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The environmental impact of beef production

A new study highlights the environmental impact of beef produced from specialist meat production based on suckler herds, as opposed to that based on the calves of dairy cows. According to the study, beef produced in this way has a greater impact in terms of greenhouse gas (GHG) emissions, acidification and eutrophication potential, and on land use.

Together, meat and milk are thought to account for around a quarter of the environmental impact of food consumption across all EU Member States[1]. Increasingly efficient milk production means that the number of dairy cows has fallen in Europe. However, this also means that a growing proportion of beef produced in the EU now comes from suckler herds rather than dairy calves. Suckler herds exist entirely for meat production, whereas beef from dairy calves comes from bull calves that have been separated from their mothers but still reared within dairy herds.

Taking into account the entire life cycle of the beef production process, the study finds that suckler herds are responsible for 27 kilograms of carbon dioxide equivalent per kilogram of beef, compared with around 18 kilograms of carbon dioxide equivalent from beef produced from dairy calves.

The main gas contributing to global warming potential across all production systems was methane, a more potent GHG than carbon dioxide, which accounted for some 30-50 per cent of all emissions. The researchers also found that eutrophication potential was higher in suckler herds, with nitrate leaching from soils making a major contribution. Acidification potential was also higher.

Another important consideration in the study was land use. When land is used to grow crops or rear livestock, this land is no longer available for other purposes that might have more positive impacts on the environment, for example, forestry, which stores carbon rather than emits it. Taking into account these effects, beef from suckler herds was less environmentally friendly than calves produced and reared from dairy herds.

The researchers suggest a number of measures to reduce the environmental impact of suckler herds:

- Identify feed strategies which reduce methane emissions by optimising the proportion of concentrate compared to roughage in calves' diets.
- Introduce proper control measures to reduce nitrous oxide loss in manure management thereby reducing emissions of this potent GHG.
- Implement initiatives to control loss of ammonia and nitrates in manure management, thereby reducing acidification and eutrophication potential.
- Production of biogas from manure could reduce non-renewable energy use and related emissions.

1. Weidema, B.P. *et al*. (2008). Environmental improvement potentials of meat and dairy products. European Commission Joint Research Centre, EUR 23491 EN. Available online: http://ftp.jrc.es/EURdoc/JRC46650.pdf

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