Silage Quality of the Legumes *Vigna unguiculata* and *Canavalia brasiliensis* solely and with Sweet Potato

Roots as an Alternative Pig Feeding

Siriwan Martens, Patricia Avila, Jorge L. Gil, Luis H. Franco, Michael Peters

1. INTRODUCTION

- As prices for feed concentrates are rising, alternative options for small and medium pig producers in the tropics are sought.
- Locally grown legumes like *Vigna unguiculata* or *Canavalia brasiliensis* could contribute to the protein supply.
- Starchy roots and tubers such as sweet potato (*Ipomoea batatas*) (Fig. 1) could add to the energetic value.

![Fig. 1: *Ipomoea batatas* var. Tainun](nanx1320158 to nanx1320190)

2. MATERIALS & METHODS

- *Vigna unguiculata* CIAT9611 and *Canavalia brasiliensis* CIAT17009 were evaluated at four different ages. *Vigna* was cut at 6 (pre-florescence), 8 (florescence), 10 (post-florescence) and 12 (pods ripening) weeks of growth;
- *Canavalia* was cut at 6, 12, 16 and 20 weeks of growth (no distinct generative stage observed);
- The forages were wilted to a target dry matter (DM) of 35% and then chopped (Fig. 2).

![Fig. 2: Harvest and ensiling](nanx1320158 to nanx1320190)

3. RESULTS

- *Canavalia brasiliensis* was difficult to chop and consequently to compact because of its long and fibrous twines.
- According to the organoleptic evaluation which emphasises the smell, silages ranged from very good to moderate/bad, and were good to satisfactory on average.
- Sweet potato only silage was rather subject to decomposing and decolouring than the forage legume silages.
- However, one of the *Vigna* (8 weeks) triplicates was completely rotten.

4. SUMMARY & OUTLOOK

- The growth habit of *Canavalia brasiliensis* make it rather unsuited for processing to silage.
- The legume harvest age is important for the ensiling success, that is especially true for *Vigna unguiculata*, with best results at 12 weeks of growth (pod-ripening stage).
- The addition of sweet potato root generally improves the fermentation result. However, it can hardly diminish proteolysis.
- Next step to test the suitability as pig feeding will be the determination of the in-vitro digestibility.

### 2. MATERIALS & METHODS

- **DM, pH, ratio of ammonia-nitrogen (NH₃-N) to total N and volatile fatty acids** were determined to be judged according to the DLG key for evaluation of silages based on chemical analysis.

### 3. RESULTS

- *Canavalia brasiliensis* was difficult to chop and consequently to compact because of its long and fibrous twines.
- According to the organoleptic evaluation which emphasises the smell, silages ranged from very good to moderate/bad, and were good to satisfactory on average.
- Sweet potato only silage was rather subject to decomposing and decolouring than the forage legume silages.
- However, one of the *Vigna* (8 weeks) triplicates was completely rotten.

### 4. SUMMARY & OUTLOOK

- The growth habit of *Canavalia brasiliensis* make it rather unsuited for processing to silage.
- The legume harvest age is important for the ensiling success, that is especially true for *Vigna unguiculata*, with best results at 12 weeks of growth (pod-ripening stage).
- The addition of sweet potato root generally improves the fermentation result. However, it can hardly diminish proteolysis.
- Next step to test the suitability as pig feeding will be the determination of the in-vitro digestibility.