

STABILITY AND BIOACCESSIBILITY OF NANOENCAPSULATED COENZYME Q10 IN YOGURTS

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Coenzyme Q10 (CoQ10) is an antioxidant essential for the mitochondrial electron transport chain. Although CoQ10 is naturally synthesized by human body, its production is reduced by ageing or genetic failure, requiring frequent ingestion through supplements or fortified foods. Due to its hydrophobicity and low bioaccessibility, the successful incorporation of CoQ10 in food matrices depend on the application of strategies like the nanoencapsulation in lipid carriers. In order to verify the stability and bioaccessibility of nanoencapsulated CoQ10 in yoghurts, Ynano Q10 (YQ10 - nanoemulsion developed by Yosen Nanotechnology, containing 5% of CoQ10) was incorporated in different concentrations (0, 1 and 7%, w/w) to commercial plain products. The samples were evaluated in different days of storage regarding CoQ10 concentration and color (instrumental colorimetry). Besides, the yogurts and YQ10 were subjected to in vitro digestion and subsequent CoQ10 quantifications. The results revealed a good stability of the encapsulated bioactive throughout 30 days of storage. The bioactive concentrations at 1st day of storage were $5.797\% \pm 0.178$, $0\% \pm 0$, $0.060\% \pm 0.0015$ and $0.422\% \pm 0.047\%$, for YQ10, blank yogurt, 1% YQ10 yogurt and 7% YQ10 yogurt, respectively, while, at the 30th day were $4.582\% \pm 0.325$, $0\% \pm 0$, $0.047\% \pm 0.0041$ and $0.314\% \pm 0.022$. Regarding the colorimetric parameter chroma, at 1st day of storage the values were 40.63 ± 0.79 , 4.83 ± 0.03 , 9.30 ± 0.06 and 23.19 ± 0.11 for YQ10, blank yogurt, 1% YQ10 yogurt and 7% YQ10 yogurt, while at 30th day were 34.31 ± 1.18 , 4.03 ± 0.01 , 10.40 ± 0.13 and 22.59 ± 0.02 . The values of Hue angle at 1st day were 79.14 ± 0.54 , 107.74 ± 1.00 , 102.75 ± 0.14 and 93.68 ± 0.07 for YQ10, blank yogurt, 1% YQ10 yogurt and 7% YQ10 yogurt, while at 30th day were 79.24 ± 0.60 , 109.78 ± 0.32 , 101.75 ± 0.68 and 94.82 ± 0.14 . The results obtained after the in vitro digestion indicated the presence of bioactive even after the gastric and intestinal steps, revealing that the nanoencapsulation was not only effective in protecting the CoQ10 in yoghurts, but also in increasing its bioaccessibility.