

Life Cycle Assessment of small, medium and large dairy cattle farms in Colombia⁽¹⁾

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In Colombia, cattle production is responsible for 31% of greenhouse gas (GHG) emissions from the agricultural sector. Dairy farms account for 15% of the Colombian cattle herd. Life Cycle Assessment (LCA) of GHG emissions from these farms are not common, and when performed, are based on a small number of farms. LCA is important because the identification of appropriate GHG mitigation actions requires larger data sets. This study quantified the carbon footprints (CF) on 192 dairy farms in Colombia by using LCA methodology. Farms were classified according to their herd size: small (0-30 animals; n=94), medium (31-50; n=32), large (>50; n=66). Emissions were estimated using the GHG emission factors reported in the 2006 IPCC Guidelines for National Greenhouse Gas Inventories, and locally estimated emission factors. A “cradle to farm gate” system boundary was established, and a physical allocation method proposed by the International Dairy Federation, was used to distribute GHG emissions between co-products. The functional units were 1 kg fat and protein corrected milk (FPCM) and 1 kg live weight gain (LWG). The CF (kg CO₂-eq kg⁻¹FPCM/LWG) for medium (1.6 FPCM and 13.8 LWG) and large farmers (1.6 FPCM and 13.1 LWG) were the lowest among the categories. The medium and large farm categories were characterized by implementing better pasture and herd management practices, by the highest milk productivity (3240.8 and 3645.6 kgFPCM Cow⁻¹Year⁻¹) and stocking rate (4.5 AU ha⁻¹; 4.4 AU ha⁻¹). It is possible to improve the environmental performance of farms by increasing productivity and adopting better agricultural practices.

Keywords: carbon footprint (CF), global warming potential (GWP), greenhouse gases (GHG), livestock production systems.

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