

Ammonia maps

Methodology

April 2026

This research maps the production of ammonia from industrial livestock units ('factory farms') in the UK. Ammonia production estimates are based on both emissions released by livestock housing, and from the spread of manure and slurry produced by factory farms.

The locations of farms, estimated waste production rates, definition of 'factory farm', and manure export distances are the same as for [Muck Maps \(Compassion in World Farming and Sustain. 2024\)](#).

Factory Farm location:

Factory farms are those defined as intensive, with over 40,000 poultry or 2000 pigs, and require a permit from the devolved environmental regulators. DEFRA records the locations of these farms, and this source was used to create Muck Maps. As this project is based on the same data, the ammonia maps reflect the number and locations of intensive farms in 2024. See [Muck Maps methodology](#) for more detail ([Materiality et al. 2024](#)).

Ammonia Released by Factory Farms:

Quantities of ammonia released directly from factory farms was estimated using [Environment Agency guidance](#) for calculating ammonia emissions ([Environment Agency 2025](#)). This is the process used by farmers to report their emissions to the devolved environmental regulators. While DEFRA does publish reporting from intensive farms, farms are only required to report on emissions over 1,000kg in Great Britain ([Environment Agency 2023; SPRI 2023](#)), and likely over 10,000kg in Northern Ireland* ([DEFRA 2023](#)). This means that not all farms have publicly available ammonia emissions data. We therefore followed an estimated emissions per animal methodology to maintain a consistent method of estimation across all farms.

Manure Production from Factory Farms:

Estimates of manure production follow the same methodology as Muck Maps, which used the livestock capacity according to intensive livestock environmental permits and manure production rates from the DEFRA commissioned Manures-GIS study, following a method previously used by Sustain ([ADAS and North Wyke Research 2008](#); [Sustain 2023](#); [Sustain et al. 2024](#)).

Ammonia Production from the spread of manure and slurry from Factory Farms:

The ammonia content of manure produced by factory farms was estimated during Muck Maps, following nutrient levels in Manures-GIS. The NH₄-N content of manure was also derived from Manures-GIS, at 70% of nitrogen for both poultry and pigs.

Estimations of ammonia emitted from spreading poultry and pig slurry and manure have been derived using emissions factors from the Inventory of Ammonia Emissions from UK Agriculture 2022, the latest report in which the methodology was published in sufficient detail ([Carswell et al. 2024](#)). The emission factors used were poultry manure, farmyard manure, and pig slurry on page 16. This corresponded to the Muck Maps categories of Dry (poultry litter), Wet (pig farmyard manure) and Liquid (pig slurry) respectively ([Materiality et al. 2024](#)).

Fields Spread with Factory Farm Manure:

Data for manure spreading per constituency were derived using spread distance estimates as per the [methodology in Muck Maps](#). This was multiplied according to the (normalised) area of farmland per constituency, as estimated by the 2021 land cover data used in Muck Maps ([UKCEH 2021](#)).

Data limitations

The map is an estimation of ammonia produced by industrial livestock units, from housing itself and from manure and slurry spreading. Calculations were derived from permitted stocking numbers, and averaged ammonia production factors for different categories of livestock, such as broilers, indoor eggs, and pigs.

Actual ammonia production is likely to vary from day to day according to actual numbers of animals, and stage in production cycle (ie age of animals).

The map is not designed to show ammonia concentrations in the air, or deposition rates for local ecosystems, soils, or human health. This is dependent on a number of factors including temperature, humidity and windspeed, and other atmospheric chemical compositions.

**We emailed DAERA to ask for clarification on ammonia reporting thresholds in Northern Ireland, as only entries above 10,000kg of NH3 were published, with the majority of intensive farms not included in the published data. DAERA did not respond to our inquiries.*

References:

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