

How Brazilian cattle ranching policies can reduce deforestation

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Policies to intensify cattle production in Brazil could help cut greenhouse gas emissions. Credit: Davi Ozolin via Flickr, Creative Commons License: (CC BY-NC-SA 2.0)

A new study led by UC Berkeley researchers finds that policies to support sustainable cattle ranching practices in Brazil could reduce deforestation and the industry's greenhouse gas impact.

There is a higher cost to steaks and hamburgers than what is reflected on

the price tags at grocery stores and restaurants. Producing food – and [beef](#), in particular – is a significant source of [greenhouse gas](#) emissions, which are projected to grow as rising incomes in emerging economies lead to greater demands for meat.

But an encouraging new study by researchers at the University of California, Berkeley, and international collaborators finds that policies to support sustainable cattle ranching practices in Brazil could put a big dent in the beef and food industry's greenhouse gas impact.

The new study, to be published Monday, April 28, in the journal *Proceedings of the National Academy of Sciences*, found that by subsidizing more productive use of pastureland, and by taxing those who stick with less sustainable practices, Brazil could cut its rate of deforestation by half and shave off as much as 25 percent of all global [greenhouse gas emissions](#) from deforestation.

The researchers used an economic model of global land use to assess the effects of encouraging "semi-intensive" cattle ranching practices in Brazil. These practices include better management of pastureland by rotating where animals graze, planting better grasses more frequently, and amending the soil to unlock more nutrients. The authors noted that better land management could double productivity of pasturelands compared to conventional practices, thereby reducing the pressure to cut down more trees.

"These practices are already used commercially on some ranches in Brazil, but they're not yet cost-competitive because of higher upfront costs, so subsidies can provide a needed boost to make the investment worthwhile," said study lead author Avery Cohn, an independent fellow at the UC Berkeley Energy Biosciences Institute and a graduate of the Department of Environmental Science, Policy, and Management. "We found that it's possible to put policies in place that help good behavior

outcompete bad behavior."

Local changes, global impact

Over the past several decades, Brazil has risen to become the largest beef exporter in the world. More than 200 million cattle occupy upward of 494 million acres (200 million hectares) of land in Brazil, an area almost a quarter the size of the continental United States. Brazil is also second, behind the United States, when it comes to the production of beef.

While the growth of cattle ranching has been blamed for 75 to 80 percent of Brazil's deforested areas, particularly in the Amazon rainforest, the study authors emphasize that many factors beyond beef production cause deforestation. These include mining, logging and the production of other agricultural crops.

The researchers point out that roughly 200 million acres of cattle pastureland could be used more efficiently, either for higher yield cattle ranching or to grow other crops.

"Our study doesn't just ask whether policies affecting beef production will impact deforestation. We're the first to look at Brazil's national policies in an international context by asking what would happen if Brazil did this even if other countries did nothing," said Cohn, now an assistant professor of environment and resource policy at Tufts University. "Can the world see benefits from what Brazil does? Our findings indicate that the answer is yes."

Exploring options and tradeoffs

Because beef is such a greenhouse-gas intensive food, the researchers looked for unintended impacts, such as lowering beef prices to the point

where people want to consume more, or raising beef prices to the point where beef production is increased elsewhere.

"We did find that there was some increase in beef consumption with the policies, but one of the big takeaways from this study is that the effect is overshadowed by other gains in reducing deforestation and greenhouse gases," said Cohn, who was supported by the International Institute for Applied Systems Analysis while he was a UC Berkeley student.

The study authors say the subsidy and tax policies present a cost-effective method for Brazil to meet its greenhouse gas reduction targets.

"There's this notion that fighting climate change requires a stark tradeoff for emerging economies, that they must forego development to meet their emissions target," said Cohn. "This paper suggests that there is a pathway where that compromise may not be needed."

More information: Cattle ranching intensification in Brazil can reduce global greenhouse gas emissions by sparing land from deforestation, *PNAS*, www.pnas.org/cgi/doi/10.1073/pnas.1307163111

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