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Carbon footprint of intensive broiler production

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Abstract

The intensive broiler production is a significant economic activity when considering the increase in broiler production and the number of slaughtered birds. However, this commercial segment needs to adjust to the perspectives of low carbon emission economy. There is a lack of information of carbon equivalent emitted in the broiler production supply chain under certain rearing conditions. Therefore this study aimed to estimate the greenhouse gasses (GHG) from broilers reared in the dark-house system in Brazil and to find the carbon footprint for subsidizing future mitigation. Dark house systems consisted of a house 15 m wide, 150 m long and 3.8 m high, and a floor area of 31500 m² with forced ventilation; exhaust fans (12 with an air flow of 580 m³ s⁻¹), a high-pressure fogging system, and internal built walls painted with a black coating. To evaluate the carbon footprint the total rearing time was considered (1d old to 42d old). Data from 5 similar houses were registered including electricity use, dimensions, and material of the house, the number of reared birds, litter management, the number of flocks in the same litter per year, and feed ration. GHG emissions were estimated using the method developed by the World Resources Institute using emission factors based on the region and the type of animal, according to the recommendations of the IPCC for inventories. Mechanical emissions were approximately 97% of the total emissions. Annual total emissions from mechanical sources added 740 tons of CO₂eq/year. This value is a result of the use of electricity (21 tons of CO₂eq/year) and the technological level of the system (exhaust fans, automatic feeders, and drinkers). Emission from the litter added up 55 tons of CO₂eq/year. Feed represented nearly 75% of all emissions depending on the origin and the type of feed grains for the production of the feed ration. The total estimation of the environmental impact of broiler production under the dark-house system in the center-west of Brazil is 740 tons of CO₂eq/year.

Keywords: environmental impact; greenhouse gasses; broiler meat