Growth response of pigs supplemented with two contrasting tropical legume silages in Colombia

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1. Introduction

In a framework project tropical forage legumes with different levels of processing were assessed as alternative protein supplement for pigs. The high quality annual *Vigna unguiculata* and the more fibrous biennial *Canavalia brasiliensis* were ensiled and included in balanced diets for comparison.

2. Objective

The objective was to assess the growth potential of pigs when *Vigna unguiculata* CIAT 4555 or *Canavalia brasiliensis* CIAT 17009 silage replaced 200 g/kg crude protein from soybean meal in the diet.

Fig. 1:
Silage + meal diet

Fig. 2: Pig consuming silage mixed with dry feed

Fig. 3: Weighing pigs

3. Material and methods

- **Silages**: fresh forages were wilted to achieve 300 g dry matter DM/kg fresh matter (FM), chopped, *Lactobacillus* CIAT S66.7 and in the case of *Vigna* sucrose (20 g/kg FM) were added, and compacted in 19 l-buckets. Those were stored for several months at ambient temperature.
- **Animals**: 12 commercial male pigs with 43.0 ±1.6 kg live weight (LW) were housed individually and weighed every 14 days (Fig. 3).
- **Experimental design**: A crossover with duplicated Latin squares was applied, for a total of four squares with three treatments (see Table 1), and six orders.
- **Feeding**: The silage was mixed with the basal diet before feeding (Fig. 1). The diet for each animal changed every three weeks, for a total of 9 weeks. Food was offered starting with 80 g DM/kg $LW^{0.75}$*d (Fig. 2).

Table 1. Composition of the experimental diets for growing pigs using silage of forage legumes as partial source of protein

	Control	Canavalia	Vigna
Ingredients (g/kg DM)			
Yellow corn	587	555	596
Wheat bran	153	0	0
Soybean 46% meal	240	200	200
Palm oil	---	30	30
L-Lysine HCL 78%	0.3	3	2
Silage	---	190	150
Vitamin and mineral mix	20	22	22
Composition (g/kg DM)			
Dry matter	877	765	792
Crude protein	168	160	163
Neutral detergent fiber	271	240	207
Acid detergent fiber ADF	75	101	65
Acid detergent lignin ADL	23	28	22
Gross energy, kcal/kg	3781	3836	3698

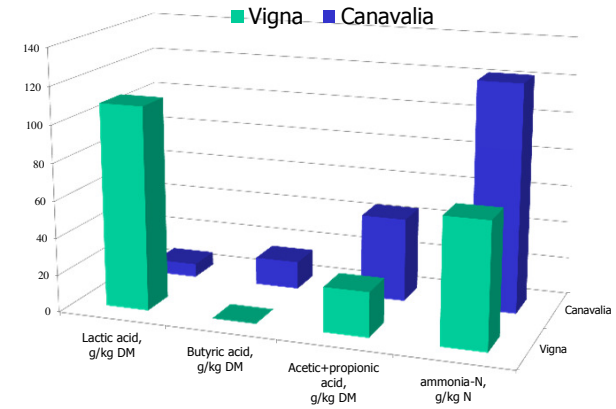
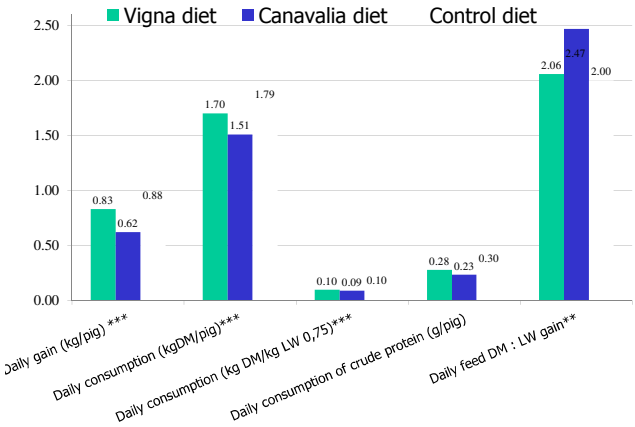


Figure 4. Fermentation quality of both silages

4. Results and discussion

- The fermentation quality was better in the *Vigna* silage (pH 4.4) than *Canavalia* silage (pH 5.3) (Fig. 4). This led to less palatability and minor growth in pigs supplemented with *Canavalia* silage (Fig. 5).
- Although the Canavalia diet contained a higher silage proportion as it was lower in crude protein, less overall consumption probably caused lower weight gain (Fig. 5)
- Canavalia diet had higher ADF and ADL contents (Table 1) which affected digestibility in earlier own studies.



*** (P<0.001), ** (P<0.01), *(P<0.05)

Figure 5. Performance parameters of growing pigs fed with diets with tropical silages and a control

5. Conclusions

- All three diets gave at least reasonably good weight gains.
- Good quality forage silage of *Vigna unguiculata* offered the most promising option to be included in balanced diets for growing-finishing pigs.

This study was part of the project "More chicken and pork in the pot, and money in pocket: Improving forages for monogastric animals with low-income farmers".

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