

### **Market based approaches for food safety and animal health interventions in smallholder pig systems: the case of Vietnam**

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Food safety and animal health concerns place rising burdens on smallholder pig production in Viet Nam, both in terms of negatively affecting livelihoods and profitability as well as reducing consumer confidence in pork. While reducing the incidence of pig disease and improving the safety of pork products are potentially important public goods, it is critical to take into account the tradeoffs between improved animal health and food safety outcomes and their associated costs. These net benefits could be markedly different for various value chain actors. Coordinating these interventions across the value chain and identifying market-based incentives for their adoption will be critical for their success and sustainability over time. However, this requires analytical frameworks that accommodate the analysis of food safety and animal health impacts across the value chain. In this paper, we developed a system dynamics model of the pig value chain as a decision-support tool to assess the benefits and costs associated with market-based interventions in the pig value chain. System dynamics models are simulation approaches that highlight the feedbacks between different actors and processes within the value chain. As such, they can be used to identify both the potential entry points for upgrading food safety and animal health as well as potential areas of tension within the chain that may undermine uptake. The model combines a detailed model of herd production and marketing with sub-modules on short- and long-term investment in pig capacity, and decisions by value chain actors to adopt different innovations. Model results demonstrate that interventions focusing on individual parts of the value chain (e.g. only at farm or slaughterhouse level) are less cost-effective and sustainable than those that jointly enhance incentives for control across the value chain, as weak links downstream undermine the ability of producers to sustain good health practices.

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