

Rapid appraisal of good practice: feeding goats for better growth and results

The Resilient Livelihoods for the Poor program, implemented with DFAT support, includes asset transfer and livelihoods support for meat goat production. The program conducted enterprise analysis, prepared posters describing the goat maintenance cycle and caring for goats (what to do) and employs people to mentor families receiving and managing assets.

This rapid appraisal of good agricultural practices reviews more than 10 years of experience in Laos and Vietnam to identify good practice feeding of goats for better growth and results.

Challenges

Research in Lao PDR shows the performance of goats is generally far below potential because of limited grazing area, low inputs, as well as low quantity and quality of forage (grasses and herbs) and browse (trees and bushes). Feed shortages occur in areas of intensive crop production, where grazing land becomes limited. In many cases during the rice-growing season, goats are tethered or confined in small areas where feed is limited, to avoid crop damage. In the dry season, the amount and quality of feed is low; and although goats are allowed to graze freely, they may have to walk long distances to find food. All of these problems have a negative impact on growth and productivity of goats. Considerable labour inputs for finding feed and herding are also required.¹

Possible Solutions

In Lao PDR, there are about 12 broadly adapted forage varieties suitable for good practice goat production, but only 5 of them have been widely used by goat farmers: Gamba grass (*Andropogon gayanus*), Mulato (*Brachiaria* hybrid), Simuang (*Panicum maximum*), Stylo (*Stylosanthes guianensis* e.g. variety CIAT 184) and *Gliricidia sepium*. The feed mixes that result in the fastest growth rates for goats are a combination of forage grasses (e.g. Gamba grass, Mulato or Simuang) and tree legumes (e.g. *Gliricidia*)² but forage legumes (e.g. Stylo) are also effective if there is land available.³

The growth rate of goats grazing or browsing on natural feed resources is only about 25-35 grams per day. By using some improved forages such as Gamba grass (*Andropogon gayanus*) and Stylo (*Stylosanthes guianensis*), the growth rate of goats has been improved up to 70 grams per day.⁴ Use of *Gliricidia sepium* and Stylo hay as a supplement resulted in increased growth rates up to 55 and 44 grams per day, respectively.⁵

Similarly, the inclusion of Stylo in feed for goats in Lao PDR fed mainly on Gamba grass resulted in better growth rate because of higher intake and improved quality of the diet. The highest total feed intake, approaching 3% of body weight, was obtained in the diets with 30 and 40% Stylo. The highest daily weight

¹ Phengsavanh, P. (2003a) *Goat production in smallholder farming systems in Lao PDR and the possibility of improving the diet quality by using Stylosanthes guianensis CIAT 184 and Andropogon gayanus cv. Kent*. Livestock Research Centre, NAFRI, Lao PDR.

² International Livestock Research Institute (2008) *Proceedings of the APHCA-ILRI Regional Workshop on Goat Production Systems and Markets*, Luang Prabang, Lao PDR, 24 – 25 October 2006. ILRI and Animal Production and Health Commission for Asia and the Pacific, Bangkok, Thailand.

³ Xaypha, S., Keonouchanh, S. and Phengvilaisouk, A. (2009) Improving productivity of local goat in upland area in Lao P.D.R. *Lao Journal of Agriculture and Forestry*, 16: 39-48.

⁴ Phengsavanh, P. (2003a) *Goat production in smallholder farming systems in Lao PDR and the possibility of improving the diet quality by using Stylosanthes guianensis CIAT 184 and Andropogon gayanus cv. Kent*. Livestock Research Centre, NAFRI, Lao PDR. See also: Phengsavanh, P. (2003b) *Productivity of local goats in smallholder farming systems in Xieng Nguen district, Luang Prabang, Lao PDR*. Livestock Research Centre, NAFRI, Lao PDR.

⁵ Xaypha, S., Phimphachanvongsoth, V. and Ledin, I (2002) *Performance of growing goats fed Panicum maximum and leaves of Gliricidia sepium*. Asian-Aust.J.Anim.sci. Vol 15, No.11:1585-1590.

gain was 70 grams/day with 40% Stylo. Increasing the amount of Stylo in the ration increased the amount of food goats ate each day, which in turn led them to grow faster and reach a market weight more quickly.⁶

⁶ Phengsavanh, P. and Ledin, I (2003) Effect of Stylo 184 (*Stylosanthes guianensis*) and Gamba grass (*Andropogon gayanus*) in diets for growing goats. *Livestock Research for Rural Development* 15 (10).

Inclusion of 30% of *Gliricidia* leaves by dry weight in a goat feeding ration improved the digestibility of food provided to goats as well as the amount of protein eaten by the goats. The highest daily live weight gain was 43 grams/day was achieved with 30% of the ration by dry weight made up of *Gliricidia* leaves.⁷

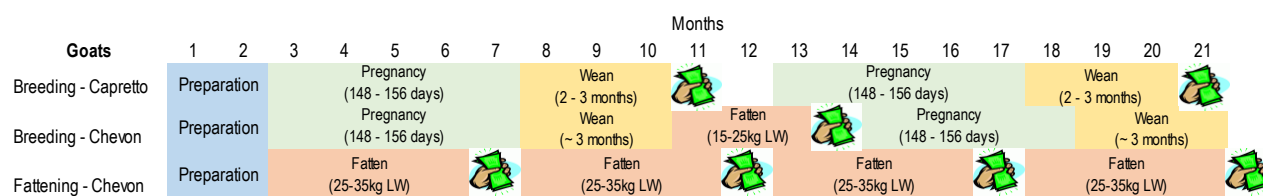
Strategies for good practice

By having feed resources near the village, farmers can provide better housing and animal health management (Phengsavanh *et al.*, 2004). Goat production has a great potential for smallholder farmers as an alternative enterprise and a first step out of poverty.⁸ Strategies for growing forage legumes include share-cropped shade tree growing (e.g. *Gliricidia* planted in vegetable gardens, coffee plantations or on the boundary of rice fields) and inter-cropped *Stylo* between maize, tree crops or fruit trees.

Gliricidia can be quickly established rapidly from cuttings, using stakes of 56 months of age, 1.5 m long and with a diameter of 3.54.0 cm. If the moisture is adequate, foliage will appear in four weeks. For living fences, use stakes 1.5-2.5 metres long with diameters of 5-10 cm, planted 1.5-5.0 metres apart to 20 cm depth. For densely planted protein banks, use stakes 50 cm long and six months of age. Various planting patterns can be used (e.g. double rows or triangular). Plant populations range from 4,000-10,000 trees/ha. Very high densities are used in small protein banks. The direction of planting should be east to west to maximise sunlight interception. Otherwise, planting seeds in the field or nursery beds is easily done. Plant seeds 2 cm deep. Scarification is not needed, and germination rates are typically high. Seedlings establish rapidly, generally reaching a height of 3 metres before flowering at 68 months of age.⁹

Gliricidia tolerates repeated cutting. For forage, first cut 812 months after sowing at 0.51.0 m above soil level, and thereafter every 24 months depending on rainfall and temperature. *Gliricidia* is normally used as a cut and carry forage and is rarely directly grazed. Goats accustomed to *Gliricidia* will eat the bark as well as leaves and small stems and may kill young trees.⁹

Because there is stratification of the goat industry in Lao PDR there is an opportunity for households choosing the goat enterprise to specialise in production systems where they have a comparative advantage. Most goats are produced in extensive production systems with low capital and other inputs, particularly in sloping areas that are ideally suited to breeding and supplying weaned goats. These young goats may then be fattened closer to market and where there is higher quality feed for finishing.⁴ Focusing on comparative advantage can reduce risks and improve cash flow (see chart).



Source: LADLF analysis and modelling

Other research in Lao PDR suggests that case studies are an effective method for demonstrating options for system changes across a wide range of farming households and different areas. However, case studies take time to develop and require skills in recognising, capturing and documenting impacts. Cross visits and champion farmer visits are more effective for rapid farmer learning about practical applications of the technology. These events can also assist farmers to solve problems and make future plans. Limiting the number of farmers on a cross visit will allow more interaction and learning between host and visiting farmers.¹⁰

⁷ Xaypha, S., Phimpachanvongsod, V. and Ledin, I. (2002) Performance of growing goats fed *Panicum maximum* and leaves of *Gliricidia sepium*. *Asian-Aust.J.Anim.sci.* Vol 15, No.11:1585-1590

⁸ Phengsavanh, P., Fahrney, K., Phimpachanhvongsod, V. and Varney, K. (2004). *Livestock Intensification: forage and livestock technologies for complex upland systems. Proceedings of the workshop on poverty reduction and shifting cultivation stabilisation in the uplands of Lao PDR: technologies, approaches and methods for improving upland livelihoods.* Luang Prabang, 27-30 January 2004. LRC, NAFRI, Vientiane, Lao PDR.

⁹ Tropical Forage Factsheet. http://www.tropicalforages.info/key/Forages/Media/Html/Gliricidia_sepium.htm Accessed July 10, 2015.

¹⁰ Millar, J., Photakoun, V. and Connell, J. (2005) *Scaling out impacts: A study of three methods for introducing forage technologies to villages in Lao PDR.* Australian Centre for International Agricultural Research, Canberra, Australia.