

# DIETARY LIPID SUPPLEMENTS AFFECT MILK COMPOSITION AND BUTTER PROPERTIES IN DAIRY COWS

Myriam Landry

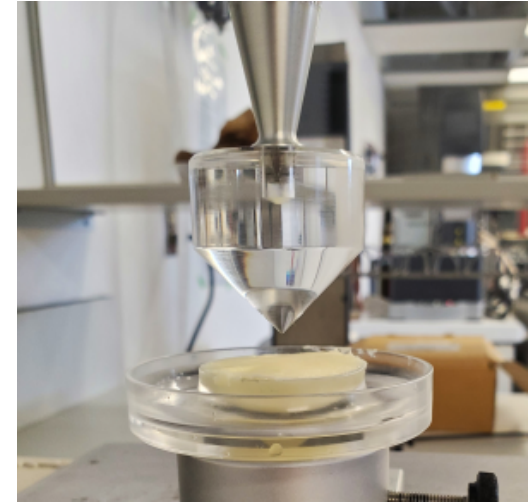
Y. Lebeuf, M. Blouin, F. Huot, J.  
Chamberland, G. Brisson, D. E.  
Santschi, É. Paquet, D. E. Rico, P. Y.  
Chouinard, and R. Gervais



UNIVERSITÉ  
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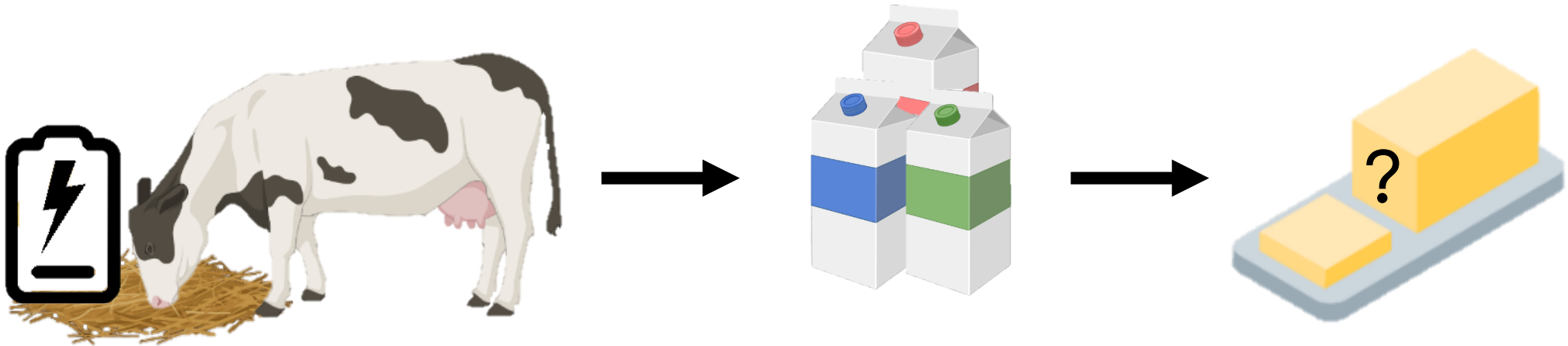


# Our approach



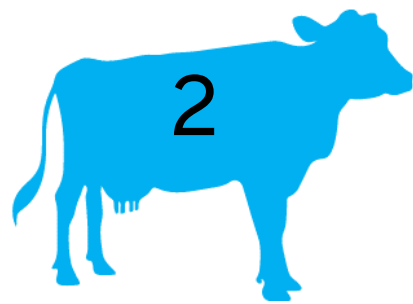
# Objective

Evaluate the effects of 4 lipid supplements on  
milk composition + butter manufacture



# Feeding trial

+ 2% (dry matter basis)  $\approx$  600 g/day

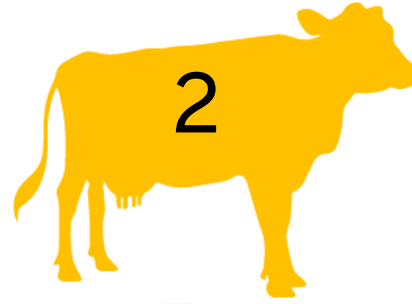


∅

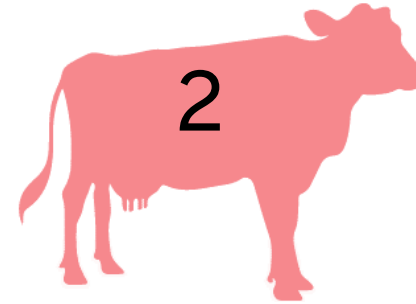
Control  
(CTL)



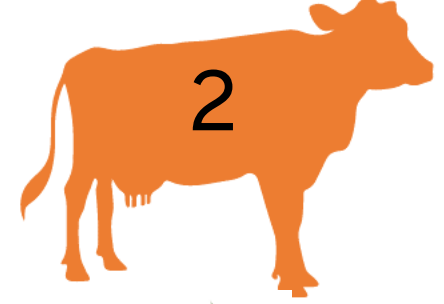
Soybean oil  
(SO)  
18:2



Calcium salts of  
palm fatty acids  
(CS)  
16:0 + 18:1



Hydrogenated  
+ hydrolyzed  
tallow  
(HT)  
18:0

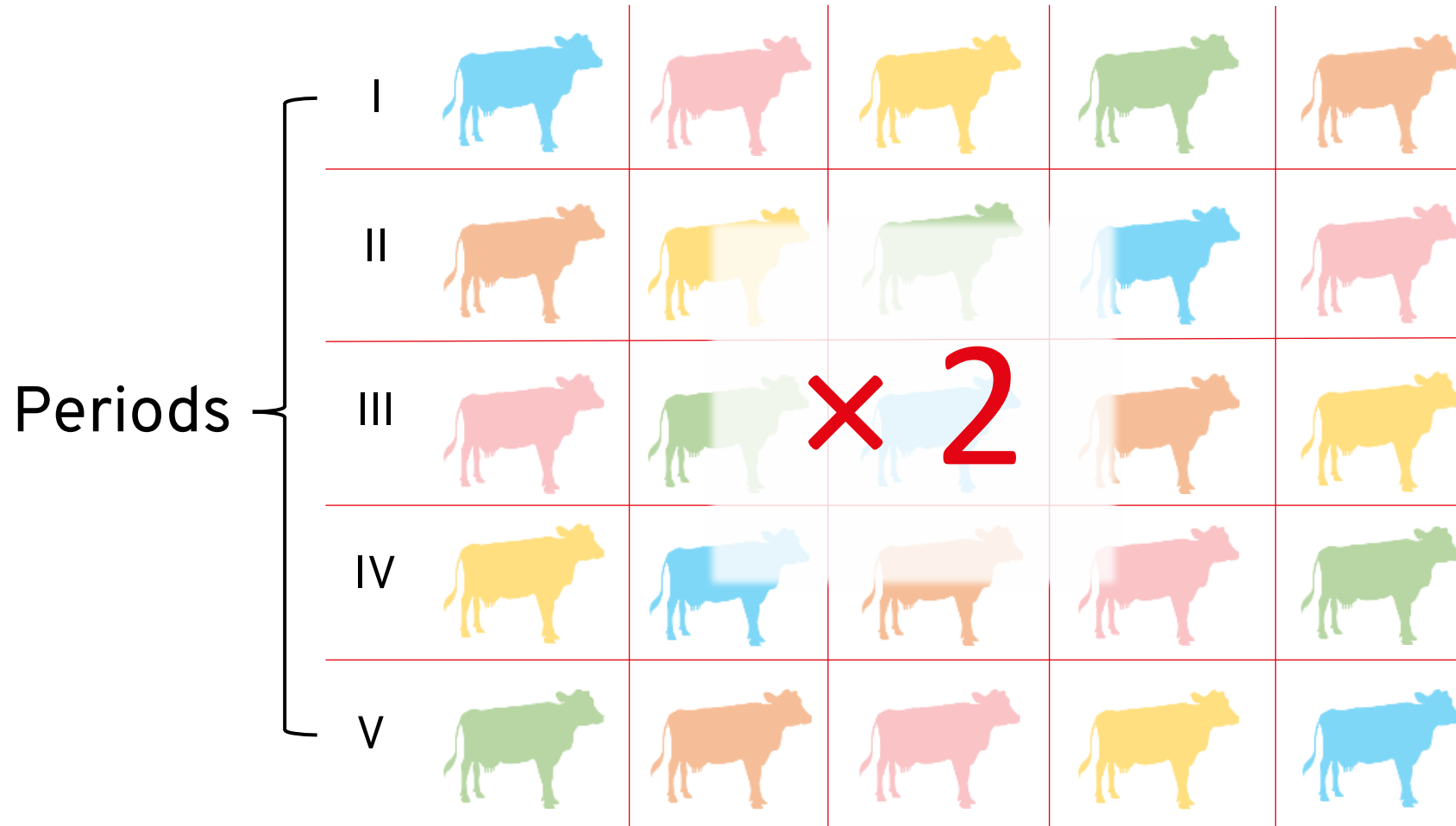


Palmitic acid  
(PA)  
16:0



# Feeding trial

Replicated Latin square  $5 \times 5$



$64 \pm 21$  days  
in milk

Milk pooled by  
treatment for butter  
manufacture

MIXED procedure of  
SAS

# Feeding trial

Period

Adaptation

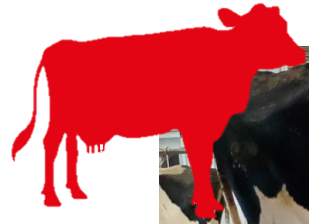
Sampling

0

8

16

21 days



Intake

Milk production + composition

Butter manufacture



Stephan mixer

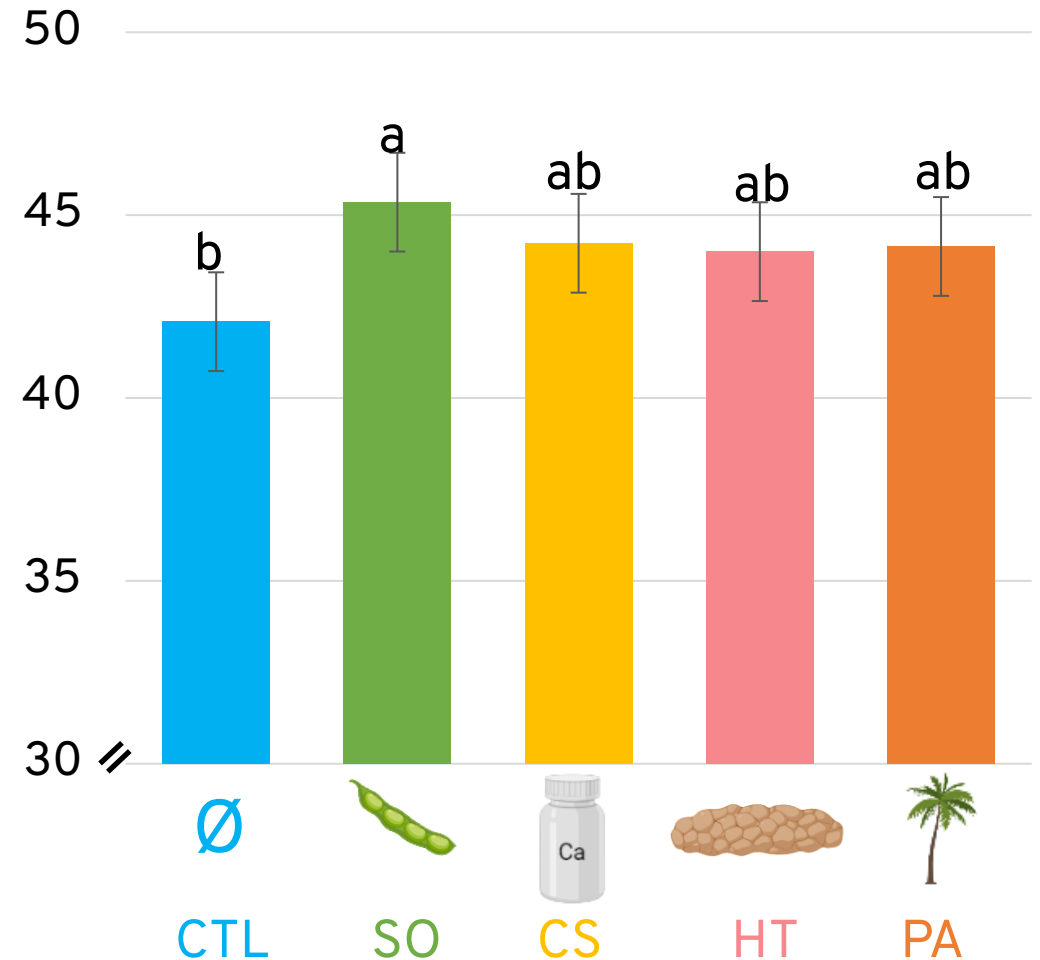
# Results – animal performance

Different letters  $P \leq 0.05$   
T SEM

Dry matter intake  
 $29.5 \pm 0.6$  kg/day (mean  $\pm$  SEM)  
 $P = 0.14$

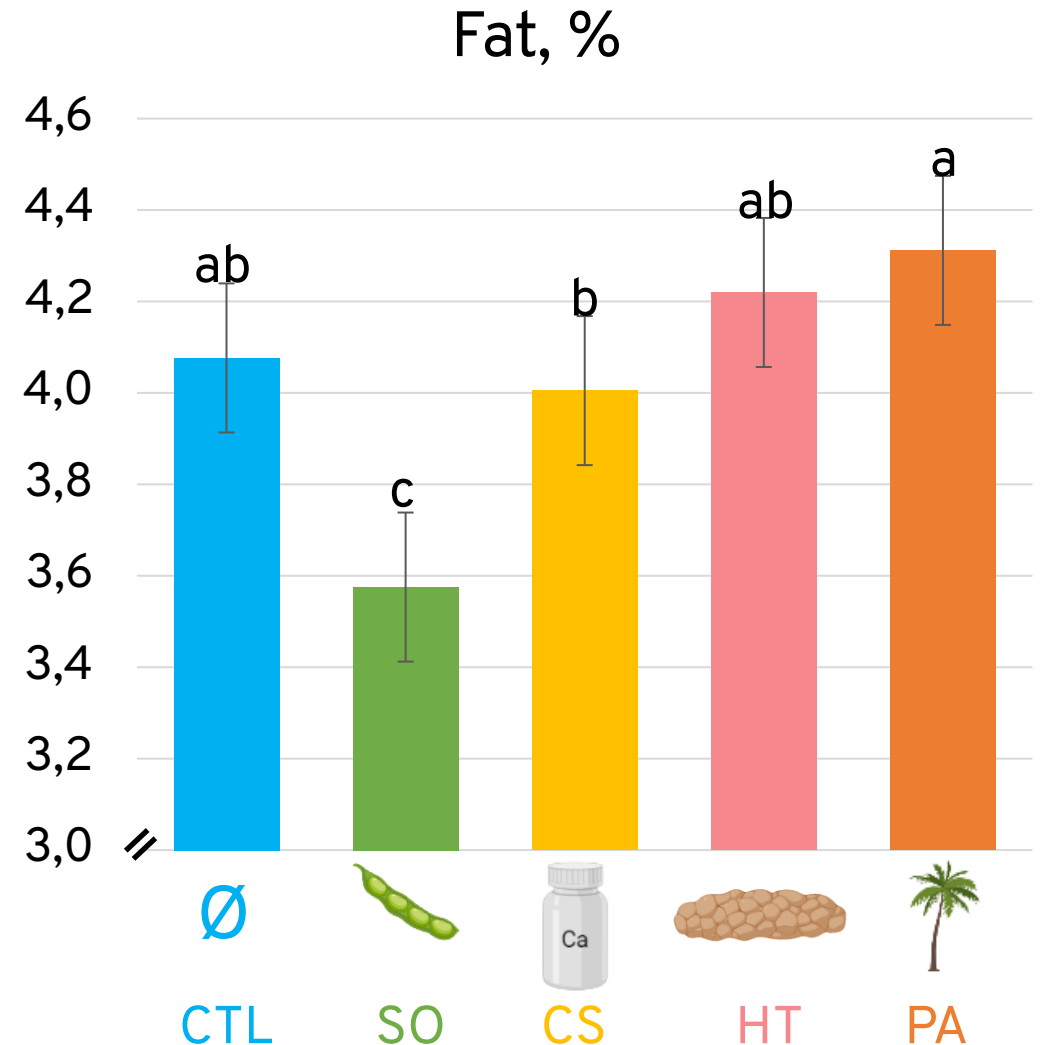
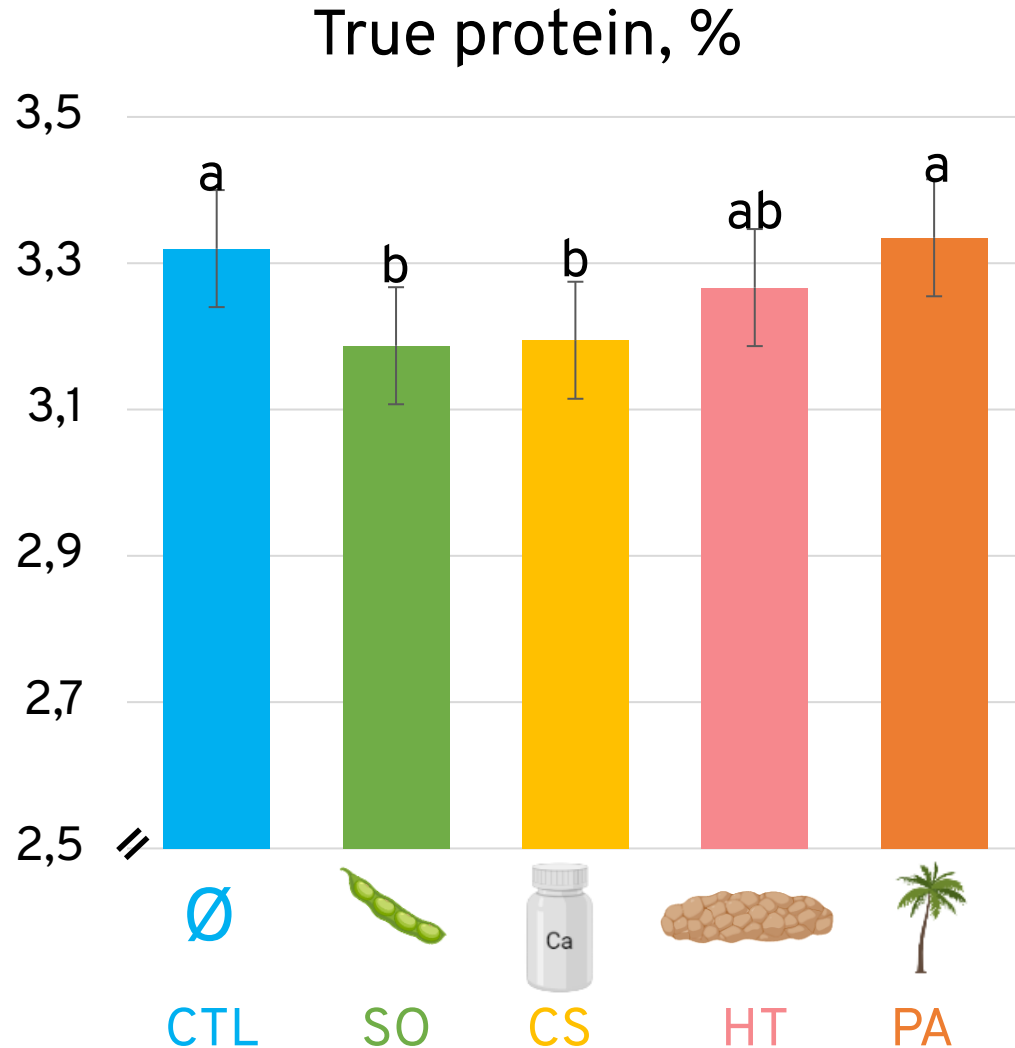


Milk yield, kg/day

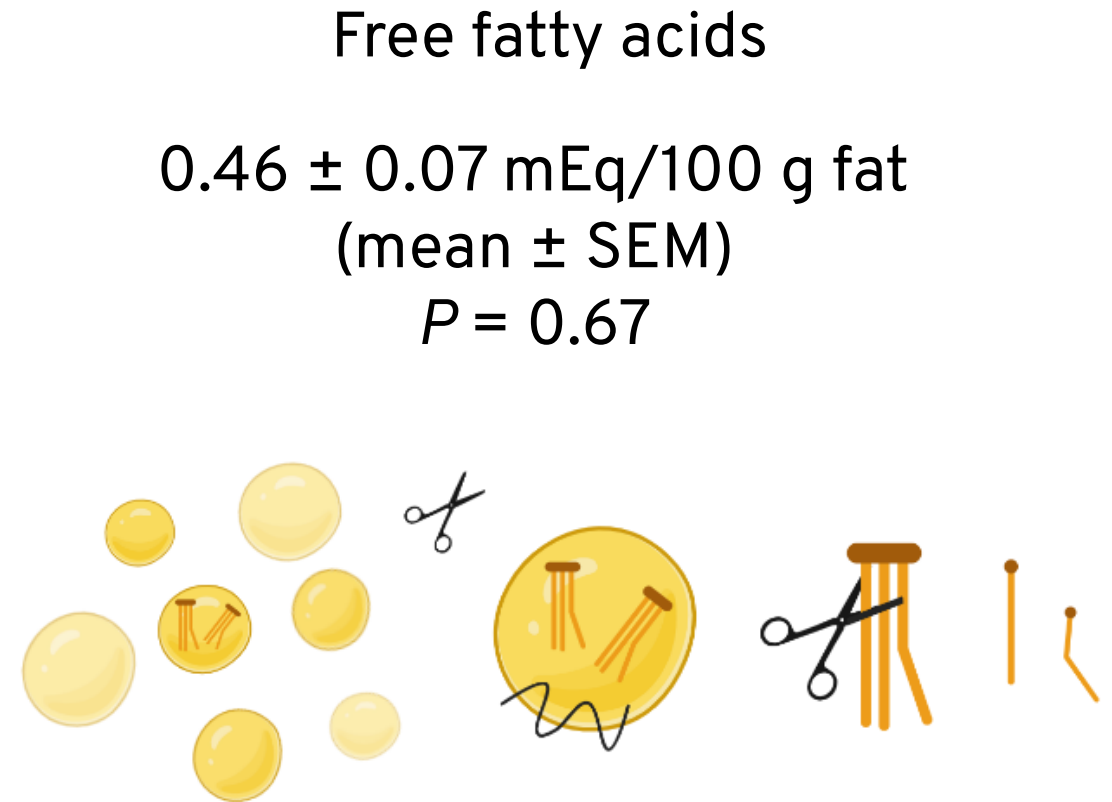
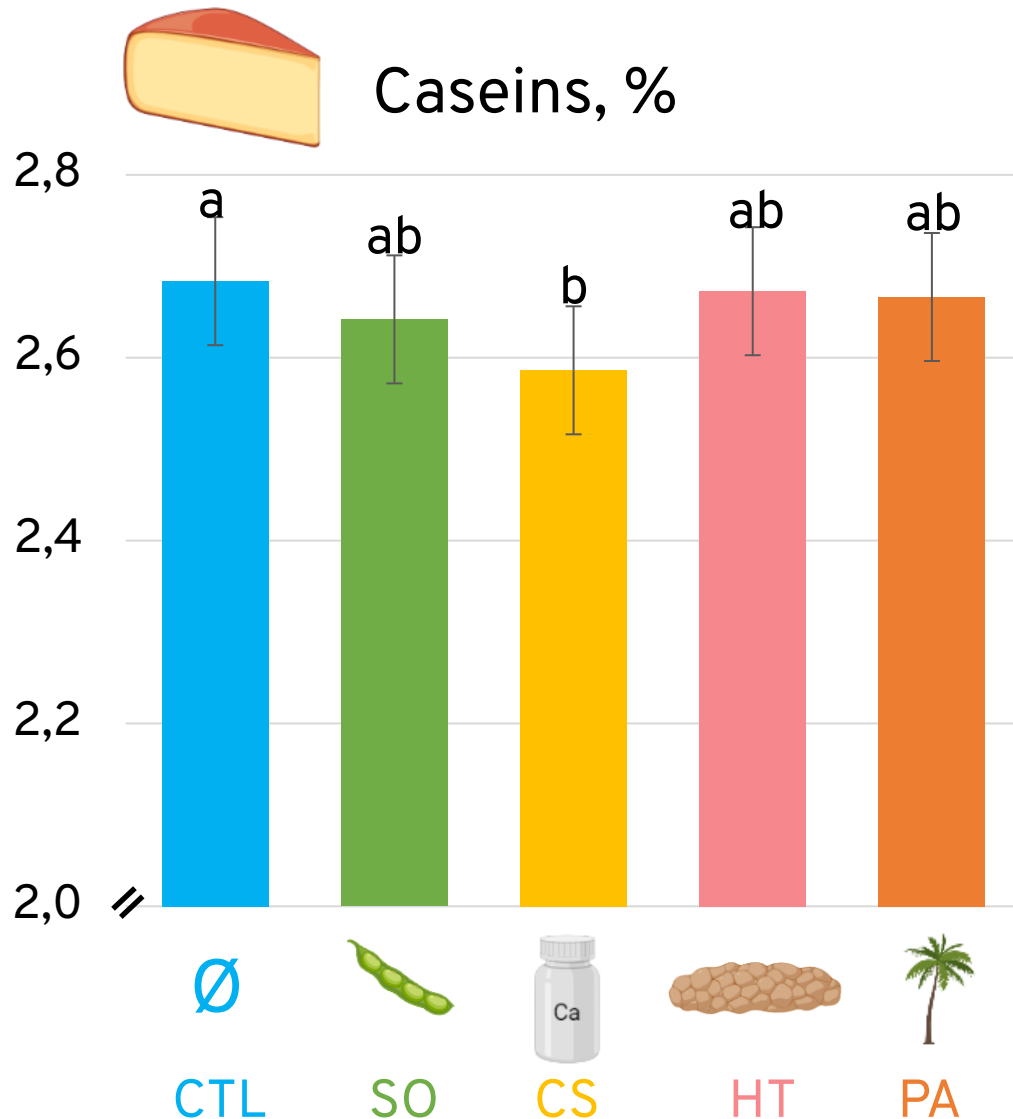




# Results - milk composition

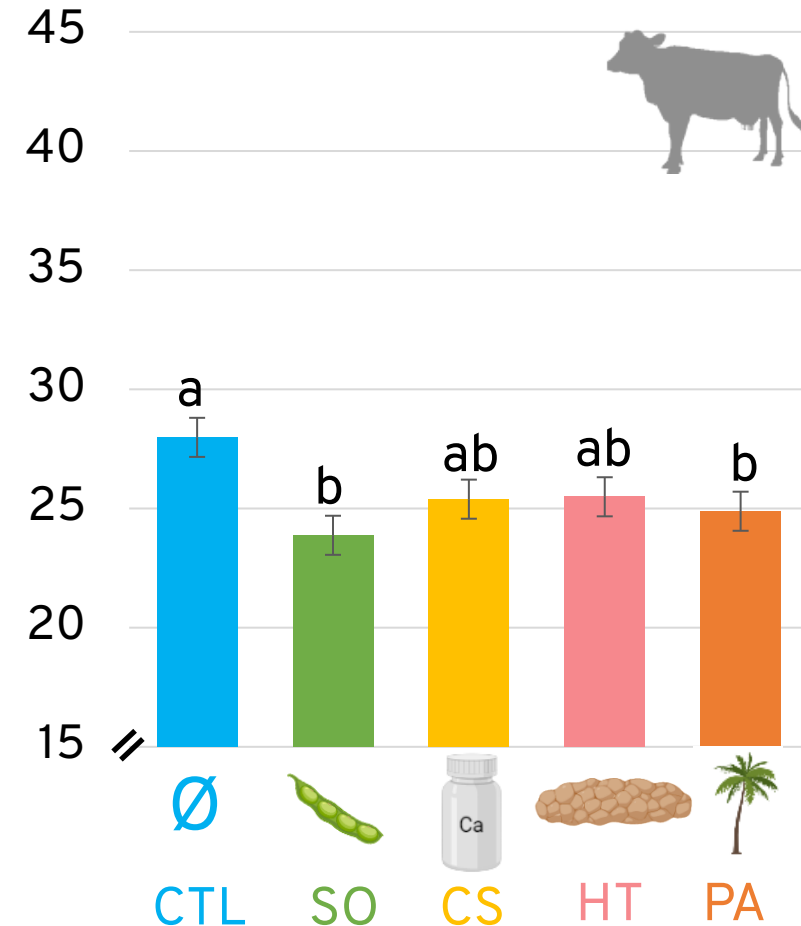


# Results - milk composition

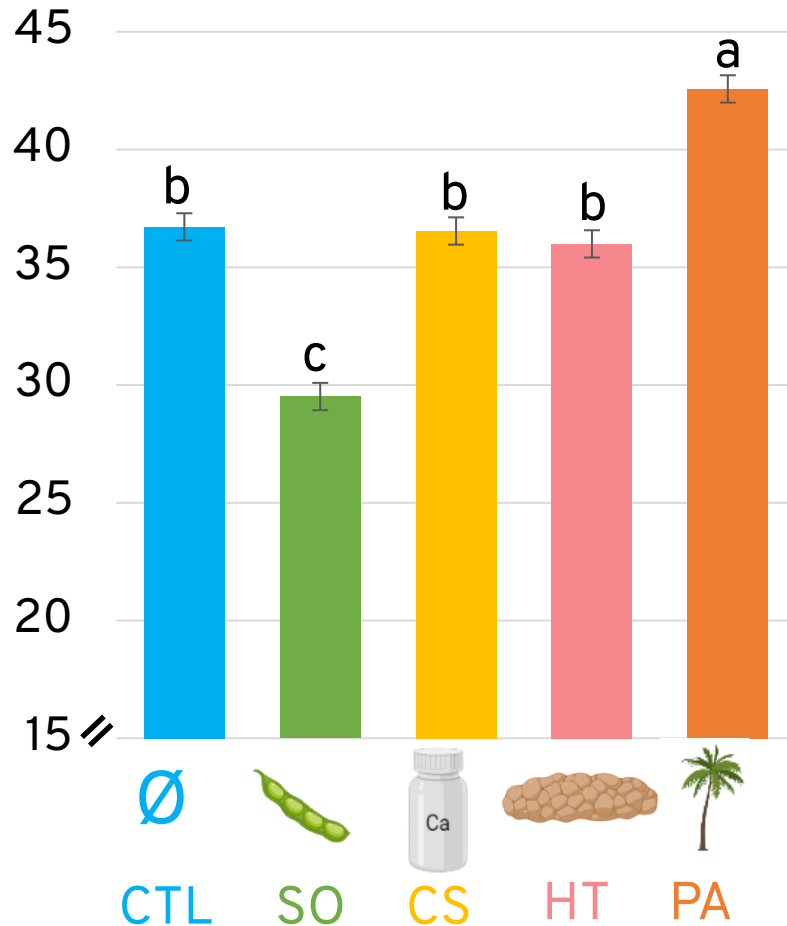


# Results - milk fatty acids (FA)

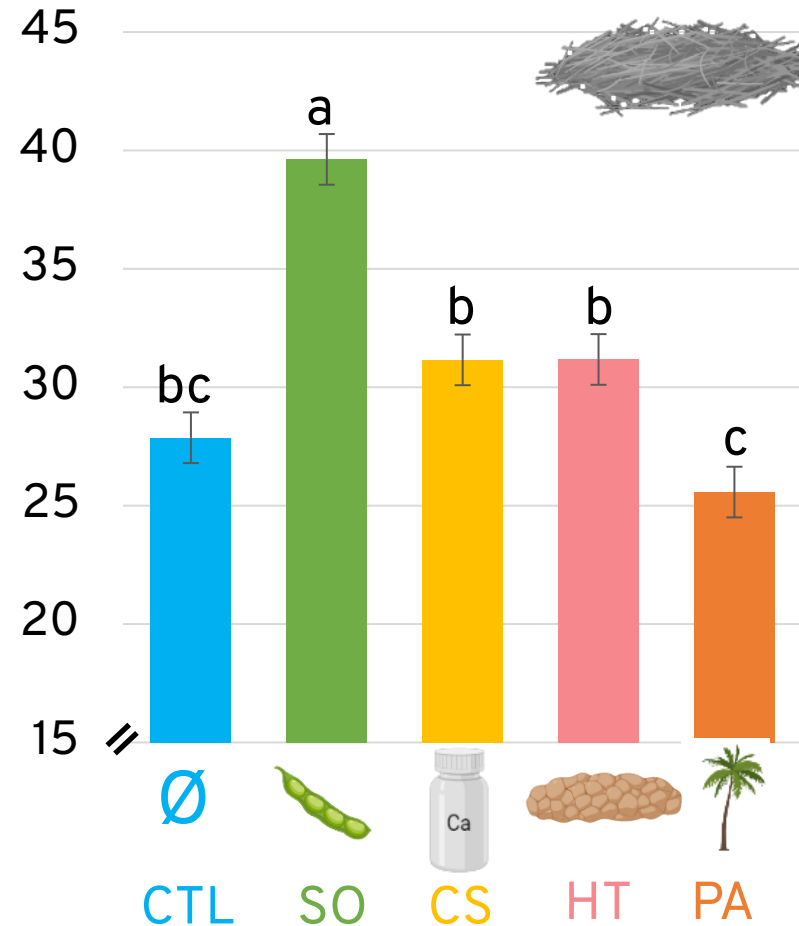
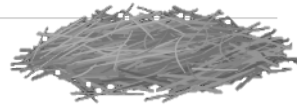
De novo, g/100 g FA



16 carbons FA, g/100 g FA



Preformed, g/100 g FA



# Results – butter manufacture



Skimming



Maturation



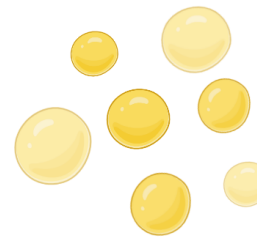
Churning



Blending



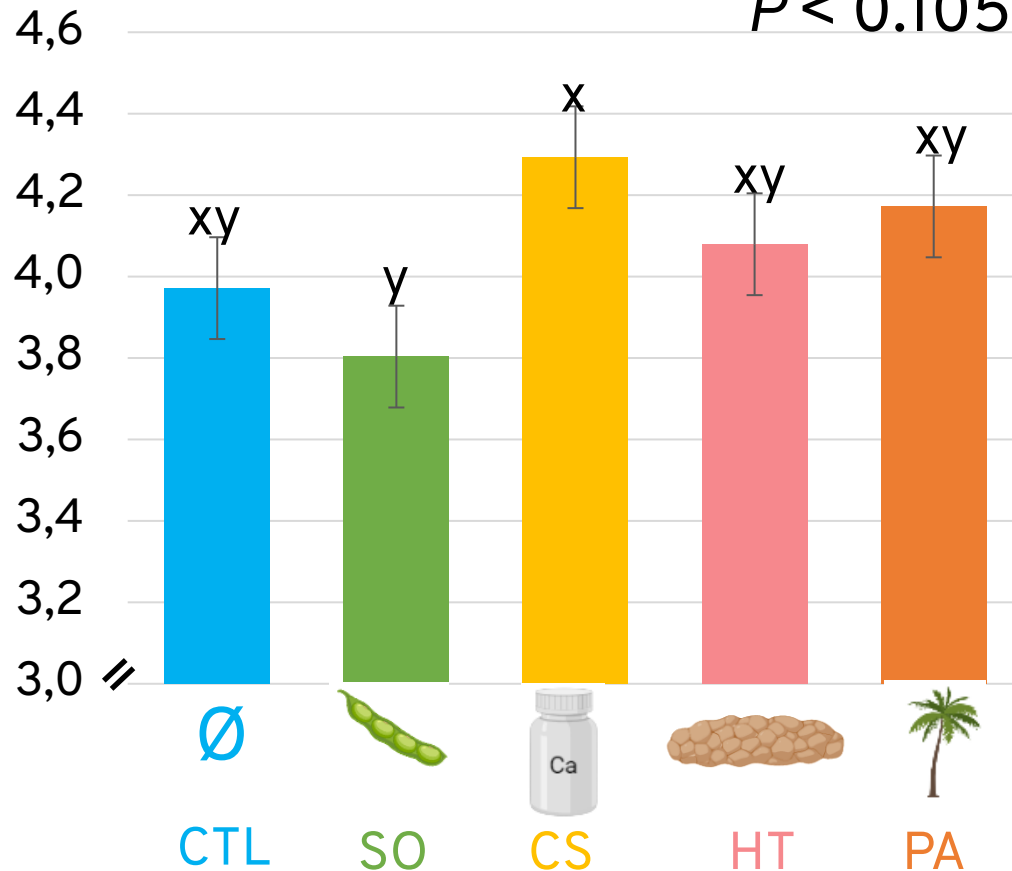
# Results - milk fat structure



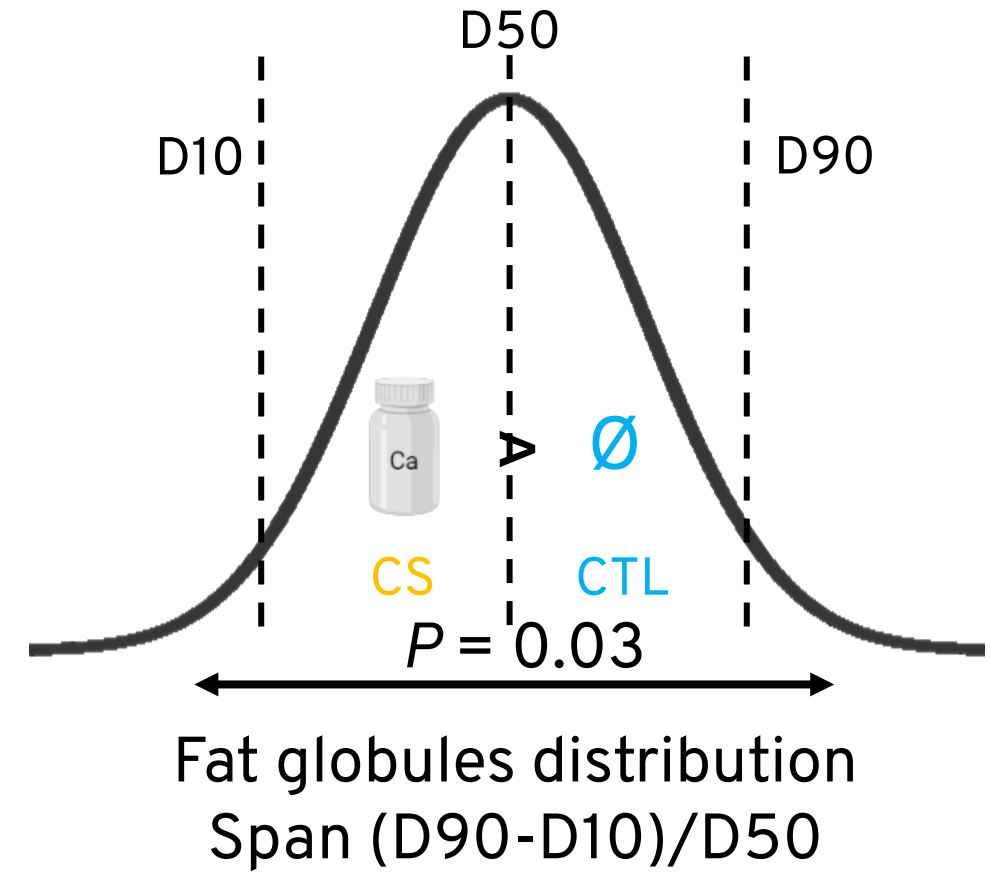
Before cream maturation

Mean fat globule diameter  
( $D_{4,3}$ ),  $\mu\text{m}$

$P < 0.105$

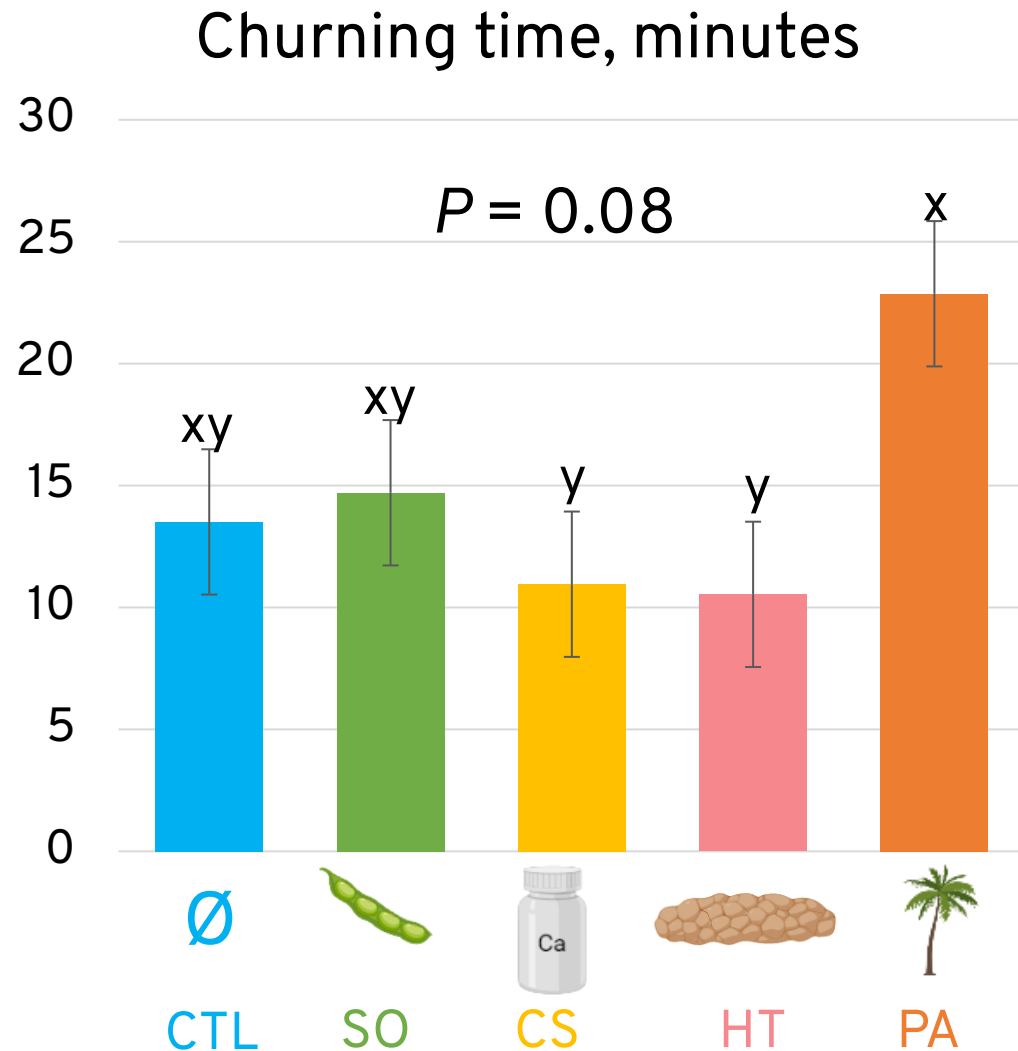


After cream maturation

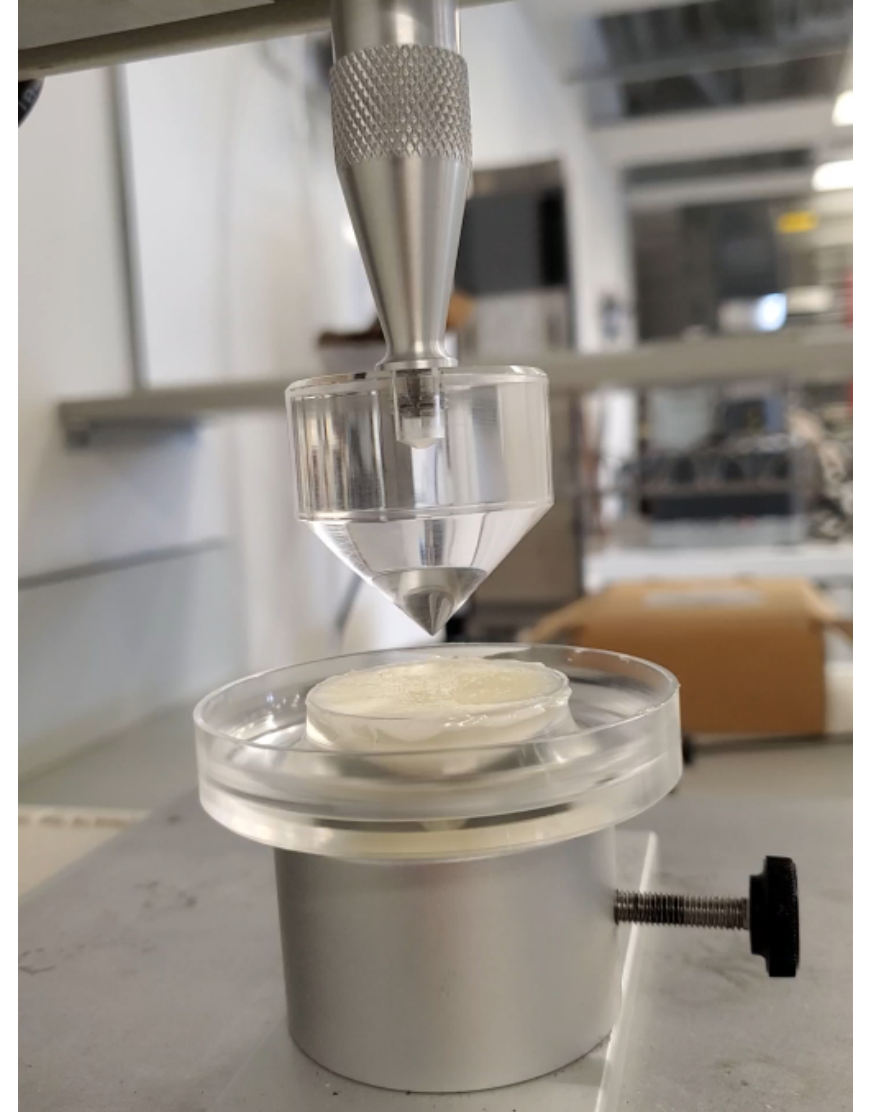
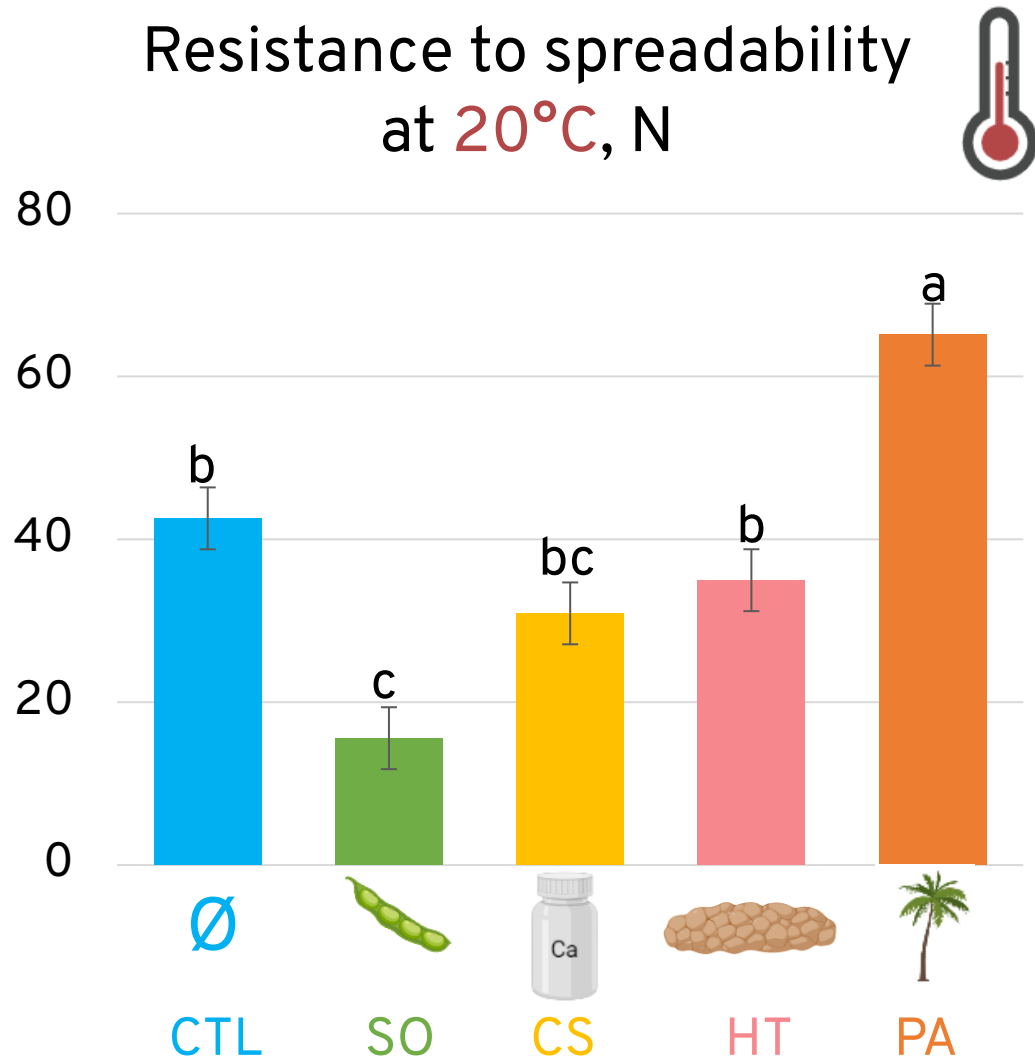


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# Results – butter manufacture



# Results – butter properties

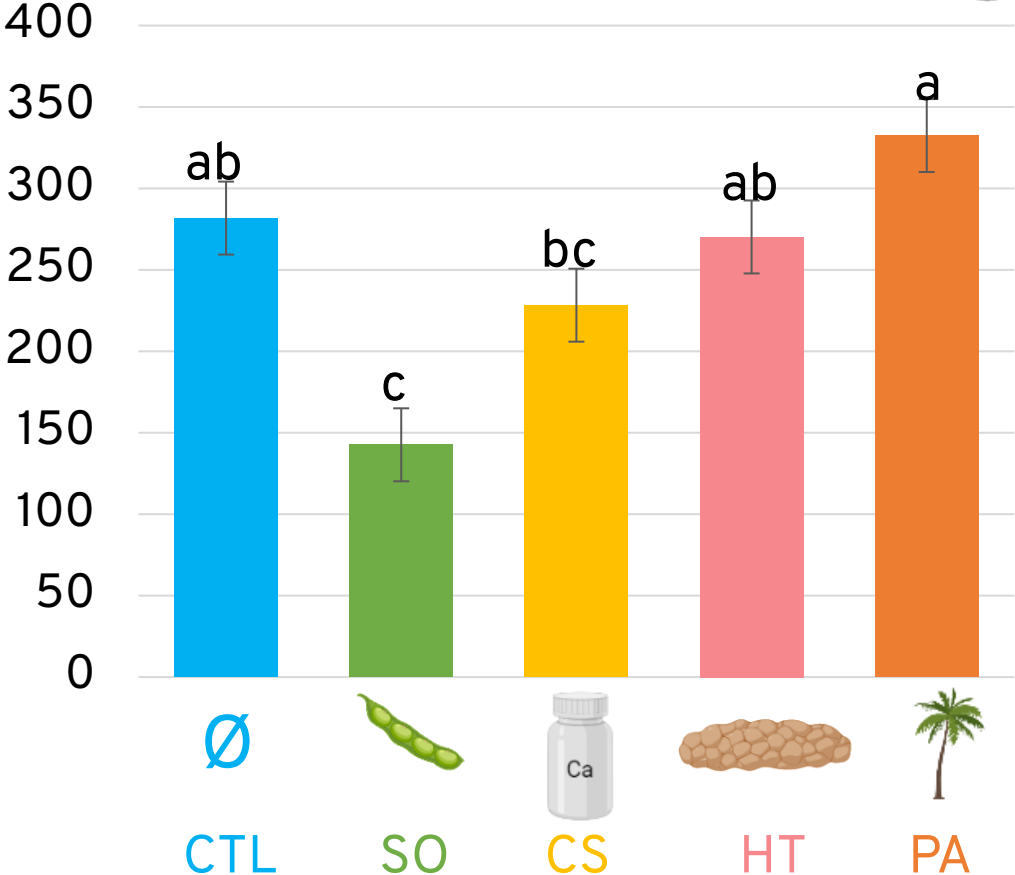


# Results – butter properties

Resistance to spreadability  
at 20°C, N

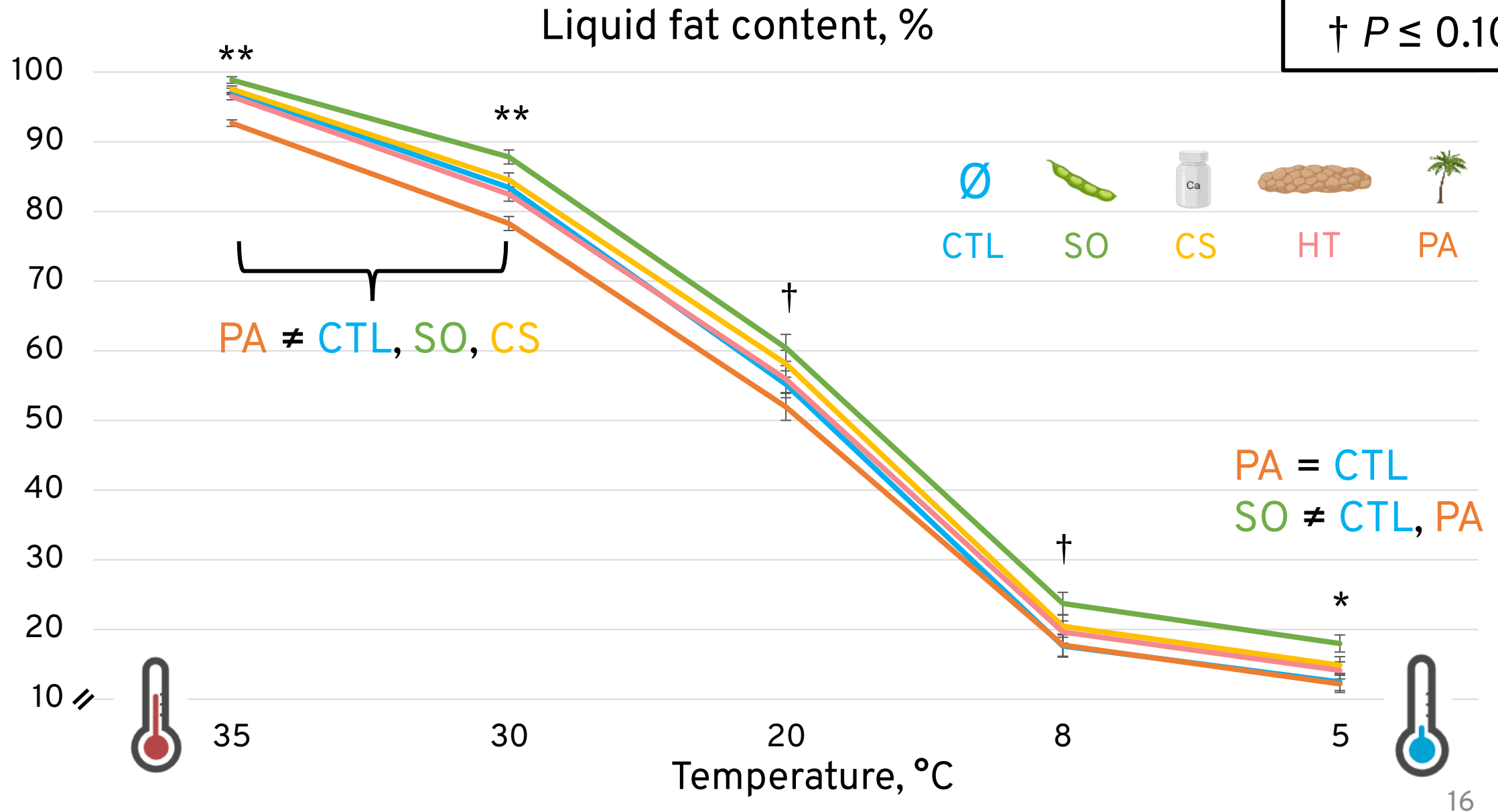


Resistance to spreadability  
at 4°C, N





# Results



# Conclusions

Interest of considering milk processing challenges while looking for on-farm solutions to improve the cohesion of the dairy industry

Compared with control

| Fat supplement                                                                                                       | Milk composition | Butter spreadability |
|----------------------------------------------------------------------------------------------------------------------|------------------|----------------------|
| Soybean oil                         |                  |                      |
| Calcium salts of palm fatty acids  |                  |                      |
| Hydrogenated+hydrolyzed tallow  |                  |                      |
| Palmitic acid                     |                  |                      |



# Thank you

PROGRAMME  
**INNOV'  
ACTION**  
AGROALIMENTAIRE

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Catalyseur de recherche

 **CRSAD**  
Centre de recherche en sciences animales de Deschambault

 **CRSNG  
NSERC**

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technologies  
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