Comparison of two methods of milk fatty acid composition to detect SARA (subacute rumen acidosis in dairy goats)

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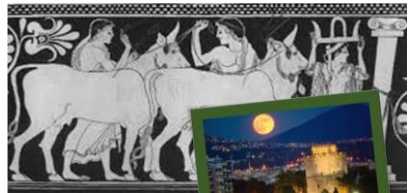
Fifth DairyCare Conference, Thessaloniki, March 19th and 20th 2018



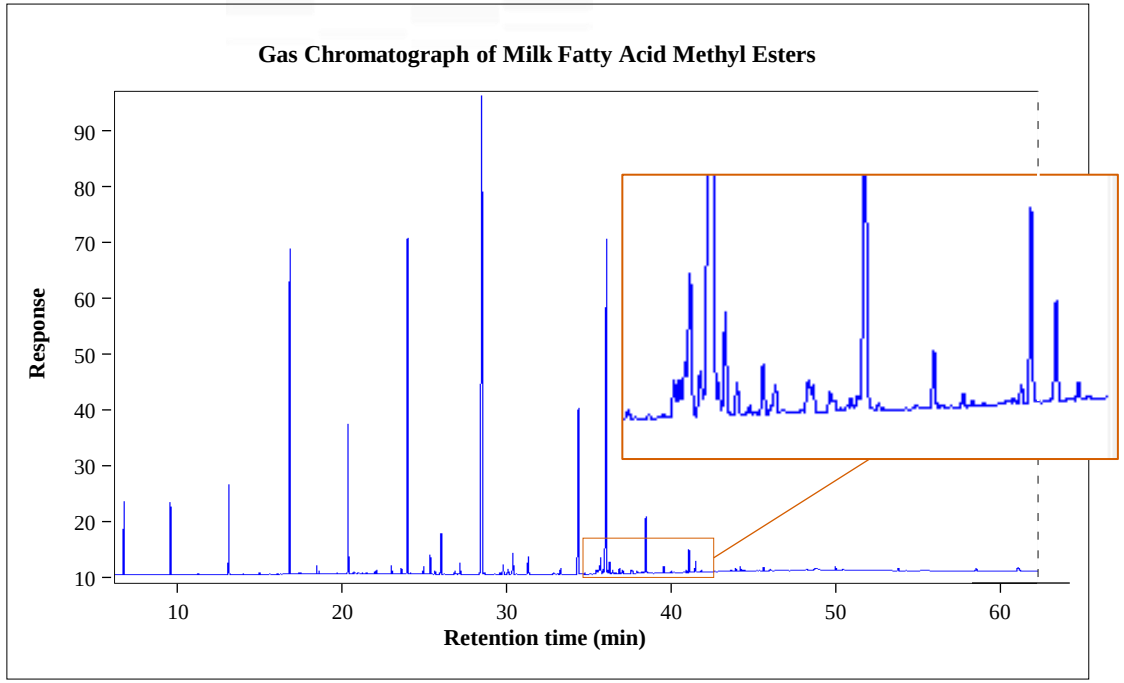
Introduction

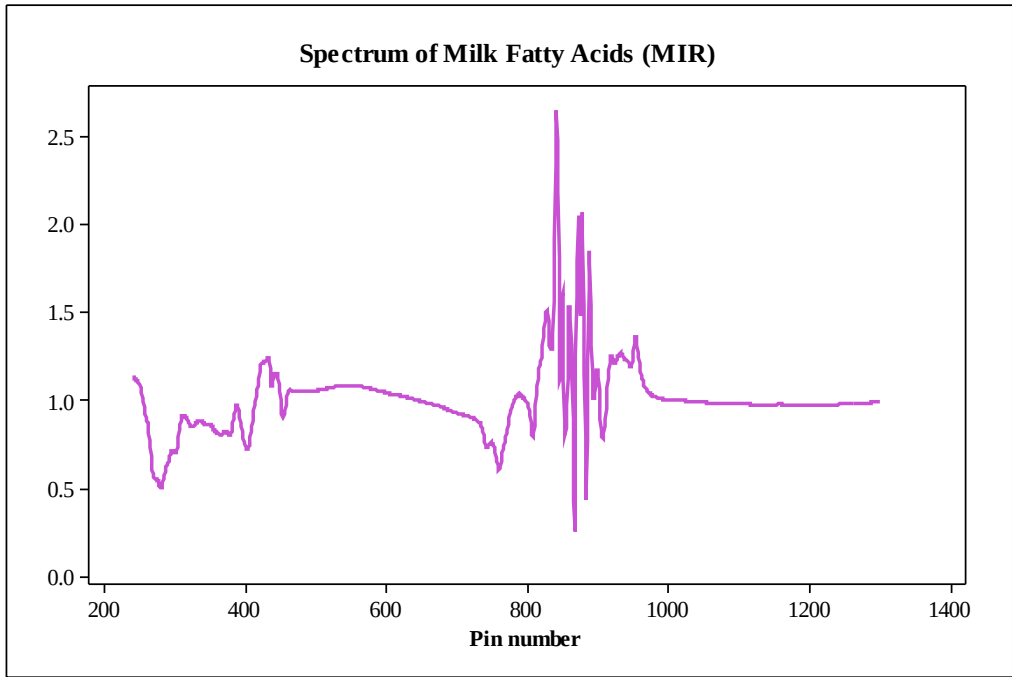
- High yielding ruminants need diets of high nutritive value
- These diets might be acidogenic, but the occurrence of acidosis depends on the animal

The challenge is to find noninvasive markers to detect animals suffering from SARA

Aim of the study

Comparison of two methods of measure of milk fatty acid composition:

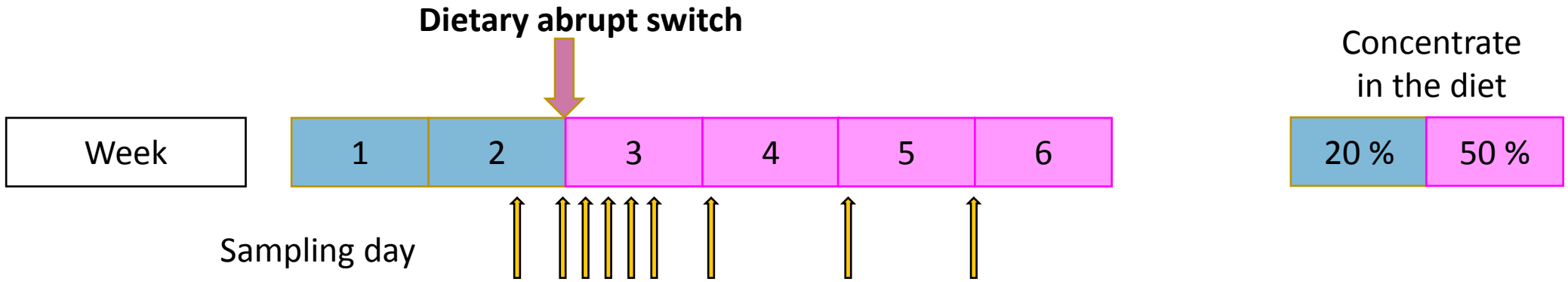




Gas Chromatography (GC)

Medium Infrared Analysis (MIR)

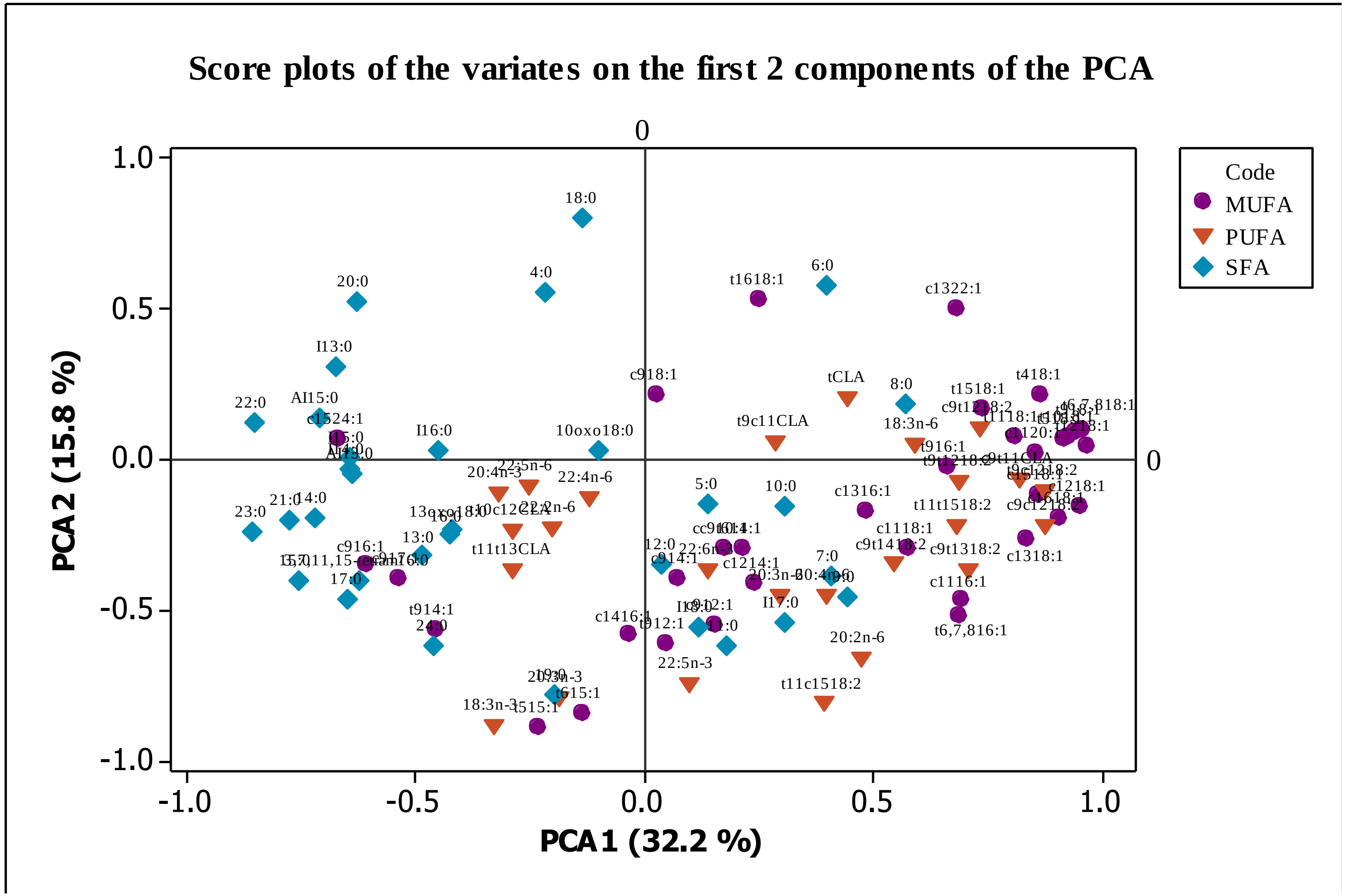
Experimental design



Samples in 8 goats

- **Milk: morning (GC: 91 FA, MIR: 58 FA)**
- **Rumen T0, T1, T2, T4 & T6 : pH, VFA**

Results



Score plots of the variates on the first 2 components of the PCA
PCA 2 (15.8 %)
PCA 1 (32.2 %)
1.0
0.5
0.0
-0.5
-1.0
0
Code
MUFA
PUFA
SFA
18:0
4:0
20:0
6:0
t1618:1
c1322:1
I13:0
c918:1
tCLA
8:0
t1518:1
t418:1
22:0
AI15:0
c1524:1
I16:0
10oxo18:0
t9c11CLA
18:3n-6
22:4n-6
5:0
10:0
c1316:1
23:0
21:0
14:0
t11t1518:2
c1118:1
13:0
c916:1
t11t13CLA
12:0
c1214:1
7:0
c9t1318:2
c1318:1
17:0
c1116:1
t914:1
I17:0
c1416:1
t912:1
20:2n-6
t6,7,816:1
22:5n-3
t11c1518:2
18:3n-3
t615:1
24:0

Results

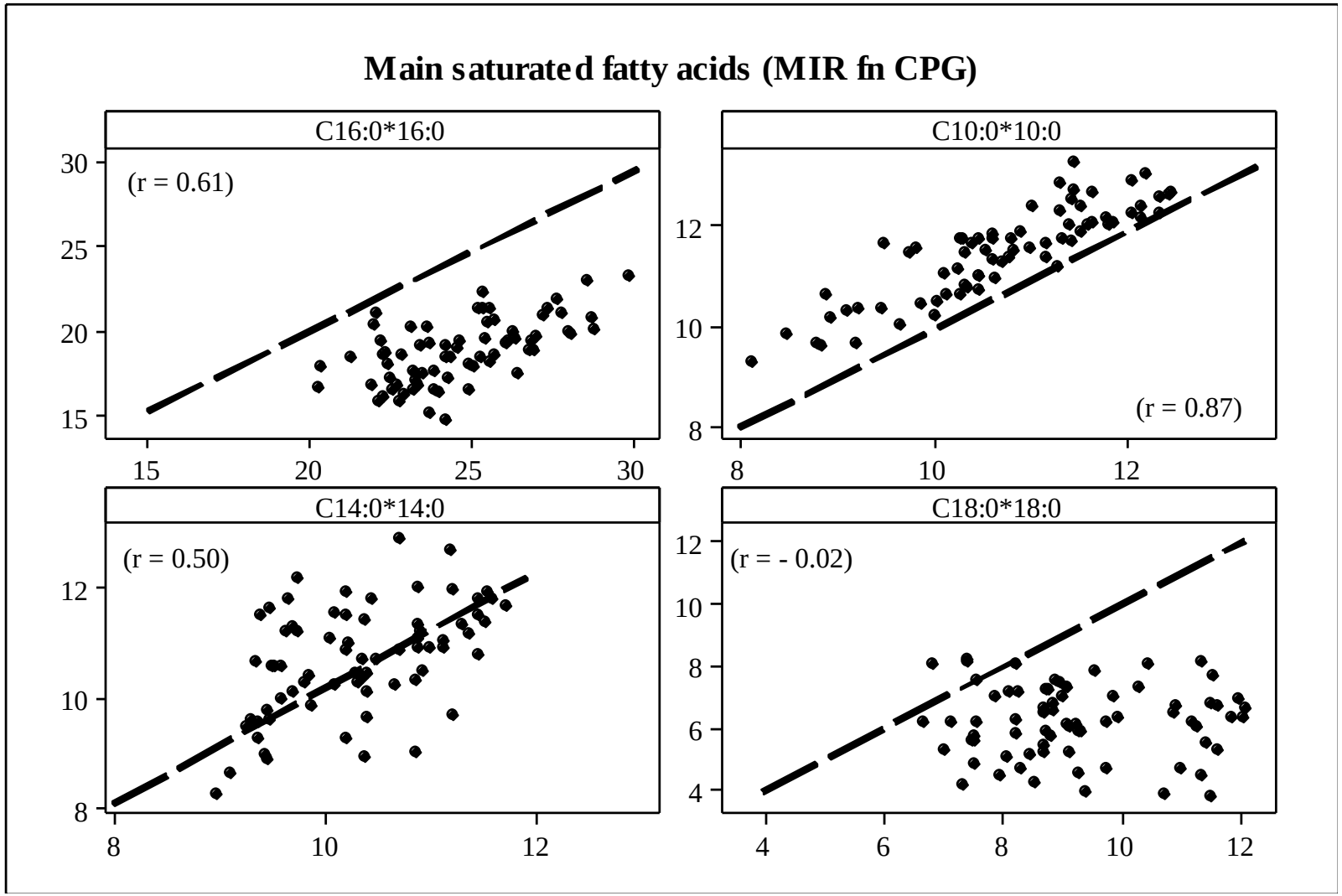
✓ Calculation of the ratio (Short an Medium SFA)/Long FA:

GC ratio: 0.50 ± 0.05

MIR ratio: 0.72 ± 0.06

Correlations	pH		VFA (mmol/L)	
Ratio	CPG	MIR	CPG	MIR
T0	**0.51**	(0.19)	**-0.46**	**-0.34**
T1	(0.08)	(-0.09)	**-0.28**	**-0.32**
T2	(0.01)	**-0.27**	**-0.29**	(-0.20)
T4	**0.25**	(-0.15)	**-0.26**	(-0.17)
T6	**0.33**	(0.11)	**-0.24**	(-0.13)
Mean	**0.31**	(-0.03)		

(n = 72 samples)

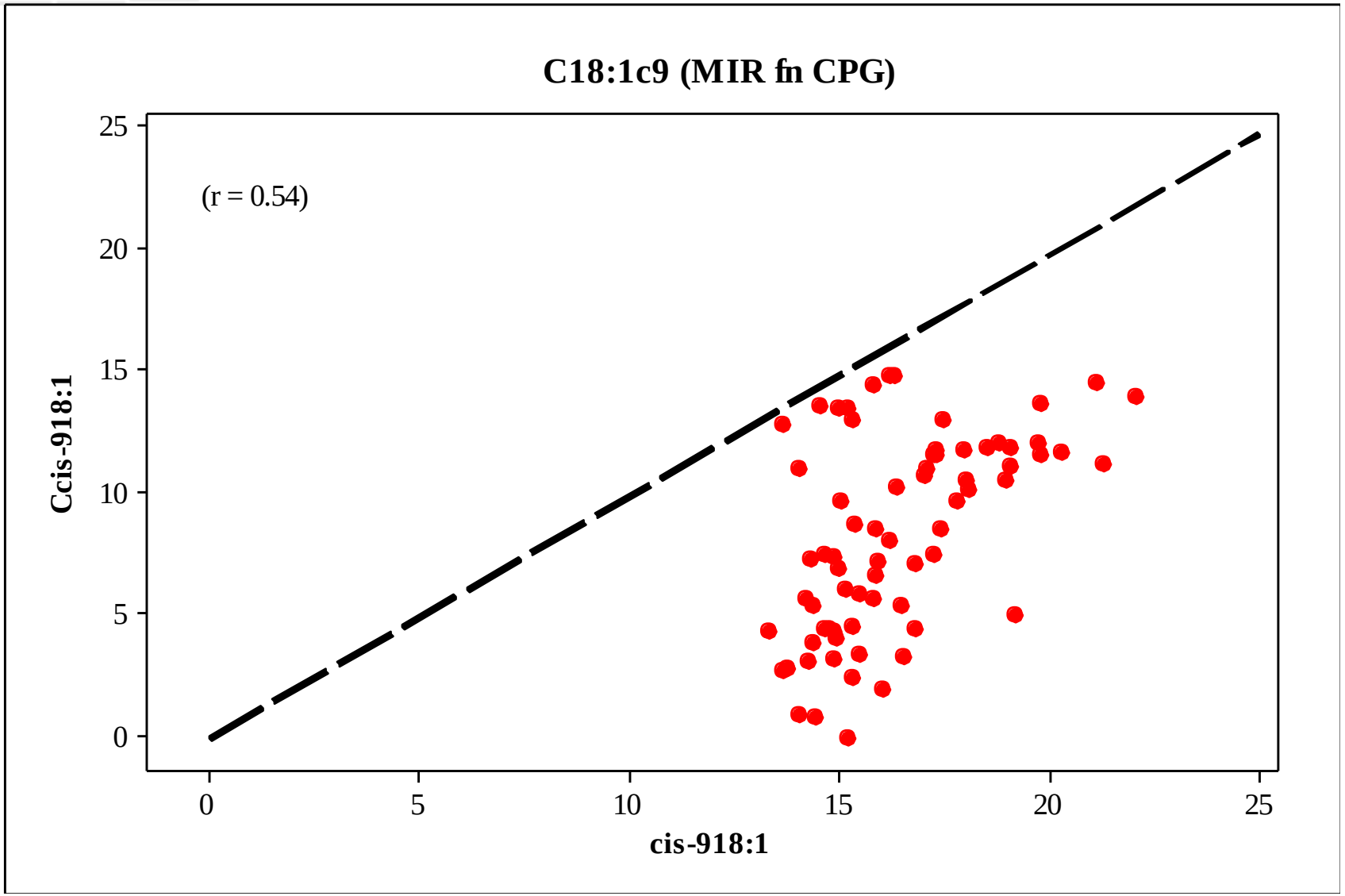

Main saturated fatty acids (MIR fn CPG)
C16:0*16:0
(r = 0.61)
C10:0*10:0
(r = 0.87)
C14:0*14:0
(r = 0.50)
C18:0*18:0
(r = - 0.02)

(n = 72 samples)

In conclusion,

- GC is a useful tool to detect SARA in dairy goats from milk composition
- MIR is not a relevant method due to the inaccuracy in the prediction of FA


Thank you for your attention


C18:1c9 (MIR fn CPG)
(r = 0.54)
Ccis-918:1
cis-918:1
0
5
10
15
20
25