



Effect of season and management system on “Sfakion” sheep milk fatty acid profile.

Voutzourakis N., Tzanidakis N., Atsali I., Franceschin E., Stefanakis A., Sotiraki S., Leifert C., Stergiadis S., Eyre M.D., Cozzi G. and Butler G

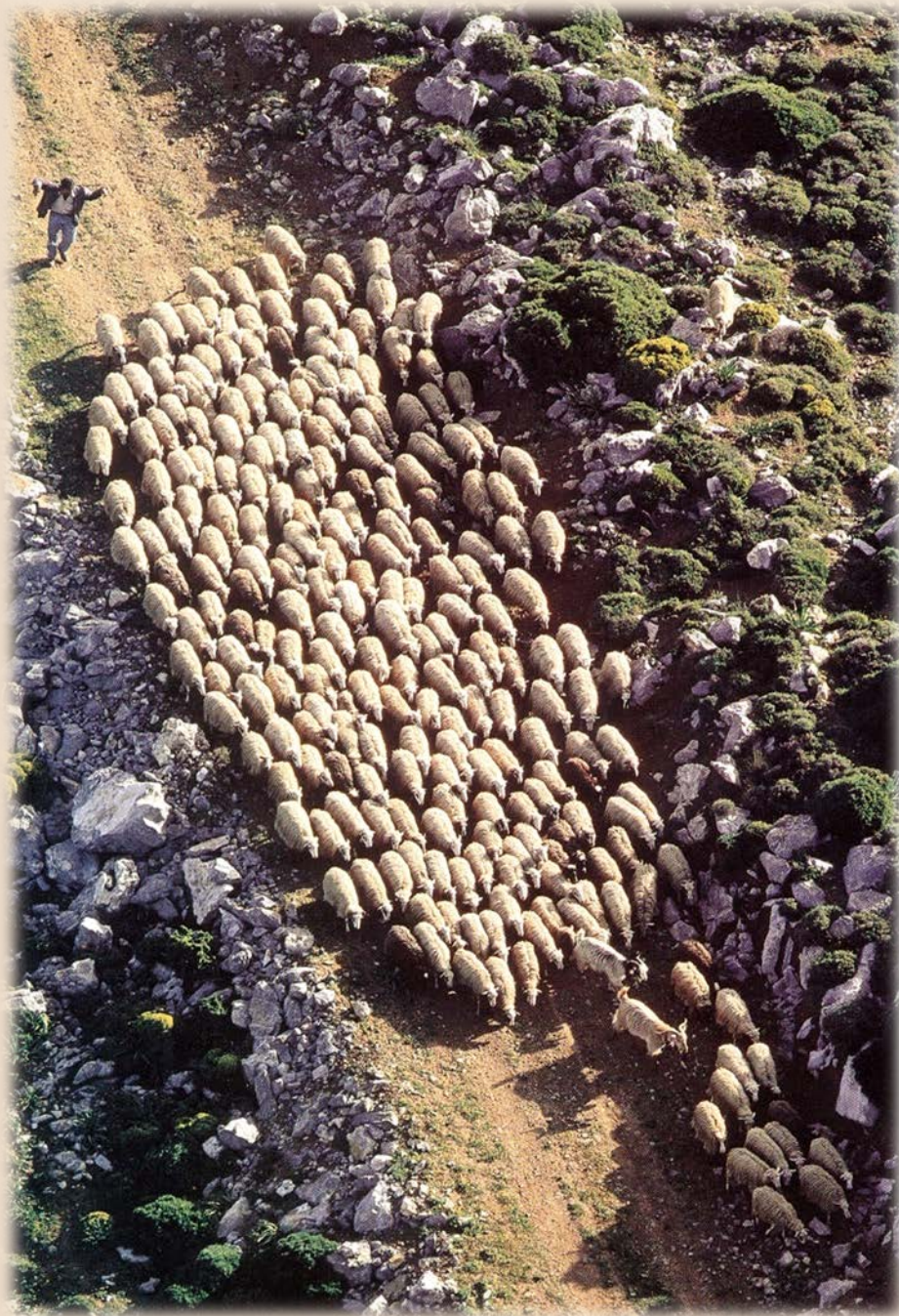


Island of Crete, Greece







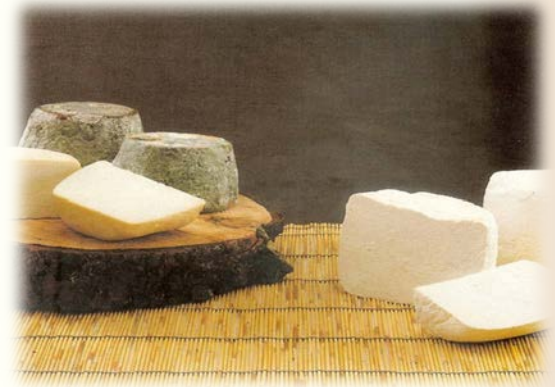




Over 1,000,000 sheep and goats
compromising 1/6th of national flock



Dairy products



SFAKION BREED

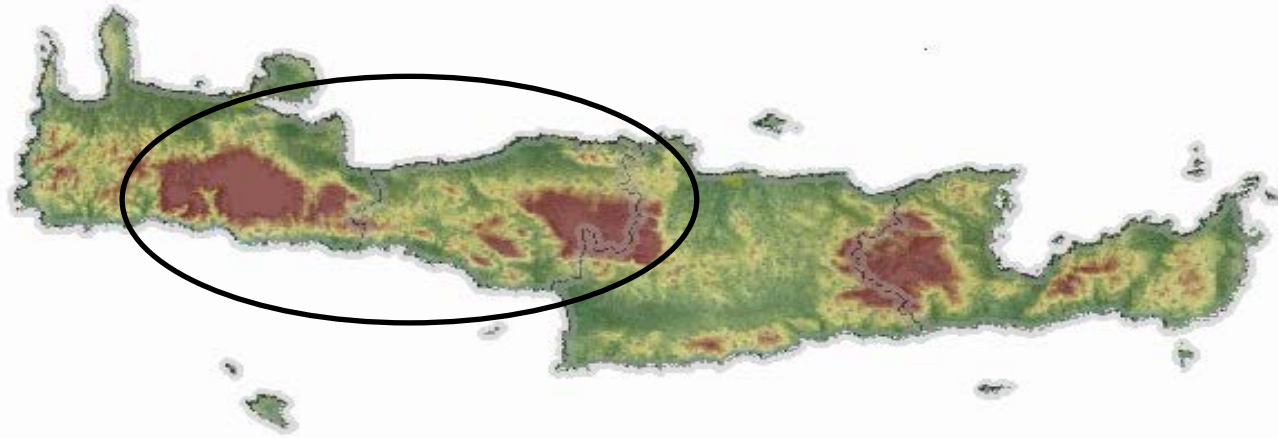


Average Body Weight	~ 40 Kg
Lambs per ewe per birth	1.2 – 1.5
Average annual milk production	180 kg



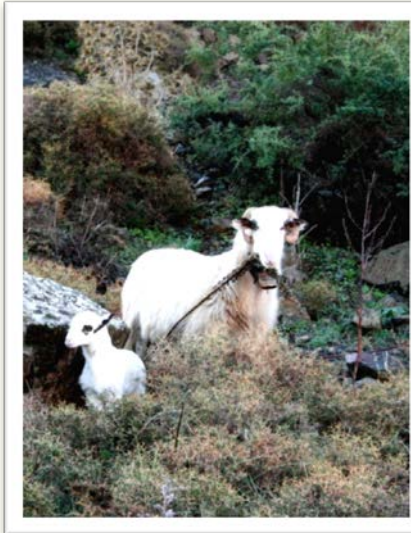
EXPERIMENTAL PLAN

20 sheep flocks with Sfakion breed ewes



10 EXTENSIVE FARMS

- Low invested Capital
- Limited supplementary feed
- Natural pastures
- Moderate productivity



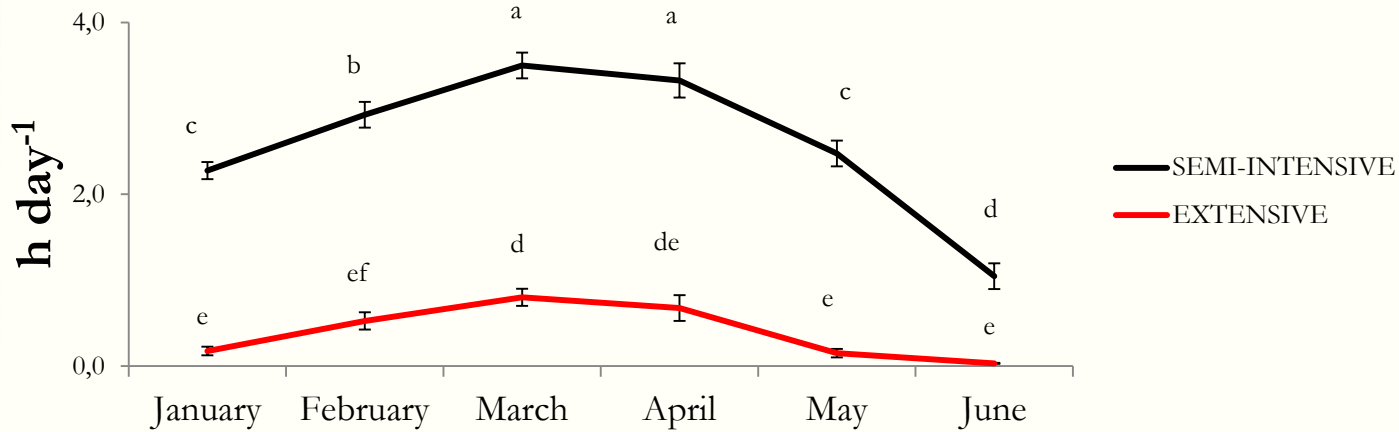
10 SEMI-INTENSIVE FARMS

- High invested Capital
- Increased use of supplementary feed
- Land cultivation
- Increased productivity

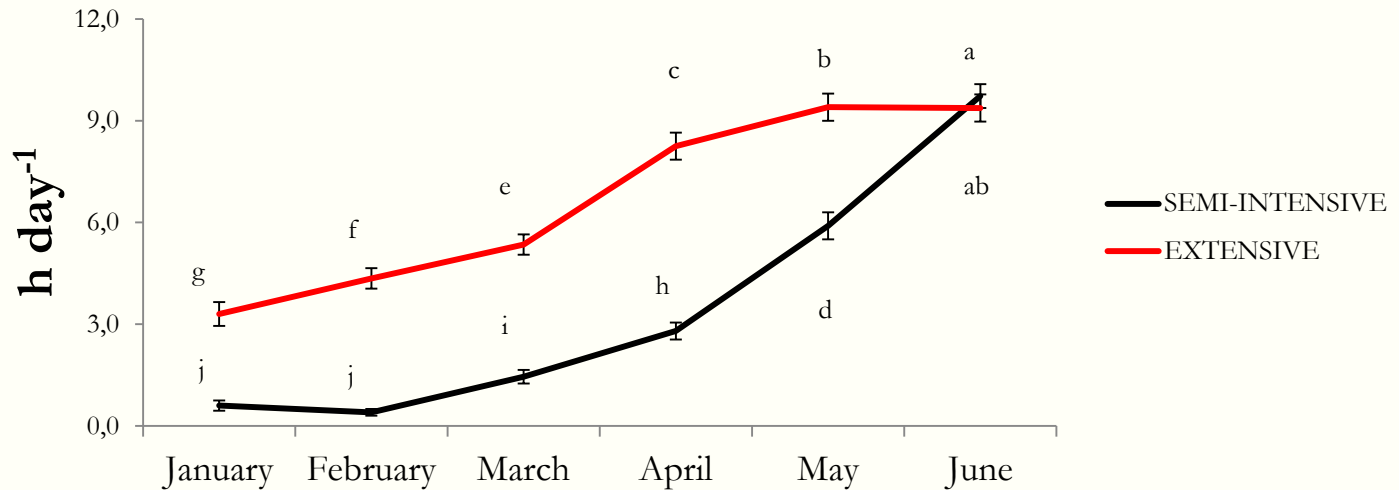


Study Data on Grazing Regimes

Cultivated pastures

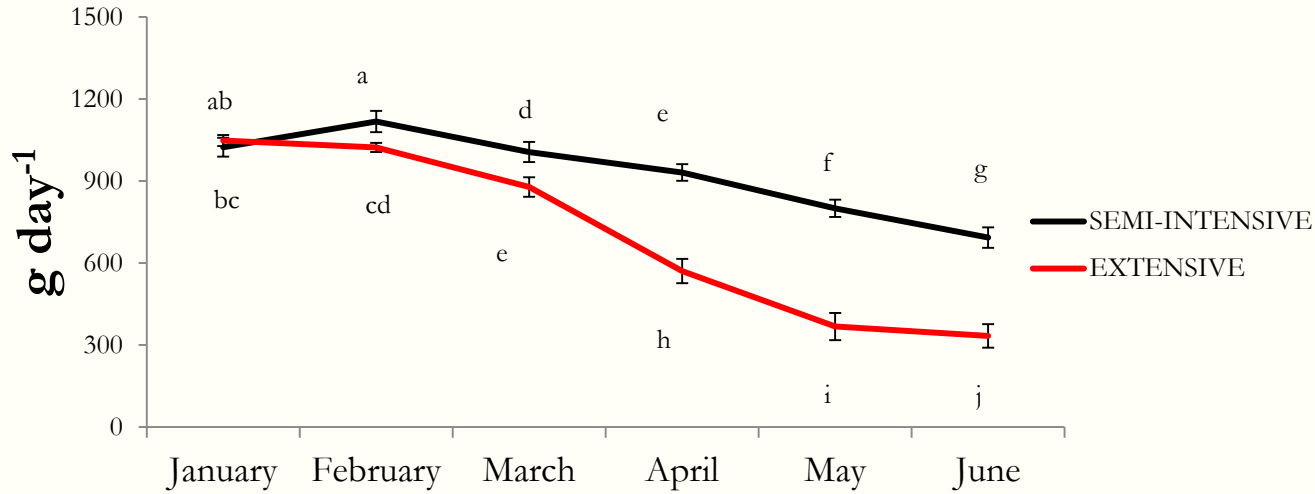


Natural pastures

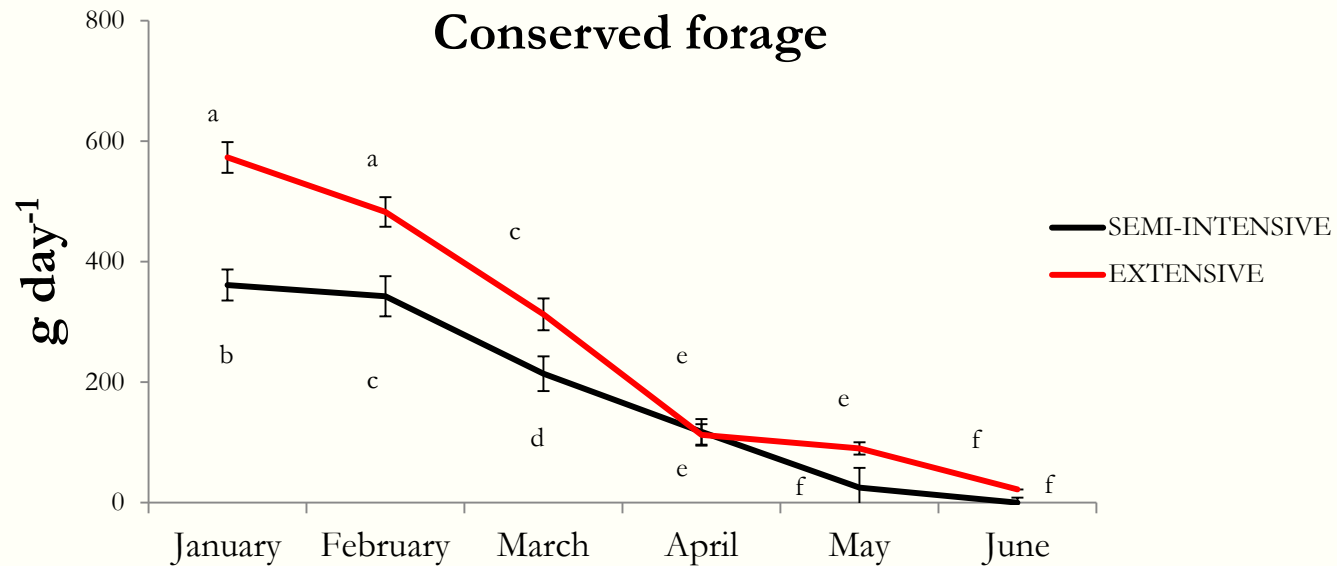


Study Data on concentrate and conserved forage feeding

Concentrate feed



Conserved forage



N	D	J	F	M	A	M	J	J	A	S	O	N	D	J	F	M	A	M	J	J	A	S	O	N	D
2009		2010												2011											

1. Management records

2. Environmental conditions records

(T&D Recorders, RTR-53)

3. Individual animals - assessments - samples

4. Milk samples from bulk tank

**297 Milk
samples**

Seasonal variation of sheep milk Fatty Acid (FA) profile

- In **2** management systems
- In **2** consecutive lactations

Milk samples

Chemical composition

(fat, protein, lactose, SNF)

Milkoscan™ FT, FOSS



Microbial load

Colony Forming Units (CFU)

BactoScan™ FC, FOSS

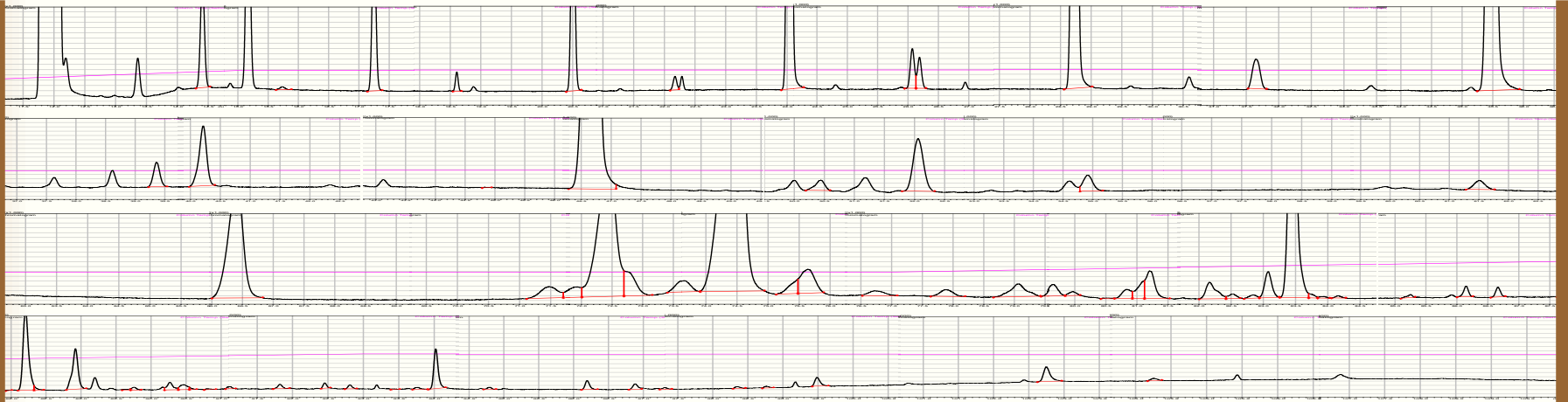
Somatic Cell Count (SCC)

Fossomatic™ FC, FOSS

Milk samples

Milk Fatty Acid (FA) profiling

Gas chromatography (Shimadzu, GC-2014, Kyoto, Japan) (Varian CP-SIL 88 fused silica capillary column, 100m x 0.25mmID x 0.2 μ m film thickness).

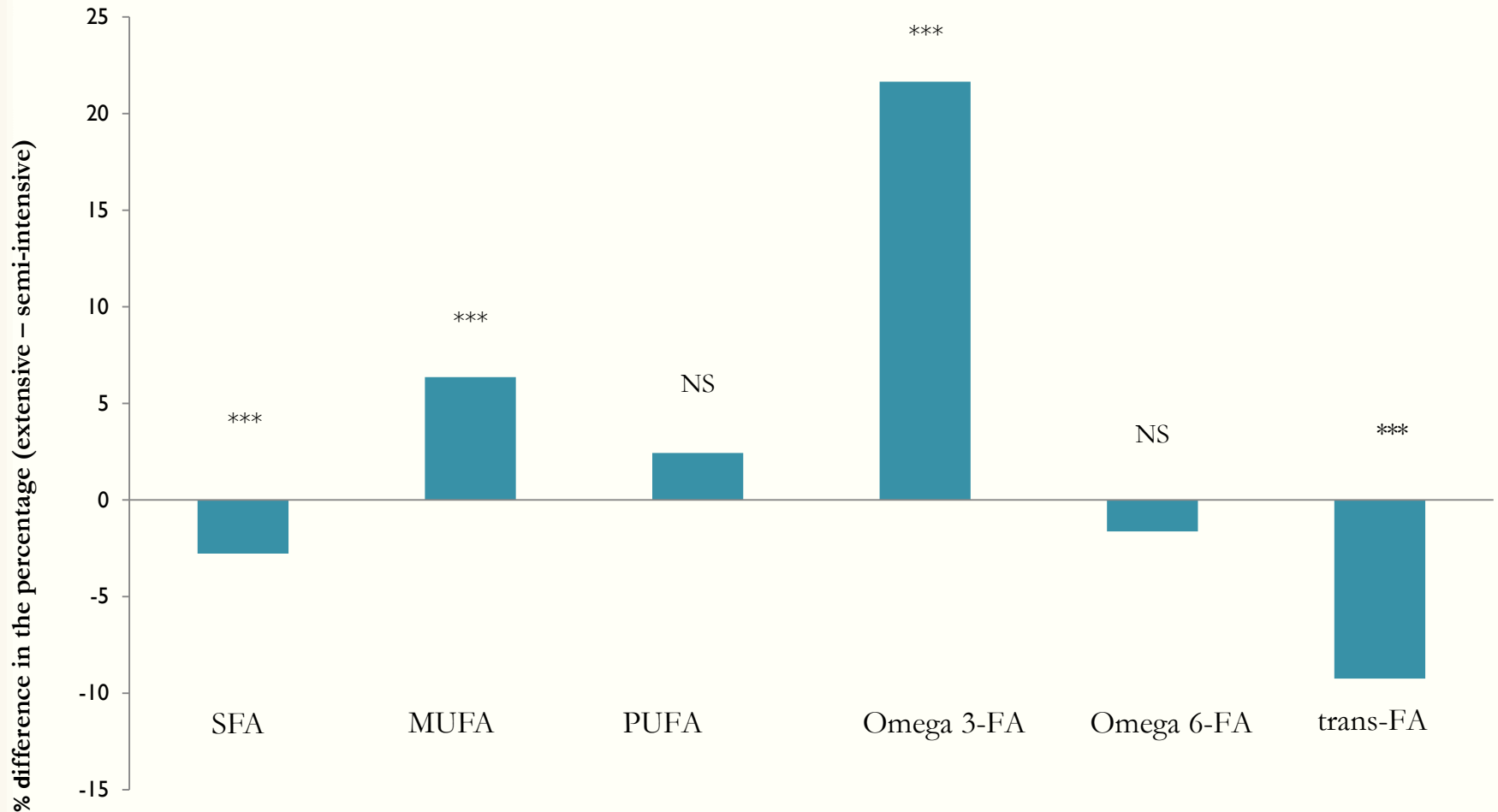


Analysis of variance was performed by **linear mixed effects models in R**, using “management”, “month” and “year” as fixed factors and “flock” as a random factor

RESULTS

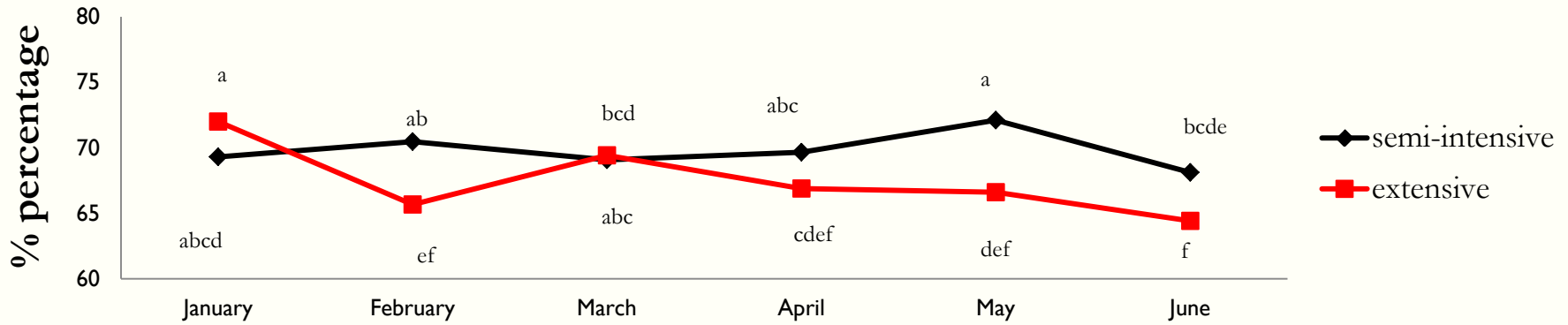
a) differences between management systems

% difference in the percentage of major FA groups between extensive and semi-intensive systems

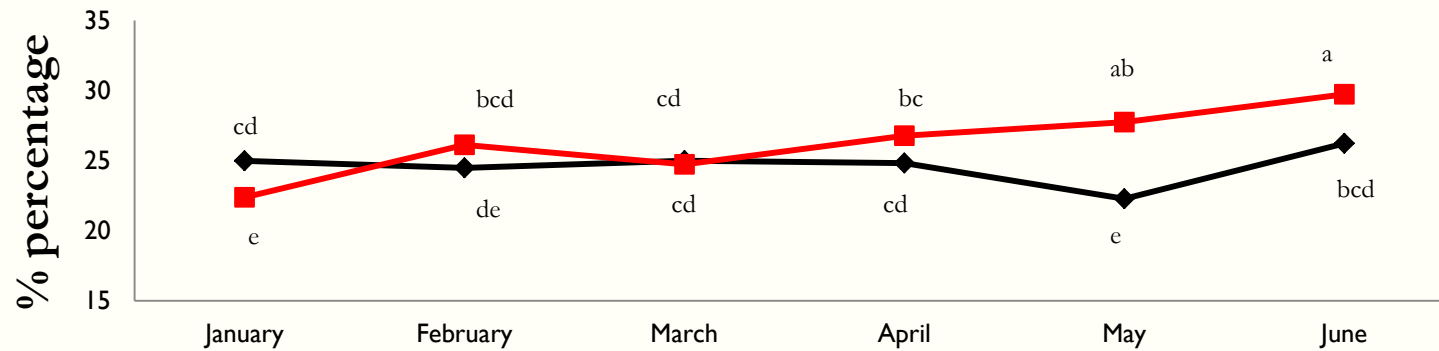


*** The difference is statistically significant $p < 0.001$ – NS The difference is not statistically significant

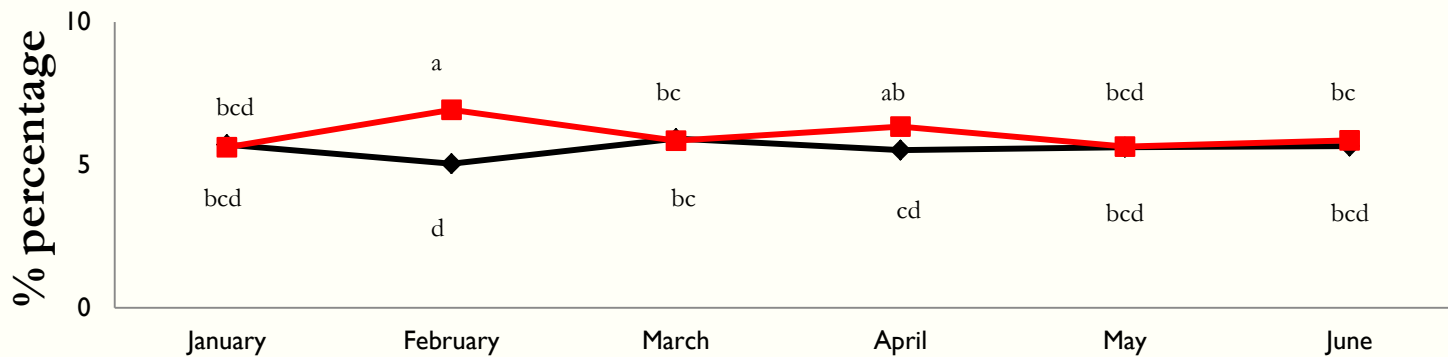
changes in the percentage of saturated FA



changes in the percentage of mono-unsaturated FA



changes in the percentage of poly-unsaturated FA



% difference in the percentage of individual FA between extensive and semi-intensive systems

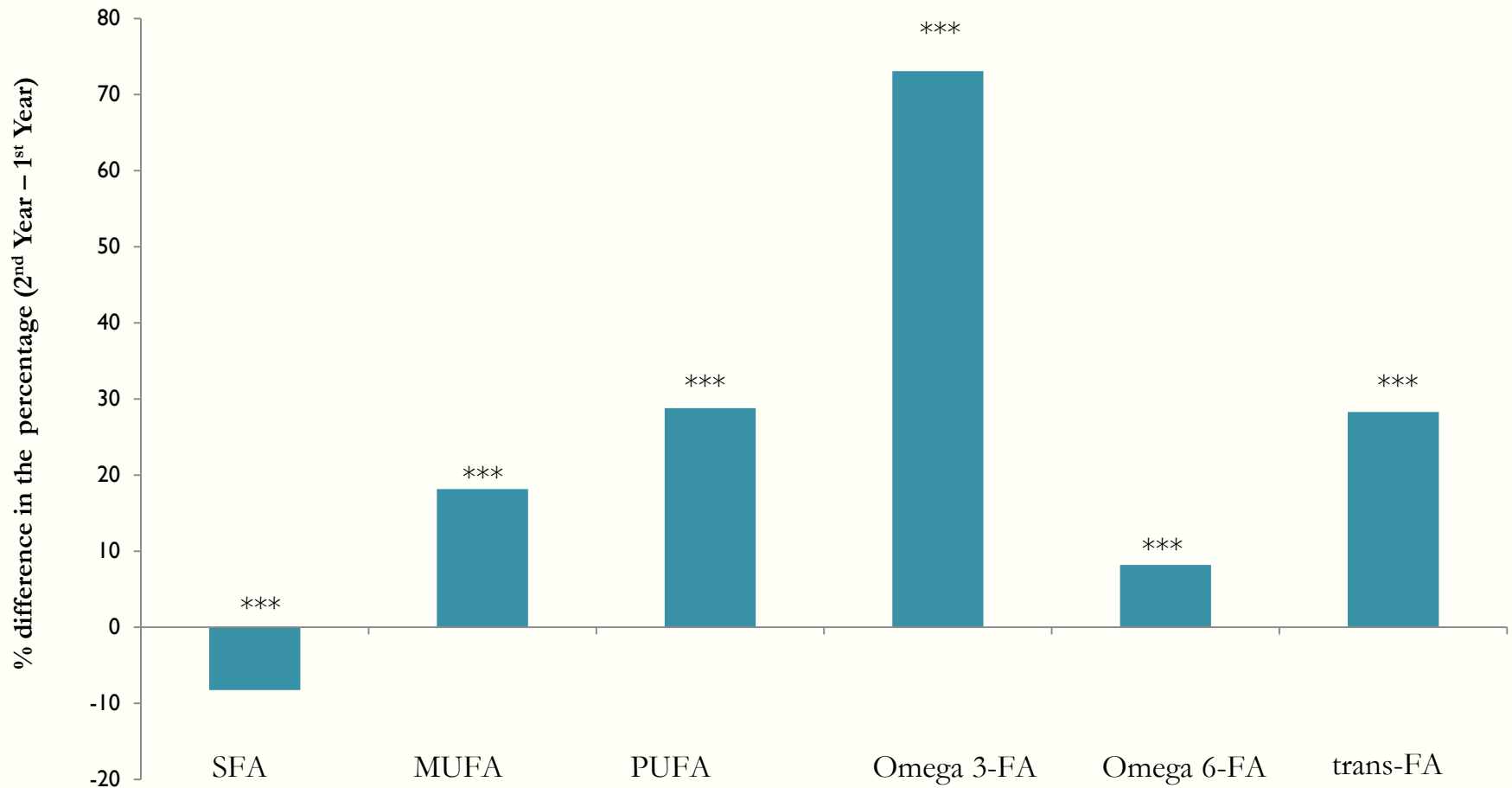


*** The difference is statistically significant $p < 0.001$ - ** The difference is statistically significant $p < 0.01$ - NS The difference is not statistically significant

RESULTS

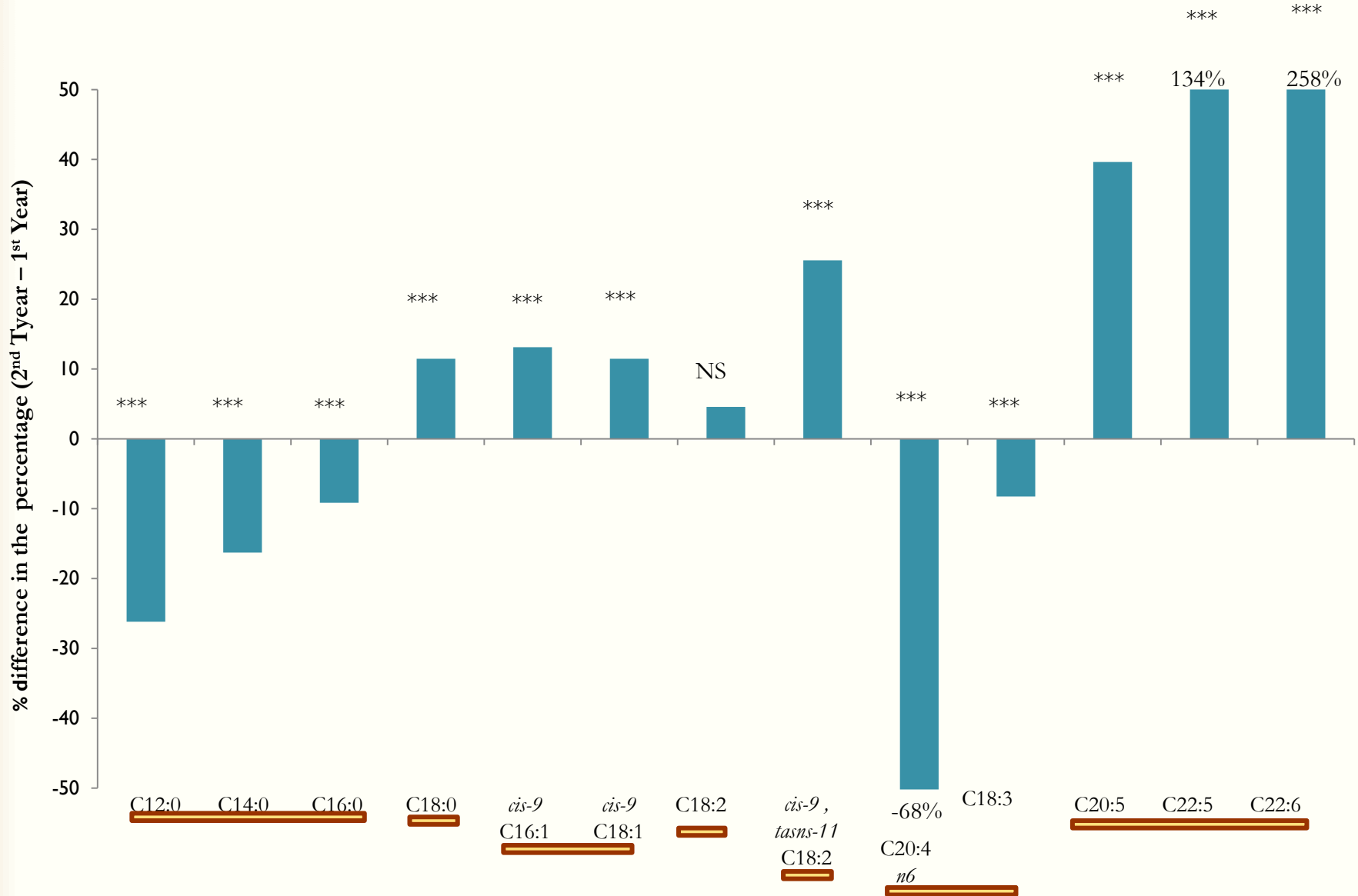
b) differences during and between years

% difference in the percentage of major FA groups between 2nd and 1st Year



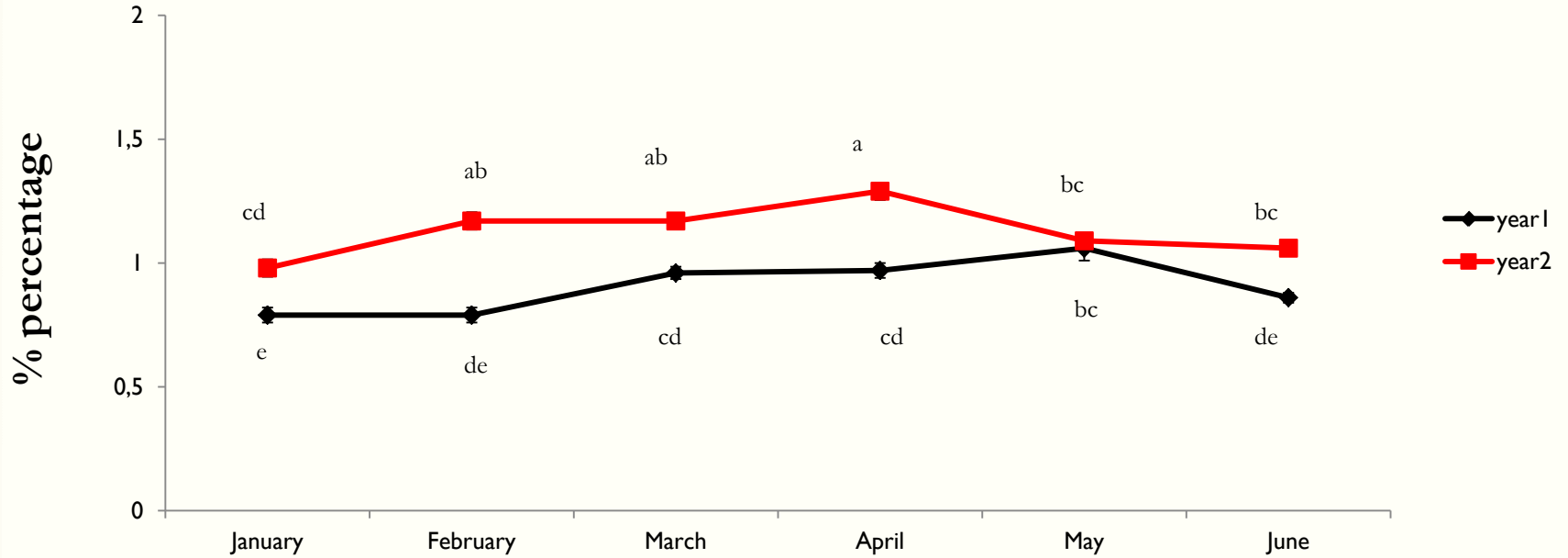
*** The difference is statistically significant $p < 0.001$ – NS The difference is not statistically significant

% difference in the percentage of individual FA between 2nd and 1st Year

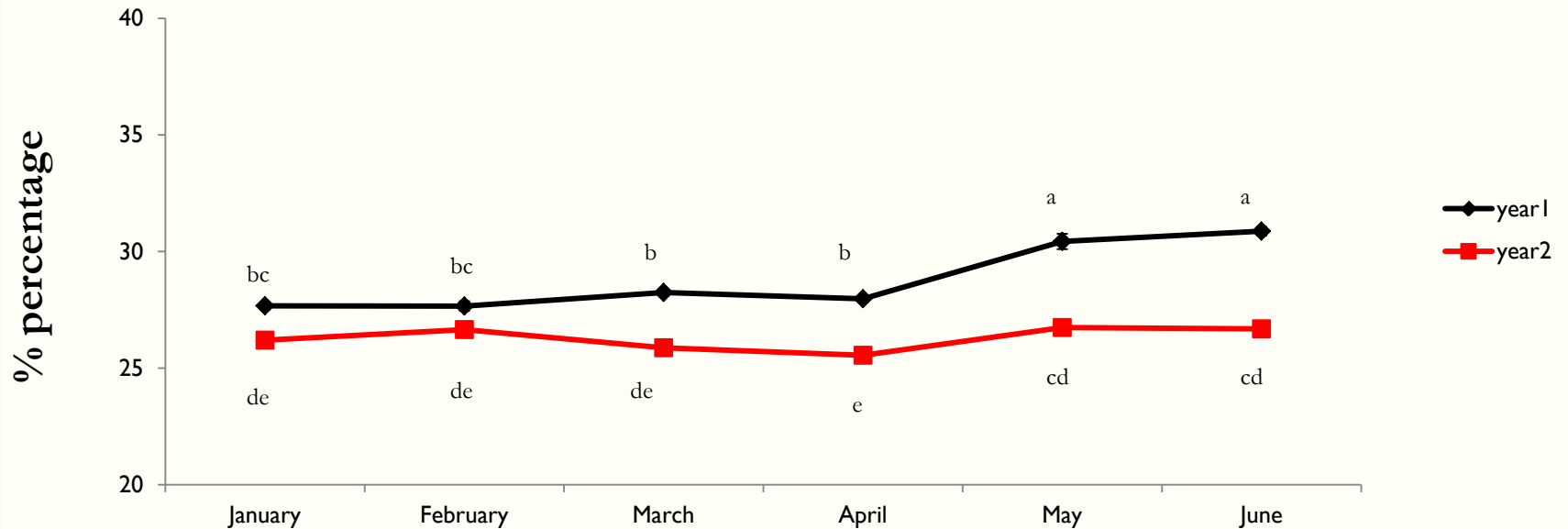


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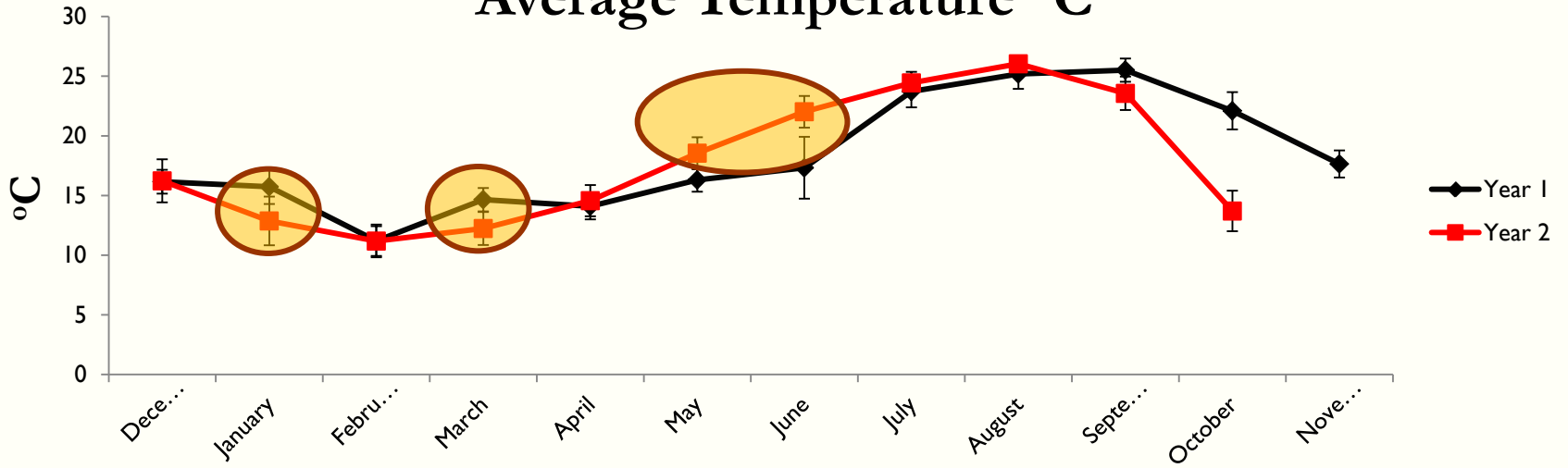
changes in the percentage of *cis-9, trans-11* C18:2 CLA



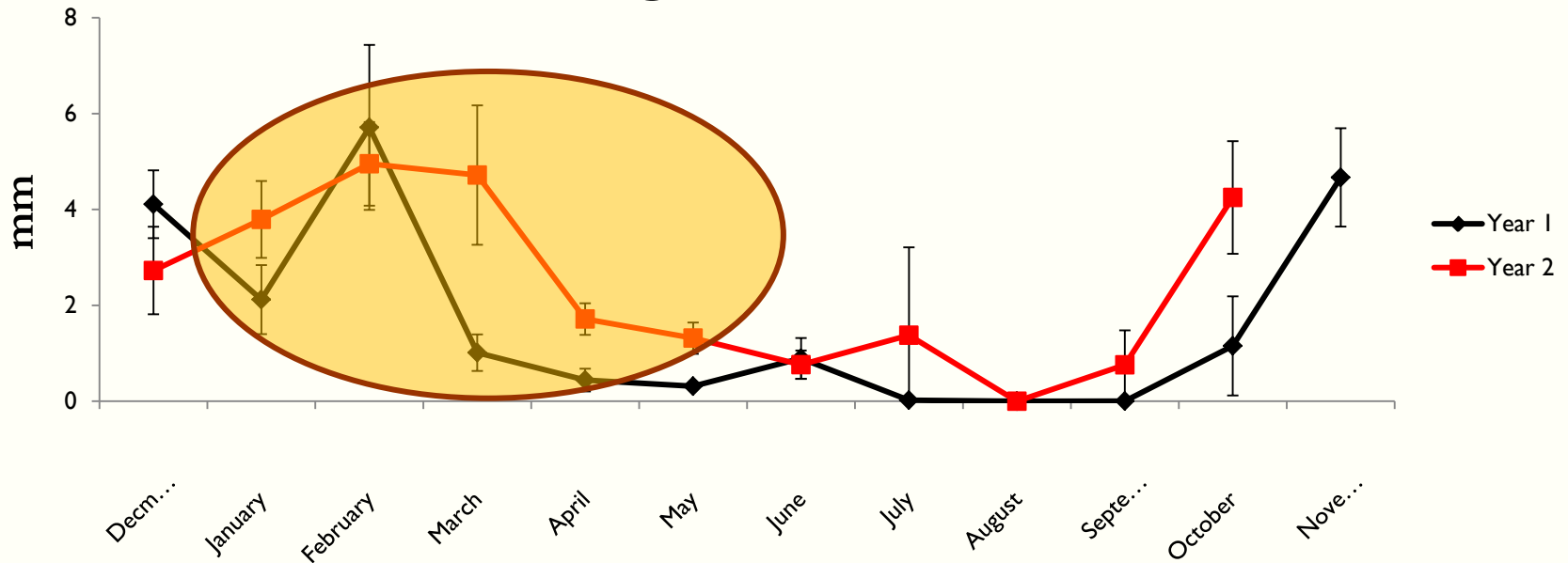
changes in the percentage of C16:0



Average Temperature °C



Average Rainfall (mm)



CONCLUSIONS

- **Semi-intensive farms had a more stable FA profile throughout the lactation**
- **Extensive systems had the more preferable FA profile, but only at the end of lactation.**
- **PUFA percentages are more susceptible to changes due to differences in the environmental conditions**

THANK YOU FOR YOUR ATTENTION



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