

**FOR-REPRO STALLION &
FOR-RECOVERY TECHNICAL SHEET**

EFFECT OF DAILY SUPPLEMENTATION WITH UBIQUINOL ON MUSCLE COENZYME Q10 CONCENTRATIONS IN THOROUGHBRED RACEHORSES

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STUDY SUMMARY

This randomised, controlled crossover study is the first report documenting concentrations of CoQ10 in the skeletal muscle of equine athletes and the effects of supplementation on these concentrations.

STUDY PARTICIPANTS:

7 fit Thoroughbred racehorse geldings (5-9 yrs, 461- 542 kg).

DIET AND SUPPLEMENTATION REGIME:

All horses were fed a diet consisting of twice daily alfalfa and grass hay plus a daily ration of grain each morning. Ubiquinol CoQ10 was given with the grain.

Three horses received 1g Ubiquinol CoQ10 orally for 3 weeks followed by 21 days without the supplement (Group A).

Three others had a 3 week unsupplemented period followed by 3 weeks of supplementation with 1 g Ubiquinol CoQ10 (Group B).

A seventh horse served as a negative control, receiving no Ubiquinol CoQ10 but otherwise fed the same diet.

EXERCISE REGIME:

Pre-study intensive training for 14 weeks and continued with regular levels of moderate to intense (exercise to fatigue) treadmill exercise throughout the study in order to maintain the same high level of fitness. This exercise schedule was independent of the muscle sampling protocol.

SAMPLING AND SAMPLE ANALYSIS:

Middle gluteal muscle biopsies were obtained using Bergstrom biopsy needles at day 0 (baseline), and after 10 and 21 days of the supplementation and non-supplemented periods. All biopsies were taken from the right side 12-13 cm caudal to the wing of the ileum and 15 cm lateral to the dorsal midline. Biopsies were frozen in liquid nitrogen immediately after collection and stored at -80°C until they were transported to the laboratory on dry ice for analysis. Muscle CoQ10 concentration was determined by HPLC with UV detection at 275 nm.

STATISTICAL ANALYSIS:

Data (mean ± standard deviation) were analysed by 2-way RM ANOVA for effects of supplementation and time. Significance was set at $P < 0.05$. Due to the small number of subjects, a tendency or trend was deemed to exist when $0.05 < P < 0.10$.

RESULTS:

Daily supplementation with Ubiquinol CoQ10 resulted in a doubling or greater of non-supplemented concentrations in 5 of the 6 horses. Despite individual variances in magnitude of response to supplementation, CoQ10 concentrations in the gluteal muscle following 10 and 21 days of supplementation were still higher than any pre-supplementation value for all horses in this study.

Table 1. Concentrations of coenzyme Q10 (pmol/mg) in the middle gluteal muscle of 7 fit Thoroughbreds who were regularly exercised at varying intensities, including supramaximally, before, and 10 and 21 days after daily supplementation (suppl) with 1g oral Ubiquinol CoQ10.¹

STATISTIC	NON-SUPPLEMENT	10 DAYS SUPPL	21 DAYS SUPPL
Mean	458	977 ^a	867 ^a
Standard deviation	156	227	194
Median	407	696 ^b	724 ^b
IQR	367-579	606-1,653	558-1,248
95% confidence interval	359-557	393-1,461	327-1,407
Minimum	279	441	511
Maximum	810	1,740	1,602

1. IQR = interquartile range; superscripts reflect concentrations that were significantly greater than values in the same horses prior to being supplemented ($p < 0.05$).

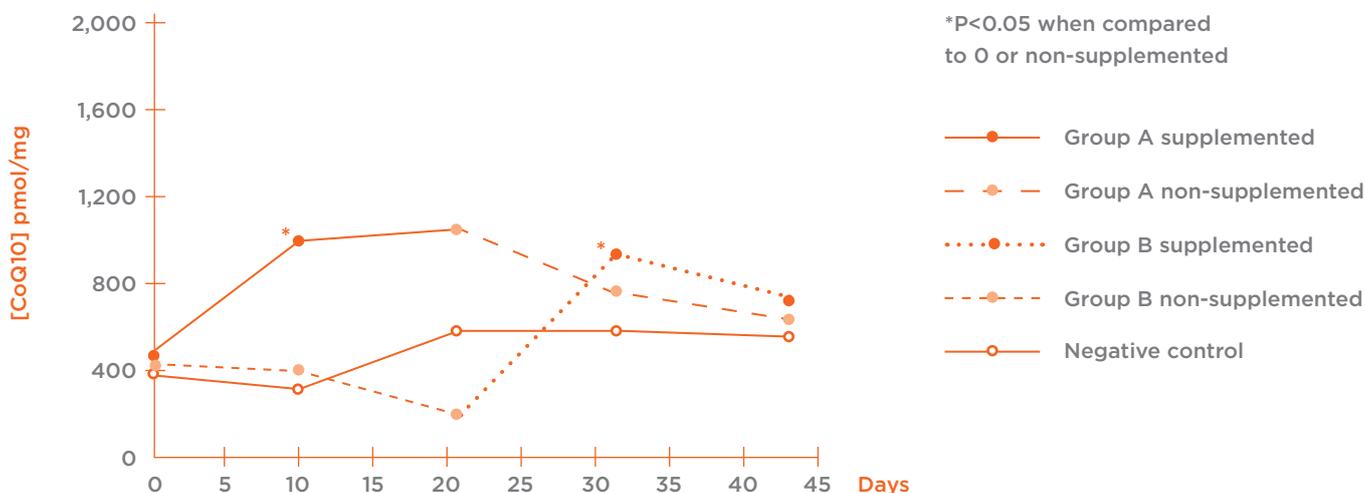


Figure 1. Changes in gluteal muscle CoQ10 concentrations in 7 fit Thoroughbred horses in response to daily oral supplementation of their diet with 1g Ubiquinol CoQ10.

CONCLUSION

Daily dietary supplementation with 1g Ubiquinol CoQ10 increases gluteal muscle CoQ10 concentration in fit Thoroughbreds. Gluteal muscle CoQ10 is steadily utilised by racehorses in training, as demonstrated by decreases in gluteal CoQ10 concentrations when supplementation was discontinued.

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