EQUI TEST
Physiologie du Sport

EFFECTS OF DHA SUPPLEMENTATION ON CARDIAC RESPONSE IN TROTTERS: A DOUBLE-BLIND PLACEBO-CONTROLLED STUDY

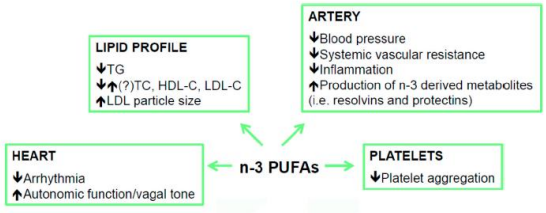
C. LELEU[1], A.S. MAILLIOT PIVAN[1], S. JOTHY[2], E. ZOH

1 Equi-Test, Grez-en-Bouère, France
2 Royal Horse, Saint Nolff, France
3 Neovia, Saint Nolff, France

Funding sources : Neovia
Conflicts of interest : SJ and EZ are employed by Neovia

INTRODUCTION AND AIM

- In humans, increasing proof of evidence of the influence of n3 PUFA on cardio-vascular health



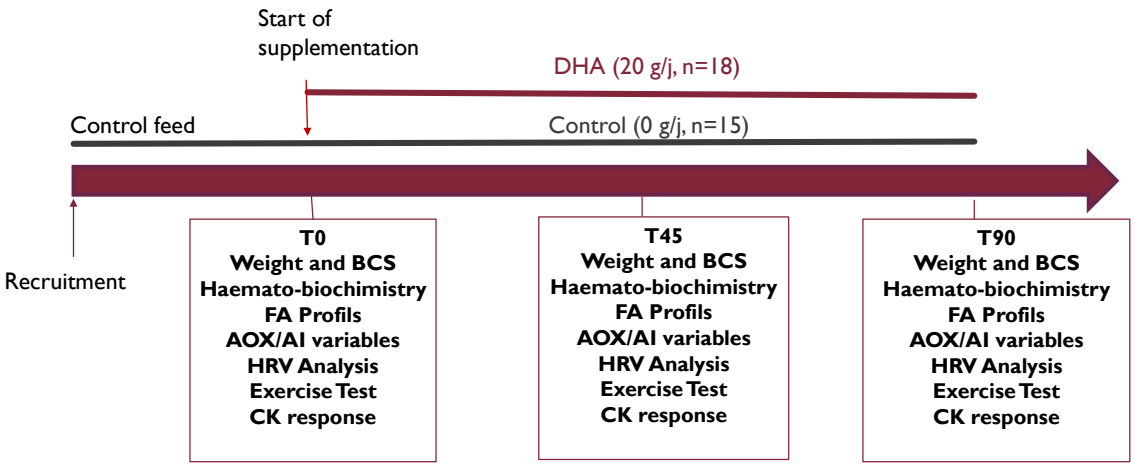
- In humans, many researchers have hypothesized that Omega-3 FA supplementation would provide benefits during endurance exercise by improving cardiac function or modulating oxygen consumption.

The aim of the study was to evaluate the effects of a 90-day oral supplementation with DHA on cardiac response in trotters under training.

MATERIALS AND METHODS

- Thrity three young Trotters of 3 y-old under training (5 stables)
- Randomised, controlled, double blind trial
- Pellets enriched with DHA from algaes (DHA group, n= 18, daily dose DHA: 20 g/j)
- Same pellets not enriched (C group, n= 15).

MATERIALS AND METHODS



MATERIALS AND METHODS

- Before supplémentation (T0), after 45 days (T45) and after 90 days (T90):

Evaluation of plasma DHA concentration (HPLC)

Resting HRV (Polar Team Pro)

- Standardized exercise tests at submaximal and maximal speeds,

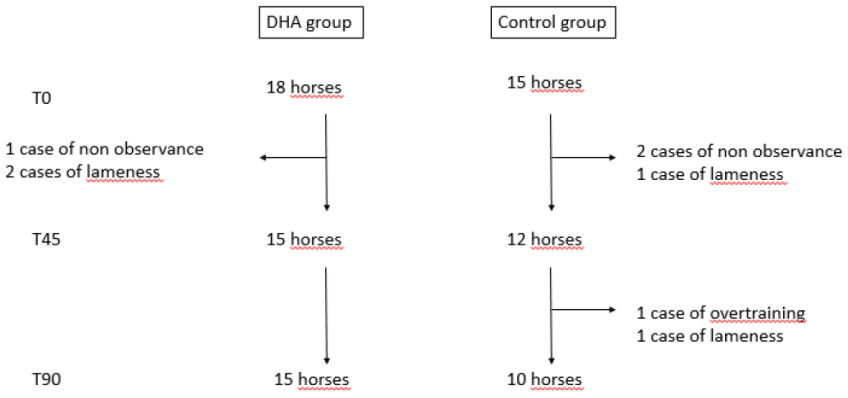
Calculation of V200 (velocity for HR of 200 bpm), of Vla4 (velocity for blood lactate concentration of 4 mmol/l) and measurement of max velocity and HR.

- Statistical analysis

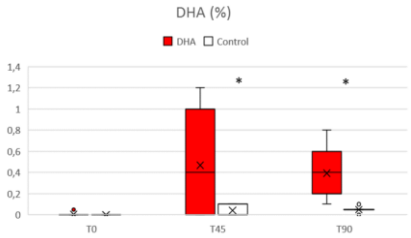
Repeated measurements analysis of variance

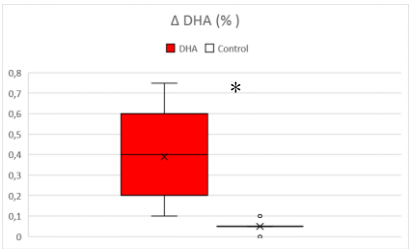
$P < 0,05$

RESULTS : FLOW CHART



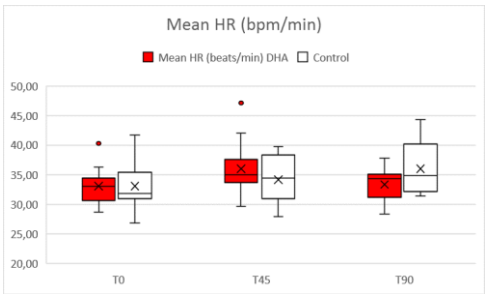
RESULTS : PLASMA DHA

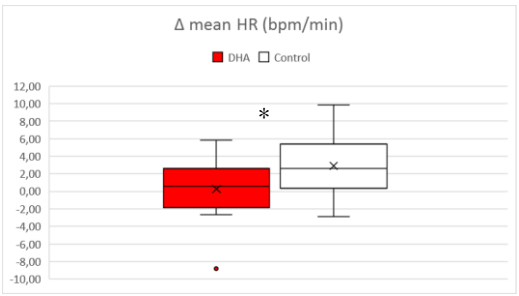




- Significant increase of plasma DHA at T45 and T90
- Plasma DHA undetectable or quasi in control group on the whole period

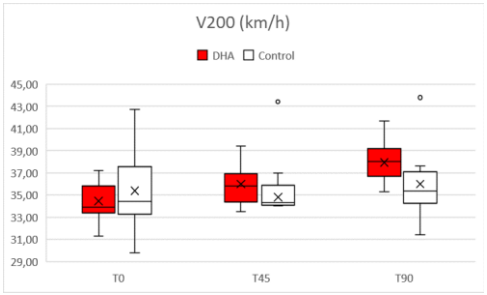
RESULTS : RESTING HR

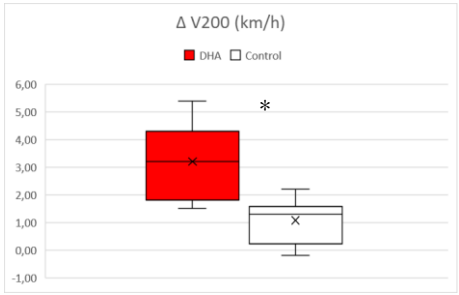




- Significant increase of mean resting HR in control group between T0 and T90 (+ 3 bpm)
- Mean resting HR constant in DHA group

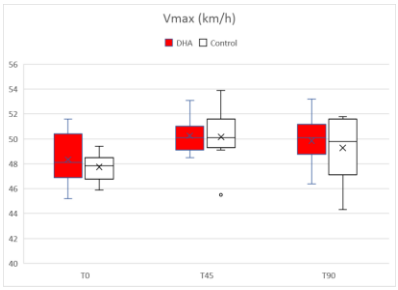
RESULTS : HR DURING SUB MAXIMAL EXERCISE

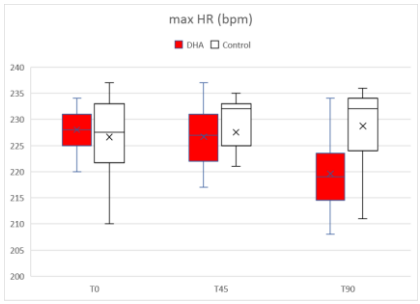




- Significant increase of V200 in both groups between T0 and T90
- Significantly higher increase of V200 in DHA group compared to control

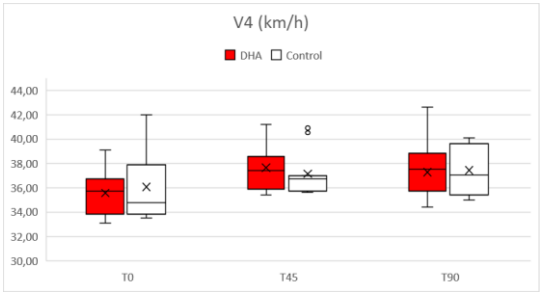
RESULTS : MAX HR

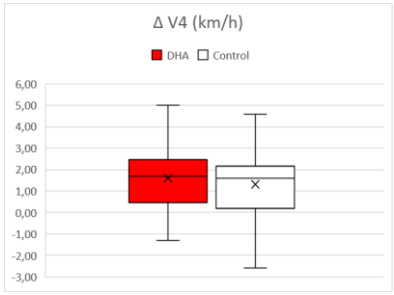




- Significant increase of Vmax between T0 and T45 with no treatment effect
- Significant decrease of max HR in DHA group (p = 0,01)

RESULTS : LACTATES



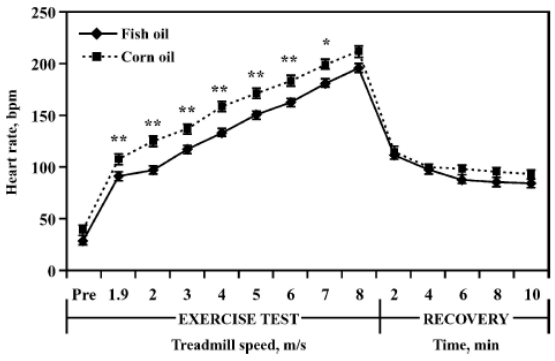


- Increase of V4 between T0 and T90 but similar in both treatment groups

DISCUSSION

DHA supplementation (20g/d) during 90 d:

- Increase of plasma DHA concentration,
- Relative or absolute decrease of HR at rest and during sub max and max exercise
- Signification correlations between the two
- No change in lactates metabolism
- Consistant with a study by O'Connor et al. 2004 (cross over trial, 10 TB, 60 d with 14 g/d of DHA)



DISCUSSION

DHA supplementation : decrease of HR in humans

Possible mecanisms:
- Modification of myocardial FA composition (ion channels and Ca regulation)
- Changes in intrinseque pace maker
- Production relaxing endothelium factors (vascular resistance)
- Decrease blood viscosity
- Effect on production of catecholamins

DISCUSSION

Effect on performance ?

- Endurance horses
- Sprinter and middle distance runners ?

Rat models :
Increase of endurance capacity (mitochondrial function)

Human athlets :
Muscle protection / decrease of DMSO
Decrease of energetic cost by changing O_2 consumption (cyclists)

CONCLUSION

Impact of micronutrition of the response to exercise

Further investigations needed :

- Influence on performance ?
- Dose/ effect trials ?
- Long term effects ?
- Behaviour trials ?

THANK YOU FOR YOUR ATTENTION