

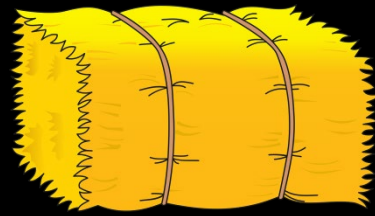
SLOVENIA | APRIL 2023
2nd ISO-FOOD SYMPOSIUM

**Stable isotope ratio analysis in the study of
Simmental cows organism and diet**

**PRESENTING AUTHOR:
SILVIA PIANEZZE**



13 COWS

**C3 GROUP**

C3 diet (n = 6)

**C4 GROUP**

C4 diet (n = 7)

Fractionation processes of the FAs in the bovine organism

GC-C-IRMS on the single FAs
(Pianezze et al., 2021a - J.Chromatogr.A)

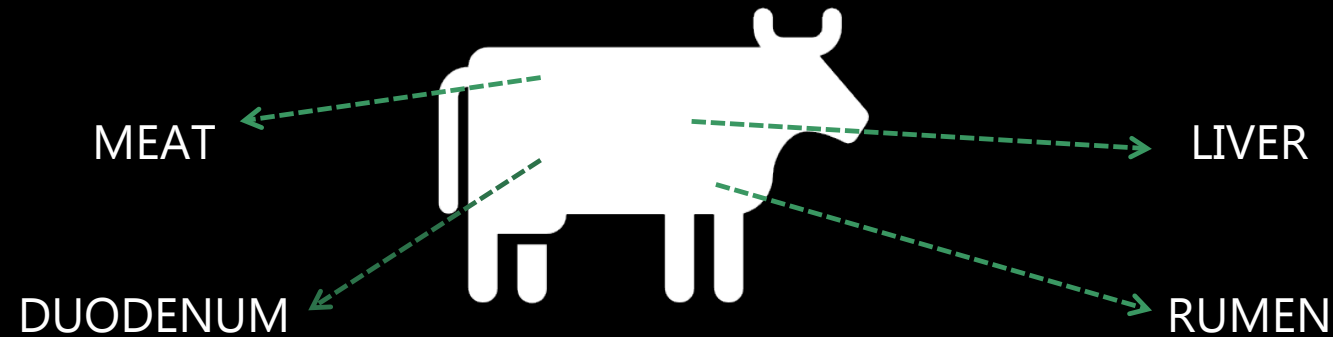
Comparison of the FAs carbon isotopic ratio of the two diets

EA-IRMS on the bulk lipid
(Pianezze et al., 2021b - Measurements : Sensors)

GC-C-IRMS on the single FAs
(Pianezze et al., 2022 - Molecules)

Fractionation processes of the FAs in the bovine organism

C3 GROUP

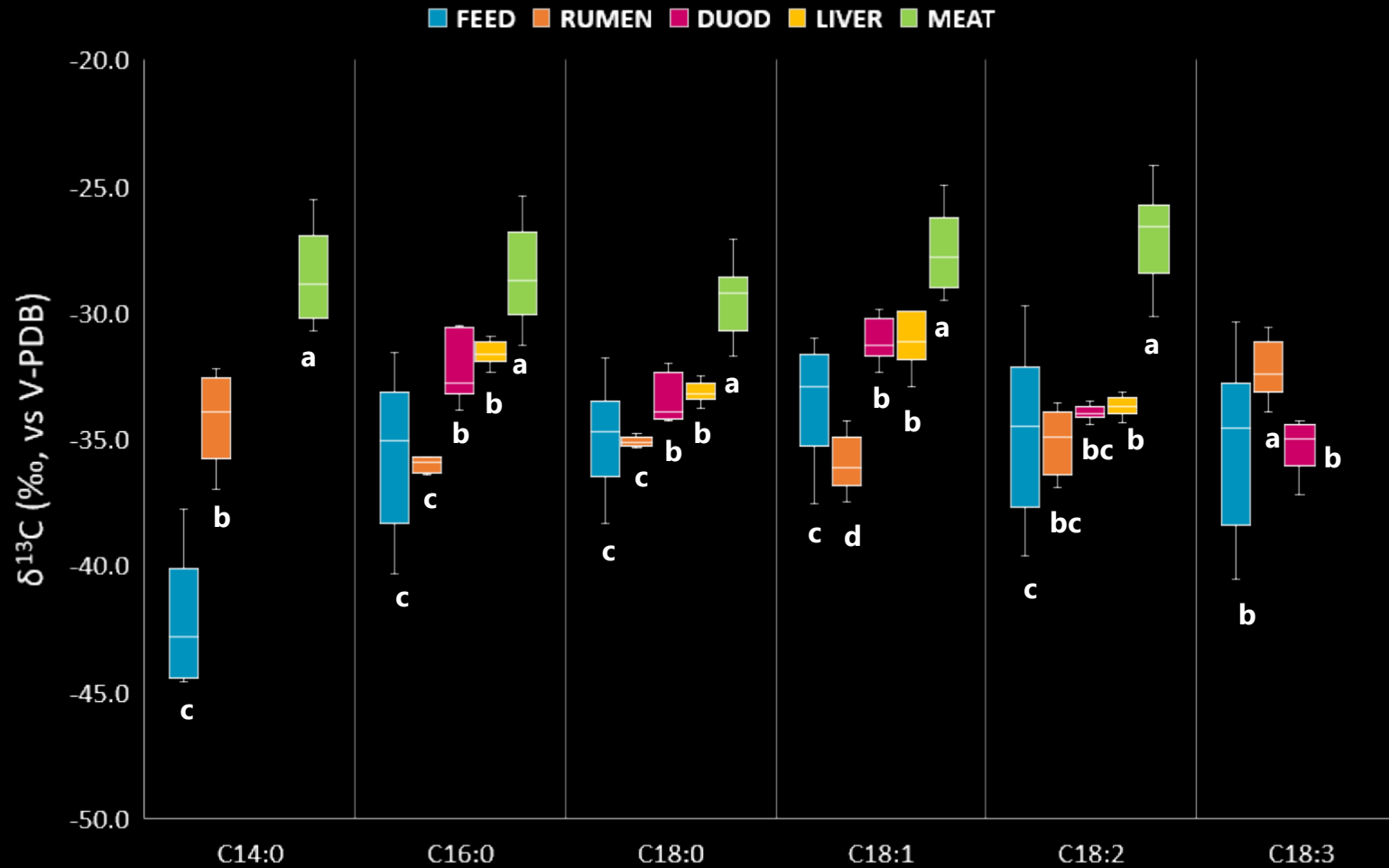


Item	Diet	Rumen	Duodenum	Liver	Meat	RMSE	P-value
Content (mg/g DM)							
MYRISTIC C _{14:0}	0.08 ^d	0.30 ^{bc}	0.16 ^{cd}	0.44 ^b	2.92 ^a	0.041	<0.01
PALMITIC C _{16:0}	3.50 ^C	3.26 ^C	4.51 ^C	9.93 ^B	32.84 ^A	0.090	<0.01
STEARIC C _{18:0}	0.49 ^C	7.63 ^B	7.77 ^B	23.75 ^A	25.23 ^A	1.987	<0.01
OLEIC C _{18:1n-9}	2.34 ^C	0.43 ^D	2.05 ^C	5.39 ^B	41.13 ^A	0.085	<0.01
LINOLEIC C _{18:2n-6}	6.98 ^A	0.17 ^C	3.67 ^B	6.05 ^A	2.49 ^B	0.734	<0.01
LINOLENIC C _{18:3n-3}	1.86 ^a	0.06 ^c	0.27 ^b	0.38 ^b	0.38 ^b	0.207	<0.01

A,B,C,D,E: P<0.01 within row; ^{a,b,c,d,e}: P<0.05 within row; RMSE: root mean square error

Fractionation processes of the FAs in the bovine organism

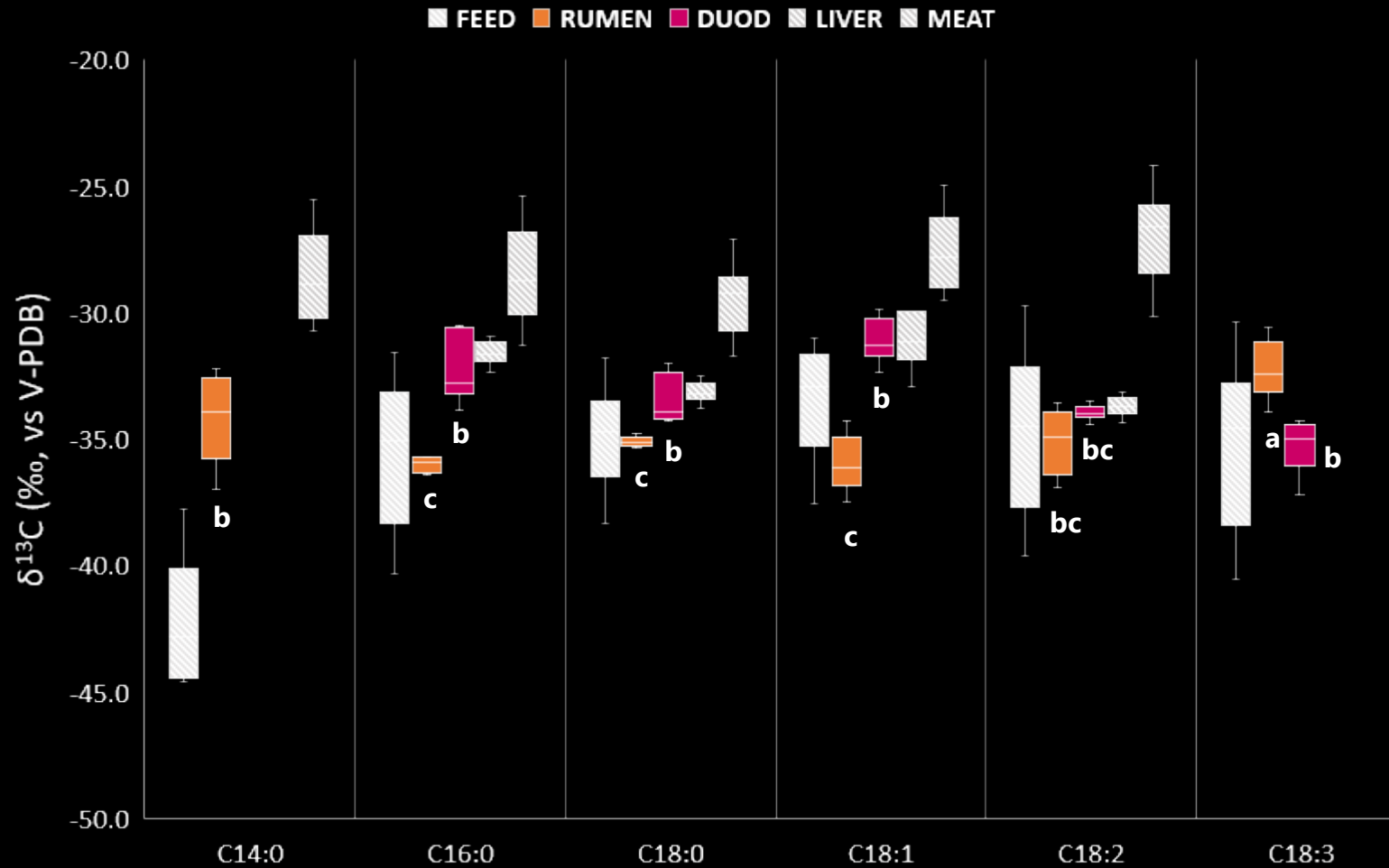
C3 GROUP



Variation (mean \pm se) of the carbon isotopic ratio of FAs in the different compartments of C3 group. a,b,c,d: P < 0.05 within compartments.

Fractionation processes of the FAs in the bovine organism

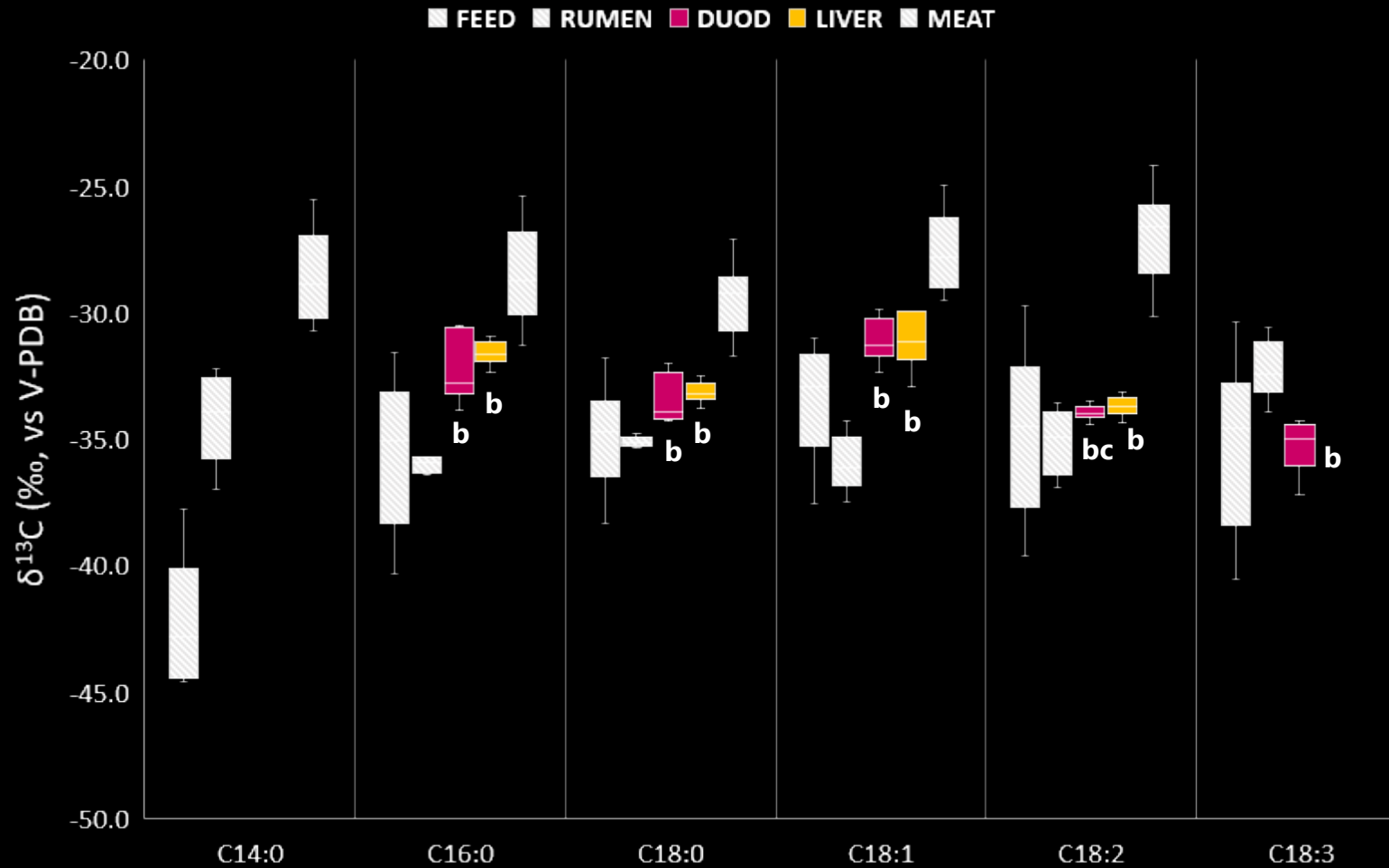
C3 GROUP



Variation (mean ± se) of the carbon isotopic ratio of FAs in the different compartments of C3 group. a,b,c,d: P<0.05 within compartments.

Fractionation processes of the FAs in the bovine organism

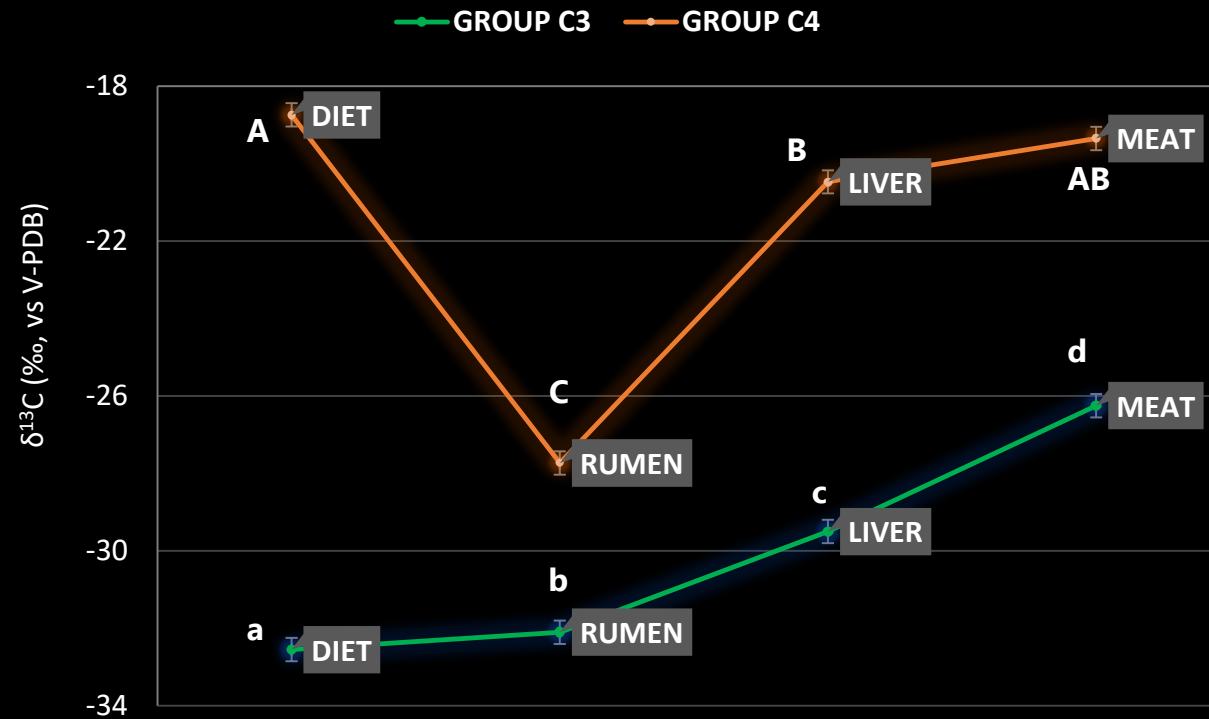
C3 GROUP



Variation (mean ± se) of the carbon isotopic ratio of FAs in the different compartments of C3 group. a,b,c,d: P<0.05 within compartments.

Comparison of the bulk fat carbon isotopic ratio of the two diets

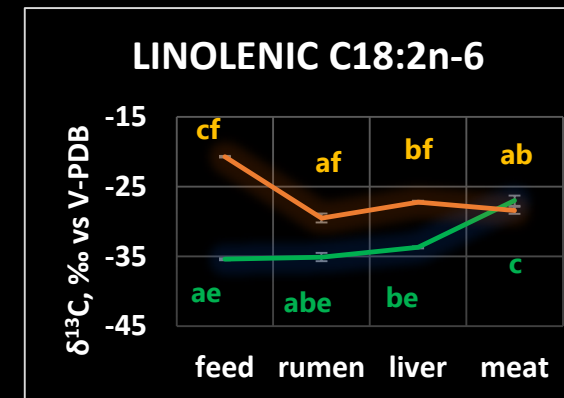
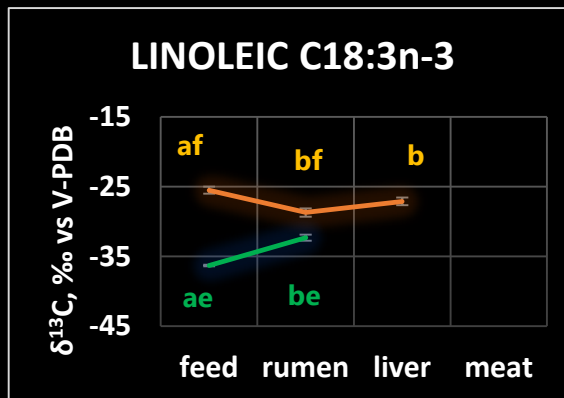
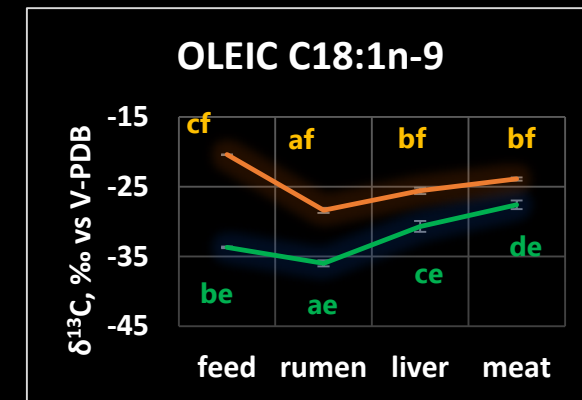
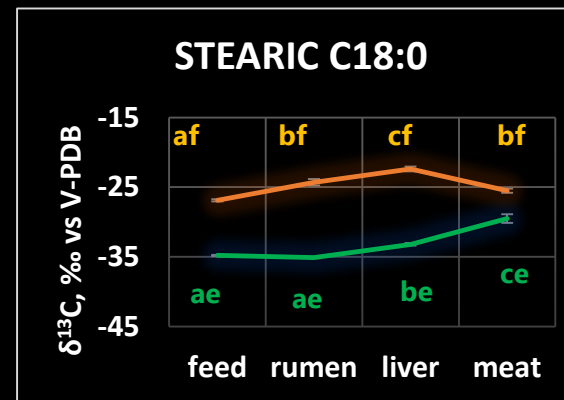
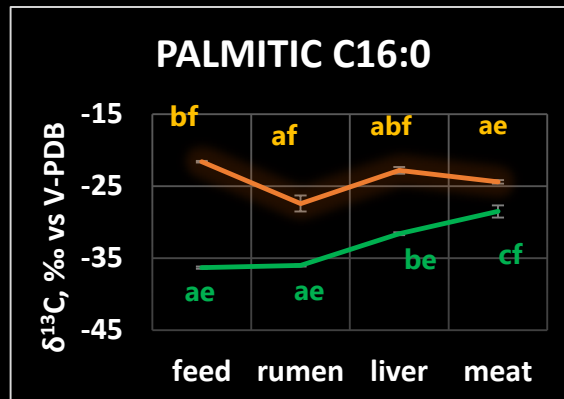
C3 + C4
GROUP



Variation (mean \pm se) of the carbon isotopic ratio in groups C3 and C4 in the different compartments. A,B,C: $P < 0.01$; a,b,c,d: $P < 0.05$ within C3 and C4 groups.

Comparison of the FAs carbon isotopic ratio of the two diets

C3 + C4
GROUP



Isotopic Ratio
($\delta^{13}\text{C}\text{‰}$)

— C4 group

— C3 group

Variation (mean \pm se) of the carbon isotopic ratio of FAs in the different compartments of groups C3 and C4. a,b,c: $P < 0.05$ within C3 and C4 groups; e, f: $P < 0.05$ within the same compartment.

INTRO

PART A

PART B

PART C

CONCLUSIONS

Future questions to be answered

What's going on
in the rumen?

Why different diets
result in such
different rumen fatty
acids $\delta^{13}\text{C}$?

What would I
expect for grass-
fed cows?

THANK YOU
FOR
YOUR KIND ATTENTION



UNIVERSITÀ
DEGLI STUDI
DI UDINE



FONDAZIONE
EDMUND
MACH



Safety
Quality
Traceability