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Can the efforts to intensify smallholder pig production in Uganda be sustained?

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Abstract

The pig industry supports over two million livelihoods in Uganda. However, surging demand for pork and related products strains resources and affects the environment. This study evaluates the productivity and environmental impacts of smallholder pig intensification in the Masaka and Mukono districts of the central region of Uganda. These areas have pronounced rural-rural, rural-urban, and urban-urban value chain domains and thriving pig production driven by urbanisation and favourable market conditions. We conducted a literature search of six publications and identified extensive and intensive production systems as the prevalent systems across study sites. We then extracted data on herd size and composition, diets, and productivity. These were further validated by stakeholders, including the district's livestock experts. This followed a mapping exercise to prioritise interventions into two: (i) focused; includes pig biosecurity, genetics, and manure management (ii) integrated; incorporates optimised, improved feeding into the focused intervention. Both interventions were proposed for extensive systems, while integrated interventions were suggested for intensive systems. CLEANED tool (https://alliancebioversityciat.org/tools-innovations/cleaned) was applied to estimate these interventions' potential environmental and productivity trade-offs. Environmental domains assessed include land requirement (ha/yr; ha/MT pork), soil health (N balance; t soil/year; kg; soil/ kg pork), water use (m^3/year; m^3/kg pork), and greenhouse gas (GHG) emissions (t CO_2 eq./year; kg CO_2 eq. /kg pork). Results showed that integrated and focused interventions minimise environmental effects per unit product. Integrated interventions achieved environmental efficiency gains of 54.07 % to 54.59 % and 55.65 % to 65.43 % across production systems in Mukono and Masaka, respectively. The integration, however, raised the total absolute environmental footprints ranging from 49.53 % to 110.03 % and 62.27 % to 79.49 %, respectively. A focused package performed better in Masaka (52.45 %) than Mukono (37.53 %) but increased absolute total footprints by 185.72 % and 146.86 %, respectively. Generally, extensive systems were more suited for integrated than focused interventions. Intensifying extensive systems decreased GHG emission intensity between 1.92 and 3.94 kg CO_2 eq. for every kilo of pork produced. Proper manure management and improving the reproductive performance of pigs through breeding, biosecurity measures, and optimised diet intake can balance both production and environmental goals, eventually sustaining the pig industry.

Keywords: CLEANED, environmental impacts, smallholder systems

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