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# Feed quality and availability on smallholder/semi-commercial farms in Limpopo – A comparative assessment of quality of cattle dung and forage

## Objectives

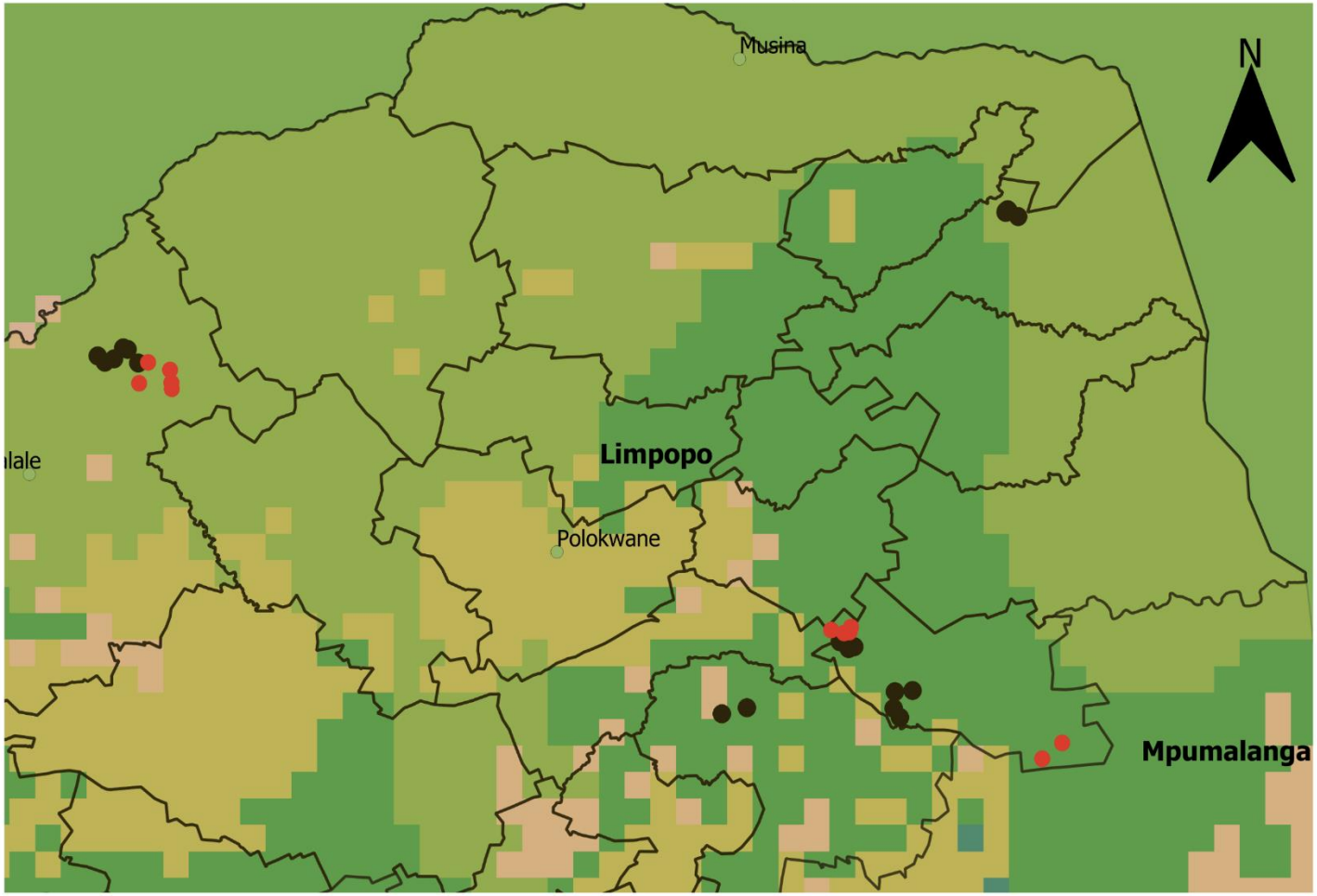
1) **Identification of common dry-season feeds for cattle and their quality**

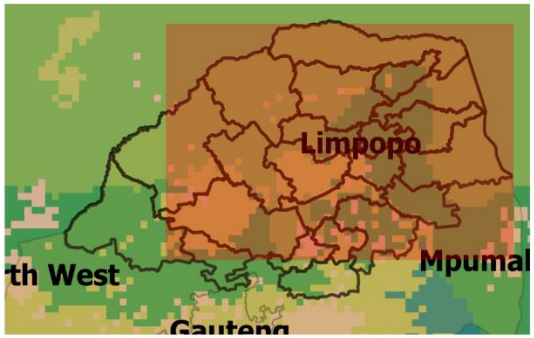
2) **How can animals utilize these feeds?**

3) **Assess winter feed shortages**

→ **On-farm surveys**
→ **Collection of cattle dung**
→ **Collection of rangeland biomass and feed samples**

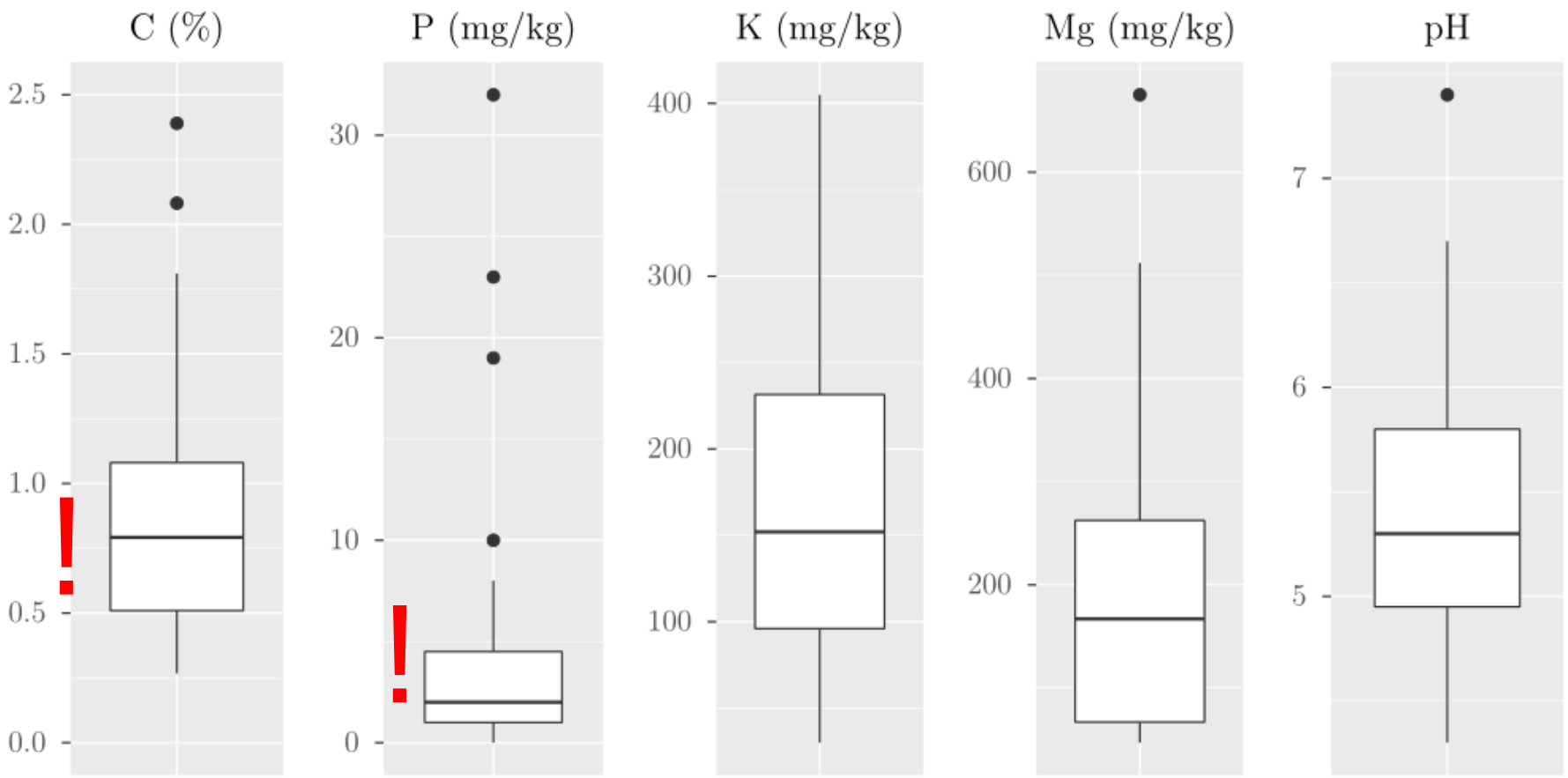
# Study sites



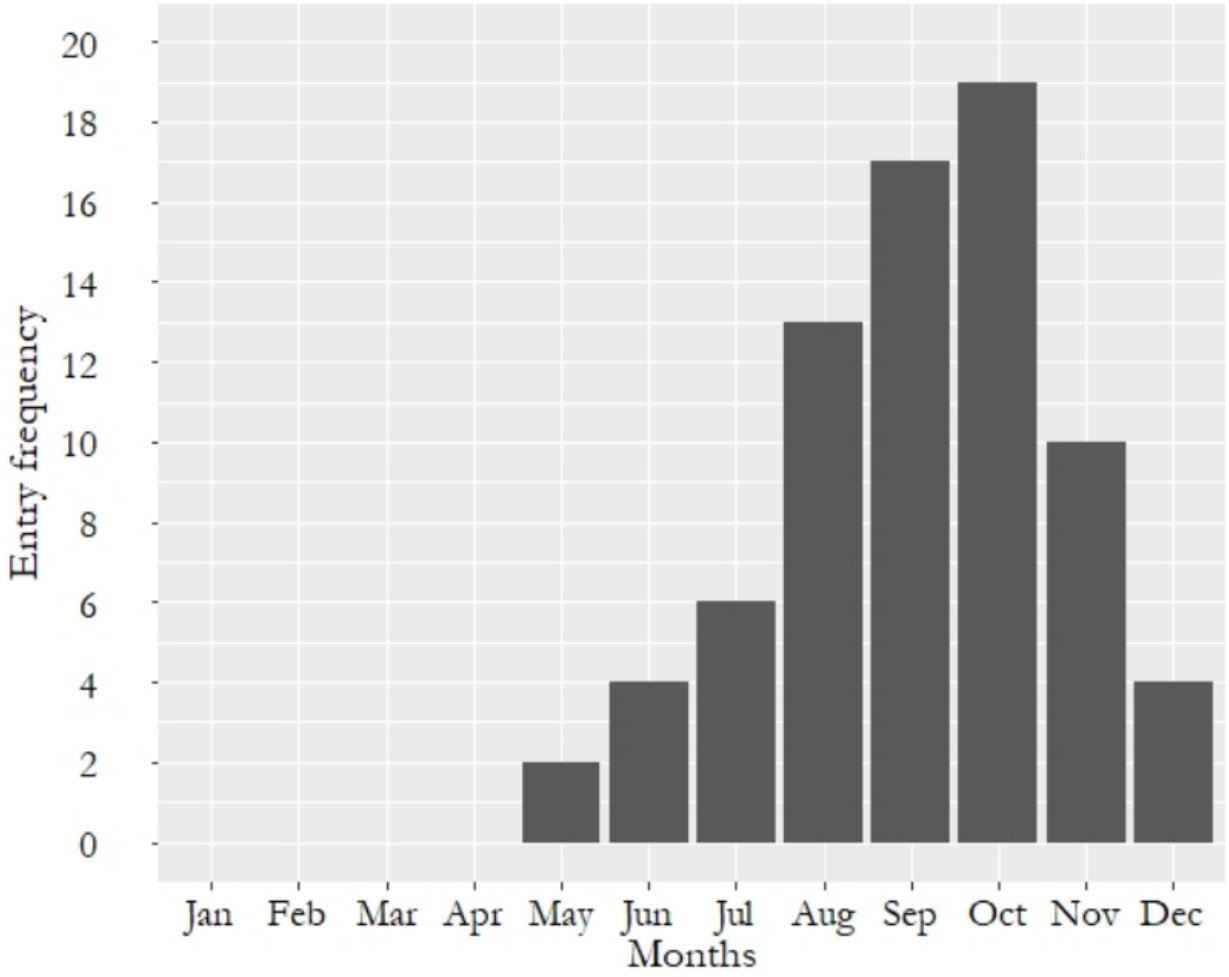

0 50 100 km

## Soil basic nutrients




C, P, K, Mg and pH of rangeland soil samples

## Feed shortage perception




Periods of severe feed shortages as perceived by farmers (n=32)

**Feed quality analysis** ⇔ **Metabolic utilization by animals**

## Feed nutritive value (1):

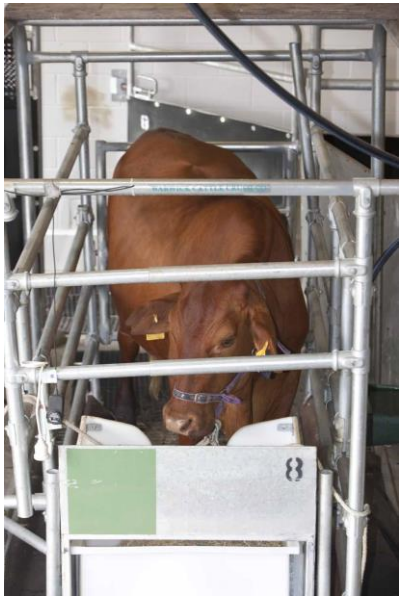
| Rangeland forage (n=22) | CP (%) | C (%) | Ash (%) | C/N | oADF (%) | oNDF (%) | ME (MJ/kg DM) |
|---|---|---|---|---|---|---|---|
| Mean | | | | | | | |
| Min | | | | | | | |
| Max | | | | | | | |
| St. Dev. | | | | | | | |
| **Feedstuffs** | | | | | | | |
| Feed mix: Hay & Supplements | | | | | | | |
| Hay | | | | | | | |
| White bean stover | | | | | | | |
| Feed mix: Hay & chicken manure | | | | | | | |
| Apple-leaf (*P. violaceae*) | | | | | | | |

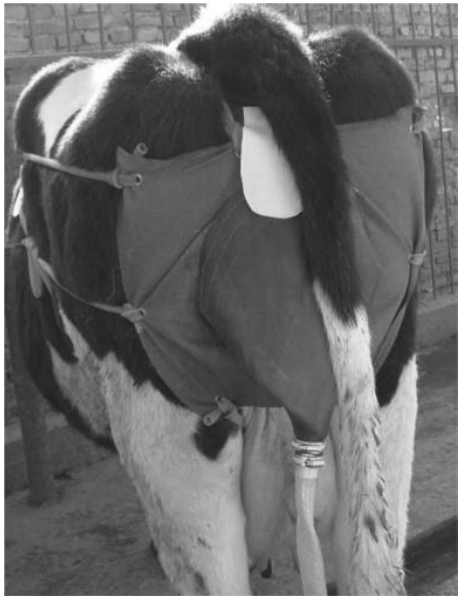
- Grasses poor in crude protein
- High C/N ratio and high in undigestible fibre (oADF)
- Rather low metabolizable energy (ME)

- Supplementary feedstuffs important!
- Tree species browsed by cattle (*Philenoptera violaceae*) of high feed quality

## Feed energy value (1)

Studying actual feed intake and nutritive value (digestibility) very laborious!



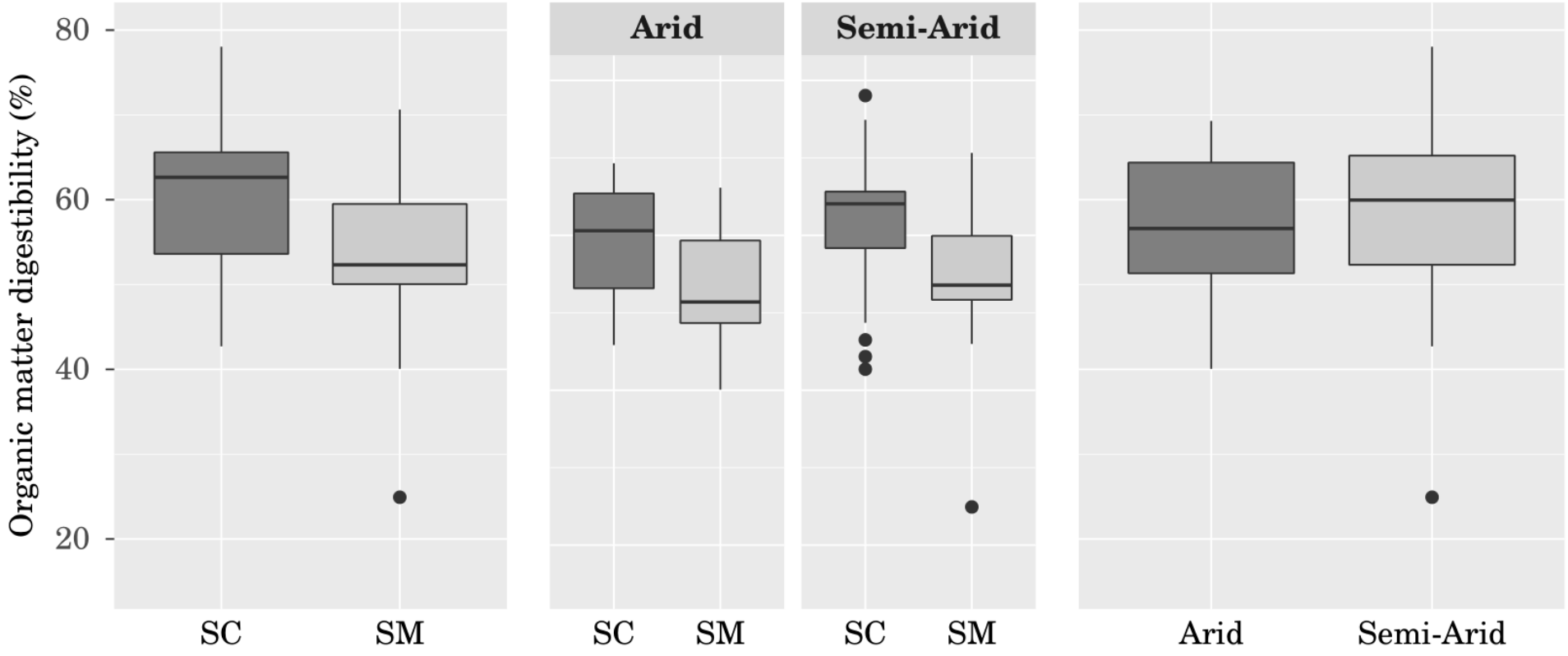


Alternative:
Conclusions from Dung-N-content!

→ Assessment of the energy balance per animal

## Feed energy value (2)

### Differences between farm classes and agro-ecological zones




SC = Semi-commercial; SM = Smallholder

# $\delta^{15}N$ and $\delta^{13}C$

Isotopic signatures of nitrogen (N) and carbon (C) in dung and feed contribute to a clearer picture of the

- nitrogen limitation in the system
- relative importance of $C_3/C_4$ plants in the animals‘ diet

→ Important: Grazing management, stocking density, access to water, ...

## Preliminary conclusions

- Rangeland soils rather low in basic nutrients → implications for management?
- Grazing management affects animals‘ reliance on supplements (de-stock?)
- Utilization of leguminous trees as forage: Implications for agroforestry/forage cover crop options?
- **Follow-up study**:
  - Exploration of potential of cover crops (rye, clover, vetch) as fodder

Thank you!