Eating less meat might not be the way to go green, say researchers

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Reduced meat consumption might not lower greenhouse gas emissions from one of the world's biggest beef producing regions, new research has found. The finding may seem incongruous, as intensive agriculture is responsible for such a large proportion of global greenhouse gas emissions.

According to research by University of Edinburgh, Scotland's Rural College (SRUC) and Brazilian Agricultural Research Corporation (Embrapa), reducing beef production in the Brazilian Cerrado could actually increase global greenhouse gas emissions. The findings were published this week in the journal *Nature Climate Change*.

Lead author Rafael Silva, of the University of Edinburgh's School of Mathematics, explains: "Much of Brazil's grassland is in poor condition,

leading to low beef productivity and high greenhouse gas emissions from cattle. However, increasing demand for meat provides an incentive for farmers to recover degraded pastures. This would boost the amount of carbon stored in the soil and increase cattle productivity. It would require less land for grazing and reduce deforestation, potentially lowering emissions."

While grasslands are not as effective as forests at storing carbon, Brazilian grass - mostly Brachiaria genus - has a greater capacity to do so than grass found in Europe, due to its long roots. High quality grasslands will cause more carbon to be stored in the soil, which will lead to a decrease in CO2 emissions. Grassland improvement involves chemical and mechanical treatment of the soil, and use of better adapted seeds along with calcium, limestone and nitrogen fertilisers. Most Brazilian grassland soils are acidic, requiring little nitrogen.

In the case of the Brazilian Cerrado, reduced meat consumption could remove the incentive for grassland improvement and therefore lead to higher emissions. The researchers worked out that if demand for beef is 30% higher by 2030 compared with current estimates, net emissions would decrease by 10%. Reducing demand by 30% would lead to 9% higher emissions, provided the deforestation rates are not altered by a higher demand. However, if deforestation rates increase along with demand, emissions could increase by as much as 60%.

Prof Dominic Moran, of the SRUC says: "The message of our research is to beware of unintended consequences. In some production regions, shifting to less meat-dependent diets would help curb climate change, but it is important to understand the nature of different production systems before concluding that reduced consumption will have the same effects in all systems."

More information: R. de Oliveira Silva et al. Increasing beef

production could lower greenhouse gas emissions in Brazil if decoupled from deforestation, *Nature Climate Change* (2016). DOI: 10.1038/nclimate2916

Provided by University of Edinburgh