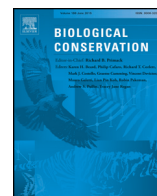




ELSEVIER

Contents lists available at ScienceDirect

Biological Conservation

journal homepage: www.elsevier.com/locate/bioc

Book review

M. Zaraska (Eds.), *The paradox of the carnivorous conservationist. Meathooked: The History and Science of Our 2.5-Million-Year Obsession With Meat*, 2016 Basic Books, New York, NY, 2016, (263 pp. \$26.99 (hardcover)). ISBN 9780465036622)

As conservation scientists, we know our food choices have consequences for the planet. Meat consumption has well-documented impacts on biodiversity loss and climate change, in addition to human health. Yet, conversations about changing diet remain surprisingly taboo. If reducing meat consumption would help resolve the biodiversity crisis and improve human well-being, why do we continue to eat so much meat? Our own lab group is not exempt from this apparent paradox, as few of us consciously or consistently limit our meat consumption. To gain perspective on this predicament, we read Marta Zaraska's *Meathooked: The History and Science of our 2.5-Million-Year Obsession with Meat*.

As a self-described vegetarian, Zaraska wonders why her cravings for meat drove her to "cheat." And she is not alone; Zaraska notes that 60% of "vegetarians" have eaten meat in the last 24 h. Drawing on a rich literature from multiple disciplines, Zaraska uses metaphorical "meathooks" to explore the diverse reasons humans seem unwilling and unable to sacrifice meat as a cornerstone of their diets. Zaraska's first "meathook" focuses on the evolution of carnivores. She starts at the cellular level, explaining how "cheating bacteria" rid themselves of cell walls to become predators, and then she scales up to human communities. The development of traits such as the ability to form social bonds and create tools allowed humans to ingest more nutrient-dense foods like meat, reallocating energy so that our brains could grow and stomachs shrink. Human populations began to spread around the globe and sought out meat as a safe and consistent staple without the constraint of learning which new plants would provide non-toxic food sources.

In addition to the legacy of evolution, there are two cultural myths that may keep us hooked on meat, which Zaraska deftly dispels. First, we don't need nearly as much protein as historically recommended. According to Zaraska, today's guidelines suggest that a 68 kg human consume approximately 55 g/day of protein - quite a bit less than the 19th century recommendation of 150 g/day. Second, animal meat need not be the sole source of this protein, nor is it necessary for obtaining essential vitamins and minerals. Zaraska writes that diets with sufficient calories typically provide enough protein and minerals regardless of meat consumption. For instance, Zaraska notes that a single serving of black licorice packs four times the iron as a serving of steak.

Despite the lack of evidence that meat is critical to well-being for most people, Zaraska argues that rates of meat consumption remain high because of economic and political "meathooks." The \$200 billion meat industry is a powerful segment of the US economy; Tyson's revenue alone is four times the Gross Domestic Product of Belize. This industry works hard to maintain subsidies that benefit meat production and funds aggressive and widespread advertising campaigns (e.g., "Beef. It's what's for dinner"). Zaraska describes how the meat industry couples these advertisements with beef-centered K-12

education programs that together help generate \$186 billion dollars in meat sales annually in the U.S. alone. Parallels can be found in other countries, such as China, where meat consumption is a symbol of success for the growing middle class. To satisfy this burgeoning demand, the Chinese government heavily subsidizes the pork industry through grants and tax benefits.

Beyond economic and political forces, past cultural norms may also shape meat consumption today. Zaraska explores meat's religious ties, from Judaism, to Christianity, to Hinduism. For example, Zaraska tells the story of failed vegetarian movements in the United States led by religious leaders, the Kellogg brothers and Sylvester Graham, in the early 1800s. The vegetarian mantra extolled by these leaders was tied to strict Christian sects that eschewed decadence (including flavorful food). Thus, vegetarianism became associated with soggy, tasteless vegetables. Two of these gentlemen met untimely deaths - due to health problems unrelated but widely attributed to their diets - and the vegetarian movement quickly fizzled in the U.S., not to return until the late 1900s. In contrast, Zaraska describes the powerful and enduring influence of an ancient Indian emperor who popularized vegetarianism as a path to spiritual fulfillment. Notably, Emperor Asoka reigned over a country which produced flavorful spices and protein-rich legumes, providing tasty alternatives to meat-based dishes.

Zaraska concludes by depicting the likely future of humanity's relationship with meat. This is to say, a future where we run out of resources to equitably meet current demands for animal protein. She proposes alternatives such as farming insects as food for cattle - or humans - and imposing a meat tax. She also describes the emerging potential of synthesizing meat in labs, a technology not yet ready for mass consumption, with its hefty price tag of \$66,000 per ounce. Instead of advocating strict vegetarianism, which carries cultural stereotypes and is unpalatable for some, she suggests widespread adoption of a "reductarian" lifestyle. In this way, earth and health conscious carnivores can enjoy meat in moderation, perhaps by instituting "Meatless Mondays" or consuming meat only on weekends. Compared to her discussion of these strategies, however, Zaraska gives little attention to reducing waste as a means of reducing the footprint of meat consumption. In the United States, about half of the water used to produce food is wasted, and 30% of this food is discarded (Nellemann, 2009).

This book is journalistic writing at its best - entertaining and well-written while also drawing on a deep well of research from diverse disciplines. This book could be incorporated into college courses wrestling with global environmental challenges, used as a tool to elicit student discussion, and serve as a model of interdisciplinary scholarship. This book could also be a valuable resource for organizations adopting a "One Health" approach to sustaining human and natural communities. By unpacking the evolutionary, cultural, economic and political factors that shape our diet, Zaraska's book tackles some critical dimensions of animal, environmental, and human health so that we can envision a more sustainable future. Ultimately, *Meathooked* helped our lab understand our own cognitive dissonance and why it is so difficult to give up meat despite our best intentions for ourselves and the planet.

References

Nellemann, C., 2009. *The Environmental Food Crisis: The environment's Role in Averting Future Food Crises: A UNEP Rapid Response Assessment*. UNEP/Earthprint.

Hannah L. Riedl*

Department of Fish, Wildlife, and Conservation Biology, Colorado State University, Fort Collins, CO, USA

E-mail address: hanriedl@rams.colostate.edu

Drew E. Bennett

Department of Fish, Wildlife, and Conservation Biology, Colorado State University, Fort Collins, CO, USA

Anna M. Mangan

Department of Fish, Wildlife, and Conservation Biology, Colorado State University, Fort Collins, CO, USA

Lani T. Stinson

Department of Fish, Wildlife, and Conservation Biology, Colorado State University, Fort Collins, CO, USA

Kate Wilkins

Department of Fish, Wildlife, and Conservation Biology, Colorado State University, Fort Collins, CO, USA

Travis Gallo

Department of Fish, Wildlife, and Conservation Biology, Colorado State University, Fort Collins, CO, USA

Liba Pejchar

Department of Fish, Wildlife, and Conservation Biology, Colorado State University, Fort Collins, CO, USA

Available online xxxx