

Fattening Pigs on Sweet Potato

System analysis and modelling tools to develop improved feeding strategies for small-scale crop–livestock farmers in Southeast Asia

Background

Although many countries in Southeast Asia are evolving an urban- and market-based economy, rural poverty persists. More than 200 million rural people live on less than US\$1 a day, the majority depending on mixed crop–livestock agriculture for their household income, food security and asset accumulation. Pig production is an important livelihood option in China, Vietnam and parts of Thailand.

With rapid economic growth, knowledge about how to adapt small-scale farming systems to change is an essential tool in the fight against poverty. The project aims to improve small-holders' incomes by improving collaboration and strengthening links throughout the market chain. The project examines the use of modelling and simulation tools as a means of developing novel feeding strategies for small-scale crop–livestock producers. These strategies are based on the feed potential of improved sweet potato varieties and other feed resources, complemented with efficient techniques of silage making and a smallholder-based industry of protein extraction from sweet potato leaves.



Local researchers and project coordinator participating in a training day in a sweet potato field

Goals and objectives

The aim is to identify sustainable feeding strategies based on local resources managed by the smallholders themselves. By improving on-farm feed resources, including sweet potato, legumes and others, the project aims to ensure that farmers have year-round feed availability, better livestock productivity and higher household income. Production of value-added local products (e.g. sweet potato-based silage and high-protein supplements derived from sweet potato and legume leaves) will improve employment opportunities, household income and livestock nutrition. The project also aims to strengthen local feed market linkages for these value-added local products.

Main outputs and impacts

Project teams in each country have received training in management of the sweet potato crop and in the use of various livestock modelling tools. They also helped redesign the tools to make them more interactive. As suggested by the model, using sweet potato silage as the main diet for fattening pigs reduced production costs, resulting in a greater gross margin for the households. This technology represented a better option for farmers than purchasing the more expensive commercially available concentrates.

Feeding sweet potato silage and home-made concentrate feed to pigs gave farmers higher gross margins compared with those achieved using commercial concentrates and no silage. Although including sweet potato silage in the

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ration tended to lead to a lower final live weight, it resulted in a more uniform weight gain, which increased the gross margin by 37%. Therefore, sweet potato silage is a good alternative to supplementing concentrate feed with other locally available resources, since it gives a higher gross margin and better total farm income.

A ration for fattening pigs requires a good quality supply of protein. Through laboratory analysis, the team identified the most profitable combination of sweet potato and legume. Protein extracted from sweet potato vines appears to have an adequate amino acid balance and the extraction method can be adapted for use on a small farm.

Project staff will also test and validate various livestock production models as a means of further improving the use of local resources for smallholder pig production. By training extension workers and other development practitioners in the use of such tools, it is hoped to disseminate the idea more widely, resulting in more efficient use of resources and greater income for poor farmers.



Novel sweet potato silage making in smallholder pig farms

Next steps

Some adaptive on-farm research, training and dissemination activities will continue and a strategy for long-term technology dissemination will be designed with the local partners.

Lessons learned

Sweet potato has proved to be a valuable feed resource for smallholder crop–livestock systems in the tropical and subtropical lowlands of Southeast Asia. This novel strategy for sweet potato conservation can be used on most small farms. Protein extraction from sweet potato vines has proven to be a feasible option, providing good quality protein that can be used as both food and feed.

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