

# Milk fatty acid composition of camels and cattle grazing and browsing in East-African rangelands

## Introduction

- Camels and cattle: important livestock species in arid and semi-arid rangelands of East Africa.
- Differences in diet selection: cattle (grazers), camels (prefer browse, i.e., trees, shrubs, herbs).
- Hypotheses: (i) the fatty acid (FA) composition of camel and cattle milk differs, (ii) there are seasonal differences in the milk FA profile of camels, indigenous and crossbred cattle (iii), there are differences in nutrient and phenol intake and the milk FA profile of local and crossbred cattle differs.

## Conclusions

- Camels: ingestion of higher amounts of lignin, crude protein, phenols and tannins, especially during TP, compared to both cattle types.
- Cattle milk fat: contained higher proportions of SFA, while camel milk fat had higher proportions of MUFA and PUFA, including C18:3n-3.
- Supplementation: had almost no effect on milk FAs. Almost no difference in milk FA profile of local and crossbred cattle.
- The milk fatty acid profile of camel and cattle is differently affected by seasonal changes in forage and diet selected.

## Materials & Methods

Study site: Laikipia, Kenya

2 seasons: rainy season (RS), drier transition period (TP)

Half of the animals were supplemented with a urea-molasses supplement



Camel (*Camelus dromedarius*), n=11 and 12 in RS and TP



Crossbred cattle (Boran x Guernsey, *Bos indicus* x *B. taurus*), n=12/season



Pokot cattle (local cattle genotype, *B. indicus*), n=11 and 12 in RS and TP

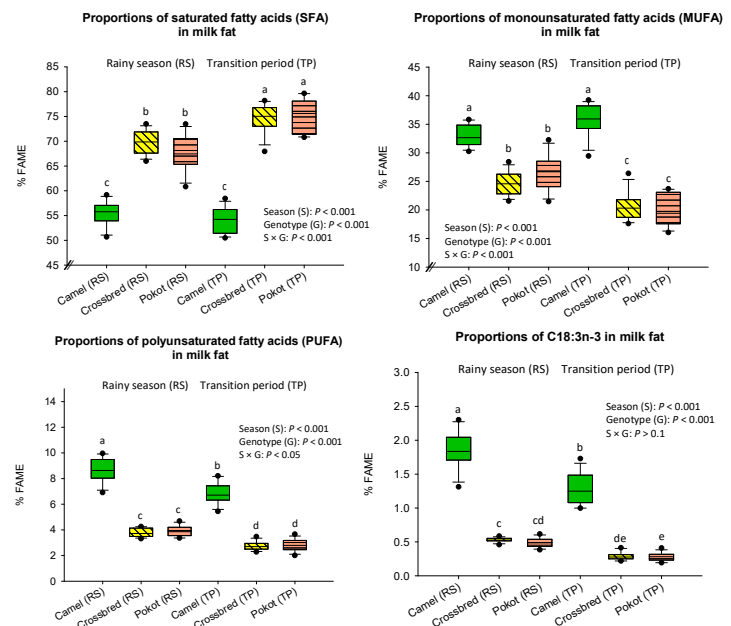
## Results

S <sup>1</sup>	Genotype	SU <sup>2</sup>	Crude protein	Lignin (ADL)	Phenols (TEP)	Tannins (TT)
RS	Camel	yes	16.42 <sup>a</sup>	22.33 <sup>a</sup>	7.54 <sup>a</sup>	2.33 <sup>a</sup>
		no	14.58 <sup>ab</sup>	19.67 <sup>a</sup>	5.54 <sup>abc</sup>	1.40 <sup>ab</sup>
	Crossbred	yes	10.19 <sup>b</sup>	10.36 <sup>bcd</sup>	3.65 <sup>bcd</sup>	0.56 <sup>cd</sup>
TP	Camel	yes	9.25 <sup>b</sup>	9.67 <sup>bcd</sup>	3.46 <sup>cd</sup>	0.56 <sup>cd</sup>
		no	10.44 <sup>ab</sup>	10.28 <sup>bc</sup>	3.36 <sup>d</sup>	0.51 <sup>cd</sup>
	Crossbred	yes	11.77 <sup>ab</sup>	11.06 <sup>bc</sup>	3.62 <sup>bcd</sup>	0.49 <sup>cd</sup>
TP	Camel	yes	9.68 <sup>b</sup>	16.27 <sup>ab</sup>	5.67 <sup>ab</sup>	1.72 <sup>ab</sup>
		no	12.93 <sup>ab</sup>	21.56 <sup>a</sup>	5.56 <sup>abc</sup>	1.33 <sup>bc</sup>
	Crossbred	yes	3.01 <sup>c</sup>	7.19 <sup>cd</sup>	1.71 <sup>e</sup>	0.34 <sup>d</sup>
TP	Camel	yes	2.67 <sup>c</sup>	6.60 <sup>cd</sup>	1.45 <sup>e</sup>	0.25 <sup>d</sup>
		no	2.93 <sup>c</sup>	6.99 <sup>cd</sup>	1.60 <sup>e</sup>	0.28 <sup>d</sup>
	Crossbred	yes	2.43 <sup>c</sup>	5.98 <sup>d</sup>	1.32 <sup>e</sup>	0.22 <sup>d</sup>
SEM			1.242	1.531	0.505	0.225
P-values						
Season (S)			<0.001	<0.001	<0.001	<0.001
Genotype (G)			<0.001	<0.001	<0.001	<0.001
Supplement (SU)			ns	ns	<0.1	<0.05
S × G			<0.001	<0.1	<0.001	ns
S × SU			ns	ns	ns	ns
G × SU			ns	ns	ns	<0.1
S × G × SU			<0.1	<0.1	ns	ns

**Table 1.** Estimated intake of nutrients and phenols of camels and cattle during time spent on pasture (8 – 16 h, in g/kg BW<sup>0.75</sup>) during the rainy season (RS) and transition period (TP) (n = 6 per subgroup).

<sup>1</sup>S: season; <sup>2</sup>SU: supplementation; ns: not significant.

- Direct observations & bite counting (one day per animal, n=36 days/season) & chem. analysis of the most selected plant species to estimate nutrient and phenol intake
- Milk samples collected at the end of each season & analysed for fatty acid (FA) composition using gas chromatography



**Figure 1.** Proportions of fatty acids in milk fat (% FA methyl esters) in camel, crossbred cattle and Pokot cattle in a rainy season (RS) and a transition period (TP).