# ANALYSIS FOR COENZYME Q IN PALM OIL

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Coenzyme $Q_{10}$ is a bioactive component known as a potent antioxidant (Mellons and Tappel, 1996; Lipshutz *et al*., 2002; Lenaz, 1985a, b). Recent studies have shown that it is able to prevent heart disease as well as slows the degradation due to Parkinsons' disease. Although naturally produced in the body, the productive mechanism degrades with age. Sources of coenzyme $Q_{10}$ include algae as well as vegetable oils, such as palm oil (Hamid *et al*., 1995; Choo *et al*., 2005; Ng *et al*., 2005).

In view of the benefits of coenzyme $Q_{10}$, it is increasingly taken as a nutritional supplement. The nutraceuticals and cosmetics industries have proliferated with products claimed to contain coenzyme $Q_{10}$.

Being a newly important ingredient in nutraceuticals, cosmetics and personal care products, analyses for coenzyme $Q_{10}$ are needed to determine its concentration for quality control of the products and production process.

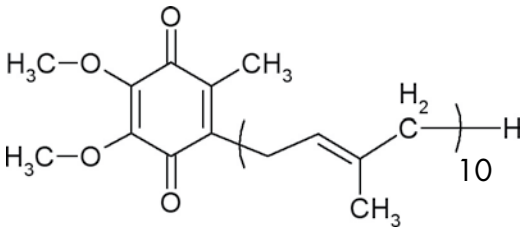


*Figure 1. Molecular structure of coenzyme $Q_{10}$.*

## ANALYSES OF COENZYME $Q_{10}$

The MPOB analysis for coenzyme $Q_{10}$ uses supercritical fluid chromatography (SFC); a safe, non-toxic and environment-friendly method. It is necessary to first know the nature of the sample *i.e.*, solubility in polar/non-polar solvents, presence of hazardous compounds and major component(s) *etc*. A report will be provided for each sample tested.

*Figure 2. Supercritical fluid chromatography system.*


*Figure 3. Coenzyme $Q_{10}$.*

## REFERENCES

CHOO, Y M; NG, M H; MA, A N and YUSOF BASIRON (2004). Production of Coenzyme $Q_{10}$ from crude palm oil. *MPOB Information Series No. 239*.

HAMID, H A; CHOO, Y M; GOH, S H and KHOR, H T (1995). The ubiquinones of palm oil. *Nutrition,*

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*Lipids, Health and Disease* (Ong; Niki and Packer eds). AOCS Press, USA. p. 122-128.

LENAZ, G (1985a). A biochemical rationale for the therapeutic effects of coenzyme Q. *Coenzyme Q* (Lenaz G ed.). John Wiley & Sons Ltd. p. 474-475.

LENAZ, G (1985b). *Coenzyme Q: Biochemistry, Bioenergetics and Clinical Applications of Ubiquinone*. Wiley, New York.

LIPSHUTZ, B H; MOLLAND, P; PFEIFFER, S S and CHRISMAN, W (2002). A short highly efficient synthesis of coenzyme $Q_{10}$. *J. Amer. Chem. Soc. Vol. 124*: 14282-14283.

MELLONS, A and TAPPEL, A L (1996). The inhibition of mitochondrial peroxidation by ubiquinone and ubiquinol. *J. Biol. Chem., 241*: 4353-4356.

NG, M H; CHOO, Y M; MA, A N; CHUAH, C H and MOHD ALI HASHIM (2005). Methods for the analyses of minor components in palm oil. *Proc. of the PIPOC 2005 International Palm Oil Congress*. Sunway Resort Hotel, Malaysia. 25-28 September 2005.

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