1: Food Addit Contam. 1996 Jan;13(1):5-11. Related Articles, Links

Effect of organic synthetic food colours on mitochondrial respiration.

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Eleven organic synthetic dyes, currently or formerly used as food colours in Brazil, were tested to determine their effect on mitochondrial respiration in mitochondria isolated from rat liver and kidney. The compounds tested were: Erythrosine, Ponceau 4R, Allura Red, Sunset yellow, Tartrazine, Amaranth, Brilliant Blue, Blue, Fast Red E, Orange GGN and Scarlet GN. All food colours tested inhibited mitochondrial respiration (State III respiration, uncoupled) supported either by alpha-ketoglutarate or succinate. This inhibition varied largely, e.g. from 100% to 16% for Erythrosine and Tartrazine respectively, at a concentration of 0.1 mg food colour per mitochondrial protein. Both rat liver and kidney mitochondria showed similar patterns of inhibition among the food colours tested. This effect was dose related and the concentration to give 50% inhibition was determined for some of the dyes. The xanthene dye Erythrosine, which showed the strongest effect, was selected for further investigation on mitochondria in vivo.

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