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Increasing Smallholder Pig Farmers' Adaptive Capacity: Low-Cost Balanced Diets for East African Pigs Using Livestock and Plant Co-Products

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Abstract

By acquiring livestock poor farmers can ascend out of poverty. Pigs require minimal inputs and raising them is often within disadvantaged members of society's means. In East Africa, 2.2 million pigs are raised by resource-poor, subsistence farmers most with under 2 hectares of cropland. They typically raise 1–4 pigs to pay for school, medical costs, food, and seeds, but pig productivity is low. Lack of feed, seasonal feed shortages and unbalanced diets contribute to slow growth, resulting in compromised earnings from pig-raising.

We estimated East African pig feedstuff nutrient composition through nutrient analysis and from literature. Seasonal availability was identified by local experts. Performance results from local-breed pig feeding trials were used to adjust the NRC (2012) nutrient requirement model for growing-finishing pigs. Local pigs' nutrient requirements under typical management conditions (intestinal parasites present and free-ranging) were estimated. A least-cost diet formulation programme was used to generate diets minimising cost and human/pig competition for food, maximising agricultural co-products and forages use, considering seasonal availability, and satisfying minimal requirements for digestible energy 2960 kcal kg^{-1} of dry matter [DM]), calcium, standardised total tract digestible phosphorous, standardised ileal digestible crude protein and lysine (0.28, 0.13, 8.5, and 0.58 % of DM respectively)

Feedstuffs availability differed between November-February; June-August; and March-May plus September-October. Estimated growth performance potential of local pigs is less when free-ranging, or intestinal parasite infected, than when restrained and non-infected (80; 217; and 259 g per day respectively) A typical least-cost diet for June-August (all as % of DM) is: maize flour 20.6; cassava leaf 20.0; sweet potato vine 19.2; ripe avocado 15.0; *Bidens pilosa* 7.9; limestone 7.7; molasses 5.0; cattle blood 3.9; *Amaranthus spinosus* 0.3; table salt 0.24; premix 0.10. Sun-dried fish (*Rastrineobola argentea*) and grist mill waste are available all year as substitutes for seasonably available ingredients e.g avocado and sweet potato vine.

Use of such diets will enable continuous pig feeding during all seasons, thereby increasing farmer resilience. Their use will improve pig performance resulting in increased farmer income, enabling poverty alleviation, improved food security, human health and nutrition, and investment in other livelihood ventures to further increase resilience.

Keywords: Adaptive capacity, diet, locally available feeding stuffs, nutrient requirements, pigs, sub-saharan Africa, subsistence farmers

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