FORAN®
EQUINE

PERFORMANCE

RECOVERY SUPPORT

A unique formulation of Coenzyme Q10/Ubiquinol

Foran Equine Recovery Support is a unique formulation of Ubiquinol, the most bioavailable version of Coenzyme Q10.

Coenzyme Q10 has been shown to decrease oxidative stress during exercise in all forms of equine competition, particularly those demanding stamina. Reduced oxidative stress therefore improves endurance and prevents muscle damage, thus aiding recovery from exertion.

RECOVERY SUPPORT

A unique formulation of Coenzyme Q10/Ubiquinol

FOR EQUINE ATHLETES

COENZYME Q10 & EXERCISE

Coenzyme Q10 supplementation has been scientifically proven to have benefits during and after exercise;

During strenuous exercise, racing and competition

- Improved energy production
- Reduced effort-induced oxidative stress
- Improved oxygen consumption in muscle

After strenuous exercise, racing and competition

- Aids recovery
- Helps maintain condition and promotes rapid return to peak performance
- Enables more frequent competitive appearances throughout the season

Coenzyme Q10 generates energy in cells, especially in the mitochondrion[1] where it has a crucial role in the electron transport system. Strenuous exercise and racing/competition cause oxidative stress. As well as generating energy, Coenzyme Q10 molecules donate and accept stress inducing OH- "free radicals" (ROS in the figure below) produced during exertion, thus acting as a very powerful antioxidant, and inhibiting exercise-induced tissue damage. (Figure 1).

Coenzyme Q10 also affects oxyhaemoglobin dissociation[2], allowing greater oxygen use, lower lactate production and improved ATP production in peripheral muscle, in the myocardium and in respiratory muscle, and thus delays the onset of fatigue[3] and promotes recovery.

Supplementation is needed where there is increased consumption or reduced synthesis of Coenzyme Q10. Strenuous training and galloping of horses has been shown to consume Coenzyme Q10 which must then be replaced (Figure 2). Hence a justification for supplementing the diet.

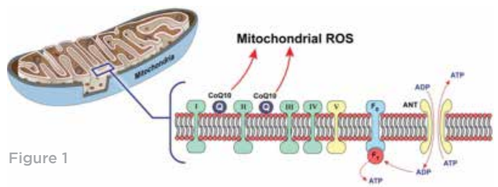
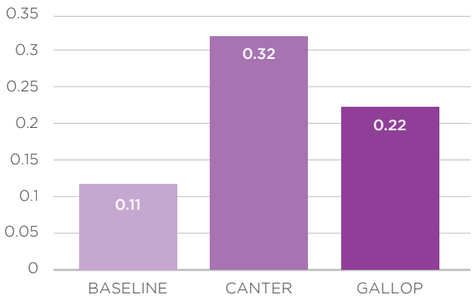


Figure 1

FAST EXERCISE SIGNIFICANTLY REDUCES COENZYME Q10 IN THOROUGHBREDS

Low dose / 1.9g /day



High dose / 3.4g /day

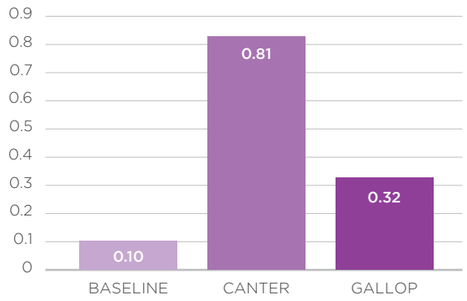


Figure 2

(adapted from Sinatra et al 2014)

Interestingly, Thoroughbred racehorses may have been inadvertently selected to be relatively Coenzyme Q10 deficient when compared to other mammals (Figure 3) and an inborn error in the Coenzyme Q10 biosynthetic pathway has been identified[4].

COENZYME Q10 DEFICIENCY

Normal Q10 ug/ml in blood in man & animals

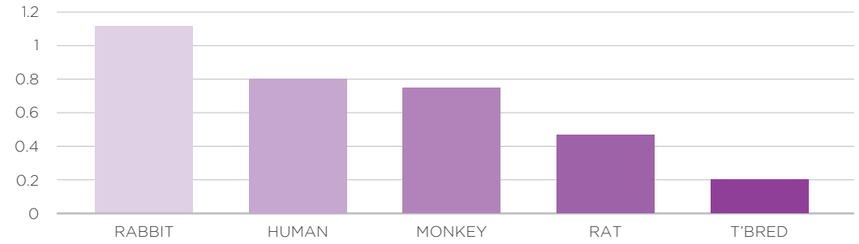


Figure 3

(adapted from Sinatra et al 2013)

Bioavailability of the many commercially available sources of Coenzyme Q10 is very variable as are the concentrations and purity of these products. The serum concentration of Coenzyme Q10 is higher in the fed compared to the fasting condition because food intake enhances absorption. Bioavailability is a reflection of the amount of Coenzyme Q10 absorbed from the intestines. The great majority of Coenzyme Q10 that enters the body is absorbed as Ubiquinol, thus explaining the superior bioavailability of Foran Equine Recovery Support. Pharmacologic AUC/Area under the curve absorption studies of Coenzyme Q10 and research into the effects of daily sampling of horses given the unique Ubiquinol formulation of Coenzyme Q10 in feed, have shown that increased plasma Coenzyme Q10 levels result from this form of supplementation and that after a three week "priming" period, significantly improved Coenzyme Q10 status can be attained (Figure 4. Bayly and Leadon 2017).

EFFECTS OF COENZYME Q10 SUPPLEMENTATION IN THOROUGHBREDS

Q10 in blood pre & post 1g/day

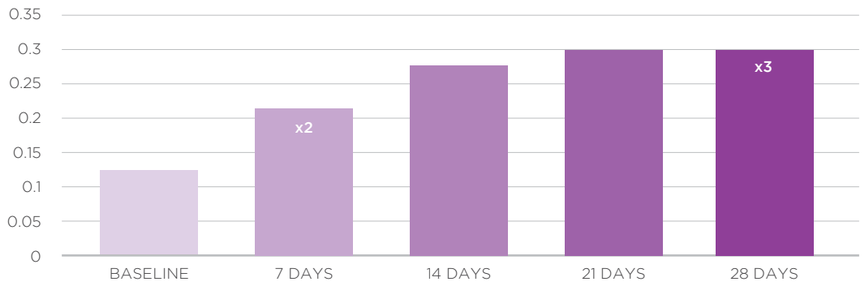


Figure 4

(Leadon & Bayly - unpublished data 2014)

Critically, for the endurance horse racing industry and all other equine stamina demanding events, Coenzyme Q10 supplementation has been shown to decrease oxidative stress during exercise, thus improving exercise endurance[5]. Administration of Coenzyme Q10 before intense exercise also prevents muscle damage induced by oxidative stress and inflammation[6].

INSTRUCTIONS FOR PROPER USE:

Foran Equines Recovery Support containing Ubiquinol Coenzyme Q10 is not a prohibited substance under the rules of racing or competition. Nor is it a prohibited substance under WADA (World Anti-Doping Agency). It is safe, tolerable and palatable.

15g (1 scoop) should be administered and mixed into feed daily.

Results are likely to be seen from 3 weeks onwards. Discontinuation of supplementation results in a gradual decrease in plasma concentrations of Coenzyme Q10.

REFERENCES

1. **Ernster, L; Dallner, G (1995). Biochemical, physiological and medical aspects of ubiquinone function.** Biochimica et Biophysica Acta 1271 (1): 195–204.
2. **Sawa H, Takezawa H 1981. Influence of cellular metabolism on coenzyme Q-10.** In Coenzyme Q10 Report (Yakamura Y, Kimura E, eds) Elsai Medical View; Tokyo.
3. **Kilmartin JV, Rossi BL 1973. Interaction of hemoglobin with hydrogen ions, carbon dioxide and organic phosphates.** Physiol Rev 53: 836-890.
4. **Bergamini C, Moruzzi N, Sblendido A, Lenaz G, Fato R (2012) A Water Soluble Coenzyme Q10 Formulation Improves Intracellular Distribution and Promotes Mitochondrial Respiration in Cultured Cells.** PLoS ONE 7(3): e33712.
5. **Okudan N, Revan S, Balci SS, Belviranli M, Pepe H, Gökbel H. Effects of Coenzyme Q10 supplementation and swimming training on exhaustive exercise-induced oxidative stress in rat heart.** Bratisl Lek Listy. 2012; 113(7):393-9.
6. **Díaz-Castro J, Guisado R, Kajarabille N, García C, Guisado IM, de Teresa C, Ochoa JJ. Coenzyme Q10 supplementation ameliorates inflammatory signaling and oxidative stress associated with strenuous exercise.** Eur J Nutr. 2012 Oct; 51(7):791-9.

FIGURE LEGENDS

Figure 1. Roles of Coenzyme Q10 in mitochondrial bioenergetics and mitochondrial ROS reduction (from J Hiebert, Q Shen, J Pierce. Application of Coenzyme Q10 in Clinical Practice. The Internet Journal of Internal Medicine. 2012 Volume 9 Number 2.)

Figure 2. Effect of fast galloping exercise on plasma Coenzyme Q10 levels of horses. (from S. Sinatra, S. Jankowitz, R. Chopra, H. Bhagavan. Plasma Coenzyme Q10 and Tocopherols in Thoroughbred Race Horses: Effect of Coenzyme Q10 Supplementation and Exercise. J Eq Vet Sci 2014 Vol 34, 265-269

Figure 3. Resting plasma levels of Coenzyme Q10 in different mammalian species, reflecting the comparatively low levels found in horses. (derived from data cited and presented in S. Sinatra, R. Chopra, S. Jankowitz, D. Horohov, H, Bhagavan. Coenzyme Q10 in Equine Serum: Response to Supplementation. J Eq Vet Sci 2013 Vol 33, 71-73.)

Figure 4. Effect of daily supplementation of Thoroughbreds with Coenzyme Q10 (QHP30) indicating 3-fold increase in plasma concentrations after 3 weeks. Concentrations decreased 2 weeks after supplementation was discontinued.

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