

Mineral-vitamin free choice blocks impact on productivity and oxidative status of transition and lactating cows



ΓΕΩΠΟΝΙΚΟ
ΠΑΝΕΠΙΣΤΗΜΙΟ ΑΘΗΝΩΝ

Τμήμα Επιστήμης
Ζωικής Παραγωγής



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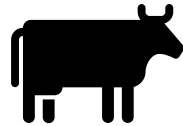
OBJECTIVE

Evaluating the effect of different molasses-based MinVit free choice blocks (FC-BLOCK) in partial substitution to conventional TMR MinVit additives (CTL) on productivity and oxidative status of transition and lactating cows.

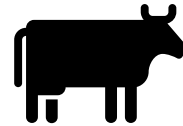
EXPERIMENTAL DESIGN

Multiparous Holstein dairy cows (n=42), blocked by BCS, parity and previous milk yield.

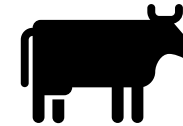
CTL (n16)



MINVIT (n 14)



LIN (n 12)



TMR including 75% of the Mineral and Vitamin requirements (NRC2001)

+

+

+

25% MIN-VIT
in
TOP DRESSING



-60 to 0

0 to 180



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DIETS' COMPOSITION

	Lactating	Dry
Ingredients, Kg as fed		
Mixed hay (wheat, ryegrass)	2,3	10,92
Alfalfa hay	11	
Corn flakes	7	0,98
Soybean hulls + Dry beet pulp	1,70	2,10
Min Vit lact.	0,30	
Min Vit dry		0,15
SUGAR	0,50	
FEEDSTUFF in the milking robot + molasses	3,33	
Chemical composition, %DM		
ASH	8,80	8,71
CP	15,92	10,07
EE	2,31	1,91
STARCH	17,74	6,60
NDF	41,77	40,09
ADF	24,84	29,51
ADL	4,20	4,46



Plasma and milk samples at 0, 20, 60 and 180 DIM

Milk yield (MY) measurement at 0, 20, 60 and 180 DIM

MDA, Protein carbonyls (PC), FRAP and ABTS determined on plasma

-60 -7 0 20 60 180

DATA AND SAMPLES' COLLECTION AND ANALYSES

Data were analyzed through the univariate procedure of the GLM using values at drying of as covariate

RESULTS: FRAP and ABTS

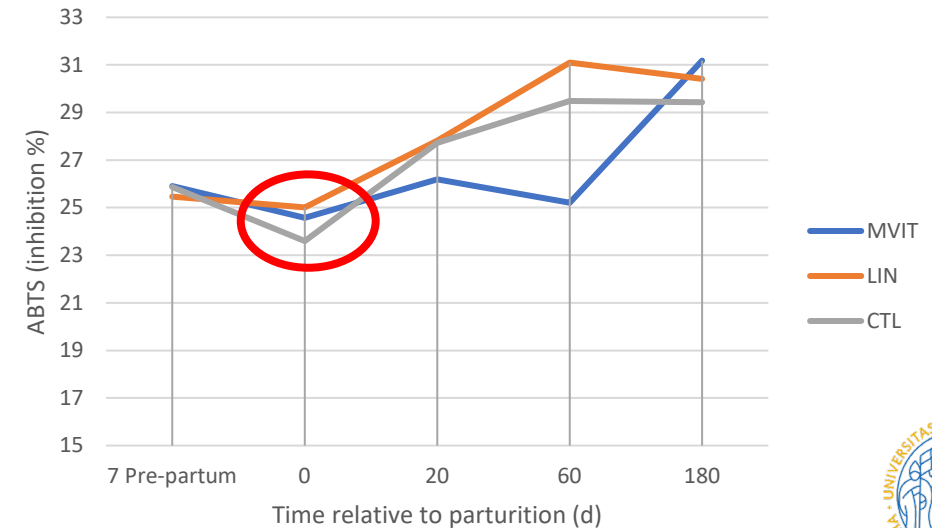
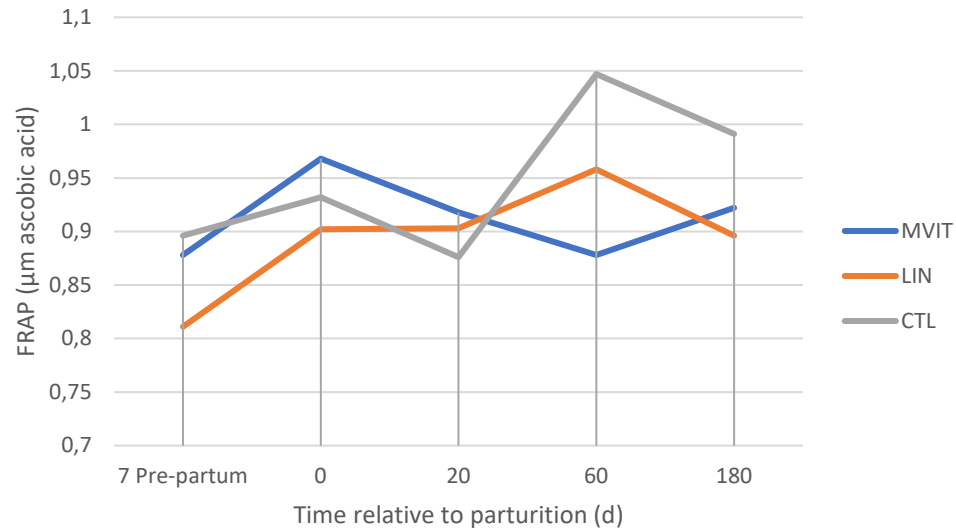
FRAP (μm ascorbic acid)

Group	meno7	0	20	60	180
MVIT	0,878	0,968	0,918	0,878	0,922
LIN	0,811	0,902	0,903	0,958	0,896
CTL	0,896	0,932	0,876	1,047	0,991

ABTS (inhibition %)

Group	meno7	0	20	60	180
MVIT	25,911 ab	24,573 a	26,194 ab	25,212 ab	31,18 b
LIN	25,462	25,011	27,812	31,098	30,41
CTL	25,871 ab	23,597 a	27,726 b	29,485 b	29,425 b

None of the oxidative status markers differed among groups
The ABTS tended to have lower values at PA (24.39 on average)



RESULTS: MDA e PC

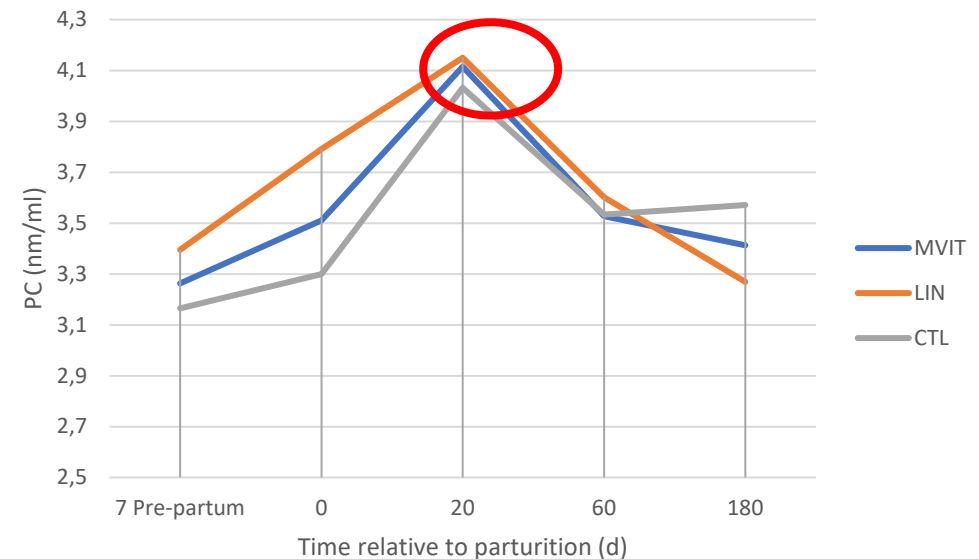
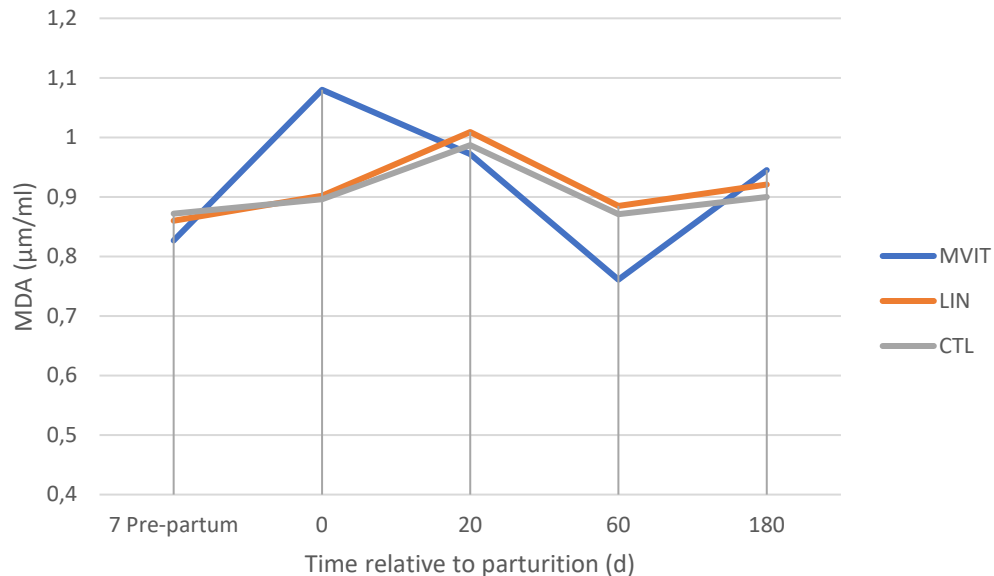
MDA ($\mu\text{m}/\text{ml}$)

Group	meno7	0	20	60	180
MVIT	0,827 ab	1,08 ab	0,972 b	0,761 a	0,945 b
LIN	0,86	0,902	1,009	0,885	0,921
CTL	0,872	0,896	0,987	0,871	0,9

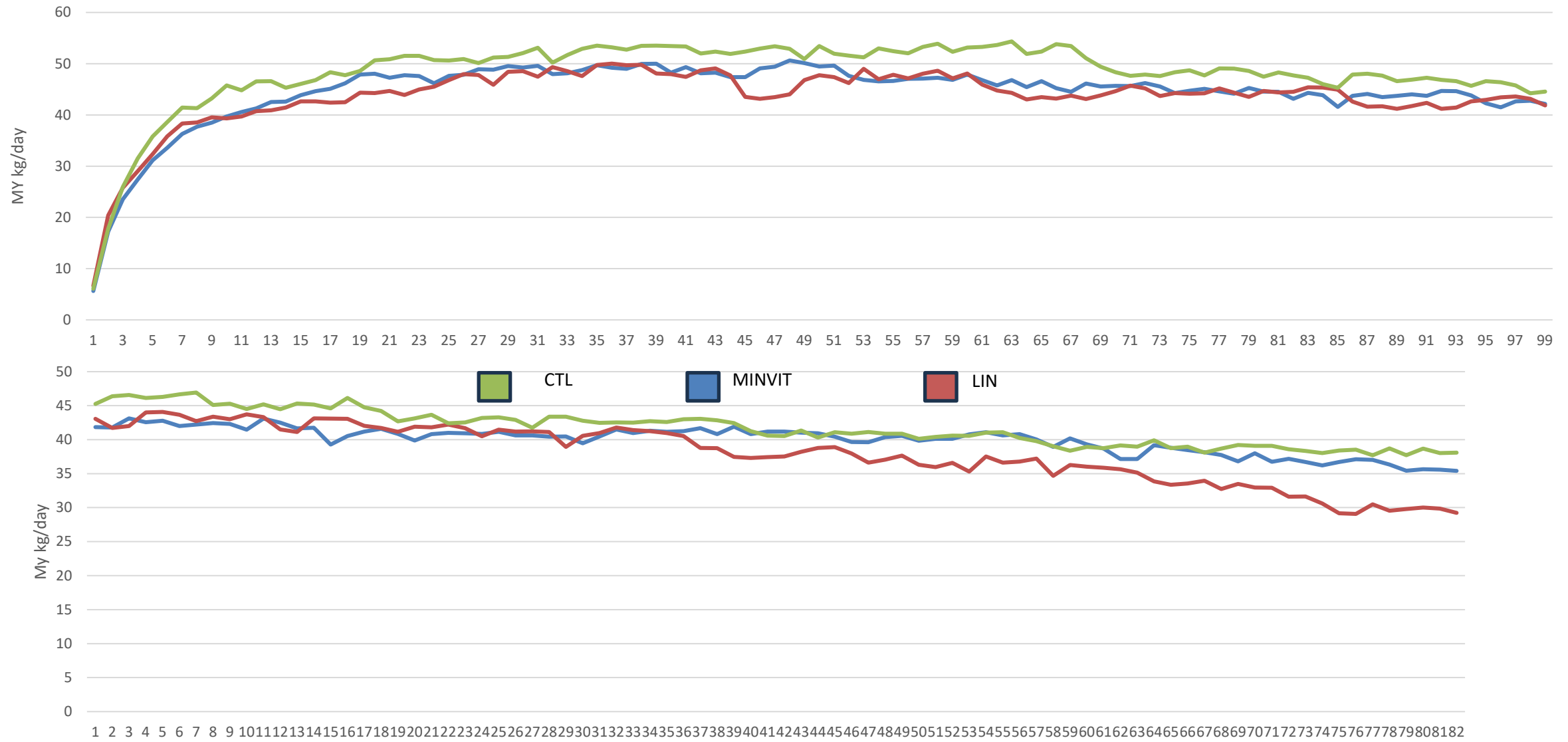
PC (nm/ml)

Group	meno7	0	20	60	180
MVIT	3,263 a	3,511 ab	4,115 b	3,527 ab	3,413 ab
LIN	3,395 ab	3,792 ab	4,15 b	3,602 ab	3,269 a
CTL	3,165 a	3,3 a	4,032 b	3,534 ab	3,571 ab

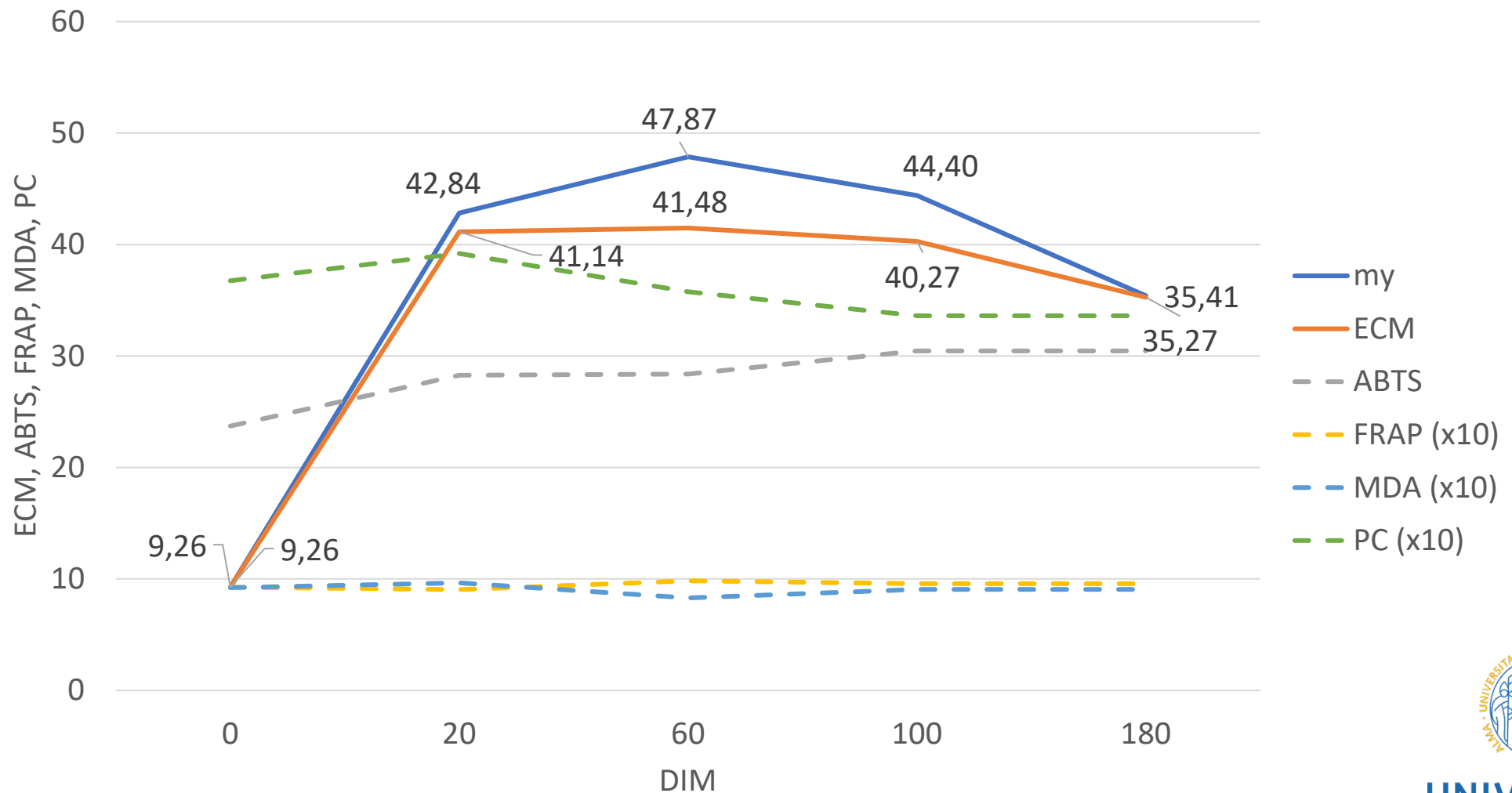
- None of the oxidative status markers differed among groups
- PC: gradual increase from -7 to 20 DIM -showed highest values at 20 DIM compared to PA and the lowest 7 days before PA in the CTL (4.03 vs 3.30 and 3.16)



RESULTS: Productivity

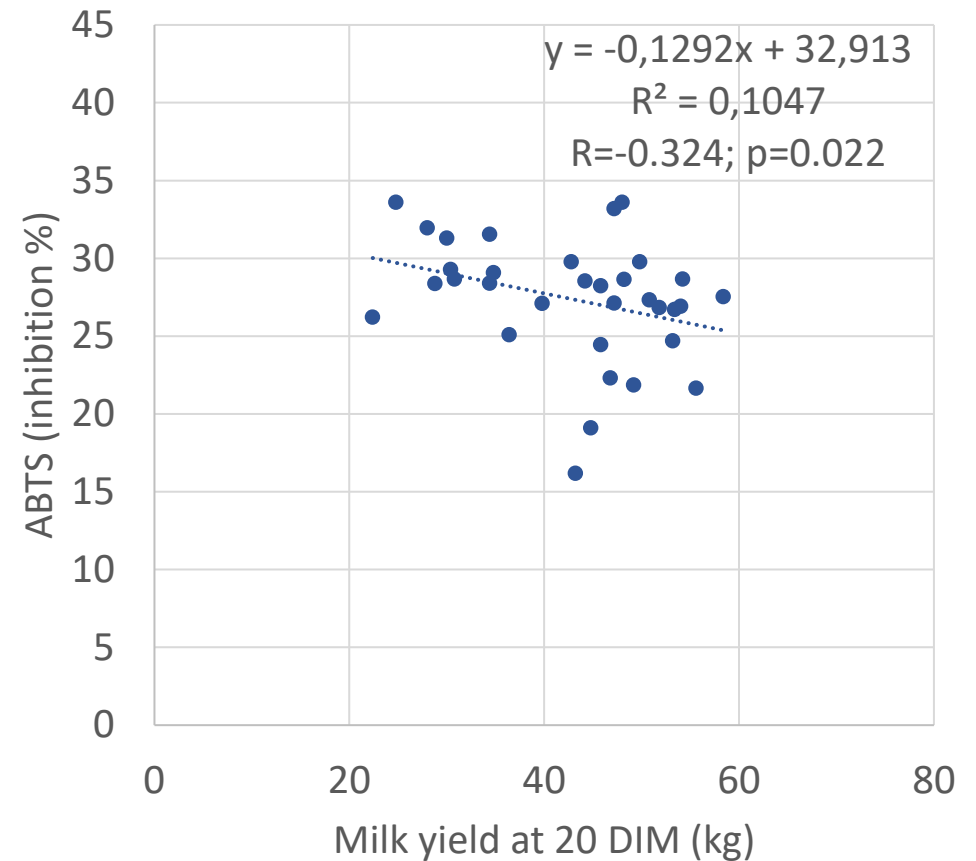
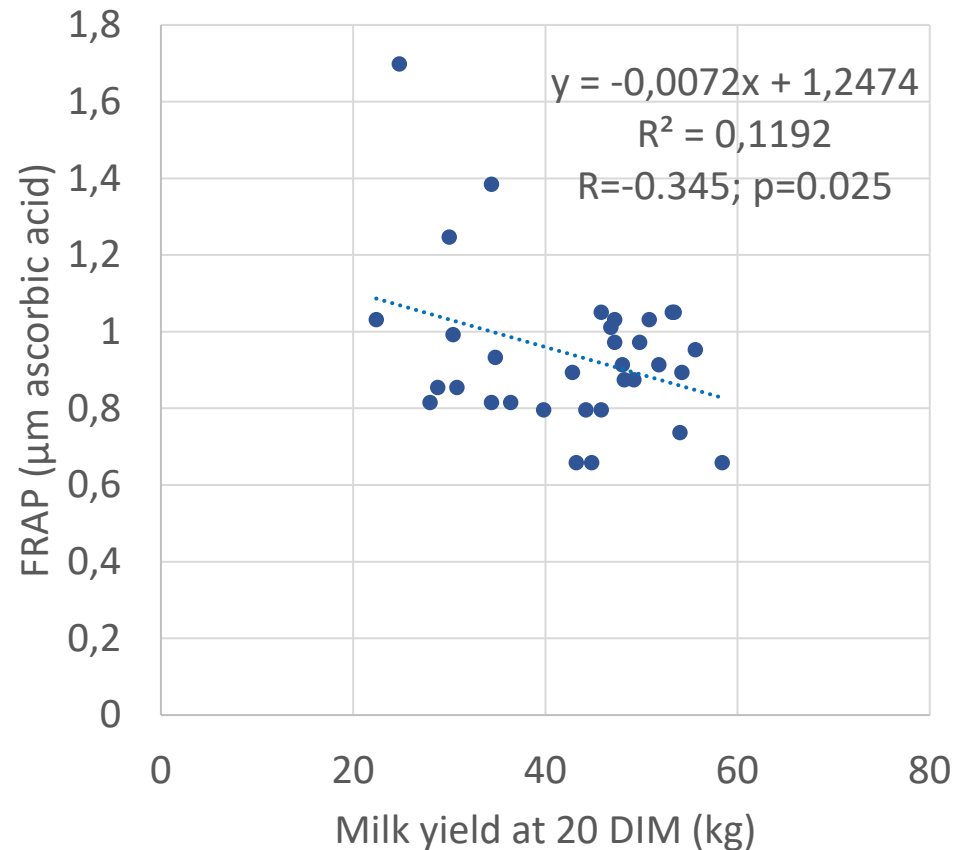


RESULTS: Productivity



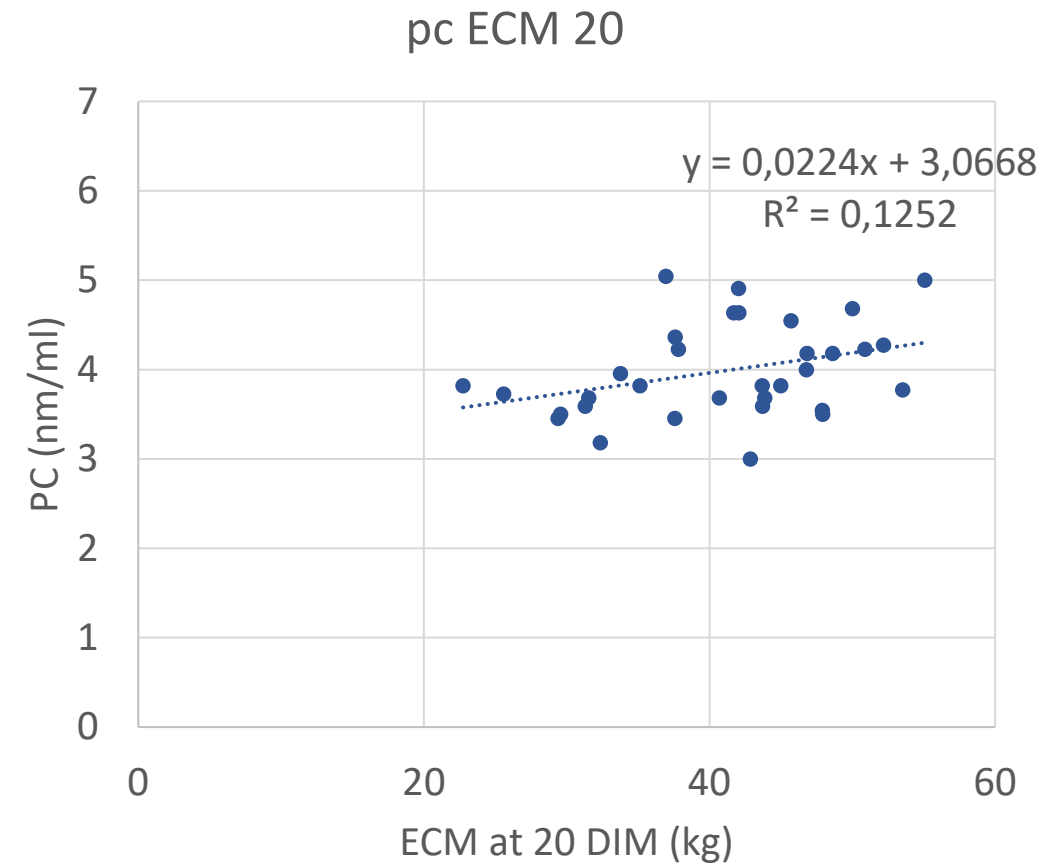
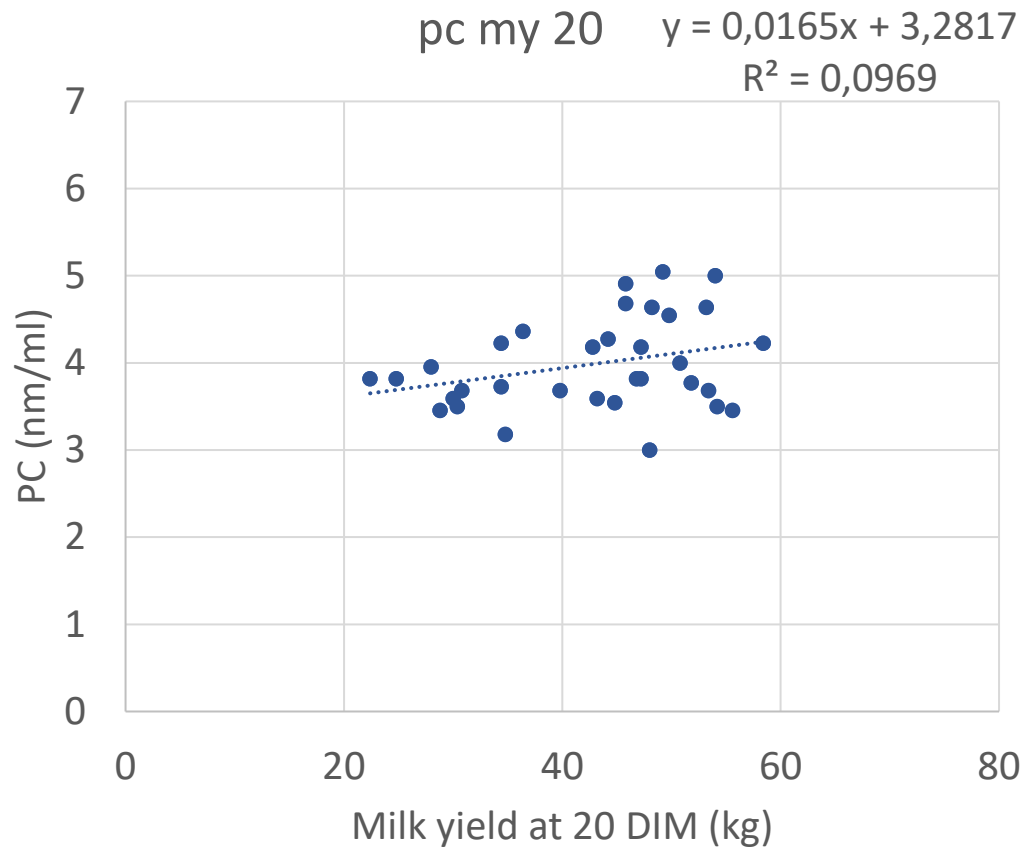
RESULTS: FRAP and ABTS and MY at 20 DIM

- At 20 DIM, ABTS and FRAP appeared negatively correlated with MY ($r=-0.324$; $p=0.033$ and $r=-0.345$; $p=0.025$) and PC positively correlated with MY ($r=0.311$; $p=0.039$) and ECM ($r=0.354$; $p=0.022$).



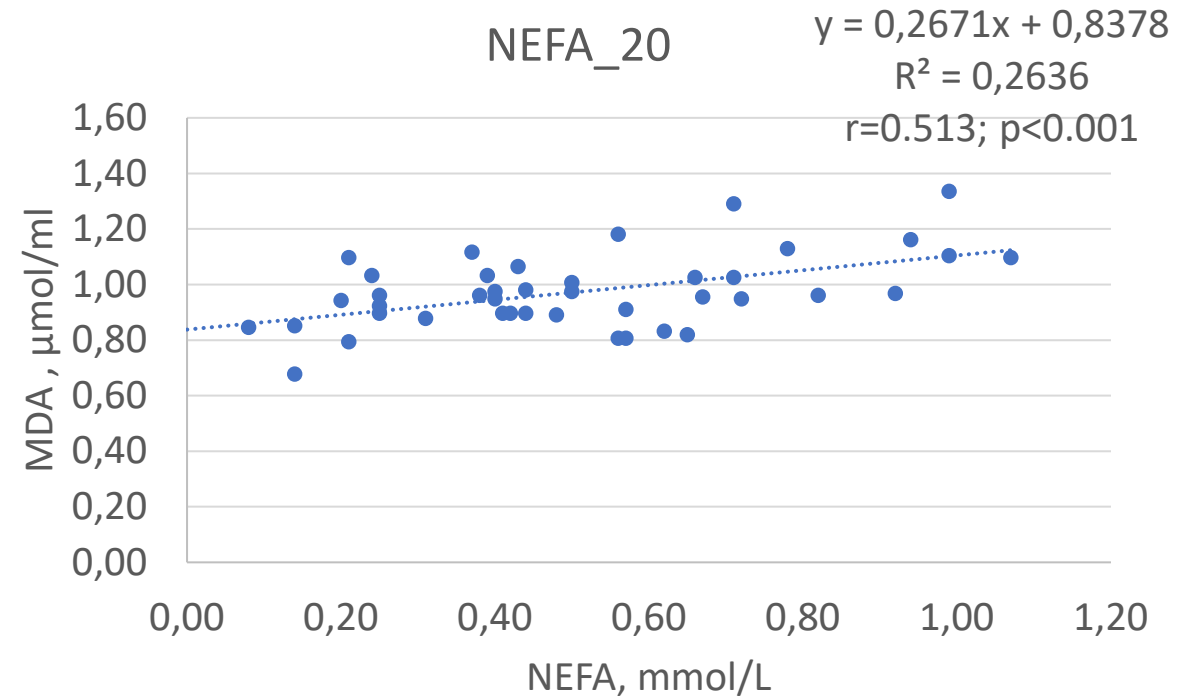
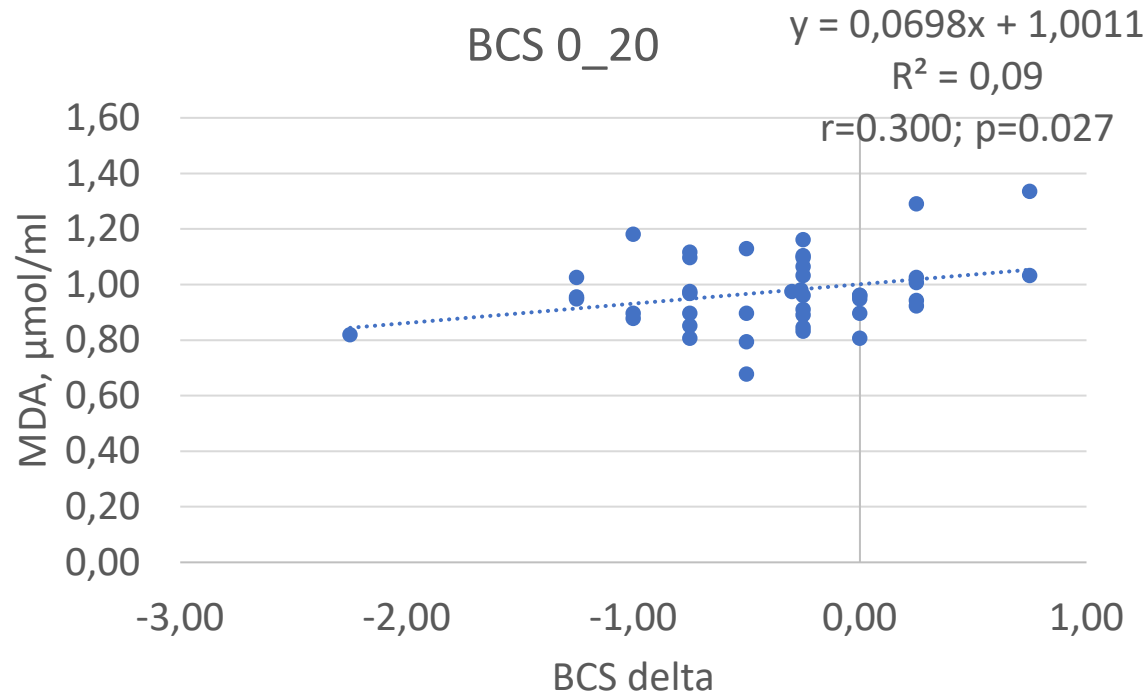
RESULTS:

- At 20 DIM: PC positively correlated with MY ($r=0.311$; $p=0.039$) and ECM ($r=0.354$; $p=0.022$).



RESULTS:

- At -20, MDA positively correlated with NEFA ($r=0.513$; $P<0.001$) and BCS loss from parturition ($r=0.300$; $p=0.027$)



CONCLUSIONS

- From a nutritional perspective, the use of MinVit free choice blocks could be a valid alternative to conventional additives
- Oxidative stress is increased by catabolic and synthetic activities in dairy cattle.
- Adjust the MinVit supplementation based on individual needs?



THANKS FOR YOU ATTENTION!



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