# Supplemental material

Table A.1. Description of activity data sources, values and sources of emissions factors and parameters, level of detail applied in estimates (approach), allocation of emissions for reporting.

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| **Activity description** | | **Sources of activity data and local parameters** | **Approach** | **Emission factors** (source IPCC 2006, [1]) | **Other parameters** (source IPCC 2006) |  | **Allocation** | |
| **This work** | | **IPCC** |
| Animal husbandry | Beef cattle | Lence [2]; SENASA [3]; Vázquez Amábile et al. [4]; Castesana et al. [5] | Tier 2 | Manure on pasture:  EFD: 1% EFATD: 1% EFL: 0.75%  Feedlot (MM):  EFD: 2% EFATD: 1% EFL: 0.75% | Manure on pasture:  FracGAS: 20% FracLEACH: 30%  Feedlot (MM):  FracGAS: 30% FracLEACH: 10% | Manure Management (MM) and Manure deposited on Pasture (MP) | | Manure Management (3A2), and Direct (3C4) and indirect (3C5) N2O Emissions from Managed Soils |
| Dairy cattle | SENASA [3]; CNA [6] | Tier 1 | Manure on pasture (MP):  As beef cattle  Anaerobic lagoons (MM):  EFD: NA EFATD: 1% | MP: As beef cattle  Anaerobic lagoons:  FracGAS: 35% FracLEACH: NA |
| Swine | SENASA [3]; Castesana et al. [5]; CNA [6]; SAGyP [7]; sectoral experts | MP: As beef cattle  Anaerobic lagoons:  FracGAS: 40% FracLEACH: NA |
| Poultry | SENASA [3]; Vázquez Amábile et al. [4]; Castesana et al. [5]; Chiappe [8]; Finster [9] | Poultry manure with and without litter (MM):  EFD: 0.1% EFATD: 1% | FracGAS with litter: 40% FracGAS without litter: 55% FracLEACH: NA | Manure Management (MM) | | Manure Management (3A2) |
| Other livestock (sheep, buffalos, goats, camelids, horses and asses/mules) | SENASA [3]; Vázquez Amábile et al. [4] | Grazing (MP):  As beef cattle | FracGAS: 20%  FracLEACH: 30% | Manure deposited on Pasture (MP) | | Direct (3C4) and indirect (3C5) N2O Emissions from Managed Soils |
| N-fertilizers | | Vázquez Amábile et al. [4]; CNA [6]; CIAFA [10]; Fertilizar [11]; PDA [12] | EFD: 1%  EFD from N-inputs to flooded rice: 0.3%  EFATD: 1%  EFL: 0.75% | FracGAS: 10%  FracLEACH: 30% | Fertilizers (Fert) | | Direct (3C4) and indirect (3C5) N2O Emissions from Managed Soils |
| Crop residues | | Vázquez Amábile et al. [4]; PDA [12] | FracGAS: 0%  FracLEACH: 30% | Crop Residues (CR) | |
| Open burning of agricultural residues | | Vázquez Amábile et al. [4]; Castesana et al. [5] | EFD: 0.07 g N2O kg-1 dry matter  EFATD: 1% | Amount of fuel actually burnt (*Mb.Cf*, ton dry matter ha-1)  Sugarcane: 6.5 Flax: 4.0 | Agricultural waste burning (AWB) | | Emissions from Biomass Burning (3C1) |
| Where NA: not applicable, FracLEACH: fraction of N lost through leaching and runoff, EFD: direct emission factor, EFATD: indirect emission factor from atmospheric deposition, EFL: indirect emission factor from N leaching and runoff  References:  1. IPCC. 2006 IPCC Guidelines for National Greenhouse Gas Inventories. In: Eggelston S, Buendia L, Miwa K, Ngara T, Tanabe K, editors. Intergovernmental Panel on Climate Change (IPCC). Hayama, Japan: Intergovernmental Panel on Climate Change (IPCC), Institute for Global Environmental Strategies (IGES); 2006.  2. Lence S. The agricultural sector in Argentina: Major trends and recent developments. In: Alston J, Babcock B, Pardey P, editors. The Midwest Agribusiness Trade Research and Information Center. Ames, USA: Midwest Agribusiness Trade Research and Information Center; 2010.  3. SENASA. Servicio Nacional de Sanidad y Calidad Agroalimentaria. Ministerio de Agroindustria de la Nación [Internet]. 2018. Available from: http://www.senasa.gov.ar  4. Vázquez Amabile G, Feiguín F, Ortiz de Zárate M, Feldkamp C, Cañada P, Fariña S, et al. Inventario de Gases de Efecto Invernadero de la República Argentina: Agricultura, Ganadería, y Cambio de Uso del Suelo y Silvicultura [Internet]. Hernán Carlino, Magnasco E, editors. Argentina: Asociación Argentina de Consorcios Regionales de Experimentación Agrícola (AACREA), Fundación Torcuato Di Tella (FTDT), Price Waterhouse & Co. Asesores de Empresas SRL (PwC); 2015. Available from: https://www.argentina.gob.ar/sites/default/files/1.-inventario-geis-agricultura-ganaderia-y-cuss-v2.pdf  5. Castesana P, Dawidowski L, Finster L, Gómez D, Taboada M. Ammonia emissions from the agriculture sector in Argentina, 2000-2012. Atmos Environ. 2018;178:293–304.  6. CNA. Censo Nacional Agropecuario 2002 [Internet]. Argentina: Instituto Nacional de Estadística y Censos (INDEC); 2002. Available from: http://www.indec.gov.ar/index\_agropecuario.asp  7. SAGyP. Secretaría de Agricultura, Ganadería y Pesca. Ministerio de Agroindustria [Internet]. 2017. Available from: http://www.agroindustria.gob.ar  8. Chiappe G. Pautas de manejo para crianza de pollos parrilleros: análisis de un caso bajo condiciones reales de producción en galpones con sistema manual y automático de alimentación. Trabajo final, Universidad Católica Argentina, Facultad de Ciencias Agrarias, Argentina. Disponible en: http://bibliotecadigital.uca.edu.ar/repositorio/tesis/pautas-manejo-crianza-pollos-parrilleros.pdf; 2010.  9. Finster L. Inventario de emisiones de GEI provenientes de la ganadería. In: Pascale Medina C, Zubillaga M, Taboada M, editors. Suelos, producción agropecuaria y cambio climático: avances en la Argentina. Ciudad Autónoma de Buenos Aires, Argentina: Ministerio de Agricultura, Ganadería y Pesca de la Nación; 2014.  10. CIAFA. Cámara de la Industria Argentina de Fertilizantes y Agroquímicos [Internet]. 2018. Available from: http://www.ciafa.org.ar  11. Fertilizar. Estadísticas Asociación Civil Fertilizar [Internet]. 2018. Available from: http://www.fertilizar.org.ar  12. PDA. Portal de Datos Abiertos del Ministerio de Agroindustria [Internet]. 2018. Available from: https://datos.magyp.gob.ar | | | | | | | | |

Figure A.1. Maps of 2012 highest emission flux districts corresponding to each aggregated source and overall sources. Results obtained for outliers (O) and extreme outliers (EO). Lower bounds, expressed as kg N2O km-2 were: crop residues EO>79, O>47; fertilizers EO>49, O>30; burning of agricultural wastes EO>0, livestock O>120; totals EO>369, O>300.

