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## animal

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### Full Paper

#### **Trends in greenhouse gas emissions from consumption and production of animal food products – implications for long-term climate targets**

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### Abstract

To analyse trends in greenhouse gas (GHG) emissions from production and consumption of animal products in Sweden, life cycle emissions were calculated for the average production of pork, chicken meat, beef, dairy and eggs in 1990 and 2005. The calculated average emissions were used together with food consumption statistics and literature data on imported products to estimate trends in per capita emissions from animal food consumption. Total life cycle emissions from the Swedish livestock production were around 8.5 Mt carbon dioxide equivalents (CO<sub>2</sub>e) in 1990 and emissions decreased to 7.3 Mt CO<sub>2</sub>e in 2005 (14% reduction). Around two-thirds of the emission cut was explained by more efficient production (less GHG emission per product unit) and one-third was due to a reduced animal production. The average GHG emissions per product unit until the farm-gate were reduced by 20% for dairy, 15% for pork and 23% for chicken meat, unchanged for eggs and increased by 10% for beef. A larger share of the average beef was produced from suckler cows in cow–calf systems in 2005 due to the decreasing dairy cow herd, which explains the increased emissions for the average beef in 2005. The overall emission cuts from the livestock sector were a result of several measures taken in farm production, for example increased milk yield per cow, lowered use of synthetic nitrogen fertilisers in grasslands, reduced losses of ammonia from manure and a switch to biofuels for heating in chicken houses. In contrast to production, total GHG emissions from the Swedish consumption of animal products increased by around 22% between 1990 and 2005. This was explained by strong growth in meat consumption based mainly on imports, where growth in beef consumption especially was responsible for most emission increase over the 15-year period. Swedish GHG emissions caused by consumption of animal products reached around 1.1 t CO<sub>2</sub>e per capita in 2005. The emission cuts necessary for meeting a global temperature-increase target of 2° might imply a severe constraint on the long-term global consumption of animal food. Due to the relatively limited potential for reducing food-related emissions by higher productivity and technological means, structural changes in food consumption towards less emission-intensive food might be required for meeting the 2° target.

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### Keywords

greenhouse gas; emissions trends; animal production; animal consumption; climate target

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