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Fatty acid and mineral composition of milk from Italian local goat breeds

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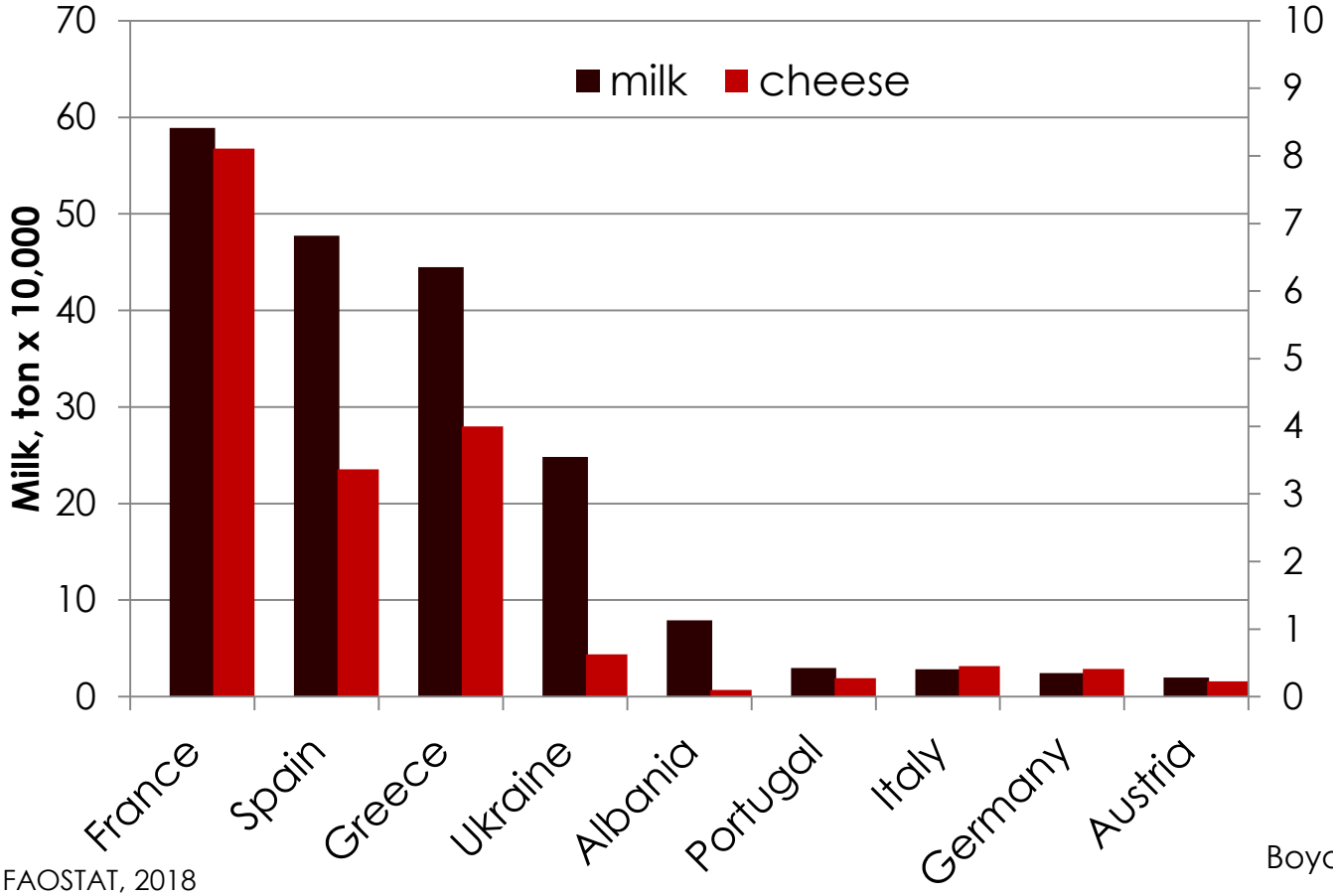
Introduction

Milk and cheese goat production in Europe



FAOSTAT, 2018

95%

Boyazoglu & Morand-Fehr, 2001

Goat in Italy

620,000 dairy goats

52 Local breeds

Cosmopolitan breeds

Garganica
Girgentana
Jonica
Maltese
Mediterranean Red

Italian Herd book

Saanen
Alpine

Genetic variability
Adaptability
Milk quality traits

FAOSTAT, 2018

Fatty acids and minerals

Cheese making process

- Taste and Flavour
- Curd Strenght

Human health

- Energy Source
- Body function

AIM

To investigate fatty acid and mineral composition of milk from 6 goat breeds


Garganica, **GA**


Girgentana, **GI**


Saanen, **SA**


Jonica, **JO**


Maltese, **MA**


Mediterranean Red, **MR**

Material and Methods

Experimental farm: 1
Feed: 6h/d pasture and concentrate
Goats : 39
Breeds: 6
Parity Order: 2 to 5 (twin birth)
Milking: 2 times/d

Council for Agricultural Research and Economics (CREA, Potenza, Italy)

Parturition

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	2016
		4th	8th	12th	16th	20th	24th					week of lactation

Milk sampling

Milk Analysis (n=231)

Gross Composition (%)	Fatty acids (% iFA)	Minerals (PPM)
Fat, protein, lactose	C4-C24 CLA, SFA, MUFA, PUFA, n3, n6	Ca, K, Mg, Na, P, Zn
Milkoscan FT6000	Agilent 7820A GC System	Ciros Vision EOP (ICP- OES)

Statistical analysis

SAS v9.4 (SAS Inst. Inc., Cary, NC)
MIXED procedure with **repeated measures** according to the following mixed linear model:

$$y_{ijkl} = \mu + B_i + P_j + W_k + (B \times W)_{ik} + \varepsilon_{ijkl}$$

Y_{ijkl} = dependent variable
μ = overall mean
B_i = breed (i = GA, GI, JO, MA, MR, SA)
P_j = parity (j = 2 to 5)
W_k = week of lactation
$(B \times W)_{ik}$ = interaction between breed and week of lactation
ε_{ijkl} = random residual

Results

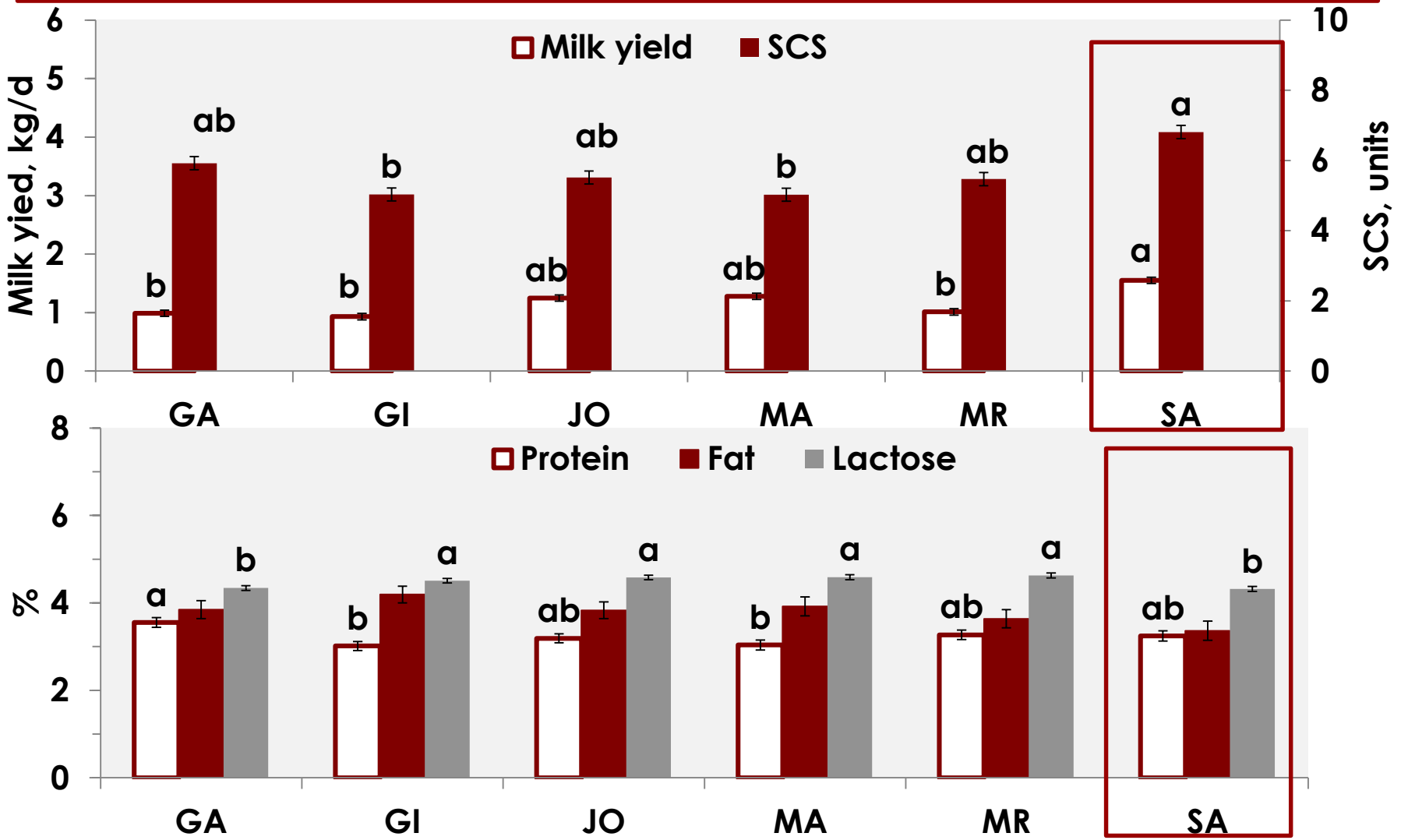
Descriptive statistics

Trait	Mean	SD	Min	Max
Milk yield, kg/d	1.32	0.48	0.50	3.30
Fat, %	3.81	0.90	2.00	7.23
Protein, %	3.21	0.46	2.24	4.87
Lactose, %	4.49	0.31	3.30	5.41
SCS, units	5.42	1.72	1.40	9.01

Significance of fixed effects

- **Breed differences for milk yield, protein, lactose, SCS, C4:0, C14:0, C16:0, C18:0, CLA, Na, P, Mg and Zn ($P<0.05$)**
- **Week of lactation for all the traits ($P<0.05$)**
- **Parity significant only for UFA and MUFA ($P<0.05$)**

LS means of breed effect



GA, Garganica; GI, Girgentana; JO, Jonica; MA, Maltese, MR, Mediterranean Red; SA, Saanen; *P<0.05*

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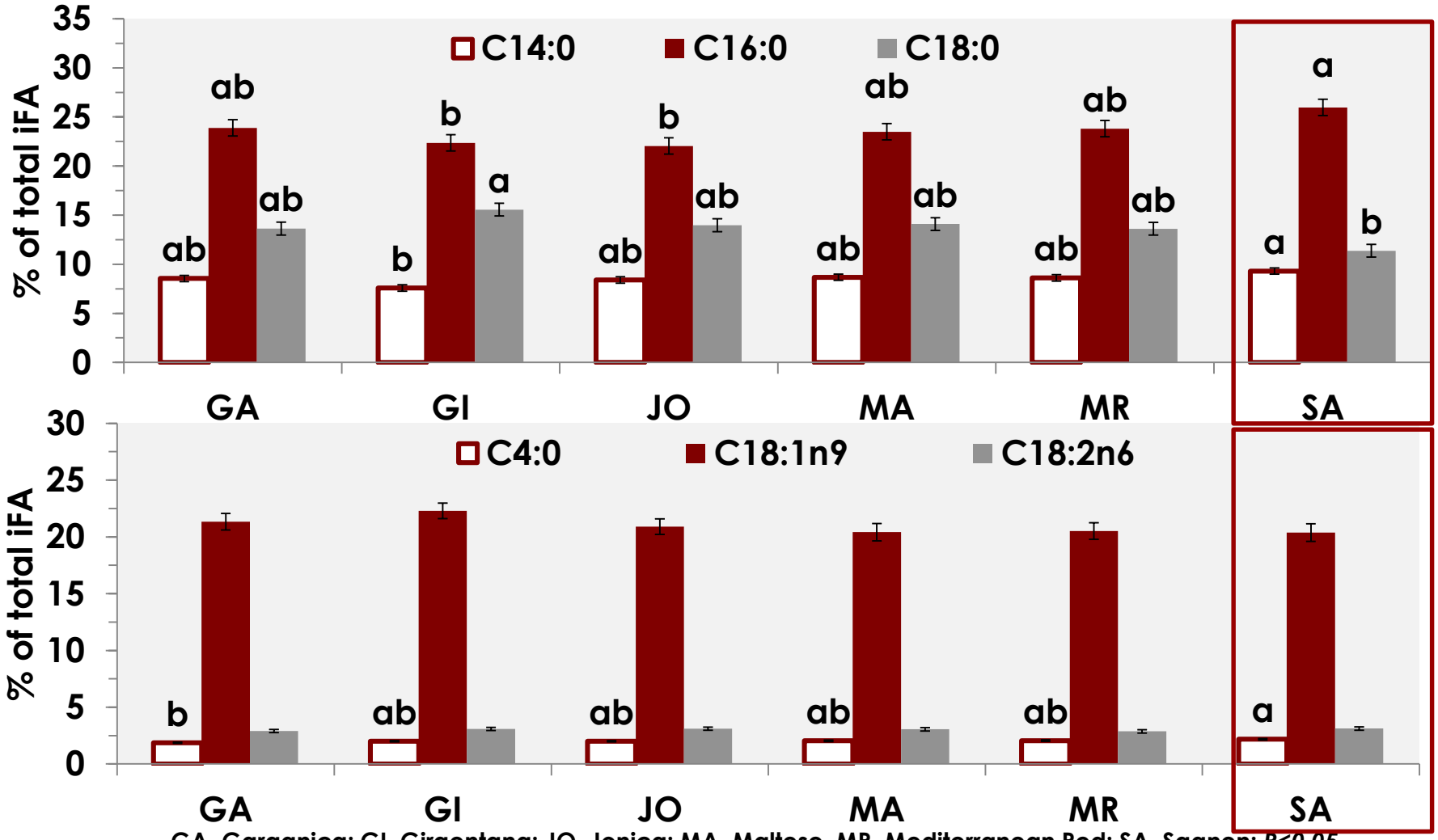

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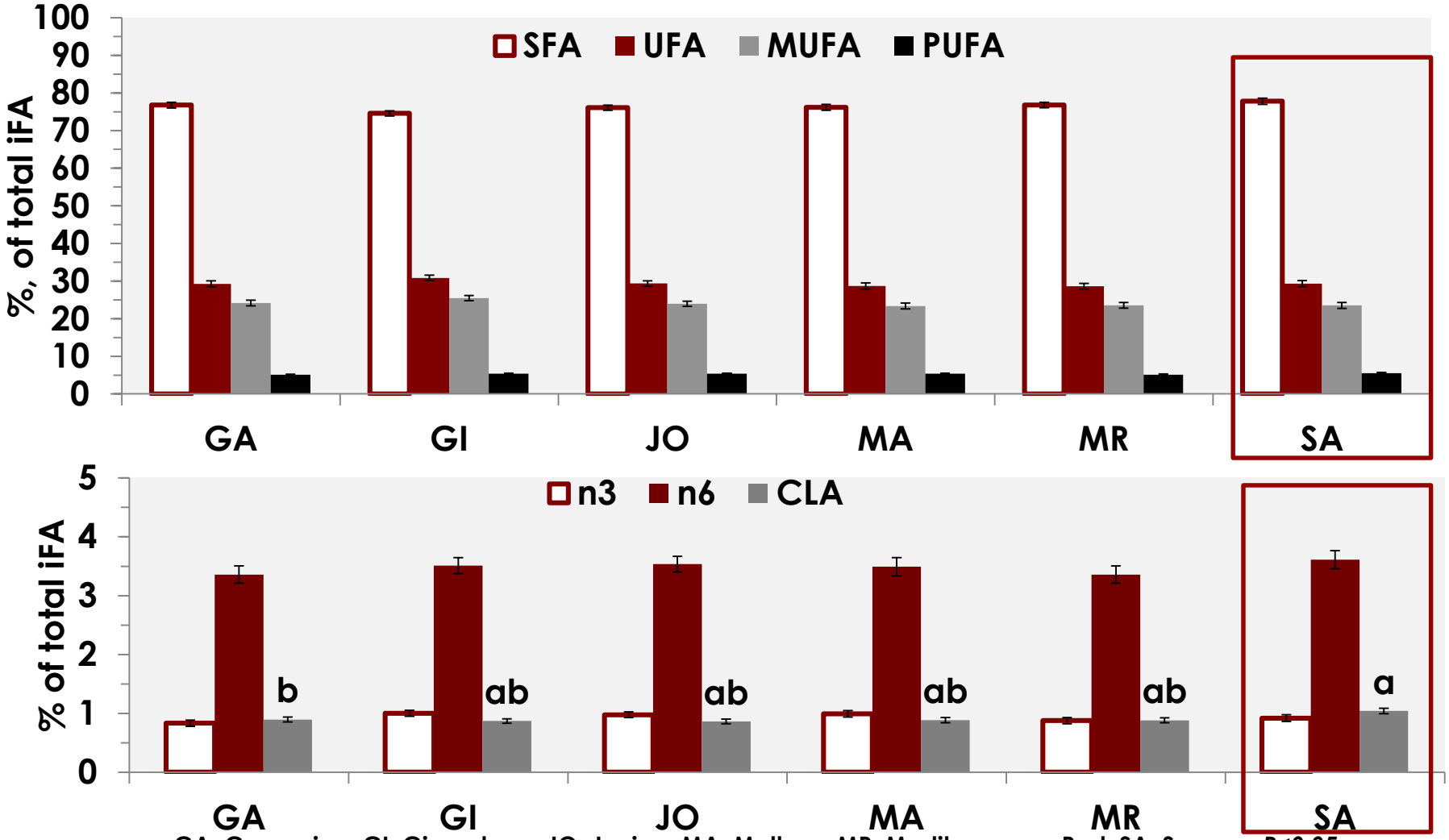

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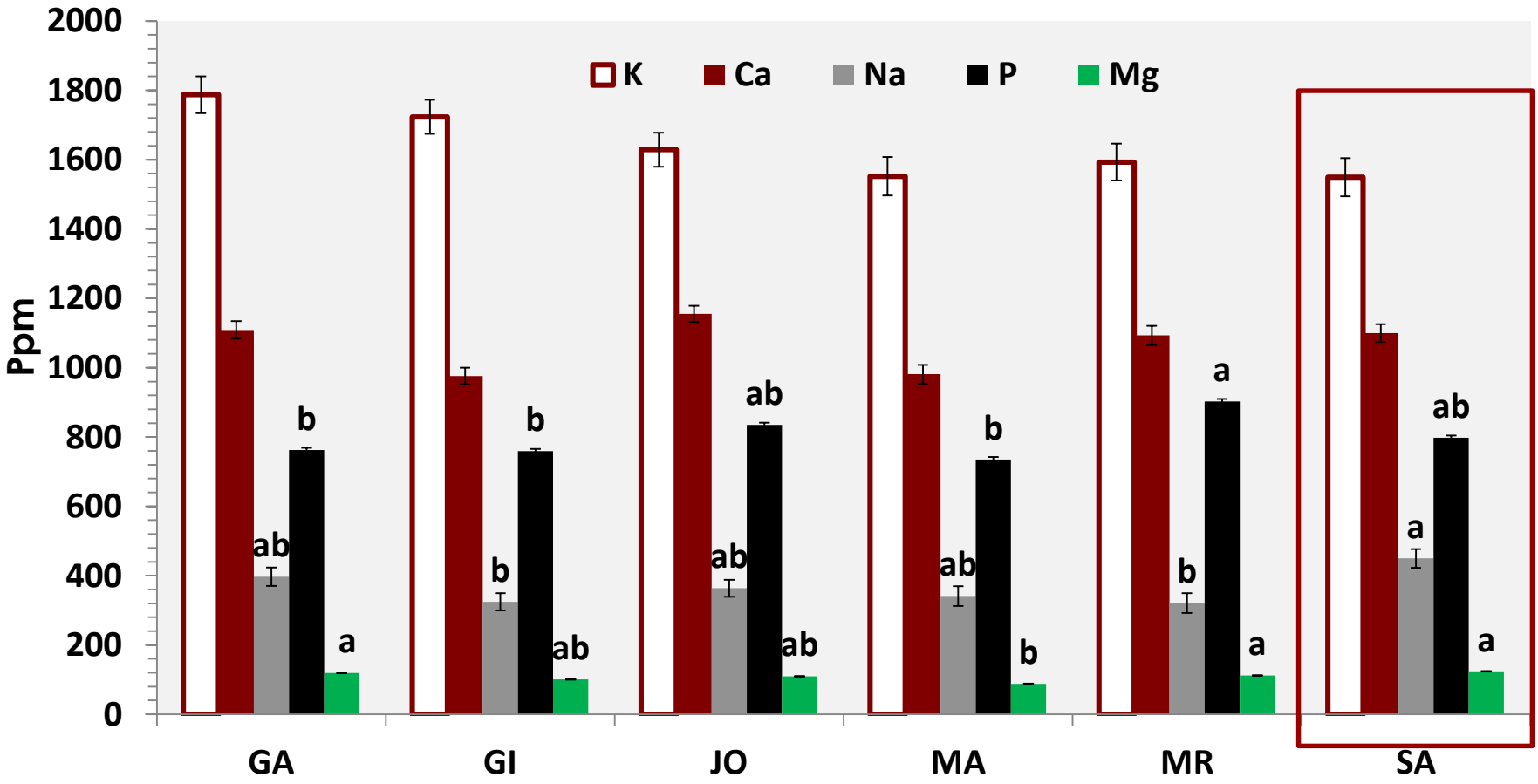

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Conclusions

- This study characterized FA and mineral composition of 5 Italian local goat breeds
- Few differences between Saanen and some local breeds were detected
- Local breeds produced less milk than Saanen but with better milk quality (low SCS and Na; high level of lactose and C18:0)
- Results might be useful for biodiversity issues and to valorize the milk and cheese of these local goat breed

Thank you for your attention