

## Tropical forages for monogastric animals : enhancing smallholders competitiveness in local and emerging markets

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**Introduction** Market changes provide opportunities and create challenges for smallholder producers . Throughout the world , consumer demand for livestock products is rapidly increasing , with pork and poultry dominating the changes . Meanwhile , higher costs of grain-based concentrate feeds , partly caused by biofuel production , are affecting the competitiveness of livestock producers (World Bank , 2007) . Although purchased animal feeds could enable farmers to expand production , household funds of smallholders are typically insufficient , or feed is expensive , distant , or simply unavailable . Women and children , who have an important role in small-scale monogastric production (e .g . fewer than 20 chickens or 3 pigs) , are most likely to benefit from enhancing feed production capacity on-farm .

### Advances : identifying niches for alternative protein feeds in smallholder monogastric systems

Recent diagnostic studies conducted in Colombia , Honduras and Nicaragua clarified the constraints and potentials of smallholder pig and poultry production . The rapid survey and data analysis approach obtained in-depth information of monogastric production systems and facilitated the identification of priority interventions for the entire market chain-from forage production to animal product marketing . Many smallholder farm families produce chickens and pigs , but other monogastric animals can also be important including duck , guinea pigs , rabbits and fish .

Protein is lacking in most smallholder monogastric systems , thereby limiting animal productivity and quality . In Colombia , concentrates are widely used , despite their high price and variable quality . Therefore , most farmers integrate locally-produced feed and/or agricultural by-products in monogastric feeding . In Nicaragua and Honduras , protein deficiencies are more pronounced . Feed is mainly limited to energy sources such as maize and sorghum .

In the three countries , monogastric production is an integral component of many smallholder farms and important strategy to diversify household risk . Occasional and/or informal sales of meat , eggs , and animals provide an additional income source , especially for women . Livestock serve as a living asset that can be sold according to cash needs and sales opportunities . With increasing prices of imported grain , the domestic production of forage-based feed is becoming financially attractive . A challenge for research and development is to identify favorable production and market niches and foster enhanced market access according to local context .

**The way forward** The local production of high-quality feed can increase monogastric animal production and quality , therefore serving as a livelihood strategy that improves household cash generation and/or family nutrition . Forage legumes are a promising source of protein for monogastric production (see Muñoz et al . , this volume) . These alternative feed sources are often well adapted to specific production niches : both spatial (e .g . low soil fertility and variable water availability) and temporal (e .g . seasonal availability of labor and soil moisture) . Nevertheless , smallholders need better information regarding production and market contexts in order to expand production and earnings . Essential necessary conditions for increasing market participation include (1) supply chain information and knowledge management , (2) knowledge of differentiated markets that capitalize on quality characteristics , (3) effective business skills of producer organizations , (4) forage and animal production technologies adapted to local contexts .

CIAT and its partners diagnose the existing capacities , constraints and potentials in order to prioritize interventions that enable smallholder farmers to effectively participate in changing markets . These contexts can be categorized per demands of specific end users . The first end-use category is *on-farm* . Forage-based protein feeds are grown to feed pigs and poultry of the farm , thereby enhancing production for household consumption and sales to local and differentiated markets . The second category is forages for *local sale* . Smallholder farmers sell forage-based high-protein feeds to neighboring animal producers . The third end-use category is *sales to the feed industry* . Farmers sell feeds according to formal transactions , which likely be formal require enhanced organization and business skills .

### References

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