

The effect of mineral-vitamin free choice blocks on transition cows' feeding behavior and health

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1-5 September 2024 - Florence, Italy



Ruminants are capable to self-select appropriate intakes of specific nutrients (Methu et al., 2001)

Sorting behavior may result in an unbalanced intake of nutrients and reduces the *nutritive* value of the ration found in the bunk across the day (DeVries et al., 2005).

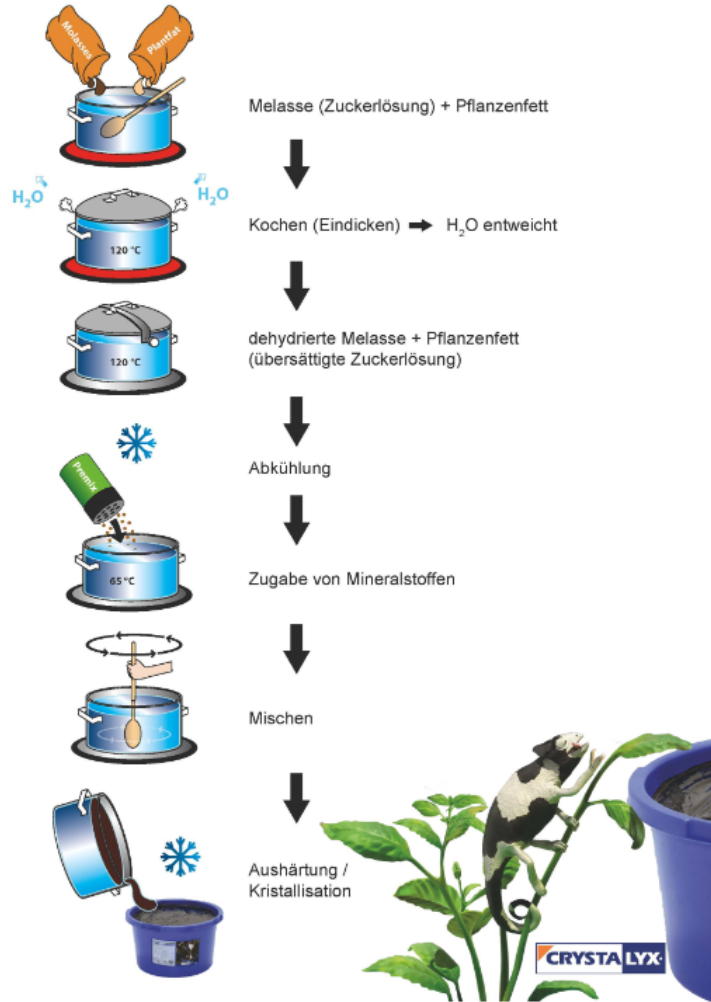
In high forage diets mineral supply may be insufficient for high producing cows

During stressful periods, like the transition phase, cows face with NEB, massive mineral utilization, and high perturbed immune function



MINERAL-VITAMIN BLOCKS

Physikalischer Aushärtungs-Prozess von **CRYSTALYX®**



Dehydrated molasses (energy and palatability)

Vegetable oil (concentrated energy, rumen protected fats)

Trace elements, vitamins, additives

Minerals (Ca, Mg, P)

OBJECTIVE

To assess the effect of different molasses-based MinVit free choice blocks (FC-BLOCK) as alternative to conventional TMR MinVit additives on transition cows' feeding behavior and metabolic status

PRODUCTS TESTED



MINVIT: molasses based free choice MINVIT block



LIN: molasses based MINVIT block with linseed oil and 2.5% yeast (LIN)



VITA: molasses based MINVIT block with propylene glycole

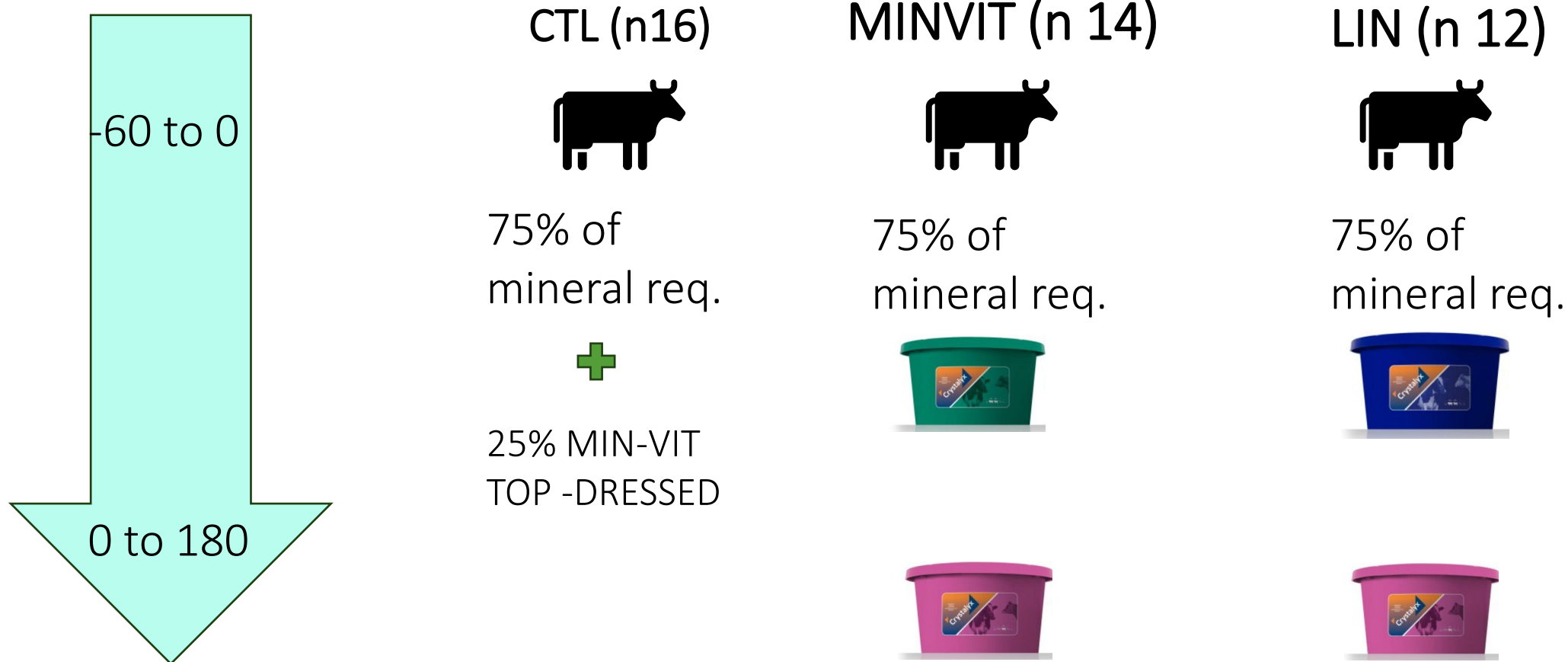
<u>Ingredients (kg as fed)</u>	Dry	Lactating
Mixed hay (wheat, ryegrass)	10.92	2.3
Alfalfa hay		11.00
Corn flakes	0.98	7.00
Soybean hulls+ Dry beet pulp	2.10	1.70
Min Vit Dry	0.50	-
Min Vit Lact.	-	0.5
Sugar	-	0.5
Feedstuff + molassess (AMS)	-	3.33

Chemical composition (%DM)

ASH	8.71	8.80
CP	10.07	15.92
EE	1.91	2.31
STARCH	6.60	17.74
NDF	40.09	41.77
ADF	29.51	24.84
ADL	4.46	4.20



EXPERIMENTAL DESIGN



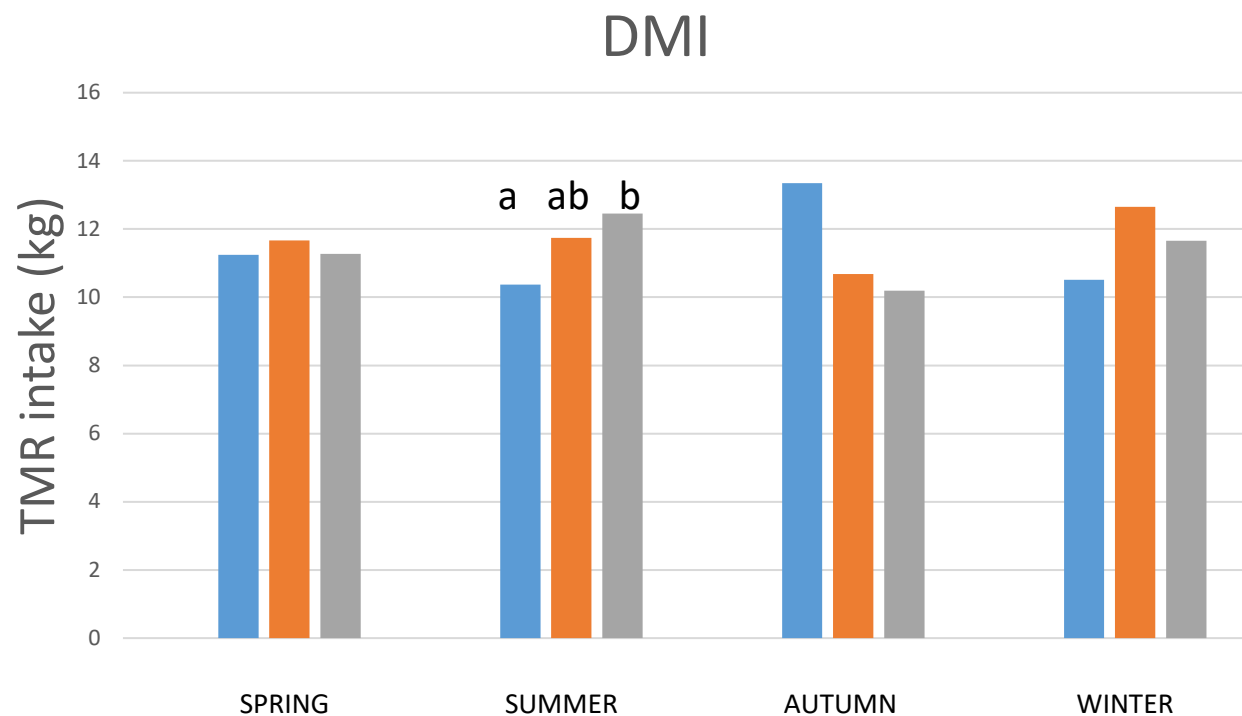
Multiparous Holstein dairy cows (n=42), blocked by BCS, parity and previous milk yield
Fed TMR and concentrates through robotic milking system.

- **DAILY:** feedstuff consumption, eating and rumination time, milk yield
- **TWICE A WEEK:** AVG PEN INTAKE
- **ONCE OFF:** Colostrum yield and quality was recorded
- **-60, -7, 0, +6, +20, +60,+100 DIM:** BCS, fecal score (FS), fecal pH (FpH), urine pH (UpH); blood NEFA, BHBA and GLUCOSE levels.
- **20 AND 60 DIM:** rumen fluid collection for pH, protozoa count and enzymes activity

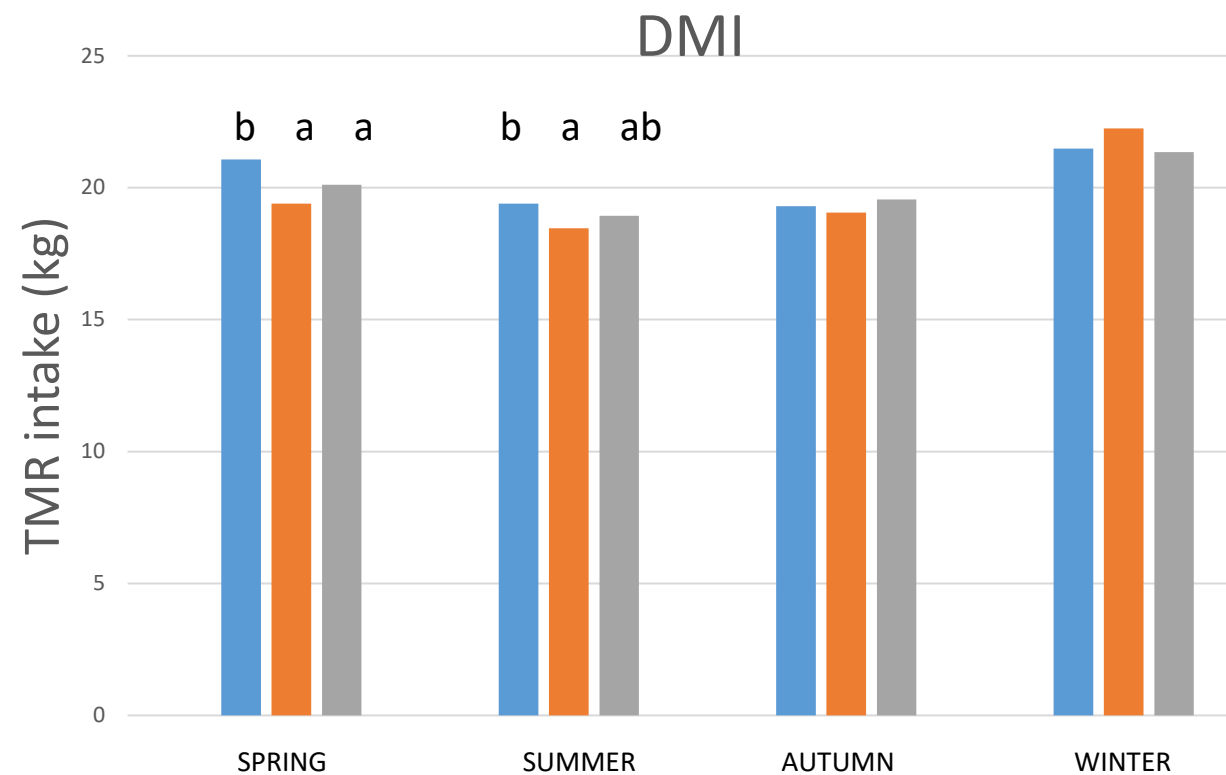
DATA AND SAMPLES' COLLECTION AND ANALYSES

Daily data were analyzed using the univariate GLM procedure, whereas the other data were analyzed using PROC MIXED procedures of SAS 9.4

RESULTS: TMR INTAKE



DRY PERIOD



LACTATION PERIOD

CTL

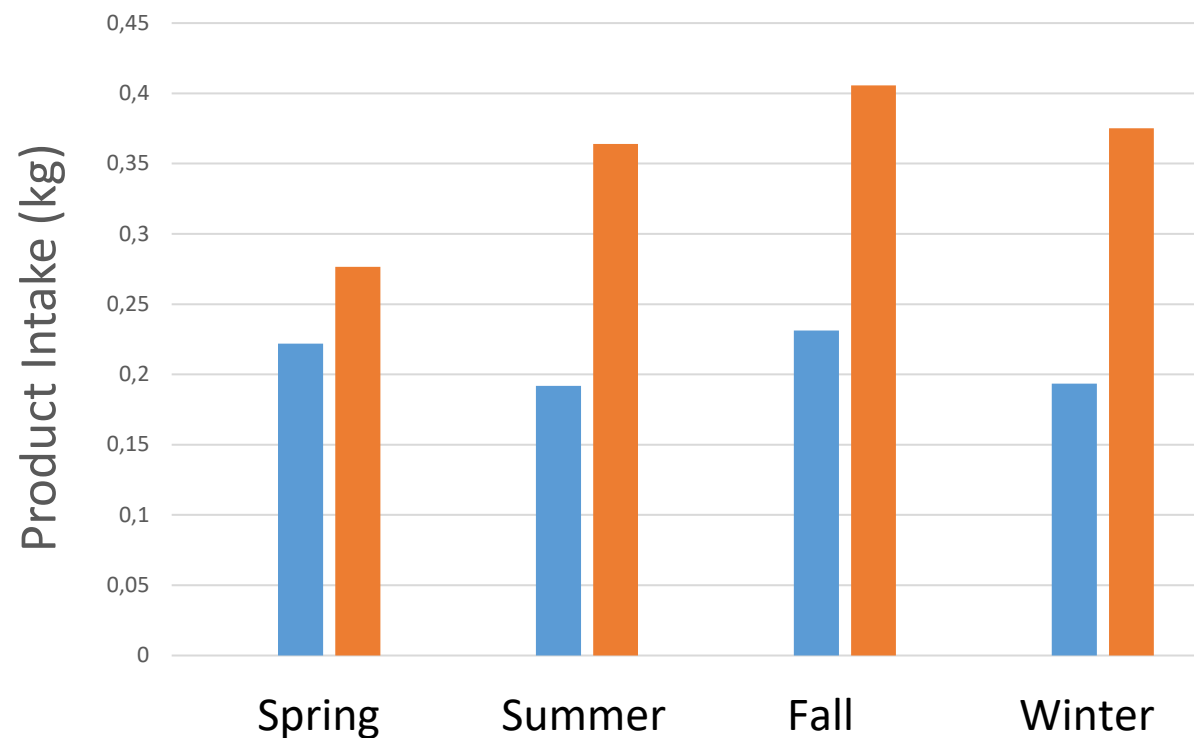
MINVIT

LIN

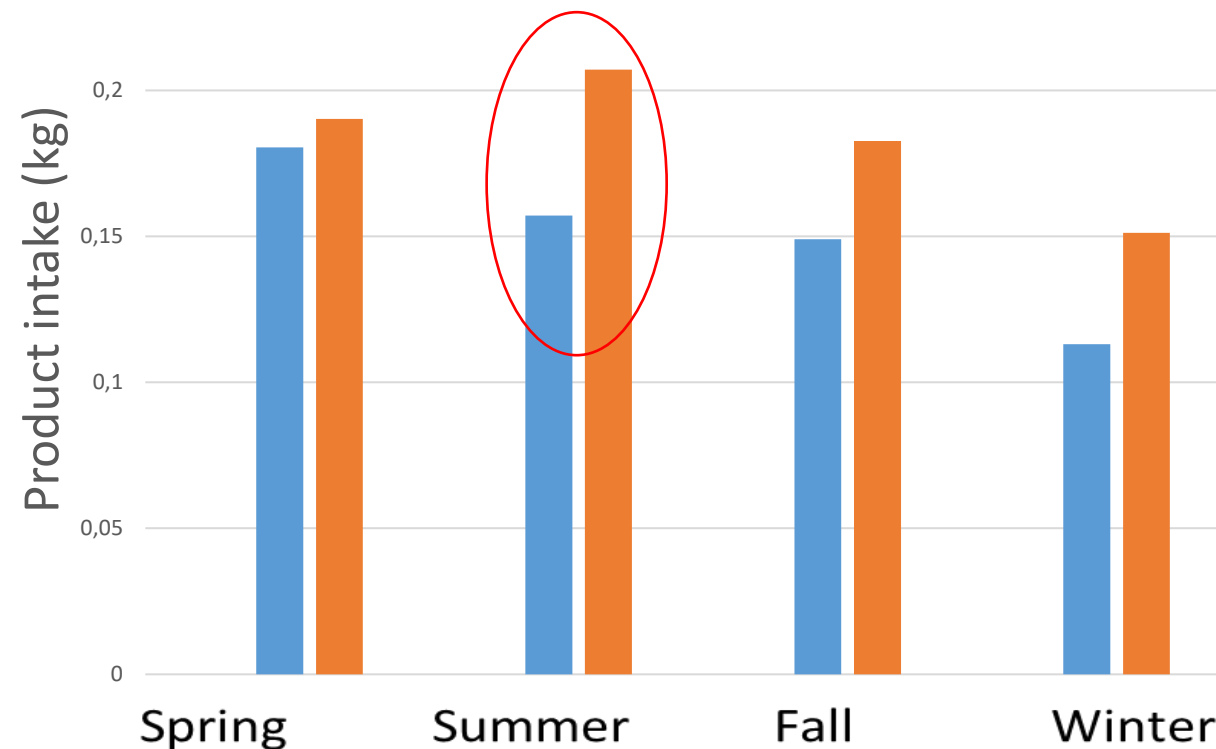


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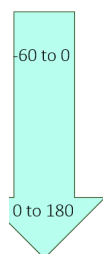
RESULTS: PRODUCT INTAKE



DRY PERIOD



LACTATION PERIOD



CTL (n16)



75% of mineral req.



25% MIN-VIT TOP-DRESSED

MINVIT (n 14)



75% of mineral req.



LIN (n 12)



75% of mineral req.



MINVIT

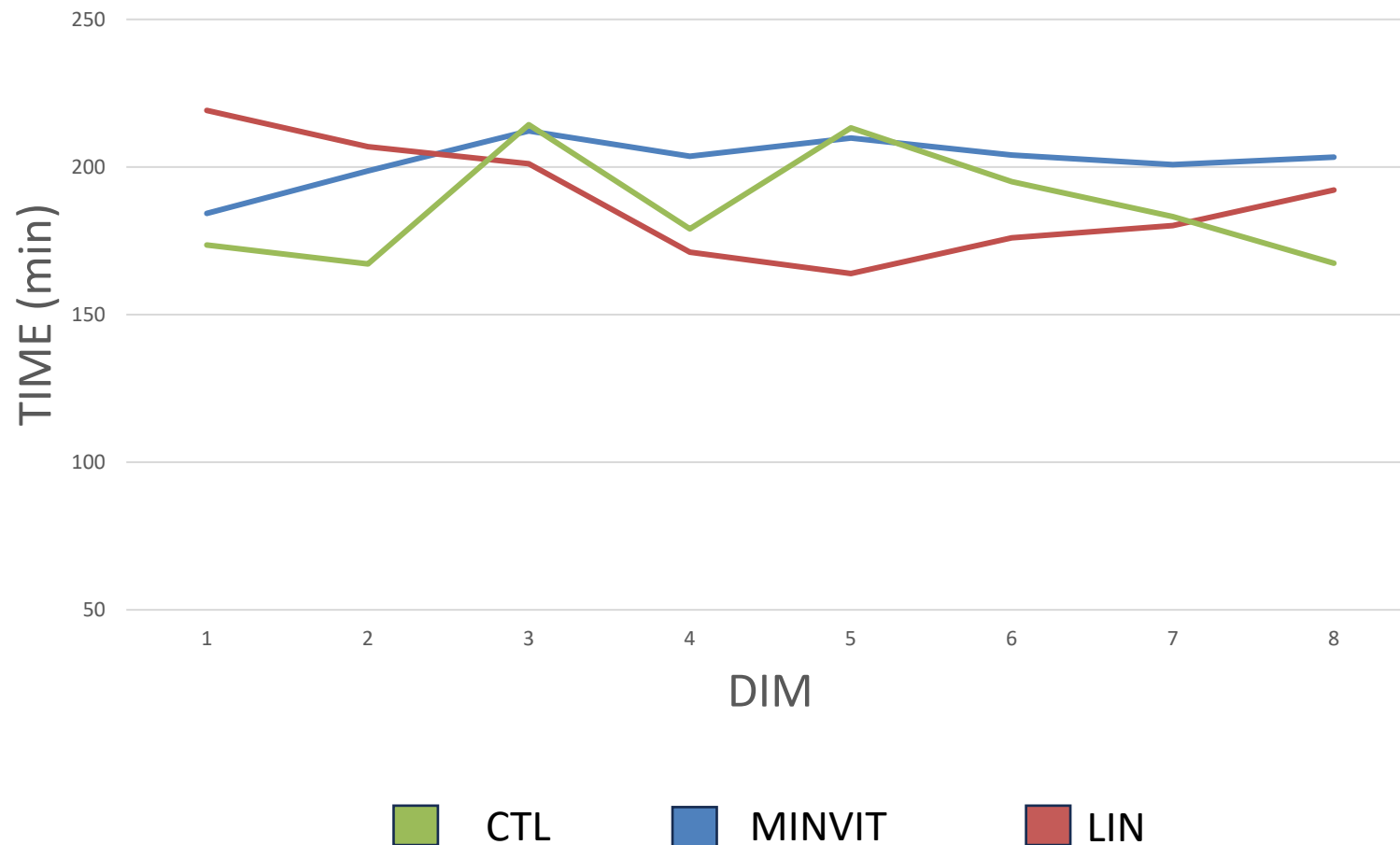


LIN

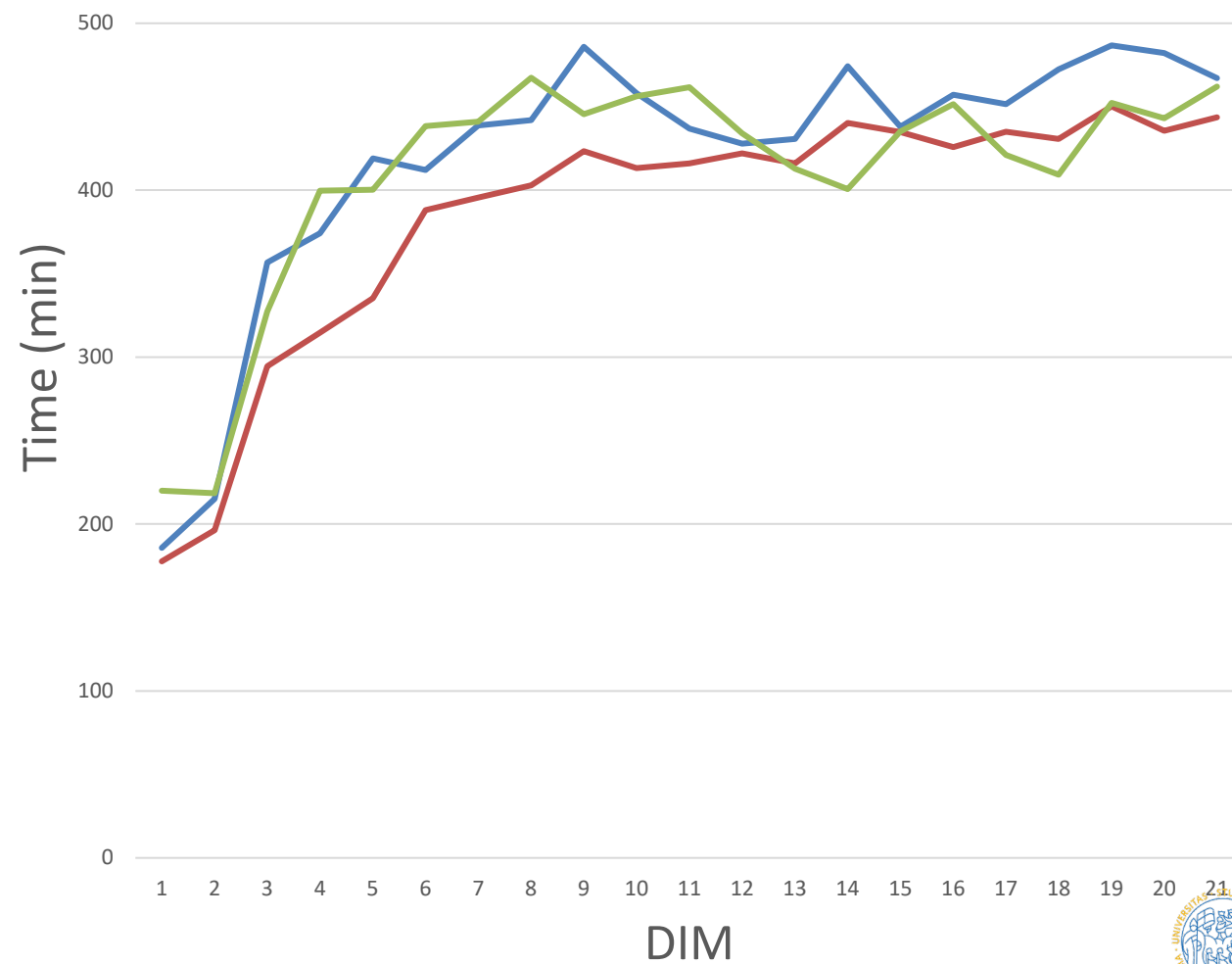
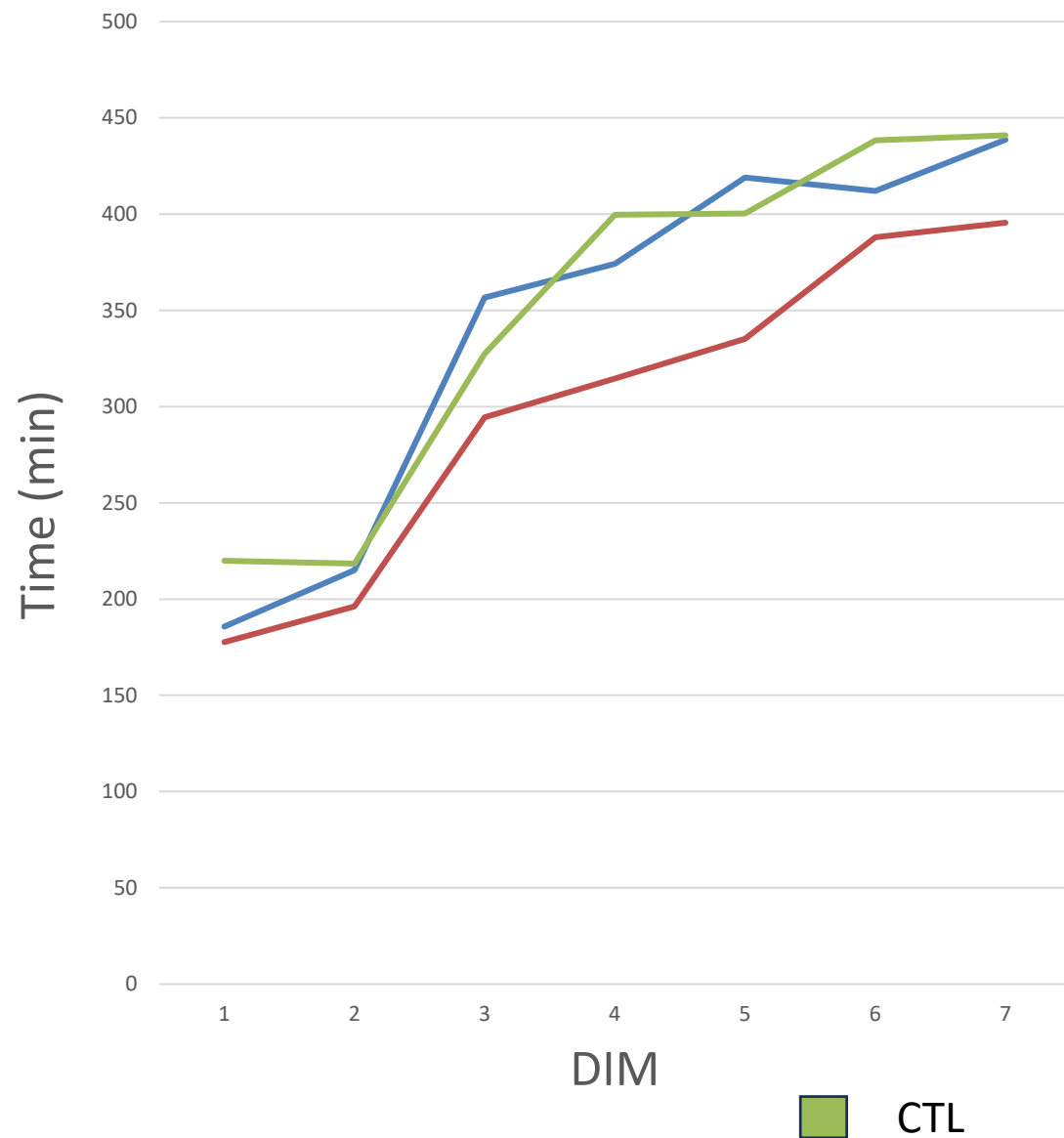


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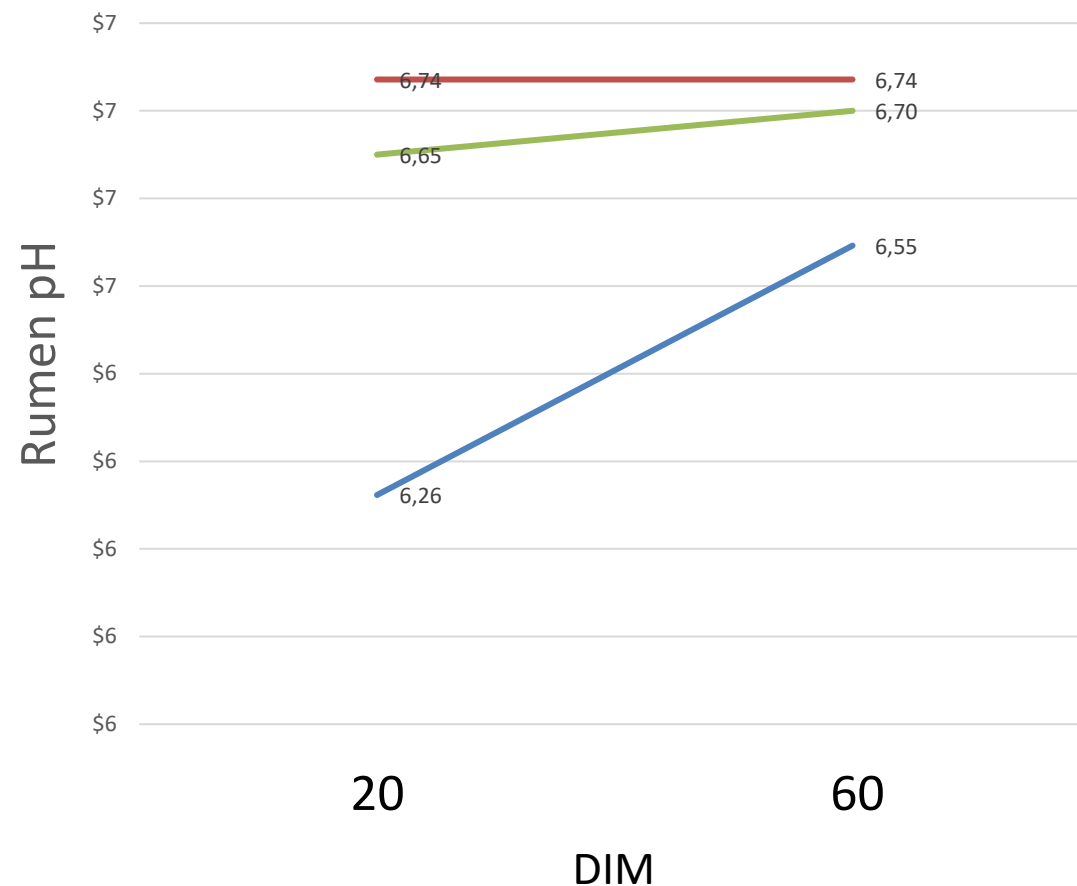
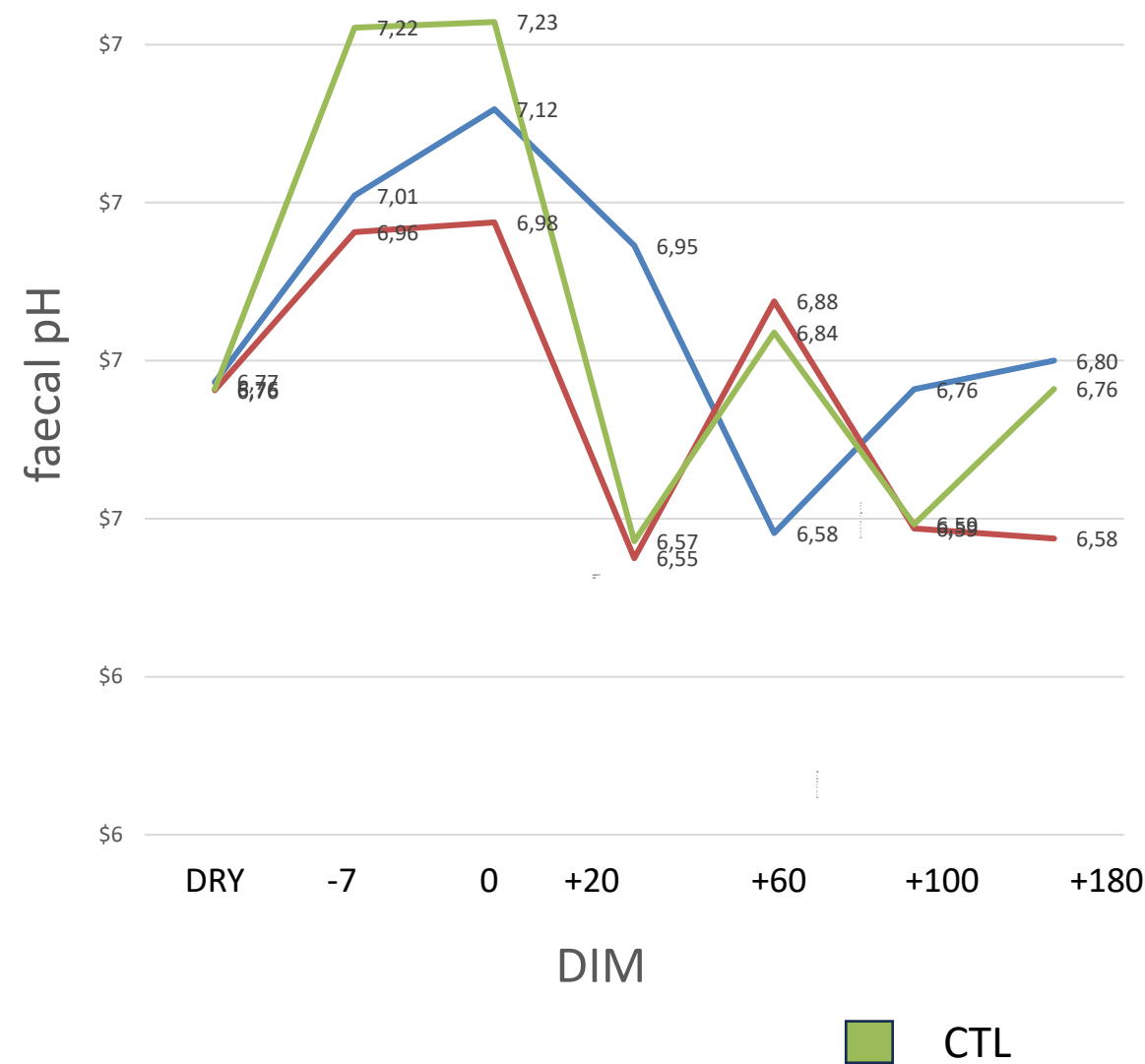
RESULTS: TIME AT THE FEEDBUNK(0 to 7 DIM)



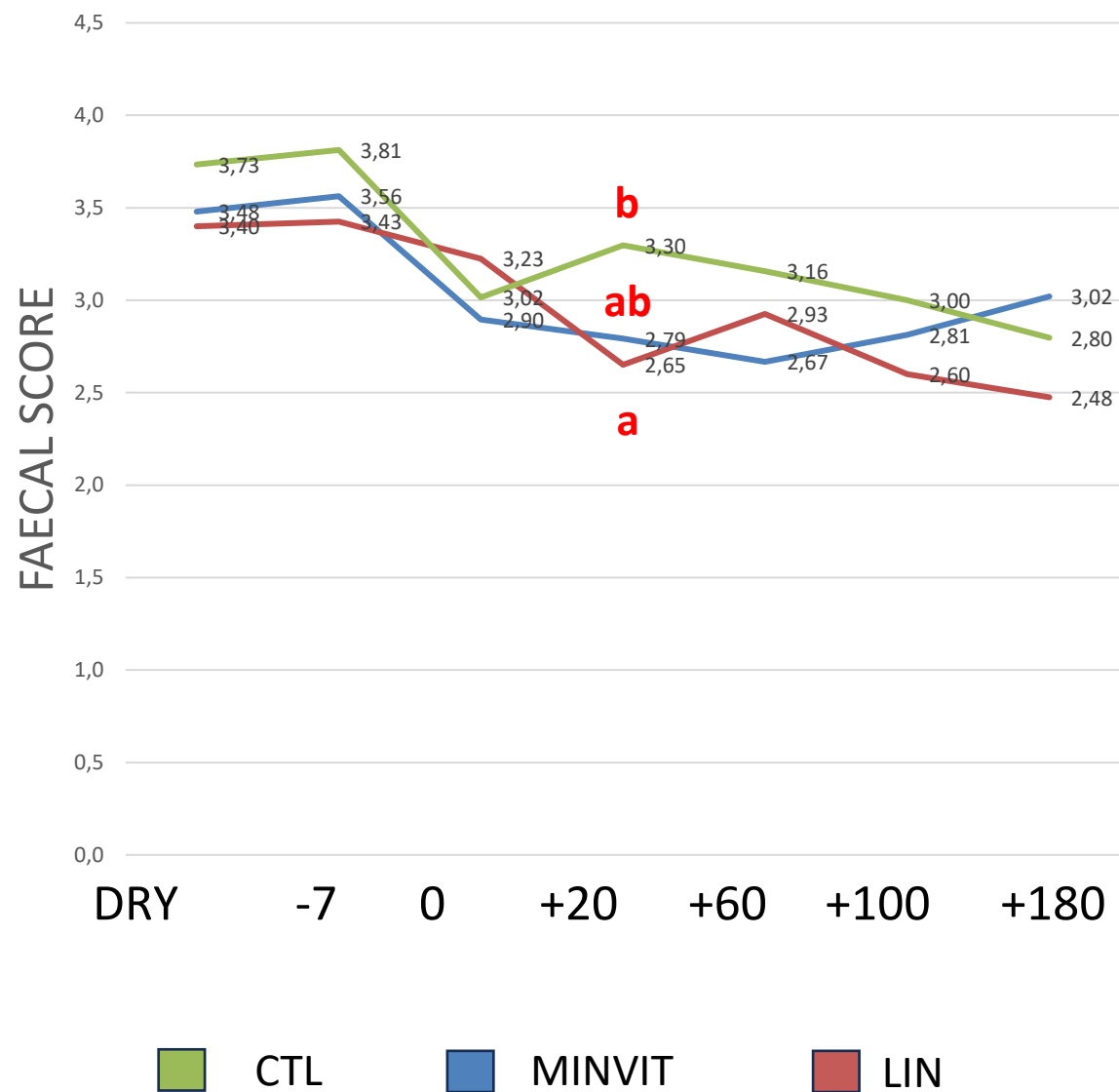
RESULTS: RUMINATION TIME



RESULTS: FAECES AND RUMEN pH

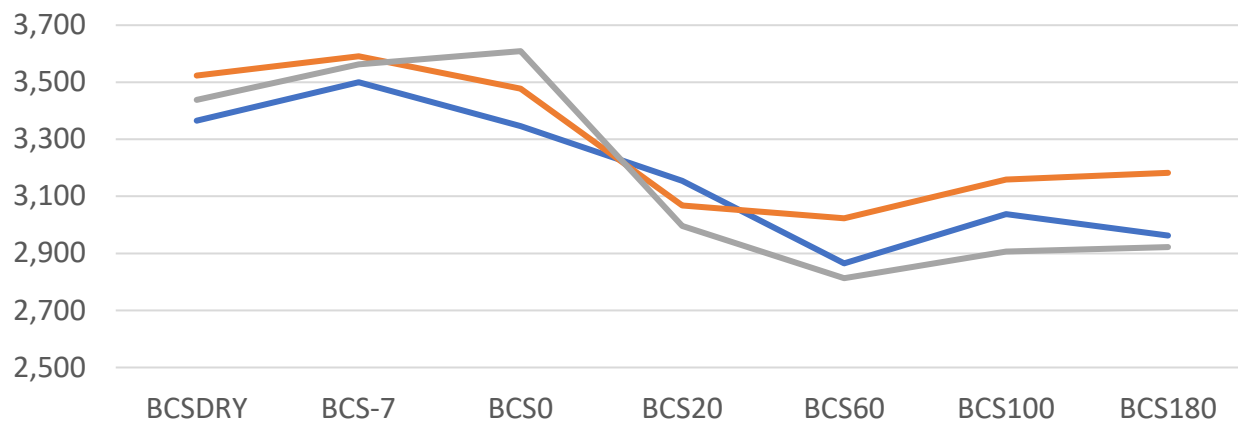


RESULTS: FAECAL SCORE

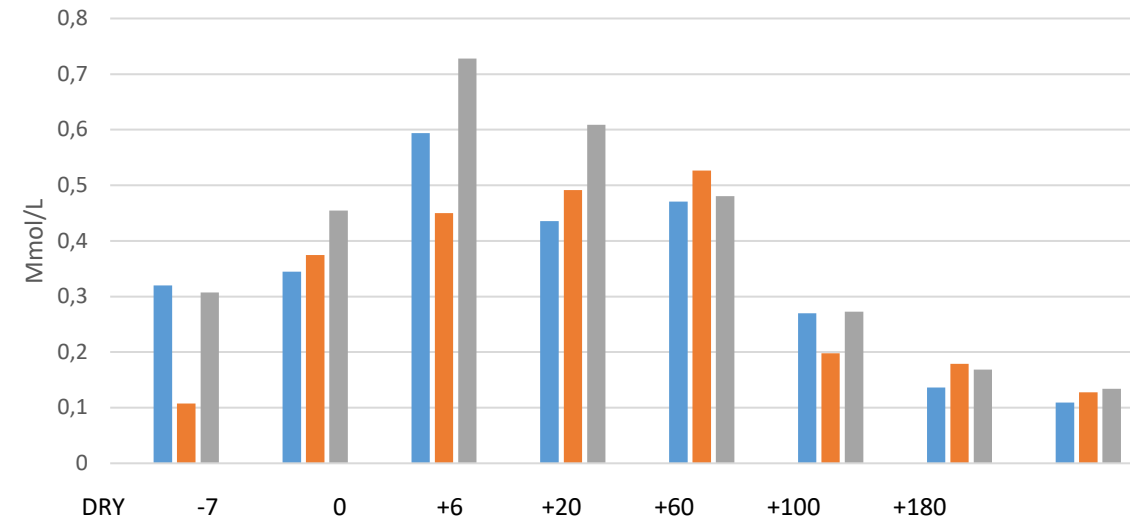


RESULTS:BCS, NEFA, GLUCOSE, BHB

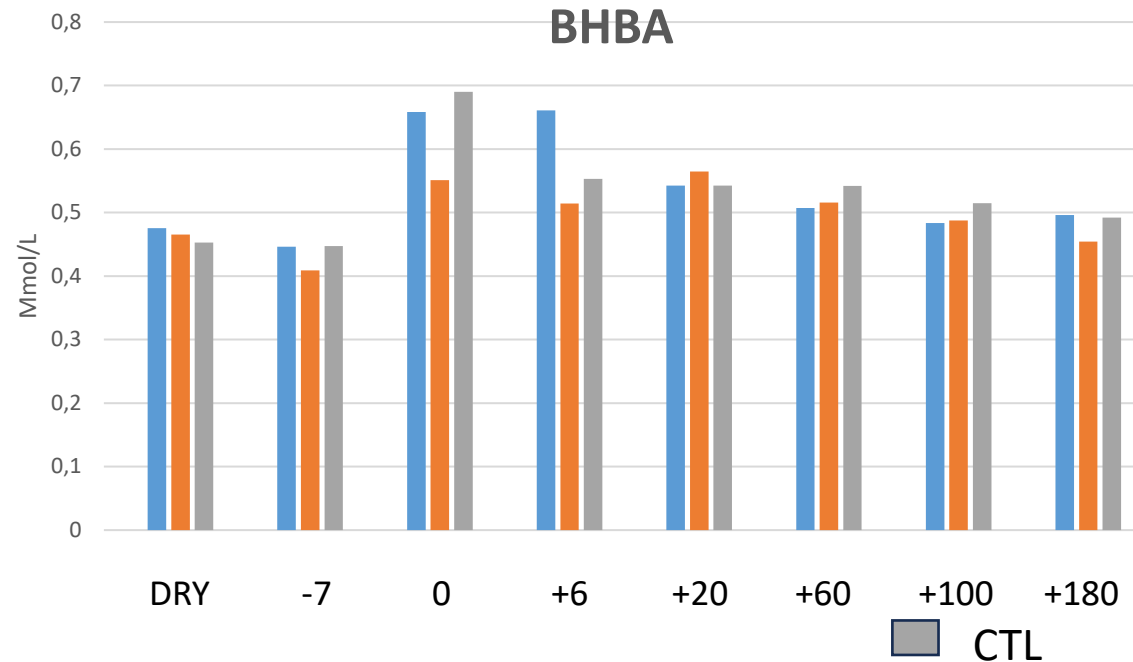
BCS



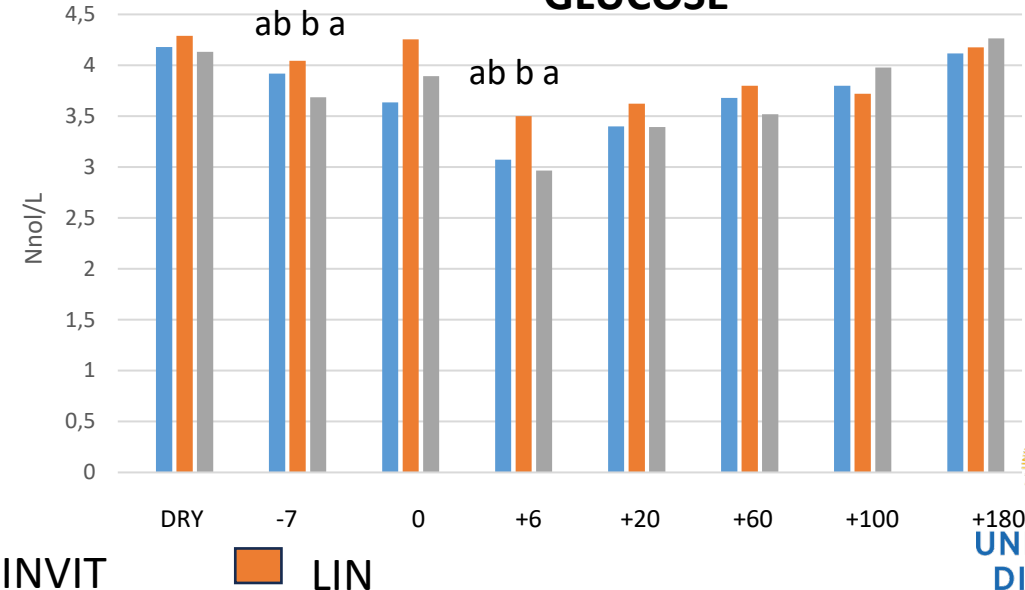
NEFA



BHBA



GLUCOSE



REMARKS

- **What is the role of FC blocks during summer (heat stress)?**
- **Why the LIN reduces rumination time and time at the feedbunk?**
- **Better energy availability for LIN group**

CONCLUSIONS

- The FC MINVIN BLOCKS may be a valid alternative for MINVIT dietary supplementation. However, further investigation is needed to better understand:
 - Rumen availability of different components in the FC blocks
 - Mechanism of action in different condition (environment and/or physiological status)

THANK YOU



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DIPARTIMENTO DI SCIENZE
MEDICO-VETERINARIE

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