Using Kangaroos to Produce Low-Emission Meat

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Using kangaroos to produce low-emission meat

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Introduction Australian agriculture contributes 16 % of the total national greenhouse gas (GHG) emissions , mainly methane and nitrous oxide . The methane comes from enteric fermentation , which is microbial fermentation during digestion of feed by ruminants , mostly domestic livestock-cattle and sheep . Enteric methane accounts for 67 % of the total agricultural emissions and 11 % of Australia's total emissions* . This means that methane from livestock is equivalent to two thirds the emissions produced by the Australian transport sector* . To reduce GHG emissions , the Australian Government has committed to implementing a cap and trade emissions trading scheme (ETS) by 2010 and to consult with the agriculture and forestry sectors on the terms and time frame for their inclusion in the scheme** . When agriculture is covered in the ETS , ruminant livestock owners or downstream service providers such as abattoirs and shipping terminals will have to account for livestock emissions .

Research projects to ameliorate the methane problem include changing diets and attempts to replace the methane-producing bacteria in the rumen by inoculating livestock with kangaroo microorganisms*** . Modifications to rumen physiology and new feeding regimes may be useful for intensive industries such as dairying and feedlots but cost effective self sustaining options for cattle and sheep on the rangelands are not readily apparent . This raises the prospect of a decline in extensive livestock industries because they continue to produce significant quantities of GHG**** .

Kangaroos are non-ruminant forestomach fermenters that produce negligible amounts of methane . One of the ways being trialled by Australia's livestock industries to reduce methane emissions is to introduce kangaroo gut microorganisms to cattle but this approach has not been successful . Our study tested another option , particularly for Australia's vast rangelands , that farmers use kangaroos to produce low-emission meat .

Materials and methods To analyse the option of reducing methane while producing an equivalent quantity of meat , we developed a spreadsheet model (Microsoft Excel 2007) . The model covered the period 2007 to 2020 and simulated changes in cattle , sheep and kangaroo populations in the kangaroo harvesting areas of the rangelands . We simulated gradually selling down the cattle and sheep whilst allowing the kangaroo population to rise .

Results On the rangelands where kangaroo harvesting currently occurs , increasing the kangaroo population to 175 million from 34 million while reducing the cattle and sheep by 20 % per year to 2020 would lower Australia's GHG by 16 .4 megatonnes or 3 % of Australia's total emissions .

Conclusions When livestock are included in Australia's emissions trading schemes , permits for kangaroo emissions will be significantly cheaper than those for cattle and sheep , perhaps providing the incentive for farmers to switch to kangaroos . The free ranging behaviour of kangaroos makes them more difficult to manage than livestock , presenting another set of challenges . To address these challenges , other research is trialling ways for farmers to manage kangaroos and increase the value of the kangaroo product . Work to date shows that farmers could collaborate with one another , support the existing kangaroo industry and build on the kangaroos conservation and animal welfare attributes . Throughout the world , wildlife plays an increasingly significant role in rural production processes . Kangaroos are adapted to Australia's variable environment and could play a large role in the rangelands producing low-emission meat .

References

Department of the Environment and Water Resources , National Greenhouse Gas Inventory 2005 (Australian Greenhouse Office , Canberra , 2005) .

P .Wong , Paper presented at the Australian Industry Group , Climate Change : A Responsibility Agenda , Melbourne , 2008 .

Ouwerkerk , D . , Klieve , A . V . , Forster , R . J . , Templeton , J . M . & Maguire A . , J . Characterization of culturable anaerobic bacteria from the forestomach of an eastern grey kangaroo , Macropus giganteus . *Lett . Appl . Microbiol .* **41** , 327-333 (2005) .

Howden , S . M . & Reyenga , P . J . Methane emissions from Australian livestock : implications of the Kyoto Protocol . *Aust . J . Agr . Res .* 50 , 1285-1291 (1999) .