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Smallholder goat production systems in Lao PDR: assessing production efficiency

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Goat numbers in Lao PDR are increasing rapidly, fuelled by exports of goats to Vietnam. Since 2017 the Australian Centre for International Agricultural Research (ACIAR) has worked with government agencies in Lao PDR and Vietnam to evaluate the sustainability and future direction of this trade and the production systems underpinning it. Research to date has identified that almost all production in Lao PDR is by smallholders and was found to contribute 35 ± 16% of household income in goat keeping households (Gray *et al*. 2019). Smallholder systems, particularly in the lowlands, benefit from a relatively low-cost production model in which goats are typically housed at night and released to graze unsupervised on communal land during the day. Vulnerable crops, rather than livestock, are fenced and free ranging and browsing behaviour limits the severity of helminthiasis. Goats are sold to visiting traders at high prices, commanding a premium in Vietnam of 20–40% over local Vietnamese crossbred goats with farmers capturing approximately 70% of the market value of goats they sell (Gray *et al*. 2019).

This study is part of the 'Goat Production Systems and Marketing in Lao PDR and Vietnam Project (LS/2017/034)' funded by the Australian Government though ACIAR and was approved by University of New England Human Ethics Committee (HE19-218). The study is focused on smallholder goat farmers in seven villages in the central province of Savannakhet, Lao PDR. Ten households in each of 7 villages (n = 70 households) were registered to take part in a series of surveys of their goat production system including a monthly household survey (MHS). The results presented are from 16 months of MHS. Only households that completed three or more MHS were included in the analysis (n = 60). Researchers from the National Agriculture and Forestry Research Institute interviewed the farmers in Lao language using a survey built in CommCare® software (Dimagi Ltd, Cambridge, MA, USA). The survey included questions on household farming activities and changes in the goat herd (births, deaths, sales, purchases and lost goats). These data were used to calculate key production indicators including mean number of kids/doe/year, litter size, annual rate of sales (%), annual mortality rate (%), annual rate of goats going missing (%). To utilise the most complete dataset available the data collected over 15 months were annualised. The objective of this study was to assess production efficiency of smallholder goat farms in Lao PDR.

The mean goat number (including does, kids and bucks) over the 16-month period was 11.5 goats per household. The mean number of live kids/doe/year was 1.9 (Table 1). The rate of sales (total sales/mean monthly goat number) was highly variable with four farmers reporting zero sales and two reporting very high rates of sales. Kids comprised the majority of the annual mortality rate (total deaths/mean monthly goat number) and some households suffered a surprisingly high rate of missing goats (Table 1).

Table 1. Mean annual key production indicators of smallholder goat production systems in Lao PDR

	Number of kids/doe/year	Number of kids/litter	Annual rate of sales (%)	Annual total mortality rate (%)	Annual kid mortality rate (%)	Annual missing goat rate (%)
Mean	1.9	1.6	65.4%,	37.5%	26.3%,	7.9%
Median	1.8	1.5	56.3	30.0%	20.0%	0%
Range	0.2–3.9	1–3	0–327.4%	0–143.3%	0–84.7%	0–55.7%

This study found that smallholder goat production systems in central Lao PDR had good reproductive performance with the mean number of kids/doe/year being higher than those reported in other studies of goats in Laos (1.3 kids/doe/year; Kounnavongsa *et al.* 2010) and in high rainfall areas of Australia (1.6 kids/doe/year; Nogueira *et al.* 2016). Mean litter size was the same as reported by Kounnavongsa *et al.* (2010). The upper range of mortality rates and rates of sales are plausible for the upper range of kidding rates and/or with short term trading of goats. They may also reflect events where large numbers of goats were sold or died. These would have a small effect on average herd size but a very large effect on the number of goats sold or died. The high mortality rate is currently being investigated with disease causation studies. Through interventions including ensuring kids are born into a clean, dry, warm and ventilated goat house, and improving overall nutritional status, the project aims to reduce kid mortality to increase the annual rate of sales and profitability of goat raising for smallholders.

References

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