

Mitigating ammonia losses from beef cattle feedlots with lignite

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The techniques combining open-path Fourier transform infrared spectroscopy (OP-FTIR) with an inverse dispersion model (backward Lagrangian stochastic technique, bLS) and quantum cascade laser (QCL) based eddy covariance were used to quantify CH₄, N₂O and NH₃ emissions from large cattle feedlots. The daily averaged NH₃ flux was 192 g/head/d, nearly three times IPCC Tier II modelled estimates, accounting for about 70% diet nitrogen. For average size feedlot of 15,000 to 20,000 cattle in Australia the daily NH₃ loss is equivalent to 6 tonnes urea fertilisers. Application of lignite reduced NH₃ loss by 65%, which resulted in much higher (about 3 times) N content in manure when compared to the control. The application of N rich manure to irrigated sorghum increased the biomass yield by 40%. The technique is economic viable.