processed red meat, which clearly have consequences for both our health and our planet. So the takeaway is maybe cut down a little bit. There are costs to us, like direct health consequences. And there’s a cost to our environment.”

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