

# Optimization of the methane production from *Mangifera Indica* (mango) and *Manihot Utilissima* (cassava) leaves in co-digestion



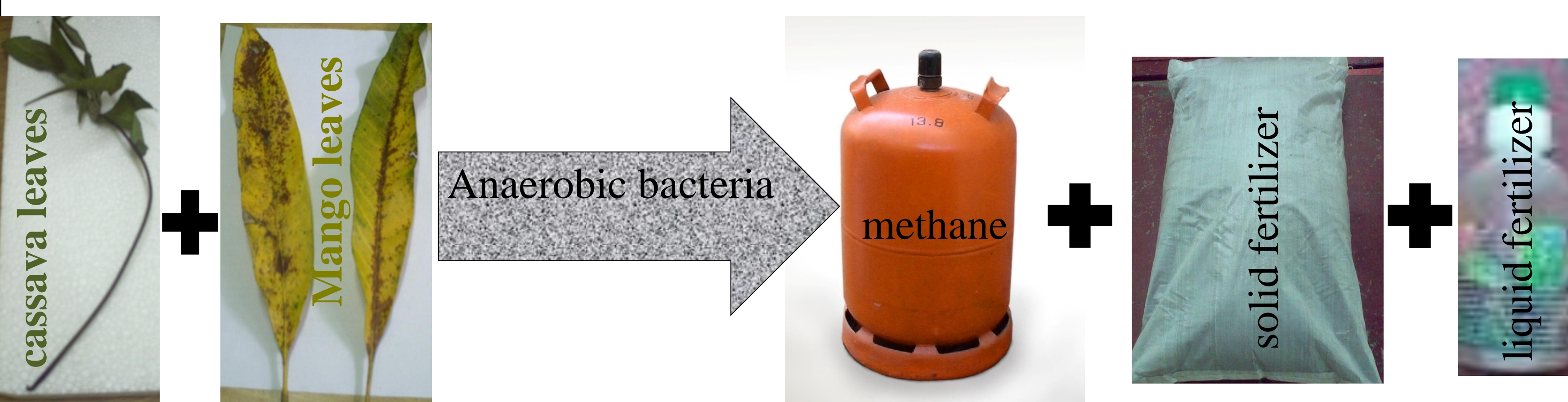
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## Context

- Clean renewable energy (no CO<sub>2</sub> to atmosphere)
- Biofertilizers
- Vegetable solid wastes management

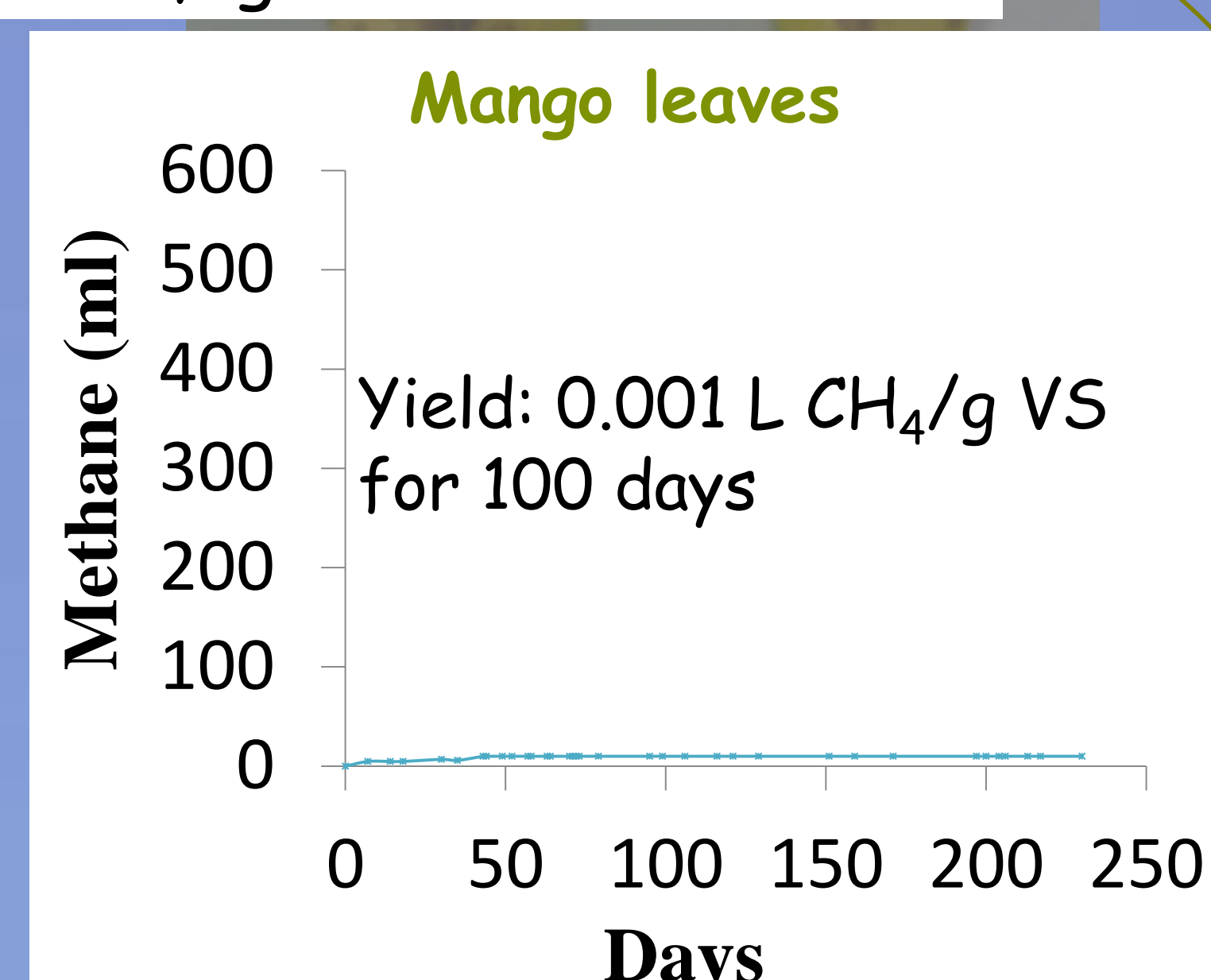
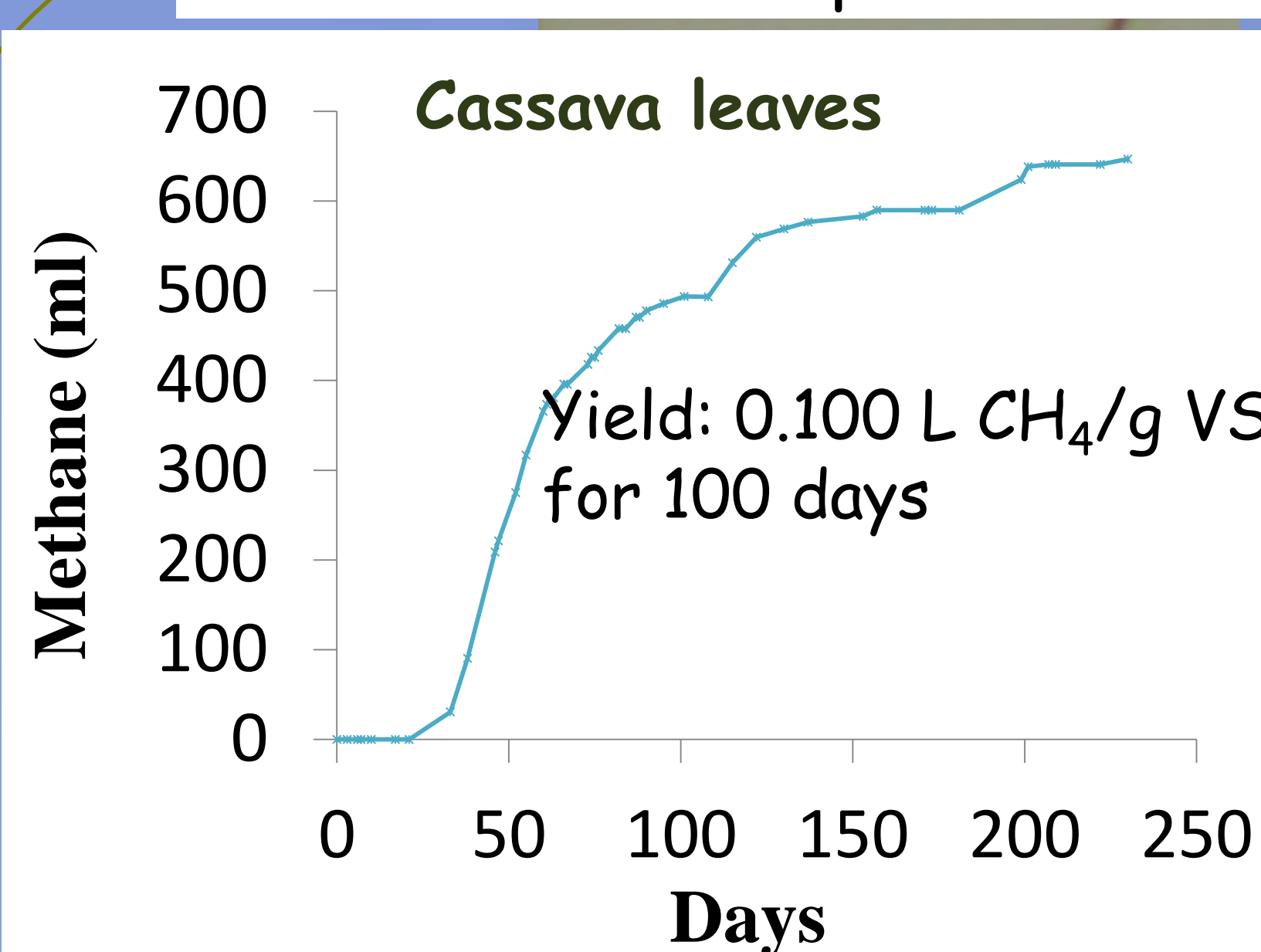


## Results 1 and discussion

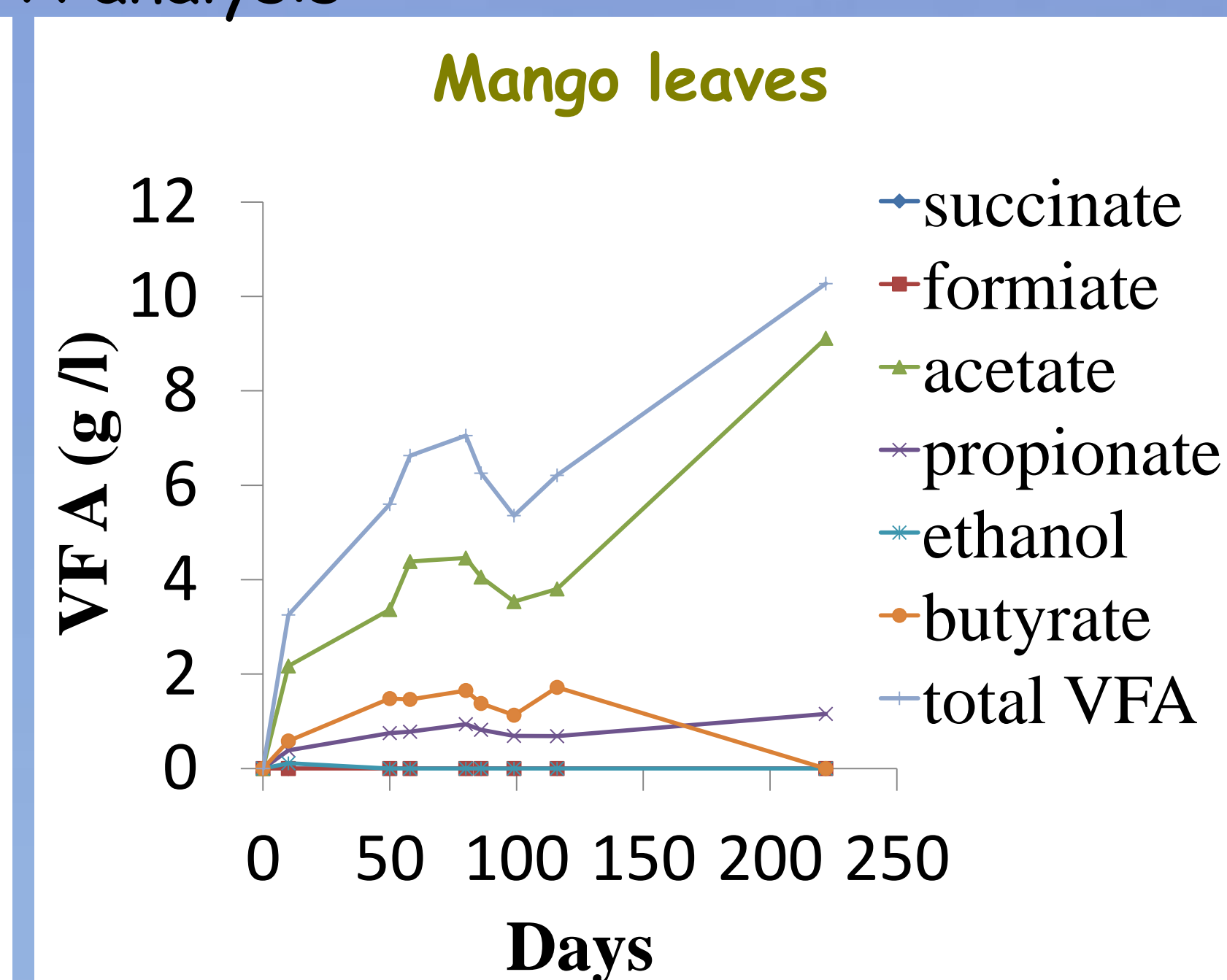
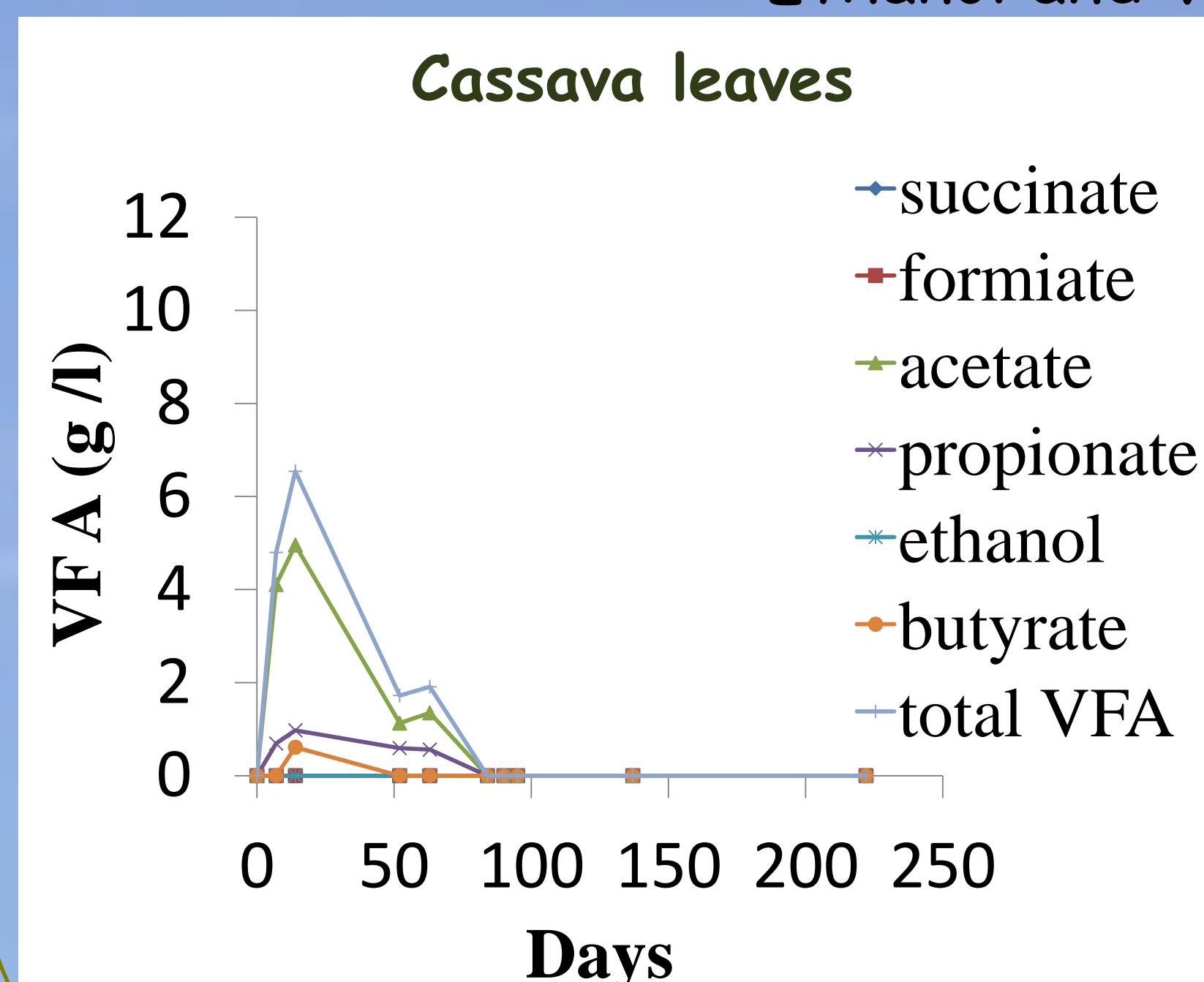
CHARACTERISTICS	Leaves characteristics	
	CASSAVA LEAVES	MANGO LEAVES
DW	80.76	88.68
VS	85.17	90.25
C/N	7.08	48.70
Mineral elements	14.83	9.75
Saponins	++	+
Anthraquinones	-	+
Water-soluble polyphenols	2.0	20.0

## Results 2 and discussion

### Methane production from 9,2g of leaves



### Ethanol and VFA analysis



➔ No VFAs accumulation

➔ VFAs accumulation

## Objective and research strategy

### Objective

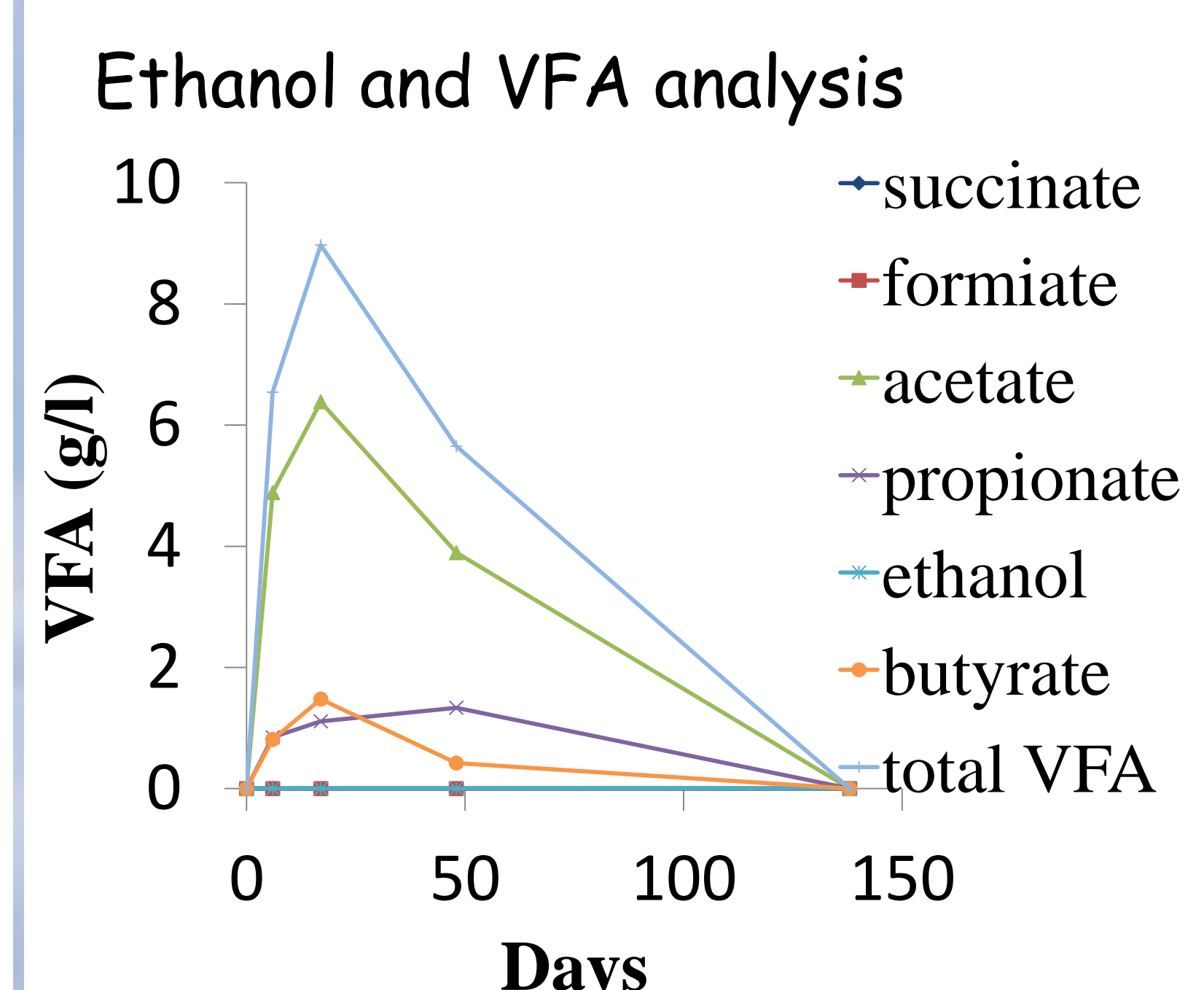
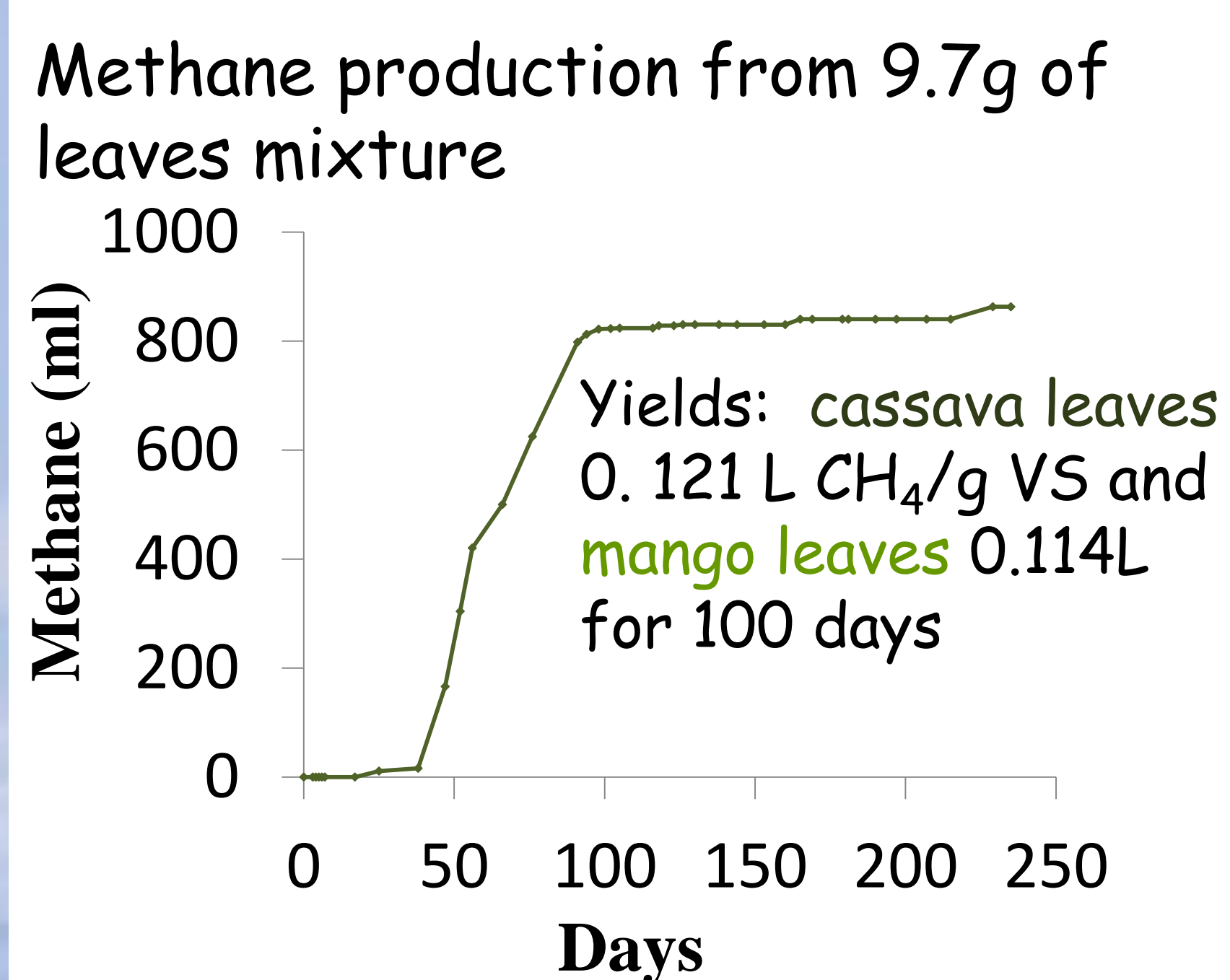
Simple and less expensive technique for a rapid anaerobic digestion of leaves

### Strategy

- Biochemical methane potential (BMP) assay of: leaves and their active substances
- Identification of inhibitory factors of the leaves biodegradation
- Optimization of the leaves anaerobic digestion
- Bioreactors assay

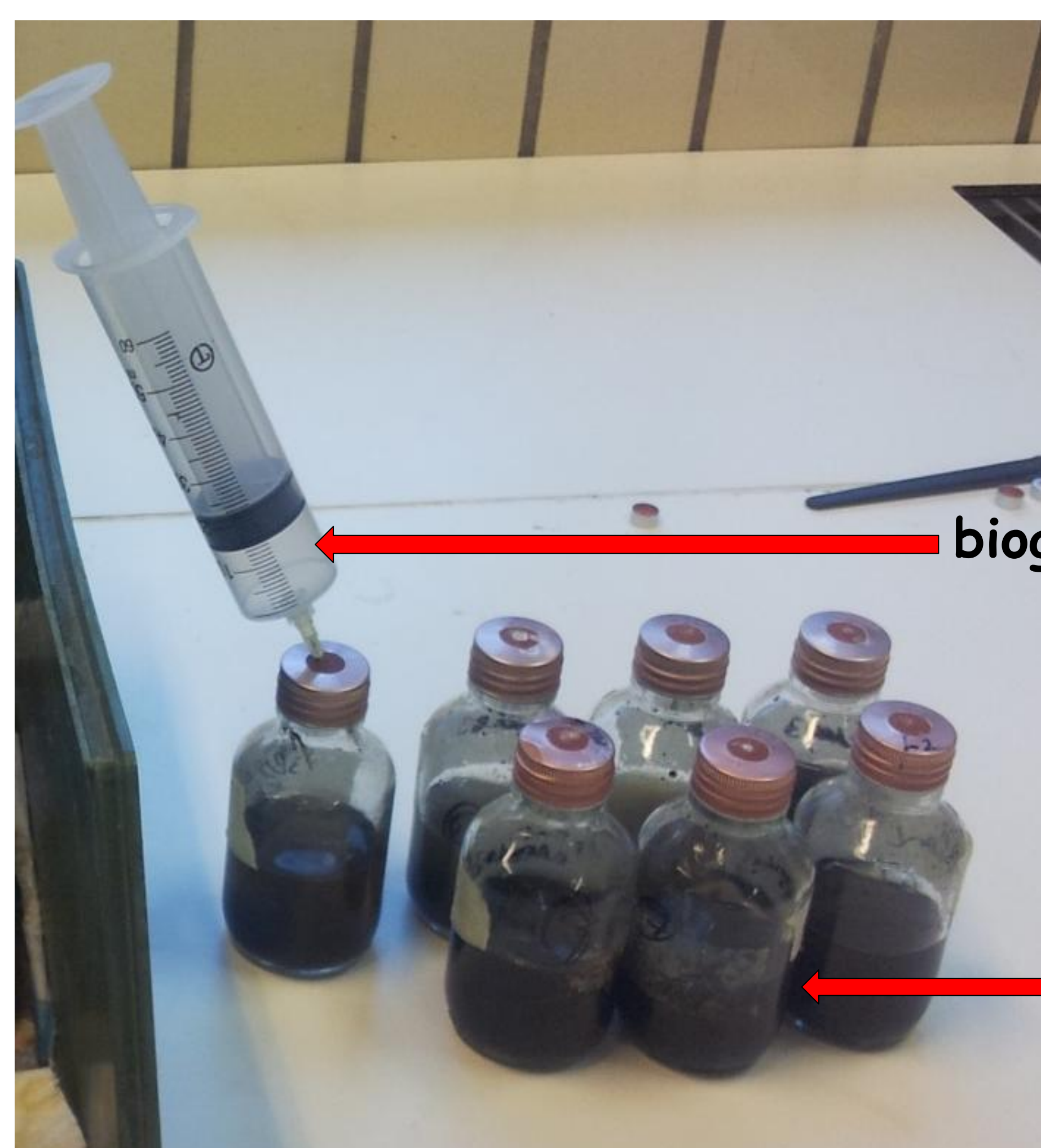
## Results 3 and discussion

Mixture of cassava leaves (75%) and mango leaves (25%) leads to C/N ratio of 9.3



No VFAs accumulation

## BMP assay



biogas sampling and measurement

medium volume (150 ml)

## Conclusions

Anaerobic co-digestion of both organic matter for the methane production enables:

- 1.2-fold higher yields for cassava leaves
- 114-fold higher yields for mango leaves (non-biodegradable alone)